

Kinetix Motion Control



Rotary Motion

- MP-Series
- TL-Series
- HPK-Series
- RDD-Series

Linear Motion

- MP-Series
- TL-Series
- LDC-Series
- LDL-Series

Logix Motion Modules

- 1756
- 1768

Servo Drives

- 2092 2097
- 2093 2098
- 2094 2099

Motion Accessories

- 2090
- 1394



Important User Information

This guide has been developed as a quick reference tool for Allen-Bradley motion controls and systems. It is not intended to replace user manuals or technical documentation supplied with our Allen-Bradley equipment, which should be referred to for actual installation, connection, operation, and maintenance of Allen-Bradley equipment.

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to ensure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes, and standards.

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Contents of This Guide

This selection guide provides features, specifications, and dimensions for selecting Kinetix Motion Control servo drives, motors, actuators, and accessory components.

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This selection guide contains new products and updated information.

New and Updated Information

This revision contains product specifications for these new Kinetix motion control servo drives, motors, actuators, and accessory items:

Section	Changes	Page
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	Cables, performance specifications, and force/velocity curves for Bulletin MPAR, Bulletin TLAR, and Bulletin MPAI electric cylinders; LDC-Series and LDL-Series linear motors; and compatible drive families	

Notes:

What Is Kinetix Integrated Motion?

Kinetix Integrated Motion solutions are a key element of the Rockwell Automation Integrated Architecture platform. The Integrated Architecture platform brings together an outstanding range of pre-integrated systems including Logix controllers, NetLinx-based networks, Kinetix Integrated Motion, ViewAnyWhere visualization platforms, Intelligent Motor Control, and advanced software tools including RSLogix 5000 Enterprise series software.

Kinetix Integrated Motion solutions offer seamless integration of the Allen-Bradley Logix controllers, SERCOS interface digital-motion modules, Allen-Bradley servo drives, motors and actuators, and extensive application knowledge – to make integrated motion the new standard for machine control.

Kinetix Integrated Motion servo-drive families include the Kinetix 2000, Kinetix 6000, Kinetix 6200, Kinetix 6500, Kinetix 7000, and Ultra3000-SE, letting you select the drive that matches the specific needs of your application. They are seamlessly integrated into the Logix architecture and communicate with the CompactLogix and ControlLogix controller platforms. All Kinetix drives support high-resolution feedback encoders for improved system performance and have built-in support for multi-turn absolute encoders to maintain position during power loss. As part of the Kinetix Integrated Motion solution, they offer:

- a single, comprehensive software package for simplified programming and development.
- plug and play configurability for fast integration and start up.
- superior diagnostic capabilities for reduced downtime.
- reduced wiring for lower installation costs.
- easy, intuitive access to data for process optimization.
- intuitive, tag-based addressing for reduced design time.

Kinetix Integrated Motion uses Smart Motor Technology to provide automatic identification of correct motor-to-drive connectivity, reducing commissioning time. Accuracy and velocity stability are increased with more than two million position counts per motor revolution. A variety of Allen-Bradley motors and actuators are available to provide the ideal combination of performance and cost-effectiveness for your application. Motors offer continuous torque as low as 0.10 N•m (0.85 lb•in) and up to 955 N•m (8452 lb•in). Linear actuators offer peak forces of up to 14,679 N (3300 lb).

Motion Analyzer Software

Motion Analyzer software is a comprehensive motion-application sizing tool used for analysis, optimization, selection, and validation of your Kinetix motion control system.

Motion Analyzer software facilitates the machine design and investigation process by making it fast, simple, and accurate. Motion Analyzer software offers a fact-based decision path and design optimization approach that enables machine builders to:

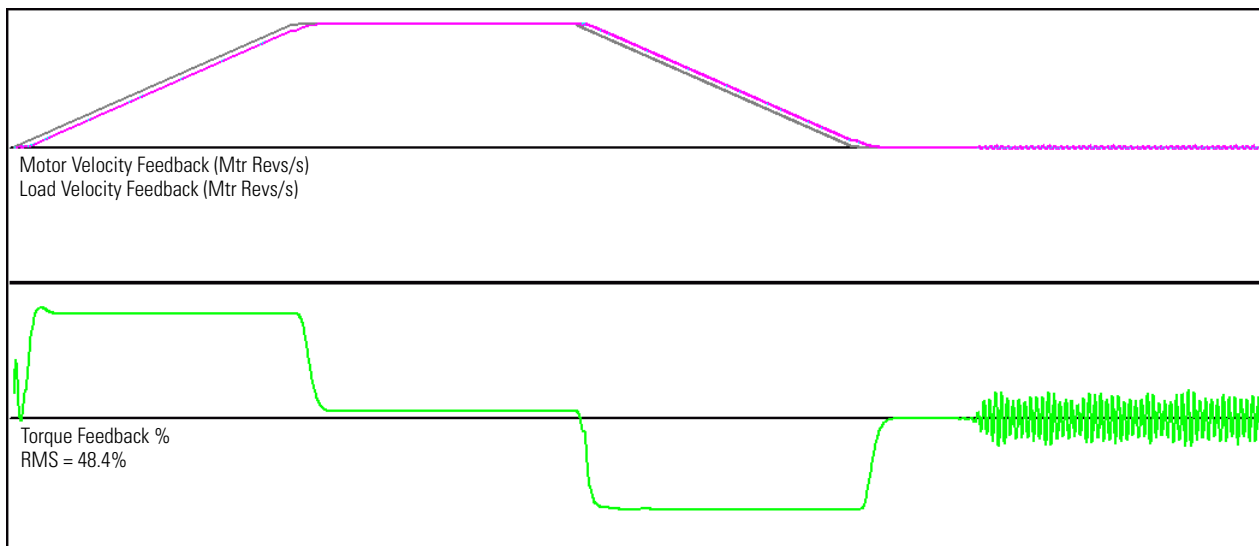
- reduce motion system design risk.
- reduce time from machine design to shipment.
- optimize motion control system cost and size.
- enhance machine performance and reliability.
- create a bill of materials.

Motion Analyzer software includes the full range of Kinetix Motion Control products and features:

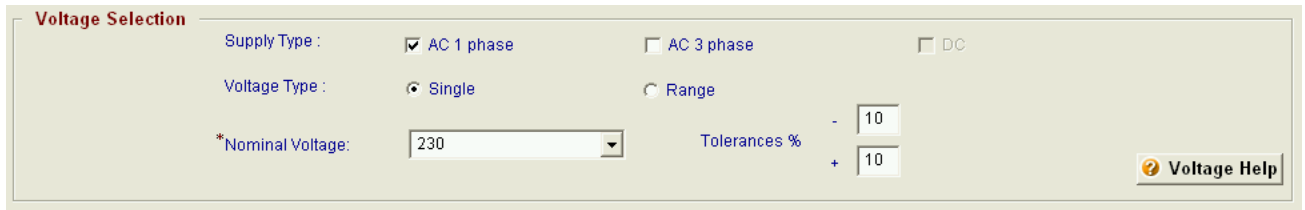
MP-Series Electric Cylinders - deliver off-the-shelf linear motion without the need to search through catalogs looking for suitable ballscrews, timing belts, pulleys, and bearings. No mechanical data to enter, just input load information and move profile. Output even includes an L_{10} life estimate.



Tuning simulation - is a tool to help predict how your machine will perform under real-world conditions. Emulates tuning an axis in RSLogix 5000 software (including Auto-tune) and then simulates the behavior of the load, motor, and drive. Factors-in the mechanical compliance or backlash to give a realistic simulation.



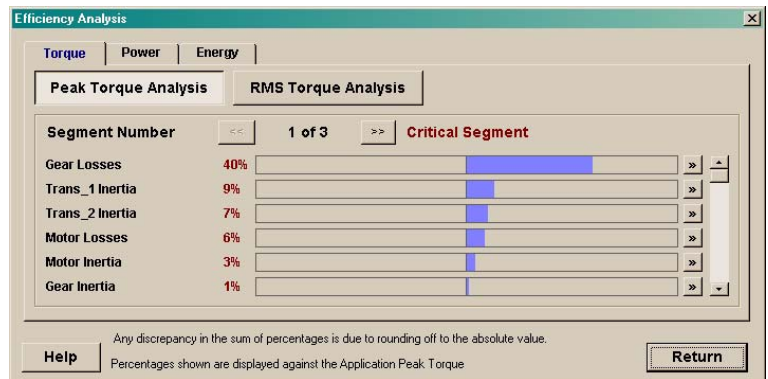
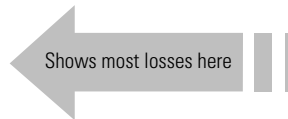
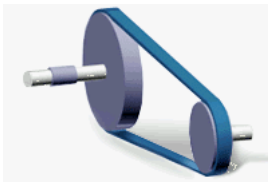
Variable mains supply analysis - is especially useful for machine builders exporting machines overseas.



Motor thermal performance prediction - takes into account the motor ambient temperature to verify performance in extreme-heat conditions.



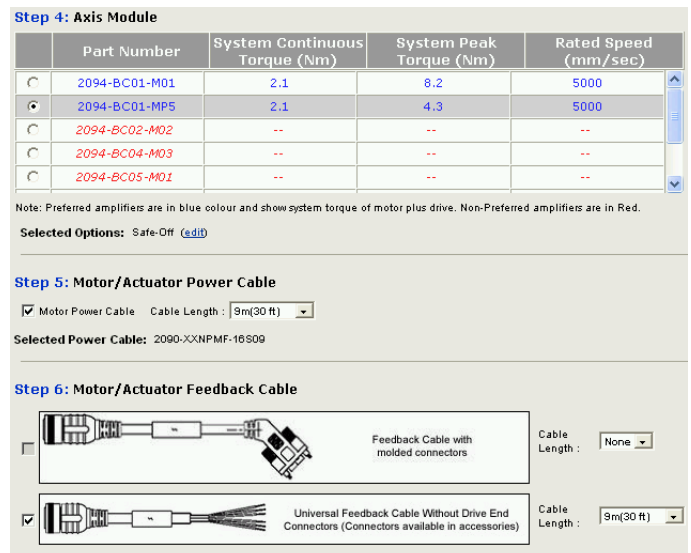
Efficiency analysis - provides an understanding of where the torque produced by the motor is consumed.



Motion Analyzer software also helps generate a bill of materials (BOM). With its rule-based approach, selecting the right drive, motor, cables, I/O connectors, and other accessory items is fast and error free.

You can have a system specified as a BOM or have selections based on the results of motor/actuator and drive sizing calculated by Motion Analyzer software.

Once finished, you can print out the BOM or export the BOM file to Microsoft Word or Excel application files.



To download Motion Analyzer software, go to <http://www.ab.com>.

Kinetix Motion Control System Checklist

1 - Start with Motion Analyzer Software

Motion Analyzer software is a comprehensive sizing tool used for analysis, optimization, selection, and validation of your Kinetix Motion Control system. Given any drive and compatible motor/actuator, Motion Analyzer software will provide you with the data to determine the optimum drive and motor/actuator combination for your application.

You can also use Motion Analyzer software to build your bill of materials and receive an itemized list of system components with catalog numbers and product descriptions.

2 - Select System Components

Kinetix Motion Control System Component	Product Family	Chapter	√
Rotary Servo Motors (see features table on page 9)	<ul style="list-style-type: none"> MP-Series Low Inertia Motors MP-Series Medium Inertia Motors MP-Series Food Grade Motors MP-Series Stainless Steel Motors RDD-Series Direct Drive Motors HPK-Series Motors TL-Series Motors 	Chapter 1	
Linear Servo Motors (see features table on page 11)	<ul style="list-style-type: none"> LDC-Series Iron Core Linear Motors LDL-Series Ironless Linear Motors 	Chapter 2	
Linear Actuators (see features table on page 12)	<ul style="list-style-type: none"> MP-Series Integrated Linear Stages MP-Series Integrated Multi-axis Linear Stages MP-Series and TL-Series Electric Cylinders 		
Logix Controllers	<ul style="list-style-type: none"> 1756 ControlLogix Platform 1768 CompactLogix Platform 	Chapter 3	
Servo Drives (see features table on page 14)	Kinetix 300 EtherNet/IP Indexing Servo Drives	Chapter 4	
	Kinetix 6200 and Kinetix 6500 Modular Multi-axis Servo Drives	Chapter 5	
	Kinetix 6000 Multi-axis Servo Drives	Chapter 6	
	Kinetix 2000 Multi-axis Servo Drives	Chapter 7	
	Kinetix 7000 High Power Servo Drives	Chapter 8	
	Ultra3000 Digital Servo Drives	Chapter 9	
	Ultra5000 Intelligent Positioning Servo Drives	Chapter 10	
	Ultra1500 Servo Drives	Chapter 11	
Motion Control Accessories	<ul style="list-style-type: none"> Motor Cables Interface Cables Connector Kits Power Components 	Chapter 12	

3 - Verify System Combinations

Rotary System Combinations, in chapter 13, include cable combinations, system performance specifications tables, connector kit requirements, and torque/speed curves for the optimum drive/motor or drive/actuator combination.

Linear System Combinations, in chapter 14, include cable combinations, system performance specifications tables, connector kit requirements, and force/velocity curves for the optimum drive/actuator combination.

Rotary Servo Motors

Rotary motors (except TL-Series) are UL Recognized components to applicable UL and CSA standards. CE marked for all applicable directives. Refer to <http://www.ab.com> for more information.

MP-Series Servo Motors

Motor Features	MP-Series (Bulletin MPL) Low Inertia Motors	MP-Series (Bulletin MPM) Medium Inertia Motors	MP-Series (Bulletin MPF) Food Grade Motors	MP-Series (Bulletin MPS) Stainless Steel Motors
Main characteristics	<ul style="list-style-type: none"> High torque to size ratio Smart Motor Technology Low rotor inertia 	<ul style="list-style-type: none"> High torque to size ratio Smart Motor Technology Medium rotor inertia Easy migration from 1326AB motors 	<ul style="list-style-type: none"> Combined characteristics of MP-Series low-inertia motors and features specifically designed for food and beverage applications. Low rotor inertia 	<ul style="list-style-type: none"> Specifically designed for hygienic environments for use with high pressure, highly caustic washdown applications. Low rotor inertia
Features	<ul style="list-style-type: none"> 230V and 460V windings High-energy rare-earth magnets Shaft end threaded hole DIN connectors, rotates 180° Standard IEC 72-1 mounting dimensions 	<ul style="list-style-type: none"> 230V and 460V windings Multiple winding speed options High-energy rare-earth magnets Shaft end threaded hole SpeedTec-ready DIN connectors, rotates 180° Standard IEC 72-1 mounting dimensions 	<ul style="list-style-type: none"> Epoxy coated 230V and 460V windings Shaft end threaded hole SpeedTec-ready DIN connectors, rotates 180° Standard IEC 72-1 mounting dimensions 	<ul style="list-style-type: none"> Smooth, passivated 300 series stainless-steel cylindrical exterior. Certified and listed to NSF/ANSI Standard 169 230V and 460V windings Shaft end threaded hole Cable extensions, 3 m (9.8 ft) Standard IEC 72-1 mounting dimensions
Motor type	Brushless AC synchronous servo motors			
Environmental rating	<ul style="list-style-type: none"> IP50 minimum, without shaft seal (standard). IP66 with optional shaft seal and use of environmentally sealed cable connectors. 	<ul style="list-style-type: none"> IP50 minimum, without shaft seal (standard). IP67 with optional shaft seal and use of environmentally sealed cable connectors. 	<ul style="list-style-type: none"> IP66/IP67 with shaft seal (standard) and use of environmentally sealed cable connectors. Food grade grease on shaft seal 	<ul style="list-style-type: none"> IP66/IP67 with shaft seal (standard) and use of environmentally sealed cable connectors. IP69K for 1200 psi washdown
Continuous torque	0.26...163 N•m (2.3...1440 lb•in)	2.18...62.8 N•m (19.3...556 lb•in)	1.6...19.4 N•m (14...172 lb•in)	3.6...21.5 N•m (32...190 lb•in)
Peak torque	0.74...278 N•m (6.6...2460 lb•in)	6.6...154.2 N•m (58...1365 lb•in)	3.61...48.6 N•m (32...430 lb•in)	11.1...98 N•m (67.8...600 lb•in)
Speed	Up to 8000 rpm	Up to 7000 rpm	Up to 5000 rpm	3000 and 5000 rpm
Motor rated output	0.16...18.6 kW	0.75...7.50 kW	0.73...4.1 kW	1.3...3.5 kW
Feedback options	<ul style="list-style-type: none"> Multi-turn, high-resolution absolute position Single-turn, high-resolution absolute position 	<ul style="list-style-type: none"> Multi-turn, high-resolution absolute position Single-turn, high-resolution absolute position Resolver 	<ul style="list-style-type: none"> Multi-turn, high-resolution absolute position Single-turn, high-resolution absolute position 	
Motor options	<ul style="list-style-type: none"> 24V DC brake Shaft seal kit Keyless shaft (limited frame sizes) 	<ul style="list-style-type: none"> 24V DC brake Shaft seal kit Positive air pressure kit 	<ul style="list-style-type: none"> 24V DC brake Shaft seal kit Positive air pressure kit 	<ul style="list-style-type: none"> 24V DC brake Shaft seal kit with slinger Positive air pressure kit
Typical applications	<ul style="list-style-type: none"> Packaging Converting Material handling Electronic assembly Automotive Metal forming 	<ul style="list-style-type: none"> Printing Web handling Converting Automotive Metal forming 	<ul style="list-style-type: none"> Food packaging Volumetric filling Form, fill, seal Food handling For meat and poultry applications, the MP-Series Stainless Steel motors are recommended. 	<ul style="list-style-type: none"> Meat and poultry Food slicing and filling Raw food handling Processing Life science Consumer products

RDD-Series and HPK-Series Servo Motors

Motor Features	RDD-Series Motors	HPK-Series Motors
Main characteristics	<ul style="list-style-type: none"> Smart Motor Technology Direct coupling to the load Bearingless housed configuration 	<ul style="list-style-type: none"> High-power Large load inertia
Features	<ul style="list-style-type: none"> 460V windings Multiple winding speed options SpeedTec-ready DIN connectors, rotates 180° Standard IEC 72-1 mounting dimensions 	<ul style="list-style-type: none"> 400V and 460V windings DIN connectors, rotates 180° Blower cooled IEC flange or foot mount
Motor type	Direct-drive rotary servo motor	Asynchronous Induction Motors
Environmental rating	IP65 with use of environmentally sealed cable connectors.	IP54
Continuous torque	32.7...426 N•m (289...3770 lb•in)	96...482 N•m (849...4266 lb•in)
Peak torque	86.5...1050 N•m (766...9293 lb•in)	192...964 N•m (1699...8531 lb•in)
Speed	Base speeds between 177...1836 rpm	Base speeds of 1500 and 3000 rpm
Motor rated output	1.97...8.69 kW	17.1...150 kW
Feedback options	<ul style="list-style-type: none"> Multi-turn, high-resolution Heidenhain EnDat 2.2 Single-turn, high-resolution Heidenhain EnDat 2.2 	<ul style="list-style-type: none"> Multi-turn, high-resolution absolute position Single-turn, high-resolution absolute position
Motor options	N/A	380...480V AC brake
Typical applications	<ul style="list-style-type: none"> Use to replace mechanical gear reduction (gear boxes, belts, pulleys) Tight space constraints Axes with high-power and high-performance requirements 	<ul style="list-style-type: none"> High power packaging Converting Wind/unwind/rewind Sheeters Flying knife Material handling

TL-Series Servo Motors

Motor Features	TL-Series (Bulletin TL and TLY) Motors
Main characteristics	<ul style="list-style-type: none"> Compact size, high torque density Metric and NEMA frame sizes Smart Motor Technology Low rotor inertia
Features	<ul style="list-style-type: none"> 230V windings High-energy Neodymium-Iron-Boron (NeFeB) magnets Cable extensions, 1 m (3.2 ft) 17-bit serial communication
Motor type	Brushless AC Synchronous Servo Motors
Environmental rating	IP65 with optional shaft seal
Continuous torque	0.086...5.42 N•m (0.76...48 lb•in)
Peak torque	0.22...13 N•m (1.94...115 lb•in)
Speed	4500, 5000, and 6000 rpm
Motor rated output	0.037...2.0 kW
Feedback options	<ul style="list-style-type: none"> Multi-turn, high-resolution absolute position Incremental (2000 counts)
Motor options	<ul style="list-style-type: none"> 24V DC brake Shaft seal kit
Typical applications	<ul style="list-style-type: none"> Robotics Material handling X-Y tables Specialty machinery Semiconductor manufacturing Medical/laboratory equipment Light packaging machines Office machinery

Linear Servo Motors

Linear motors are UL Recognized components to applicable UL and CSA standards. CE marked for all applicable directives. Refer to <http://www.ab.com> for more information.

LDC-Series and LDL-Series Linear Servo Motors

Linear Motor Features	LDC-Series Linear Servo Motors	LDL-Series Linear Servo Motors
Main characteristics	<ul style="list-style-type: none"> High thrust force to cost ratio for less costly solutions Cogging torque < 5% of the continuous force 230/400 and 460V AC operation 	<ul style="list-style-type: none"> Non-cogging technology for super smooth motion No magnetic attraction between the coil and magnet channel allows for the use of smaller, less expensive linear bearings No external magnetic field to have to shield in magnetic sensitive applications 230V AC operation
Features	<ul style="list-style-type: none"> Speed capabilities to 10 m/s (32.8 ft/s) to increase machine productivity Direct drive technology for extreme servo responsiveness No wear parts to increase machine productivity through less maintenance and replacement. Standard MP-Series motor power and feedback connectors to easily combine with Allen-Bradley extension and flex cables 	
Motor type	Iron core coil and magnet track	Ironless coil and magnet channel
Environmental rating	IP65 and RoHS compliant	
Continuous forces	74...2882 N (17...648 lb)	63...596 N (14...134 lb)
Peak forces	188...5246 N (42...1179 lb)	209...1977 N (47...444 lb)
Peak velocity	10 m/s (32.8 ft/s)	10 m/s (32.8 ft/s)
Cogging torque	< 5% of the continuous force	Zero
Field-installable accessories	<ul style="list-style-type: none"> Cooling plates Bulkhead connector kit Encoder connector kit Hall sensor for connectorized coil Hall sensor for flying-lead coil 	<ul style="list-style-type: none"> Bulkhead connector kit Encoder connector kit Hall sensor for connectorized coil Hall sensor for flying-lead coil
Typical applications	<ul style="list-style-type: none"> Form-fill and seal packaging machines Large format gantries (pick and place, scribing and palletizing) Material handling (pallet movers and sheet glass) Plasma, laser and water jet cutting machines Machine tools Flying cut off machines Coordinate measuring machines Large format routers Large format printers (step axis) 	<ul style="list-style-type: none"> Wafer cutting, handling and marking Computer-to-plate printing machines Large format printing (print head axis) Solar and flat panel scribing (scribe head axis) Axis requiring extremely smooth/constant velocity

Linear Actuators

Actuators are UL Recognized components to applicable UL and CSA standards. CE marked for all applicable directives. Refer to <http://www.ab.com> for more information.

MP-Series Integrated Linear Stages

Actuator Features	MP-Series (Bulletin MPAS) Integrated Linear Stages	MP-Series (Bulletin MPMA) Integrated Multi-axis Linear Stages
Main characteristics	<ul style="list-style-type: none"> Rugged linear stages with integrated direct-drive linear motor or ballscrew with MP-Series servo motor Available in three frame sizes (base widths) to accommodate a variety of load requirements for general automation Smart Motor Technology (ballscrew) Very high linear speeds (direct drive) 	<ul style="list-style-type: none"> Out of box alignment of 30 arc seconds Field replaceable quick change cable management for ease of maintenance Sealed stages having IP30 rating for environmental protection Caged ball-type linear guides that retain lubrication for longer bearing life and provide lower noise levels Absolute encoders on ballscrew axis and incremental encoders on direct-drive linear motor axis MP-Series motor power and feedback connectors for connection to Allen-Bradley extension cables and drives Access holes for easy lubrication
Features	<ul style="list-style-type: none"> 200/230V and 400/460V operation (230V only for 150 mm direct-drive frame size) High-energy neodymium (NeFeB) magnets Heavy duty connectors Operation without limit and home switches Carriage and base mounting design allows 200 mm and 250 mm frame sizes to be stacked Standard MP-Series motor power and feedback connectors Optional air purge kit for added protection against ingress of foreign substances 	
Actuator type	<ul style="list-style-type: none"> Direct-drive linear stage Ballscrew-drive linear stage 	
Environmental rating	Unique, long life strip seal system provides IP30 environmental rating to prevent debris, larger than 2.5 mm (0.1 in.) diameter, from entering the linear stage.	
Continuous forces	83...521 N (19...117 lb)	
Peak forces	312...1212 N (70...273 lb)	
Peak velocities	200...5000 mm/s (7.9...196.9 in./s)	
Stroke lengths ⁽¹⁾	120...1940 mm (4.7...76.4 in.)	
Feedback options	<ul style="list-style-type: none"> Multi-turn, high-resolution absolute position (ballscrew) 5 micron resolution incremental magnetic linear encoder (direct drive) 	
Field-installable accessories	<ul style="list-style-type: none"> Cable track module replacement kit Strip seal replacement kit Top cover Side cover Coupling T-nut kit (package of 10) Toe-clip kit (package of 10) Grease gun kit Grease replacement cartridge 	<ul style="list-style-type: none"> Cable track module replacement kit Strip seal replacement kits Top cover kits (for Y or Z-axis only) Side cover kits Coupling kits (for Y or Z-axis only) Tee-nut kit (package of 10) Tee-nut bar kit Grease gun kit Grease replacement cartridge Rotary servo motor (for Y or Z-axis only)
Typical applications	<ul style="list-style-type: none"> Electronic assembly Pick and place Robots Inspection Labeling Dispensing Micro-arraying 	<ul style="list-style-type: none"> Material handling Pick and place Dispensing Scanning Contouring Contoning Flying shape cutting

(1) Applies to Bulletin MPAS linear stages. Not all Bulletin MPAS stroke lengths (travels) are available with Bulletin MPMA multi-axis linear stages.

MP-Series and TL-Series Electric Cylinders

Actuator Features	TL-Series (Bulletin TLAR) Electric Cylinders	MP-Series (Bulletin MPAR) Electric Cylinders	MP-Series (Bulletin MPAI) Heavy Duty Electric Cylinders
Main characteristics	State-of-the-art design features ball-screw construction driven by TL-Series (Bulletin TLY) servo motors.	State-of-the-art design features ball-screw construction driven by MP-Series (Bulletin MPL) servo motors.	<ul style="list-style-type: none"> State-of-the-art design features ball-screw and roller-screw construction driven by MP-Series (Bulletin MPL) servo motors. Front flange-mount and front trunnion-mount cylinders
	<ul style="list-style-type: none"> Fully assembled and ready to mount cylinders contribute to reductions in mechanical design engineering, wiring, and commissioning time Smart Motor Technology Very high linear speeds 		
Features	<ul style="list-style-type: none"> 200/230V operation Absolute, high-resolution feedback options consistent with TL-Series (Bulletin TLY) servo motors Standard TL-Series motor power and feedback connectors 	<ul style="list-style-type: none"> 200/230V and 400/460V operation Absolute, high-resolution feedback options consistent with MP-Series servo motors Standard MP-Series motor power and feedback connectors 	
	<ul style="list-style-type: none"> Rated for 100% duty cycle and designed for repeatable, reproducible performance over the actuator's operating life Absolute feedback allows operation without limit and home switches No piping, valving, air, or oil supply required 		
	ISO 15552 pneumatic-class frame sizes 32, 40, and 63 mm		Frame sizes 83 and 110 mm
Actuator type	Ball-screw driven electric cylinders		Ball-screw and roller-screw electric cylinders
Environmental rating	IP40 (complete unit) includes rod-end seal and breather port	<ul style="list-style-type: none"> IP40 (complete unit) includes rod-end seal and breather port IP66 for electronic components with the use of environmentally sealed (Bulletin 2090) cable connectors 	IP67 with the use of environmentally sealed (Bulletin 2090) cable connectors
Continuous feed force	240...2000 N (54...450 lb)		2002...7784 N (450...1750 lb)
Max feed force	300...2500 N (67...562 lb)		4003...8896 N (900...2000 lb)
Peak velocities	0.15...1.0 m/s (5.9...39.4 in./s)		279...559 mm/s (11.0...22.0 in./s)
Stroke lengths ⁽¹⁾	100...800 mm (4.0...32.0 in.)		150, 300, 450 mm (6.0, 12.0, 18.0 in.)
Optional equipment	24V DC holding brakes		24V DC holding brakes
Field-installable accessories	<ul style="list-style-type: none"> Foot mounting for axial motor attachment Flange mounting Trunnion mounting kit Trunnion support Mounting attachments (clevis foot, right-angle clevis foot) Piston-rod attachments (rod eye, rod clevis, rod coupler, coupling piece) Guide rod 		<ul style="list-style-type: none"> Mounting plates Front flange mount Rear clevis mount Rod-end attachments (rod eye, rod clevis) Anti-rotation guide
Typical applications	<ul style="list-style-type: none"> Material handling (loading, unloading, lifts, pick and place, diverters, transfers, gantries) Volumetric filling and process control (web guides, valve, nozzle, van, and gate positioning) Fabrication (adjustments for machine backstops and cutting tools, works alignment) 	<ul style="list-style-type: none"> Push, pull, eject, press, or clamp parts Packaging (consumer products, automotive, medical) Electronic assembly Insertion systems Inspection and test equipment 	

(1) Not all stroke lengths (travels) are available with all frame sizes.

Servo Drives

Servo drives meet CE compliance and are UL Listed to U.S. and Canadian safety standards. Refer to <http://www.ab.com> for more information.

Servo Drives

Drive Features	Kinetix 6500	Kinetix 6200	Kinetix 6000	Kinetix 7000
Main characteristics	<ul style="list-style-type: none"> Multi-axis Common Bus Modular Design Integrated Motion Drive 		<ul style="list-style-type: none"> Multi-axis Common Bus Enhanced Peak Performance ⁽¹⁾ Integrated Motion Drive 	<ul style="list-style-type: none"> High-power applications Common Bus Integrated Motion Drive
	Safe Speed Monitoring and Safe Torque-off Control TUV certified SIL CL3, PLc, category 4		Safe-off Control TUV certified SIL CL3, PLc, category 3	
Drive configuration	1...8 Axes on Bulletin 2094 Power Rail			Single-axis
Input voltage	324...528V AC, Three-phase (460V systems)		195...265V AC, Three-phase (230V systems) 324...528V AC, Three-phase (460V systems)	342...528V AC Three-phase
Common-bus follower input voltage	458...747V DC (460V systems)		275...375V DC (230V systems) 458...747V DC (460V systems)	450...750V DC
Continuous output power (inverter)	1.8...6.6 kW (460V systems)		1.2...11 kW (230V systems) 1.8...22 kW (460V systems)	22...149 kW
Continuous output current (inverter)	2.8...10.3 A rms (460V systems)		3.7...34.6 A rms (230V systems) 2.8...34.6 A rms (460V systems)	40...248 A rms
Drive digital inputs	<ul style="list-style-type: none"> Enable, Home, OverTravel ± High Speed Registration (2/axis) 			<ul style="list-style-type: none"> Enable, Home, OverTravel ± High Speed Registration (2)
Drive digital outputs	Motor Brake Relay Output (with suppression)			
DPI connector	N/A		DriveExplorer software or DPI HIM Module	
Programming	RSLogix 5000 software (Ladder Logic, Structured Text, and Sequential Function Charts)			
	Version 18 or later	Version 17 or later	Version 11 or later	Version 15 or later
Logix module compatibility	1756-EN2T, 1756-EN2TR, 1756-EN3TR	<ul style="list-style-type: none"> 1756-M03SE, 1756-M08SE, 1756-M16SE 1768-M04SE 		
I/O control	EtherNet/IP	Fiber-optic SERCOS		
Feedback	<ul style="list-style-type: none"> High-resolution absolute multi-turn and single-turn encoder Incremental encoder EnDat 2.1 and 2.2 encoders (Kinetix 6200/6500 support has not been implemented) 		<ul style="list-style-type: none"> High-resolution absolute multi-turn and single-turn encoder Incremental encoder EnDat 2.1 and 2.2 encoder support with 2090-K6CK-KENDAT feedback module Resolver 	<ul style="list-style-type: none"> High-resolution absolute multi-turn and single-turn encoder Incremental encoder EnDat 2.1 and 2.2 encoder support with 2090-K7CK-KENDAT feedback module
	Feedback-only Auxiliary Axis			
Rotary motors compatibility	<ul style="list-style-type: none"> MP-Series Low Inertia (Bulletin MPL) MP-Series Medium Inertia (Bulletin MPM) MP-Series Food Grade (Bulletin MPF) MP-Series Stainless Steel (Bulletin MPS) MP-Series RDD-Series Direct Drive (Bulletin RDB) 		<ul style="list-style-type: none"> MP-Series (Bulletin MPL/MPM/MPF/MPS) RDD-Series Direct Drive (Bulletin RDB) TL-Series (Bulletin TLY-Axxxx-H) 	<ul style="list-style-type: none"> HPK-Series MP-Series (Bulletin MPL and MPM) RDD-Series Direct Drive (Bulletin RDB)
Linear motors compatibility	LDC-Series Iron Core		<ul style="list-style-type: none"> LDC-Series Iron Core LDL-Series Ironless 	N/A
Linear actuator compatibility	<ul style="list-style-type: none"> MP-Series Linear Stages (Bulletin MPAS) MP-Series Multi-axis Linear Stages (Bulletin MPMA) MP-Series Electric Cylinders (Bulletin MPAI) 		<ul style="list-style-type: none"> MP-Series Linear Stages (Bulletin MPAS) MP-Series Multi-axis Stages (Bulletin MPMA) MP-Series Electric Cylinders (Bulletin MPAI) 	N/A
Accessory compatibility	<ul style="list-style-type: none"> 2094 Line Interface Modules 2090 Resistive Brake Modules 1394 External Passive Shunt 		<ul style="list-style-type: none"> 2094 Line Interface Modules 2090 Resistive Brake Modules 1394 External Passive Shunt 1336 External Active Shunt 	<ul style="list-style-type: none"> 8720MC Regenerative PS 8720MC Line Reactor 1336 External Active Shunt 2094 Line Interface Modules

(1) Refer to Kinetix 6000 IAM/AM Module Series Change on [page 268](#) for more information.

Servo Drives

Drive Features	Kinetix 2000	Kinetix 300
Main characteristics	<ul style="list-style-type: none"> Low-power SERCOS interface solution for complex motion applications Multi-axis Common Bus Integrated Motion Drive 	<ul style="list-style-type: none"> Single-axis solution for low-complexity motion applications Low cost EtherNet/IP network solution with integrated safe torque-off functionality Flexible control architecture for simple analog, PTO, or EtherNet/IP Indexing control 120V models drive 240V motors at full speed Memory module for Automatic Device Replacement (ADR)
Drive configuration	1...8 Axes on Bulletin 2093 Power Rail	Single-axis
Input voltage	170...264V AC, Single-phase or Three-phase (230V systems)	<ul style="list-style-type: none"> 120V AC, single-phase 240V AC, single-phase with integrated AC (EMC) line filter 120V/240V AC, single-phase or three-phase 480V AC, three-phase
Common-bus follower input voltage	240...375V DC (230V systems)	N/A
Continuous output power (inverter)	0.3...3.0 kW	0.4...1.7 kW (single-phase input) 0.5...3.0 kW (single-phase or three-phase input) 1.0...3.0 kW (three-phase input)
Continuous output current (inverter)	1.0...9.5 A rms	2.0...12.0 A rms
Drive digital inputs	<ul style="list-style-type: none"> Enable, Home, OverTravel ± High Speed Registration (2/axis) 	<ul style="list-style-type: none"> Enable and OverTravel ± High Speed Registration (1) Eight configurable inputs
Drive digital outputs	Motor Brake Relay Output (with suppression)	<ul style="list-style-type: none"> Ready Four configurable outputs
DPI connector	<ul style="list-style-type: none"> DriveExplorer software DPI HIM module 	N/A
Programming	RSLogix 5000 software, version 16 or later (Ladder Logic, Structured Text, and Sequential Function Charts)	<ul style="list-style-type: none"> Built-in Web server for configuration and diagnostics RSLogix 5000 software, version 17 or later (Ladder Logic, Structured Text, and Sequential Function Charts)
Logix module compatibility	<ul style="list-style-type: none"> 1756-M03SE, 1756-M08SE, 1756-M16SE 1768-M04SE 	<ul style="list-style-type: none"> 1769-L23x or 1769-L3x controller with integrated EtherNet/IP port 1768-L4x controller with 1768-ENBT or 1768-EWEB module 1766-L32x controller with integrated EtherNet/IP port
I/O control	Fiber-optic SERCOS	EtherNet/IP
Feedback	<ul style="list-style-type: none"> High-resolution absolute multi-turn and single-turn encoder Incremental Encoder 	
	Feedback-only Auxiliary Axis	Auxiliary axis for master gearing mode
Rotary motors compatibility	<ul style="list-style-type: none"> MP-Series Low Inertia (Bulletin MPL) MP-Series Medium Inertia (Bulletin MPM) MP-Series Food Grade (Bulletin MPF) MP-Series Stainless Steel (Bulletin MPS) TL-Series (Bulletin TLY-Axxx-H and TLY-Axxx-B) 	
Linear motors compatibility	<ul style="list-style-type: none"> LDC-Series Iron Core LDL-Series Ironless 	N/A
Linear actuator compatibility	<ul style="list-style-type: none"> MP-Series Linear Stages (Bulletin MPAS) MP-Series Multi-axis Linear Stages (Bulletin MPMA) MP-Series and TL-Series Electric Cylinders (Bulletin MPA, MPAL, and TLAR) 	<ul style="list-style-type: none"> MP-Series Linear Stages (Bulletin MPAS) ballscrew only MP-Series Multi-axis Linear Stages (Bulletin MPMA) ballscrew only MP-Series and TL-Series Electric Cylinders (Bulletin MPA, MPAL, and TLAR)
Accessory compatibility	<ul style="list-style-type: none"> 2094 Line Interface Modules 1336 External Active Shunt 	<ul style="list-style-type: none"> 2097 I/O Terminal Expansion Block 2097 Memory Module Programmer 2097 AC (EMC) Line Filters 2097 Shunt Resistors

Servo Drives

Drive Features	Ultra1500	Ultra3000 (SERCOS)	Ultra3000 (Non-SERCOS)	Ultra5000
Main characteristics	<ul style="list-style-type: none"> Standalone Component Based Low kW 	<ul style="list-style-type: none"> Standalone SERCOS Interface Integrated Motion Drive 	<ul style="list-style-type: none"> Standalone Indexing DeviceNet with Indexing 	<ul style="list-style-type: none"> Standalone Integrated Control ANSI C Programmable
Drive configuration	Single-axis	Single-axis		Single-axis
Input voltage	200...240V AC Single-phase	100...240V AC, Single-phase (230V systems)		
	200...240V AC Three-phase	240V AC, Three-phase (230V systems)		
Common-bus follower input voltage	N/A	230/480V AC, Three-phase (460V systems)		
Continuous output power	N/A	0.5...15 kW (230V systems)		
		3...22 kW (460V systems)		
Continuous output current	1.0...3.3 A rms Single-phase	1.8...45.9 A rms (230V systems)		
	7.6...11.6 A rms Three-phase	5.0...33.2 A rms (460V systems)		
Drive digital inputs	7 Digital Inputs (sourcing)	<ul style="list-style-type: none"> Enable, Home, OverTravel ± High Speed Registration (2) 	8 Digital Inputs (sinking)	16 Digital Inputs (sinking or sourcing)
Drive digital outputs	3 Digital Outputs	Motor Brake Relay Output	<ul style="list-style-type: none"> 4 Digital Outputs Normally Open Relay Output 	<ul style="list-style-type: none"> 7 Digital Outputs Normally Open Relay Output
DPI connector	N/A	N/A		
Programming	Ultraware software	RSLogix 5000 software (Ladder Logic, Structured Text, and Sequential Function Charts)	Ultraware software	
Logix module compatibility	<ul style="list-style-type: none"> 1756-M02AE 1756-HYD02 1756-M02AS 1762-L24BXB 1764-28BXB 	<ul style="list-style-type: none"> 1756-M03SE 1756-M08SE 1756-M16SE 1768-M04SE 	<ul style="list-style-type: none"> 1756-M02AE 1756-HYD02 1756-M02AS 	N/A
I/O control	<ul style="list-style-type: none"> Analog ± 10V Stepper/Follower/PTI 	Fiber-optic SERCOS	<ul style="list-style-type: none"> Analog ± 10V Preset Positions Stepper/Follower DeviceNet interface RS-485 	<ul style="list-style-type: none"> Preset Positions Stepper/Follower DeviceNet interface RS-485
Feedback	<ul style="list-style-type: none"> High-resolution absolute (17-bit) encoder Incremental encoder 	<ul style="list-style-type: none"> High-resolution absolute (multi-turn) encoder High-resolution (single-turn) encoder Incremental encoder 		
Rotary motors compatibility	<ul style="list-style-type: none"> TL-Series (Bulletin TL-Axxxx-B) Incremental Encoder-based Rotary Linear 	<ul style="list-style-type: none"> MP-Series Low Inertia (Bulletin MPL) MP-Series Medium Inertia (Bulletin MPM) MP-Series Food Grade (Bulletin MPF) MP-Series Stainless Steel (Bulletin MPS) TL-Series (Bulletin TLY-Axxxx-H) 		<ul style="list-style-type: none"> MP-Series (Bulletin MPL-x3xxx...MPL-x9xxx) MP-Series (Bulletin MPM/MPF/MPS) TL-Series (Bulletin TLY-Axxxx-H)
Linear motors compatibility	N/A	<ul style="list-style-type: none"> LDC-Series LDL-Series 		N/A
Linear actuator compatibility	N/A	<ul style="list-style-type: none"> MP-Series Linear Stages (Bulletin MPAS) MP-Series Multi-axis Linear Stages (Bulletin MPMA) MP-Series Electric Cylinders (Bulletin MPAI) 		N/A
Accessory compatibility	N/A	<ul style="list-style-type: none"> 2090 External Shunt Modules 2090 Resistive Brake Modules 		

Additional Resources

Resource	Description	
Literature Library, website http://www.rockwellautomation.com/literature	Electronic copies of installation instructions, user manuals, and other publications related to your Kinetix Motion Control selection process.	
Hardcopy motion control publications	Your local Rockwell Automation distributor or sales representative.	
Kinetix 6200 and Kinetix 6500 Safe Speed Monitoring Servo Drives Safety Reference Manual, publication 2094-RM001	Information on wiring, configuring, and troubleshooting the safe-speed features of your Kinetix 6200 and Kinetix 6500 drives.	
Kinetix 6200 and Kinetix 6500 Safe Torque-off Servo Drives Safety Reference Manual, publication 2094-RM002	Information on wiring, configuring, and troubleshooting the safe torque-off features of your Kinetix 6200 and Kinetix 6500 drives.	
Kinetix Safe-off Feature Safety Reference Manual, publication GMC-RM002	Information on wiring and troubleshooting your Kinetix 6000 and Kinetix 7000 servo drives with the safe-off feature.	
System Design for Control of Electrical Noise Reference Manual, publication GMC-RM001	Information, examples, and techniques designed to minimize system failures caused by electrical noise.	
EMC Noise Management DVD, publication GMC-SP004		
ControlLogix Selection Guide, publication 1756-SG001	Information to determine which ControlLogix controller fits your application and the product specifications to help design a ControlLogix system and select the appropriate components.	
CompactLogix Selection Guide, publication 1769-SG001	Information to determine which CompactLogix controller fits your application and the product specifications to help design a CompactLogix system and select the appropriate components.	
Technical Support	Phone	440-646-5800
	Fax	440-646-5801
	Email	RACleAsktheExpert@ra.rockwell.com
Motion Analyzer software download from http://www.ab.com	Comprehensive motion application sizing tool used for analysis, optimization, selection, and validation of your Kinetix Motion Control system.	
Rockwell Automation Configuration and Selection Tools, website http://www.ab.com	Online product selection and system configuration tools, including AutoCad (DXF) drawings.	

Notes:

Rotary Motion

Use this chapter to become familiar with the Kinetix Motion Control rotary servo motors and select the rotary motion components required for your application. To compare features from one family of rotary motion components to another, refer to Rotary Servo Motors on [page 9](#).

Topic	Page
Common Rotary Motor Specifications	19
MP-Series Low Inertia Motors	21
MP-Series Medium Inertia Motors	37
MP-Series Food Grade Motors	49
MP-Series Stainless Steel Motors	56
RDD-Series Direct Drive Servo Motors	62
HPK-Series Asynchronous Servo Motors	69
TL-Series Motors	79

Common Rotary Motor Specifications

These rotary motor specifications are common to all motor families unless otherwise noted.

Environmental Specifications

Attribute	MP-Series	RDD-Series	TL-Series	HPK-Series
Ambient temperature	0...40 °C (32...104 °F)			
Storage temperature	-30...70 °C (-22...158 °F)			
Relative humidity (noncondensing)	5...95%			
Shock	20 g peak, 6 ms duration			10 g peak, 6 ms duration
Vibration	2.5 g peak @ 30...2000 Hz			

Environmental Ratings

IP Rating	Dust Protection	Liquid Protection	Shaft Seal	Motor
IP50	Limited protection from dust (no harmful deposit).	No protection from liquids.	Motor without shaft seal.	Bulletin MPL and MPM
IP54		Protected against sprays from all directions.		TL-Series, HPK-Series
IP65	Total protection from dust.	Protected against low-pressure jets of water from all directions.	Motor with shaft seal (cable connectors rated IP54).	TL-Series
IP66		Protected against strong jets of water.	Motor with shaft seal and Bulletin 2090 environmentally sealed cable connectors.	RDD-Series ⁽¹⁾
IP67		Protected against the effects of temporary liquid immersion.		Bulletin MPL, MPF, and MPS
IP69K		Protected against the effects of water/stream jets up to 100 bar (1200 psi) with nozzle temperature at approximately 80 °C (176 °F).		Bulletin MPF, MPS, and MPM
				Bulletin MPS

(1) Environmental rating applies from mounting face to rear of motor. Customer is responsible for providing environmental protection to mounting face of motor.

Motor Brake Application Guidelines

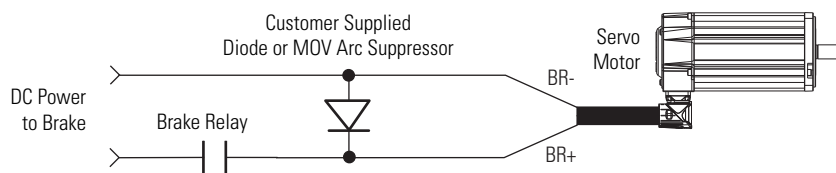
The brakes offered as options on these servo motors are holding brakes designed to hold the motor shaft at 0 rpm up to the rated brake holding torque. The brakes release when voltage is applied to the brake coil. Voltage and polarity supplied to the brake must be as specified to be sure of proper brake performance.

The brakes are not designed for stopping rotation of the motor shaft. Servo drive inputs should be used to stop motor shaft rotation. The recommended method of stopping motor shaft rotation is to command the servo drive to decelerate the motor to 0 rpm, and engage the brake after the servo drive has decelerated the motor to 0 rpm.

If system mains power fails, the brakes can withstand use as stopping brakes. However, use of the brakes as stopping brakes creates rotational mechanical backlash that is potentially damaging to the system, increases brake pad wear, and reduces brake life. The brakes are not designed nor are they intended to be used as a safety device.

A separate power source is required to disengage the brake. This power source can be controlled by the servo motor controls, in addition to manual operator controls. Electrical arcing may occur at the relay contacts until the brake power dissipates. A customer supplied diode or metal oxide varistor (MOV) is recommended to prevent arcing. Use of an MOV can also reduce the time to mechanically engage the brake. For brake response time specifications, refer to the motor brake specification tables.

Suppression Device for Brake Relay Contacts



Kinetix 2000, Kinetix 6000, Kinetix 6200, Kinetix 6500, and Kinetix 7000 servo drives provide motor brake relay outputs and supply an MOV arc suppressor, so customer supplied arc suppressor is not required unless the coil current of motor brake is greater than the maximum brake current rating of the drive relay output.

MP-Series Low Inertia Motors



MP-Series low-inertia (Bulletin MPL), high output brushless servo motors utilize innovative design characteristics to reduce motor size while delivering significantly higher torque. These compact and highly dynamic brushless servo motors are designed by Allen-Bradley to meet the demanding requirements of high performance motion systems.

For drive compatibility, refer to Servo Drives on [page 14](#).

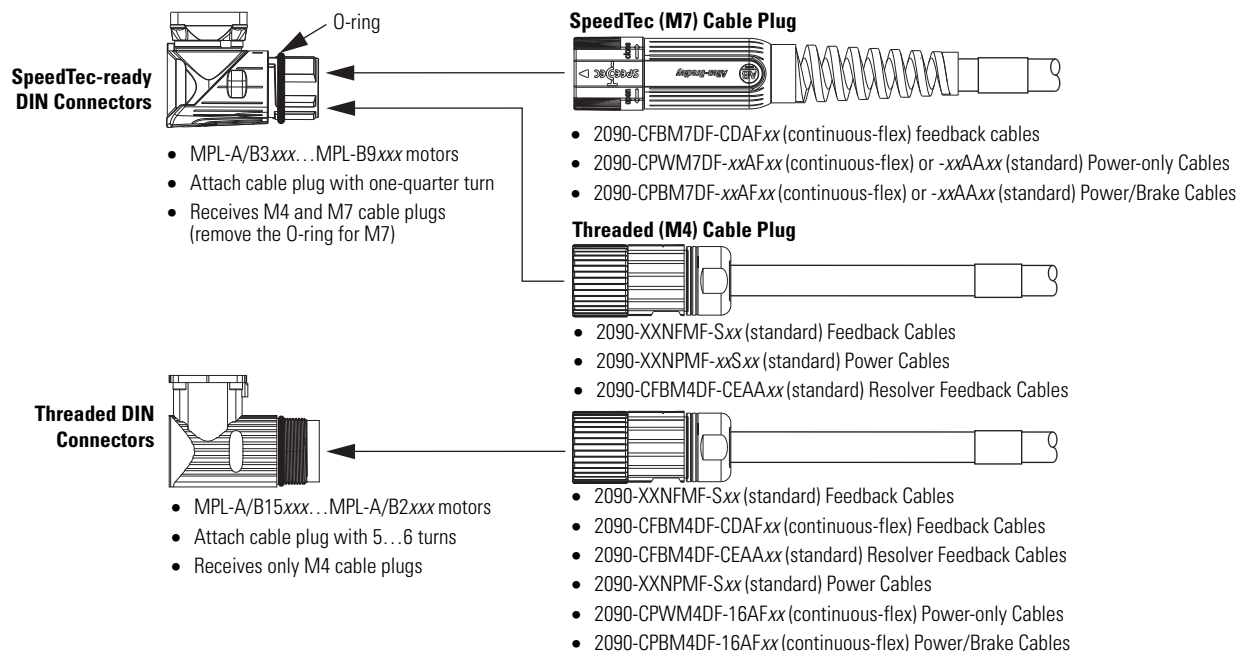
MP-Series Low Inertia Motor High Resolution Encoder Features

MP-Series low-inertia motors are available with high performance encoders with a choice of Single-turn (-E, -S) or Multi-turn (-V, -M) high resolution feedback.

- Up to 2 million counts per revolution (-M and -S) for smooth performance (MPL-A/B3xxx, MPL-A/B4xxx, MPL-A/B45xxx, MPL-A/B5xxx, MPL-B6xxx, MPL-B8xxx, and MPL-B9xxx motors).
- Up to 260 thousand counts per revolution (-E and -V) for smooth performance (MPL-A/B15xxx and MPL-A/B2xxx motors).
- Single-turn encoder provides high-resolution absolute position feedback within one turn.
- Multi-turn encoder provides high-resolution absolute position feedback within 4096 turns. The electromechanical design does not require a battery.

Circular DIN Connector/Cable Compatibility

MP-Series (Bulletin MPL) motors are equipped with either threaded or SpeedTec-ready DIN connectors.



For information on transitioning your Bulletin MPL motor installation from bayonet cables to circular DIN cables, refer to Motor Power and Feedback Transition Cables on [page 378](#).

MP-Series Low Inertia Motor Options

MP-Series low-inertia motors are available with these options:

- 24V DC brake.
- Shaft seal kit available for field installation. Shaft seals are made of nitrile. Kits include a lubricant to reduce wear.
- Optional keyless shaft available in limited frame sizes with extended lead times (MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx, and MPL-A/B5xx motors).

Motor Shaft Seal Kit Combinations and Dimensions

Motor Series	Shaft Seal Cat. No.	Inside Diameter mm (in.)	Outside Diameter mm (in.)	Width mm (in.)
MPL-A15xx and MPL-B15xx	MPL-SSN-F63F75	12 (0.47)	24 (0.95)	7 (0.28)
MPL-A2xx and MPL-B2xx				
MPL-A3xx and MPL-B3xx	MPL-SSN-A3B3	17 (0.67)	47 (1.85)	7 (0.28)
MPL-A4xx and MPL-B4xx	MPL-SSN-A4B4	20 (0.79)	52 (2.05)	7 (0.28)
MPL-A45xx and MPL-B45xx	MPL-SSN-A5B5	25 (0.98)	62 (2.44)	7 (0.28)
MPL-A520 and MPL-B520 MPL-A540 and MPL-B540 MPL-A560 and MPL-B560	MPL-SSN-F165	30 (1.18)	72 (2.83)	8 (0.31)
MPL-B580	MPL-SSN-F165-32MM	35 (1.38)	72 (2.83)	8 (0.31)
MPL-B6xx	MPL-SSN-A6B6	40 (1.57)	90 (3.54)	8 (0.31)
MPL-B8xx	MPL-SSN-A8B8	45 (1.77)	75 (2.95)	8 (0.31)
MPL-B9xx	MPL-SSN-A9B9	52 (2.05)	72 (2.83)	8 (0.31)

MP-Series Low Inertia Motor Performance Specifications

MP-Series Low Inertia Motor (230V) Performance Specifications

Motor MPL-	Max Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output kW	Speed at Motor Rated Output rpm	Rotor Inertia ⁽¹⁾ kg-m ² (lb-in-s ²)	Motor Weight, approx. ⁽¹⁾ kg (lb)
A1510V	8000	0.26 (2.3)	0.77 (6.8)	0.16	8000	0.000074 (0.000065)	1.0 (2.2)
A1520U	7000	0.49 (4.3)	1.58 (14)	0.27	7000	0.00013 (0.00012)	1.2 (2.6)
A1530U	7000	0.90 (8.0)	2.80 (25)	0.39	7000	0.00023 (0.00020)	1.6 (3.4)
A210V	8000	0.55 (4.9)	1.50 (13.5)	0.37	8000	0.00015 (0.00013)	1.4 (3.1)
A220T	6000	1.61 (14.2)	4.74 (42)	0.62	6000	0.00039 (0.00035)	2.0 (4.4)
A230P	5000	2.10 (18.6)	8.20 (73)	0.86	5000	0.00063 (0.00056)	2.6 (5.7)
A310P	5000	1.58 (14)	3.61 (32)	0.73	4750	0.00044 (0.00039)	2.7 (5.8)
A310F	3000	1.58 (14)	3.61 (32)	0.46	3000		
A320P	5000	3.05 (27)	7.91 (70)	1.3	4750	0.00078 (0.00069)	3.7 (8.0)
A320H	3500	3.05 (27)	7.91 (70)	1.0	3350		
A330P	5000	4.18 (37)	11.1 (98)	1.8	5000	0.00012 (0.0010)	4.6 (10)
A420P	5000	4.74 (42)	10.2 (90)	2.0	5000	0.00026 (0.0023)	4.3 (9.4)
A430P	5000	5.99 (53)	19.8 (175)	2.2	5000	0.00038 (0.0033)	5.5 (12)
A430H	3500	6.21 (55)	19.8 (175)	1.8	3500		
A4530K	4000	8.13 (72)	20.3 (180)	2.5	4000	0.00040 (0.0036)	7.3 (16)
A4530F	2800	8.36 (74)	20.3 (180)	1.9	2800		
A4540C	1500	10.2 (90)	27.1 (240)	1.5	1500	0.00052 (0.0046)	8.6 (19)
A4540F	3000	10.2 (90)	27.1 (240)	2.6	3000		
A4560F	3000	14.1 (125)	34.4 (305)	3.0	3000	0.00078 (0.0067)	11.82 (26)
A520K	4000	10.7 (95)	24.3 (215)	3.5	3500	0.000783 (0.0069)	9.8 (21.5)
A540K	4000	19.4 (172)	48.6 (430)	5.5	4000	0.00147 (0.013)	15.0 (33)
A560F	3000	26.8 (237)	61.0 (540)	5.3	3000	0.00213 (0.019)	20.2 (44.5)

(1) Refer to MP-Series Low Inertia Motor Brake Specifications on [page 25](#) for Brake Rotor Inertia and Brake Motor Weight.

System Combinations (230V)

For MP-Series Low Inertia Motors and	Refer to
Kinetix 300 (240V) drives	page 492
Kinetix 6000 (230V) drives	page 516
Kinetix 2000 (230V) drives	page 562
Ultra3000/5000 (230V) drives ⁽¹⁾	page 597

(1) MPL-A15xxx and MPL-A2xxx motors are not compatible with Ultra5000 drives. All other MPL-Axxx motors are compatible with both Ultra3000 and Ultra5000 drives.

MP-Series Low Inertia Motor (460V) Performance Specifications

Motor MPL-	Max Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output kW	Speed at Motor Rated Output rpm	Rotor Inertia ⁽¹⁾ kg-m ² (lb-in-s ²)	Motor Weight, approx. ⁽¹⁾ kg (lb)
B1510V	8000	0.26 (2.3)	0.77 (6.8)	0.16	8000	0.000074 (0.000065)	1.0 (2.2)
B1520U	7000	0.49 (4.3)	1.58 (14)	0.27	7000	0.000013 (0.00012)	1.2 (2.6)
B1530U	7000	0.90 (8.0)	2.80 (25)	0.39	7000	0.000023 (0.00020)	1.6 (3.4)
B210V	8000	0.55 (4.9)	1.50 (13.5)	0.37	8000	0.000015 (0.00013)	1.4 (3.1)
B220T	6000	1.61 (14.2)	4.74 (42)	0.62	6000	0.000039 (0.00035)	2.0 (4.4)
B230P	5000	2.10 (18.6)	8.20 (73)	0.86	5000	0.000063 (0.00056)	2.6 (5.7)
B310P	5000	1.58 (14)	3.61 (32)	0.77	5000	0.000044 (0.00039) ⁽²⁾	2.7 (5.8)
B320P	5000	3.05 (27)	7.91 (70)	1.5	5000	0.000078 (0.00069) ⁽²⁾	3.7 (8.0)
B330P	5000	4.18 (37)	11.1 (98)	1.8	5000	0.00012 (0.0010) ⁽²⁾	4.6 (10)
B420P	5000	4.74 (42)	13.5 (120)	1.9	5000	0.00026 (0.0023) ⁽²⁾	4.3 (9.4)
B430P	5000	6.55 (58)	19.8 (175)	2.2	5000	0.00038 (0.0033) ⁽²⁾	5.5 (12)
B4530F	3000	8.25 (73)	20.3 (180)	2.1	3000	0.00040 (0.0036) ⁽²⁾	7.3 (16)
B4530K	4000	8.25 (73)	20.3 (180)	2.6	4000		
B4540F	3000	10.2 (90)	27.1 (240)	2.6	3000	0.00052 (0.0046) ⁽²⁾	8.6 (19)
B4560F	3000	14.1 (125)	34.4 (305)	3.2	3000	0.00078 (0.0067) ⁽²⁾	11.82 (26)
B520K	4000	10.7 (95)	23.2 (205)	3.5	3500	0.000783 (0.0069)	9.8 (21.5)
B540D	2000	19.4 (172)	41.0 (362)	3.4	2000	0.00147 (0.013)	15 (33)
B540K	4000	19.4 (172)	48.6 (430)	5.4	4000	0.00147 (0.013)	
B560F	3000	26.8 (237)	67.8 (600)	5.5	3000	0.00213 (0.019)	20.2 (44.5)
B580F	3000	34.0 (301)	87.0 (770)	7.1	3000	0.00289 (0.023)	25.4 (56)
B580J	3800	34.0 (301)	81.0 (716)	7.9	3800		
B640F	3000	36.7 (325)	72.3 (640)	6.11	2000	0.004 (0.0354)	26.8 (59)
B660F	3000	48.0 (425)	101.1 (895)	6.15	2000	0.0058 (0.051)	35.0 (77)
B680D	2000	62.8 (556)	154.2 (1365)	9.3	2000	0.00775 (0.0685)	40.4 (89)
B680F	3000	60.0 (531)	108.5 (960)	7.5	2000		
B860D	2000	83.0 (735)	152.5 (1350)	12.5	2000	0.0169 (0.150)	57.3 (126)
B880C	1500	110.0 (973)	203 (1800)	12.6	1500	0.0224 (0.198)	72.7 (160)
B880D	2000	110.0 (973)	147 (1300)	12.6	2000		
B960B	1200	130.0 (1150)	231 (2050)	12.7	1200	0.0273 (0.242)	76.0 (167)
B960C	1500	124.3 (1100)	226 (2000)	14.8	1500		
B960D	2000	124.3 (1100)	226 (2000)	15.0	2000		
B980B	1000	162.7 (1440)	278 (2460)	15.2	1000	0.0354 (0.313)	94.5 (208)
B980C	1500	158.2 (1400)	271 (2400)	16.8	1500		
B980D	2000	158.2 (1400)	260 (2300)	18.6	2000		

(1) Refer to MP-Series Low Inertia Motor Brake Specifications on [page 25](#) for Brake Rotor Inertia and Brake Motor Weight.

(2) Rotor inertia may vary slightly depending on feedback.

System Combinations (460V)

For MP-Series Low Inertia Motors and	Refer to
Kinetix 300 (480V) drives	page 497
Kinetix 6000 and Kinetix 6200/6500 (460V) drives	page 522
Kinetix 7000 drives	page 583
Ultra3000/5000 (460V) drives ⁽¹⁾	page 603

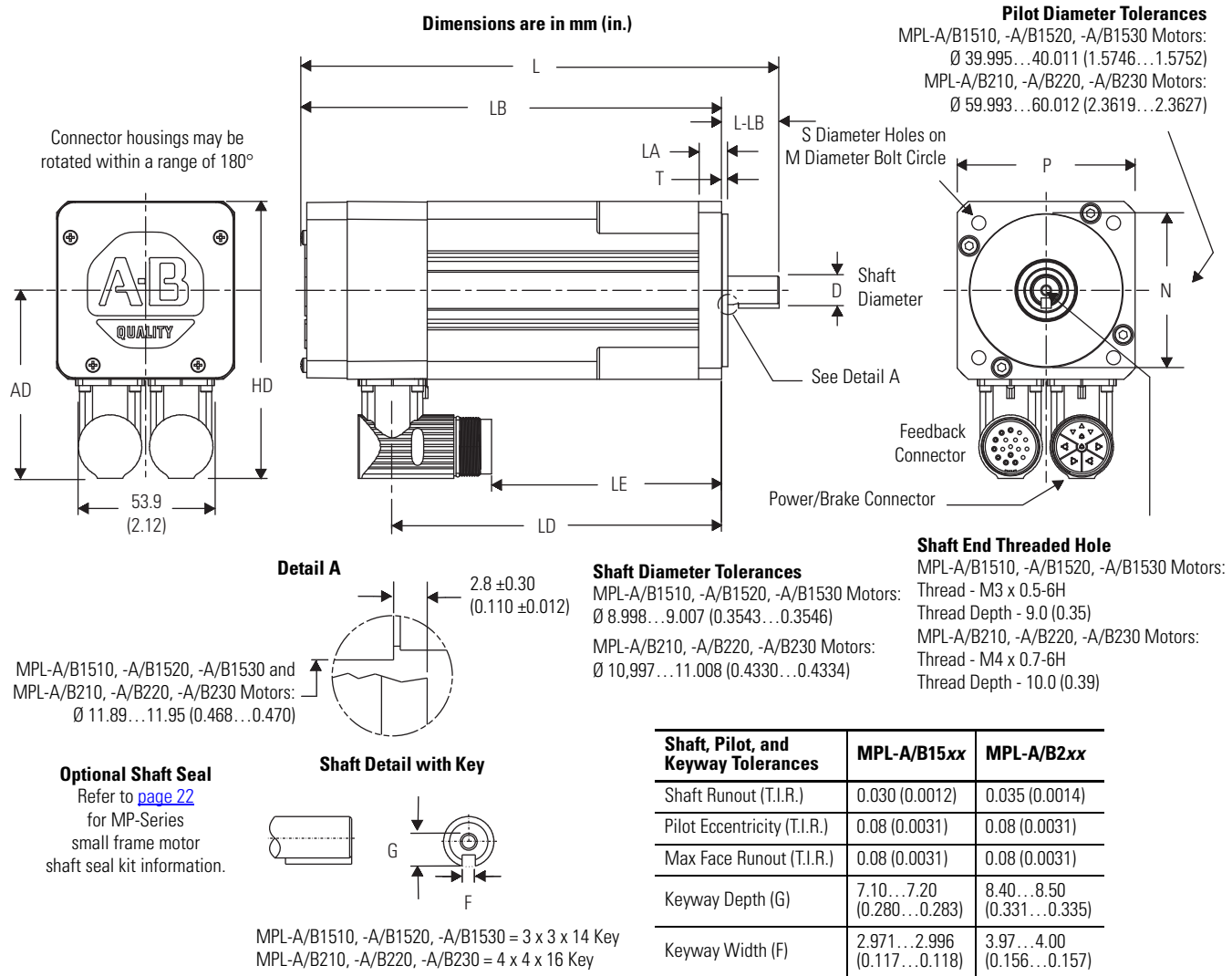
(1) MPL-B15.xxx and MPL-B2xxx motors are not compatible with Ultra5000 drives. All other MPL-Bxxx motors are compatible with both Ultra3000 and Ultra5000 drives.

MP-Series Low Inertia Motor Brake Specifications

Motor MPL-	Max Backlash (brake engaged) arc minutes	Holding Torque Nm (lb-in)	Coil Current at 24V DC A	Brake Response Time			Brake Rotor Inertia kg-m ² (lb-in-s ²)	Brake Motor Weight, approx. kg (lb)
				Release ms	Engage (using external arc suppression device)			
					MOV ms	Diode ms		
A/B1510V	0	0.9 (8.0)	0.43...0.53	23	9	18	0.000099 (0.000088)	1.2 (2.6)
A/B1520U							0.000015 (0.00013)	1.4 (3.1)
A/B1530U							0.000026 (0.00023)	1.8 (3.9)
A/B210V		4.5 (40)	0.46...0.56	58	20	42	0.000033 (0.00029)	1.8 (4.0)
A/B220T							0.000057 (0.00050)	2.4 (5.4)
A/B230P							0.000082 (0.00073)	3.0 (6.7)
A/B310	45	4.18 (37)	0.45...0.55	50	20	110	0.000057 (0.00050)	3.7 (8)
A/B320							0.000092 (0.00081)	4.6 (10)
A/B330							0.00013 (0.0011)	5.6 (12.4)
A/B420	37	10.2 (90)	0.576...0.704	110	25	160	0.00030 (0.0027)	6.0 (13.2)
A/B430							0.00042 (0.0038)	7.3 (16)
A/B4530							0.00044 (0.0039)	9.1 (20)
A/B4540							0.00056 (0.0050)	11.0 (24)
A/B4560							0.00084 (0.0072)	15.1 (33.2)
A/B520	25	28.3 (250)	1.05...1.28	70	50	250	0.000897 (0.0079)	12.38 (27.25)
A/B540							0.00157 (0.0139)	17.6 (38.75)
A/B560							0.00227 (0.020)	22.8 (50.1)
B580							0.0030 (0.026)	29.0 (63.8)
B640	25	70.0 (619)	1.91...2.19	200	120	900	0.00438 (0.03863)	37.27 (82.0)
B660							0.00628 (0.0555)	42.95 (94.5)
B680							0.0079 (0.0698)	50.8 (112.0)
B860		106.0 (938)	2.05...2.50	250	200	1000	0.0177 (0.1570)	72.7 (160)
B880							0.0232 (0.205)	87.7 (193)
B960		153.0 (1350)	3.85...4.70	300	200	1200	0.0290 (0.256)	89.5 (197)
B980							0.0378 (0.334)	116.5 (256)

MP-Series Low Inertia Motor Dimensions

MP-Series Small Frame (230/460V) Motor Dimensions (MPL-A/B15xx and MPL-A/B2xx) Threaded DIN Connectors



MP-Series Small Frame (230/460V) Motor Dimensions (MPL-A/B15xx and MPL-A/B2xx) Threaded DIN Connectors

Motor Series MPL-A or MPL-B	AD mm (in.)	HD mm (in.)	T mm (in.)	LA mm (in.)	LD (1) mm (in.)	LE (1) mm (in.)	L (1) mm (in.)	LB (1) mm (in.)	L-LB (2) mm (in.)	D mm (in.)	M mm (in.)	S (3) mm (in.)	N mm (in.)	P mm (in.)	G mm (in.)	F mm (in.)
1510					78.3 (3.08)	39.2 (1.54)	133.2 (5.25)	113.5 (4.47)								
1520	66.5 (2.62)	94.0 (3.70)	2.50 (0.098)	9.0 (0.35)	91.3 (3.60)	52.4 (2.06)	146.2 (5.76)	126.5 (4.98)	19.7 (0.776)	9.0 (0.35)	63.0 (2.480)	5.80 (0.228)	40.0 (1.57)	55.0 (2.17)	7.2 (0.283)	3.0 (0.118)
1530					116.3 (4.58)	77.2 (3.04)	171.2 (6.74)	151.5 (5.96)								
210					78.6 (3.09)	39.6 (1.56)	137.3 (5.40)	114.6 (4.51)								
220	74.0 (2.91)	109 (4.29)	2.50 (0.098)	9.0 (0.35)	104.1 (4.10)	65.1 (2.56)	162.8 (6.41)	140.1 (5.52)	22.7 (0.894)	11.0 (0.43)	75.0 (2.953)	5.80 (0.228)	60.0 (2.36)	70.0 (2.76)	8.5 (0.335)	4.0 (0.157)
230					129.6 (5.10)	90.6 (3.57)	188.3 (7.41)	165.6 (6.52)								

(1) If ordering an MPL-A/B1510, A/B1520, or A/B1530 motor with brake, add 36.1 mm (1.421 in.) to dimension L and LB, and add 33.4 mm (1.32 in.) to LD and LE.
If ordering an MPL-A/B210, A/B220, or A/B230 motor with brake, add 39.0 mm (1.535 in.) to dimension L and LB, and add 24.7 mm (0.97 in.) to LD and LE.

(2) Tolerance for this dimension is ± 0.7 mm (± 0.028 in.).

(3) Tolerance for this dimension is $+0.3$ mm ($+0.012$ in.).

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MP-Series Low Inertia Motor Dimensions (MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx, MPL-A/B5xx) SpeedTec DIN Connectors

Motor Series MPL-	AD mm (in.)	HD mm (in.)	T mm (in.)	LA mm (in.)	LD ⁽¹⁾ mm (in.)	LE ⁽¹⁾ mm (in.)	L ⁽¹⁾ mm (in.)	LB ⁽¹⁾ mm (in.)	L-LB ⁽²⁾ mm (in.)	D mm (in.)	M mm (in.)	S ⁽³⁾ mm (in.)	N mm (in.)	P mm (in.)	GE mm (in.)	F mm (in.)
A/B310					102.0 (4.03)	62.0 (2.45)	168.0 (6.62)	128.0 (5.04)								
A/B320	87.2 (3.44)	132.0 (5.20)	2.74 (0.108)	9.90 (0.39)	128.0 (5.03)	88.0 (3.45)	193.0 (7.62)	153.0 (6.04)	40.0 (1.58)	16.0 (0.629)	100.0 (3.937)	7.0 (0.283)	80.0 (3.15)	89.4 (3.52)	3.0 (0.118)	5.0 (0.197)
A/B330					153.0 (6.03)	113.0 (4.45)	219.0 (8.62)	179.0 (7.04)								
A/B420	90.9 (3.58)	140.1 (5.52)	2.74 (0.108)	10.16 (0.40)	124.0 (4.89)	84.0 (3.31)	190.0 (7.48)	150.0 (5.90)	40.0 (1.58)	19.0 (0.748)	115.0 (4.528)	10.0 (0.401)	95.0 (3.74)	96.3 (3.87)	3.5 (0.138)	6.0 (0.236)
A/B430					150.0 (5.89)	110.0 (4.31)	215.0 (8.48)	175.0 (6.90)								
A/B4530					153.0 (6.02)	113.0 (4.44)	229.0 (9.0)	179.0 (7.03)								
A/B4540	98.6 (3.88)	155.4 (6.12)	2.74 (0.108)	12.19 (0.48)	178.0 (7.02)	138.0 (5.44)	254.0 (10.0)	204.0 (8.03)	50.0 (1.97)	24.0 (0.945)	130.0 (5.118)	10.0 (0.401)	110.0 (4.331)	113.7 (4.48)	4.0 (0.158)	8.0 (0.315)
A/B4560					229.0 (9.02)	189.0 (7.44)	305.0 (12.0)	255.0 (10.03)								
A520					151.0 (5.95)	80.0 (3.15)	236.0 (9.28)	176.0 (6.92)								
A540	136.4 (5.37)	208.1 (8.19)	3.12 (0.123)	14.0 (0.55)	202.0 (7.95)	131.0 (5.15)	287.0 (11.28)	227.0 (8.92)	60.0 (2.362)	28.0 (1.102)	165.0 (6.496)	12.0 (0.481)	130.0 (5.118)	143.5 (5.65)	4.0 (0.158)	8.0 (0.315)
A560					253.0 (9.95)	182.0 (7.15)	337.0 (13.28)	277.0 (10.92)								
B520					149.0 (5.88)	109.0 (4.30)	236.0 (9.28)	176.0 (6.92)								
B540	113.4 (4.47)	185.2 (7.29)	3.12 (0.123)	14.0 (0.55)	200.0 (7.88)	160.0 (6.30)	287.0 (11.28)	227.0 (8.92)	60.0 (2.38)	28.0 (1.102)	165.0 (6.496)	12.0 (0.481)	130.0 (5.118)	143.5 (5.65)	4.0 (0.158)	8.0 (0.315)
B560					251.0 (9.88)	211.0 (8.30)	337.0 (13.28)	277.0 (10.92)								
B580	136.4 (5.37)	208.1 (8.19)	3.12 (0.123)	14.0 (0.55)	304.0 (11.95)	232.0 (9.15)	408.0 (16.07)	328.0 (12.92)	80.0 (3.15)	32.0 (1.260)					5.0 (0.198)	10.0 (0.393)

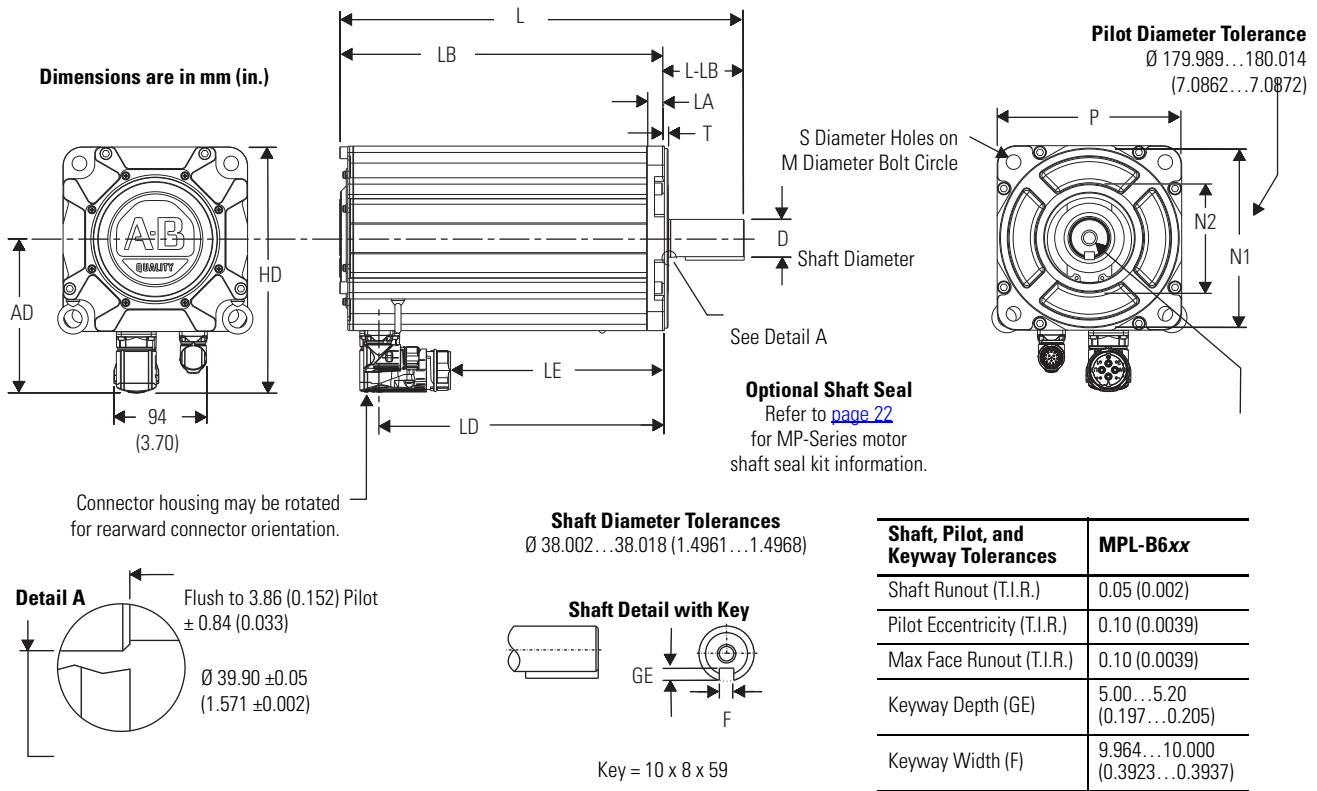
(1) If ordering an MPL-A/B310, MPL-A/B320, or MPL-A/B330 motor with brake, add 35.0 mm (1.38 in.) to dimensions L, LB, LE, and LD.
 If ordering an MPL-A/B420, MPL-A/B430, MPL-A/B4530, MPL-A/B4540, or MPL-A/B4560 motor with brake, add 48.0 mm (1.89 in.) to dimensions L, LB, LE, and LD.
 If ordering an MPL-A/B520, MPL-A/B540, MPL-A/B560, or MPL-B580 motor with brake, add 52.0 mm (2.03 in.) to dimensions L, LB, LE, and LD.

(2) Tolerance for this dimension is ±0.7 mm (±0.028 in.) in.

(3) Tolerance for this dimension is +0.36 mm (±0.007 in.) on MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx, and +0.43 mm (±0.008 in.) on MPL-A/B5xx.

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MP-Series Low Inertia (460V) Motor Dimensions (MPL-B6xx) SpeedTec DIN Connectors



Motor Series	AD	HD	T	LA	LD (1)	LE (1)	L (1)	LB (1)	L-LB (2)	D	M	S (3)	N	P	GE	F
MPL-	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)
B640					184.0 (7.23)	113.0 (4.43)	304.0 (11.96)	224.0 (8.83)								
B660	154.0 (6.06)	246.5 (9.70)	3.73 (0.147)	17.8 (0.70)	234.0 (9.23)	163.0 (6.43)	355.0 (13.96)	275.0 (10.83)	80.0 (3.15)	38.0 (1.5)	215.0 (8.465)	14.50 (0.579)	180.0 (7.09)	184.9 (7.28)	5.0 (0.197)	10.0 (0.394)
B680					285.0 (11.23)	214.0 (8.43)	405.0 (15.96)	325.0 (12.83)								

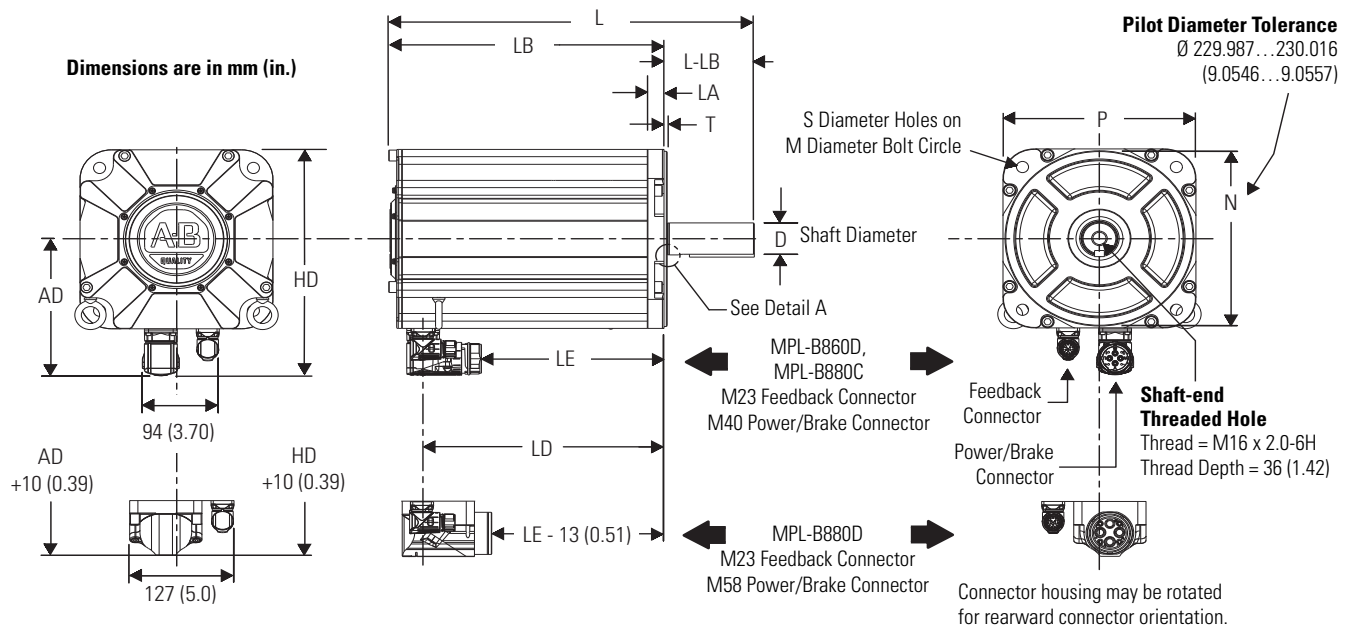
(1) If ordering an MPL-B640, MPL-B660, or MPL-B680 motor with brake, add 89 mm (3.5 in.) to dimensions LD, LE, L, and LB.

(2) Tolerance for this dimension is ±0.7 mm (±0.028 in.).

(3) Tolerance for this dimension is ±0.215 mm (±0.008 in.).

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MP-Series Low Inertia (460V) Motor Dimensions (MPL-B8xx) SpeedTec DIN Connectors



Shaft, Pilot, and Keyway Tolerances	MPL-B8xx
Shaft Runout (T.I.R.)	0.05 (0.0016)
Pilot Eccentricity (T.I.R.)	0.10 (0.0039)
Max Face Runout (T.I.R.)	0.10 (0.0039)
Keyway Depth (GE)	5.00 ... 5.20 (0.197 ... 0.205)
Keyway Width (F)	11.957 ... 12.000 (0.4708 ... 0.4724)

Motor Series	AD mm (in.)	HD mm (in.)	T mm (in.)	LA mm (in.)	LD ⁽¹⁾ mm (in.)	LE ⁽¹⁾ mm (in.)	L ⁽¹⁾ mm (in.)	LB ⁽¹⁾ mm (in.)	L-LB ⁽²⁾ mm (in.)	D mm (in.)
B860	179 (7.05)	297 (11.67)	3.86 (0.152)	20.3 (0.80)	243 (9.55)	171 (6.75)	394 (15.53)	284 (11.20)	110 (4.33)	42.0 (1.654)
B880					293 (11.55)	222 (8.75)	445 (17.53)	335 (13.20)		

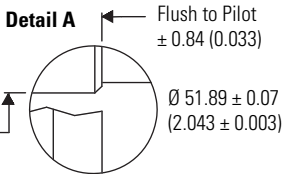
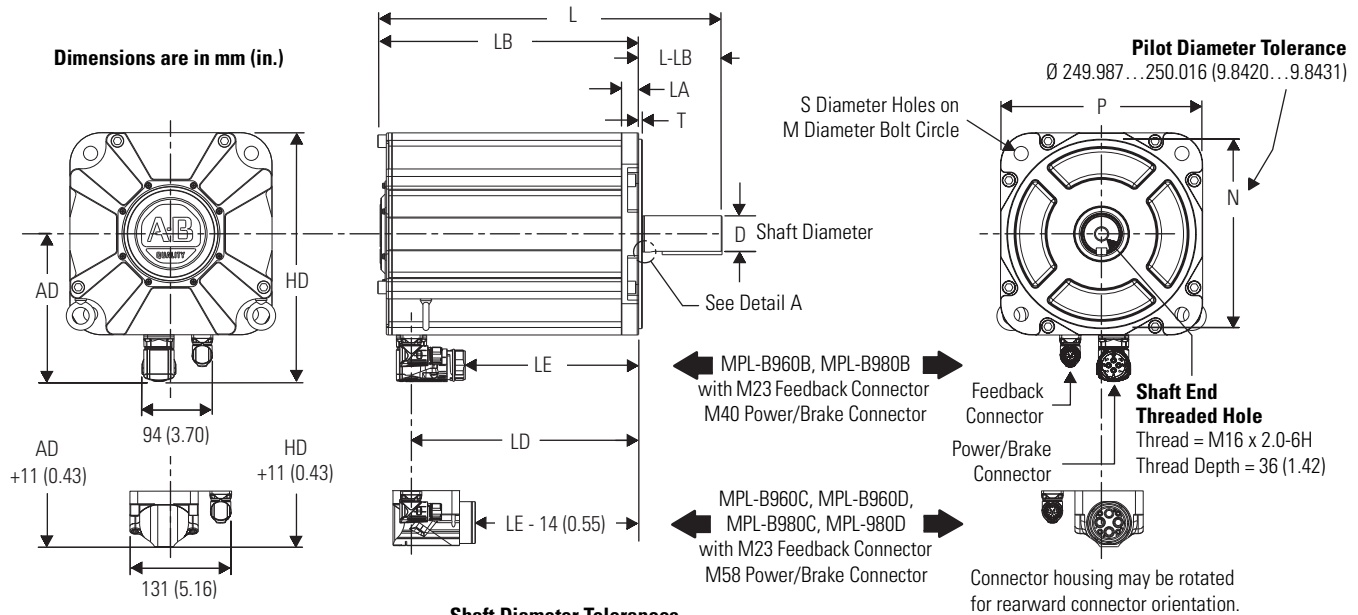
(1) If ordering an MPL-B860 or MPL-B880 motor with brake, add 108 mm (4.24 in.) to dimensions LD, LE, L, and LB.
 (2) Tolerance for this dimension is ± 0.7 mm (± 0.028 in.).

Motor Series	M mm (in.)	S ⁽¹⁾ mm (in.)	N mm (in.)	P mm (in.)	GE mm (in.)	F mm (in.)
B860	265 (10.43)	14.50 (0.579)	230 (9.055)	235 (9.25)	5.0 (0.197)	12.0 (0.4724)
B880						

(1) Tolerance for this dimension is ± 0.43 mm (± 0.008 in.).

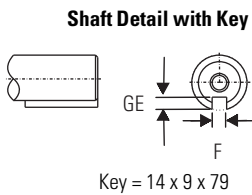
Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MP-Series Low Inertia (460V) Motor Dimensions (MPL-B9xx) SpeedTec DIN Connectors



Optional Shaft Seal
 Refer to [page 22](#) for MP-Series motor shaft seal kit information.

Shaft Diameter Tolerances
 $\varnothing 48.002 \dots 48.018$ (1.8899...1.8905)



Shaft, Pilot, and Keyway Tolerances	MPL-B9xx
Shaft Runout (T.I.R.)	0.05 (0.002)
Pilot Eccentricity (T.I.R.)	0.125 (0.005)
Max Face Runout (T.I.R.)	0.125 (0.005)
Keyway Depth (GE)	5.50...5.70 (0.217...0.224)
Keyway Width (F)	13.957...14.000 (0.5495...0.5512)

Motor Series	AD	HD	T	LA	LD (1)	LE (1)	L (1)	LB (1)	L-LB (2)	D
MPL-	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)
B960	195 (7.68)	328 (12.92)	4.88 (0.192)	22.9 (0.90)	249 (9.80)	178 (7.0)	403 (15.87)	293 (11.55)	110 (4.33)	42.0 (1.6)
B980					300 (11.80)	229 (9.0)	454 (17.87)	344 (13.55)		

(1) If ordering an MPL-B960 or MPL-B980 motor with brake, add 127 mm (5.0 in.) to dimensions LD, LE, L, and LB.

(2) Tolerance for this dimension is ± 0.7 mm (± 0.028 in.).

Motor Series	M	S (1)	N	P	GE	F
MPL-	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)
B960	300 (11.81)	18.50 (0.738)	250 (9.84)	267 (10.50)	5.50 (0.217)	14.0 (0.5512)
B980						

(1) Tolerance for this dimension is $+0.52$ mm (± 0.010 in.).

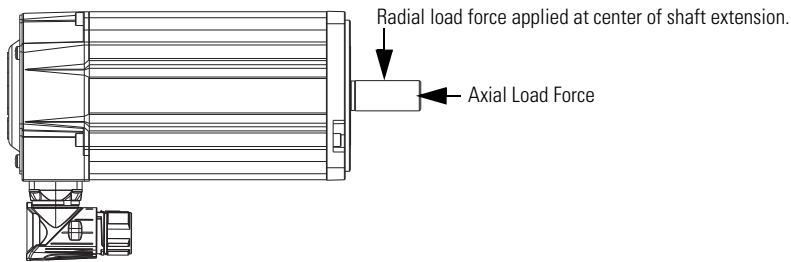
Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MP-Series Low Inertia Motor Load Force Ratings

Bulletin MPL motors are capable of operating with the maximum radial or maximum axial shaft loads listed in the following tables. Radial loads listed are applied in the middle of the shaft extension. The tables starting below represent an L_{10} bearing fatigue life of 20,000 hours. This 20,000-hour life does not account for possible application-specific life reduction that may occur due to bearing grease contamination from external sources. Maximum operating speed is limited by motor winding.

Radial Load Force Ratings

Motor Cat. No.	500 rpm kg (lb)	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	3500 rpm kg (lb)	4000 rpm kg (lb)	5000 rpm kg (lb)	6000 rpm kg (lb)	7000 rpm kg (lb)	8000 rpm kg (lb)
MPL-A/B1510	–	24 (52)	19 (41)	–	–	15 (33)	–	–	–	12 (26)
MPL-A/B1520	–	25 (56)	20 (45)	–	–	16 (36)	–	–	14 (30)	–
MPL-A/B1530	–	28 (62)	22 (49)	–	–	18 (39)	–	–	15 (33)	–
MPL-A/B210	–	24 (52)	19 (41)	–	–	15 (33)	–	–	–	12 (26)
MPL-A/B220	–	27 (59)	21 (47)	–	18 (39)	–	–	15 (33)	–	–
MPL-A/B230	–	29 (64)	23 (51)	–	19 (42)	–	17 (37)	–	–	–
MPL-A/B310	78 (172)	62 (137)	49 (108)	–	40 (88)	–	36 (79)	–	–	–
MPL-A/B320	87 (192)	69 (152)	55 (121)	–	45 (99)	–	40 (88)	–	–	–
MPL-A/B330	–	74 (163)	59 (130)	–	49 (108)	–	43 (95)	–	–	–
MPL-A/B420	–	78 (172)	62 (137)	–	51 (112)	–	45 (99)	–	–	–
MPL-A/B430	106 (234)	84 (185)	67 (148)	–	55 (121)	–	49 (108)	–	–	–
MPL-A/B4530	133 (293)	105 (232)	84 (185)	73 (161)	–	66 (146)	–	–	–	–
MPL-A4540C	140 (309)	112 (245)	96 (211)	–	–	–	–	–	–	–
MPL-A/B4540	140 (309)	111 (245)	89 (196)	77 (170)	–	–	–	–	–	–
MPL-A/B4560	–	151 (332)	119 (263)	95 (209)	–	–	–	–	–	–
MPL-A/B520	–	127 (280)	100 (222)	88 (194)	–	80 (176)	–	–	–	–
MPL-A/B540	–	143 (316)	114 (251)	99 (219)	–	90 (199)	–	–	–	–
MPL-A/B560	–	153 (338)	121 (268)	106 (234)	–	–	–	–	–	–
MPL-B580	–	153 (338)	121 (268)	106 (234)	–	–	–	–	–	–
MPL-B640	253 (557)	200 (442)	159 (351)	139 (307)	–	–	–	–	–	–
MPL-B660	275 (607)	219 (482)	173 (382)	151 (334)	–	–	–	–	–	–
MPL-B680	291 (641)	230 (508)	183 (404)	160 (353)	–	–	–	–	–	–
MPL-B860	347 (764)	276 (607)	219 (481)	–	–	–	–	–	–	–
MPL-B880	368 (810)	292 (643)	231 (510)	–	–	–	–	–	–	–
MPL-B960	466 (1028)	370 (816)	323 (713)	–	–	–	–	–	–	–
MPL-B980	494 (1089)	392 (864)	352 (775)	–	–	–	–	–	–	–

MP-Series Low Inertia Motor Load Forces (MPL-xxxxx-xxxxAA)**Axial Load Force Ratings (Maximum Radial Load)**

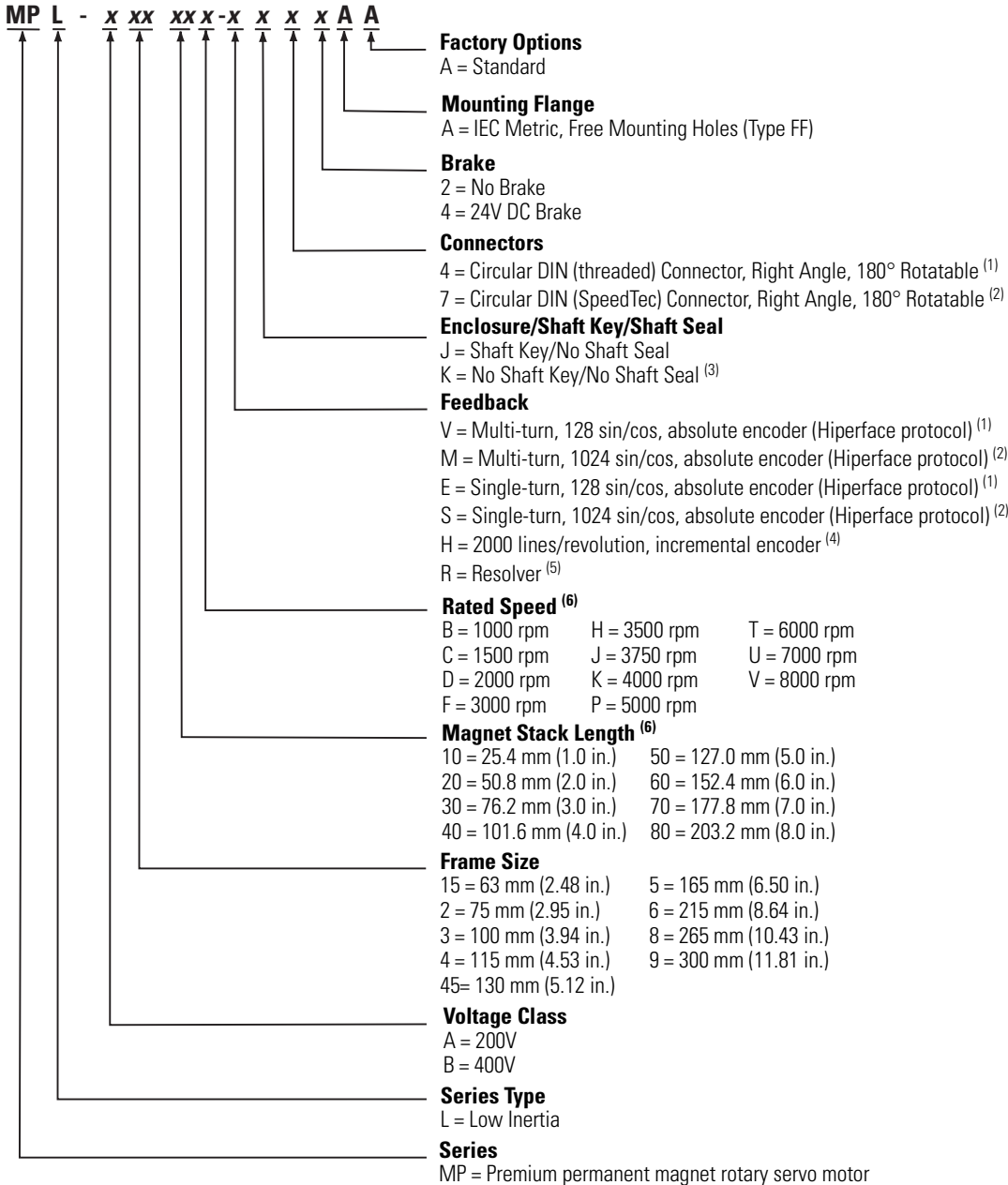
Motor Cat. No.	500 rpm kg (lb)	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	3500 rpm kg (lb)	4000 rpm kg (lb)	5000 rpm kg (lb)	6000 rpm kg (lb)	7000 rpm kg (lb)	8000 rpm kg (lb)
MPL-A/B1510	—	15 (33)	10 (22)	—	—	7 (15)	—	—	—	5 (11)
MPL-A/B1520	—	14 (31)	10 (22)	—	—	6 (13)	—	—	4 (9)	—
MPL-A/B1530	—	13 (29)	9 (20)	—	—	6 (13)	—	—	4 (8)	—
MPL-A/B210	—	15 (33)	10 (22)	—	—	7 (15)	—	—	—	5 (11)
MPL-A/B220	—	14 (30)	9 (20)	—	7 (15)	—	—	5 (11)	—	—
MPL-A/B230	—	13 (28)	9 (19)	—	6 (13)	—	5 (11)	—	—	—
MPL-A/B310	30 (66)	23 (51)	16 (35)	—	13 (29)	—	11 (24)	—	—	—
MPL-A/B320	34 (75)	25 (55)	19 (42)	—	15 (33)	—	13 (29)	—	—	—
MPL-A/B330	—	27 (60)	20 (44)	—	16 (35)	—	13 (29)	—	—	—
MPL-A/B420	—	36 (79)	27 (60)	—	21 (46)	—	18 (40)	—	—	—
MPL-A/B430	52 (115)	39 (86)	29 (64)	—	22 (49)	—	19 (42)	—	—	—
MPL-A/B4530	45 (99)	34 (75)	25 (55)	21 (46)	—	19 (42)	—	—	—	—
MPL-A4540C	31 (68)	37 (81)	49 (108)	—	—	—	—	—	—	—
MPL-A/B4540	49 (108)	36 (79)	27 (60)	22 (49)	—	—	—	—	—	—
MPL-A/B4560	—	53 (117)	40 (88)	30 (65)	—	—	—	—	—	—
MPL-A/B520	—	42 (94)	30 (68)	26 (58)	—	22 (50)	—	—	—	—
MPL-A/B540	—	48 (107)	35 (79)	30 (66)	—	26 (58)	—	—	—	—
MPL-A/B560	—	52 (115)	43 (95)	32 (71)	—	—	—	—	—	—
MPL-B580	—	52 (115)	43 (95)	32 (71)	—	—	—	—	—	—
MPL-B640	89 (197)	66 (146)	48 (107)	41 (90)	—	—	—	—	—	—
MPL-B660	98 (217)	72 (159)	53 (118)	45 (99)	—	—	—	—	—	—
MPL-B680	104 (230)	77 (169)	34 (125)	47 (104)	—	—	—	—	—	—
MPL-B860	145 (320)	107 (237)	79 (175)	—	—	—	—	—	—	—
MPL-B880	153 (338)	113 (250)	84 (185)	—	—	—	—	—	—	—
MPL-B960	142 (314)	105 (232)	88 (194)	—	—	—	—	—	—	—
MPL-B980	153 (338)	113 (249)	94 (207)	—	—	—	—	—	—	—

Axial Load Force Ratings (Zero Radial Load)

Motor Cat. No.	500 rpm kg (lb)	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	3500 rpm kg (lb)	4000 rpm kg (lb)	5000 rpm kg (lb)	6000 rpm kg (lb)	7000 rpm kg (lb)	8000 rpm kg (lb)
MPL-A/B1510	—	24 (53)	17 (37)	—	—	12 (26)	—	—	—	8 (18)
MPL-A/B1520	—	24 (53)	17 (37)	—	—	12 (26)	—	—	9 (19)	—
MPL-A/B1530	—	24 (53)	17 (37)	—	—	12 (26)	—	—	9 (19)	—
MPL-A/B210	—	24 (53)	17 (37)	—	—	12 (26)	—	—	—	8 (18)
MPL-A/B220	—	24 (53)	17 (37)	—	13 (28)	—	—	10 (22)	—	—
MPL-A/B230	—	24 (53)	17 (37)	—	13 (28)	—	10 (22)	—	—	—
MPL-A/B310	49 (108)	36 (79)	27 (60)	—	21 (46)	—	18 (40)	—	—	—
MPL-A/B320	49 (108)	36 (79)	27 (60)	—	21 (46)	—	18 (40)	—	—	—
MPL-A/B330	—	36 (79)	27 (60)	—	21 (46)	—	18 (40)	—	—	—
MPL-A/B420	—	51 (112)	38 (84)	—	30 (66)	—	25 (55)	—	—	—
MPL-A/B430	69 (152)	51 (112)	38 (84)	—	30 (66)	—	25 (55)	—	—	—
MPL-A/B4530	69 (152)	51 (112)	38 (84)	31 (68)	—	28 (62)	—	—	—	—
MPL-A4540C	68 (150)	51 (112)	43 (95)	—	—	—	—	—	—	—
MPL-A/B4540	69 (152)	51 (112)	38 (84)	31 (68)	—	—	—	—	—	—
MPL-A/B4560	—	69 (152)	51 (112)	38 (84)	—	—	—	—	—	—
MPL-A/B520	—	67 (149)	49 (109)	41 (92)	—	36 (81)	—	—	—	—
MPL-A/B540	—	67 (149)	49 (109)	41 (92)	—	36 (81)	—	—	—	—
MPL-A/B560	—	67 (149)	49 (109)	41 (92)	—	—	—	—	—	—
MPL-B580	—	67 (149)	49 (109)	41 (92)	—	—	—	—	—	—
MPL-B640	136 (300)	99 (219)	74 (163)	62 (137)	—	—	—	—	—	—
MPL-B660	136 (300)	99 (219)	74 (163)	62 (137)	—	—	—	—	—	—
MPL-B680	136 (300)	99 (219)	74 (163)	62 (137)	—	—	—	—	—	—
MPL-B860	201 (443)	147 (323)	110 (242)	—	—	—	—	—	—	—
MPL-B880	201 (443)	147 (323)	110 (242)	—	—	—	—	—	—	—
MPL-B960	215 (473)	159 (350)	133 (293)	—	—	—	—	—	—	—
MPL-B980	215 (473)	159 (350)	133 (293)	—	—	—	—	—	—	—

MP-Series Low Inertia Motor Catalog Number

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your motor. For questions regarding product availability, contact your Allen-Bradley distributor.



(1) Applies to MPL-A/B15xx and MPL-A/B2xx motors.

(2) Applies to MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx, MPL-A/B5xx, MPL-B6xx, MPL-B8xx, and MPL-B9xx motors.

(3) Requires longer lead times. Applies to limited frame sizes only.

(4) Applies to MPL-A/B15xxx-H, MPL-A/B2xxx-H, MPL-A/B3xxx-H, MPL-A/B4xxx-H, MPL-A/B45xxx-H motors.

(5) Applies to MPL-B3xxx-R, MPL-B4xxx-R, and MPL-B45xxx-R motors.

(6) Not all combinations are available. Only the configurations for rated speed and magnet stack length as listed in MP-Series Low Inertia Motor (230V) Performance Specifications (page 23) and MP-Series Low Inertia Motor (460V) Performance Specifications (page 24) are available.

MP-Series Medium Inertia Motors



The MP-Series (Bulletin MPM) medium-inertia servo motors offer a compact, power dense, feature-rich solution for applications with heavier loads and greater inertia. Leveraging the proven MP-Series motor technology and quality standards, these new servo motors are ideal for users with print, converting, web handling, automotive, and other applications requiring more power in a smaller package.

For drive compatibility, refer to Servo Drives on [page 14](#).

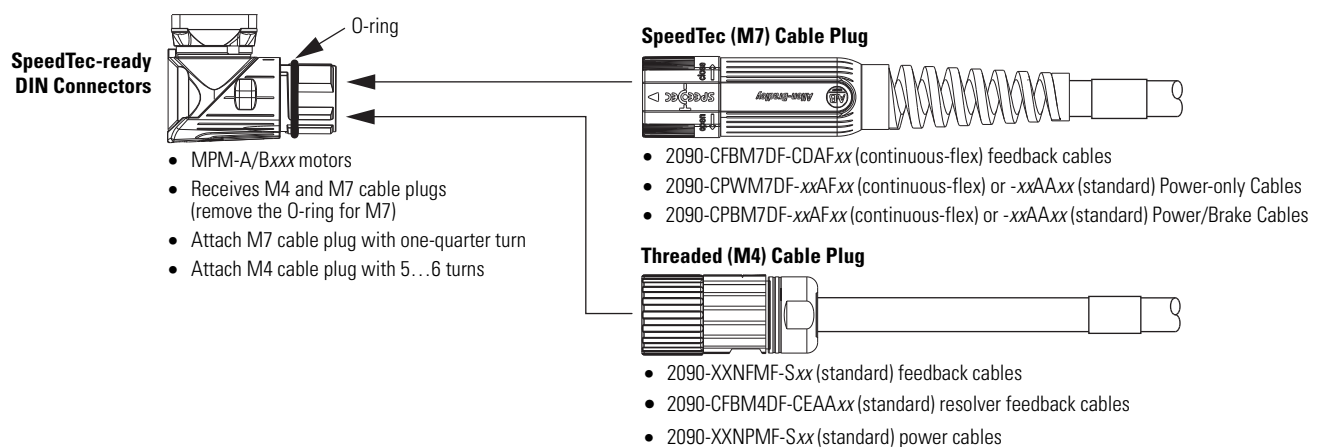
MP-Series Medium Inertia Motor High Resolution Encoder Features

MP-Series medium-inertia motors are available with high performance encoders with a choice of Single-turn (-S) or Multi-turn (-M) high-resolution feedback.

- Up to 2 million counts per revolution (-M and -S) for smooth performance.
- Single-turn encoder provides high-resolution absolute position feedback within one turn.
- Multi-turn encoder provides high-resolution absolute position feedback within 4096 turns. The electromechanical design does not require a battery.

Circular DIN Connector/Cable Compatibility

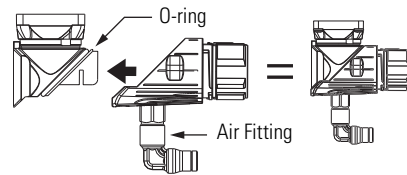
MP-Series (Bulletin MPM) motors are equipped with SpeedTec-ready DIN connectors.



MP-Series Medium Inertia Motor Options

MP-Series medium-inertia motors are available with these options:

- 24V DC brake.
- Shaft seal kit available for field installation. Shaft seals are made of nitrile. Kits include a lubricant to reduce wear.
- Positive Air Pressure kit (catalog number MPF-7-AIR-PURGE) is mounted on the feedback connector to provide positive air pressure to further reduce the chance of contamination inside the motor.



Refer to the MP-Series Medium Inertia Servo Motor Installation Instructions, publication [MPM-IN001](#), for more information.

Motor Shaft Seal Kit Combinations and Dimensions

Motor Series	Shaft Seal Cat. No.	Inside Diameter mm (in.)	Outside Diameter mm (in.)	Width mm (in.)
MPM-A115xx and MPL-B115xx	MPL-SSN-A4B4	20 (0.79)	52 (2.05)	7 (0.28)
MPM-A130xx and MPL-B130xx	MPL-SSN-A5B5	25 (0.98)	62 (2.44)	
MPM-A165xx and MPM-B165xx	MPL-SSN-F165	30 (1.18)	72 (2.83)	8 (0.31)
MPM-A215xx and MPL-B215xx	MPL-SSN-A6B6	40 (1.57)	90 (3.54)	

MP-Series Medium Inertia Motor Performance Specifications

MP-Series Medium Inertia Motor (230V) Performance Specifications

Motor MPM-	Base Speed rpm	Max Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output kW	Speed at Motor Rated Output rpm	Rotor Inertia ⁽¹⁾ kg-m ² (lb-in-s ²)	Motor Weight, ⁽¹⁾ approx. kg (lb)
A1151M	4500	6000	2.18 (19.3)	6.60 (58.0)	0.90	5000	0.00065 (0.00575)	3.45 (7.6)
A1152F	3000	5000	4.74 (42.0)	13.5 (119)	1.40	4000	0.00077 (0.00682)	5.20 (11.4)
A1153F	3000	5000	6.55 (58.0)	19.8 (175)	1.45	4000	0.00089 (0.00784)	6.4 (14.0)
A1302F	3000	4500	5.99 (53.0)	13.5 (119)	1.65	4000	0.000983 (0.00870)	6.8 (15.0)
A1304F	3000	4000	9.30 (82.0)	19.3 (171)	2.20	3500	0.001223 (0.01082)	9.6 (21.2)
A1651F	3000	5000	10.7 (95.0)	20.5 (181)	2.50	3000	0.006745 (0.05970)	15.3 (33.8)
A1652F	3000	4000	13.5 (119)	36.0 (319)	4.03	3500	0.007405 (0.06554)	20.6 (45.4)
A1653F	3000	4000	18.6 (165)	42.0 (372)	5.10	3000	0.008165 (0.07227)	25.6 (56.4)
A2152F	3000	4000	27.0 (239)	56.0 (496)	5.20	2000	0.02059 (0.18223)	35.8 (79.0)
A2153F	3000	3600	34.0 (301)	58.0 (513)	5.80	2000	0.02254 (0.19950)	44.6 (98.3)
A2154C	1500	2000	55.0 (487)	106 (938)	6.50	1750	0.02449 (0.21675)	53.6 (118)
A2154E	2250	2650	44.0 (389)	84.0 (743)	7.00	2000		

(1) Refer to MP-Series Medium Inertia Motor Brake Specifications on [page 41](#) for Rotor Inertia and Brake Motor Weight.

System Combinations (230V)

For MP-Series Medium Inertia Motors and	Refer to
Kinetix 300 (240V) drives	page 500
Kinetix 6000 (230V) drives	page 532
Kinetix 2000 (230V) drives	page 562
Ultra3000/5000 (230V) drives	page 611

MP-Series Medium Inertia Motor (460V) Performance Specifications

Motor MPM-	Base Speed rpm	Max Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output kW	Speed at Motor Rated Output rpm	Rotor Inertia ⁽¹⁾ kg-m ² (lb-in-s ²)	Motor Weight, ⁽¹⁾ approx. kg (lb)
B1151F	3000	5000	2.18 (19.3)	6.6 (58.0)	0.75	4000	0.00065 (0.00575)	3.45 (7.6)
B1151T	6000	7000			0.90	5000		
B1152C	1500	3000	4.74 (42.0)	13.5 (119)	1.20	2500	0.00077 (0.00681)	5.20 (11.4)
B1152F	3000	5200			1.40	4000		
B1152T	6000	7000						
B1153E	2250	3500	6.55 (58.0)	19.8 (175)	1.40	3000	0.00089 (0.00788)	6.40 (14.0)
B1153F	3000	5500			1.45	4000		
B1153T	6000	7000						
B1302F	3000	4500	5.99 (53.0)	13.5 (119)	1.65	4000	0.000983 (0.00870)	6.80 (15.0)
B1302M	4500	6000						
B1302T	6000	7000						
B1304C	1500	2750	10.2 (90.0)	27.1 (240)	2.00	3500	0.001223 (0.01082)	9.60 (21.2)
B1304E	2250	4000			2.20			
B1304M	4500	6000						
B1651C	1500	3500	10.7 (95.0)	23.2 (205)	2.50	3000	0.006745 (0.05969)	15.3 (33.8)
B1651F	3000	5000						
B1651M	4500	5000						
B1652C	1500	2500	16.0 (142)	40.0 (354)	3.80	2500	0.007405 (0.06554)	20.6 (45.4)
B1652E	2250	3500	19.4 (172)	48.0 (425)	4.30	3500		
B1652F	3000	4500						
B1653C	1500	2500	26.8 (237)	67.8 (600)	4.60	2000	0.008165 (0.07227)	25.6 (56.4)
B1653E	2250	3500		62.0 (549)	5.10	3000		
B1653F	3000	4000		56.0 (496)				
B2152C	1500	2500	36.7 (325)	72.3 (640)	5.60	2000	0.02059 (0.18224)	35.8 (79.0)
B2152F	3000	4500	33.0 (292)		5.90	2500		
B2152M	4500	5000	30.0 (266)					
B2153B	1300	2000	48.0 (425)	101.1 (895)	6.80	1750	0.02254 (0.19949)	44.6 (98.3)
B2153E	2250	3000			7.20	2000		
B2153F	3000	3800						
B2154B	1300	2000	62.8 (556)	154.2 (1365)	6.90	1750	0.02449 (0.21675)	53.6 (118.2)
B2154E	2250	3000	56.0 (496)	112.0 (991)	7.50	2000		
B2154F	3000	3300		88.0 (779)				

(1) Refer to MP-Series Medium Inertia Motor Brake Specifications on [page 41](#) for Rotor Inertia and Brake Motor Weight.

System Combinations (460V)

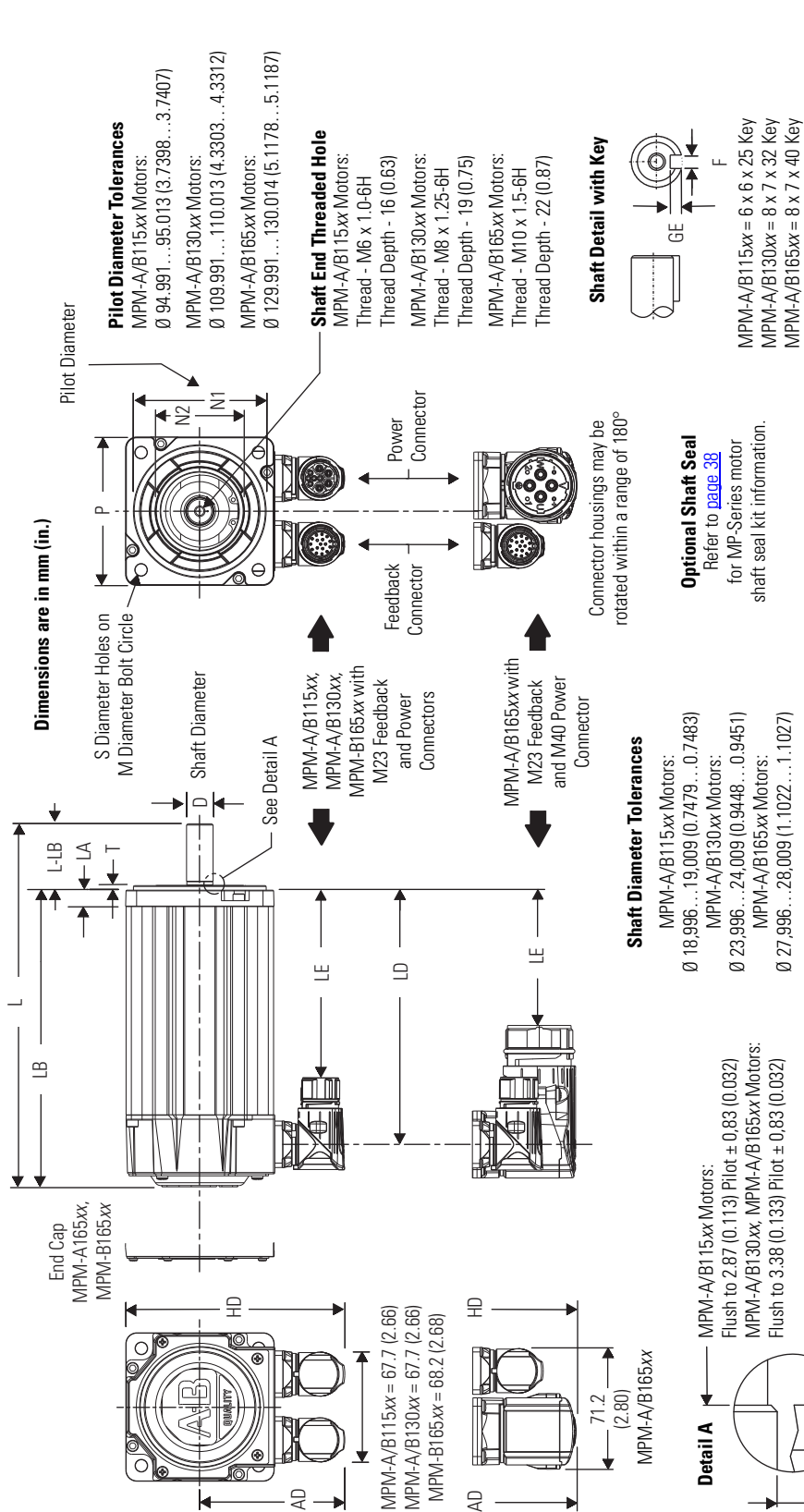
For MP-Series Medium Inertia Motors and	Refer to
Kinetix 300 (480V) drives	page 501
Kinetix 6000 and Kinetix 6200/6500 (460V) drives	page 534
Kinetix 7000 drives	page 588
Ultra3000/5000 (460V) drives	page 614

MP-Series Medium Inertia Motor Brake Specifications

Motor MPM-	Max Backlash (brake engaged) arc minutes	Holding Torque Nm (lb-in)	Coil Current at 24V DC A	Brake Response Time			Brake Rotor Inertia kg-m ² (lb-in-s ²)	Brake Motor Weight, approx. kg (lb)
				Release ms	Engage (using external arc suppression device)			
					MOV ms	Diode ms		
A/B1151	45	4.18 (37)	0.45...0.55	50	20	110	0.00065 (0.00575)	5.2 (11.4)
A/B1152							0.00077 (0.00681)	6.9 (15.2)
A/B1153							0.00089 (0.00788)	8.1 (17.8)
A/B1302	48	10.2 (90)	0.576...0.704	110	25	160	0.000983 (0.00870)	8.6 (19.0)
A/B1304							0.001223 (0.01082)	11.7 (25.7)
A/B1651	25	28.3 (250)	1.05...1.28	70	50	250	0.006745 (0.05969)	17.9 (39.5)
A/B1652							0.007405 (0.06554)	23.2 (51.1)
A/B1653							0.008165 (0.07227)	28.2 (62.1)
A/B2152	25	70 (619)	1.84...2.25	200	120	900	0.02059 (0.18224)	43.8 (96.5)
A/B2153							0.02254 (0.19949)	53.6 (115.8)
A/B2154							0.02449 (0.21675)	61.6 (135.7)

MP-Series Medium Inertia Motor Dimensions

MP-Series Medium Inertia Motor Dimensions (MPM-A/B115xx, MPM-A/B130xx, MPM-A/B165xx)



Shaft, Pilot, and Keyway Tolerances	MPM-A/B115xx	MPM-A/B130xx	MPM-A/B165xx
Shaft Runout (T.I.R.)	0.04 (0.0016)	0.04 (0.0016)	0.04 (0.0016)
Pilot Eccentricity (T.I.R.)	0.08 (0.0031)	0.10 (0.0039)	0.10 (0.0039)
Max Face Runout (T.I.R.)	0.08 (0.0031)	0.10 (0.0039)	0.10 (0.0039)
Keyway Depth (GE)	3.50...3.60 (0.138...0.142)	4.00...4.20 (0.158...0.165)	4.00...4.20 (0.158...0.165)
Keyway Width (F)	5.97...6.00 (0.235...0.236)	7.96...8.00 (0.314...0.315)	7.964...8.000 (0.3135...0.3150)

Power Connectors on MPM-A/B165xx Motors	MPM-A165xx	MPM-B165xx
M23 Power Connector	N/A	MPM-B1651F, MPM-B1651C, MPM-B1652C, MPM-B1652E, MPM-B1653C
M40 Power Connector	MPM-A165xx	MPM-B1651M, MPM-B1652F, MPM-B1653E, MPM-B1653F

MP-Series Medium Inertia Motor Dimensions (MPM-A/B115x, MPM-A/B130x, MPM-A/B165x)

Motor Series MPM-	AD (1) mm (in.)	HD (1) mm (in.)	T mm (in.)	LA mm (in.)	LD (2)(3) mm (in.)	LE (2)(4) mm (in.)	L (2) mm (in.)	LB (2) mm (in.)	L-LB (5) mm (in.)	D mm (in.)	M mm (in.)	S (6) mm (in.)	N1 mm (in.)	N2 mm (in.)	P mm (in.)	GE mm (in.)	F mm (in.)
A/B1151					124 (4.89)	84.1 (3.31)	190 (7.48)	150 (5.90)									
A/B1152	90.9 (3.58)	140.1 (5.52)	2.74 (0.108)	10.16 (0.40)	150 (5.89)	110 (4.31)	215 (8.48)	175 (6.90)	40.0 (1.58)	19.0 (0.748)	115.0 (4.528)	10.0 (0.401)	95.0 (3.74)	59.0 (2.32)	98.3 (3.87)	3.5 (0.138)	6.0 (0.236)
A/B1153					175 (6.89)	135 (5.31)	241 (9.48)	201 (7.90)									
A/B1302	98.6 (3.88)	155.4 (6.12)	2.74 (0.108)	12.19 (0.48)	153 (6.02)	113 (4.44)	229 (9.0)	179 (7.03)	50.0 (1.97)	24.0 (0.945)	130.0 (5.118)	10.0 (0.401)	110.0 (4.331)	70.3 (2.77)	113.7 (4.48)	4.0 (0.158)	8.0 (0.315)
A/B1304					204 (8.02)	164 (6.44)	279 (11.0)	229 (9.03)									
A/B1651					200 (7.88)	160 (6.30)	287 (11.28)	227 (8.92)									
A/B1652	113.4 (4.47)	185.2 (7.29)	3.12 (0.123)	14.0 (0.55)	251 (9.88)	211 (8.30)	337 (13.28)	277 (10.92)	60.0 (2.36)	28.0 (1.102)	165.0 (6.496)	12.0 (0.481)	130.0 (5.118)	81.0 (3.19)	143.5 (5.65)	4.0 (0.158)	8.0 (0.315)
A/B1653					302 (11.88)	262 (10.30)	388 (15.28)	328 (12.92)									

(1) This dimension applies to MPM-B165x motors with M23 connectors. For MPM-A/B165x motors with M40 connectors, add 23 mm (0.91 in.).

(2) If ordering an MPM-A/B115x or MPM-A/B130x motor with brake, add 48.5 mm (1.91 in.) to dimensions L, LB, LE, and LD.
If ordering an MPM-A/B165x motor with brake, add 51.5 mm (2.03 in.) to dimensions L, LB, LE, and LD.

(3) This dimension applies to MPM-B165x motors with M23 connectors. For MPM-A/B165x motors with M40 connectors, add 2.0 mm (0.07 in.).

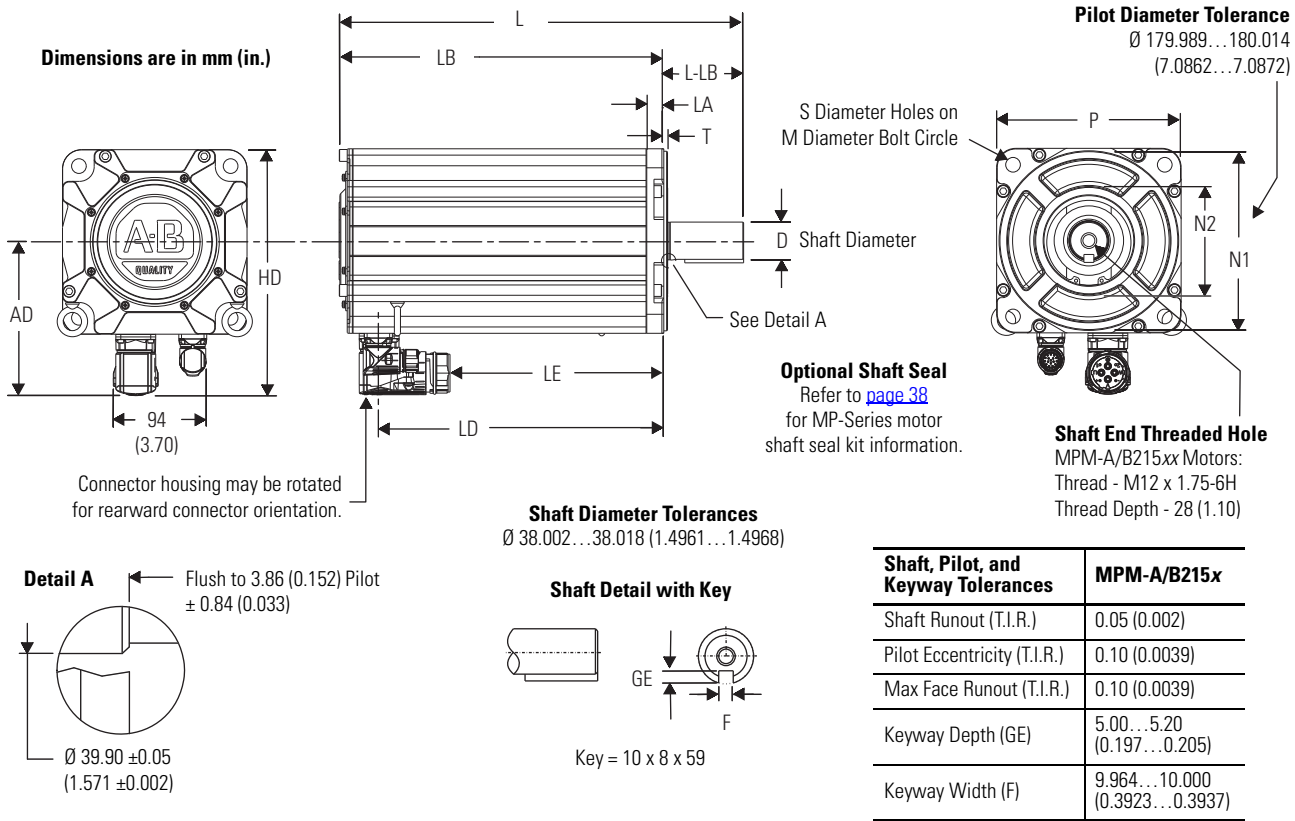
(4) This dimension applies to MPM-B165x motors with M23 connectors. For MPM-A/B165x motors with M40 connectors, subtract 29.0 mm (1.15 in.).

(5) The tolerance for this dimension is ± 0.7 mm (± 0.028 in.).

(6) For MPM-A/B115x and MPM-A/B130x motors, the tolerance for this dimension is ± 0.36 mm (± 0.007 in.).
For MPM-A/B165x motors, the tolerance is ± 0.43 mm (± 0.008 in.).

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MP-Series Medium Inertia Motor Dimensions (MPM-A/B215x)



Motor Series	AD	HD	T	LA	LD (1)	LE (1)	L (1)	LB (1)	L-LB (2)	D	M	S (3)	N1	N2	P	GE	F
MPM-	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)
A/B2152					234 (9.23)	163 (6.43)	355 (13.96)	275 (10.81)									
A/B2153	154 (6.06)	247 (9.70)	3.73 (0.147)	17.8 (0.70)	285 (11.23)	214 (8.43)	405 (15.96)	325 (12.81)	80.0 (3.150)	38.0 (1.50)	215 (8.465)	14.50 (0.579)	180 (7.09)	108 (4.25)	185 (7.28)	5.0 (0.197)	10.0 (0.394)
A/B2154					336 (13.23)	265 (10.43)	456 (17.96)	376 (14.81)									

(1) If ordering an MPM-A/B215x motor with brake, add 88.9 mm (3.5 in.) to dimensions LD, LE, L, and LB.

(2) Tolerance for this dimension is ±0.7 mm (±0.028 in.).

(3) Tolerance for this dimension is +0.43 mm (±0.008 in.).

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

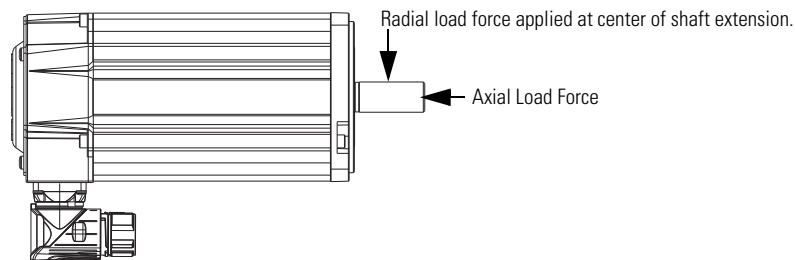
MP-Series Medium Inertia Motor Load Force Ratings

Bulletin MPM motors are capable of operating with the maximum radial or maximum axial shaft loads listed in the following tables. Radial loads listed are applied in the middle of the shaft extension. The tables starting below represent an L_{10} bearing fatigue life of 20,000 hours. This 20,000-hour life does not account for possible application-specific life reduction that may occur due to bearing grease contamination from external sources. Maximum operating speed is limited by motor winding.

Radial Load Force Ratings

Motor Cat. No.	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	5000 rpm kg (lb)	7000 rpm kg (lb)
MPM-A/B1151	77 (170)	61 (134)	54 (119)	45 (99)	40 (88)
MPM-A/B1152	84 (185)	66 (145)	58 (128)	49 (108)	43 (95)
MPM-A/B1153	88 (194)	70 (154)	61 (134)	51 (112)	46 (101)
MPM-A/B1302	105 (231)	83 (183)	72 (159)	61 (134)	54 (119)
MPM-A/B1304	115 (253)	91 (200)	80 (176)	67 (148)	–
MPM-A/B1651	141 (311)	112 (247)	97 (214)	82 (181)	–
MPM-A/B1652	151 (333)	119 (262)	104 (229)	–	–
MPM-A/B1653	156 (344)	123 (271)	107 (236)	–	–
MPM-A/B2152	216 (476)	171 (377)	149 (328)	–	–
MPM-A/B2153	228 (502)	180 (396)	156 (344)	–	–
MPM-A/B2154	235 (518)	185 (407)	161 (355)	–	–

MP-Series Medium Inertia Motor Load Forces (MPM-xxxx-xxxxAA)



Axial Load Force Ratings (Maximum Radial Load)

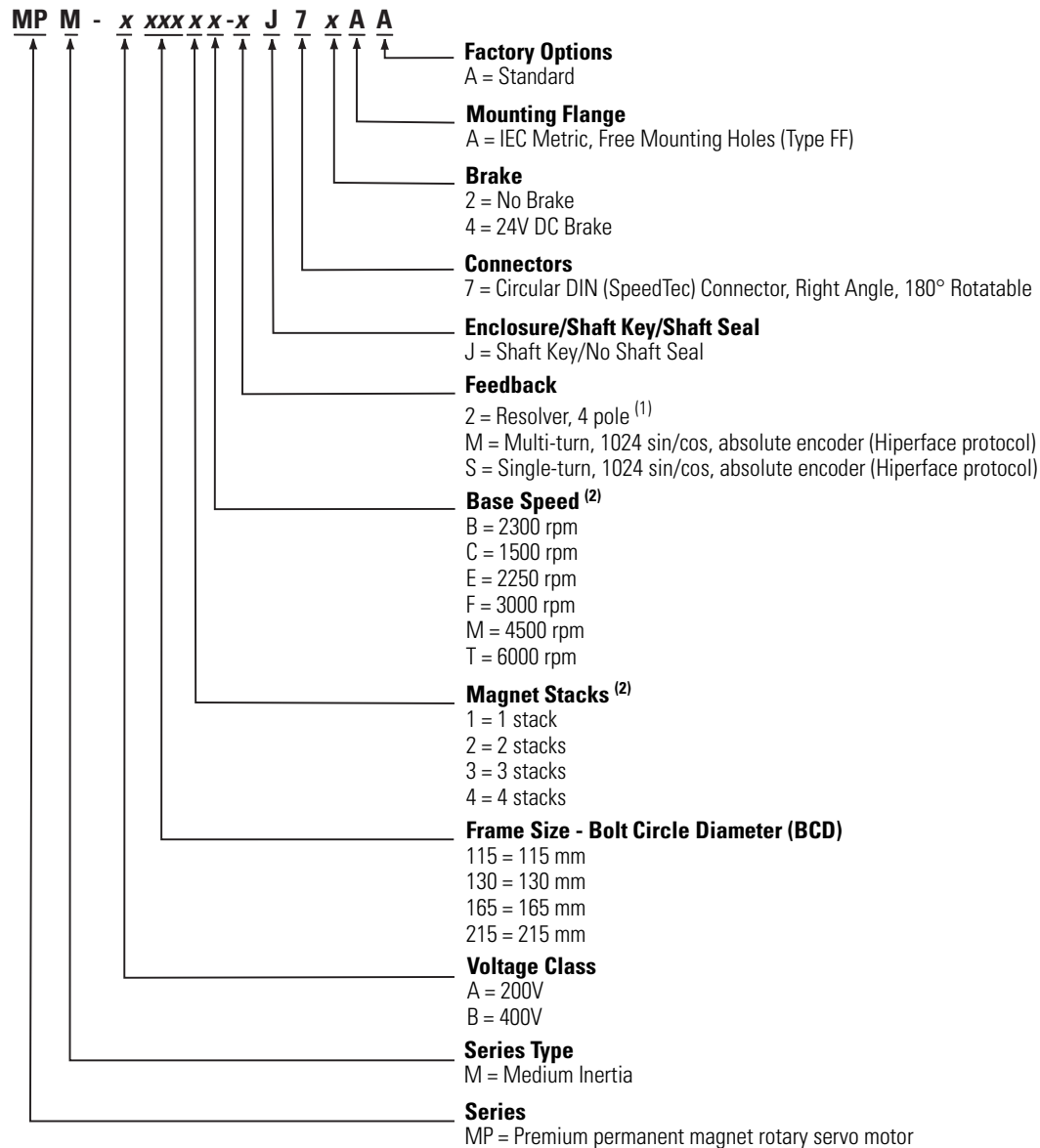
Motor Cat. No.	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	5000 rpm kg (lb)	7000 rpm kg (lb)
MPM-A/B1151	29 (64)	22 (48)	18 (40)	14 (31)	12 (26)
MPM-A/B1152	31 (68)	23 (51)	19 (42)	15 (33)	13 (29)
MPM-A/B1153	33 (73)	24 (53)	20 (44)	16 (35)	14 (31)
MPM-A/B1302	26 (57)	19 (42)	16 (35)	13 (29)	11 (24)
MPM-A/B1304	30 (66)	22 (48)	18 (40)	15 (33)	–
MPM-A/B1651	37 (81)	28 (62)	23 (51)	18 (40)	–
MPM-A/B1652	41 (90)	30 (66)	25 (55)	–	–
MPM-A/B1653	43 (95)	32 (70)	27 (59)	–	–
MPM-A/B2152	55 (121)	40 (88)	34 (75)	–	–
MPM-A/B2153	60 (132)	44 (97)	36 (79)	–	–
MPM-A/B2154	63 (139)	46 (101)	38 (84)	–	–

Axial Load Force Ratings (Zero Radial Load)

Motor Cat. No.	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	5000 rpm kg (lb)	7000 rpm kg (lb)
MPM-A/B1151	46 (101)	34 (75)	28 (62)	23 (51)	19 (42)
MPM-A/B1152	46 (101)	34 (75)	28 (62)	23 (51)	19 (42)
MPM-A/B1153	46 (101)	34 (75)	28 (62)	23 (51)	19 (42)
MPM-A/B1302	46 (101)	34 (75)	28 (62)	23 (51)	19 (42)
MPM-A/B1304	46 (101)	34 (75)	28 (62)	23 (51)	–
MPM-A/B1651	61 (134)	44 (97)	38 (84)	30 (66)	–
MPM-A/B1652	61 (134)	44 (97)	38 (84)	–	–
MPM-A/B1653	61 (134)	44 (97)	38 (84)	–	–
MPM-A/B2152	90 (198)	65 (143)	54 (119)	–	–
MPM-A/B2153	90 (198)	65 (143)	54 (119)	–	–
MPM-A/B2154	90 (198)	65 (143)	54 (119)	–	–

MP-Series Medium Inertia Motor Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your motor. For questions regarding product availability, contact your Allen-Bradley distributor.

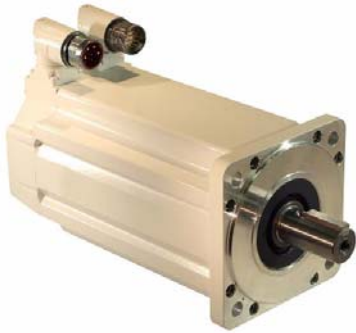


(1) Resolver feedback is not available on all models.

(2) Not all combinations are available. Only the configurations for rated speed and magnet stacks as listed in MP-Series Medium Inertia Motor (230V) Performance Specifications ([page 39](#)) and MP-Series Medium Inertia Motor (460V) Performance Specifications ([page 40](#)) are available.

Notes:

MP-Series Food Grade Motors



MP-Series (Bulletin MPF) food-grade motors combine the characteristics of the MP-Series low-inertia servo motors with features specifically designed to meet the unique needs of many food and beverage applications. These high performance servo motors address the challenges of food environments by incorporating improved sealing techniques and noncorrosive food-grade fasteners and coatings. For meat and poultry applications, and for applications with high pressure wash and caustic chemicals, the MP-Series stainless-steel servo motors are recommended.

For drive compatibility, refer to Servo Drives on [page 14](#).

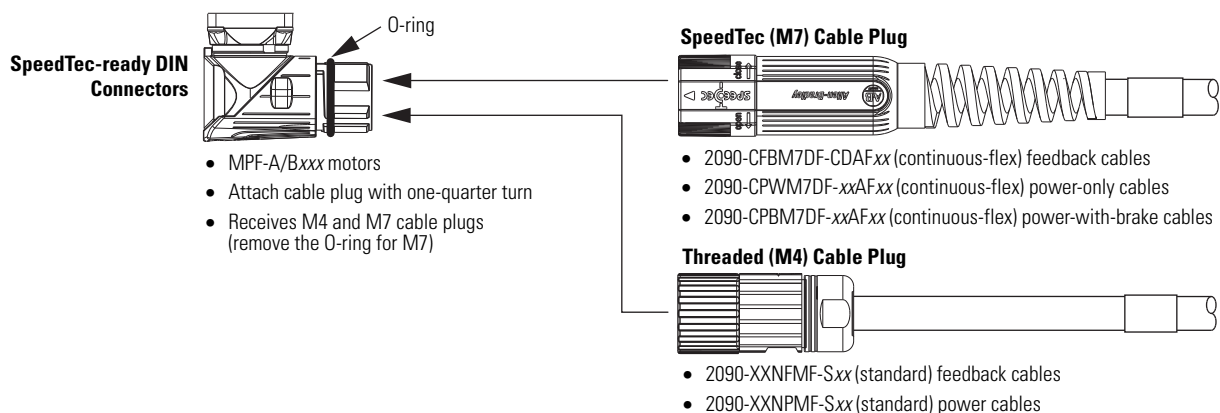
MP-Series Food Grade Motor High Resolution Encoder Features

MP-Series Food Grade motors are available with high performance encoders with a choice of Single-turn (-S) or Multi-turn (-M) high resolution feedback.

- Up to 2 million counts per revolution for smooth performance
- Single-turn encoder provides high-resolution absolute position feedback within one turn.
- Multi-turn encoder provides high-resolution absolute position feedback within 4096 turns.

Circular DIN Connector/Cable Compatibility

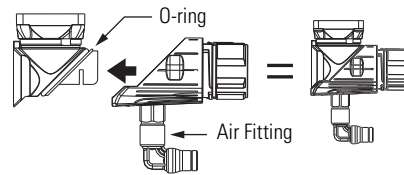
MP-Series (Bulletin MPF) motors are equipped with SpeedTec-ready DIN connectors.



MP-Series Food Grade Motor Options

MP-Series Food Grade motors are available with these options:

- 24V DC brake
- Shaft seal kit is available for field replacement. Shaft seals are made of PTFE. Kits include a lubricant to reduce wear.
- Positive Air Pressure kit (catalog number MPF-7-AIR-PURGE) is mounted on the feedback connector to provide positive air pressure to further reduce the chance of contamination inside the motor.
- Refer to the MP-Series Food Grade Servo Motor Installation Instructions, publication [MP-IN004](#), for more information.



Motor Shaft Seal Kit Combinations and Dimensions

Motor Series	Shaft Seal Cat. No.	Inside Diameter mm (in.)	Outside Diameter mm (in.)	Width mm (in.)
MPF-A3xx and MPF-B3xx	MPF-SST-A3B3	23 (0.90)	47 (1.85)	6 (0.24)
MPF-A4xx and MPF-B4xx	MPF-SST-A4B4	20 (0.79)	52 (2.05)	7 (0.28)
MPF-A45xx and MPF-B45xx	MPF-SST-A45B45	31 (1.22)	62 (2.44)	7 (0.28)
MPF-A5xx and MPF-B5xx	MPF-SST-F165	30 (1.18)	72 (2.84)	8 (0.32)

MP-Series Food Grade Motor Performance Specifications

MP-Series Food Grade (230V) Performance Specifications

Motor MPF-	Max Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output kW	Speed at Motor Rated Output rpm	Rotor Inertia ⁽¹⁾ kg·m ² (lb-in·s ²)	Motor Weight, approx. ⁽¹⁾ kg (lb)
A310P	5000	1.58 (14)	3.61 (32)	0.73	4750	0.000044 (0.00039)	2.8 (6.1)
A320P	5000	3.05 (27)	7.91 (70)	1.3	4750	0.000078 (0.00069)	3.8 (8.3)
A320H	3500	3.05 (27)	7.91 (70)	1.0	3350		
A330P	5000	4.18 (37)	11.1 (98)	1.6	5000	0.00012 (0.0010)	4.7 (10)
A430P	5000	5.99 (53)	19.8 (175)	1.9	5000	0.00038 (0.0033)	5.6 (12)
A430H	3500	6.21 (55)	19.8 (175)	1.8	3500		
A4530K	4000	8.13 (72)	20.3 (180)	2.3	4000	0.00040 (0.0036)	7.4 (16)
A4540F	3000	10.2 (90)	27.1 (240)	2.5	3000	0.00052 (0.0046)	8.7 (19)
A540K	4000	19.4 (172)	48.6 (430)	4.1	4000	0.00147 (0.013)	16 (35)

(1) Refer to MP-Series Low Inertia Motor (230V) Performance Specifications on [page 23](#) for Brake Rotor Inertia and Brake Motor Weight.

System Combinations (230V)

For MP-Series Food Grade Motors and	Refer to
Kinetix 300 (240V) drives	page 503
Kinetix 2000 drives	page 568
Kinetix 6000 (230V) drives	page 542
Ultra3000/5000 (230V) drives	page 622

MP-Series Food Grade Motor (460V) Performance Specifications

Motor MPF-	Max Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output kW	Speed at Motor Rated Output rpm	Rotor Inertia ⁽¹⁾ kg-m ² (lb-in-s ²)	Motor Weight, approx. ⁽¹⁾ kg (lb)
B310P	5000	1.58 (14)	3.61 (32)	0.77	5000	0.000044 (0.00039)	2.8 (6.1)
B320P	5000	3.05 (27)	7.91 (70)	1.5	5000	0.000078 (0.00069)	3.8 (8.3)
B330P	5000	4.18 (37)	11.1 (98)	1.6	5000	0.00012 (0.0010)	4.7 (10)
B430P	5000	6.55 (58)	19.8 (175)	2.0	5000	0.00038 (0.0033)	5.6 (12)
B4530K	4000	8.25 (73)	20.3 (180)	2.4	4000	0.00040 (0.0036)	7.4 (16)
B4540F	3000	10.2 (90)	27.1 (240)	2.5	3000	0.00052 (0.0046)	8.7 (19)
B540K	4000	19.4 (172)	48.6 (430)	4.1	4000	0.00147 (0.013)	16 (35)

(1) Refer to MP-Series Low Inertia Motor (230V) Performance Specifications on [page 23](#) for Brake Rotor Inertia and Brake Motor Weight.

System Combinations (460V)

For MP-Series Food Grade Motors and	Refer to
Kinetix 300 (480V) drives	page 505
Kinetix 6000 and Kinetix 6200/6500 (460V) drives	page 546
Ultra3000/5000 (460V) drives	page 625

MP-Series Food Grade Motor Brake Specifications

Motor MPF-	Max Backlash (brake engaged) arc minutes	Holding Torque Nm (lb-in)	Coil Current at 24V DC A	Brake Response Time			Brake Rotor Inertia kg-m ² (lb-in-s ²)	Brake Motor Weight, approx. kg (lb)
				Release ms	Engage (using external arc suppression device)			
					MOV ms	Diode ms		
A/B310	45	4.18 (37)	0.45...0.55	50	20	110	0.000057 (0.00050)	3.8 (8.3)
A/B320							0.000092 (0.00081)	4.7 (10)
A/B330							0.00013 (0.0011)	5.7 (13)
A/B430	37	10.2 (90)	0.576...0.704	110	25	160	0.00042 (0.0038)	7.4 (16)
A/B4530							0.00044 (0.0039)	9.2 (20)
A/B4540							0.00056 (0.0050)	11 (24)
A/B540	25	28.3 (250)	1.05...1.28	70	50	250	0.00157 (0.0139)	19 (41)

MP-Series Food Grade Motor Dimensions (MPF-A/B3xx, MPF-A/B4xx, MPF-A/B45xx, MPF-A/B5xx)

Motor Series MPF-	AB mm (in.)	AD mm (in.)	HD mm (in.)	T mm (in.)	LA mm (in.)	LD ⁽¹⁾ mm (in.)	LE ⁽¹⁾ mm (in.)	L ⁽¹⁾ mm (in.)	LB ⁽¹⁾ mm (in.)	L-LB ⁽²⁾ mm (in.)	D mm (in.)	M mm (in.)	S ⁽³⁾ mm (in.)	N mm (in.)	P mm (in.)	GE mm (in.)	F mm (in.)
A/B310						102.0 (4.03)	62.0 (2.45)	168.0 (6.62)	128.0 (5.04)								
A/B320	66.0 (2.60)	87.25 (3.43)	133.4 (5.25)	2.74 (0.11)	9.91 (0.39)	128.0 (5.03)	88.0 (3.45)	193.0 (7.62)	153.0 (6.04)	40.0 (1.57)	16.0 (0.629)	100.0 (3.94)	7.0 (0.283)	80.0 (3.15)	92.39 (3.64)	3.0 (0.118)	5.0 (0.197)
A/B330						153.0 (6.03)	113.0 (4.45)	219.0 (8.62)	179.0 (7.04)								
A/B430	67.7 (2.66)	90.9 (3.58)	142.0 (5.59)	2.74 (0.11)	10.16 (0.40)	150.0 (5.89)	110.0 (4.31)	215.0 (8.48)	175.0 (6.90)	40.0 (1.57)	19.0 (0.748)	115.0 (4.53)	10.0 (0.401)	95.0 (3.74)	102.1 (4.02)	3.5 (0.138)	6.0 (0.236)
A/B4530						153.0 (6.02)	113.0 (4.44)	229.0 (9.0)	179.0 (7.03)								
A/B4540	67.7 (2.66)	98.6 (3.88)	157.6 (6.20)	2.74 (0.11)	12.19 (0.48)	178.0 (7.02)	138.0 (5.44)	254.0 (10.0)	204.0 (8.03)	50.0 (1.97)	24.0 (0.945)	130.0 (5.12)	10.0 (0.401)	110.0 (4.33)	118.1 (4.65)	4.0 (0.158)	8.0 (0.315)
A/B540	71.2 (2.80)	136.4 (5.37)	209.0 (8.23)	3.12 (0.12)	13.97 (0.55)	202.0 (7.95)	162.0 (6.38)	287.0 (11.30)	227.0 (8.92)	60.0 (2.36)	28.0 (1.102)	165.0 (6.50)	12.0 (0.481)	130.0 (5.12)	145.3 (5.72)	4.0 (0.158)	8.0 (0.315)

(1) If ordering an MPF-A/B310, MPF-A/B320, or MPF-A/B330 motor with brake, add 35 mm (1.38 in.) to dimensions L, LB, LD, and LE.

If ordering an MPF-A/B430 motor with brake, add 48 mm (1.89 in.) to dimensions L, LB, LD, and LE.

If ordering an MPF-A/B4530 or MPF-A/B4540 motor with brake, add 23 mm (0.90 in.) to dimensions L, LB, LD, and LE.

If ordering an MPF-A/B540 motor with brake, add 51 mm (2.0 in.) to dimensions L, LB, LD, and LE.

(2) Tolerance for this dimension is ± 0.7 mm (± 0.028 in.).

(3) Tolerance for this dimension is: MPF-A/B3xx, MPF-A/B4xx, or MPF-A/B45xx ± 0.36 mm (± 0.007 in.) and MPF-A/B5xx ± 0.43 mm (± 0.008 in.).

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

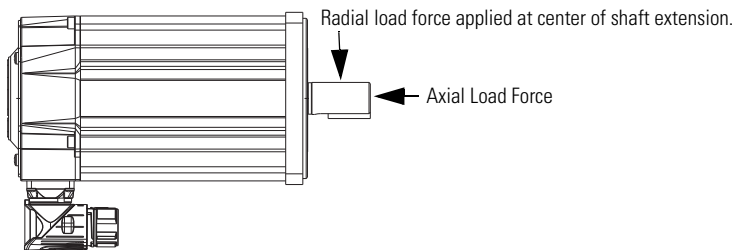
MP-Series Food Grade Motor Load Force Ratings

Bulletin MPF motors are capable of operating with the maximum radial or maximum axial shaft loads listed in the following tables. Radial loads listed are applied in the middle of the shaft extension. The tables below represent an L_{10} bearing fatigue life of 20,000 hours. This 20,000-hour life does not account for possible application-specific life reduction that may occur due to bearing grease contamination from external sources. Maximum operating speed is limited by motor winding.

Radial Load Force Ratings

Motor Cat. No.	500 rpm kg (lb)	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	3500 rpm kg (lb)	4000 rpm kg (lb)	5000 rpm kg (lb)
MPF-A/B310	78 (172)	62 (137)	49 (108)	–	40 (88)	–	36 (79)
MPF-A/B320	87 (192)	69 (152)	55 (121)	–	45 (99)	–	40 (88)
MPF-A/B330	–	74 (163)	59 (130)	–	49 (108)	–	43 (95)
MPF-A/B430	106 (234)	84 (185)	67 (148)	–	55 (121)	–	49 (108)
MPF-A/B4530	133 (293)	105 (232)	84 (185)	73 (161)	–	66 (146)	–
MPF-A/B4540	140 (309)	111 (245)	89 (196)	77 (170)	–	–	–
MPF-A/B540	–	143 (316)	114 (251)	99 (219)	–	90 (199)	–

MP-Series Food Grade Motor Load Forces (MPF-xxxx-xJ7xAB)



Axial Load Force Ratings (Maximum Radial Load)

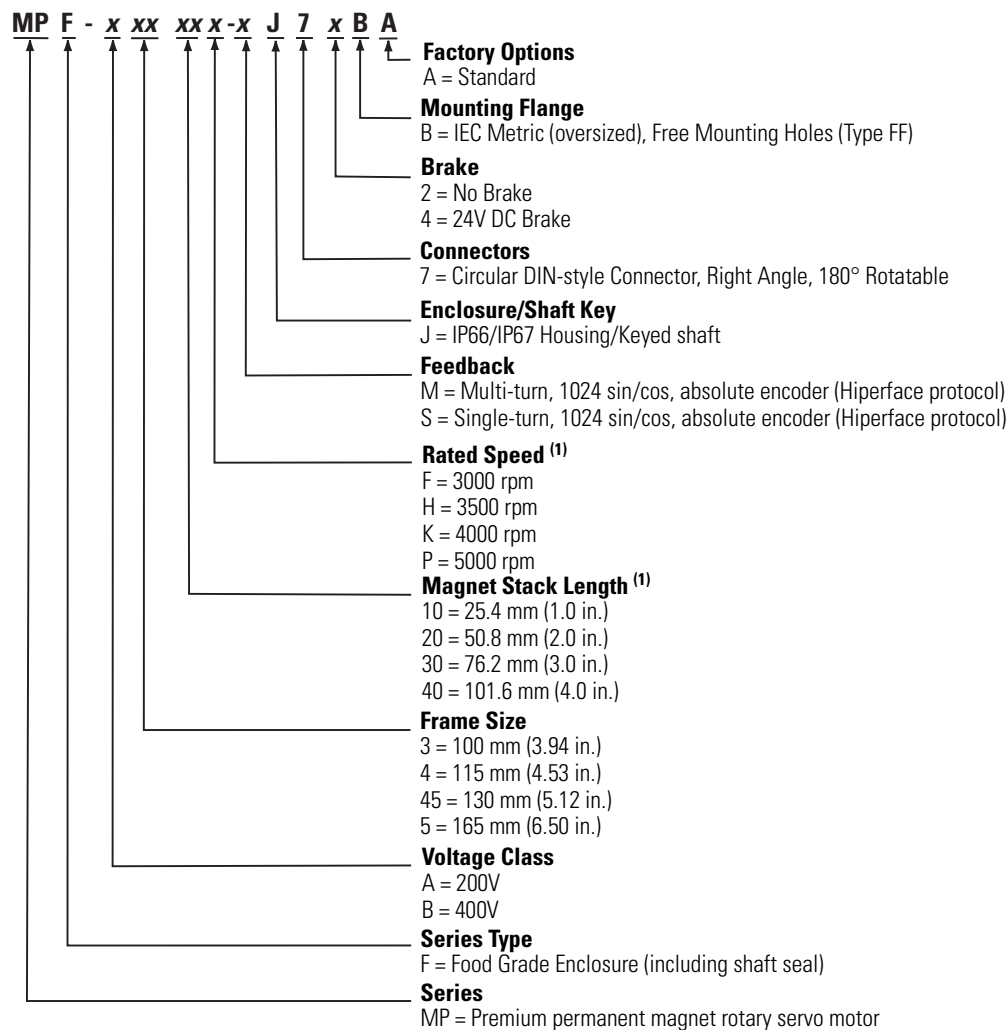
Motor Cat. No.	500 rpm kg (lb)	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	3500 rpm kg (lb)	4000 rpm kg (lb)	5000 rpm kg (lb)
MPF-A/B310	30 (66)	23 (51)	16 (35)	–	13 (29)	–	11 (24)
MPF-A/B320	34 (75)	25 (55)	19 (42)	–	15 (33)	–	13 (29)
MPF-A/B330	–	27 (60)	20 (44)	–	16 (35)	–	13 (29)
MPF-A/B430	52 (115)	39 (86)	29 (64)	–	22 (49)	–	19 (42)
MPF-A/B4530	45 (99)	34 (75)	25 (55)	21 (46)	–	19 (42)	–
MPF-A/B4540	49 (108)	36 (79)	27 (60)	22 (49)	–	–	–
MPF-A/B540	–	48 (107)	35 (79)	30 (66)	–	26 (58)	–

Axial Load Force Ratings (Zero Radial Load)

Motor Cat. No.	500 rpm kg (lb)	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	3500 rpm kg (lb)	4000 rpm kg (lb)	5000 rpm kg (lb)
MPF-A/B310	49 (108)	36 (79)	27 (60)	–	21 (46)	–	18 (40)
MPF-A/B320	49 (108)	36 (79)	27 (60)	–	21 (46)	–	18 (40)
MPF-A/B330	–	36 (79)	27 (60)	–	21 (46)	–	18 (40)
MPF-A/B430	69 (152)	51 (112)	38 (84)	–	30 (66)	–	25 (55)
MPF-A/B4530	69 (152)	51 (112)	38 (84)	31 (68)	–	28 (62)	–
MPF-A/B4540	69 (152)	51 (112)	38 (84)	31 (68)	–	–	–
MPF-A/B540	–	67 (149)	49 (109)	41 (92)	–	36 (81)	–

MP-Series Food Grade Motor Catalog Number

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your motor. For questions regarding product availability, contact your Allen-Bradley distributor.



(1) Not all combinations are available. Only the configurations for rated speed and magnet stack length as listed in MP-Series Food Grade (230V) Performance Specifications ([page 50](#)) and MP-Series Food Grade Motor (460V) Performance Specifications ([page 51](#)) are available.

MP-Series Stainless Steel Motors



The MP-Series stainless-steel motors are specifically designed to meet the unique needs of hygienic environments. With these servo motors, the benefits of Kinetix Integrated Motion are available to a greater range of applications, allowing the use of servo motors even in high pressure, highly caustic washdown environments. The MP-Series Stainless Steel motors extend the wide range of Allen-Bradley servo motors into new applications on food, beverage, brewing, dairy, pharmaceutical, and health and beauty manufacturing equipment.

For drive compatibility, refer to Servo Drives on [page 14](#).

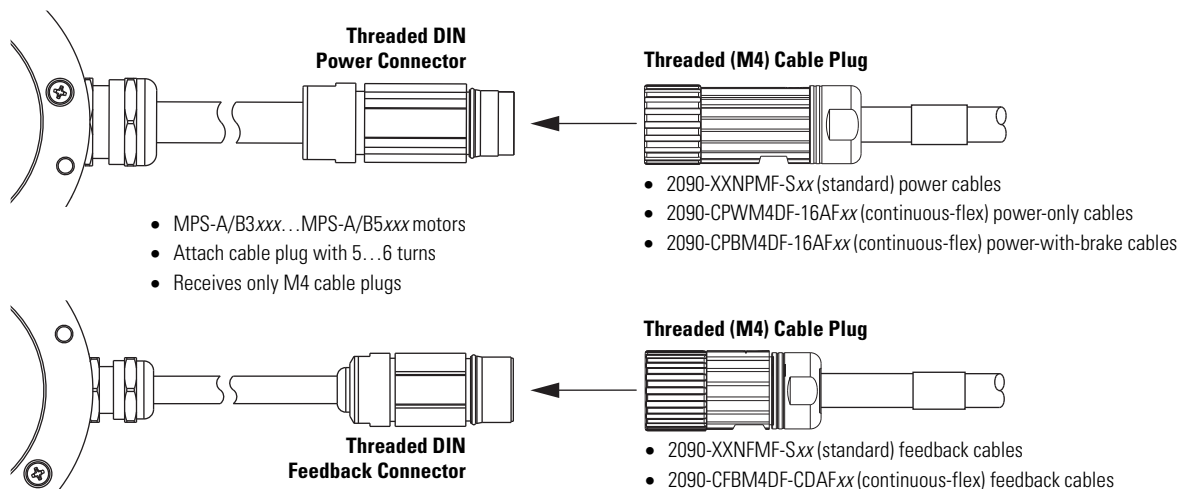
MP-Series Stainless Steel Motor High Resolution Encoder Features

MP-Series Stainless Steel motors are available with high performance encoders with a choice of Single-turn (-S) or Multi-turn (-M) high resolution feedback.

- Up to 2 million counts per revolution for smooth performance
- Single-turn encoder provides high-resolution absolute position feedback within one turn.
- Multi-turn encoder provides high-resolution absolute position feedback within 4096 turns.

Circular DIN Connector/Cable Compatibility

MP-Series (Bulletin MPS) motors are equipped with threaded DIN connectors.



MP-Series Stainless Steel Motor Options

MP-Series Stainless Steel motors are available with these options:

- 24V DC brake.
- Shaft seal kit (with slinger) is available for field replacement. Shaft seals are made of PTFE. Kits include a lubricant to reduce wear.
- Positive Air Pressure accessory kit (catalog number MPS-AIR-PURGE) is mounted to the rear cover of the motor to provide positive air pressure and further reduce the chance of contamination inside the motor. No special tool is required for installation and removal.

Refer to the MP-Series Stainless Steel Servo Motor Installation Instructions, publication [MP-IN005](#), for more information.

Motor Shaft Seal Kit Combinations and Dimensions

Motor Series	Shaft Seal Cat. No.	Shaft Seal Dimensions			Slinger Dimensions		
		Inside Diameter mm (in.)	Outside Diameter mm (in.)	Width mm (in.)	Inside Diameter mm (in.)	Outside Diameter mm (in.)	Width mm (in.)
MPS-A3xx and MPF-B3xx	MPS-SST-A3B3	23.0 (0.90)	47.0 (1.85)	6.0 (0.24)	16.0 (0.63)	50.8 (2.0)	5.1 (0.20)
MPS-A45xx and MPF-B45xx	MPS-SST-A45B45	31.0 (1.22)	62.0 (2.44)	7.0 (0.27)	24.0 (0.94)	63.5 (2.50)	5.2 (0.20)
MPS-B5xx	MPS-SST-F165	36 (1.42)	72 (2.84)	8 (0.32)	28 (1.10)	82.6 (3.25)	5.1 (0.20)

MP-Series Stainless Steel Motor Performance Specifications

MP-Series Stainless Steel Motor (230V) Performance Specifications

Motor MPS-	Max Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output kW	Speed at Motor Rated Output rpm	Rotor Inertia ⁽¹⁾ kg-m ² (lb-in-s ²)	Motor Weight, approx. ⁽¹⁾ kg (lb)
A330P	5000	3.6 (32)	11.1 (98)	1.3	5000	0.00012 (0.0010)	7.4 (16.2)
A4540F	3000	8.1 (72)	27.1 (240)	1.4	3000	0.00052 (0.0046)	13 (28.5)

(1) Refer to MP-Series Stainless Steel Motor Brake Specifications on page 56 for Brake Rotor Inertia.

System Combinations (230V)

For MP-Series Stainless Steel Motors and	Refer to
Kinetix 300 (240V) drives	page 507
Kinetix 2000 drives	page 570
Kinetix 6000 (230V) drives	page 550
Ultra3000/5000 (230V) drives	page 627

MP-Series Stainless Steel Motor (460V) Performance Specifications

Motor MPS-	Max Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output kW	Speed at Motor Rated Output rpm	Rotor Inertia ^{(1) (2)} kg-m ² (lb-in-s ²)	Motor Weight, approx. ⁽¹⁾ kg (lb)
B330P	5000	3.6 (32)	11.1 (98)	1.3	5000	0.00012 (0.0010)	7.4 (16.2)
B4540F	3000	8.1 (72)	27.1 (240)	1.4	3000	0.00052 (0.0046)	13 (28.5)
B560F	3000	21.5 (190)	67.8 (600)	3.5	3000	0.00227 (0.0200)	30 (66)

(1) Refer to MP-Series Stainless Steel Motor Brake Specifications on [page 58](#) for Brake Rotor Inertia.

(2) Rotor inertia may vary slightly depending on feedback.

System Combinations (460V)

For MP-Series Stainless Steel Motors and	Refer to
Kinetix 300 (480V) drives	page 508
Kinetix 6000 and Kinetix 6200/6500 (460V) drives	page 551
Ultra3000/5000 (460V) drives	page 628

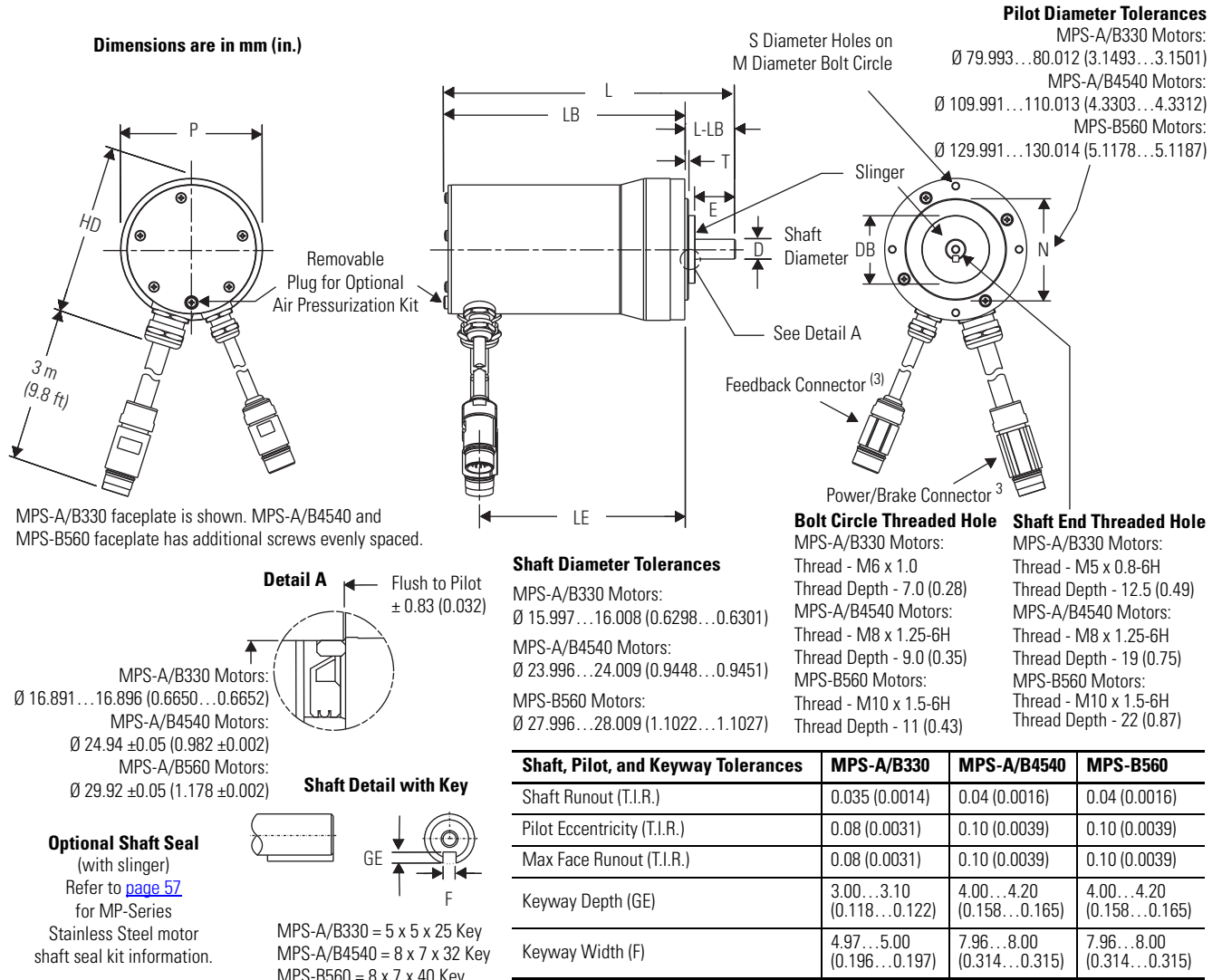
MP-Series Stainless Steel Motor Brake Specifications

MP-Series Stainless Steel Motor Brake Specifications

Motor MPS-	Max Backlash (brake engaged) arc minutes	Holding Torque Nm (lb-in)	Coil Current at 24V DC A	Brake Response Time			Brake Rotor Inertia kg-m ² (lb-in-s ²)	Brake Motor Weight, approx. kg (lb)
				Release ms	Engage (using external arc suppression device)			
					MOV ms	Diode ms		
A/B330	45	4.18 (37)	0.45...0.55	50	20	110	0.00013 (0.0011)	8.8 (19.3)
A/B4540	48	10.2 (90)	0.576...0.704	110	25	160	0.00052 (0.0046)	15.4 (34.0)
B560	25	28.3 (250)	1.05...1.28	70	50	250	0.00227 (0.0200)	32.2 (70.8)

MP-Series Stainless Steel Motor Dimensions

MP-Series Stainless Steel Motor Dimensions (MPS-A/B330, MPS-A/B4540, and MPS-B560)



Motor Series	HD	T	E	LE (1)	L (1)	LB (1)	L-LB (2)	D	DB	M	S	N	P	GE	F
MPS-	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)	mm (in.)
A/B330	135 (5.31)	2.87 (0.113)	32.1 (1.26)	162 (6.38)	230 (9.05)	190 (7.49)	40.0 (1.57)	16.0 (0.63)	50.8 (2.0)	100 (3.94)	7.0 (0.28)	80.0 (3.15)	112 (4.41)	3.0 (0.118)	5.0 (0.197)
A/B4540	164 (6.46)	3.38 (0.133)	41.4 (1.63)	185 (7.30)	266 (10.45)	216 (8.48)	50.0 (1.97)	24.0 (0.945)	63.5 (2.50)	130 (5.12)	9.0 (0.35)	110 (4.33)	143.2 (5.64)	4.0 (0.158)	8.0 (0.315)
B560	198 (7.79)	3.38 (0.13)	51.52 (2.03)	302 (11.90)	396 (15.60)	336 (13.24)	60.0 (2.36)	28.0 (1.10)	82.6 (3.25)	165 (6.49)	11.0 (0.43)	130 (5.12)	181 (7.13)	4.0 (0.158)	8.0 (0.315)

(1) If ordering an MPS-A/B330 motor with brake, add 35 mm (1.38 in.) to dimensions L and LB, and 34 mm (1.34 in.) to dimension LE.
 If ordering an MPS-A/B4540 motor with brake add 48.5 mm (1.91 in.) to dimensions L, LB, and LE.

(2) Tolerance for this dimension is ± 0.7 mm (± 0.028 in.).

(3) Specifications for the 3 m (9.8 ft) power and feedback cable leads are identical to those of the 2090-XXNPMF-xxSxx (power) and 2090-XXNFMF-Sxx (feedback) cables. Refer to Cables beginning on page 376 for more information.

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

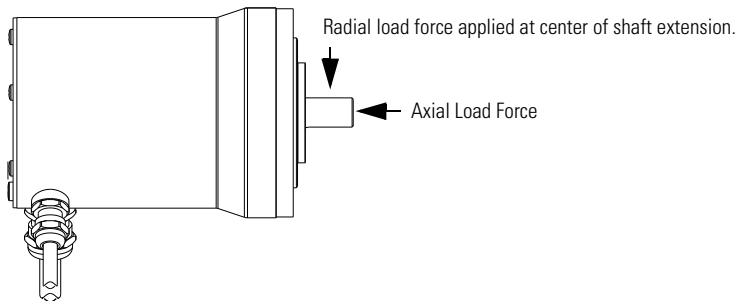
MP-Series Stainless Steel Motor Load Force Ratings

Bulletin MPS motors are capable of operating with the maximum radial or maximum axial shaft loads listed in the following tables. Radial loads listed are applied in the middle of the shaft extension. The tables starting below represent an L_{10} bearing fatigue life of 20,000 hours. This 20,000-hour life does not account for possible application-specific life reduction that may occur due to bearing grease contamination from external sources. Maximum operating speed is limited by motor winding.

Radial Load Force Ratings

Motor Cat. No.	500 rpm kg (lb)	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	3500 rpm kg (lb)	4000 rpm kg (lb)	5000 rpm kg (lb)
MPS-A/B330	–	74 (163)	59 (130)	–	49 (108)	–	43 (95)
MPS-A/B4540	140 (309)	111 (245)	89 (195)	77 (170)	–	–	–
MPS-B560	–	154 (338)	122 (268)	106 (234)	–	–	–

MP-Series Stainless Steel Motor Load Forces (MPS-xxxx-xJ5xDA)



Axial Load Force Ratings (Maximum Radial Load)

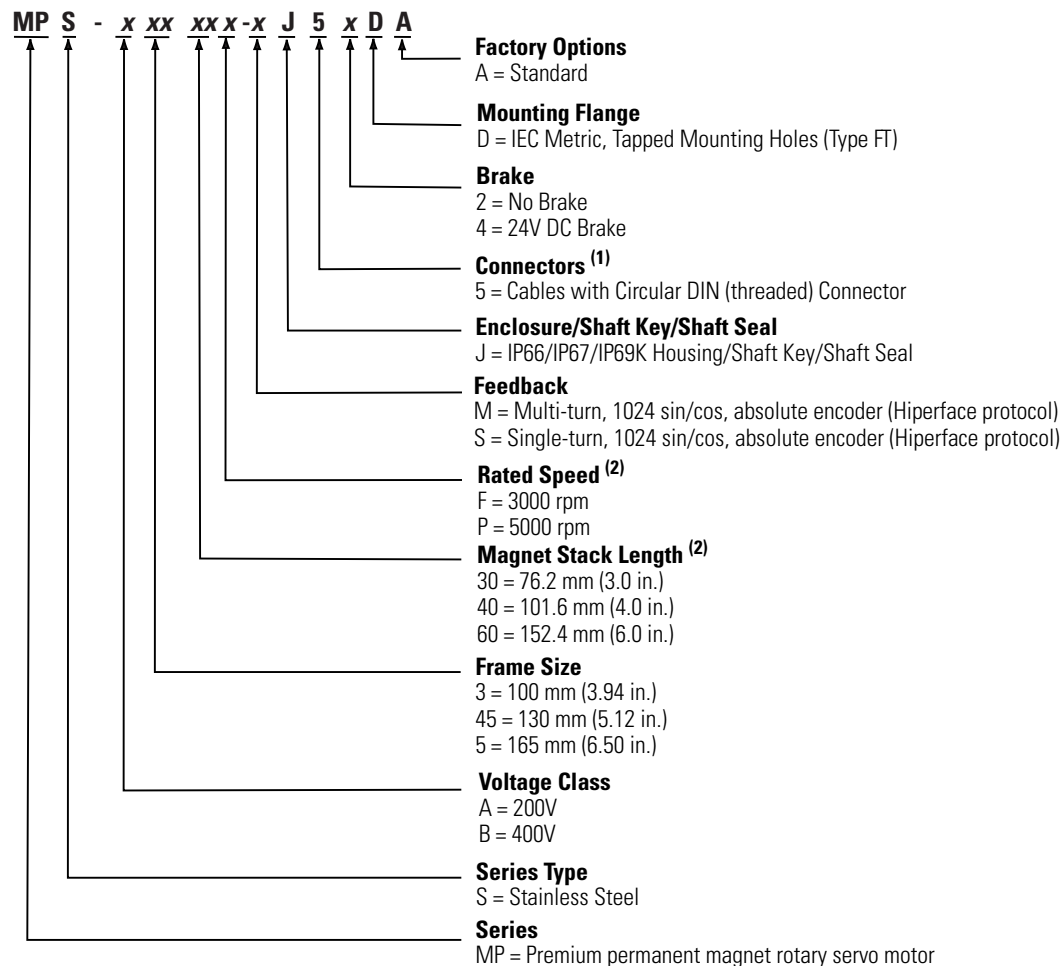
Motor Cat. No.	500 rpm kg (lb)	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	3500 rpm kg (lb)	4000 rpm kg (lb)	5000 rpm kg (lb)
MPS-A/B330	–	27 (59)	20 (44)	–	16 (35)	–	13 (29)
MPS-A/B4540	49 (107)	36 (80)	27 (59)	22 (49)	–	–	–
MPS-B560	–	52 (115)	39 (85)	32 (71)	–	–	–

Axial Load Force Ratings (Zero Radial Load)

Motor Cat. No.	500 rpm kg (lb)	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	3500 rpm kg (lb)	4000 rpm kg (lb)	5000 rpm kg (lb)
MPS-A/B330	–	36 (79)	27 (59)	–	21 (46)	–	18 (40)
MPS-A/B4540	69 (152)	51 (112)	38 (83)	31 (69)	–	–	–
MPS-B560	–	68 (149)	50 (109)	42 (92)	–	–	–

MP-Series Stainless Steel Motor Catalog Number

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your motor. For questions regarding product availability, contact your Allen-Bradley distributor.



(1) The motor has 3 m (9.8 ft) cables with nickel-plated connector extensions.

IMPORTANT

The connectors are O-ring sealed, but not designed to withstand direct high-pressure washdown with aggressive cleaning compounds. The 3 m (9.8 ft) cables are provided so the connectors can be positioned in an area away from direct exposure to the cleaning process, such as within washdown-rated conduit or junction boxes.

(2) Not all combinations are available. Only the configurations for rated speed and magnet stack length as listed in MP-Series Stainless Steel Motor Performance Specifications ([page 58](#)) and MP-Series Stainless Steel Motor (460V) Performance Specifications ([page 58](#)) are available.

RDD-Series Direct Drive Servo Motors



The RDD-Series (Bulletin RDB) direct-drive servo motor design provides direct-coupling to the load, thus improving system performance and efficiency by eliminating the need for inefficient mechanical power transmission devices, such as gearboxes, timing belts and pulleys. The initial RDD-Series offering incorporates a bearingless housed configuration designed for applications where the load is already supported by its own bearings.

For drive compatibility, refer to Servo Drives on [page 14](#).

RDD-Series Direct-drive Motor High-resolution Encoder Features

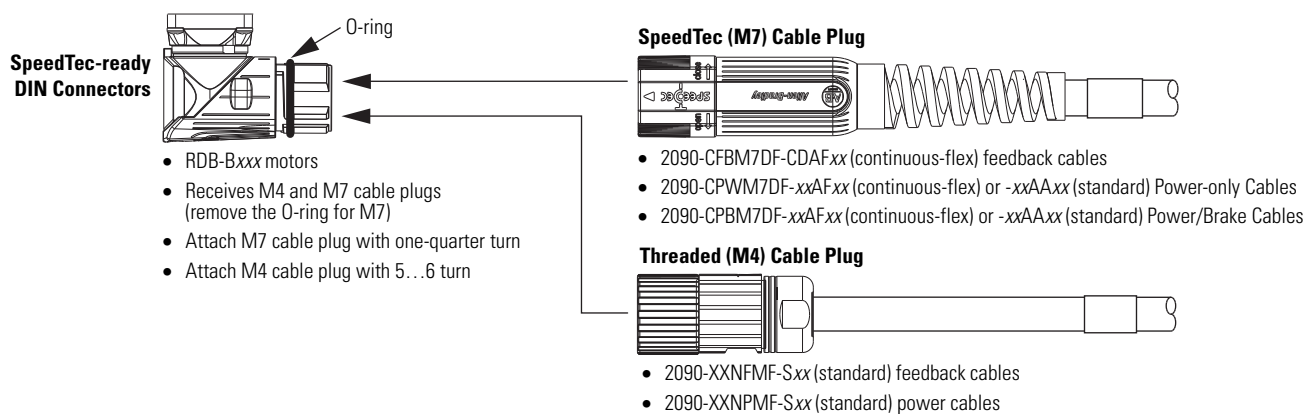
RDD-Series direct drive motors are available with high performance encoders with a choice of Single-turn (-3) or Multi-turn (-7) high-resolution feedback.

- Up to 4 million counts per revolution (-3 and -7) for smooth performance.
- Single-turn encoder provides high-resolution absolute position feedback within one turn.
- Multi-turn encoder provides high-resolution absolute position feedback within 4096 turns. The electromechanical design does not require a battery.

Use the 2090-K6CK-KENDAT feedback module (Kinetix 6000 drives) and 2090-K7CK-KENDAT feedback module (Kinetix 7000 drives) for wiring motor feedback connections. The Kinetix 6200 and Kinetix 6500 drives require the 2090-K6CK-D15M low-profile connector kit.

Circular DIN Connector/Cable Compatibility

RDD-Series motors are equipped with SpeedTec-ready DIN connectors.



RDD-Series Direct Drive Motor Performance Specifications

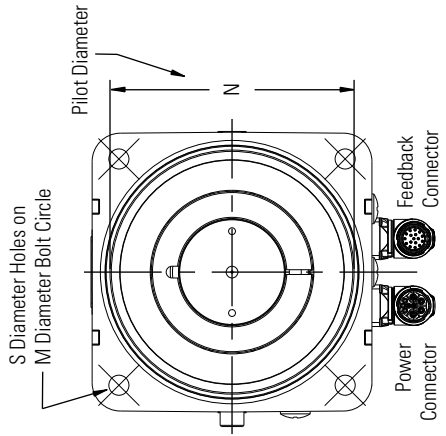
Motor RDB-	Base Speed rpm	Max Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output kW	Speed at Motor Rated Output rpm	Rotor Inertia kg-m ² (lb-in-s ²)	Motor Weight, approx. kg (lb)																																																																																																																										
B21519	750	1235	32.7 (289)	86.5 (766)	3.64	1235	0.0094 (0.083)	19.1 (42)																																																																																																																										
B2151C	1500	2125			5.23	2125			B21529	750	1035	45.4 (402)	116 (1027)	4.33	1035	0.0126 (0.112)	24.5 (54)	B2152C	1500	2125	6.41	2125	B21539	750	1250	53.7 (475)	143 (1266)	5.34	1250	0.0157 (0.139)	29.5 (65)	B2153C	1500	2250	5.87	1772	B29014	200	450	49.2 (435)	110 (974)	1.97	391	0.028 (0.25)	28.6 (63)	B29016	375	785	3.18	729	B29019	750	1500	3.63	1128	B29024	200	435	98.0 (867)	214 (1894)	3.33	413	0.047 (0.42)	42.7 (94)	B29026	375	885	4.05	632	B29029	750	1200			B29034	200	500	140 (1239)	318 (2815)	5.16	493	0.066 (0.58)	55.4 (122)	B29036	375	750	5.49	646	B29039	750	1000	4.41	578	B41014	200	385	183 (1620)	340 (3009)	5.20	360	0.123 (1.09)	67.6 (149)	B41016	375	700	4.83	440	B41018	625	700			B41024	200	365	332 (2938)	690 (6107)	7.29	350	0.225 (1.99)	108 (238)	B41026	375	600	308 (2726)	B41035	250	490	426 (3770)	1050 (9293)
B21529	750	1035	45.4 (402)	116 (1027)	4.33	1035	0.0126 (0.112)	24.5 (54)																																																																																																																										
B2152C	1500	2125			6.41	2125			B21539	750	1250	53.7 (475)	143 (1266)	5.34	1250	0.0157 (0.139)	29.5 (65)	B2153C	1500	2250	5.87	1772	B29014	200	450	49.2 (435)	110 (974)	1.97	391	0.028 (0.25)	28.6 (63)	B29016	375	785	3.18	729	B29019	750	1500			3.63	1128			B29024	200	435	98.0 (867)	214 (1894)	3.33	413	0.047 (0.42)	42.7 (94)	B29026	375	885	4.05			632	B29029			750	1200			B29034	200	500	140 (1239)	318 (2815)	5.16	493	0.066 (0.58)	55.4 (122)			B29036	375			750	5.49	646	B29039	750	1000	4.41	578	B41014	200	385	183 (1620)	340 (3009)			5.20	360			0.123 (1.09)	67.6 (149)	B41016	375	700	4.83	440	B41018	625	700			B41024	200	365	332 (2938)	690 (6107)	7.29	350	0.225 (1.99)	108 (238)	B41026	375	600	308 (2726)	B41035	250	490
B21539	750	1250	53.7 (475)	143 (1266)	5.34	1250	0.0157 (0.139)	29.5 (65)																																																																																																																										
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B29014	200	450	49.2 (435)	110 (974)	1.97	391	0.028 (0.25)	28.6 (63)																																																																																																																										
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System Combinations (460V)

For RDD-Series Direct Drive Motors and	Refer to
Kinetix 6000 and Kinetix 6200/6500 (460V) drives	page 553
Kinetix 7000 drives	page 593

RDD-Series Direct Drive Motor Dimensions

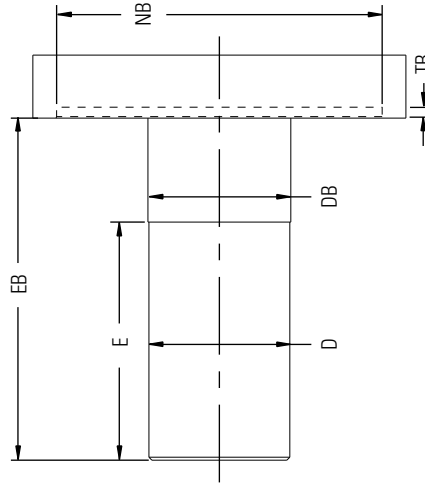
RDD-Series Direct Drive Motor Dimensions (RDB-B215xx)



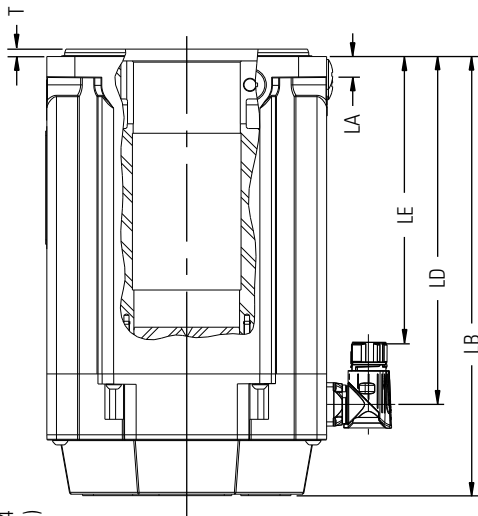
Pilot Diameter (N) Tolerance
 Ø 163.989...164.014
 (6.4563...6.4572)

Pilot Diameter (NB) Tolerance
 Ø 164.040...164.090
 (6.4583...6.4602)

Machine Mounting Dimensions

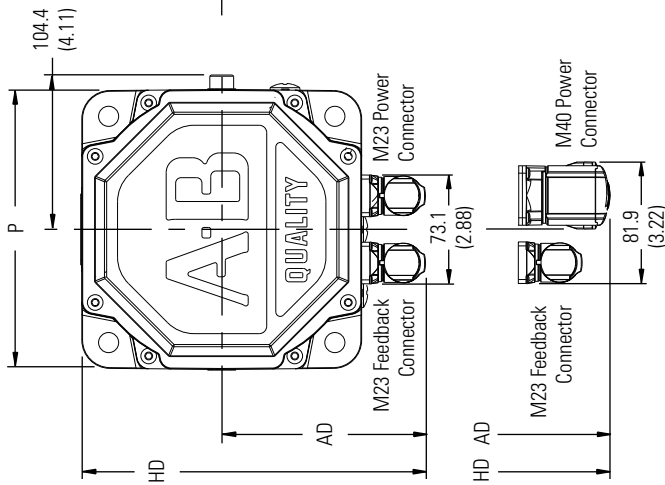


Dimensions are in mm (in.)



Shaft Diameter (D) Tolerance
 Ø 70.985...71.000
 (2.7947...2.7953)

Shaft Diameter (DB) Tolerance
 Ø 71.985...72.000
 (2.8340...2.8346)



Shaft and Pilot Tolerances	RDB-B215xx
Shaft Runout (T.I.R.)	0.13 (0.005)
Pilot Concentricity (T.I.R.)	0.10 (0.004)
Mounting Surface Perpendicularity	0.10 (0.004)

RDD-Series Direct Drive Motor Dimensions (RDB-B215.xx)

Motor Series RDB-	AD (1) mm (in.)	HD (1) mm (in.)	T mm (in.)	LA mm (in.)	LD mm (in.)	LE mm (in.)	LB (2) mm (in.)	D mm (in.)	DB mm (in.)	E (3) mm (in.)	EB (4) mm (in.)	TB mm (in.)	M mm (in.)	S (5) mm (in.)	N mm (in.)	NB mm (in.)	P mm (in.)
B2151					166 (6.52)	124 (4.90)	226 (8.90)			49.0 (1.93)	104 (4.09)						
B2152	136.7 (5.38)	230.9 (9.09)	5.0 (0.197)	14.0 (0.55)	200 (7.86)	158 (6.24)	260 (10.24)	71.0 (2.795)	72.0 (2.834)	83.0 (3.27)	138 (5.43)	5.5 (0.22)	215 (8.465)	13.50 (0.5315)	164 (6.456)	164 (6.459)	189 (7.44)
B2153					234 (9.20)	192 (7.58)	294 (11.58)			117 (4.61)	172 (6.77)						


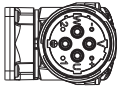
(1) Dimension is for motor with M23 power connector. For motor with M40 power connector, add 18.6 (0.73 in.).

(2) Tolerance for this dimension is ±0.52 mm (±0.02 in.).

(3) Tolerance for this dimension is ±0.40 mm (±0.015 in.).

(4) Tolerance for this dimension is ±1.50 mm (±0.06 in.) static, ±0.13 mm (±0.005 in.) dynamic.

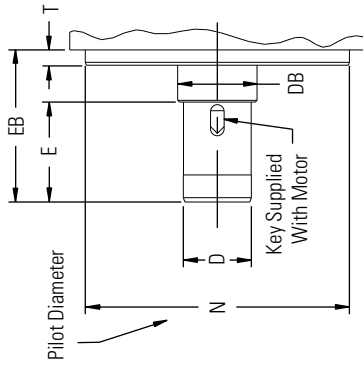
(5) Tolerance for this dimension is +0.430, -0.000 mm (+0.0169, -0.0000 in.).

Power Connectors on RDD-Series Motors	RDB-B215.xx
M23 Power Connector	 RDB-B21519 RDB-B21529, RDB-B2151C, RDB-B21539, RDB-B2152C
M40 Power Connector	 RDB-B2153C

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

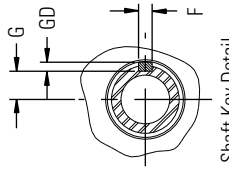
RDD-Series Direct Drive Motor Dimensions (RDB-B290xx and RDB-B410xx)

Machine Mounting Dimensions



Pilot Diameter Tolerance

RDB-B290xx Motors:
 Ø 232.92...232.96 (9.170...9.172)
 RDB-B410xx Motors:
 Ø 333.94...333.98 (13.147...13.149)

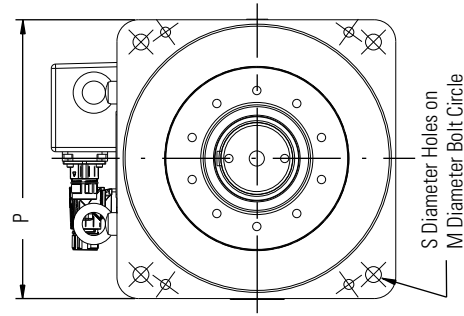


Shaft Diameter (D) Tolerance

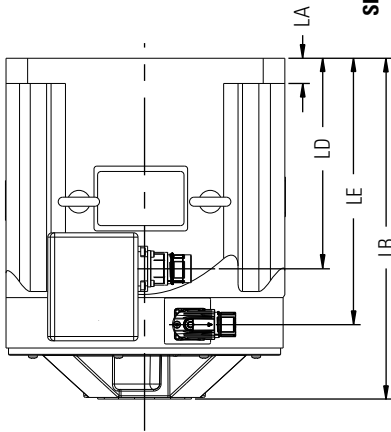
RDB-B290xx Motors:
 Ø 59.988...59.999 (2.3617...2.3622)
 RDB-B410xx Motors:
 Ø 69.988...69.999 (2.7554...2.7559)

Shaft Diameter (DB) Tolerance

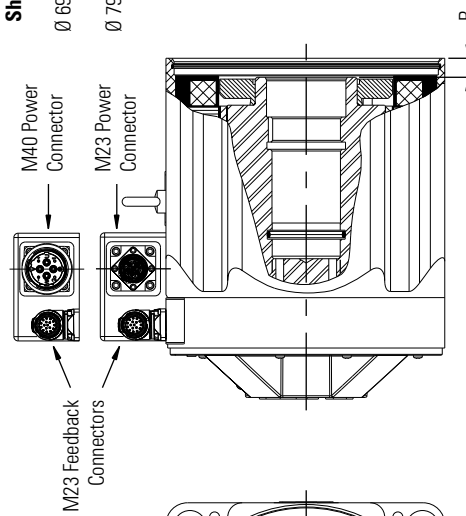
RDB-B290xx Motors:
 Ø 69.988...69.999 (2.7554...2.7559)
 RDB-B410xx Motors:
 Ø 79.988...79.999 (3.1491...3.1496)



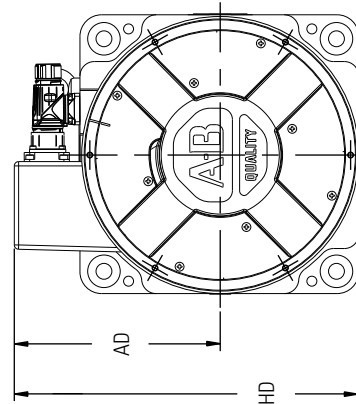
Dimensions are in mm (in.)



RDB-B290xx and RDB-B410xx motors have either M23 or M40 power connectors, with no significant difference in dimensions.



Shaft, Pilot, and Keyway Tolerances	RDB-B290xx	RDB-B410xx
Shaft Runout (T.I.R.)	0.038 (0.0015)	
Pilot Concentricity (T.I.R.)	0.05 (0.002)	
Mounting Surface Perpendicularity	0.05 (0.002)	
Keyway Depth (G)	24.80...24.99 (0.976...0.984)	29.80...29.99 (1.173...1.181)
Keyway Depth (GD)	7.90...8.00 (0.311...0.315)	
Keyway Width (F)	11.957...12.000 (0.4707...0.4724)	



RDD-Series Direct Drive Motor Dimensions (RDB-B290xx and RDB-B410xx)

Motor Series RDB-	AD mm (in.)	HD mm (in.)	T mm (in.)	LA ⁽¹⁾ mm (in.)	LD mm (in.)	LE mm (in.)	LB ⁽²⁾ mm (in.)	D mm (in.)	DB mm (in.)	E ⁽³⁾ mm (in.)	EB ⁽⁴⁾ mm (in.)	M mm (in.)	S mm (in.)	N mm (in.)	P ⁽⁵⁾ mm (in.)	G mm (in.)	GD mm (in.)	F mm (in.)
B2901					86.5 (3.40)	136 (5.34)	201 (7.92)			43.94 (1.730)	88.92 (3.540)							
B2902	182.3 (7.18)	305.9 (12.05)	13.5 (0.53)	22.2 (0.88)	136 (5.36)	185 (7.30)	251 (9.90)	59.9 (2.362)	69.9 (2.755)	88.14 (3.470)	134.11 (5.280)	290 (11.417)	14.0 (0.551)	232.9 (9.17)	245.9 (9.68)	24.99 (0.984)	8.00 (0.315)	12.0 (0.472)
B2903					186 (7.31)	235 (9.25)	301 (11.83)			124.7 (4.910)	170.69 (6.720)							
B4101					105 (4.14)	164 (6.46)	230 (9.05)			40.39 (1.590)	114.05 (4.490)							
B4102	256.3 (10.09)	432.1 (17.01)	17.8 (0.70)	25.4 (1.00)	174 (6.86)	233 (9.18)	300 (11.77)	69.9 (2.755)	79.9 (3.149)	83.82 (3.300)	167.89 (6.610)	410 (16.142)	17.5 (0.689)	333.9 (13.14)	350.0 (13.78)	29.99 (1.181)	8.00 (0.315)	12.0 (0.472)
B4103					243 (9.58)	302 (11.90)	368 (14.49)			118.62 (4.670)	253.49 (9.980)							



(1) Tolerance for this dimension is ± 2.15 mm (± 0.085 in.).

(2) Tolerance for this dimension is ± 2.30 mm (± 0.09 in.).

(3) Tolerance for this dimension is ± 0.13 mm (± 0.005 in.).

(4) Tolerance for this dimension is ± 1.50 mm (± 0.060 in.) static, ± 0.05 mm (± 0.002 in.) dynamic.

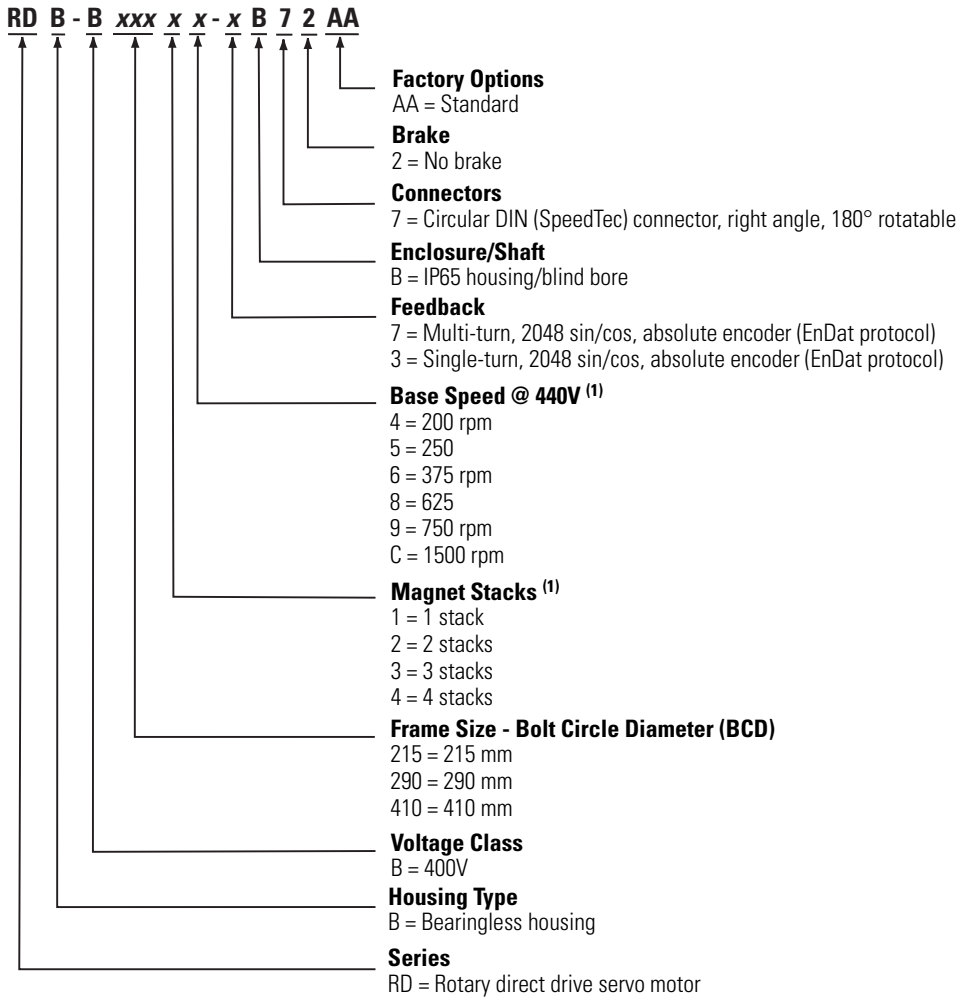
(5) Tolerance for this dimension is ± 1.52 mm (± 0.06 in.).

Power Connectors on RDD-Series Motors	RDB-B290xx	RDB-B410xx
M23 Power Connector	 RDB-B29014, RDB-B29016, RDB-B29024, RDB-B29019, RDB-B29034, RDB-B29026	N/A
M40 Power Connector	 RDB-B29036, RDB-B29029, RDB-B29039	RDB-B410xx

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

RDD-Series Direct Drive Servo Motor Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your motor. For questions regarding product availability, contact your Allen-Bradley distributor.



(1) Not all combinations are available. Only the configurations for rated speed and magnet stacks as listed in RDD-Series Direct Drive Motor Performance Specifications on [page 63](#) are available.

HPK-Series Asynchronous Servo Motors



The HPK-Series Asynchronous Servo Motors employ proven induction motor technology optimized for servo system performance. These high horsepower motors offer exceptional performance for rapid acceleration and deceleration. Team these AC motors with the Kinetix 7000 high power servo drives to extend the range of Kinetix Integrated Motion solutions up to 150 kW.

For drive compatibility, refer to Servo Drives on [page 14](#).

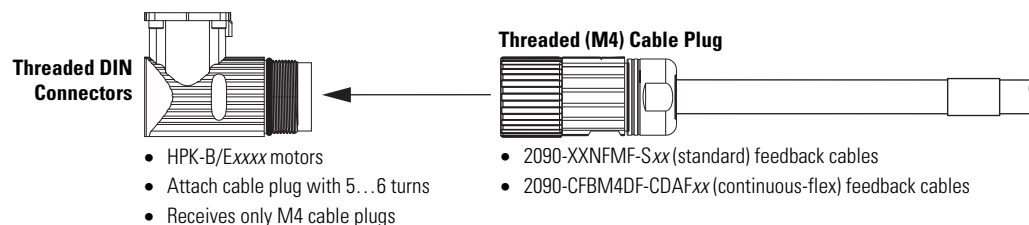
HPK-Series Asynchronous Servo Motor Encoder Features

HPK-Series motors are available with high performance encoders with a choice of Single-turn (-S) or Multi-turn (-M) high-resolution feedback.

- Up to 2 million counts per revolution for smooth performance.
- Single-turn encoder provides high-resolution absolute position feedback within one turn.
- Multi-turn encoder provides high-resolution absolute position feedback within 4096 turns.

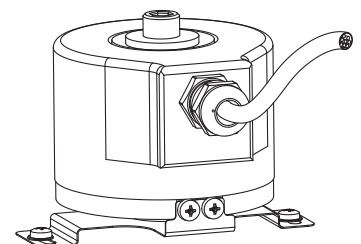
Circular DIN Connector/Cable Compatibility

HPK-Series motors are equipped with threaded DIN connectors.



HPK-Series Asynchronous Servo Motor Options

- Multiple junction box mounting locations (F1, F2, and F3)
- Holding brake, 380V...460V AC
- 460V and 400V windings
- Encoder kit (catalog number HPK-xxxxxxx-ENC-xx) available for field replacement. Kits are pre-programmed for a specific motor catalog number. Kit includes cable and DIN connector.



HPK-Series Asynchronous Servo Motor Performance Specifications

HPK-Series Asynchronous Servo Motor (460V) Performance Specifications

Motor HPK-	Base Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output at Base Speed kW (Hp)	Rotor Inertia ⁽¹⁾ kg-m ² (lb-in-s ²)	Motor Weight, approx. kg (lb)
B1307C	1500	112 (991)	260 (2301)	17.1 (22.9)	0.081 (0.7168)	135 (297)
B1308C		141 (1247)	262 (2319)	21.6 (28.9)	0.098 (0.8673)	152 (335)
B1310C		155 (1372)	325 (2876)	23.8 (31.9)	0.111 (0.9823)	166 (366)
B1613C		271 (2398)	541.9 (4796)	41.7 (55.9)	0.206 (1.8231)	275 (606)
B1815C		360 (3186)	850 (7523)	55.9 (74.9)	0.468 (4.1418)	474 (1045)
B2010C		482 (4266)	970 (8585)	75.0 (100.5)	0.885 (7.8322)	531 (1170)
B2212C		714 (6319)	1356 (12,000)	112 (150)	1.900 (16.829)	1095 (2414)
B2510C		955 (8452)	1927 (17,054)	150 (200)	3.070 (27.192)	1005 (2216)
B1307E	3000	96 (849)	165 (1460)	29.8 (39.9)	0.081 (0.7168)	135 (297)
B1308E		115 (1018)	230 (2035)	35.7 (47.8)	0.098 (0.8673)	152 (335)
B1609E		156 (1381)	270 (2390)	48.4 (64.8)	0.147 (1.3009)	231 (469)
B1611E		183 (1619)	400 (3540)	57.0 (76.4)	0.177 (1.5664)	244 (538)
B1613E		237 (2097)	459 (4062)	73.7 (98.8)	0.206 (1.8231)	275 (606)
B2010E		295 (2610)	500 (4425)	92.0 (125)	0.885 (7.8322)	351 (1170)

(1) Rotor inertia may vary slightly depending on feedback.

HPK-Series Asynchronous Servo Motor (400V) Performance Specifications

Motor HPK-	Base Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output at Base Speed kW (Hp)	Rotor Inertia ⁽¹⁾ kg-m ² (lb-in-s ²)	Motor Weight, approx. kg (lb)
E1307C	1500	112 (991)	263 (2327)	17.1 (22.9)	0.081 (0.7168)	135 (297)
E1310C		155 (1372)	380 (3363)	23.8 (32.4)	0.111 (0.9823)	166 (366)
E1613C		271 (2398)	625 (5531)	41.7 (55.9)	0.206 (1.8231)	275 (606)
E1815C		360 (3186)	840 (7434)	55.9 (74.9)	0.468 (4.1418)	474 (1045)
E2010C		482 (4266)	870 (7700)	75.0 (100.5)	0.885 (7.8322)	531 (1170)
E1307E		3000	96.0 (849)	202 (1788)	29.8 (39.9)	0.081 (0.7168)
E1308E	107 (947)		200 (1770)	33.2 (45.0)	0.098 (0.8673)	152 (335)
E1609E	156 (1381)		359 (3176)	48.4 (64.9)	0.147 (1.3009)	213 (469)
E1611E	183 (1619)		430 (3805)	57.0 (76.4)	0.177 (1.5664)	244 (538)
E1613E	237 (2097)		430 (3805)	73.7 (98.8)	0.206 (1.8231)	275 (606)

(1) Rotor inertia may vary slightly depending on feedback.

System Combinations

For HPK-Series Motors and	Refer to
Kinetix 7000 drives	page 577

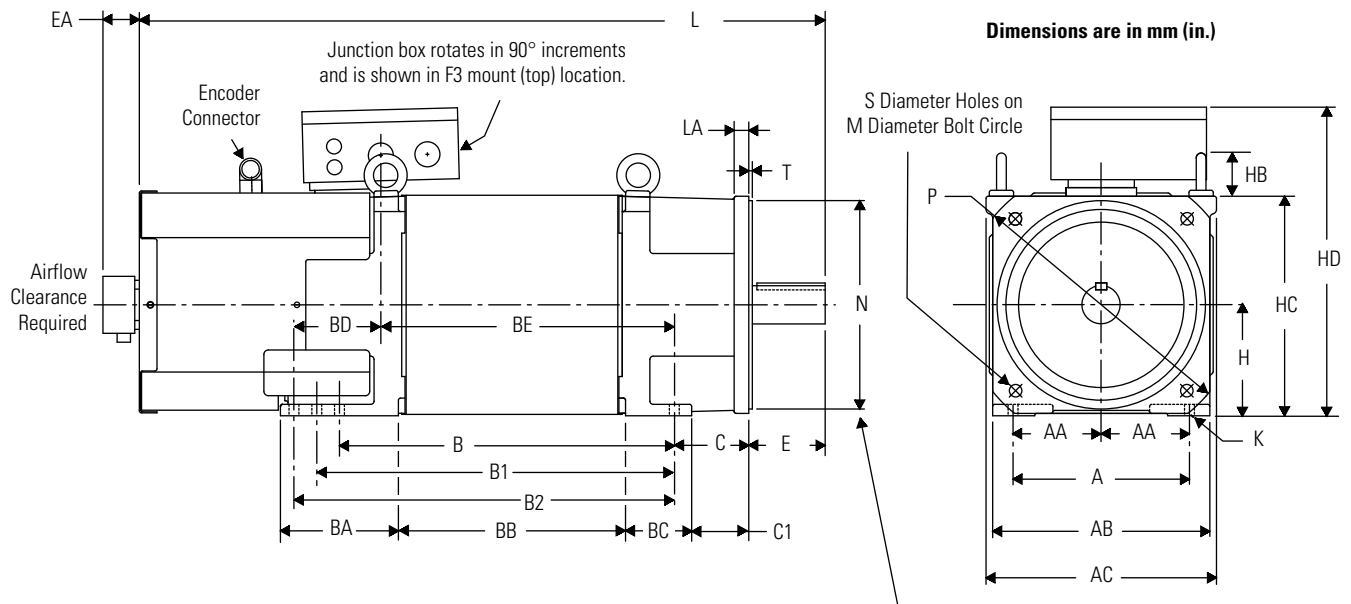
HPK-Series Asynchronous Servo Motor Brake Specifications

Motor Cat. No.	Holding Torque Nm (lb-in)
B/E1307C	20 (177)
B/E1308C	
B/E1310C	
B/E1613C	
B/E1815C	48 (425)
B/E2010C	
B2212C	102 (903)

Motor Cat. No.	Holding Torque Nm (lb-in)
B/E1307E	20 (177)
B/E1308E	
B/E1609E	
B/E1611E	
B/E1613E	48 (425)
B/E2010E	

HPK-Series Asynchronous Servo Motor Dimensions

HPK-Series Motor (non-brake) Dimensions (HPK-B/E13xx and HPK-B/E16xx)



Dimensions are in mm (in.)

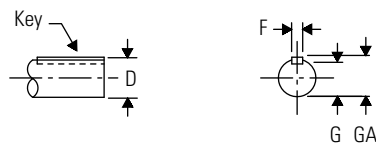
Shaft Diameter Tolerances

HPK-B/E1307, 1308, 1310
 Ø 48.003...48.016 (1.8899...1.8904)
 HPK-B/E1609, 1611, 1613
 Ø 55.011...55.030 (2.1658...2.1665)

Pilot Diameter Tolerances

HPK-B/E1307, 1308, 1310
 Ø 249.99...250.02 (9.842...9.844)
 HPK-B/E1609, 1611, 1613
 Ø 299.99...300.02 (11.809...11.811)

Shaft Detail with Key



HPK-B/E1307, 1308, 1310 = 14 x 9 x 80 Key
 HPK-B/E1609, 1611, 1613 = 16 x 10 x 90 Key

Shaft, Pilot, and Keyway Tolerances	HPK-B/E13xx	HPK-B/E16xx
Shaft Runout (T.I.R.)	0.06 (0.002)	0.06 (0.002)
Max Face Runout (T.I.R.)	0.13 (0.005)	0.13 (0.005)
Keyway Depth (GA)	51.30...51.9 (2.02...2.04)	58.67...58.92 (2.31...2.32)
Keyway Depth (G)	42.42...42.92 (1.67...1.69)	48.50...49.00 (1.91...1.93)
Keyway Width (F)	13.94...13.99 (0.549...0.551)	15.95...16.00 (0.628...0.630)

HPK-Series Motor (non-brake) Dimensions (HPK-B/E13xx and HPK-B/E16xx)

Motor Series HPK-B/E	H mm (in.)	HC mm (in.)	HD mm (in.)	HB mm (in.)	L mm (in.)	EA mm (in.)	LA mm (in.)	T mm (in.)	P mm (in.)	M mm (in.)	S ⁽¹⁾ mm (in.)	N mm (in.)	D mm (in.)	G mm (in.)	GA mm (in.)	F mm (in.)
1307					806 (31.7)											
1308	132 (5.20)	262 (10.3)	366 (14.4)	53.0 (2.09)	845 (33.2)	52.0 (2.05)	17.0 (0.67)	5.0 (0.20)	350 (13.7)	300 (11.8)	18.5 (0.73)	250 (9.84)	48.0 (1.89)	42.4 (1.67)	51.3 (2.02)	13.9 (0.55)
1310					876 (34.4)											
1609			444 (17.4)		886 (34.8)											
1611	160 (6.30)	316 (12.4)	450 (17.7)	62.0 (2.44)	937 (36.8)	52.0 (2.05)	21.0 (0.83)	5.0 (0.20)	400 (15.7)	350 (13.7)	18.5 (0.73)	300 (11.8)	55.0 (2.16)	48.5 (1.91)	58.7 (2.31)	16.0 (0.63)
1613					987 (38.8)											

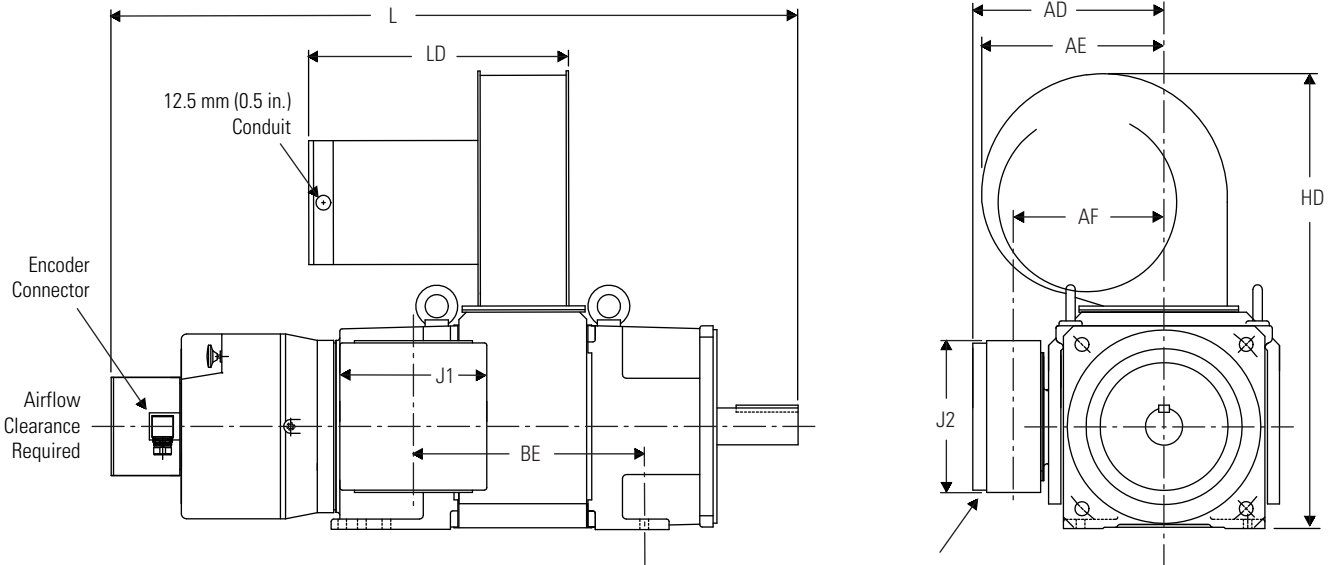
(1) Tolerance for this dimension is +0.52, -0.0 mm (+0.02, -0.0 in.).

Motor Series HPK-B/E	K mm (in.)	A mm (in.)	AA mm (in.)	AB mm (in.)	AC mm (in.)	B mm (in.)	B1 mm (in.)	B2 mm (in.)	BA mm (in.)	BB mm (in.)	BC mm (in.)	C mm (in.)	C1 mm (in.)	E mm (in.)	BD mm (in.)	BE mm (in.)
1307						333 (13.1)	365 (14.3)	390 (15.3)		187 (7.36)						300 (11.8)
1308	12.0 (0.47)	216 (8.50)	108 (4.25)	260 (10.2)	279 (10.9)	371 (14.6)	403 (15.8)	428 (16.8)	154 (6.06)	226 (8.90)	95.0 (3.74)	89.0 (3.50)	57.0 (2.24)	110 (4.33)	91.0 (3.58)	338 (13.3)
1310						403 (15.8)	435 (17.1)	462 (18.1)		257 (10.1)						369 (14.5)
1609						N/A	414 (16.3)	452 (17.8)		225 (8.86)						321 (12.6)
1611	14.0 (0.55)	254 (10.0)	127 (5.0)	313 (12.3)	332 (13.0)	N/A	464 (18.2)	502 (19.7)	170 (6.69)	276 (10.8)	95.0 (3.74)	108 (4.25)	82.0 (3.23)	110 (4.33)	130 (5.12)	372 (14.6)
1613						N/A	515 (20.2)	548 (21.5)		327 (12.8)					125 (4.92)	423 (16.6)

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

HPK-Series Motor (brake) Dimensions (HPK-B/E13xx and HPK-B/E16xx)

Dimensions are in mm (in.)



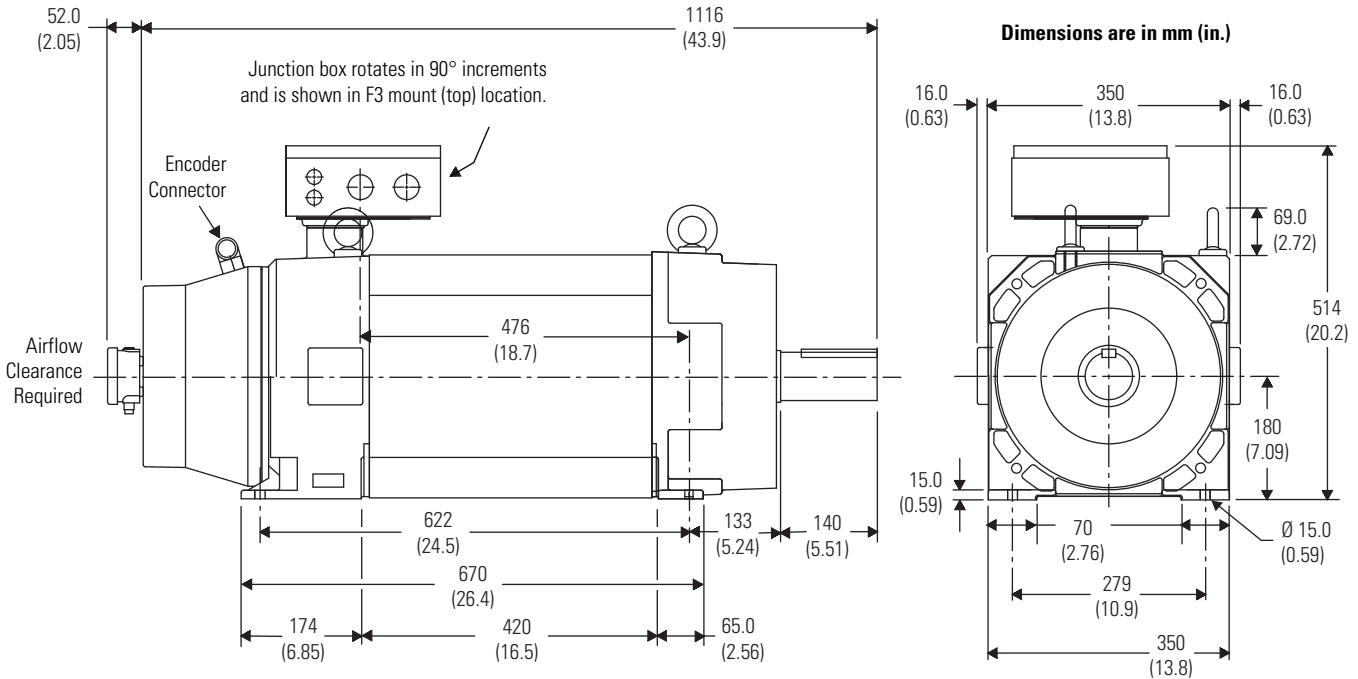
Junction box rotates in 90° increments and is shown in F1 mount (left side) location, motor is also available in F2 mount (right side) location.

HPK-Series Motor (brake) Dimensions (HPK-B/E13xx and HPK-B/E16xx)

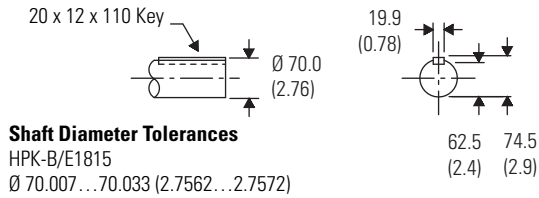
Motor Series	L mm (in.)	LD mm (in.)	BE mm (in.)	AD mm (in.)	AE mm (in.)	AF mm (in.)	HD mm (in.)	J1 mm (in.)	J2 mm (in.)
HPK-B/E									
1307	888 (34.9)		298 (11.7)						
1308	926 (36.4)	336 (13.2)	336 (13.2)	247 (9.72)	236 (9.29)	195 (7.68)	588 (23.1)	190 (7.48)	196 (7.72)
1310	957 (37.7)		368 (14.5)						
1609	967 (38.0)		328 (12.9)						
1611	1018 (40.1)	332 (13.0)	379 (14.9)	285 (11.2)	236 (9.29)	225 (8.86)	670 (26.3)	224 (8.82)	228 (8.98)
1613	1069 (42.1)		430 (16.9)						

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

HPK-Series Motor (non-brake) Dimensions (HPK-B/E1815)

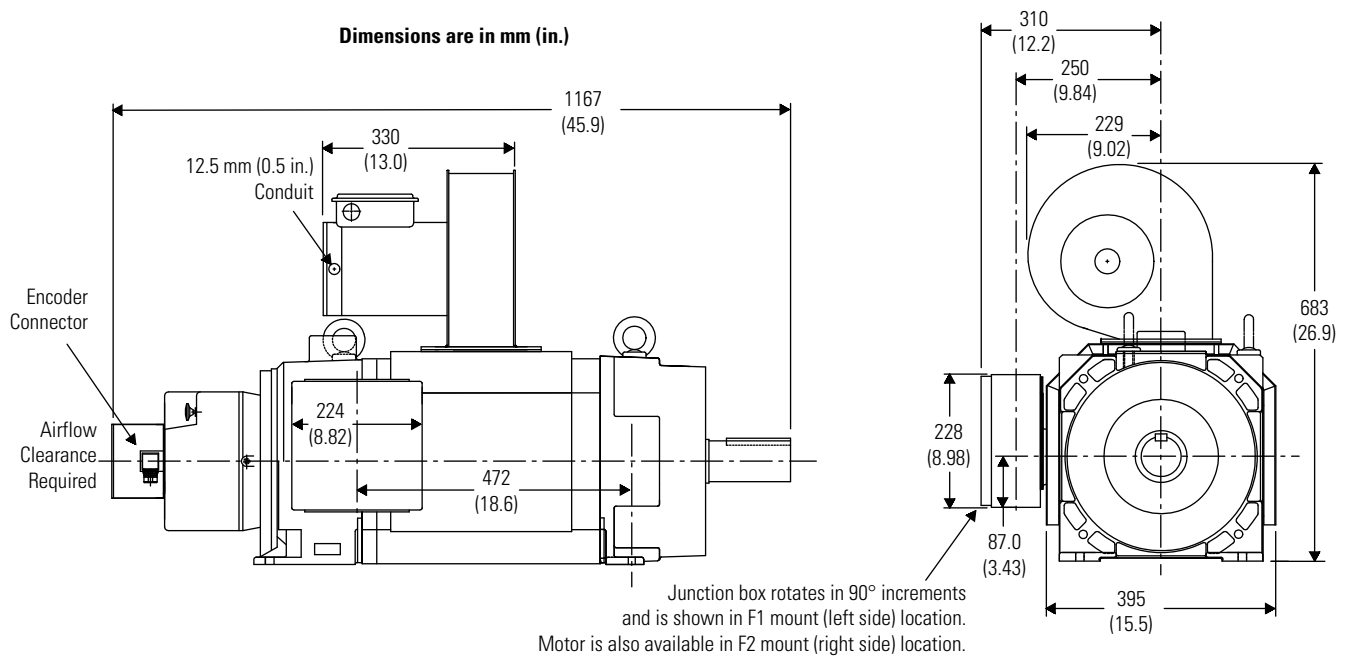


Shaft Detail with Key

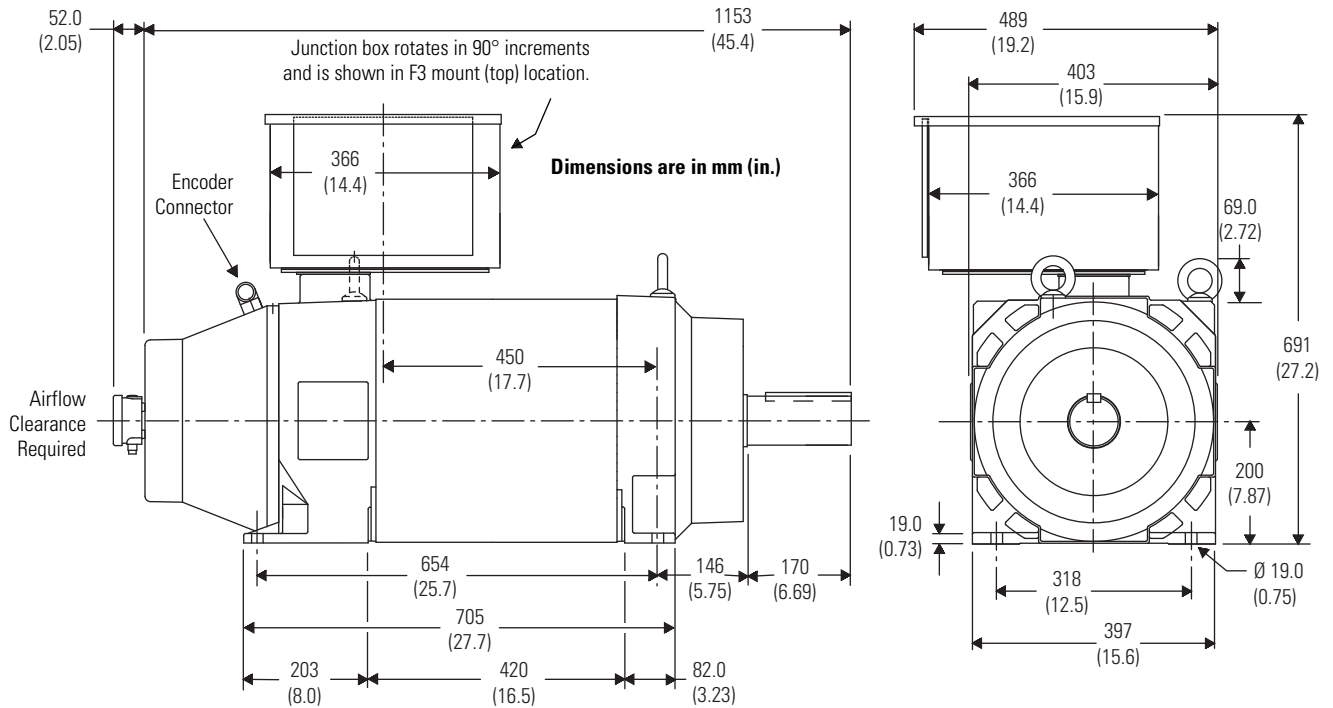


Shaft, Pilot, and Keyway Tolerances	HPK-B/E1815
Shaft Runout (T.I.R.)	0.06 (0.002)
Max Face Runout (T.I.R.)	0.13 (0.005)
Keyway Depth	73.90...74.50 (2.91...2.93)
Keyway Depth	62.00...62.50 (2.44...2.46)
Keyway Width	19.94...19.99 (0.785...0.787)

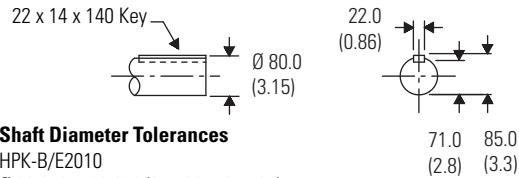
HPK-Series Motor (brake) Dimensions (HPK-B/E1815)



HPK-Series Motor (non-brake) Dimensions (HPK-B/E2010)



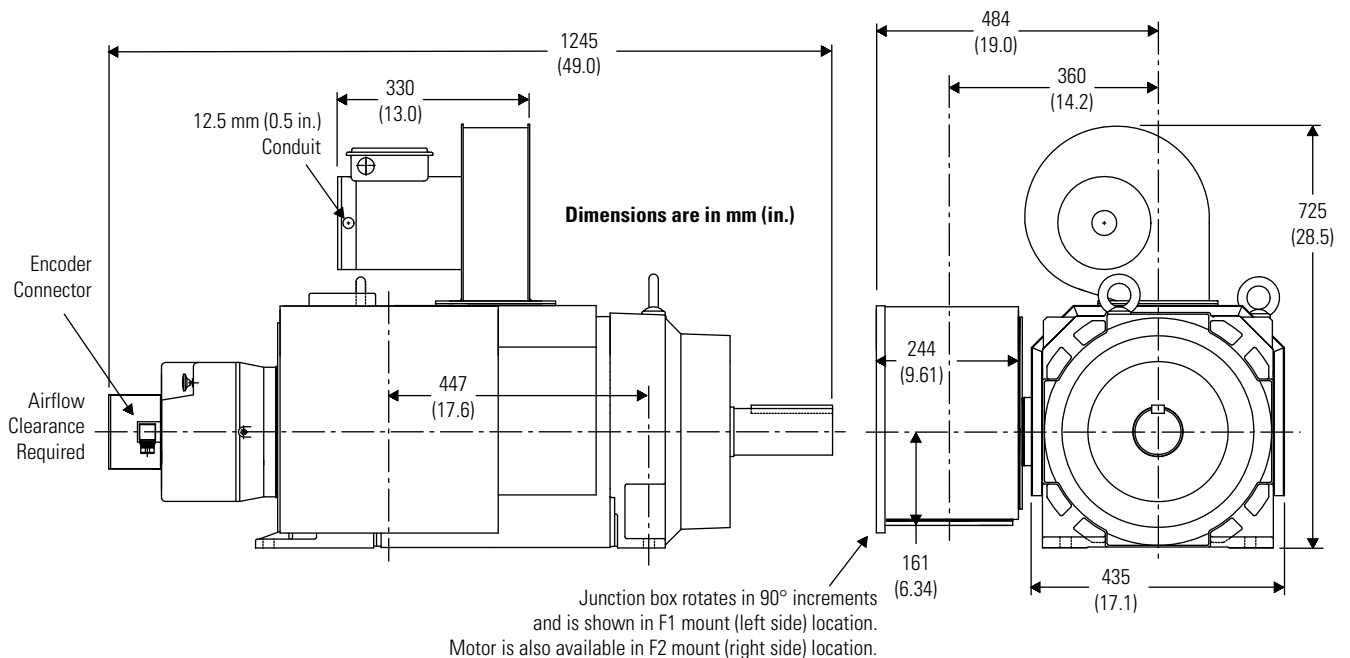
Shaft Detail with Key



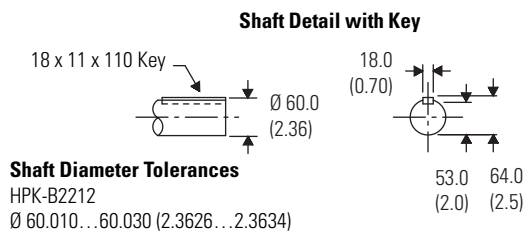
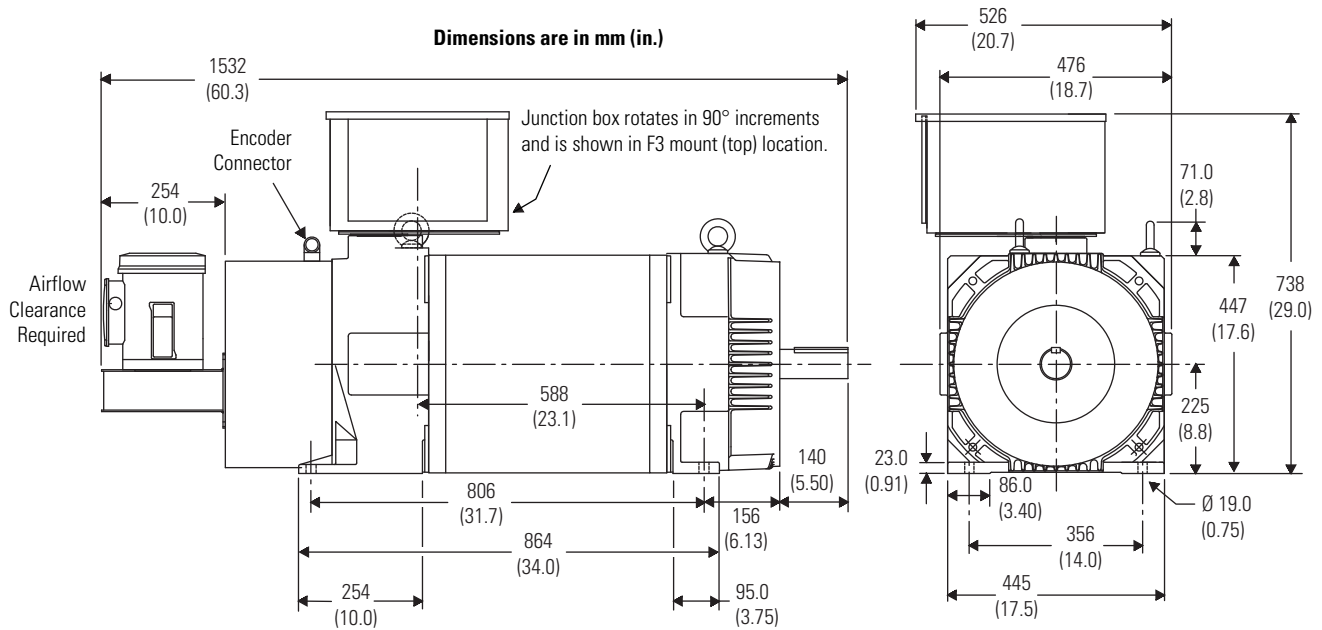
Shaft Diameter Tolerances
 HPK-B/E2010
 Ø 80.010...80.028 (3.1500...3.1507)

Shaft, Pilot, and Keyway Tolerances	HPK-B/E2010
Shaft Runout (T.I.R.)	0.06 (0.002)
Max Face Runout (T.I.R.)	0.13 (0.005)
Keyway Depth	84.50...85.10 (3.33...3.35)
Keyway Depth	70.60...71.10 (2.78...2.80)
Keyway Width	21.95...22.00 (0.864...0.866)

HPK-Series Motor (brake) Dimensions (HPK-B/E2010)

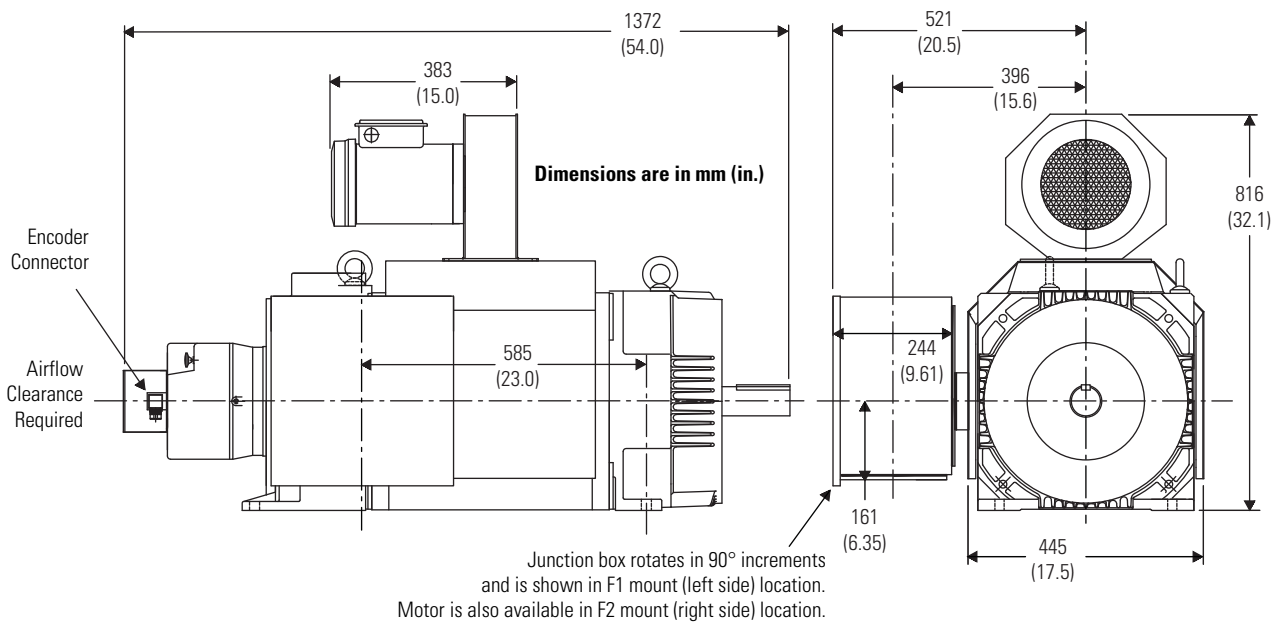


HPK-Series Motor (non-brake) Dimensions (HPK-B2212)



Shaft, Pilot, and Keyway Tolerances	HPK-B2212
Shaft Runout (T.I.R.)	0.06 (0.002)
Max Face Runout (T.I.R.)	0.13 (0.005)
Keyway Depth	63.08...64.08 (2.48...2.59)
Keyway Depth	52.57...53.08 (2.07...2.09)
Keyway Width	21.95...22.00 (0.864...0.866)

HPK-Series Motor (brake) Dimensions (HPK-B2212)



Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

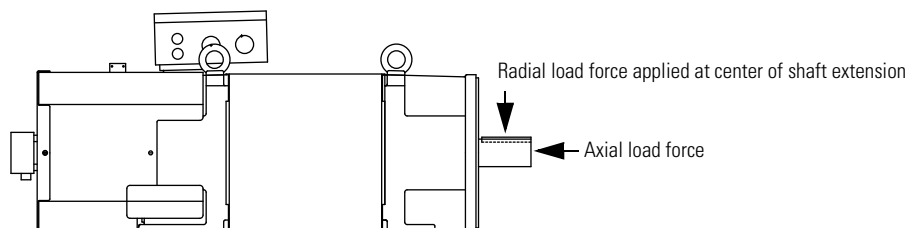
HPK-Series Asynchronous Servo Motor Load Force Ratings

HPK-Series motors are capable of operating with the maximum radial or maximum axial shaft loads listed in the following tables. Radial loads listed are applied in the middle of the shaft extension. The tables starting below represent an L_{10} bearing fatigue life of 10,000 hours. This 10,000-hour life does not account for possible application-specific life reduction that may occur due to bearing grease contamination from external sources. Maximum operating speed is limited by motor winding.

Radial Load Force Ratings (Zero Axial Load)

Motor Cat. No.	850 rpm kg (lb)	1150 rpm kg (lb)	1750 rpm kg (lb)	2500 rpm kg (lb)
HPK-B/E1307	320 (704)	290 (638)	250 (550)	220 (485)
HPK-B/E1308	320 (704)	290 (638)	250 (550)	220 (485)
HPK-B/E1310	320 (704)	290 (638)	250 (550)	220 (485)
HPK-B/E1609	500 (1100)	450 (990)	390 (858)	350 (770)
HPK-B/E1611	500 (1100)	450 (990)	390 (858)	350 (770)
HPK-B/E1613	500 (1100)	450 (990)	390 (858)	350 (770)
HPK-B/E1815	530 (1166)	530 (1166)	530 (1166)	450 (990)
HPK-B/E2010	660 (1452)	660 (1452)	660 (1452)	580 (1276)
HPK-B2212	730 (1609)	690 (1521)	600 (1323)	530 (1168)
HPK-B2510				

HPK-Series Motor Load Forces (HPK-xxxxxx-xxxxxAA)

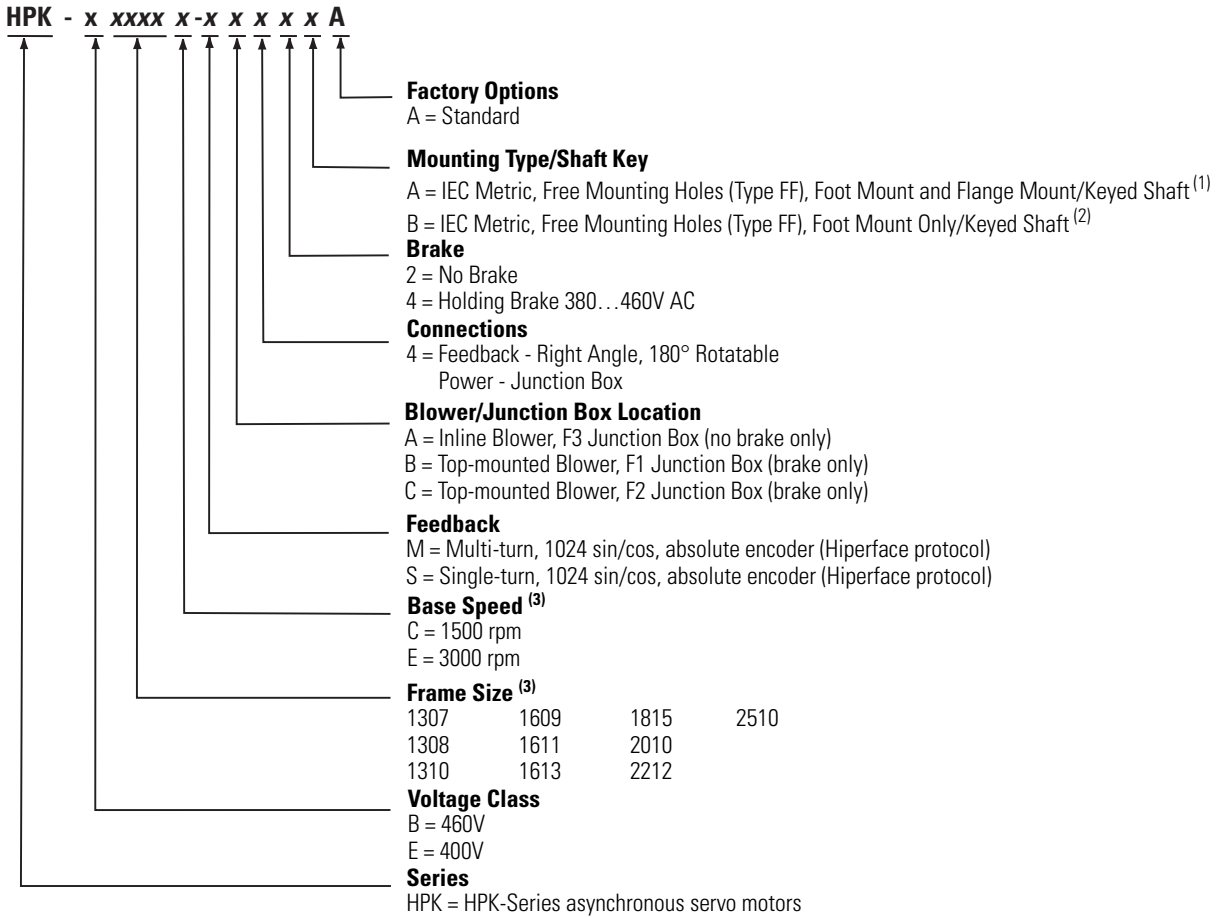


Axial Load Force Ratings (Zero Radial Load)

Motor Cat. No.	850 rpm kg (lb)	1150 rpm kg (lb)	1750 rpm kg (lb)	2500 rpm kg (lb)
HPK-B/E1307	260 (572)	240 (528)	210 (462)	180 (396)
HPK-B/E1308	260 (572)	240 (528)	210 (462)	180 (396)
HPK-B/E1310	260 (572)	240 (528)	210 (462)	180 (396)
HPK-B/E1609	360 (796)	330 (726)	290 (638)	250 (550)
HPK-B/E1611	360 (796)	330 (726)	290 (638)	250 (550)
HPK-B/E1613	360 (796)	330 (726)	290 (638)	250 (550)
HPK-B/E1815	440 (970)	380 (838)	310 (682)	260 (572)
HPK-B/E2010	530 (1166)	460 (1012)	370 (814)	310 (682)
HPK-B2212	800 (1764)	730 (1609)	630 (1389)	560 (1235)
HPK-B2510				

HPK-Series Asynchronous Servo Motor Catalog Number

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your motor. For questions regarding product availability, contact your Allen-Bradley distributor.



(1) Applies to HPK-B/E13xx and HPK-B/E16xx motors only.

(2) Applies to HPK-B/E18xx, HPK-B/E20xx, HPK-B22xx, and HPK-B25xx motors only.

(3) Not all combinations are available. Only the configurations for base speed and frame size as listed in HPK-Series Asynchronous Servo Motor (460V) Performance Specifications (page 70) and HPK-Series Asynchronous Servo Motor (400V) Performance Specifications (page 70) are available.

TL-Series Motors

The TL-Series motors are low-inertia high-performance servo motors featuring metric and NEMA frame sizes. They combine a compact size with a high torque density afforded by their superior stator design. The result is a package that provides substantial power in a small footprint.

TL-Series (Bulletin TLY) Motors



The TL-Series (Bulletin TLY) motors are equipped with circular plastic connectors and when used with the Kinetix 2000, Kinetix 6000, or Ultra3000 drives, the TL-Series (Bulletin TLY) motors are able to offer the benefits of Kinetix Integrated Motion.

For drive compatibility, refer to Servo Drives on [page 14](#).

TL-Series (Bulletin TL) Motors



The TL-Series (Bulletin TL) motor performance specifications match the Bulletin TLY motor specifications identically, but are available only in metric frame sizes and with high-resolution absolute position encoders. Similar to the Bulletin TLY motors, Bulletin TL motors support frame sizes TL-A110, TL-A120, TL-A130, TL-A220, TL-A230, TL-A2530, TL-A2540, and TL-A410 (TL-A310 is not supported).

The Bulletin TL motors are equipped with rectangular plastic connectors and are intended for use with Ultra1500 drives.

TL-Series Motor Encoder Features

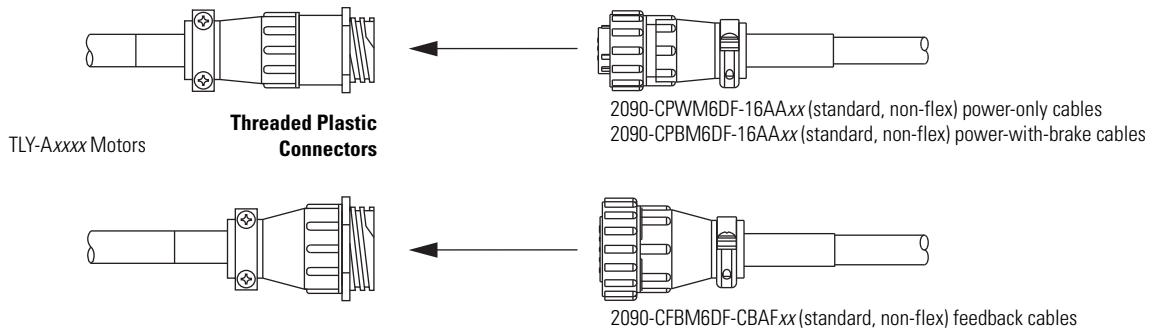
TL-Series motors are available with high-resolution or industry standard incremental encoder feedback.

- High-resolution, high performance encoders providing multi-turn absolute position feedback (131,072 counts/revolution) for smooth performance.
- Industry standard incremental encoder feedback (2,000 counts/revolution) applies to Bulletin TLY motors.

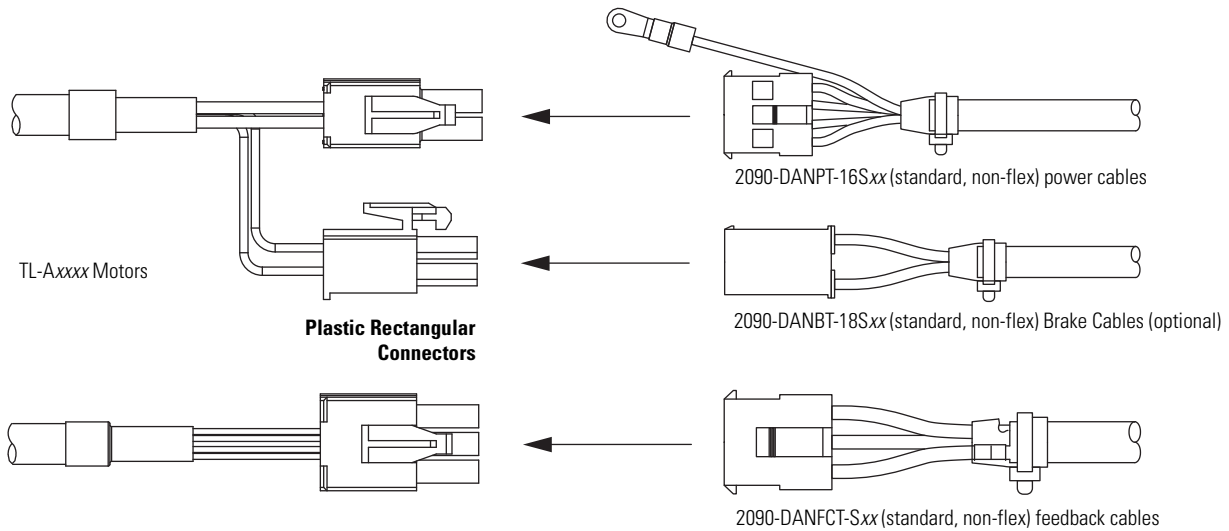
Motor Connector/Cable Compatibility

TL-Series motors are equipped with either threaded or rectangular plastic connectors.

Bulletin TLY Motor Connectors



Bulletin TL Motor Connectors



TL-Series Motor Options

TL-Series motors are available with these options:

- 24V DC brake.
- Shaft seal kit is available for field installation. Lubricant is provided with each shaft seal kit to reduce wear.

Motor Shaft Seal Kit Combinations and Dimensions

Motor Cat. No.	Seal Kit Cat. No.	Inside Diameter mm (in.)	Outside Diameter mm (in.)	Width mm (in.)
TLY/TL-A1xx	TL-SSN-1	8.9 (0.35)	16 (0.71)	3 (0.12)
TLY/TL-A2xx	TL-SSN-2	14 (0.55)	24 (0.95)	5 (0.20)
TLY/TL-A25xx	TL-SSN-3	19.8 (0.78)	30 (1.18)	5 (0.20)
TLY-A3xx				
TL-A4xx	TL-SSN-4	24.0 (0.95)	40 (1.57)	10 (0.39)

Transition Plates for N-Series Retrofit

Transition plates provide a means of retrofitting an existing N-Series motor with a TL-Series (Bulletin TLY) NEMA motor. In most applications, the TL-Series (Bulletin TLY) NEMA motor will be physically smaller, but will deliver the same torque rating as the N-Series motor it is replacing. Transition plates are not available for the N-56xx motors. Select your transition plate catalog number from the table below.

N-Series to TL-Series Transition Plates

Transition Plate Cat. No.	Description	Converts from This N-Series Motor	To This TL-Series NEMA Motor
TL-TRPLAT-17-23	TL-Series Transition Plate, NEMA 17 to 23	N-23xx	TLY-A1xxx-HxxxAN
TL-TRPLAT-23-34	TL-Series Transition Plate, NEMA 23 to 34	N-34xx	TLY-A2xxx-HxxxAN
TL-TRPLAT-34-42	TL-Series Transition Plate, NEMA 34 to 42	N-42xx	TLY-A25xxx-HxxxAN

TL-Series Motor Performance Specifications

TL-Series (non-brake) Motor Performance Specifications

Motor Cat. No.	Max Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output kW	Speed at Motor Rated Output rpm	Rotor Inertia ⁽¹⁾ kg-m ² (lb-in-s ²)
TLY/TL-A110 ⁽²⁾	6000 ⁽³⁾	0.096 (0.85)	0.20 (1.75)	0.041	5000	0.000001 (0.0000089)
TLY/TL-A120		0.181 (1.60)	0.36 (3.20)	0.086	5000	0.000002 (0.000018)
TLY/TL-A130		0.325 (2.88)	0.76 (6.70)	0.14	5000	0.000003 (0.000027)
TLY/TL-A220		0.836 (7.40)	1.48 (13.1)	0.35	5000	0.000018 (0.00016)
TLY/TL-A230		1.30 (11.50)	3.05 (27.0)	0.44	5000	0.000034 (0.00030)
TLY/TL-A2530	5000	2.60 (23.0)	5.20 (46.0)	0.69	4400	0.000098 (0.00087)
TLY/TL-A2540		2.94 (26.0)	7.10 (63.0)	0.86	4575	0.00011 (0.00096)
TLY-A310	4500	3.61 (32.0)	9.0 (80.0)	0.95	4000	0.00015 (0.0013)
TL-A410 ⁽²⁾		5.42 (48.0)	13.00 (115)	2.0	4500	0.00036 (0.0032)

(1) Refer to TL-Series Motor Weight Specifications on [page 83](#) for Brake Motor Weight.

(2) The TLY/TL-A110 and TL-A410 motors are available only in metric frame sizes. All other motors are available in metric and NEMA frame sizes.

(3) Applies to TLY-AxxxT-H motors with incremental feedback. The TLY/TL-AxxxP-B motors with absolute high-resolution encoders are rated at 5000 rpm.

TL-Series (brake) Motor Performance Specifications

Motor Cat. No.	Max Speed rpm	Continuous Stall Torque Nm (lb-in)	Peak Stall Torque Nm (lb-in)	Motor Rated Output kW	Speed at Motor Rated Output rpm	Rotor Inertia ⁽¹⁾ kg-m ² (lb-in-s ²)
TLY/TL-A110 ⁽²⁾	6000 ⁽³⁾	0.086 (0.76)	0.20 (1.75)	0.037	5000	0.000004 (0.000035)
TLY/TL-A120		0.163 (1.44)	0.36 (3.20)	0.077	5000	0.000005 (0.000044)
TLY/TL-A130		0.293 (2.59)	0.76 (6.70)	0.13	5000	0.000006 (0.000053)
TLY/TL-A220		0.757 (6.70)	1.48 (13.1)	0.24	5000	0.000028 (0.00025)
TLY/TL-A230		1.16 (10.3)	3.05 (27.0)	0.32	4250	0.000044 (0.00039)
TLY/TL-A2530	5000	2.60 (23.0)	5.20 (46.0)	0.55	3650	0.00012 (0.0011)
TLY/TL-A2540		2.94 (26.0)	7.10 (63.0)	0.66	3750	0.00013 (0.0012)
TLY-A310	4500	3.61 (32.0)	9.0 (80.0)	0.90	3900	0.00017 (0.0017)
TL-A410 ⁽²⁾		4.86 (43.0)	13.0 (115)	1.80	4500	0.00041 (0.0036)

(1) Refer to TL-Series Motor Weight Specifications on [page 83](#) for Brake Motor Weight.

(2) The TLY/TL-A110 and TL-A410 motors are available only in metric frame sizes. All other motors are available in metric and NEMA frame sizes.

(3) Applies to TLY-AxxxT-H motors with incremental feedback. The TLY/TL-AxxxP-B motors with absolute high-resolution encoders are rated at 5000 rpm.

System Combinations

For TL-Series Motors and	Feedback Option Compatibility	Refer to
Kinetix 300 (240V) drives	High-resolution or Incremental	page 509
Kinetix 2000 drives		page 571
Kinetix 6000 (230V) drives	Incremental only	page 558
Ultra3000/5000 (230V) drives	Incremental only	page 630
Ultra1500 drives	High-resolution only	page 634

TL-Series Motor Weight Specifications

Motor Cat. No.	High Resolution Feedback Option TLY/TL-Axxxx-B Motors		Incremental Feedback Option TLY-Axxxx-H Motors	
	Motor Weight, approx. kg (lb)	Brake Motor Weight, approx. kg (lb)	Motor Weight, approx. kg (lb)	Brake Motor Weight, approx. kg (lb)
TLY/TL-A110	0.29 (0.64)	0.55 (1.2)	0.29 (0.64)	0.55 (1.2)
TLY/TL-A120	0.34 (0.75)	0.59 (1.3)	0.35 (0.78)	0.59 (1.3)
TLY/TL-A130	0.46 (1.0)	0.68 (1.5)	0.50 (1.1)	0.68 (1.5)
TLY/TL-A220	0.95 (2.1)	1.4 (3.0)	1.1 (2.4)	1.5 (3.4)
TLY/TL-A230	1.4 (3.0)	1.8 (4.0)	1.5 (3.3)	2.0 (4.4)
TLY/TL-A2530	2.3 (5.0)	3.2 (7.0)	2.3 (5.1)	3.2 (7.0)
TLY/TL-A2540	2.6 (5.7)	3.5 (7.7)	2.6 (5.8)	3.5 (7.7)
TLY-A310	3.9 (8.6)	4.5 (10.0)	3.9 (8.6)	4.5 (10.0)
TL-A410	5.5 (12.0)	6.80 (15.0)	5.5 (12.0)	6.80 (15.0)

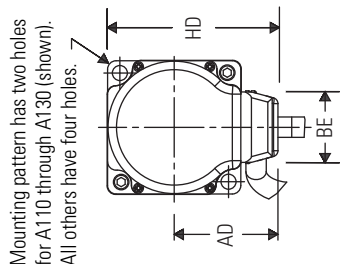
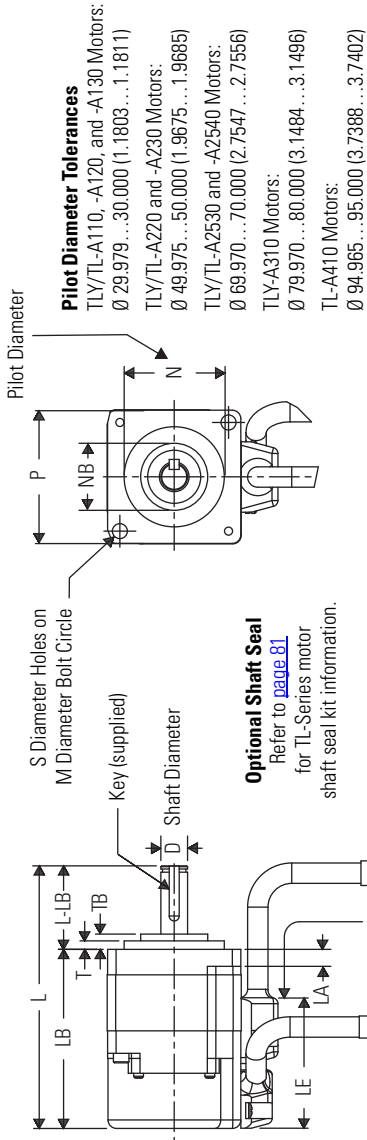
TL-Series Motor Brake Specifications

Motor Cat. No.	Max Backlash (brake engaged) arc minutes	Holding Torque Nm (lb-in)	Coil Current at 24V DC A	Brake Response Time		
				Release ms	Engage (using external arc suppression device)	
					MOV ms	Diode ms
TLY/TL-A110	60	0.32 (2.8)	0.18...0.22	21	7	40
TLY/TL-A120						
TLY/TL-A130						
TLY/TL-A220		1.24 (11.0)	0.333...0.407	22	13	73
TLY/TL-A230						
TLY/TL-A2530		2.5 (22.0)	0.351...0.429	42	14	86
TLY/TL-A2540						
TLY-A310						
TL-A410	9.3 (82.0)	0.648...0.792	69	20	84	

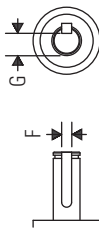
TL-Series Motor Dimensions

TL-Series Motor Dimensions (TLY-Axxxx-xx6xAA or TL-Axxxx-Bx3xAA)

Dimensions are in mm (in.)



Shaft Detail with Key

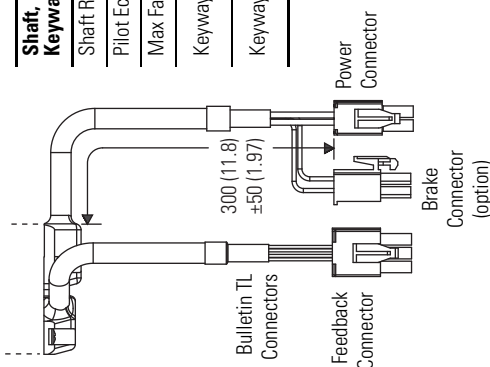


- TLY/TL-A110, -A120, and -A130 Motors
 3+0, -0.025 x 3+0, -0.025 x 15 Key
- TLY/TL-A220 and -A230 Motors
 4+0, -0.030 x 4+0, -0.030 x 15 Key
- TLY/TL-A2530 and -A2540 Motors
 5+0, -0.030 x 5+0, -0.030 x 20 Key
- TLY-A310 Motors
 5+0, -0.030 x 5+0, -0.030 x 20 Key
- TL-A410 Motors
 8+0, -0.036 x 7+0, -0.036 x 25 Key

Shaft Diameter Tolerances

- TLY/TL-A110, -A120, and -A130 Motors:
 Ø 7.991...8.000 (0.3146...0.3150)
- TLY/TL-A220 and -A230 Motors:
 Ø 11.989...12.000 (0.4720...0.4724)
- TLY-A310 Motors:
 Ø 15.989...16.000 (0.6295...0.6299)
- TL-A410 Motors:
 Ø 21.987...22.000 (0.8656...0.8661)

Shaft, Pilot, and Keyway Tolerances	TLY/TL-A1xx	TLY/TL-A2xx	TLY/TL-A25xx	TLY-A3xx	TL-A4xx
Shaft Runout (T.I.R.)	0.02 (0.001)	0.02 (0.001)	0.02 (0.001)	0.04 (0.0016)	0.02 (0.001)
Pilot Eccentricity (T.I.R.)	0.06 (0.0024)	0.06 (0.0024)	0.06 (0.0024)	0.04 (0.0016)	0.04 (0.0016)
Max Face Runout (T.I.R.)	0.07 (0.003)	0.07 (0.003)	0.07 (0.003)	0.04 (0.0016)	0.04 (0.0016)
Keyway (G)	6.00...6.20 (0.236...0.244)	9.30...9.50 (0.366...0.374)	12.8...13.0 (0.504...0.512)	17.8...18.0 (0.701...0.709)	17.8...18.0 (0.701...0.709)
Keyway (F)	2.969...2.994 (0.117...0.118)	3.958...3.998 (0.156...0.157)	4.958...4.988 (0.1952...0.1964)	7.949...7.985 (0.313...0.314)	7.949...7.985 (0.313...0.314)



TL-Series Motor Dimensions (TLY-Axxxxx-x6xAA or TL-Axxxxx-B3xAA)

Motor Cat. No.	AD mm (in.)	BE mm (in.)	D mm (in.)	HD mm (in.)	L ⁽¹⁾ mm (in.)	L-LB ⁽²⁾ mm (in.)	LA mm (in.)	LB ⁽¹⁾ mm (in.)	LE ⁽¹⁾ mm (in.)	M mm (in.)	N mm (in.)	NB mm (in.)	P mm (in.)	S mm (in.)	T mm (in.)	TB mm (in.)	G mm (in.)	F mm (in.)
TLY/TL-A110					78.5 (3.09)			53.5 (2.11)										
TLY/TL-A120	31.1 (1.22)	21.0 (0.83)	8.0 (0.31)	51.1 (2.01)	84.5 (3.33)	25.0 (0.98)	5.0 (0.20)	59.5 (2.34)	39.1 (1.54)	46.0 (1.81)	30.0 (1.18)	20.0 (0.79)	40.0 (1.57)	4.5 (0.18)	2.5 (0.10)	4.5 (0.18)	6.2 (0.24)	3.0 (0.12)
TLY/TL-A130					98.5 (3.88)			73.5 (2.89)										
TLY/TL-A220	43.0 (1.69)	27.6 (1.09)	12.0 (0.47)	73.0 (2.87)	106.1 (4.18)	30.0 (1.18)	6.0 (0.24)	76.1 (3.00)	42.8 (1.69)	70.0 (2.76)	50.0 (1.97)	27.0 (1.06)	60.0 (2.36)	5.5 (0.22)	3.0 (0.12)	7.0 (0.28)	9.5 (0.37)	4.0 (0.16)
TLY/TL-A230					128.0 (5.04)			98.1 (3.86)										
TLY/TL-A2530	53.0 (2.09)	27.6 (1.09)	16.0 (0.63)	93.0 (3.66)	134.7 (5.30)	35.0 (1.38)	8.0 (0.32)	99.7 (3.93)	43.8 (1.72)	90.0 (3.54)	70.0 (2.76)	34.0 (1.34)	80.0 (3.15)	6.6 (0.26)	3.0 (0.12)	7.0 (0.28)	13.0 (0.51)	5.0 (0.20)
TLY/TL-A2540					143.7 (5.66)			108.7 (4.28)										
TLY-A310	56.0 (2.20)			99.0 (3.90)	179.2 (7.06)			144.2 (5.68)	57.1 (2.24)	100.0 (3.94)	80.0 (3.15)		86.0 (3.39)					
TL-A410	67.0 (2.64)	38.4 (1.51)	22.0 (0.87)	117.0 (4.61)	216.0 (8.50)	40.0 (1.57)	17.0 (0.67)	176.0 (6.93)	102.0 (4.02)	115.0 (4.53)	95.0 (3.74)	N/A	100.0 (3.94)	9.0 (0.35)	7.0 (0.28)	N/A	18.0 (0.71)	8.0 (0.32)

(1) If ordering an TLY/TL-A110, TLY/TL-A120 or TLY/TL-A130 motor with brake, add 35.6 mm (1.40 in.) to dimensions L, LB, and LE.
 If ordering an TLY/TL-A220 or TLY/TL-A230 motor with brake, add 34.6 mm (1.36 in.) to dimensions L, LB, and LE.

If ordering an TLY/TL-A2530 or TLY/TL-A2540 motor with brake, add 36.6 mm (1.44 in.) to dimensions L, LB, and LE.
 If ordering an TLY-A310 motor with brake, add 23.0 mm (0.90 in.) to dimensions L, LB, and LE.

If ordering an TL-A410 motor with brake, add 32.0 mm (1.26 in.) to dimensions L, LB, and LE.

(2) Tolerance for this dimension is ±1.0 mm (±0.039 in.).

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

TL-Series (Bulletin TLY) NEMA Motor Dimensions

TL-Series NEMA Motor Dimensions (TLY-Axxxx-Hx6xAN)

Dimensions are in mm (in.)

Mounting pattern has two holes for A120 through A130 (shown). All others have four holes.

Optional Shaft Seal
Refer to [page 81](#) for TL-Series motor shaft seal kit information.

Shaft Diameter Tolerances

TLY-A120 and -A130 Motors:
 $\varnothing 6.341 \dots 6.350$ (0.2496...0.2500)

TLY-A220 and -A230 Motors:
 $\varnothing 38.075 \dots 38.100$ (0.4990...0.5000)

TLY-A2530 and -A2540 Motors:
 $\varnothing 15.864 \dots 15.875$ (0.6246...0.6250)

Shaft Detail with Key

TLY-A220 and -A230
 $0.125 +0, -0.002$ x $0.125 +0, -0.002$ x 0.8375 Key

TLY-A2530 and -A2540
 $0.187 +0, -0.002$ x $0.187 +0, -0.002$ x 1.156 Key

Pilot Diameter Tolerances

TLY-A120 and -A130 Motors:
 $\varnothing 21.979 \dots 22.000$ (0.8653...0.8661)

TLY-A220 and -A230 Motors:
 $\varnothing 38.075 \dots 38.100$ (1.4990...1.5000)

TLY-A2530 and -A2540 Motors:
 $\varnothing 72.99 \dots 73.02$ (2.874...2.875)

Shaft, Pilot, and Keyway Tolerances

Shaft, Pilot, and Keyway Tolerances	TLY-A1xx	TLY-A2xx	TLY-A25xx
Shaft Runout (T.I.R.)	0.02 (0.001)	0.02 (0.001)	0.02 (0.001)
Pilot Eccentricity (T.I.R.)	0.06 (0.0024)	0.06 (0.0024)	0.06 (0.0024)
Max Face Runout (T.I.R.)	0.07 (0.003)	0.07 (0.003)	0.07 (0.003)
Keyway (G)	N/A	10.54...10.92 (0.415...0.430)	12.75...13.13 (0.502...0.517)
Keyway (F)	N/A	3.124...3.175 (0.123...0.125)	4.763...4.814 (0.1875...0.1895)

TL-Series NEMA Motor Dimensions (TLY-Axxxx-Hx6xAN)

Motor Cat. No.	AC mm (in.)	AD mm (in.)	BE mm (in.)	D mm (in.)	HD mm (in.)	L ⁽¹⁾ mm (in.)	L-LB ⁽²⁾ mm (in.)	LA mm (in.)	LB ⁽¹⁾ mm (in.)	LE ⁽¹⁾ mm (in.)	M mm (in.)	N mm (in.)	P mm (in.)	S mm (in.)	T mm (in.)	G mm (in.)	F mm (in.)
TLY-A120		31.10 (1.22)	21.0 (0.83)	6.35 (0.25)	52.0 (2.05)	91.5 (3.603)	27.0 (1.06)	5.0 (0.20)	64.5 (2.54)	39.1 (1.54)	43.8 (1.725)	22.0 (0.86)	42.0 (1.65)	8-32 Thread	2.0 (0.08)	N/A	N/A
TLY-A130	N/A					105.5 (4.153)			78.5 (3.09)								
TLY-A220	60 (2.36)	43.0 (1.69)		12.70 (0.50)	73.0 (2.87)	137.9 (5.43)	38.1 (1.50)	6.0 (0.24)	99.8 (3.93)	43.3 (1.70)	66.7 (2.625)	38.1 (1.50)	56.4 (2.22)	5.5 (0.217)	1.5 (0.06)	10.92 (0.43)	3.175 (0.125)
TLY-A230			27.6 (1.09)			159.9 (6.30)			121.8 (4.80)								
TLY-A2530		53.0 (2.09)		15.875 (0.625)	96.0 (3.78)	149.2 (5.872)	44.5 (1.752)	8.0 (0.32)	104.7 (4.12)	43.8 (1.72)	98.4 (3.875)	73.02 (2.87)	86.0 (3.39)	5.5 (0.217)	1.5 (0.06)	13.13 (0.517)	4.814 (0.189)
TLY-A2540	N/A					158.2 (6.205)			113.7 (4.48)								

(1) If ordering an TLY-A120 or TLY-A130 motor with brake, add 35.6 mm (1.40 in.) to dimensions L, LB, and LE.

If ordering an TLY-A220 or TLY-A230 motor with brake, add 34.6 mm (1.36 in.) to dimensions L, LB, and LE.

If ordering an TLY-A2530 or TLY-A2540 motor with brake, add 36.6 mm (1.44 in.) to dimensions L, LB, and LE.

(2) Tolerance for this dimension is ± 1.0 mm (± 0.039 in.).

NEMA motor flanges and shafts are designed to inch dimensions. Other frame areas are designed to metric dimensions. Conversions are approximate values.

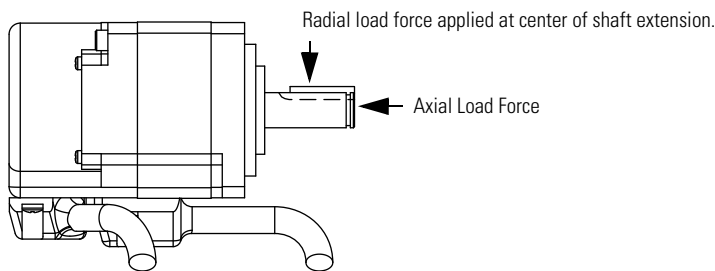
TL-Series Motor Load Force Ratings

TL-Series motors are capable of operating with the maximum radial or maximum axial shaft loads listed in the following tables. Radial loads listed are applied in the middle of the shaft extension. The tables below represent an L_{10} bearing fatigue life of 20,000 hours. This 20,000-hour life does not account for possible application-specific life reduction that may occur due to bearing grease contamination from external sources. Maximum operating speed is limited by motor winding.

Radial Load Force Ratings

Motor Cat. No.	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	4000 rpm kg (lb)	4500 rpm kg (lb)	5000 rpm kg (lb)	6000 rpm kg (lb)
TLY/TL-A110	11 (24)	9 (19)	7 (16)	7 (16)	–	6 (13)	6 (13)
TLY/TL-A120	12 (26)	10 (21)	8 (18)	7 (16)	–	7 (15)	6 (13)
TLY/TL-A130	13 (29)	10 (23)	9 (20)	8 (18)	–	8 (17)	7 (15)
TLY/TL-A220	27 (60)	22 (48)	19 (42)	17 (37)	–	16 (35)	15 (33)
TLY/TL-A230	31 (68)	24 (54)	21 (47)	19 (42)	–	18 (40)	17 (37)
TLY/TL-A2530	48 (106)	38 (84)	34 (74)	–	–	28 (62)	–
TLY/TL-A2540	50 (110)	39 (87)	34 (76)	–	–	29 (64)	–
TLY-A310	80 (177)	63 (139)	56 (123)	–	48 (106)	–	–
TL-A410	76 (168)	60 (133)	53 (117)	–	44 (98)	–	–

TL-Series Motor Load Forces (TLY-Axxxx or TL-Axxxx)



Axial Load Force Ratings (maximum radial load)

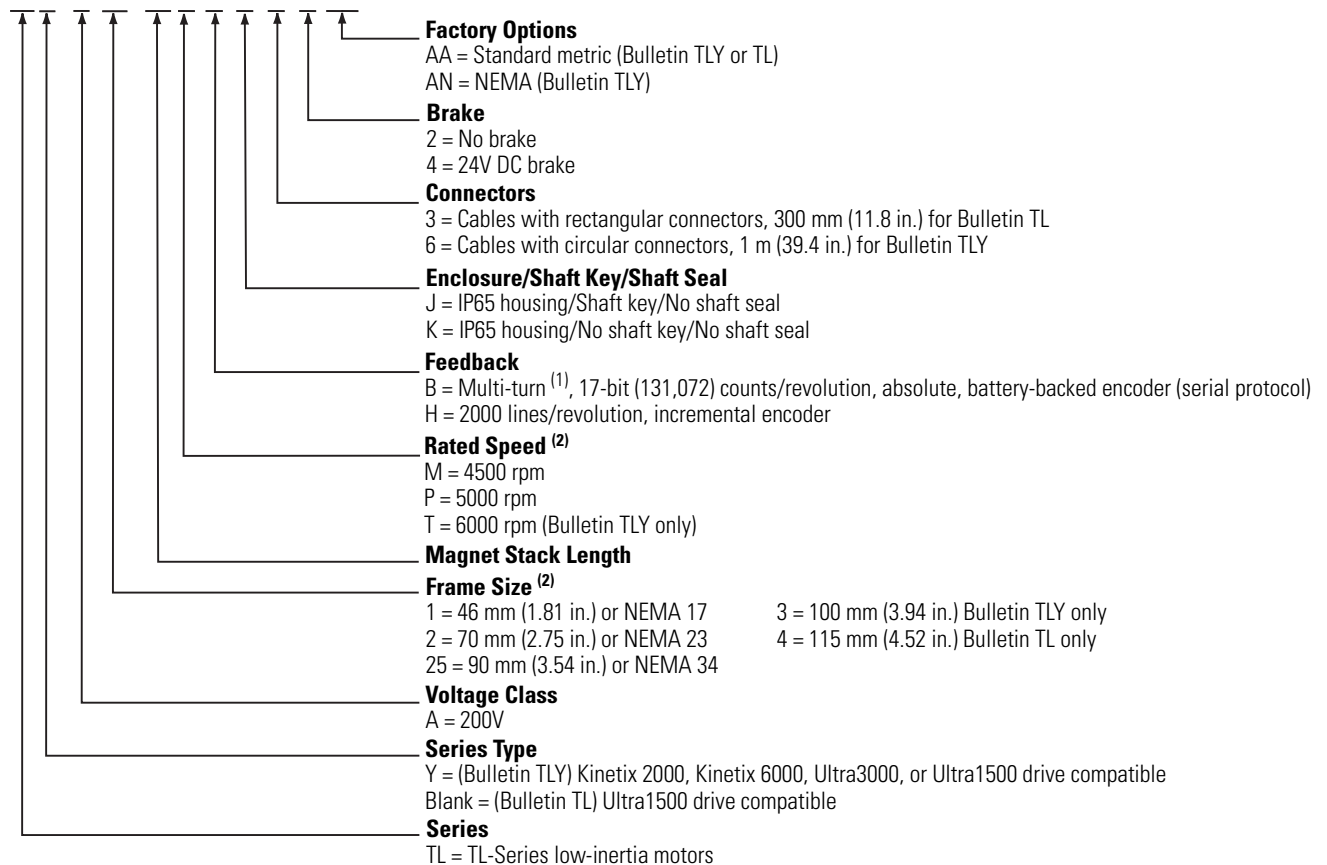
Motor Cat. No.	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	4000 rpm kg (lb)	4500 rpm kg (lb)	5000 rpm kg (lb)	6000 rpm kg (lb)
TLY/TL-A110	8 (18)	6 (13)	5 (11)	4 (9)	–	4 (9)	3 (7)
TLY/TL-A120	9 (20)	7 (16)	5 (11)	4 (9)	–	4 (9)	3 (7)
TLY/TL-A130	10 (22)	8 (17)	6 (13)	5 (12)	–	5 (11)	4 (9)
TLY/TL-A220	15 (33)	11 (24)	9 (20)	8 (17)	–	7 (16)	5 (11)
TLY/TL-A230	15 (33)	12 (26)	10 (21)	9 (20)	–	8 (17)	6 (13)
TLY/TL-A2530	18 (39)	13 (29)	11 (24)	–	–	9 (19)	–
TLY/TL-A2540	18 (39)	13 (29)	11 (25)	–	–	9 (20)	–
TLY-A310	19 (42)	14 (31)	11 (25)	–	10 (21)	–	–
TL-A410	29 (64)	21 (47)	18 (40)	–	14 (31)	–	–

Axial Load Force Ratings (zero radial load)

Motor Cat. No.	1000 rpm kg (lb)	2000 rpm kg (lb)	3000 rpm kg (lb)	4000 rpm kg (lb)	4500 rpm kg (lb)	5000 rpm kg (lb)	6000 rpm kg (lb)
TLY/TL-A110	12 (26)	9 (20)	7 (16)	6 (13)	–	6 (13)	5 (11)
TLY/TL-A120	12 (26)	9 (20)	7 (16)	6 (13)	–	6 (13)	5 (11)
TLY/TL-A130	12 (26)	9 (20)	7 (16)	6 (13)	–	6 (13)	5 (11)
TLY/TL-A220	19 (41)	14 (30)	11 (25)	10 (21)	–	9 (20)	8 (17)
TLY/TL-A230	19 (41)	14 (30)	11 (25)	10 (21)	–	9 (20)	8 (17)
TLY/TL-A2530	23 (50)	17 (37)	14 (31)	–	–	11 (25)	–
TLY/TL-A2540	23 (50)	17 (37)	14 (31)	–	–	11 (25)	–
TLY-A310	26 (57)	19 (42)	16 (35)	–	14 (31)	–	–
TL-A410	34 (75)	25 (55)	21 (47)	–	17 (37)	–	–

TL-Series Motor Catalog Number

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your motor. For questions regarding product availability, contact your Allen-Bradley distributor.

TL x - A xx xx x - x x x Ax

(1) Single-turn if used without battery backup.

(2) Not all combinations are available. Only the configurations for rated speed as listed in TL-Series Motor Performance Specifications on [page 82](#) are available.

For TL-Series connector kit catalog numbers, refer to Motor-end Connector Kits on [page 411](#).

General Motor Performance Definitions

This section contains a list of general motor performance definitions.

Rated Speed - The operating speed of the drive and motor combination at which approximately 70% of continuous rated torque (T_o) can be developed. This point is defined with the motor at 25 °C (77 °F).

Rated Operation Area - The boundary of the torque-speed curve where the motor and controller combination may operate on a servo basis without exceeding the RMS rating of either.

Intermittent Operation Area - The boundary of the torque-speed curve where the motor and controller combination may operate in acceleration/deceleration mode without exceeding peak rating of either, provided that the duty cycle RMS continuous torque limit is not exceeded.

$$\text{RMSTorque} = \sqrt{\frac{(T_{pa}^2)(t_1) + (T_{ss}^2)(t_2) + (T_{pd}^2)(t_3) + (T_r^2)(t_4)}{t_1 + t_2 + t_3 + t_4}}$$

Continuous Current - The rated current of a motor with windings at a rated temperature and an ambient temperature of 40 °C (104 °F).

Peak Current - The amount of current that can be applied to the motor without causing damage to the motor.

Mechanical Time Constant - The time required for the motor to reach 63% of its final speed when a step voltage is applied.

Electrical Time Constant - The time required for the motor to reach 63% of its rated current.

Maximum Ambient Temperature - The maximum environmental temperature in which the motor can be operated at rated loads without exceeding its insulation-type temperature rise limits.

Insulation Class - The designation of the operating temperature limits for motor insulation materials.

Thermal Time Constant - The time required for the motor windings to reach 63% of continuous temperature rise with constant watts loss.

Torque Constant - The amount of torque developed for one ampere of motor current at the stated motor temperature.

Voltage Constant - The value of the generated voltage at a specified speed when the rotor is moved mechanically in the magnetic field.

Terminal Resistance - The winding resistance.

Inductance - The winding inductance measured by a step input of zero impedance voltage applied to the locked rotor.

Rotor Polar Moment of Inertia - The moment of inertia about the axis of rotation.

Motor Weight - The approximate weight of the complete motor (including brake, if supplied) less the weight of options.

Balance - The compensation of rotor weight distribution to reduce vibrational resonance. Motors are factory balanced under running speeds.

Linear Motion

Use this chapter to become familiar with the Kinetix Motion Control linear motors and actuators and select the linear motion components required for your application. To compare features from one family of linear motion components to another, refer to Linear Servo Motors on [page 11](#) and Linear Actuators on [page 12](#).

Topic	Page
Common Linear Motion Specifications	91
MP-Series Integrated Linear Stages	93
MP-Series Integrated Multi-axis Linear Stages	110
MP-Series and TL-Series Electric Cylinders	134
MP-Series Heavy Duty Electric Cylinders	170
LDC-Series Iron Core Linear Servo Motors	188
LDL-Series Ironless Linear Servo Motors	206

Common Linear Motion Specifications

These linear motion specifications are common to Kinetix Motion Control linear motor/actuator families.

Environmental Specifications

Attribute	MP-Series Integrated Linear Stages		MP-Series and TL-Series Electric Cylinders			LDC-Series and LDL-Series Linear Motors
	Bulletin MPAS	Bulletin MPMA	Bulletin MPAR	Bulletin TLAR	Bulletin MPAI	
Ambient temperature	0...40 °C (32...104 °F)					
Storage temperature	-30...70 °C (-22...158 °F)		-25...60 °C (-13...140 °F)			-30...70 °C (-22...158 °F)
Relative humidity (noncondensing)	5...95%					
Shock	20 g peak, 6 ms duration					
Vibration	0.1 grms @ 30...2000 Hz		2.5 g peak @ 30...2000 Hz			

Environmental Ratings

IP Rating	Dust Protection	Liquid Protection	Actuator/Motor
IP30	Objects larger than 2.5 mm (0.098 in.)	No protection from liquids.	Bulletin MPAS and MPMA
IP40	Objects larger than 1.0 mm (0.039 in.)	No protection from liquids.	Bulletin MPAR and TLAR ⁽¹⁾
IP65	Total protection from dust	Protected against low-pressure jets of water from all directions.	LDC-Series and LDL-Series
IP66		Protected against strong jets of water.	Bulletin MPAR ^{(2) (3)}
IP67		Protected against the effects of temporary liquid immersion.	Bulletin MPAI ⁽³⁾

(1) Applies to complete unit, including rod-end seal and breather port.

(2) Applies to electronic components.

(3) Requires use of Bulletin 2090 environmentally sealed cable connectors.

Motor Brake Application Guidelines

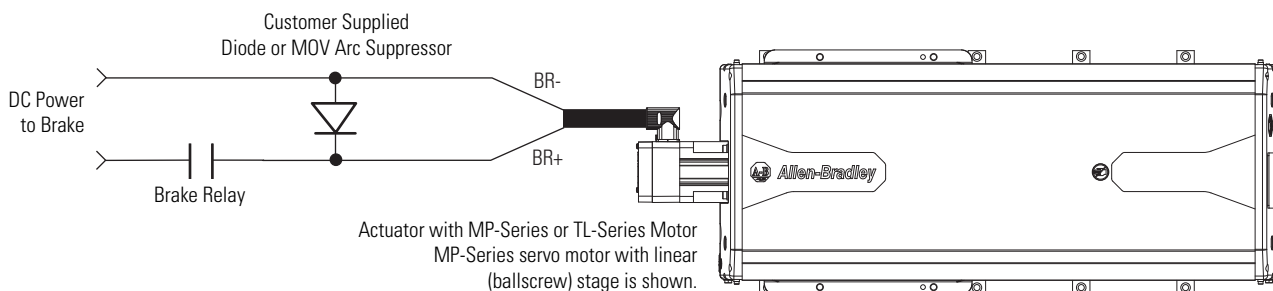
The brakes offered as options on the ballscrew driven linear stages and electric cylinders are holding brakes designed to hold the carriage/rod cylinder in position up to the rated brake holding torque. The brakes release when voltage is applied to the brake coil. Voltage and polarity supplied to the brake must be as specified to be sure of proper brake performance.

The brakes are not designed for stopping an actuator in motion. Servo drive inputs should be used to stop carriage/rod cylinder motion before the brake is activated. The recommended method of stopping motion is to command the servo drive to decelerate the carriage/rod cylinder to a complete stop and engage the brake only after the carriage/rod cylinder has stopped.

If system main power fails, the brakes can withstand use as stopping brakes. However, use of the brakes as stopping brakes can create mechanical backlash that is potentially damaging to the system, increases brake pad wear and reduces brake life. The brakes are not designed nor are they intended to be used as a safety device.

A separate power source is required to disengage the brake. This power source can be controlled by the linear stage controls, in addition to manual operator controls. Electrical arcing may occur at the relay contacts until the brake power dissipates. A customer supplied diode or metal oxide varistor (MOV) is recommended to prevent arcing. Use of an MOV can also reduce the time to mechanically engage the brake.

Example Suppression Device for Brake Relay Contacts



Kinetix 2000, Kinetix 6000, Kinetix 6200, Kinetix 6500, and Kinetix 7000 servo drives provide motor/actuator brake relay outputs and supply an MOV arc suppressor, so customer supplied arc suppressor is not required unless the coil current of the brake is greater than the maximum brake current rating of the drive relay output.

MP-Series Integrated Linear Stages



MP-Series integrated linear stages extend the performance and reliability of MP-Series servo motor technology to ballscrew and direct drive linear slide-type actuators. MP-Series linear stages are specifically designed for abusive, high throughput industrial automation applications instead of clean, high accuracy lab environments. Wear items such as cable track and strip seals can be changed in minutes to minimize machine down-time. Because the MP-Series linear stages are provided as fully integrated motor/actuators supported by Motion Analyzer and RSLogix 5000 software, the time required for mechanical design, installation, setup, and programming is dramatically reduced.

For drive compatibility, refer to Servo Drives on [page 14](#).

MP-Series Direct-drive Linear Stage Features

- High performance linear motor, linear guide bearings, and 5 micron resolution linear encoder integrated into single, compact package
- Extremely high speeds up to 5000 mm/s (197 in./s)
- Very long life due to elimination of mechanical transmission
- Quick-change cable track module to minimize downtime
- Available with and without cover/strip seal option
- Peak forces to 601 N (135 lb) and peak velocities to 5000 mm/s (197 in./s)
- Stroke lengths from 120...1940 mm (4.7...76.4 in.)

MP-Series Ballscrew-drive Linear Stage Features

- High performance MP-Series servo motor, ballscrew, and linear guide bearings integrated in to single, compact package
- Peak forces to 1212 N (273 lb) and peak velocities to 1124 mm/s (44 in./s)
- Stroke lengths from 120...1020 mm (4.7...40.2 in.)

MP-Series Integrated Linear Stage Accessory Kits

- Cable track module replacement kits
- Strip seal replacement kits
- Top cover kits
- Side cover kits
- Coupling kits
- Tee-nut kit (package of 10)
- Toe-clip kit (package of 10)
- Grease gun kit
- Grease replacement cartridge

Accessory Kits Common to All Single-axis Linear Stages

Linear Stage Cat. No.	Description	Accessory Cat. No.
MPAS-A/Bxxx	Kit, grease gun for all integrated linear stages.	MPAS-GPUMP
	Grease gun refill cartridge for all integrated linear stages.	MPAS-CART
	Kit, toe clamps (10 per package) for all integrated linear stages.	MPAS-TOE
MPAS-A6xxx, MPAS-B6xxx	Kit, Tee-nuts (10 per package).	MPAS-6-TNUT
MPAS-A8xxx, MPAS-B8xxx		MPAS-8-TNUT
MPAS-A9xxx, MPAS-B9xxx		MPAS-9-TNUT

Accessory Kits for Single-axis Direct-drive Linear Stages

Linear Stage Cat. No.	Description	Accessory Cat. No.
MPAS-x6xxx-ALMx2A	Cable track module for direct-drive linear stage.	MPAS-6xxxB-CABLE ⁽¹⁾
MPAS-x8xxx-ALMx2A		MPAS-8xxxE-CABLE ⁽²⁾
MPAS-x9xxx-ALMx2A		MPAS-9xxxK-CABLE ⁽²⁾
MPAS-x6xxx-ALMS2A	Kit, strip seal for direct-drive linear stage.	MPAS-6xxxB-SEAL ⁽¹⁾
MPAS-x8xxx-ALMS2A		MPAS-8xxxE-SEAL ⁽²⁾
MPAS-x9xxx-ALMS2A		MPAS-9xxxK-SEAL ⁽²⁾
MPAS-x6xxx-ALMS2A	Kit, side covers for direct-drive linear stage.	MPAS-6xxxB-SIDE ⁽¹⁾
MPAS-x8xxx-ALMS2A		MPAS-8xxxE-SIDE ⁽²⁾
MPAS-x9xxx-ALMS2A		MPAS-9xxxK-SIDE ⁽²⁾
MPAS-x6xxx-ALMS2A	Kit, top cover for direct-drive linear stage.	MPAS-6xxxB-TOP ⁽¹⁾
MPAS-x8xxx-ALMS2A		MPAS-8xxxE-TOP ⁽²⁾
MPAS-x9xxx-ALMS2A		MPAS-9xxxK-TOP ⁽²⁾

(1) Variable xxx (mm stroke x 10) is 012, 018, 024, 030, 036, 042, 054, 066, 078, 090, 102, or 114.

(2) Variable xxx (mm stroke x 10) is 014, 020, 026, 032, 038, 044, 056, 068, 080, 092, 104, 128, 152, 176, or 194.

Accessory Kits for Single-axis Ballscrew Linear Stages

Linear Stage Cat. No.	Description	Accessory Cat. No.
MPAS-x6xxx-VxxSxA	Coupler, for ballscrew linear stage.	MPAS-6-COUP
MPAS-x8xxx-VxxSxA		MPAS-8-COUP
MPAS-x9xxx-VxxSxA		MPAS-9-COUP
MPAS-Axxx1-V05S2A	Motor, 230V, without brake for 5 mm/rev ballscrew linear stage.	MPLS-A210E-VJ42AA
MPAS-Axxx1-V05S4A	Motor, 230V, with brake for 5 mm/rev ballscrew linear stage.	MPLS-A210E-VJ44AA
MPAS-Bxxx1-V05S2A	Motor, 460V, without brake for 5 mm/rev ballscrew linear stage.	MPLS-B210E-VJ42AA
MPAS-Bxxx1-V05S4A	Motor, 460V, with brake for 5 mm/rev ballscrew linear stage.	MPLS-B210E-VJ44AA
MPAS-Axxx2-V20S2A	Motor, 230V, without brake for 20 mm/rev ballscrew linear stage.	MPLS-A220H-VJ42AA
MPAS-Axxx2-V20S4A	Motor, 230V with brake for 20 mm/rev ballscrew linear stage.	MPLS-A220H-VJ44AA
MPAS-Bxxx2-V20S2A	Motor, 460V, without brake for 20 mm/rev ballscrew linear stage.	MPLS-B220H-VJ42AA
MPAS-Bxxx2-V20S4A	Motor, 460V with brake for 20 mm/rev ballscrew linear stage.	MPLS-B220H-VJ44AA
MPAS-x6xxx-VxxSxA	Kit, strip seal for ballscrew linear stage.	MPAS-6xxx1-SEAL ⁽¹⁾
MPAS-x8xxx-VxxSxA		MPAS-8xxx1-SEAL ⁽²⁾
MPAS-x9xxx-VxxSxA		MPAS-9xxx1-SEAL ⁽²⁾
MPAS-x6xxx-VxxSxA	Kit, side cover for ballscrew linear stage.	MPAS-6xxx1-SIDE ⁽¹⁾
MPAS-x8xxx-VxxSxA		MPAS-8xxx1-SIDE ⁽²⁾
MPAS-x9xxx-VxxSxA		MPAS-9xxx1-SIDE ⁽²⁾
MPAS-x6xxx-VxxSxA	Kit, top cover for ballscrew linear stage.	MPAS-6xxx1-TOP ⁽¹⁾
MPAS-x8xxx-VxxSxA		MPAS-8xxx1-TOP ⁽²⁾
MPAS-x9xxx-VxxSxA		MPAS-9xxx1-TOP ⁽²⁾

(1) Variable xxx (mm stroke x 10) is 012, 018, 024, 030, 036, 042, 054, or 066.

(2) Variable xxx (mm stroke x 10) is 012, 018, 024, 030, 036, 042, 054, 066, 078, 090, or 102.

MP-Series Integrated Linear Stage Life Specifications

Attribute	Value
Linear bearings	10,000 km (6213.7 mi) or one year minimum life with a maximum load of 22.7 kg (50 lb) centered on lubrication intervals every 5000 km (3106.8 mi) or three months.
Ballscrew	300,000 krevs or one year minimum life with a maximum load of 11.3 kg (25 lb), 1 g maximum acceleration in a clean dry, noncontaminating environment with lubrication every 150,000 krevs or three months.
Strip seal	10,000,000 cycles or 10,000 km min life in clean, dry, noncontaminating environment.
Cable track module	10,000,000 cycles minimum life.
Mechanical stop bumper	56.49 Nm (500 lb-in) potential energy.

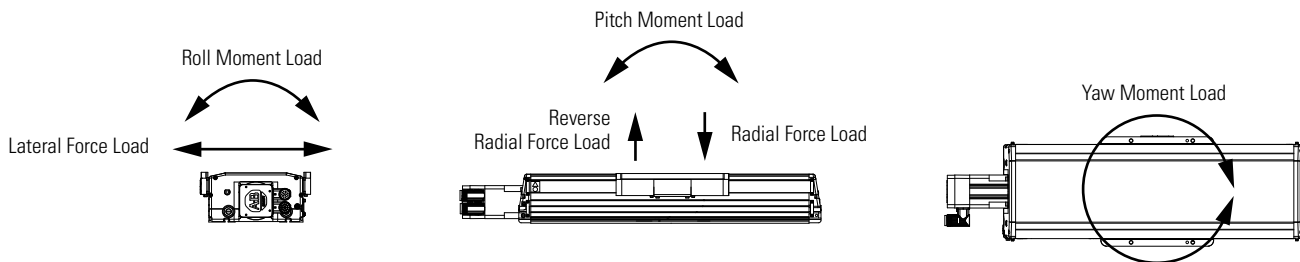
MP-Series Integrated Linear Stage Accuracy Specifications

Linear Stage Cat. No. MPAS-	Drive Mechanism and Feedback Type	Bi-directional Repeatability ⁽¹⁾	Accuracy ⁽¹⁾	Straightness	Flatness
A/B6xxx1-V05SxA A/B6xxx2-V20SxA A/B8xxx1-V05SxA A/B8xxx2-V20SxA A/B9xxx1-V05SxA A/B9xxx2-V20SxA	Ballscrew with absolute multi-turn rotary encoder	±60 µm (±0.002 in.)	60 µm + 167 µm/m (0.002 in. + 0.002 in./ft)	10 µm + 50 µm/m	10 µm + 50 µm/m
A6xxxB-ALMx2C A8xxxE-ALMx2C B8xxxF-ALMx2C A9xxxK-ALMx2C B9xxxL-ALMx2C	Linear Motor with incremental linear encoder	±15 µm (±0.0005 in.)	100 µm + 20 µm/m (0.004 in. + 0.0002 in./ft)		

(1) Measured at 20 °C (68 °F).

MP-Series Integrated Linear Stage Load Force Ratings

The static moment and force ratings shown in the performance specifications tables are the maximum permissible values possible before permanent damage to the linear stage can occur. To determine the estimated L_{10} bearing and ballscrew life of MP-Series Integrated Linear Stages, use Motion Analyzer software, version 4.4 or later.



MP-Series Integrated Linear Stage (230V) Performance Specifications

MP-Series Integrated Linear Stage Performance Specifications (150 mm frame size)

Linear Stage Cat. No. MPAS-	Screw Lead mm (in.)	Stroke Length mm (in.)	Velocity, max mm/s (in./s)	Cont. Stall Force N (lb)	Peak Stall Force N (lb)	Max Static Loads ⁽¹⁾			Max Static Moment Loads ⁽¹⁾		
						Radial N (lb)	Reverse Radial N (lb)	Lateral N (lb)	Pitch Nm (lb-ft)	Yaw Nm (lb-ft)	Roll Nm (lb-ft)
A6xxx1-V05SxA	5.0 (0.2)	120...660 (4.7...26.0)	200 (7.9)	521 (117)	1212 (272)	5506 (1238)	2367 (532)	2753 (619)	195 (144)	227 (167)	92 (68)
A6xxx2-V20SxA	20.0 (0.8)		1124 (44.3)	462 (104)	968 (218)						
A6xxxB-ALM02 C (no cover)	N/A	120...1140 (4.7...44.9)	5000 (196.9)	105 (24)	359 (81)	5506 (1238)	2367 (532)	2753 (619)	195 (144)	227 (167)	92 (68)
A6xxxB-ALMS2 C (covered)	N/A			83 (19)	312 (70)						

(1) Values apply to bearing ratings only. Contact your Rockwell Automation sales representative for structural considerations.

MP-Series Integrated Linear Stage Performance Specifications (200 mm frame size)

Linear Stage Cat. No. MPAS-	Screw Lead mm (in.)	Stroke Length mm (in.)	Velocity, max mm/s (in./s)	Cont. Stall Force N (lb)	Peak Stall Force N (lb)	Max Static Loads ⁽¹⁾			Max Static Moment Loads ⁽¹⁾		
						Radial N (lb)	Reverse Radial N (lb)	Lateral N (lb)	Pitch Nm (lb-ft)	Yaw Nm (lb-ft)	Roll Nm (lb-ft)
A8xxx1-V05SxA	5.0 (0.2)	120...780 (4.7...30.7)	200 (7.9)	521 (117)	1212 (273)	9365 (2105)	4027 (905)	4683 (1053)	336 (248)	391 (288)	258 (190)
		900 (35.4)	176 (6.9)								
		1020 (40.1)	143 (5.6)								
A8xxx2-V20SxA	20.0 (0.8)	120...660 (4.7...26.0)	1124 (44.3)	462 (104)	968 (218)	9365 (2105)	4027 (905)	4683 (1053)	336 (248)	391 (288)	258 (190)
		780 (30.7)	889 (35.0)								
		900 (35.4)	715 (28.1)								
		1020 (40.1)	582 (22.9)								
A8xxxE-ALMO2C (no cover)	N/A	140...1940 (5.5...76.4)	5000 (196.9)	189 (43)	456 (103)	9100 (2046)	4100 (922)	4700 (1057)	402 (297)	492 (363)	245 (181)
A8xxxE-ALMS2C (covered)	N/A			159 (36)	399 (90)						

(1) Values apply to bearing ratings only. Contact your Rockwell Automation sales representative for structural considerations.

MP-Series Integrated Linear Stage Performance Specifications (250 mm frame size)

Linear Stage Cat. No. MPAS-	Screw Lead mm (in.)	Stroke Length mm (in.)	Velocity, max mm/s (in./s)	Cont. Stall Force N (lb)	Peak Stall Force N (lb)	Max Static Loads ⁽¹⁾			Max Static Moment Loads ⁽¹⁾		
						Radial N (lb)	Reverse Radial N (lb)	Lateral N (lb)	Pitch Nm (lb-ft)	Yaw Nm (lb-ft)	Roll Nm (lb-ft)
A9xxx1-V05SxA	5.0 (0.2)	120...780 (4.7...30.7)	200 (7.9)	521 (117)	1212 (273)	13,282 (2986)	5711 (1284)	6641 (1493)	477 (352)	555 (409)	468 (345)
		900 (35.4)	176 (6.9)								
		1020 (40.1)	143 (5.6)								
A9xxx2-V20SxA	20.0 (0.8)	120...660 (4.7...26.0)	1124 (44.3)	462 (104)	968 (218)	13,282 (2986)	5711 (1284)	6641 (1493)	477 (352)	555 (409)	468 (345)
		780 (30.7)	889 (35.0)								
		900 (35.4)	715 (28.1)								
		1020 (40.1)	582 (22.9)								
A9xxxK-ALMO2C (no cover)	N/A	140...1940 (5.5...76.4)	5000 (196.9)	285 (64)	680 (153)	12900 (2900)	5800 (1304)	6600 (1484)	582 (429)	714 (527)	444 (328)
A9xxxK-ALMS2C (covered)	N/A			245 (55)	601 (135)						

(1) Values apply to bearing ratings only. Contact your Rockwell Automation sales representative for structural considerations.

System Combinations

For MP-Series Integrated Linear Stages and	Refer to
Kinetix 300 (240V) drives	page 640
Kinetix 6000 (230V) drives	page 654
Kinetix 2000 (230V) drives	page 683
Ultra3000 (230V) drives	page 703

MP-Series Integrated Linear Stage (460V) Performance Specifications

MP-Series Integrated Linear Stage Performance Specifications (150 mm frame size)

Linear Stage Cat. No. MPAS-	Screw Lead mm (in.)	Stroke Length mm (in.)	Velocity, max mm/s (in./s)	Cont. Stall Force N (lb)	Peak Stall Force N (lb)	Max Static Loads			Max Static Moment Loads		
						Radial N (lb)	Reverse Radial N (lb)	Lateral N (lb)	Pitch Nm (lb-ft)	Yaw Nm (lb-ft)	Roll Nm (lb-ft)
B6xxx1-V05SxA	5.0 (0.2)	120...660 (4.7...26.0)	200 (7.9)	521 (117)	1212 (273)	5506 (1238)	2367 (532)	2753 (619)	195 (144)	227 (167)	92 (68)
B6xxx2-V20SxA	20.0 (0.8)		1124 (44.3)	462 (104)	968 (218)						

MP-Series Integrated Linear Stage Performance Specifications (200 mm frame size)

Linear Stage Cat. No. MPAS-	Screw Lead mm (in.)	Stroke Length mm (in.)	Velocity, max mm/s (in./s)	Cont. Stall Force N (lb)	Peak Stall Force N (lb)	Max Static Loads			Max Static Moment Loads		
						Radial N (lb)	Reverse Radial N (lb)	Lateral N (lb)	Pitch Nm (lb-ft)	Yaw Nm (lb-ft)	Roll Nm (lb-ft)
B8xxx1-V05SxA	5.0 (0.2)	120...780 (4.7...30.7)	200 (7.9)	521 (117)	1212 (273)	9365 (2105)	4027 (905)	4683 (1053)	336 (248)	391 (288)	258 (190)
		900 (35.4)	176 (6.9)								
		1020 (40.1)	143 (5.6)								
B8xxx2-V20SxA	20.0 (0.8)	120...660 (4.7...26.0)	1124 (44.3)	462 (104)	968 (218)	9365 (2105)	4027 (905)	4683 (1053)	336 (248)	391 (288)	258 (190)
		780 (30.7)	889 (35.0)								
		900 (35.4)	715 (28.1)								
		1020 (40.1)	582 (22.9)								
B8xxxF-ALM02C (no cover)	N/A	140...1940 (5.5...76.4)	5000 (196.9)	189 (43)	456 (103)	9100 (2046)	4100 (922)	4700 (1057)	402 (297)	492 (363)	245 (181)
B8xxxF-ALMS2C (covered)	N/A			159 (36)	399 (90)						

MP-Series Integrated Linear Stage Performance Specifications (250 mm frame size)

Linear Stage Cat. No. MPAS-	Screw Lead mm (in.)	Stroke Length mm (in.)	Velocity, max mm/s (in./s)	Cont. Stall Force N (lb)	Peak Stall Force N (lb)	Max Static Loads			Max Static Moment Loads		
						Radial N (lb)	Reverse Radial N (lb)	Lateral N (lb)	Pitch Nm (lb-ft)	Yaw Nm (lb-ft)	Roll Nm (lb-ft)
B9xxx1-V05SxA	5.0 (0.2)	120...780 (4.7...30.7)	200 (7.9)	521 (117)	1212 (273)	13,282 (2986)	5711 (1284)	6641 (1493)	477 (352)	555 (409)	468 (345)
		900 (35.4)	176 (6.9)								
		1020 (40.1)	143 (5.6)								
B9xxx2-V20SxA	20.0 (0.8)	120...660 (4.7...26.0)	1124 (44.3)	462 (104)	968 (218)	13,282 (2986)	5711 (1284)	6641 (1493)	477 (352)	555 (409)	468 (345)
		780 (30.7)	889 (35.0)								
		900 (35.4)	715 (28.1)								
		1020 (40.1)	582 (22.9)								
B9xxxL-ALMO2C (no cover)	N/A	140...1940 (5.5...76.4)	5000 (196.9)	285 (64)	680 (153)	12900 (2900)	5800 (1304)	6600 (1484)	582 (429)	714 (527)	444 (328)
B9xxxL-ALMS2C (covered)	N/A			245 (55)	601 (135)						

System Combinations

For MP-Series Integrated Linear Stages and	Refer to
Kinetix 300 (480V) drives	page 642
Kinetix 6000 (460V) drives and Kinetix 6200 and Kinetix 6500 (460V) drives	page 657
Ultra3000 (460V) drives	page 707

MP-Series Integrated Linear Stages Motor Brake Specifications

Linear Stage Cat. No. MPAS-	Max Backlash (brake engaged) μm (in.)	Holding Force N (lb)	Coil Current at 24V DC A	Brake Response Time		
				Release ms	Engage (using external arc suppression device)	
					MOV ms	Diode ms
A/Bxxxx1-V05SxA	100 (0.004)	5187 (1166)	0.46...0.56	58	20	42
A/Bxxxx2-V20SxA		1294 (291)				

MP-Series Integrated Linear Stage Standard Stroke Length and Weight Specifications

MP-Series Integrated Linear Stages, Ballscrew (150 mm frame size)

Linear Stage Cat. No. MPAS-	Standard Stroke Lengths mm (in.)	Weight, approx. kg (lb)	Linear Stage Cat. No. MPAS-	Standard Stroke Lengths mm (in.)	Weight, approx. kg (lb)
A/B6xxx2-V20S2A 20 mm/rev (0.8 in./rev) Ballscrew without brake	120 (4.7)	14.5 (32.0)	A/B6xxx1-V05S2A 5 mm/rev (0.2 in./rev) Ballscrew without brake	120 (4.7)	13.9 (30.5)
	180 (7.1)	15.4 (33.9)		180 (7.1)	14.7 (32.4)
	240 (9.5)	16.3 (35.8)		240 (9.5)	15.6 (34.3)
	300 (11.8)	17.1 (37.7)		300 (11.8)	16.4 (36.2)
	360 (14.2)	18.0 (39.6)		360 (14.2)	17.3 (38.1)
	420 (16.5)	18.9 (41.5)		420 (16.5)	18.2 (40.0)
	540 (21.3)	20.6 (45.4)		540 (21.3)	19.9 (43.7)
	660 (26.0)	22.4 (49.2)		660 (26.0)	21.6 (47.5)
A/B6xxx2-V20S4A 20 mm/rev (0.8 in./rev) Ballscrew with brake	120 (4.7)	15.0 (33.0)	A/B6xxx1-V05S4A 5 mm/rev (0.2 in./rev) Ballscrew with brake	120 (4.7)	14.3 (31.5)
	180 (7.1)	15.9 (34.9)		180 (7.1)	15.2 (33.4)
	240 (9.5)	16.7 (36.8)		240 (9.5)	16.0 (35.3)
	300 (11.8)	17.6 (38.7)		300 (11.8)	16.9 (37.2)
	360 (14.2)	18.5 (40.6)		360 (14.2)	17.8 (39.1)
	420 (16.5)	19.3 (42.5)		420 (16.5)	18.6 (40.9)
	540 (21.3)	21.1 (46.4)		540 (21.3)	20.3 (44.7)
	660 (26.0)	22.8 (50.2)		660 (26.0)	22.1 (48.5)

MP-Series Integrated Linear Stages, Direct Drive (150 mm frame size)

Linear Stage Cat. No. MPAS-	Standard Stroke Lengths mm (in.)	Weight, approx. without Cover kg (lb)	Weight, approx. with Cover kg (lb)
A6xxxB-ALMx2C Direct drive without brake	120 (4.7)	18.7 (41.0)	20.3 (44.7)
	180 (7.1)	20.0 (44.0)	21.8 (48.0)
	240 (9.5)	21.4 (47.1)	23.4 (51.4)
	300 (11.8)	22.8 (50.1)	24.9 (54.8)
	360 (14.2)	24.1 (53.1)	26.5 (58.2)
	420 (16.5)	25.5 (56.1)	28.0 (61.6)
	540 (21.3)	28.3 (62.3)	31.1 (68.4)
	660 (26.0)	31.0 (68.3)	34.2 (75.2)
	780 (30.7)	33.8 (74.3)	37.2 (81.9)
	900 (35.4)	36.5 (80.4)	40.3 (88.7)
	1020 (40.2)	39.5 (86.9)	43.6 (95.9)
	1140 (44.9)	42.3 (93.0)	46.7 (102.7)

MP-Series Integrated Linear Stages, Ballscrew (200 mm frame size)

Linear Stage Cat. No. MPAS-	Standard Stroke Lengths mm (in.)	Weight, approx. kg (lb)	Linear Stage Cat. No. MPAS-	Standard Stroke Lengths mm (in.)	Weight, approx. kg (lb)
A/B8xxx2-V20S2A 20 mm/rev (0.8 in./rev) Ballscrew without brake	120 (4.7)	16.5 (36.3)	A/B8xxx1-V05S2A 5 mm/rev (0.2 in./rev) Ballscrew without brake	120 (4.7)	15.9 (34.9)
	180 (7.1)	17.5 (38.4)		180 (7.1)	16.8 (37.0)
	240 (9.5)	18.4 (40.5)		240 (9.5)	17.8 (39.2)
	300 (11.8)	19.4 (42.7)		300 (11.8)	18.8 (41.3)
	360 (14.2)	20.4 (44.8)		360 (14.2)	19.8 (43.5)
	420 (16.5)	21.4 (47.0)		420 (16.5)	20.7 (45.6)
	540 (21.3)	23.3 (51.3)		540 (21.3)	22.7 (49.9)
	660 (26.0)	25.2 (55.5)		660 (26.0)	24.6 (54.2)
	780 (30.7)	27.2 (59.8)		780 (30.7)	26.6 (58.5)
	900 (35.4)	29.1 (64.1)		900 (35.4)	28.5 (62.7)
1020 (40.2)	31.1 (68.4)	1020 (40.2)	30.5 (67.1)		
A/B8xxx2-V20S4A 20 mm/rev (0.8 in./rev) Ballscrew with brake	120 (4.7)	16.9 (37.2)	A/B8xxx1-V05S4A 5 mm/rev (0.2 in./rev) Ballscrew with brake	120 (4.7)	16.3 (35.9)
	180 (7.1)	17.9 (39.4)		180 (7.1)	17.3 (38.0)
	240 (9.5)	18.9 (41.5)		240 (9.5)	18.3 (40.2)
	300 (11.8)	19.9 (43.7)		300 (11.8)	19.2 (42.3)
	360 (14.2)	20.8 (45.8)		360 (14.2)	20.2 (44.5)
	420 (16.5)	21.8 (48.0)		420 (16.5)	21.2 (46.6)
	540 (21.3)	23.8 (52.3)		540 (21.3)	23.1 (50.9)
	660 (26.0)	25.7 (56.5)		660 (26.0)	25.1 (55.2)
	780 (30.7)	27.7 (60.8)		780 (30.7)	27.0 (59.5)
	900 (35.4)	29.6 (65.1)		900 (35.4)	29.0 (63.8)
1020 (40.2)	31.6 (69.4)	1020 (40.2)	30.9 (68.0)		

MP-Series Integrated Linear Stages, Direct Drive (200 mm frame size)

Linear Stage Cat. No. MPAS-	Standard Stroke Lengths mm (in.)	Weight, approx. without Cover kg (lb)	Weight, approx. with Cover kg (lb)	Standard Stroke Lengths mm (in.)	Weight, approx. without Cover kg (lb)	Weight, approx. with Cover kg (lb)
A8xxxE-ALMx2C B8xxxF-ALMx2C Direct drive without brake	140 (5.5)	21.0 (46.1)	22.6 (49.8)	800 (31.5)	31.9 (70.2)	35.5 (78.1)
	200 (7.9)	21.9 (48.2)	23.7 (52.2)	920 (36.2)	34.1 (75.1)	38.1 (83.7)
	260 (10.2)	22.8 (50.2)	24.9 (54.7)	1040 (40.9)	36.2 (79.6)	40.5 (89.1)
	320 (12.6)	24.1 (53.0)	26.3 (57.8)	1280 (50.4)	39.9 (87.8)	44.9 (98.8)
	380 (15.0)	24.7 (54.3)	27.1 (59.5)	1520 (59.8)	44.4 (97.6)	50.1 (110.1)
	440 (17.3)	26.0 (57.1)	28.5 (62.7)	1760 (69.3)	48.1 (105.8)	54.5 (119.9)
	560 (22.0)	27.9 (61.3)	30.8 (67.7)	1940 (76.4)	51.2 (112.7)	58.1 (127.9)
	680 (26.8)	29.7 (65.4)	33.0 (72.5)			

MP-Series Integrated Linear Stages, Ballscrew (250 mm frame size)

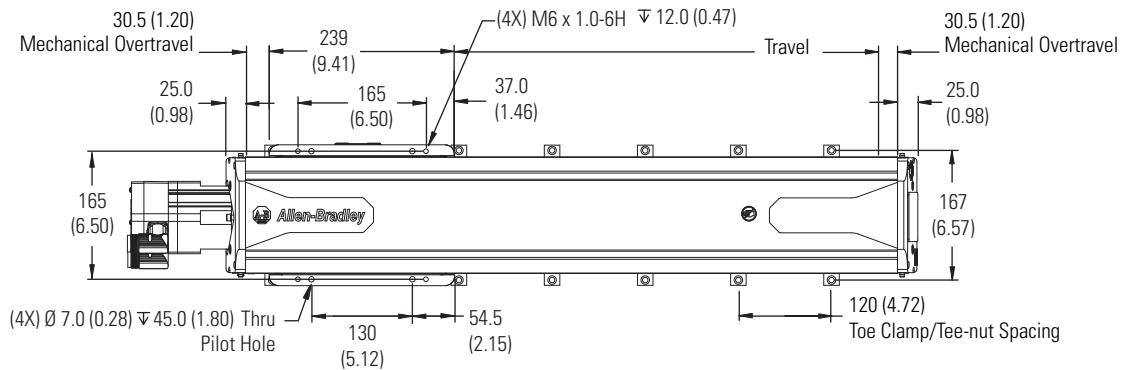
Linear Stage Cat. No. MPAS-	Standard Stroke Lengths mm (in.)	Weight, approx. kg (lb)	Linear Stage Cat. No. MPAS-	Standard Stroke Lengths mm (in.)	Weight, approx. kg (lb)
A/B9xxx2-V20S2A 20 mm/rev (0.8 in./rev) Ballscrew without brake	120 (4.7)	19.8 (43.6)	A/B9xxx1-V05S2A 5 mm/rev (0.2 in./rev) Ballscrew without brake	120 (4.7)	19.2 (42.3)
	180 (7.1)	21.1 (46.4)		180 (7.1)	20.5 (45.0)
	240 (9.5)	22.4 (49.2)		240 (9.5)	21.8 (47.9)
	300 (11.8)	23.6 (52.0)		300 (11.8)	23.0 (50.6)
	360 (14.2)	24.9 (54.8)		360 (14.2)	24.3 (53.4)
	420 (16.5)	26.2 (57.6)		420 (16.5)	25.6 (56.2)
	540 (21.3)	28.7 (63.2)		540 (21.3)	28.1 (61.8)
	660 (26.0)	31.3 (68.8)		660 (26.0)	30.6 (67.4)
	780 (30.7)	33.8 (74.3)		780 (30.7)	33.2 (73.0)
	900 (35.4)	36.3 (79.9)		900 (35.4)	35.7 (78.6)
1020 (40.2)	38.9 (85.5)	1020 (40.2)	38.2 (84.1)		
A/B9xxx2-V20S4A 20 mm/rev (0.8 in./rev) Ballscrew with brake	120 (4.7)	20.3 (44.6)	A/B9xxx1-V05S4A 5 mm/rev (0.2 in./rev) Ballscrew with brake	120 (4.7)	19.7 (43.3)
	180 (7.1)	21.5 (47.4)		180 (7.1)	20.9 (46.0)
	240 (9.5)	22.8 (50.2)		240 (9.5)	22.2 (48.8)
	300 (11.8)	24.1 (53.0)		300 (11.8)	23.5 (51.6)
	360 (14.2)	25.4 (55.8)		360 (14.2)	24.7 (54.4)
	420 (16.5)	26.6 (58.6)		420 (16.5)	26.0 (57.2)
	540 (21.3)	29.2 (64.2)		540 (21.3)	28.5 (62.8)
	660 (26.0)	31.7 (69.7)		660 (26.0)	31.1 (68.4)
	780 (30.7)	34.2 (75.3)		780 (30.7)	33.6 (74.0)
	900 (35.4)	36.8 (80.9)		900 (35.4)	36.2 (79.6)
1020 (40.2)	39.3 (86.5)	1020 (40.2)	38.7 (85.1)		

MP-Series Integrated Linear Stages, Direct Drive (250 mm frame size)

Linear Stage Cat. No. MPAS-	Standard Stroke Lengths mm (in.)	Weight, approx. without Cover kg (lb)	Weight, approx. with Cover kg (lb)	Standard Stroke Lengths mm (in.)	Weight, approx. without Cover kg (lb)	Weight, approx. with Cover kg (lb)
A9xxxK-ALMx2C B9xxxL-ALMx2C Direct drive without brake	140 (5.5)	26.8 (59.0)	29.0 (63.7)	800 (31.5)	42.4 (93.2)	47.0 (103.4)
	200 (7.9)	28.6 (62.8)	30.9 (68.0)	920 (36.2)	45.0 (98.9)	50.1 (110.1)
	260 (10.2)	29.8 (65.6)	32.5 (71.4)	1040 (40.9)	47.8 (105.1)	53.3 (117.3)
	320 (12.6)	31.1 (68.5)	34.0 (74.7)	1280 (50.4)	53.4 (117.4)	59.8 (131.6)
	380 (15.0)	32.4 (71.3)	35.5 (78.0)	1520 (59.8)	59.0 (129.8)	66.4 (146.0)
	440 (17.3)	33.7 (74.2)	37.0 (81.4)	1760 (69.3)	64.6 (142.1)	72.9 (160.3)
	560 (22.0)	36.8 (80.9)	40.5 (89.1)	1940 (76.4)	68.5 (150.6)	77.4 (170.3)
	680 (26.8)	40.0 (87.9)	43.5 (95.8)			

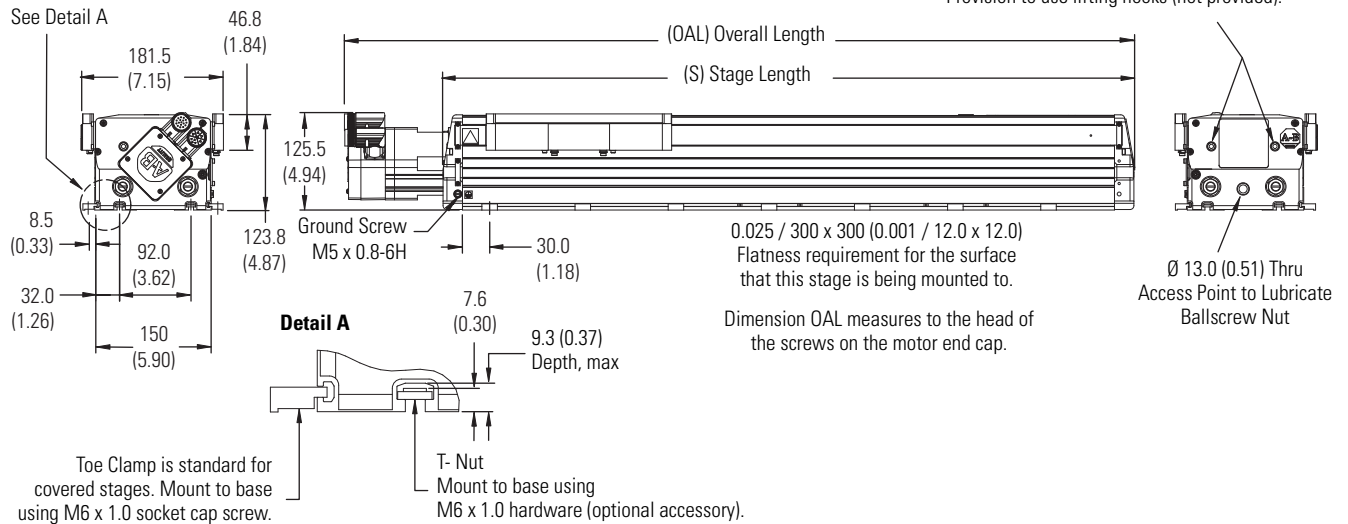
MP-Series Integrated Linear Stage Dimensions

MPAS-A/B6xxx1/2-VxxSxA (ballscrew) Linear Stage



Dimensions are in mm (in.)

(4X) M10 x 1.5-6H Thru (2 per end cap)
Access point for lubricating linear bearings.
Provision to use lifting hooks (not provided).



Linear Stage Cat. No.	S mm (in.)	OAL (5 mm/rev) (1) mm (in.)	OAL (20 mm/rev) (2) mm (in.)
MPAS-A/B6012x-VxxSxA	470 (18.5)	569 (22.4)	594 (23.4)
A/B6018x-VxxSxA	530 (20.9)	629 (24.7)	654 (25.8)
A/B6024x-VxxSxA	590 (23.2)	689 (27.1)	714 (28.1)
A/B6030x-VxxSxA	650 (25.6)	749 (29.5)	774 (30.5)

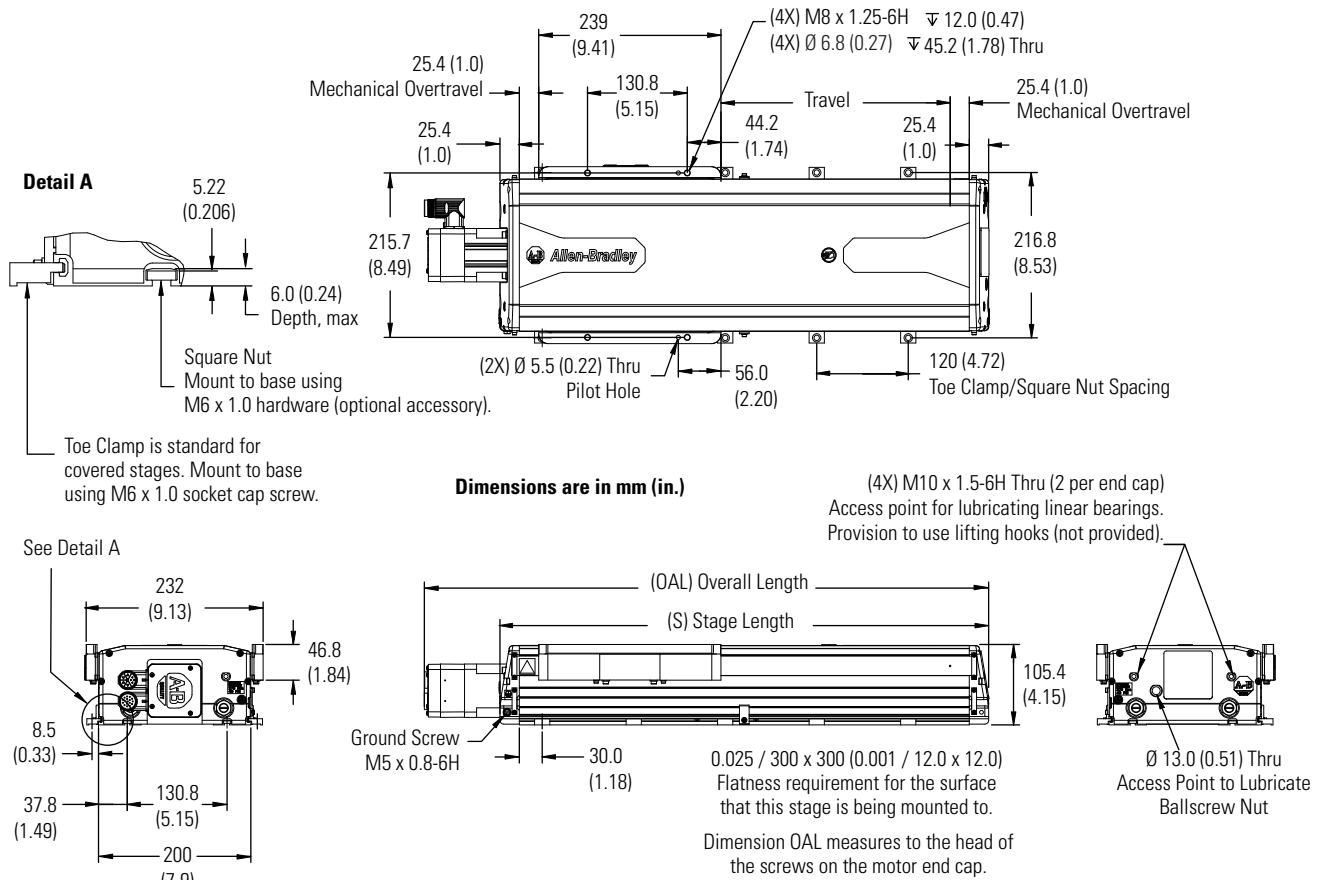
Linear Stage Cat. No.	S mm (in.)	OAL (5 mm/rev) (1) mm (in.)	OAL (20 mm/rev) (2) mm (in.)
MPAS-A/B6036x-VxxSxA	710 (28.0)	809 (31.8)	834 (32.8)
A/B6042x-VxxSxA	770 (30.3)	869 (34.2)	894 (35.2)
A/B6054x-VxxSxA	890 (35.0)	989 (38.9)	1014 (39.9)
A/B6066x-VxxSxA	1010 (39.8)	1109 (43.6)	1134 (44.6)

(1) If ordering an MPAS-A/B6xxx-V05S4A actuator with brake, add 39.0 mm (1.53 in.) to dimension OAL.

(2) If ordering an MPAS-A/B6xxx-V20S4A actuator with brake, add 39.0 mm (1.53 in.) to dimension OAL.

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MPAS-A/B8xxx1/2-VxxSxA (ballscrew) Linear Stage



Actuator Series MPAS-	S mm (in.)	OAL (5 mm/rev) ⁽¹⁾ mm (in.)	OAL (20 mm/rev) ⁽²⁾ mm (in.)
A/B8012x-VxxSxA	461 (18.1)	557 (21.9)	582 (22.9)
A/B8018x-VxxSxA	521 (20.5)	617 (24.3)	642 (25.3)
A/B8024x-VxxSxA	581 (22.9)	677 (26.6)	702 (27.6)
A/B8030x-VxxSxA	641 (25.2)	737 (29.0)	762 (30.0)
A/B8036x-VxxSxA	701 (27.6)	797 (31.4)	822 (32.4)
A/B8042x-VxxSxA	761 (29.9)	857 (33.7)	882 (34.7)

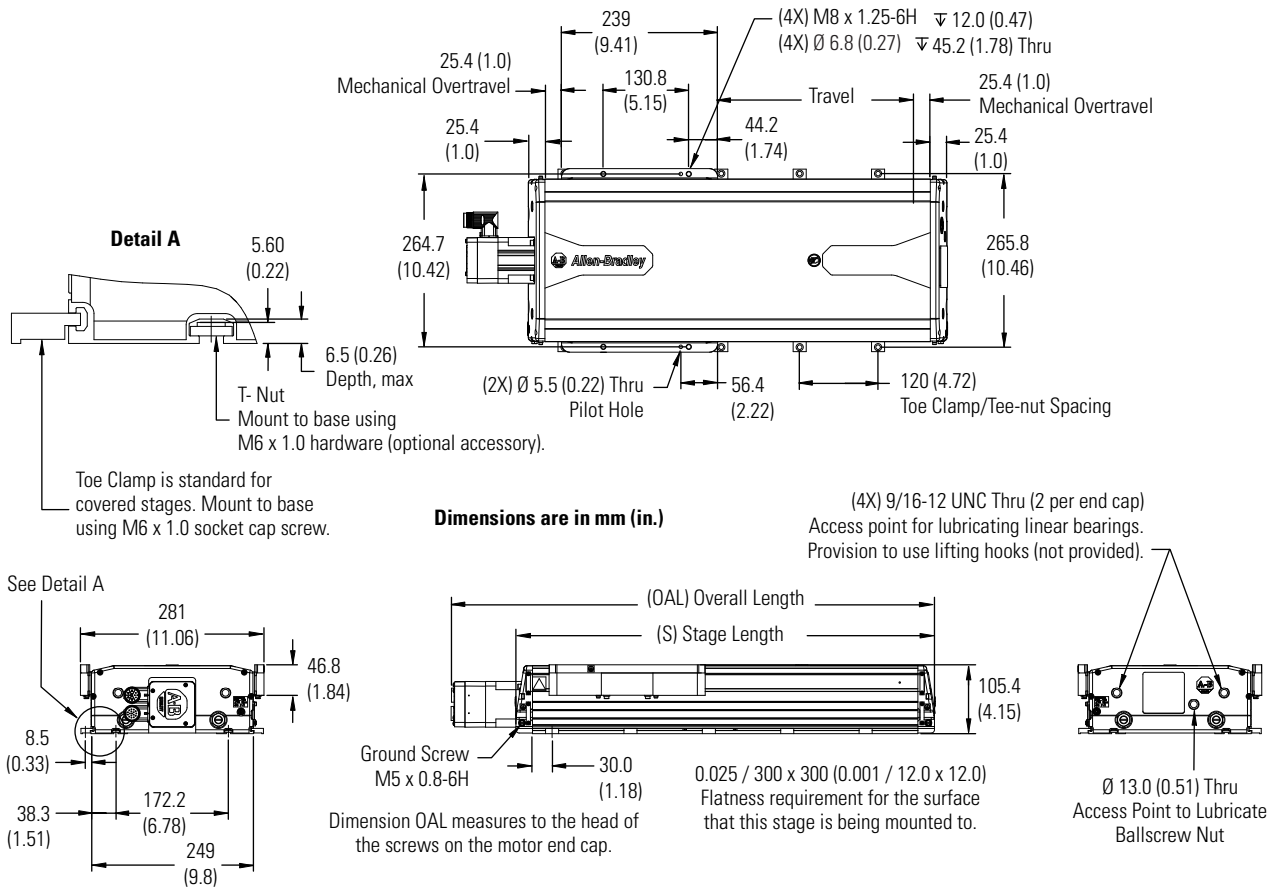
Actuator Series MPAS-	S mm (in.)	OAL (5 mm/rev) ⁽¹⁾ mm (in.)	OAL (20 mm/rev) ⁽²⁾ mm (in.)
A/B8054x-VxxSxA	881 (34.7)	977 (38.5)	1002 (39.5)
A/B8066x-VxxSxA	1001 (39.4)	1097 (43.2)	1122 (44.2)
A/B8078x-VxxSxA	1121 (44.1)	1217 (47.9)	1242 (48.9)
A/B8090x-VxxSxA	1241 (48.8)	1337 (52.6)	1362 (53.6)
A/B8102x-VxxSxA	1361 (53.6)	1457 (57.4)	1482 (58.4)

(1) If ordering an MPAS-A/B8xxx-V05S4A actuator with brake, add 39.0 mm (1.53 in.) to dimension OAL.

(2) If ordering an MPAS-A/B8xxx-V20S4A actuator with brake, add 39.0 mm (1.53 in.) to dimension OAL.

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MPAS-A/B9xxx1/2-VxxSxA (ballscrew) Linear Stage



Linear Stage Cat. No.	S mm (in.)	OAL (5 mm/rev) (1) mm (in.)	OAL (20 mm/rev) (2) mm (in.)
MPAS-			
A/B9012x-VxxSxA	461 (18.1)	557 (21.9)	582 (22.9)
A/B9018x-VxxSxA	521 (20.5)	617 (24.3)	642 (25.3)
A/B9024x-VxxSxA	581 (22.9)	677 (26.6)	702 (27.6)
A/B9030x-VxxSxA	641 (25.2)	737 (29.0)	762 (30.0)
A/B9036x-VxxSxA	701 (27.6)	797 (31.4)	822 (32.4)
A/B9042x-VxxSxA	761 (29.9)	857 (33.7)	882 (34.7)

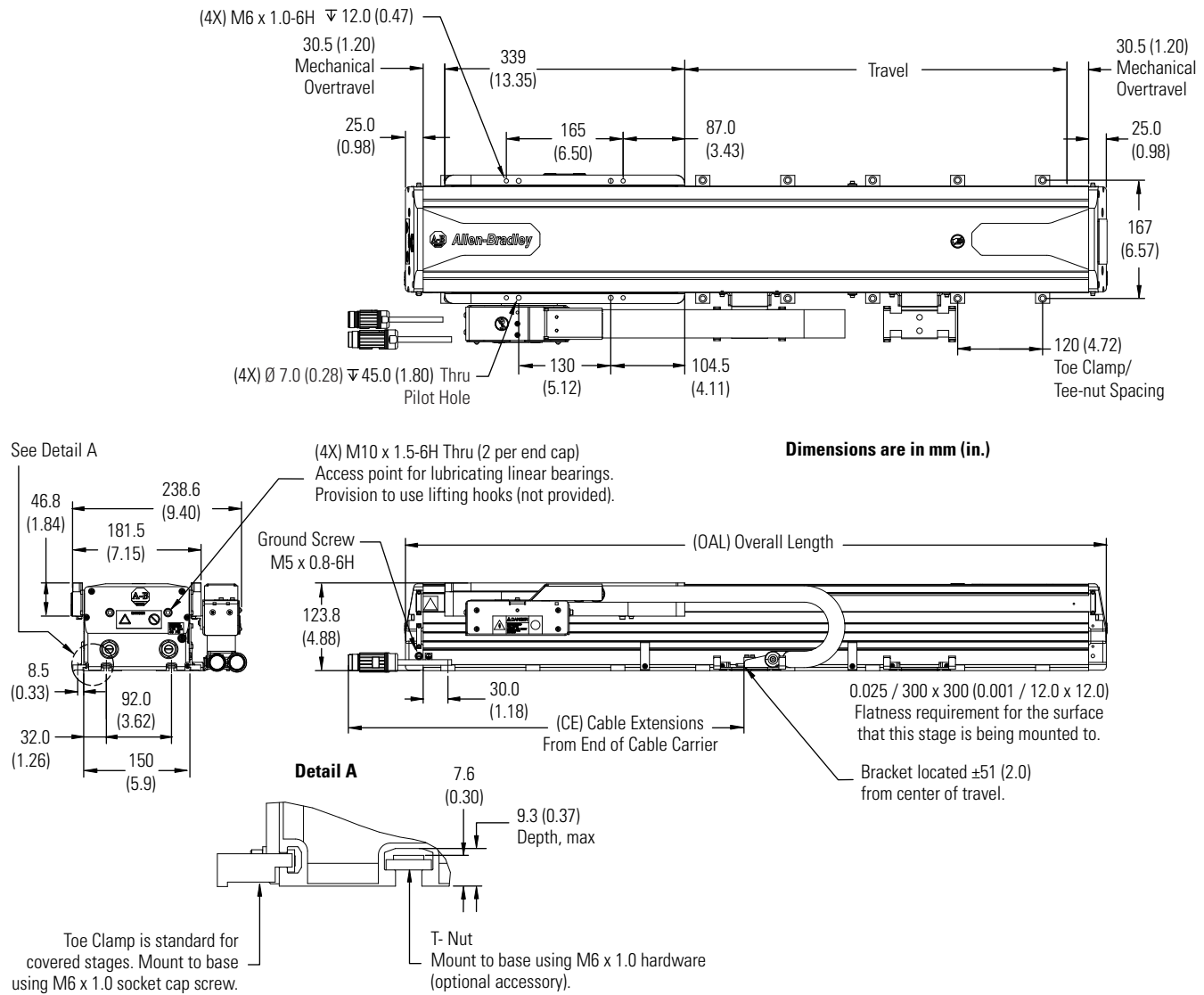
Linear Stage Cat. No.	S mm (in.)	OAL (5 mm/rev) (1) mm (in.)	OAL (20 mm/rev) (2) mm (in.)
MPAS-			
A/B9054x-VxxSxA	881 (34.7)	977 (38.5)	1002 (39.5)
A/B9066x-VxxSxA	1001 (39.4)	1097 (43.2)	1122 (44.2)
A/B9078x-VxxSxA	1121 (44.1)	1217 (47.9)	1242 (48.9)
A/B9090x-VxxSxA	1241 (48.8)	1337 (52.6)	1362 (53.6)
A/B9102x-VxxSxA	1361 (53.6)	1457 (57.4)	1482 (58.4)

(1) If ordering an MPAS-A/B9xxx-V05S4A actuator with brake, add 39.0 mm (1.53 in.) to dimension OAL.

(2) If ordering an MPAS-A/B9xxx-V20S4A actuator with brake, add 39.0 mm (1.53 in.) to dimension OAL.

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MPAS-A6xxxB-ALMx2C (direct drive) Linear Stage

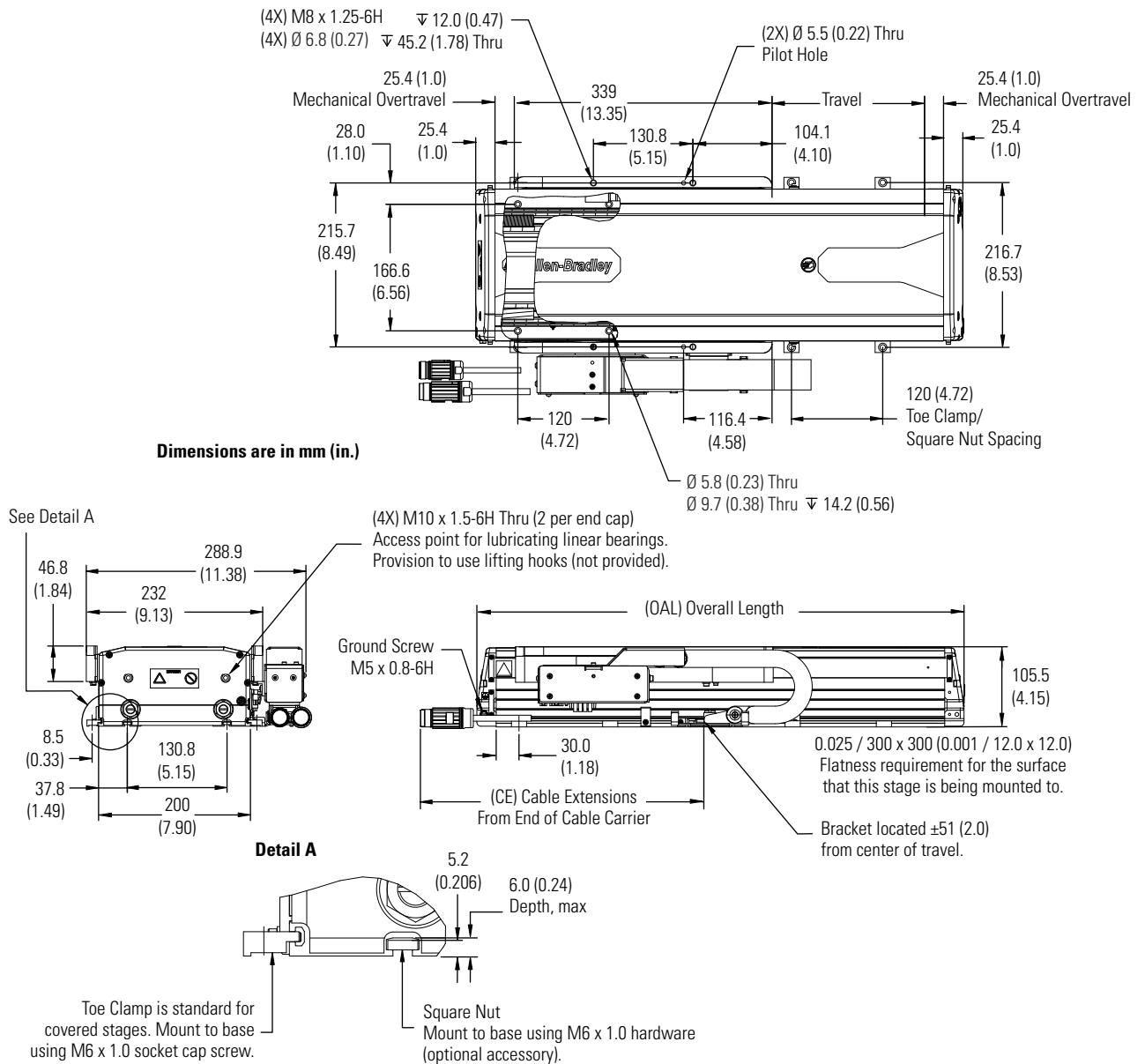


Linear Stage Cat. No.	OAL mm (in.)	CE mm (in.)
MPAS-		
A6012B-ALMx2C	570 (22.4)	1218 (48.0)
A6018B-ALMx2C	630 (24.8)	1193 (47.0)
A6024B-ALMx2C	690 (27.2)	1168 (46.0)
A6030B-ALMx2C	750 (29.5)	1118 (44.0)
A6036B-ALMx2C	810 (31.9)	1093 (43.0)
A6042B-ALMx2C	870 (34.3)	1068 (42.0)

Linear Stage Cat. No.	OAL mm (in.)	CE mm (in.)
MPAS-		
A6054B-ALMx2C	990 (39.0)	1018 (40.0)
A6066B-ALMx2C	1110 (43.7)	943 (37.0)
A6078B-ALMx2C	1230 (48.4)	893 (35.0)
A6090B-ALMx2C	1350 (53.1)	818 (32.0)
A6102B-ALMx2C	1470 (57.9)	1768 (70.0)
A6114B-ALMx2C	1590 (62.6)	1718 (68.0)

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MPAS-A/B8xxxx-ALMx2C (direct drive) Linear Stage



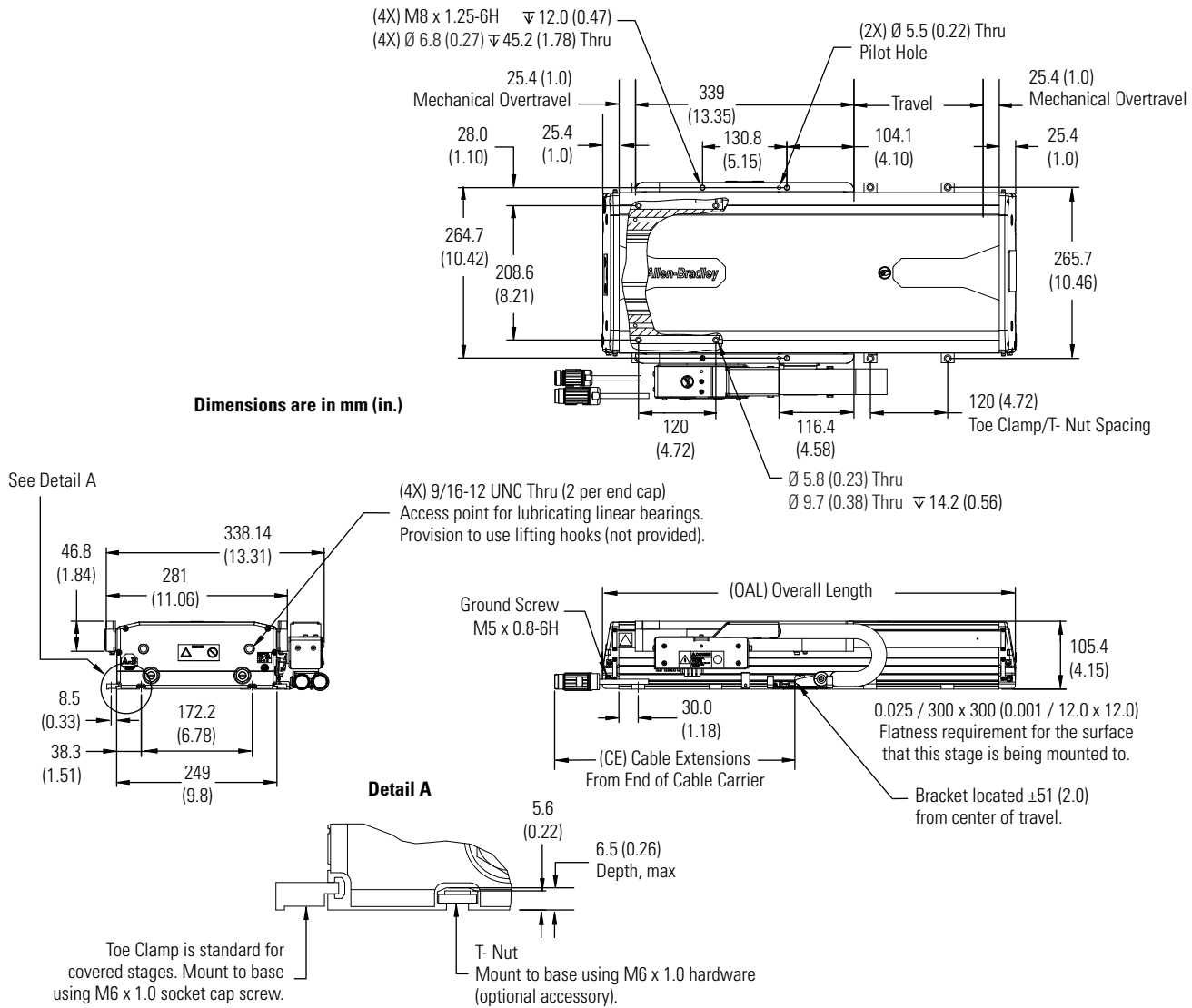
Linear Stage Cat. No.	OAL mm (in.)	CE mm (in.)
MPAS-		
A/B8014x-ALMx2C	581 (22.9)	1243 (49.0)
A/B8020x-ALMx2C	641 (25.2)	1218 (48.0)
A/B8026x-ALMx2C	701 (27.6)	1168 (46.0)
A/B8032x-ALMx2C	761 (30.0)	1143 (45.0)
A/B8038x-ALMx2C	821 (32.3)	1118 (44.0)

Linear Stage Cat. No.	OAL mm (in.)	CE mm (in.)
MPAS-		
A/B8044x-ALMx2C	881 (34.7)	1093 (43.0)
A/B8056x-ALMx2C	1001 (39.4)	1018 (40.0)
A/B8068x-ALMx2C	1121 (44.1)	968 (38.0)
A/B8080x-ALMx2C	1241 (48.9)	918 (36.0)
A/B8092x-ALMx2C	1361 (53.6)	843 (33.0)

Linear Stage Cat. No.	OAL mm (in.)	CE mm (in.)
MPAS-		
A/B8104x-ALMx2C	1481 (58.3)	1793 (71.0)
A/B8128x-ALMx2C	1721 (67.8)	1668 (66.0)
A/B8152x-ALMx2C	1961 (77.2)	1543 (61.0)
A/B8176x-ALMx2C	2201 (86.7)	1418 (56.0)
A/B8194x-ALMx2C	2381 (93.7)	1343 (53.0)

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MPAS-A/B9xxxx-ALMx2C (direct drive) Linear Stage



Linear Stage Cat. No.	OAL mm (in.)	CE mm (in.)
MPAS-		
A/B9014x-ALMx2C	581 (22.9)	1240 (49.0)
A/B9020x-ALMx2C	641 (25.2)	1220 (48.0)
A/B9026x-ALMx2C	701 (27.6)	1170 (46.0)
A/B9032x-ALMx2C	761 (30.0)	1140 (45.0)
A/B9038x-ALMx2C	821 (32.3)	1120 (44.0)

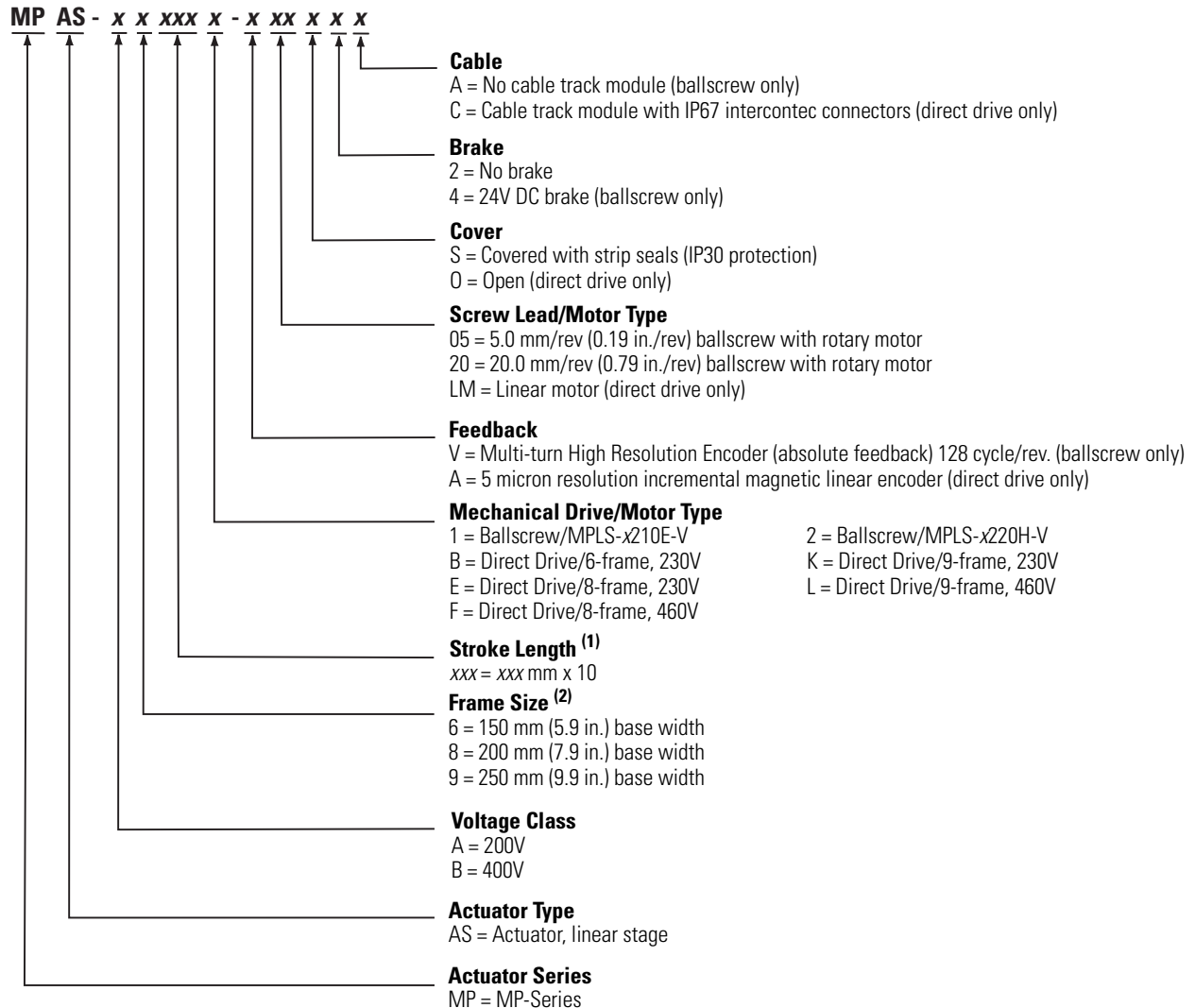
Linear Stage Cat. No.	OAL mm (in.)	CE mm (in.)
MPAS-		
A/B9044x-ALMx2C	881 (34.7)	1090 (43.0)
A/B9056x-ALMx2C	1001 (39.4)	1020 (40.0)
A/B9068x-ALMx2C	1121 (44.1)	960 (38.0)
A/B9080x-ALMx2C	1241 (48.9)	910 (36.0)
A/B9092x-ALMx2C	1361 (53.6)	840 (33.0)

Linear Stage Cat. No.	OAL mm (in.)	CE mm (in.)
MPAS-		
A/B9104x-ALMx2C	1481 (58.3)	1800 (71.0)
A/B9128x-ALMx2C	1721 (67.8)	1670 (66.0)
A/B9152x-ALMx2C	1961 (77.2)	1550 (61.0)
A/B9176x-ALMx2C	2201 (86.7)	1420 (56.0)
A/B9194x-ALMx2C	2381 (93.7)	1350 (53.0)

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MP-Series Integrated Linear Stage Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your actuator. For questions regarding product availability, contact your Allen-Bradley distributor.



(1) For 6-frame direct-drive linear stages, variable xxx (mm stroke x 10) is 012, 018, 024, 030, 036, 042, 054, 066, 078, 090, 102, or 114.
For 8 and 9-frame direct-drive linear stages, variable xxx (mm stroke x 10) is 014, 020, 026, 032, 038, 044, 056, 068, 080, 092, 104, 128, 152, 176, or 194.
For 6-frame ballscrew linear stages, variable xxx (mm stroke x 10) is 012, 018, 024, 030, 036, 042, 054, or 066.
For 8 and 9-frame ballscrew linear stages, variable xxx (mm stroke x 10) is 012, 018, 024, 030, 036, 042, 054, 066, 078, 090, or 102.

(2) The 150 mm (6-frame) linear stages are available in ballscrew (230/460V) and direct drive (230V only).
The 200 mm (8-frame) linear stages are available in ballscrew and direct drive (230/460V).
The 250 mm (9-frame) linear stages are available in ballscrew and direct drive (230/460V).

MP-Series Integrated Multi-axis Linear Stages



Cartesian X/Y Configuration



Center Stacked X/Y Configuration



Center Stacked X/Z Configuration

MP-Series integrated multi-axis linear stages extend the Allen-Bradley actuator portfolio into pre-defined and pre-assembled multi-axis configurations to suit a variety of manufacturing needs. These configurations come pre-assembled with known orthogonality and cable management, and are selectable in Motion Analyzer sizing software, version 4.7 or later.

The Cartesian X/Y configuration is typically used when you need to perform an operation on a workpiece from above such as picking and placing, dispensing, or scanning. This configuration is available with both direct-drive linear motors and ballscrew-actuated stages.

The Center Stacked X/Y is a configuration that is often used to position your workpiece under a stationary object such as a camera or dispenser head. This configuration is available with both direct-drive linear motors and ballscrew-actuated stages.

The Center Stacked X/Z configuration is often used in applications where you need to pick an object from one line and place it on a perpendicular line. This configuration is available with both direct-drive linear motors and ballscrew actuated X-axis stages, and ballscrew actuated Z-axis stages.

For drive compatibility, refer to Servo Drives on [page 14](#).

MP-Series Integrated Multi-axis Linear Stage Features

- Your choice of direct-drive linear motor or ballscrew actuation. Direct-drive linear motor actuation provides greater repeatability, increased reliability, and higher dynamics. Ballscrew actuation provides greater linear thrust capabilities.
- Ease of selection in Motion Analyzer software, version 4.7 or later, that reduces the time and cost associated with selecting a multi-axis linear stage solution.
- Ease of machine design with the availability of CAD and Solid Models that reduce the time needed to generate machine drawings.
- Ease of configuration with the integration of RSLogix 5000 software that reduces set-up time.
- Factory-supplied cable management that is field replaceable for ease of maintenance.
- Orthogonality of 30 arc seconds.

MP-Series Integrated Multi-axis Linear Stage Accessory Kits

- Cable track module replacement kits
- Strip seal replacement kits
- Top cover kits (for Y or Z-axis only)
- Side cover kits
- Coupling kits (for Y or Z-axis only)
- Tee-nut kit (package of 10)
- Tee-nut bar kit
- Grease gun kit
- Grease replacement cartridge
- Rotary servo motor (for Y or Z-axis only)

Accessory Kits Common to All Multi-axis Linear Stages

Linear Stage Cat. No.	Description	Accessory Cat. No.
MPAS-A/Bxxxx	Kit, grease gun for all integrated linear stages.	MPAS-GPUMP
	Grease gun refill cartridge for all integrated linear stages.	MPAS-CART
MPAS-A6xxx, MPAS-B6xxx	Kit, Tee-nuts (10 per package).	MPAS-6-TNUT
MPAS-A8xxx, MPAS-B8xxx		MPAS-8-TNUT
MPAS-A9xxx, MPAS-B9xxx		MPAS-9-TNUT

Accessory Kits for Multi-axis Direct-drive Linear Stages

Refer to Accessory Kits for Single-axis Direct-drive Linear Stages on [page 94](#) for accessory kit descriptions and catalog numbers.

Accessory Kits for Multi-axis Ballscrew Linear Stages

Refer to Accessory Kits for Single-axis Ballscrew Linear Stages on [page 95](#) for accessory kit descriptions and catalog numbers.

Accessory Kits for Center Stacked X/Y Cable Modules

Multi-axis Linear Stage Cat. No.	Description	Accessory Cat. No.
MPMA-xABC0C0A0-xxx	Cable track module for MPMA-xAB series X/Y Center Stacked Stages	MPMA-xABC0C0A0-CBL
MPMA-xABC6C6A0-xxx		MPMA-xABC6C6A0-CBL
MPMA-xABD2D2A0-xxx		MPMA-xABD2D2A0-CBL
MPMA-xABD8D8A0-xxx		MPMA-xABD8D8A0-CBL
MPMA-xABE4E4A0-xxx		MPMA-xABE4E4A0-CBL
MPMA-xABF6F6A0-xxx		MPMA-xABF6F6A0-CBL
MPMA-xACB4B4A0-xxx	Cable track module for MPMA-xAC series X/Y Center Stacked Stages	MPMA-xACB4B4A0-CBL
MPMA-xACC0C0A0-xxx		MPMA-xACC0C0A0-CBL
MPMA-xACC6C6A0-xxx		MPMA-xACC6C6A0-CBL
MPMA-xACD2D2A0-xxx		MPMA-xACD2D2A0-CBL
MPMA-xAPB8B8A0-xxx	Cable track module for MPMA-xAP series X/Y Center Stacked Stages	MPMA-xAPB8B8A0-CBL
MPMA-xAPC4C4A0-xxx		MPMA-xAPC4C4A0-CBL
MPMA-xAPD0D0A0-xxx		MPMA-xAPD0D0A0-CBL
MPMA-xAPE2E2A0-xxx		MPMA-xAPE2E2A0-CBL
MPMA-xAPG6G6A0-xxx		MPMA-xAPG6G6A0-CBL

Accessory Kits for Cartesian Stacked X/Y Cable Modules

Multi-axis Linear Stage Cat. No.	Description	Accessory Cat. No.
MPMA-xCBD2D2A0-xxx	Cable track module for MPMA-xCB series X/Y Cartesian Stacked Stages	MPMA-xCBD2D2A0-CBL
MPMA-xCBE4D2A0-xxx		MPMA-xCBE4D2A0-CBL
MPMA-xCBE4E4A0-xxx		MPMA-xCBE4E4A0-CBL
MPMA-xCBF6E4A0-xxx		MPMA-xCBF6E4A0-CBL
MPMA-xCBG8E4A0-xxx		MPMA-xCBG8E4A0-CBL
MPMA-xCBG8F6A0-xxx		MPMA-xCBG8F6A0-CBL
MPMA-xCBI0F6A0-xxx		MPMA-xCBI0F6A0-CBL
MPMA-xCBJ2F6A0-xxx		MPMA-xCBJ2F6A0-CBL
MPMA-xCQD0D0A0-xxx	Cable track module for MPMA-xCQ series X/Y Cartesian Stacked Stages	MPMA-xCQD0D0A0-CBL
MPMA-xCQE2D0A0-xxx		MPMA-xCQE2D0A0-CBL
MPMA-xCQE2E2A0-xxx		MPMA-xCQE2E2A0-CBL
MPMA-xCQG6E2A0-xxx		MPMA-xCQG6E2A0-CBL
MPMA-xCQG6G6A0-xxx		MPMA-xCQG6G6A0-CBL
MPMA-xCQH8G6A0-xxx		MPMA-xCQH8G6A0-CBL
MPMA-xCQJ0G6A0-xxx		MPMA-xCQJ0G6A0-CBL

Accessory Kits for Center Stacked X/Z Cable Modules

Multi-axis Linear Stage Cat. No.	Description	Accessory Cat. No.
MPMA-xBDD2A0B8-xxx	Cable track module for MPMA-xBD series X/Z Center Stacked Stages	MPMA-xBDD2A0B8-CBL
MPMA-xBDD2A0D0-xxx		MPMA-xBDD2A0D0-CBL
MPMA-xBDE4A0B8-xxx		MPMA-xBDE4A0B8-CBL
MPMA-xBDE4A0D0-xxx		MPMA-xBDE4A0D0-CBL
MPMA-xBDE4A0E2-xxx		MPMA-xBDE4A0E2-CBL
MPMA-xBDG8A0B8-xxx		MPMA-xBDG8A0B8-CBL
MPMA-xBDG8A0D0-xxx		MPMA-xBDG8A0D0-CBL
MPMA-xBDG8A0E2-xxx		MPMA-xBDG8A0E2-CBL
MPMA-xBDI0A0B8-xxx		MPMA-xBDI0A0B8-CBL
MPMA-xBDI0A0D0-xxx		MPMA-xBDI0A0D0-CBL
MPMA-xBDI0A0E2-xxx		MPMA-xBDI0A0E2-CBL
MPMA-xBDJ2A0D0-xxx		MPMA-xBDJ2A0D0-CBL
MPMA-xBDJ2A0E2-xxx		MPMA-xBDJ2A0E2-CBL
MPMA-xBDJ2A0F4-xxx		MPMA-xBDJ2A0F4-CBL
MPMA-xBED2A0B8-xxx	Cable track module for MPMA-xBE series X/Z Center Stacked Stages	MPMA-xBED2A0B8-CBL
MPMA-xBED2A0D0-xxx		MPMA-xBED2A0D0-CBL
MPMA-xBEE4A0B8-xxx		MPMA-xBEE4A0B8-CBL
MPMA-xBEE4A0D0-xxx		MPMA-xBEE4A0D0-CBL
MPMA-xBEG8A0B8-xxx		MPMA-xBEG8A0B8-CBL
MPMA-xBEG8A0D0-xxx		MPMA-xBEG8A0D0-CBL
MPMA-xBID0A0B8-xxx	Cable track module for MPMA-xBI series X/Z Center Stacked Stages	MPMA-xBID0A0B8-CBL
MPMA-xBID0A0D0-xxx		MPMA-xBID0A0D0-CBL
MPMA-xBIE2A0B8-xxx		MPMA-xBIE2A0B8-CBL
MPMA-xBIE2A0D0-xxx		MPMA-xBIE2A0D0-CBL
MPMA-xBIG6A0B8-xxx		MPMA-xBIG6A0B8-CBL
MPMP-xBIG6A0D0-xxx		MPMP-xBIG6A0D0-CBL

Mounting Bar Accessory Kits for Multi-axis X-axis Linear Stages

Multi-axis Linear Stage Cat. No.	Description	Accessory Cat. No.
MPMA-xxxB4xxx-xxx	Mounting Bar for X-axis having B4 travel	MPAS-TBAR-B4
MPMA-xxxB8xxx-xxx	Mounting Bar for X-axis having B8 travel	MPAS-TBAR-B8
MPMA-xxxC0xxx-xxx	Mounting Bar for X-axis having C0 travel	MPAS-TBAR-C0
MPMA-xxxC4xxx-xxx	Mounting Bar for X-axis having C4 travel	MPAS-TBAR-C4
MPMA-xxxC6xxx-xxx	Mounting Bar for X-axis having C6 travel	MPAS-TBAR-C6
MPMA-xxxD0xxx-xxx	Mounting Bar for X-axis having D0 travel	MPAS-TBAR-D0
MPMA-xxxD2xxx-xxx	Mounting Bar for X-axis having D2 travel	MPAS-TBAR-D2
MPMA-xxxD8xxx-xxx	Mounting Bar for X-axis having D8 travel	MPAS-TBAR-D8
MPMA-xxxE2xxx-xxx	Mounting Bar for X-axis having E2 travel	MPAS-TBAR-E2
MPMA-xxxE4xxx-xxx	Mounting Bar for X-axis having E4 travel	MPAS-TBAR-E4
MPMA-xxxF6xxx-xxx	Mounting Bar for X-axis having F6 travel	MPAS-TBAR-F6
MPMA-xxxG6xxx-xxx	Mounting Bar for X-axis having G6 travel	MPAS-TBAR-G6
MPMA-xxxG8xxx-xxx	Mounting Bar for X-axis having G8 travel	MPAS-TBAR-G8
MPMA-xxxH8xxx-xxx	Mounting Bar for X-axis having H8 travel	MPAS-TBAR-H8
MPMA-xxxI0xxx-xxx	Mounting Bar for X-axis having I0 travel	MPAS-TBAR-I0
MPMA-xxxJ0xxx-xxx	Mounting Bar for X-axis having J0 travel	MPAS-TBAR-J0
MPMA-xxxJ2xxx-xxx	Mounting Bar for X-axis having J2 travel	MPAS-TBAR-J2

MP-Series Integrated Multi-axis Linear Stage Life Specifications

Attribute	Value
Strip seal	10,000,000 cycles or 10,000 km min life in clean, dry, noncontaminating environment.
Cable track module	10,000,000 cycles minimum life.
Mechanical stop bumper	56.49 Nm (500 lb-in) potential energy.

MP-Series Integrated Multi-axis Linear Stages Motor Brake Specifications

Multi-axis Linear Stage Cat. No.	Max Backlash (brake engaged) μm (in.)	Holding Force N (lb)	Coil Current at 24V DC A	Brake Response Time		
				Release ms	Engage (using external arc suppression device)	
					MOV ms	Diode ms
MPAS-A/Bxxx2-V20SxA	100 (0.004)	1294 (291)	0.46...0.56	58	20	42

MP-Series Integrated Multi-axis Linear Stage System Combinations

The Bulletin MPMA multi-axis stages are based on the individual Bulletin MPAS stages, so the Bulletin MPAS force-velocity system performance specifications also apply to the Bulletin MPMA stages. For the Bulletin MPAS linear stage performance specifications with compatible servo drives, refer to Linear Motion System Combinations, beginning on [page 639](#).

Bulletin MPMA multi-axis stages are comprised of custom Bulletin MPAS stages. This is due to the different cable management requirements for stacked-stage assemblies. Additionally, the Bulletin MPAS individual stage identifier embedded in the Bulletin MPMA catalog number does not correspond directly to the Bulletin MPAS catalog number used in the system combinations.

Bulletin MPAS Stage Identifier

MP MA - x x x x x x x x x x - x x x

For the full Bulletin MPMA catalog number explanation, refer to MP-Series Integrated Multi-axis Linear Stage Catalog Numbers on [page 133](#).

		Bulletin MPAS Linear Stage		
		X-axis (base)	Y-axis (secondary)	Z-axis (secondary)
Direct-drive Example	→	B = MPAS-x9xxxK/L-ALMS2x	B = MPAS-x8xxxE/F-ALMS2x	B = None
		C = MPAS-x9xxxK/L-ALMS2x	C = MPAS-x9xxxK/L-ALMS2x	C = None
		D = MPAS-x9xxxK/L-ALMS2x	D = None	D = MPAS-x6xxx2-V20S4x
		E = MPAS-x8xxxE/F-ALMS2x	E = None	E = MPAS-x6xxx2-V20S4x
		I = MPAS-x8xxx2-V20S2x	I = None	I = MPAS-x6xxx2-V20S4x
Ballscrew Example	→	P = MPAS-x8xxx2-V20S2x	P = MPAS-x8xxx2-V20S2x	P = None
		Q = MPAS-x9xxx2-V20S2x	Q = MPAS-x8xxx2-V20S2x	Q = None

MPAS-xxxxxx-ALM Direct-drive Linear Stage

Follow this example to determine the Bulletin MPAS stages for MPMA-AABC0C0A0-S1C multi-axis stages:

- Replace the Voltage Rating designator (x) with A (230V) or B (460V).
- Replace the Mechanical Drive/Motor Type designator.
 - Replace (K/L) with K if 230V or L if 460V
 - Replace (E/F) with E if 230V or F if 460V
- Replace the Cable designator (x), with the direct-drive standard C option.
- In this example: X-axis = MPAS-x9xxxK/L-ALMS2 and Y-axis = MPAS-x8xxxE/F-ALMS2.
 - X-axis stage = MPAS-A9xxxK-ALMS2C
 - Y-axis stage = MPAS-A8xxxE-ALMS2C

MPAS-xxxxxx-Vxx Ballscrew Linear Stage

Follow this example to determine the Bulletin MPAS stages for MPMA-BAPB8B8A0-S1C multi-axis stages:

- Replace the Voltage Rating designator (x) with A (230V) or B (460V).
- Holding brake (4) or no brake (2) option does not affect system performance.
- In this example: X-axis = MPAS-x8xxx2-V20S2x and Y-axis = MPAS-x8xxx2-V20S2x.
 - X-axis stage = MPAS-B8xxx2-V20SxA
 - Y-axis stage = MPAS-B8xxx2-V20SxA

MPMA-xABxxxxx-xxx Product Specifications and Dimensions

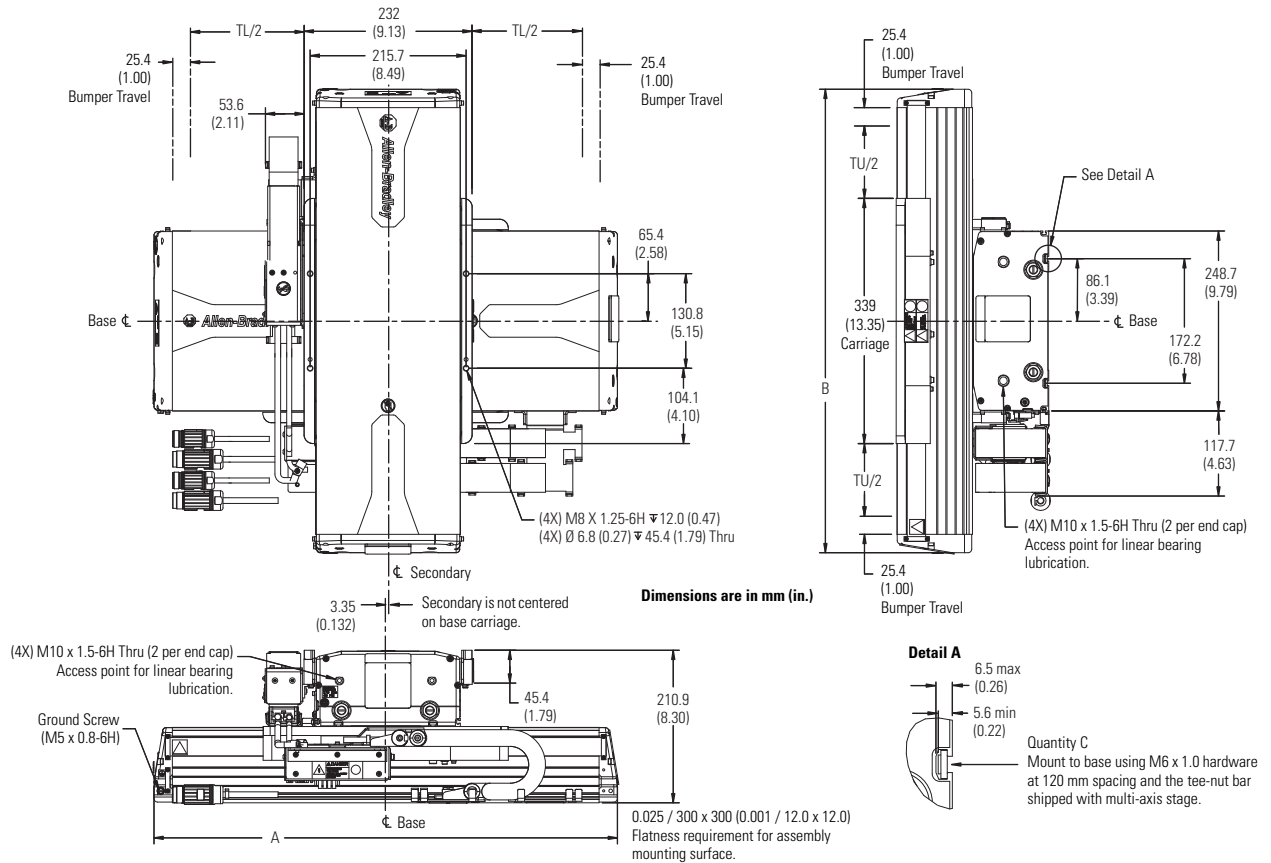
These specifications apply to Center Stacked X/Y stages with 250 mm frame linear motor driven X-axis and 200 mm frame linear motor driven Y-axis. Maximum payload is 15 kg (33.1 lb). For heavier loads, contact your Rockwell Automation sales representative.



MPMA-xABxxxxx-xxx Product Specifications

Multi-axis Linear Stage Cat. No.	Travel mm (in.)			Encoder Type			Bi-directional Repeatability (μm)			Weight, approx. kg (lb)
	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	
MPMA-xABC0C0A0-S1C	200 (7.9)			5 micron resolution incremental magnetic linear encoder (direct drive only)	N/A	N/A	15	15	N/A	56.4 (124.1)
MPMA-xABC6C6A0-S1C	260 (10.2)									59.2 (130.2)
MPMA-xABD2D2A0-S1C	320 (12.6)									62.1 (136.6)
MPMA-xABD8D8A0-S1C	380 (15.0)									64.4 (141.7)
MPMA-xABE4E4A0-S1C	440 (17.3)									67.3 (148.1)
MPMA-xABF6F6A0-S1C	560 (22.0)									73.1 (160.8)

MPMA-xABxxxxx-xxx Product Dimensions



MPMA-xABxxxxx-xxx Dimensions

Multi-axis Linear Stage Cat. No.	A Stage Length (X-axis)	TL Travel (X-axis)	B Stage Length (Y-axis)	TU Travel (Y-axis)	C Mounting Locations (X-axis)
	mm (in.)	mm (in.)	mm (in.)	mm (in.)	Qty
MPMA-AABC0C0A0-S1C	641 (25.2)	200 (7.9)	641 (25.2)	200 (7.9)	10
MPMA-AABC6C6A0-S1C	701 (27.6)	260 (10.2)	701 (27.6)	260 (10.2)	12
MPMA-AABD2D2A0-S1C	761 (30.0)	320 (12.6)	761 (30.0)	320 (12.6)	14
MPMA-AABD8D8A0-S1C	821 (32.3)	380 (15.0)	821 (32.3)	380 (15.0)	
MPMA-AABE4E4A0-S1C	881 (34.7)	440 (17.3)	881 (34.7)	440 (17.3)	16
MPMA-AABF6F6A0-S1C	1001 (39.4)	560 (22.0)	1001 (39.4)	560 (22.0)	
MPMA-BABC0C0A0-S1C	641 (25.2)	200 (7.9)	641 (25.2)	200 (7.9)	
MPMA-BABC6C6A0-S1C	701 (27.6)	260 (10.2)	701 (27.6)	260 (10.2)	12
MPMA-BABD2D2A0-S1C	761 (30.0)	320 (12.6)	761 (30.0)	320 (12.6)	14
MPMA-BABD8D8A0-S1C	821 (32.3)	380 (15.0)	821 (32.3)	380 (15.0)	
MPMA-BABE4E4A0-S1C	881 (34.7)	440 (17.3)	881 (34.7)	440 (17.3)	16
MPMA-BABF6F6A0-S1C	1001 (39.4)	560 (22.0)	1001 (39.4)	560 (22.0)	

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MPMA-xACxxxxxx-xxx Product Specifications and Dimensions

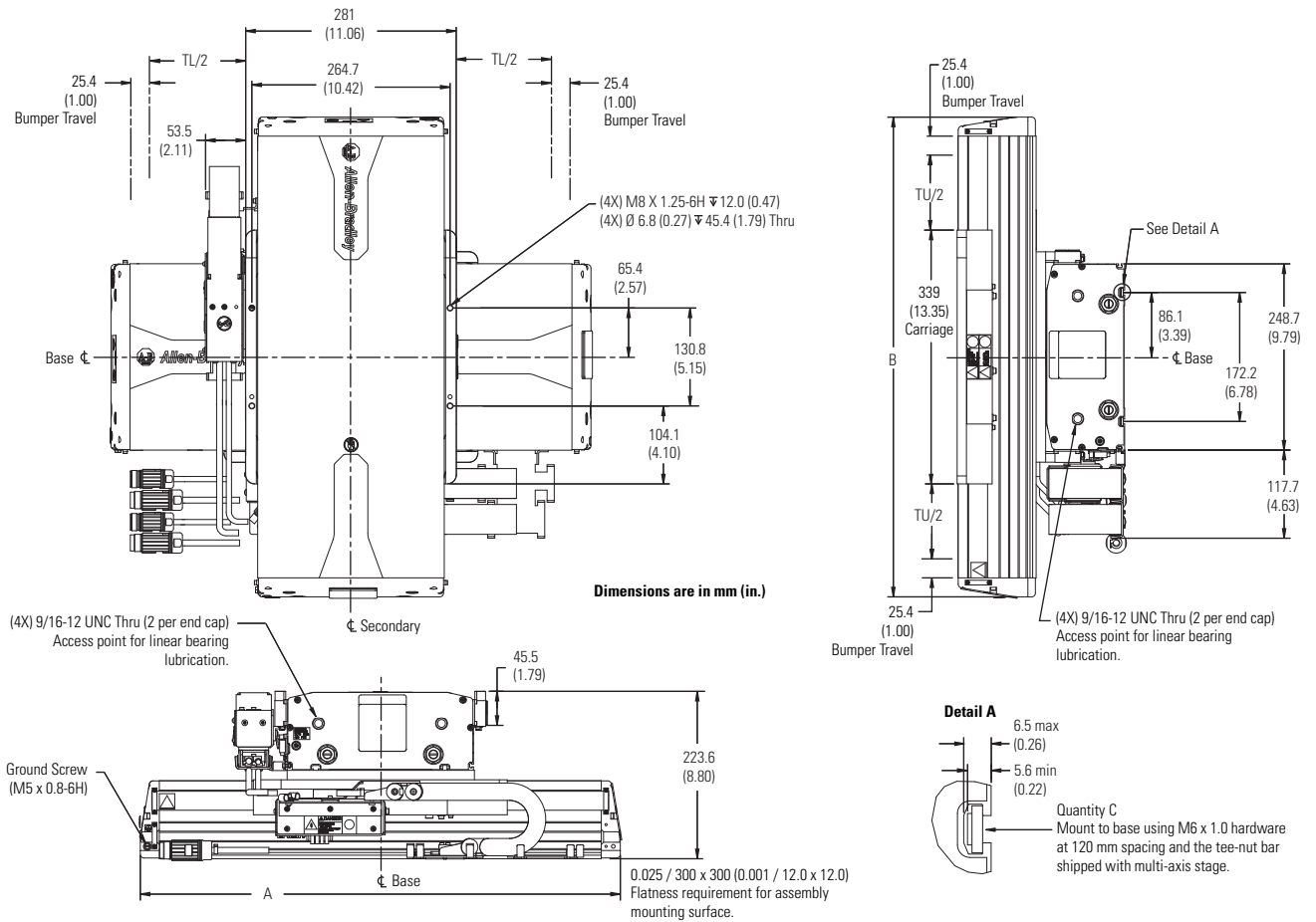
These specifications apply to Center Stacked X/Y stages with 250 mm frame linear motor driven X-axis and 250 mm frame linear motor driven Y-axis. Maximum payload is 20 kg (44.0 lb). For heavier loads, contact your Rockwell Automation sales representative.



MPMA-xACxxxxxx-xxx Product Specifications

Multi-axis Linear Stage Cat. No.	Travel mm (in.)			Encoder Type			Bi-directional Repeatability (μm)			Weight, approx. kg (lb)
	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	
MPMA-xACB4B4A0-S1C	140 (5.5)		N/A	5 micron resolution incremental magnetic linear encoder (direct drive only)	N/A	15	15	N/A	62.2 (136.8)	
MPMA-xACC0C0A0-S1C	200 (7.9)								66.0 (145.2)	
MPMA-xACC6C6A0-S1C	260 (10.2)								69.2 (152.2)	
MPMA-xACD2D2A0-S1C	320 (12.6)								72.2 (158.8)	

MPMA-xACxxxxxx-xxx Product Dimensions



MPMA-xACxxxxxx-xxx Dimensions

Multi-axis Linear Stage Cat. No.	A Stage Length (X-axis)	TL Travel (X-axis)	B Stage Length (Y-axis)	TU Travel (Y-axis)	C Mounting Locations (X-axis)
	mm (in.)	mm (in.)	mm (in.)	mm (in.)	Qty
MPMA-AACB4B4A0-S1C	581 (22.9)	140 (5.5)	581 (22.9)	140 (5.5)	10
MPMA-AACC0C0A0-S1C	641 (25.2)	200 (7.9)	641 (25.2)	200 (7.9)	
MPMA-AACC6C6A0-S1C	701 (27.6)	260 (10.2)	701 (27.6)	260 (10.2)	12
MPMA-AACD2D2A0-S1C	761 (30.0)	320 (12.6)	761 (30.0)	320 (12.6)	
MPMA-BACB4B4A0-S1C	581 (22.9)	140 (5.5)	581 (22.9)	140 (5.5)	10
MPMA-BACC0C0A0-S1C	641 (25.2)	200 (7.9)	641 (25.2)	200 (7.9)	
MPMA-BACC6C6A0-S1C	701 (27.6)	260 (10.2)	701 (27.6)	260 (10.2)	12
MPMA-BACD2D2A0-S1C	761 (30.0)	320 (12.6)	761 (30.0)	320 (12.6)	

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MPMA-xAPxxxxxx-xxx Product Specifications and Dimensions

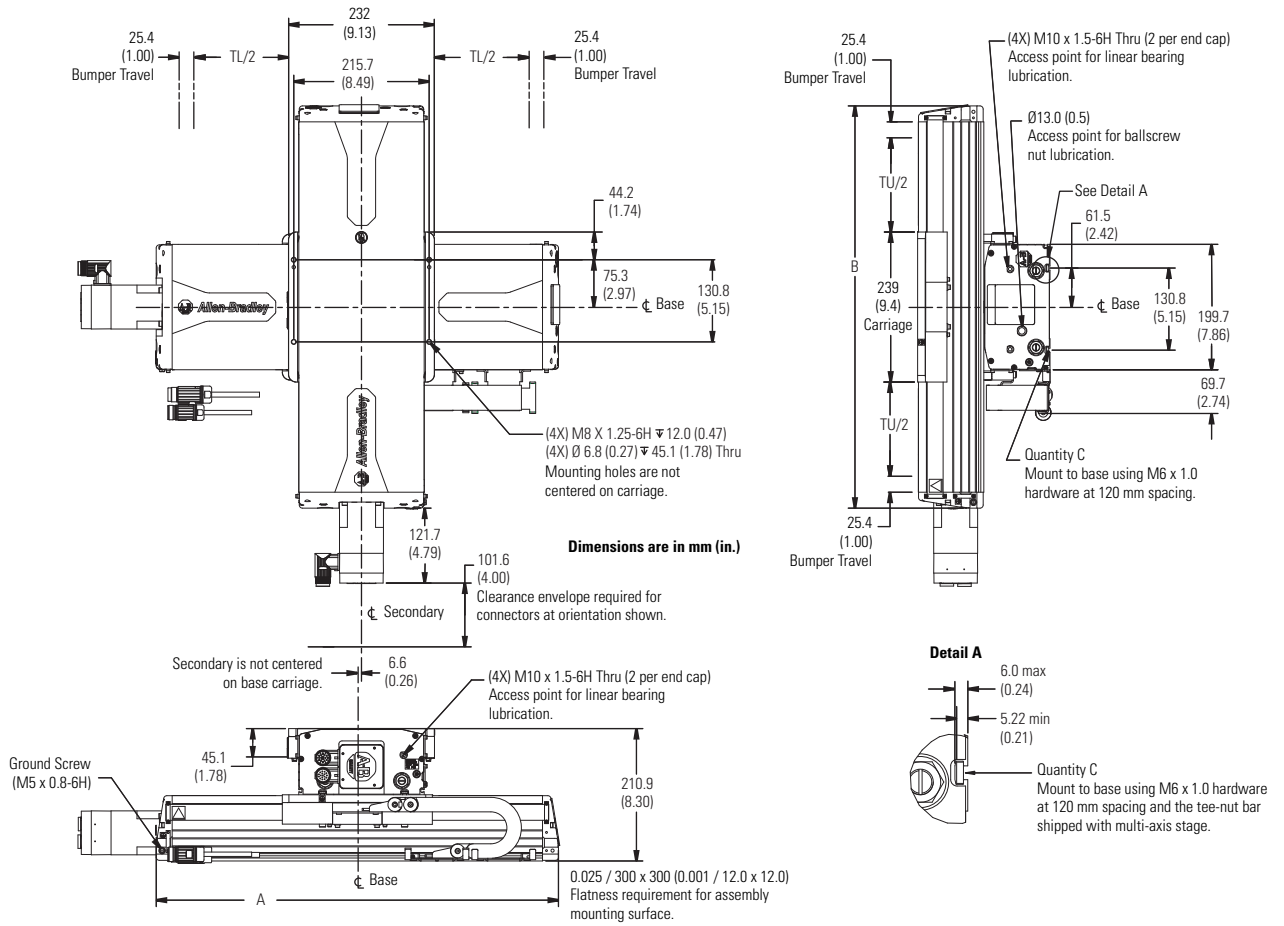
These specifications apply to Center Stacked X/Y stages with 200 mm frame ballscrew driven X-axis and 200 mm frame ballscrew driven Y-axis. Maximum payload is 20 kg (44.0 lb). For heavier loads, contact your Rockwell Automation sales representative.



MPMA-xAPxxxxxx-xxx Product Specifications

Multi-axis Linear Stage Cat. No.	Travel mm (in.)			Encoder Type			Bi-directional Repeatability (μm)			Weight, approx. kg (lb)
	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	
MPMA-xAPB8B8A0-S1C	180 (7.1)		N/A	Multi-turn high resolution encoder absolute feedback, 128 cycle/rev. (ballscrew only)		N/A	60	60	N/A	36.1 (79.4)
MPMA-xAPC4C4A0-S1C	240 (9.4)									37.9 (83.4)
MPMA-xAPD0D0A0-S1C	300 (11.8)									39.9 (87.8)
MPMA-xAPE2E2A0-S1C	420 (16.5)									43.9 (96.6)
MPMA-xAPG6G6A0-S1C	660 (26.0)									51.5 (113.3)

MPMA-xAPxxxxxx-xxx Product Dimensions



MPMA-xAPxxxxxx-xxx Dimensions

Multi-axis Linear Stage Cat. No.	A Stage Length (X-axis)	TL Travel (X-axis)	B Stage Length (Y-axis)	TU Travel (Y-axis)	C Mounting Locations (X-axis)
	mm (in.)	mm (in.)	mm (in.)	mm (in.)	Qty
MPMA-AAPB8B8A0-S1C	521 (20.5)	180 (7.1)	521 (20.5)	180 (7.1)	8
MPMA-AAPC4C4A0-S1C	581 (22.9)	240 (9.4)	581 (22.9)	240 (9.4)	10
MPMA-AAPD0D0A0-S1C	641 (25.2)	300 (11.8)	641 (25.2)	300 (11.8)	
MPMA-AAPE2E2A0-S1C	761 (30.0)	420 (16.5)	761 (30.0)	420 (16.5)	12
MPMA-AAPG6G6A0-S1C	1001 (39.4)	660 (26.0)	1001 (39.4)	660 (26.0)	16
MPMA-BAPB8B8A0-S1C	521 (20.5)	180 (7.1)	521 (20.5)	180 (7.1)	8
MPMA-BAPC4C4A0-S1C	581 (22.9)	240 (9.4)	581 (22.9)	240 (9.4)	10
MPMA-BAPD0D0A0-S1C	641 (25.2)	300 (11.8)	641 (25.2)	300 (11.8)	
MPMA-BAPE2E2A0-S1C	761 (30.0)	420 (16.5)	761 (30.0)	420 (16.5)	12
MPMA-BAPG6G6A0-S1C	1001 (39.4)	660 (26.0)	1001 (39.4)	660 (26.0)	16

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MPMA-xCBxxxxxx-xxx Product Specifications and Dimensions

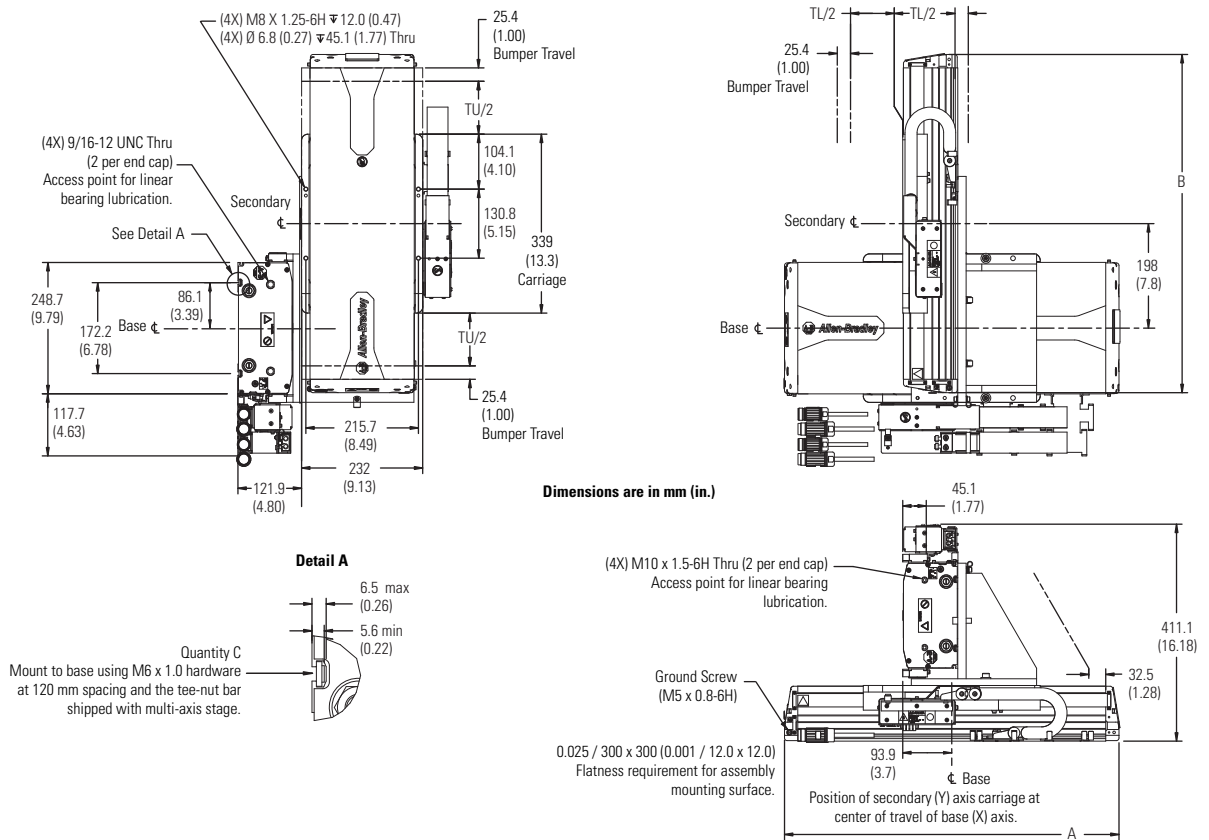
These specifications apply to Cartesian Stacked X/Y stages with 250 mm frame linear motor driven X-axis and 200 mm frame linear motor driven Y-axis. Maximum payload is 20 kg (44.0 lb). For heavier loads, contact your Rockwell Automation sales representative.



MPMA-xCBxxxxxx-xxx Product Specifications

Multi-axis Linear Stage Cat. No.	Travel mm (in.)			Encoder Type			Bi-directional Repeatability (μm)			Weight, approx. kg (lb)
	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	
MPMA-xCBD2D2A0-S1C	320 (12.6)	320 (12.6)	N/A	5 micron resolution incremental magnetic linear encoder (direct drive only)	N/A	15	15	N/A	69.7 (153.3)	
MPMA-xCBE4D2A0-S1C	440 (17.3)								72.7 (159.9)	
MPMA-xCBE4E4A0-S1C		74.9 (164.7)								
MPMA-xCBF6E4A0-S1C	440 (17.3)	78.4 (172.4)								
MPMA-xCBG8E4A0-S1C		81.4 (179.0)								
MPMA-xCBG8F6A0-S1C	680 (26.8)	560 (22.0)							83.7 (184.1)	
MPMA-xCBIOF6A0-S1C	800 (31.5)								87.2 (191.8)	
MPMA-xCBJ2F6A0-S1C	920 (36.2)	90.3 (198.6)								

MPMA-xCBxxxxxx-xxx Product Dimensions



Dimensions are in mm (in.)

MPMA-xCBxxxxxx-xxx Dimensions

Multi-axis Linear Stage Cat. No.	A Stage Length (X-axis)	TL Travel (X-axis)	B Stage Length (Y-axis)	TU Travel (Y-axis)	C Mounting Locations (X-axis)
	mm (in.)	mm (in.)	mm (in.)	mm (in.)	Qty
MPMA-ACBD2D2A0-S1C	761 (30.0)	320 (12.6)	761 (30.0)	320 (12.6)	12
MPMA-ACBE4D2A0-S1C	881 (34.7)	440 (17.3)			14
MPMA-ACBE4E4A0-S1C	1001 (39.4)	560 (22.0)	881 (34.7)	440 (17.3)	16
MPMA-ACBG8E4A0-S1C	1121 (44.1)	680 (26.8)			18
MPMA-ACBG8F6A0-S1C	1241 (48.9)	800 (31.5)	1001 (39.4)	560 (22.0)	20
MPMA-ACBJ2F6A0-S1C	1361 (53.6)	920 (36.2)			22
MPMA-BCBD2D2A0-S1C	761 (30.0)	320 (12.6)	761 (30.0)	320 (12.6)	12
MPMA-BCBE4D2A0-S1C	881 (34.7)	440 (17.3)			14
MPMA-BCBE4E4A0-S1C	1001 (39.4)	560 (22.0)	881 (34.7)	440 (17.3)	16
MPMA-BCBG8E4A0-S1C	1121 (44.1)	680 (26.8)			18
MPMA-BCBG8F6A0-S1C	1241 (48.9)	800 (31.5)	1001 (39.4)	560 (22.0)	20
MPMA-BCBJ2F6A0-S1C	1361 (53.6)	920 (36.2)			22

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MPMA-xCQxxxxxx-xxx Product Specifications and Dimensions

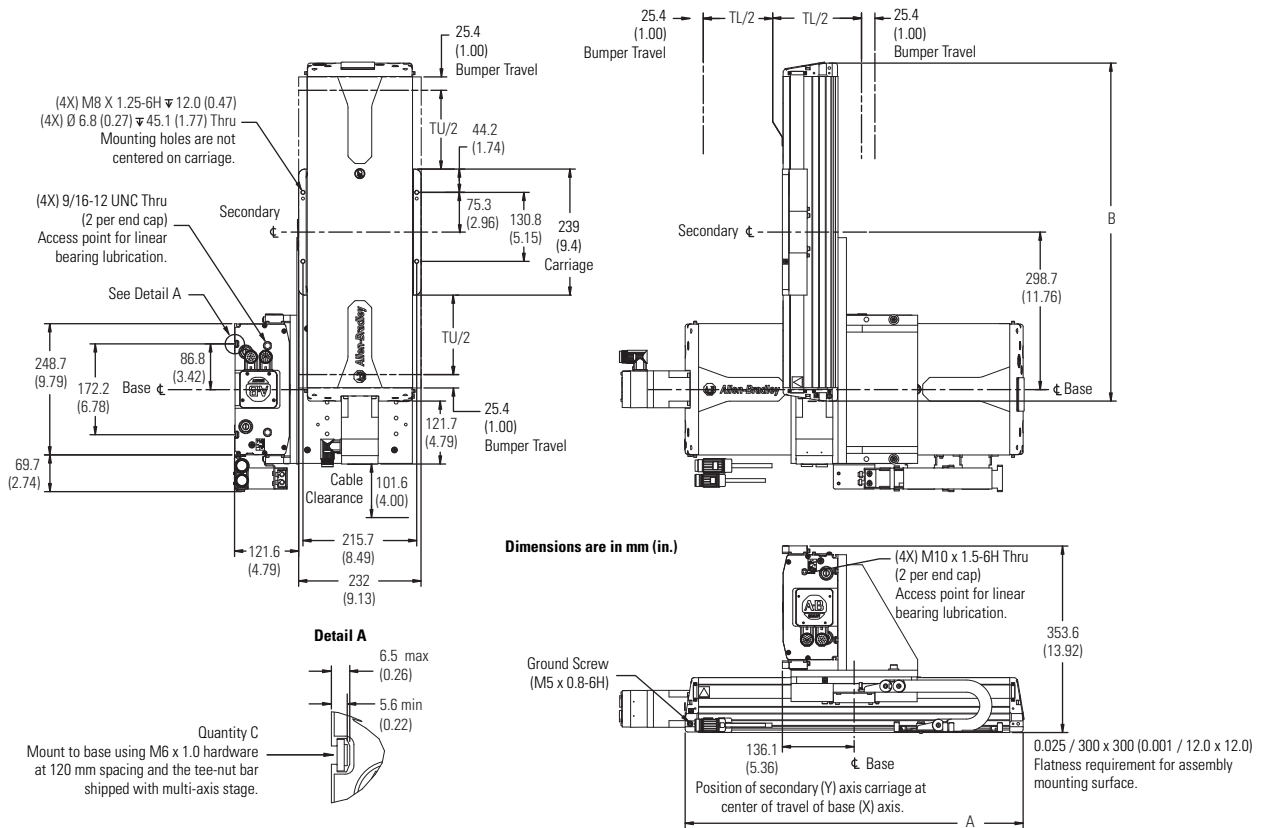
These specifications apply to Cartesian Stacked X/Y stages with 250 mm frame ballscrew driven X-axis and 200 mm frame ballscrew driven Y-axis. Maximum payload is 25 kg (55.1 lb). For heavier loads, contact your Rockwell Automation sales representative.



MPMA-xCQxxxxxx-xxx Product Specifications

Multi-axis Linear Stage Cat. No.	Travel mm (in.)			Encoder Type			Bi-directional Repeatability (μm)			Weight, approx. kg (lb)
	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	
MPMA-xCQD0D0A0-S1C	300 (11.8)	300 (11.8)	N/A	Multi-turn high resolution encoder absolute feedback, 128 cycle/rev. (ballscrew only)	N/A	60	60	N/A	51.7 (113.7)	
MPMA-xCQE2D0A0-S1C	420 (16.5)								54.3 (119.4)	
MPMA-xCQE2E2A0-S1C		420 (16.5)							56.3 (123.8)	
MPMA-xCQG6E2A0-S1C	660 (26.0)								61.4 (135.0)	
MPMA-xCQG6G6A0-S1C		660 (26.0)							65.2 (143.4)	
MPMA-xCQH8G6A0-S1C	780 (30.7)								67.7 (148.9)	
MPMA-xCQJ0G6A0-S1C		900 (35.4)							70.2 (154.4)	

MPMA-xCQxxxxxx-xxx Product Dimensions



MPMA-xCQxxxxxx-xxx Dimensions

Multi-axis Linear Stage Cat. No.	A Stage Length (X-axis)	TL Travel (X-axis)	B Stage Length (Y-axis)	TU Travel (Y-axis)	C Mounting Locations (X-axis)				
	mm (in.)	mm (in.)	mm (in.)	mm (in.)	Qty				
MPMA-ACQD0D0A0-S1C	641 (25.2)	300 (11.8)	641 (25.2)	300 (11.8)	10				
MPMA-ACQE2D0A0-S1C	761 (30.0)	420 (16.5)			12				
MPMA-ACQE2E2A0-S1C			1001 (39.4)	660 (26.0)	16				
MPMA-ACQG6E2A0-S1C	1001 (39.4)	660 (26.0)			18				
MPMA-ACQG6G6A0-S1C					1241 (48.9)	900 (35.4)	20		
MPMA-ACQH8G6A0-S1C	641 (25.2)	300 (11.8)	641 (25.2)	300 (11.8)			10		
MPMA-ACQJ0G6A0-S1C					761 (30.0)	420 (16.5)	761 (30.0)	420 (16.5)	12
MPMA-BCQD0D0A0-S1C	1001 (39.4)	660 (26.0)	1001 (39.4)	660 (26.0)					16
MPMA-BCQE2D0A0-S1C					1121 (44.1)	780 (30.7)	1001 (39.4)	660 (26.0)	18
MPMA-BCQE2E2A0-S1C									1241 (48.9)
MPMA-BCQG6E2A0-S1C	1121 (44.1)	780 (30.7)	1001 (39.4)	660 (26.0)	18				
MPMA-BCQG6G6A0-S1C					1241 (48.9)	900 (35.4)	1001 (39.4)	660 (26.0)	20

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MPMA-xBExxxxxx-xxx Product Specifications and Dimensions

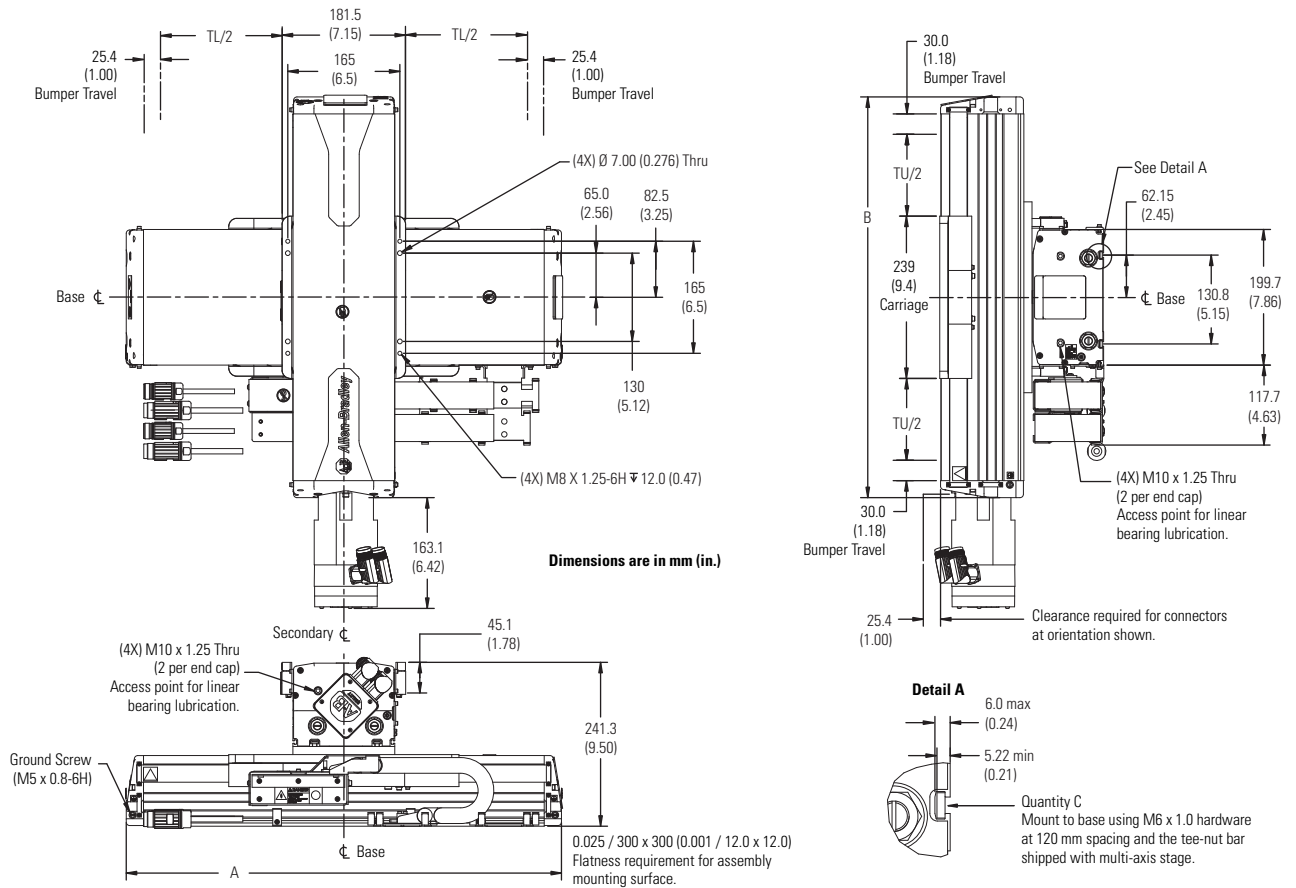
These specifications apply to Center Stacked X/Z stages with 200 mm frame linear motor driven X-axis and 150 mm frame ballscrew driven Z-axis. Maximum payload is 20 kg (44.0 lb). For heavier loads, contact your Rockwell Automation sales representative.



MPMA-xBExxxxxx-xxx Product Specifications

Multi-axis Linear Stage Cat. No.	Travel mm (in.)			Encoder Type			Bi-directional Repeatability (μm)			Weight, approx. kg (lb)
	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	
MPMA-xBED2A0B8-S2C	320 (12.6)	N/A	180 (7.1)	5 micron resolution incremental magnetic linear encoder (direct drive only)	N/A	Multi-turn high resolution encoder absolute feedback, 128 cycle/rev. (ballscrew only)	15	N/A	60	44.5 (98.0)
MPMA-xBED2A0D0-S2C			300 (11.8)							46.2 (101.7)
MPMA-xBEE4A0B8-S2C	440 (17.3)		180 (7.1)							46.7 (102.8)
MPMA-xBEE4A0D0-S2C			300 (11.8)							48.4 (106.6)
MPMA-xBEG8A0B8-S2C	680 (26.8)		180 (7.1)							51.2 (112.7)
MPMA-xBEG8A0D0-S2C			300 (11.8)							52.9 (116.9)

MPMA-xBExxxxx-xxx Product Dimensions



MPMA-xBExxxxx-xxx Dimensions

Multi-axis Linear Stage Cat. No.	A Stage Length (X-axis)	TL Travel (X-axis)	B Stage Length (Z-axis)	TU Travel (Z-axis)	C Mounting Locations (X-axis)
	mm (in.)	mm (in.)	mm (in.)	mm (in.)	Qty
MPMA-ABED2A0B8-S2C	761 (30.0)	320 (12.6)	530 (20.9)	180 (7.1)	12
MPMA-ABED2A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-ABEE4A0B8-S2C	881 (34.7)	440 (17.3)	530 (20.9)	180 (7.1)	14
MPMA-ABEE4A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-ABEG8A0B8-S2C	1121 (44.1)	680 (26.8)	530 (20.9)	180 (7.1)	18
MPMA-ABEG8A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-BBED2A0B8-S2C	761 (30.0)	320 (12.6)	530 (20.9)	180 (7.1)	12
MPMA-BBED2A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-BBEE4A0B8-S2C	881 (34.7)	440 (17.3)	530 (20.9)	180 (7.1)	14
MPMA-BBEE4A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-BBEG8A0B8-S2C	1121 (44.1)	680 (26.8)	530 (20.9)	180 (7.1)	18
MPMA-BBEG8A0D0-S2C			650 (25.6)	300 (11.8)	

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MPMA-xBIxxxxx-xxx Product Specifications and Dimensions

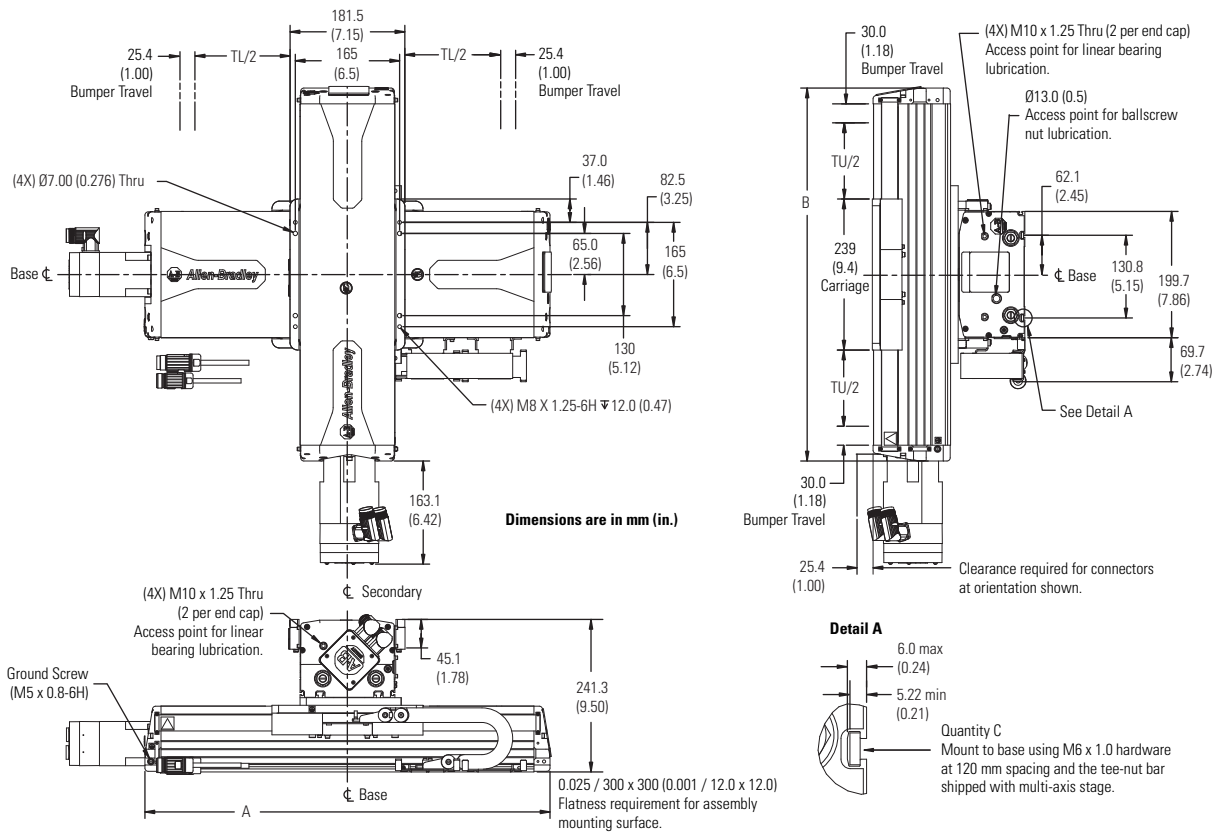
These specifications apply to Center Stacked X/Z stages with 200 mm frame ballscrew driven X-axis and 150 mm frame ballscrew driven Z-axis. Maximum payload is 25 kg (55.1 lb). For heavier loads, contact your Rockwell Automation sales representative.



MPMA-xBIxxxxx-xxx Product Specifications

Multi-axis Linear Stage Cat. No.	Travel mm (in.)			Encoder Type			Bi-directional Repeatability (μm)			Weight, approx. kg (lb)
	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	
MPMA-xBID0A0B8-S2C	300 (11.8)	N/A	180 (7.1)	Multi-turn high resolution encoder absolute feedback, 128 cycle/rev. (ballscrew only)	N/A	Multi-turn high resolution encoder absolute feedback, 128 cycle/rev. (ballscrew only)	60	N/A	60	37.7 (83.0)
MPMA-xBID0A0D0-S2C			300 (11.8)							39.4 (86.8)
MPMA-xBIE2A0B8-S2C	420 (16.5)		180 (7.1)							39.7 (87.4)
MPMA-xBIE2A0D0-S2C			300 (11.8)							41.4 (91.2)
MPMA-xBIG6A0B8-S2C	660 (26.0)		180 (7.1)							43.5 (95.8)
MPMP-xBIG6A0D0-S2C			300 (11.8)							45.2 (99.5)

MPMA-xBlxxxxx-xxx Product Dimensions



MPMA-xBlxxxxx-xxx Dimensions

Multi-axis Linear Stage Cat. No.	A Stage Length (X-axis)	TL Travel (X-axis)	B Stage Length (Z-axis)	TU Travel (Z-axis)	C Mounting Locations (X-axis)
	mm (in.)	mm (in.)	mm (in.)	mm (in.)	Qty
MPMA-ABID0A0B8-S2C	641 (25.2)	300 (11.8)	530 (20.9)	180 (7.1)	10
MPMA-ABID0A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-ABIE2A0B8-S2C	761 (30.0)	420 (16.5)	530 (20.9)	180 (7.1)	12
MPMA-ABIE2A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-ABIG6A0B8-S2C	1001 (39.4)	660 (26.0)	530 (20.9)	180 (7.1)	16
MPMA-ABIG6A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-BBID0A0B8-S2C	641 (25.2)	300 (11.8)	530 (20.9)	180 (7.1)	10
MPMA-BBID0A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-BBIE2A0B8-S2C	761 (30.0)	420 (16.5)	530 (20.9)	180 (7.1)	12
MPMA-BBIE2A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-BBIG6A0B8-S2C	1001 (39.4)	660 (26.0)	530 (20.9)	180 (7.1)	16
MPMA-BBIG6A0D0-S2C			650 (25.6)	300 (11.8)	

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MPMA-xBDxxxxxx-xxx Product Specifications and Dimensions

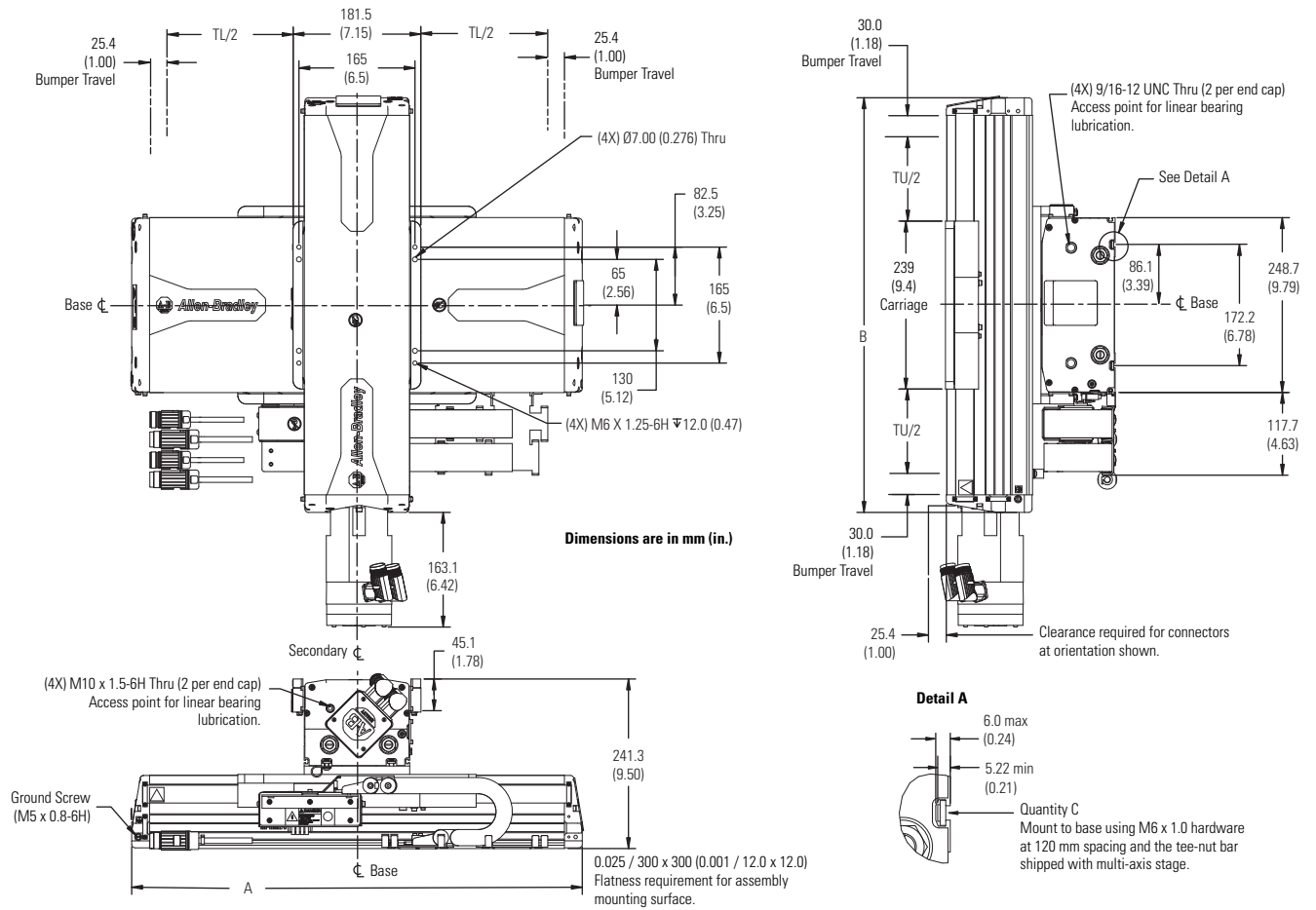
These specifications apply to Center Stacked X/Z stages with 250 mm frame linear motor driven X-axis and 150 mm frame ballscrew driven Z-axis. Maximum payload is 20 kg (44.0 lb). For heavier loads, contact your Rockwell Automation sales representative.



MPMA-xBDxxxxxx-xxx Product Specifications

Multi-axis Linear Stage Cat. No.	Travel mm (in.)			Encoder Type			Bi-directional Repeatability (μm)			Weight, approx. kg (lb)
	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	X-axis	Y-axis	Z-axis	
MPMA-xBDD2A0B8-S2C	320 (12.6)	N/A	180 (7.1)	5 micron resolution incremental magnetic linear encoder (direct drive only)	N/A	Multi-turn high resolution encoder absolute feedback, 128 cycle/rev. (ballscrew only)	15	N/A	60	52.2 (114.9)
MPMA-xBDD2A0D0-S2C			300 (11.8)							53.9 (118.7)
MPMA-xBDE4A0B8-S2C	440 (17.3)		180 (7.1)							55.2 (121.5)
MPMA-xBDE4A0D0-S2C			300 (11.8)							56.9 (125.3)
MPMA-xBDE4A0E2-S2C			420 (16.5)							58.6 (129.0)
MPMA-xBDG8A0B8-S2C			180 (7.1)							61.7 (135.8)
MPMA-xBDG8A0D0-S2C	680 (26.8)		300 (11.8)							63.4 (139.6)
MPMA-xBDG8A0E2-S2C			420 (16.5)							65.1 (143.3)
MPMA-xBDI0A0B8-S2C			180 (7.1)							65.2 (143.5)
MPMA-xBDI0A0D0-S2C	800 (31.5)		300 (11.8)							66.9 (147.3)
MPMA-xBDI0A0E2-S2C			420 (16.5)							68.6 (151.0)
MPMA-xBDJ2A0D0-S2C	920 (36.2)		300 (11.8)							70.0 (154.1)
MPMA-xBDJ2A0E2-S2C		420 (16.5)	71.7 (157.8)							
MPMA-xBDJ2A0F4-S2C		540 (21.3)	73.5 (161.8)							

MPMA-xBDxxxxxx-xxx Product Dimensions



MPMA-xBDxxxxx-xxx Dimensions

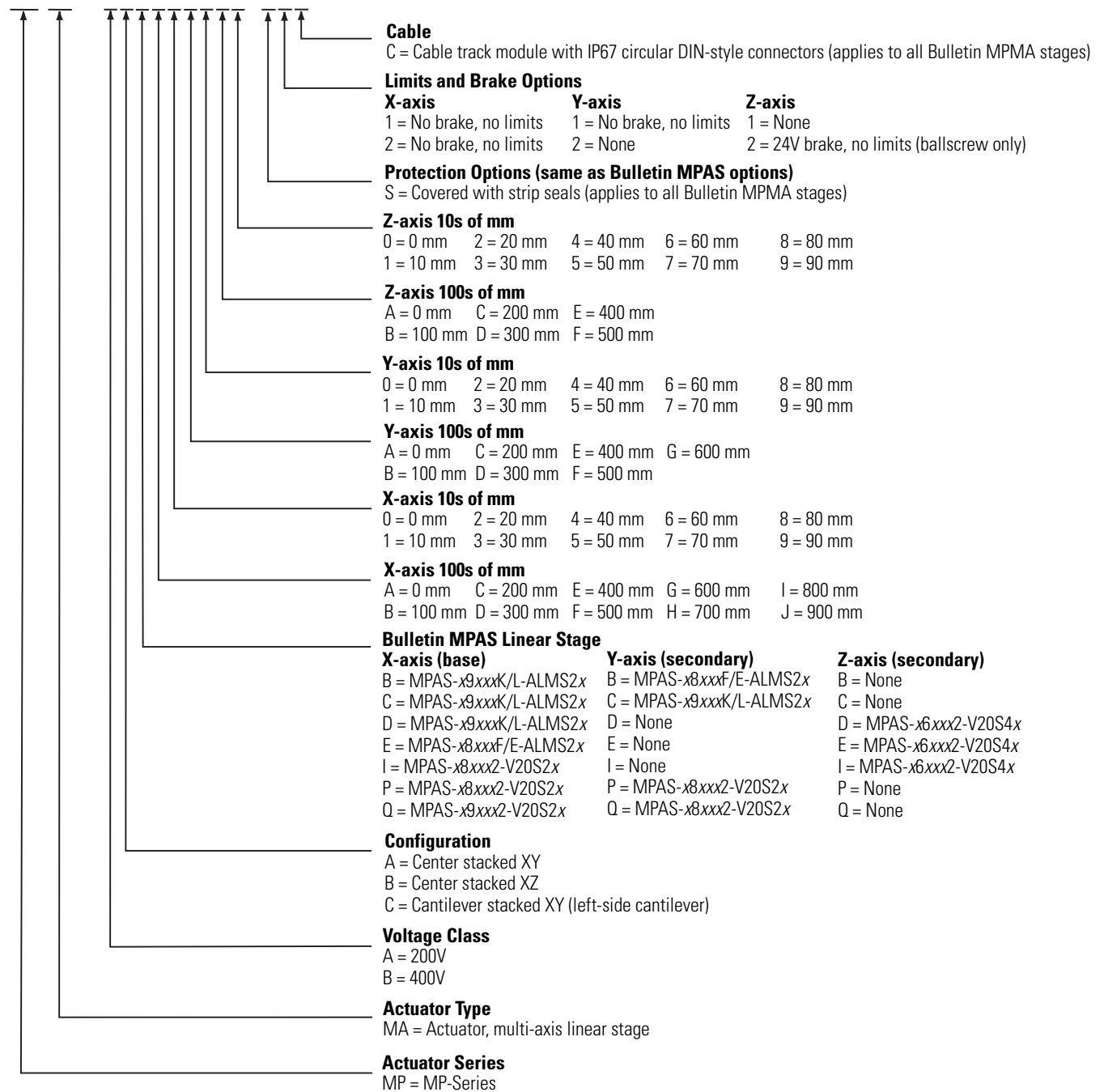
Multi-axis Linear Stage Cat. No.	A Stage Length (X-axis)	TL Travel (X-axis)	B Stage Length (Z-axis)	TU Travel (Z-axis)	C Mounting Locations (X-axis)
	mm (in.)	mm (in.)	mm (in.)	mm (in.)	Qty
MPMA-ABDD2A0B8-S2C	761 (30.0)	320 (12.6)	530 (20.9)	180 (7.1)	12
MPMA-ABDD2A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-ABDE4A0B8-S2C	881 (34.7)	440 (17.3)	530 (20.9)	180 (7.1)	14
MPMA-ABDE4A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-ABDE4A0E2-S2C			770 (30.3)	420 (16.5)	
MPMA-ABDG8A0B8-S2C	1121 (44.1)	680 (26.8)	530 (20.9)	180 (7.1)	18
MPMA-ABDG8A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-ABDG8A0E2-S2C			770 (30.3)	420 (16.5)	
MPMA-ABDI0A0B8-S2C	1241 (48.9)	800 (31.5)	530 (20.9)	180 (7.1)	20
MPMA-ABDI0A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-ABDI0A0E2-S2C			770 (30.3)	420 (16.5)	
MPMA-ABDJ2A0D0-S2C	1361 (53.6)	920 (36.2)	650 (25.6)	300 (11.8)	22
MPMA-ABDJ2A0E2-S2C			770 (30.3)	420 (16.5)	
MPMA-ABDJ2A0F4-S2C			890 (35.0)	540 (21.3)	
MPMA-BBDD2A0B8-S2C	761 (30.0)	320 (12.6)	530 (20.9)	180 (7.1)	12
MPMA-BBDD2A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-BBDE4A0B8-S2C	881 (34.7)	440 (17.3)	530 (20.9)	180 (7.1)	14
MPMA-BBDE4A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-BBDE4A0E2-S2C			770 (30.3)	420 (16.5)	
MPMA-BBDG8A0B8-S2C	1121 (44.1)	680 (26.8)	530 (20.9)	180 (7.1)	18
MPMA-BBDG8A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-BBDG8A0E2-S2C			770 (30.3)	420 (16.5)	
MPMA-BBDI0A0B8-S2C	1241 (48.9)	800 (31.5)	530 (20.9)	180 (7.1)	20
MPMA-BBDI0A0D0-S2C			650 (25.6)	300 (11.8)	
MPMA-BBDI0A0E2-S2C			770 (30.3)	420 (16.5)	
MPMA-BBDJ2A0D0-S2C	1361 (53.6)	920 (36.2)	650 (25.6)	300 (11.8)	22
MPMA-BBDJ2A0E2-S2C			770 (30.3)	420 (16.5)	
MPMA-BBDJ2A0F4-S2C			890 (35.0)	540 (21.3)	

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MP-Series Integrated Multi-axis Linear Stage Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your actuator. For questions regarding product availability, contact your Allen-Bradley distributor.

MP MA - xxxxxxxxxxx - xxx



MP-Series and TL-Series Electric Cylinders



MP-Series Electric Cylinders

With the MP-Series and TL-Series Electric Cylinders, your applications will experience flexible servo control ideal for solutions requiring forces to be built up quickly and positions that need to be approached accurately. Available in three ISO 15552 pneumatic-class frame sizes (32, 40, and 63), these durable, quiet, and energy-efficient non-rotating stainless steel piston rod actuators are an excellent upgrade for pneumatic systems.



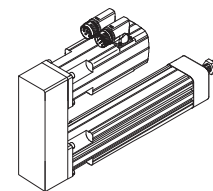
TL-Series Electric Cylinders

With the ability to synchronize and coordinate with multi-axis machine motions, the MP-Series and TL-Series cylinders provide a dynamic, precise response for a wide range of linear motion applications. When seamlessly integrated into the Rockwell Automation Integrated Architecture, MP-Series and TL-Series electric cylinders use RSLogix 5000 software to extend and retract with precise positioning, velocity or force. In Force mode, an electric cylinder continues to push the load in a manner similar to an air cylinder, but with the convenience of a limit established by using state-of-the-art software.

For drive compatibility, refer to Servo Drives on [page 14](#).

MP-Series and TL-Series Electric Cylinder Features

- Fully assembled and ready to mount cylinders contribute to reductions in mechanical design engineering, assembly, wiring, and commissioning time.
- State-of-the-art design features ballscrew construction with linear stroke lengths up to 800 mm (32 in.), absolute high-resolution feedback, and speeds up to 1.0 m/s (39.4 in./s).
- Operates without externally mounted limit or home switches and retains position during power loss for faster machine restart.
- Rated for 100% duty cycle and designed for repeatable, reproducible performance over the actuator's operating life.
- Linear feed force of up to 2500 N (562 lb).
- Positioning repeatability of ± 0.02 mm (0.0008 in.).
- No piping, valving, air, or oil supply required.
- Sizing and engineering with compatible servo drives is made easy with Motion Analyzer software and online CAD files.
- Commissioning is simplified by the use of standard Allen-Bradley motor power and feedback cables.
- Full set-up and programming support by using Allen-Bradley Logix Controller platforms. RSLogix 5000 and Ultraware software make setup and commissioning fast and easy.
- Optional 24V DC holding brakes.



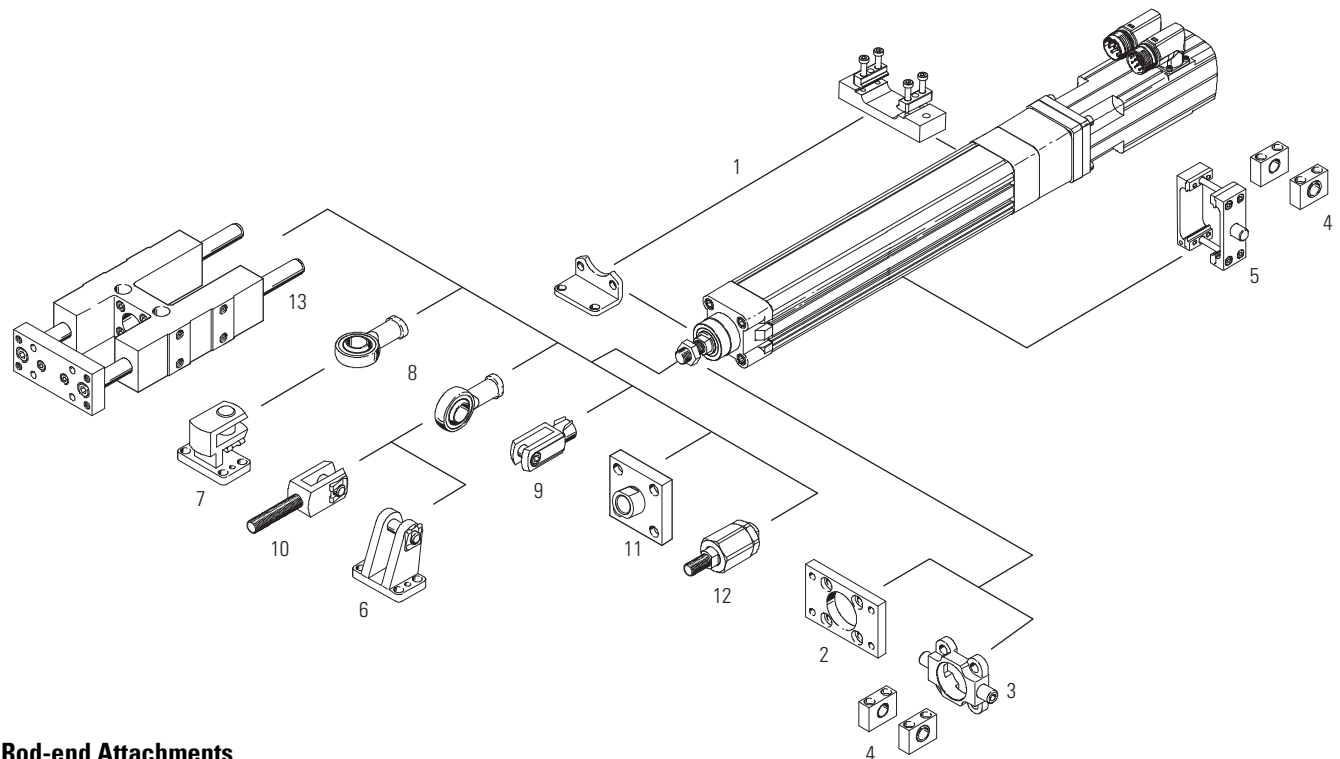
Refer to your Rockwell Automation sales representative for parallel mount availability.

MP-Series and TL-Series Electric Cylinders Accessories

These accessory items apply to MP-Series and TL-Series electric cylinders.

Mounting Attachments

Accessory Item	Description	Dimensions
1	Foot mounting kit	Includes front face bracket, body clamps, and mounting bolts. page 156
2	Flange mounting	For front face mounting. Includes mounting bolts. page 157
3	Trunnion mounting	
4	Trunnion support	Use with trunnion mounting. page 158
5	Trunnion mounting kit	For mounting anywhere along the cylinder profile barrel. page 159
6	Clevis foot	Use with rod eye. page 159
7	Clevis foot (right angle)	



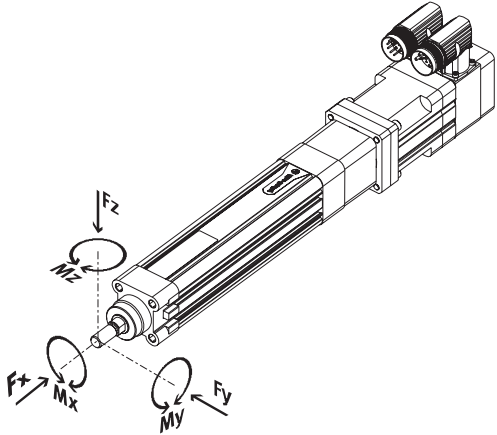
Rod-end Attachments

Accessory Item	Description	Dimensions
8	Rod eye	Use with Rod Clevis (spherical bearing), item 10 or Clevis Foot, items 6 and 7. page 161
9	Rod clevis	Permits a swivelling movement of the cylinder in one plane. page 162
10	Rod clevis	For spherical connection of cylinders with rod eye. page 162
11	Coupling piece	Links the piston rod-end of the cylinder to the machine parts to be moved. Used to compensate for radial misalignment. page 164
12	Self-aligning rod coupler	Links the piston rod-end of the cylinder to the machine parts to be moved. Used to compensate for radial and angular misalignment. page 165
13	Rod guide	Used to protect piston rod against radial or torsional side loads. page 168

MP-Series and TL-Series Electric Cylinders Rod Load Ratings

Electric cylinders must have the weight of the load supported and guided separately so that only axial force (no radial load) is required of the piston rod throughout the complete extend and retract motion. If some residual radial and/or torsional loading remains unavoidable, it may be necessary to add a rod guide. Refer to Motion Analyzer software, version 4.7 or later, for assistance when making these calculations and to determine when a rod guide is recommended.

Maximum Permissible Lateral Forces $F_{y_{max}}$ and $F_{z_{max}}$ on the Piston Rod



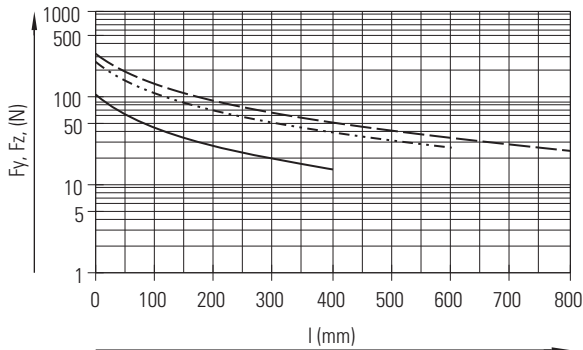
If there are two or more forces and torques acting simultaneously on the piston rod, the following equations must be true:

$$\frac{[F_y]}{F_{y_{max}}} + \frac{[F_z]}{F_{z_{max}}} + \frac{[M_y]}{M_{y_{max}}} + \frac{[M_z]}{M_{z_{max}}} \leq 1$$

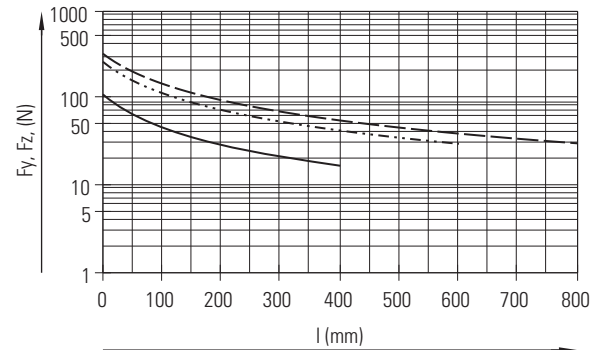
$$[F_x] \leq F_{x_{max}}$$

$$[M_x] \leq M_{x_{max}}$$

Horizontal Mounting Position



Vertical Mounting Position



- MP-Series or TL-Series (frame 32)
- - - - - MP-Series or TL-Series (frame 40)
- · - · - MP-Series or TL-Series (frame 63)

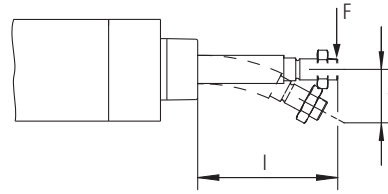
Load Force Ratings

Attribute	MP-Series and TL-Series Electric Cylinders		
	Frame 32	Frame 40	Frame 63
F_x max (static)	600 N (135 lb)	1400 N (315 lb)	3700 N (832 lb)
M_x max	1 Nm (8.8 lb-in)	1 Nm (8.8 lb-in)	1.5 Nm (13.3 lb-in)
M_y max, M_z max	8 Nm (70.7 lb-in)	20 Nm (177 lb-in)	27 Nm (239 lb-in)

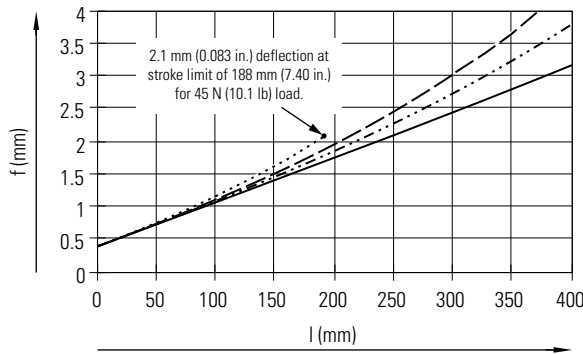
MP-Series and TL-Series Electric Cylinders Piston Rod Deflection Specifications

These specifications are for determining the amount of shaft deflection to expect from a given load.

Piston-rod deflection specifications are a function of stroke length.

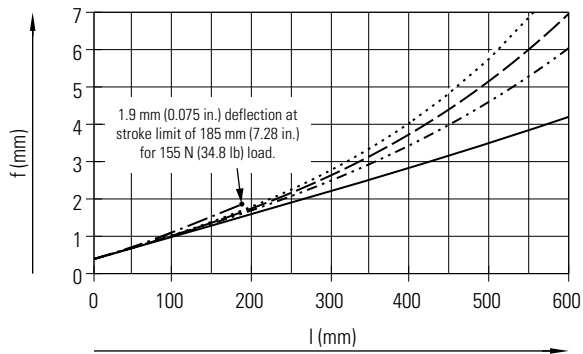


MP-Series and TL-Series Electric Cylinders (frame 32)



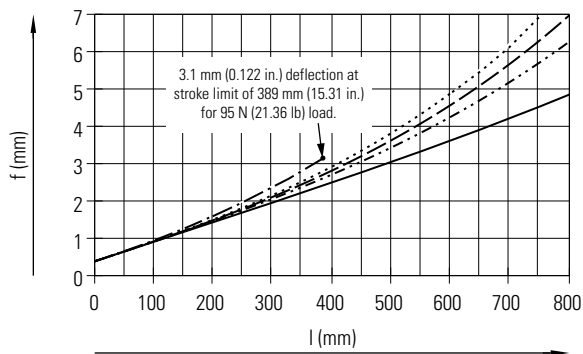
- Lateral Force $F = 0$ N
- - - Lateral Force $F = 10$ N (2.25 lb)
- · - Lateral Force $F = 20$ N (4.50 lb)
- · · Lateral Force $F = 45$ N (10.10 lb)

MP-Series and TL-Series Electric Cylinders (frame 40)



- Lateral Force $F = 0$ N
- - - Lateral Force $F = 20$ N (4.50 lb)
- · - Lateral Force $F = 30$ N (6.74 lb)
- · · Lateral Force $F = 40$ N (8.99 lb)
- · - Lateral Force $F = 115$ N (25.85 lb)

MP-Series and TL-Series Electric Cylinders (frame 63)



- Lateral Force $F = 0$ N
- - - Lateral Force $F = 20$ N (4.50 lb)
- · - Lateral Force $F = 30$ N (6.74 lb)
- · · Lateral Force $F = 40$ N (8.99 lb)
- · - Lateral Force $F = 95$ N (21.36 lb)

MP-Series and TL-Series Electric Cylinders Life Specifications

Electric cylinder life specifications, running performance (L), are based on a combination of tested and calculated data. If the parameters of your application are different, your results could be different. The achievable running performance (L) is a function of mean feed force (F), according to DIN 69051-4 as shown below and illustrated on [page 139](#). Refer to Motion Analyzer software, version 4.7 or later, for assistance when making these calculations and determining the running performance for your application.

Calculation of the Feed Force F_x

The peak feed force value must not exceed the maximum feed force within a movement cycle. In the case of vertical operation, the peak value is generally achieved during the acceleration phase of the upwards stroke. If the maximum feed force is exceeded, you can increase wear and shorten the service life of the ballscrew. The maximum speed must likewise not be exceeded.

$$F_x \leq F_{x \max}$$

$$\text{and}$$

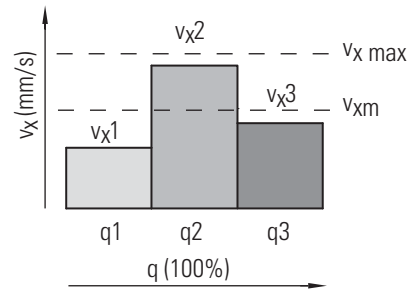
$$V_x \leq V_{x \max}$$

During operation, the continuous feed force may be briefly exceeded up to the maximum feed force. The continuous feed force must, however, be adhered to when averaged over a movement cycle.

$$F_{xm} \leq F_{x \text{ cont}}$$

Mean Feed Speed (to DIN 69051-4)

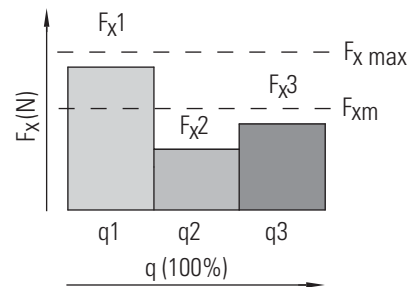
$$v_{xm} = \sum |v_x| \times \frac{q}{100} + |v_{x1}| \times \frac{q1}{100} + |v_{x2}| \times \frac{q2}{100} + |v_{x3}| \times \frac{q3}{100} + \dots$$



Mean Feed Force (to DIN 69051-4)

$$F_{xm} = \sqrt[3]{\sum |F_x|^3 \times \frac{|v_x|}{|v_{xm}|} \times \frac{q}{100}} =$$

$$F_{xm} = \sqrt[3]{|F_{x1}|^3 \times \frac{|v_{x1}|}{|v_{xm}|} \times \frac{q1}{100} + |F_{x2}|^3 \times \frac{|v_{x2}|}{|v_{xm}|} \times \frac{q2}{100} + |F_{x3}|^3 \times \frac{|v_{x3}|}{|v_{xm}|} \times \frac{q3}{100} + \dots}$$



F_x = Feed Force

V_x = Feed Speed

F_{xm} = Mean Feed Force

V_{xm} = Mean Feed Speed

$F_{x \max}$ = Maximum Feed Force

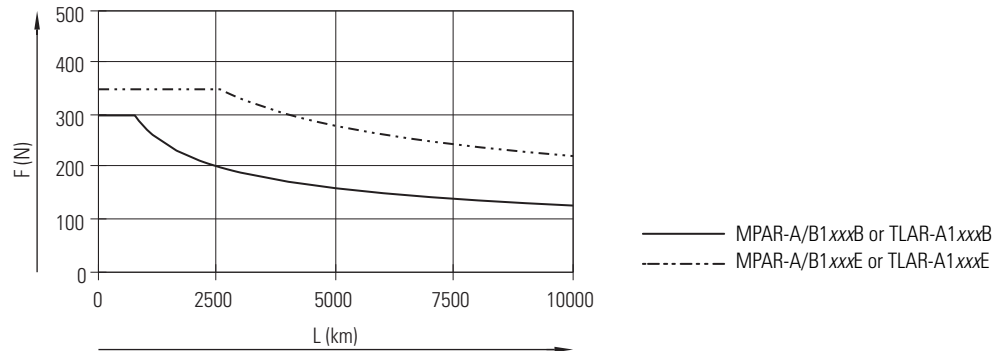
$V_{x \max}$ = Maximum Feed Speed

$F_{x \text{ cont}}$ = Continuous Feed Force

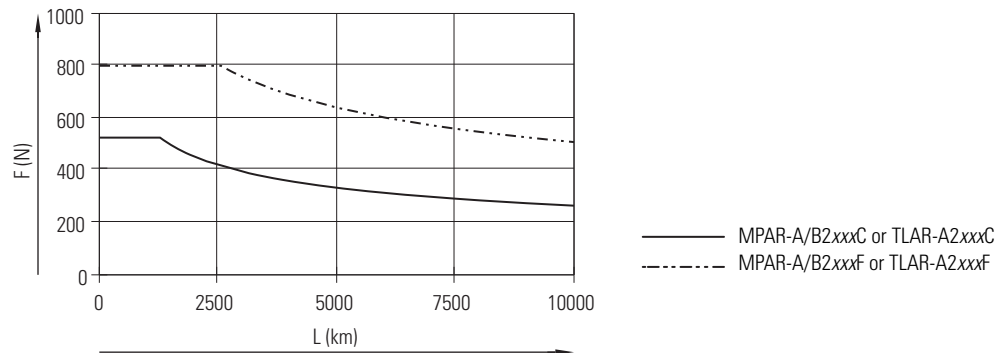
q = % of Time

The achievable running performance (L) is a function of mean feed force (F), according to DIN 69051-4 as illustrated in the figures below.

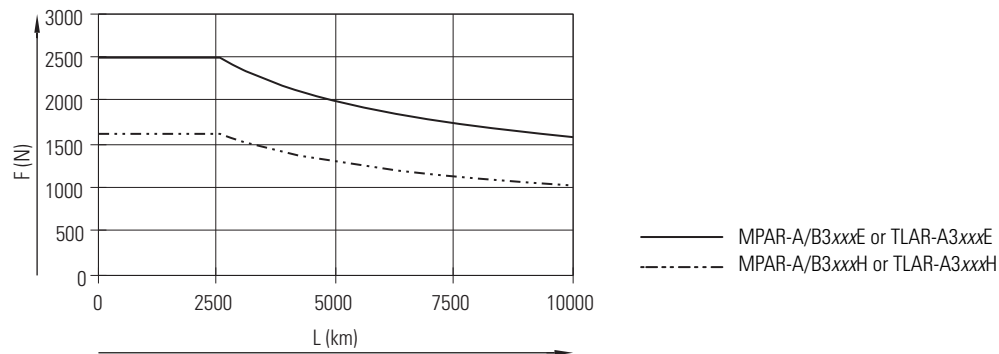
MP-Series and TL-Series Electric Cylinders (frame 32)



MP-Series and TL-Series Electric Cylinders (frame 40)



MP-Series and TL-Series Electric Cylinders (frame 63)



MP-Series and TL-Series Electric Cylinders Specifications

MP-Series and TL-Series Electric Cylinders General Specifications

Attribute	Frame 32	Frame 40	Frame 63
Construction design	Ballscrew servo-driven non-rotating piston rod ⁽¹⁾		
Piston rod thread	M10x1.25	M12x1.25	M16x1.50
Working stroke	100 mm (3.94 in.) 200 mm (7.87 in.) 300 mm (11.81 in.) 400 mm (15.75 in.)	100 mm (3.94 in.) 200 mm (7.87 in.) 300 mm (11.81 in.) 400 mm (15.75 in.) 600 mm (23.62 in.)	100 mm (3.94 in.) 200 mm (7.87 in.) 300 mm (11.81 in.) 400 mm (15.75 in.) 600 mm (23.62 in.) 800 mm (31.50 in.)
Protection against torsion/guide	Plain bearing guide		
Stroke reserve	0 mm		
Angle of rotation at the piston rod, max	±0.30°	±0.25°	±0.20°
Impact energy (E) at the end positions $E=0.5 \times m \times v^2$	0.0001 J	0.0002 J	0.0004 J
Positioning repeatability, max	±0.02 mm (0.0008 in.)		
Reversing backlash, max ⁽²⁾	0.05 mm (0.002 in.)		
Duty cycle	100%		
Position sensing (feedback)	Multi-turn absolute encoder		
Type of mounting	Via female threads Via accessories		
Mounting position	Any		

(1) The maximum rotational force (Mx) applied in the application is limited as specified in Load Force Ratings on [page 136](#).

(2) In new condition.

MP-Series and TL-Series Electric Cylinders Moving Load Specifications

Attribute	MPAR-x1xxxB TLAR-A1xxxB	MPAR-x1xxxE TLAR-A1xxxE	MPAR-x2xxxC TLAR-A2xxxC	MPAR-x2xxxF TLAR-A2xxxF	MPAR-x3xxxE TLAR-A3xxxE	MPAR-x3xxxH TLAR-A3xxxH
	Frame 32, Weight, approx. g (oz)		Frame 40, Weight, approx. g (oz)		Frame 63, Weight, approx. g (oz)	
Moving load with 0 mm stroke	170 (6.0)	200 (7.05)	310 (10.93)	380 (13.40)	810 (28.57)	810 (1.79)
Moving load per 10 mm stroke	6.9 (0.24)	6.9 (0.24)	8.9 (0.31)	8.9 (0.31)	12.8 (0.45)	12.8 (0.028)

MP-Series Electric Cylinders Performance Specifications

Electric Cylinder ⁽¹⁾ Cat. No.	Frame	Max Feed Force N (lb)	Continuous Feed Force N (lb)	Max Speed m/s (in./s)	Stroke Lengths mm (in.)	Max Acceleration m/s ² (in./s ²)
MPAR-A1xxxB-VxA MPAR-B1xxxB-VxA	32	300 (67)	240 (54)	0.15 (5.9)	100 (3.94) 200 (7.87)	6.0 (236)
MPAR-A1xxxE-VxA MPAR-B1xxxE-VxA		350 (79)	280 (63)	0.50 (19.7)	300 (11.81) 400 (15.75)	
MPAR-A2xxxC-VxA MPAR-B2xxxC-VxA	40	525 (118)	420 (94)	0.25 (9.8)	100 (3.94) 200 (7.87)	
MPAR-A2xxxF-VxA MPAR-B2xxxF-VxA		800 (180)	640 (144)	0.64 (25.2)	300 (11.81) 400 (15.75) 600 (23.62)	
MPAR-A3xxxE-MxA MPAR-B3xxxE-MxA	63	2500 (562)	2000 (450)	0.50 (19.7)	100 (3.94) 200 (7.87)	
MPAR-A3xxxH-MxA MPAR-B3xxxH-MxA		1625 (365)	1300 (292)	1.0 (39.4)	300 (11.81) 400 (15.75) 600 (23.62) 800 (31.50)	

(1) Stroke length replaces xxx in each catalog number.

TL-Series Electric Cylinders Performance Specifications

Electric Cylinder ⁽¹⁾ Cat. No.	Frame	Max Feed Force N (lb)	Continuous Feed Force N (lb)	Max Speed m/s (in./s)	Stroke Lengths mm (in.)	Max Acceleration m/s ² (in./s ²)
TLAR-A1xxxB-BxA	32	300 (67)	240 (54)	0.15 (5.9)	100 (3.94) 200 (7.87)	6.0 (236)
TLAR-A1xxxE-BxA		350 (79)	280 (63)	0.50 (19.7)	300 (11.81) 400 (15.75)	
TLAR-A2xxxC-BxA	40	525 (118)	420 (94)	0.25 (9.8)	100 (3.94) 200 (7.87)	
TLAR-A2xxxF-BxA		800 (180)	520 (117)	0.64 (25.2)	300 (11.81) 400 (15.75) 600 (23.62)	
TLAR-A3xxxE-BxA	63	2500 (562)	1750 (393)	0.50 (19.7)	100 (3.94) 200 (7.87)	
TLAR-A3xxxH-BxA		1625 (365)	975 (219)	1.0 (39.4)	300 (11.81) 400 (15.75) 600 (23.62) 800 (31.50)	

(1) Stroke length replaces xxx in each catalog number.

MP-Series and TL-Series Electric Cylinders System Combinations

For Bulletin MPAR electric cylinders and	Refer to
Kinetix 300 (240V and 480V) drives	page 644
Kinetix 6000 (230V and 460V) drives and Kinetix 6200/Kinetix 6500 (460V) drives)	page 661
Kinetix 2000 (230V) drives	page 687
Ultra3000 (230V and 460V) drives	page 710

For Bulletin TLAR electric cylinders and	Refer to
Kinetix 300 (240V) drives	page 650
Kinetix 2000 (230V) drives	page 692

MP-Series and TL-Series Electric Cylinders Weight Specifications

MP-Series Electric Cylinders (weight of cylinder with non-brake motor)

Electric Cylinder Cat. No.	Weight, approx. ⁽¹⁾ kg (lb)
MPAR-A/B1100B-V2A	2.6 (5.73)
MPAR-A/B1200B-V2A	2.9 (6.39)
MPAR-A/B1300B-V2A	3.2 (7.05)
MPAR-A/B1400B-V2A	3.5 (7.72)
MPAR-A/B1100E-V2A	3.0 (6.61)
MPAR-A/B1200E-V2A	3.3 (7.27)
MPAR-A/B1300E-V2A	3.6 (7.94)
MPAR-A/B1400E-V2A	4.0 (8.82)

Electric Cylinder Cat. No.	Weight, approx. ⁽¹⁾ kg (lb)
MPAR-A/B2100C-V2A	3.7 (8.16) ⁽¹⁾
MPAR-A/B2200C-V2A	4.1 (9.04) ⁽¹⁾
MPAR-A/B2300C-V2A	4.6 (10.14) ⁽¹⁾
MPAR-A/B2400C-V2A	5.0 (11.02) ⁽¹⁾
MPAR-A/B2600C-V2A	6.0 (11.02) ⁽¹⁾
MPAR-A/B2100F-V2A	4.2 (9.26) ⁽³⁾
MPAR-A/B2200F-V2A	4.7 (10.36) ⁽³⁾
MPAR-A/B2300F-V2A	5.2 (11.46) ⁽³⁾
MPAR-A/B2400F-V2A	5.6 (12.34) ⁽³⁾
MPAR-A/B2600F-V2A	6.6 (14.55) ⁽³⁾

Electric Cylinder Cat. No.	Weight, approx. ⁽²⁾ kg (lb)
MPAR-A/B3100E-M2A	9.5 (20.94) ⁽²⁾
MPAR-A/B3200E-M2A	10.3 (22.71) ⁽²⁾
MPAR-A/B3300E-M2A	11.1 (24.47) ⁽²⁾
MPAR-A/B3400E-M2A	11.9 (26.23) ⁽²⁾
MPAR-A/B3600E-M2A	13.5 (29.76) ⁽²⁾
MPAR-A/B3800E-M2A	15.2 (33.51) ⁽²⁾
MPAR-A/B3100H-M2A	9.3 (20.50) ⁽⁴⁾
MPAR-A/B3200H-M2A	10.1 (22.27) ⁽⁴⁾
MPAR-A/B3300H-M2A	10.9 (24.03) ⁽⁴⁾
MPAR-A/B3400H-M2A	11.7 (25.79) ⁽⁴⁾
MPAR-A/B3600H-M2A	13.4 (29.54) ⁽⁴⁾
MPAR-A/B3800H-M2A	15.0 (33.07) ⁽⁴⁾

(1) If ordering an MPAR-A/Bxxxx-V4A electric cylinder with brake, add 0.2 kg (0.4 lb).

(2) If ordering an MPAR-A/Bxxxx-M4A electric cylinder with brake, add 1.0 kg (2.2 lb).

(3) If ordering an MPAR-A/Bxxxx-V4A electric cylinder with brake, add 0.4 kg (0.9 lb).

(4) If ordering an MPAR-A/Bxxxx-M4A electric cylinder with brake, add 1.7 kg (3.7 lb).

TL-Series Electric Cylinders (weight of cylinder with non-brake motor)

Electric Cylinder Cat. No.	Weight, approx. ⁽¹⁾ kg (lb)
TLAR-A1100B-B2A	1.7 (3.75) ⁽³⁾
TLAR-A1200B-B2A	2.0 (4.41) ⁽³⁾
TLAR-A1300B-B2A	2.4 (5.29) ⁽³⁾
TLAR-A1400B-B2A	2.7 (5.95) ⁽³⁾
TLAR-A1100E-B2A	2.4 (5.29) ⁽⁴⁾
TLAR-A1200E-B2A	2.8 (6.17) ⁽⁴⁾
TLAR-A1300E-B2A	3.1 (6.83) ⁽⁴⁾
TLAR-A1400E-B2A	3.4 (7.49) ⁽⁴⁾

Electric Cylinder Cat. No.	Weight, approx. ⁽¹⁾ kg (lb)
TLAR-A2100C-B2A	3.1 (6.83)
TLAR-A2200C-B2A	3.6 (7.94)
TLAR-A2300C-B2A	4.0 (8.82)
TLAR-A2400C-B2A	4.5 (9.92)
TLAR-A2600C-B2A	5.4 (11.90)
TLAR-A2100F-B2A	3.7 (8.16)
TLAR-A2200F-B2A	4.1 (9.04)
TLAR-A2300F-B2A	4.6 (10.14)
TLAR-A2400F-B2A	5.1 (11.24)
TLAR-A2600F-B2A	6.0 (13.23)

Electric Cylinder Cat. No.	Weight, approx. ⁽²⁾ kg (lb)
TLAR-A3100E-B2A	9.5 (20.94)
TLAR-A3200E-B2A	10.3 (22.71)
TLAR-A3300E-B2A	11.1 (24.47)
TLAR-A3400E-B2A	11.9 (26.23)
TLAR-A3600E-B2A	13.5 (29.76)
TLAR-A3800E-B2A	15.2 (33.51)
TLAR-A3100H-B2A	9.3 (20.50)
TLAR-A3200H-B2A	10.1 (22.27)
TLAR-A3300H-B2A	10.9 (24.03)
TLAR-A3400H-B2A	11.7 (25.79)
TLAR-A3600H-B2A	13.4 (29.54)
TLAR-A3800H-B2A	15.0 (33.07)

(1) If ordering an TLAR-Axxxx-B4A electric cylinder with brake, add 0.4 kg (0.9 lb).

(2) If ordering an TLAR-Axxxx-B4A electric cylinder with brake, add 0.6 kg (1.3 lb).

(3) If ordering an TLAR-Axxxx-B4A electric cylinder with brake, add 0.2 kg (0.4 lb).

(4) If ordering an TLAR-Axxxx-B4A electric cylinder with brake, add 0.5 kg (1.1 lb).

Actuator Cylinders (weight of replacement cylinder)

Actuator Cylinder ⁽¹⁾ Cat. No.	Weight, approx. kg (lb)	Actuator Cylinder ⁽¹⁾ Cat. No.	Weight, approx. kg (lb)	Actuator Cylinder ⁽¹⁾ Cat. No.	Weight, approx. kg (lb)
MPAR-X1100B	1.1 (2.43)	MPAR-X2100C	1.7 (3.75)	MPAR-X3100E	3.8 (8.38)
MPAR-X1200B	1.4 (3.09)	MPAR-X2200C	2.2 (4.85)	MPAR-X3200E	4.6 (10.14)
MPAR-X1300B	1.7 (3.75)	MPAR-X2300C	2.6 (5.73)	MPAR-X3300E	5.4 (11.90)
MPAR-X1400B	2.1 (4.63)	MPAR-X2400C	3.1 (6.83)	MPAR-X3400E	6.3 (13.89)
MPAR-X1100E	1.1 (2.43)	MPAR-X2600C	4.0 (8.82)	MPAR-X3600E	7.9 (17.42)
MPAR-X1200E	1.4 (3.09)	MPAR-X2100F	1.8 (3.97)	MPAR-X3800E	9.5 (20.94)
MPAR-X1300E	1.8 (3.97)	MPAR-X2200F	2.3 (5.07)	MPAR-X3100H	3.8 (8.38)
MPAR-X1400E	2.1 (4.63)	MPAR-X2300F	2.8 (6.17)	MPAR-X3200H	4.6 (10.14)
		MPAR-X2400F	3.2 (7.05)	MPAR-X3300H	5.4 (11.90)
		MPAR-X2600F	4.2 (9.26)	MPAR-X3400H	6.3 (13.89)
				MPAR-X3600H	7.9 (17.42)
				MPAR-X3800H	9.5 (20.94)

(1) Replacement actuator cylinders apply to MP-Series and TL-Series electric cylinders. For example, if ordering a replacement cylinder for electric cylinder catalog numbers MPAR-A2100C-V2A or TLAR-A2100C-B2A, the replacement actuator cylinder catalog number is MPAR-X2100C.

MP-Series and TL-Series Electric Cylinders Mounting Accessories

Accessory	Frame	Cat. No.	Weight, approx. g (oz)	Accessory	Frame	Cat. No.	Weight, approx. g (oz)
Foot mounting	32	MPAR-NA174991	240 (8.46)	Trunnion mounting kit	32	MPAR-NA163525	210 (7.41)
	40	MPAR-NA174992	310 (10.93)		40	MPAR-NA163526	390 (13.76)
	63	MPAR-NA174993	510 (17.99)		63	MPAR-NA163528	890 (31.39)
Clevis foot	32	MPAR-NA31761	220 (7.76)	Clevis foot (right angle)	32	MPAR-NA31768	290 (10.23)
	40	MPAR-NA31762	300 (10.58)		40	MPAR-NA31769	360 (12.70)
	63	MPAR-NA31764	580 (20.46)		63	MPAR-NA31771	880 (31.0)
Flange mounting	32	MPAR-NA174376	240 (8.46)	Flange mounting (corrosion resistant)	32	MPAR-NA161846	240 (8.46)
	40	MPAR-NA174377	280 (9.88)		40	MPAR-NA161847	300 (10.58)
	63	MPAR-NA174379	690 (24.34)		63	MPAR-NA161849	710 (25.04)
Trunnion flange	32	MPAR-NA174411	130 (4.58)	Trunnion flange (corrosion resistant)	32	MPAR-NA161852	150 (5.29)
	40	MPAR-NA174412	240 (8.46)		40	MPAR-NA161853	260 (9.17)
	63	MPAR-NA174414	600 (21.16)		63	MPAR-NA161855	640 (22.57)
Trunnion support	32	MPAR-NA32959	130 (4.58)	Trunnion support (corrosion resistant)	32	MPAR-NA161874	200 (7.05)
	40	MPAR-NA32960	400 (14.11)		40	MPAR-NA161875	330 (11.64)
	63	MPAR-NA32961	480 (16.93)		63	MPAR-NA161876	440 (11.64)

MP-Series and TL-Series Electric Cylinders Rod-end Accessories

Accessory	Frame	Cat. No.	Weight, approx. g (oz)
Rod eye	32	MPAR-NE9261	70 (2.47)
	40	MPAR-NE9262	110 (3.53)
	63	MPAR-NE9263	210 (7.41)
Rod clevis	32	MPAR-NE32954	140 (4.94)
	40	MPAR-NE10767	210 (7.41)
	63	MPAR-NE10768	500 (17.64)
Rod clevis (corrosion resistant)	32	MPAR-NE13569	110 (3.88)
	40	MPAR-NE13570	180 (6.35)
	63	MPAR-NE13571	400 (14.11)
Coupling piece	32	MPAR-NE36125	110 (3.88)
	40	MPAR-NE36126	180 (6.35)
	63	MPAR-NE36127	250 (8.82)

Accessory	Frame	Cat. No.	Weight, approx. g (oz)
Rod eye (corrosion resistant)	32	MPAR-NE195582	70 (2.47)
	40	MPAR-NE195583	110 (3.53)
	63	MPAR-NE195584	210 (7.41)
Rod clevis	32	MPAR-NE6144	110 (3.88)
	40	MPAR-NE6145	170 (6.00)
	63	MPAR-NE6146	390 (13.76)
Self-aligning rod coupler	32	MPAR-NE6140	210 (7.41)
	40	MPAR-NE6141	220 (7.76)
	63	MPAR-NE6142	650 (22.93)

MP-Series and TL-Series Electric Cylinders Rod Guide Accessories

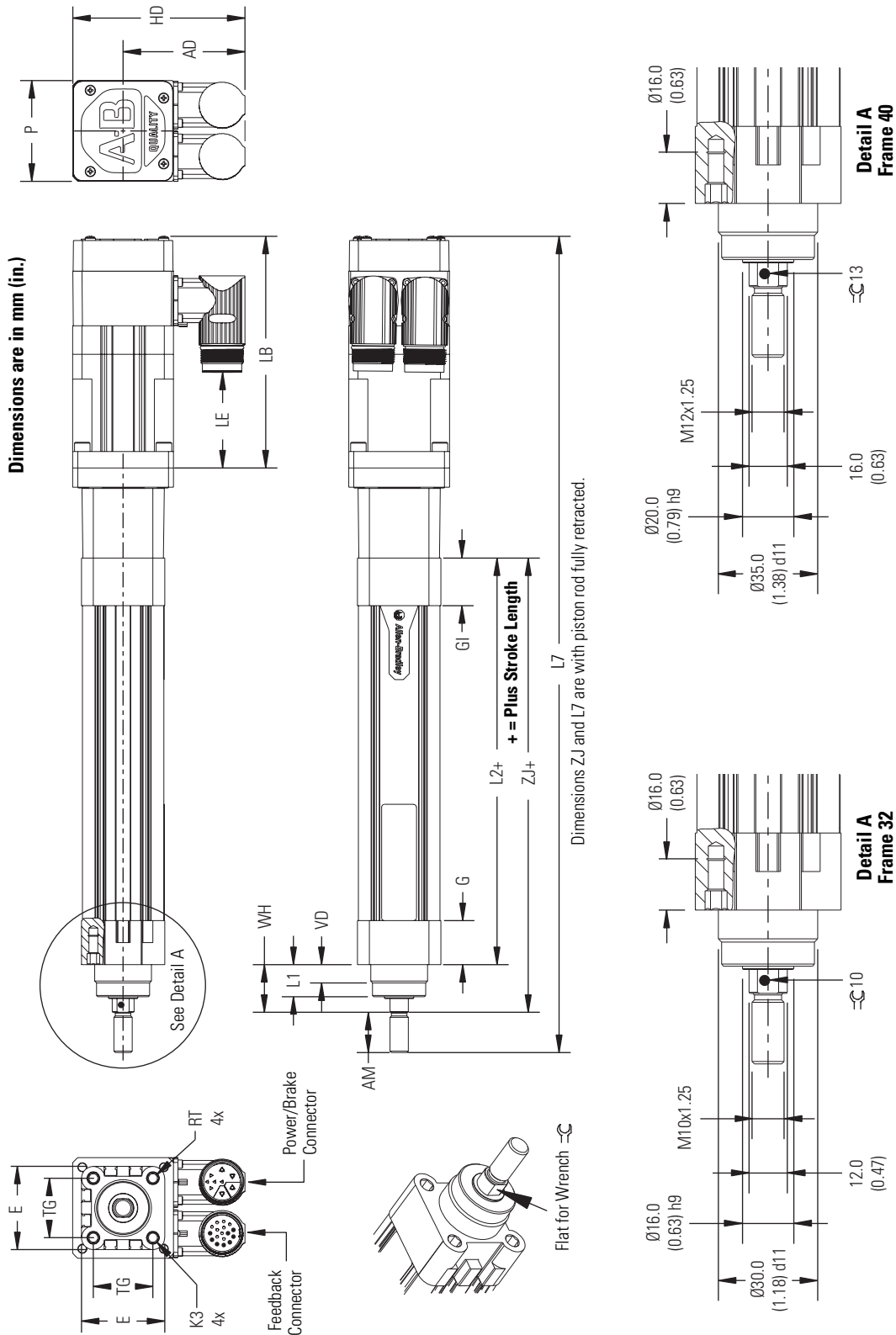
Rod Guide Cat. No.	Frame	Stroke Length mm (in.)	Weight, approx. kg (lb)
MPAR-NE34494	32	100 (3.9)	1.7 (3.75)
MPAR-NE34496		200 (7.9)	1.9 (4.19)
MPAR-NE34497		320 (12.6)	2.1 (4.63)
MPAR-NE150290		400 (15.7)	2.3 (5.07)
MPAR-NE34500	40	100 (3.9)	2.7 (5.95)
MPAR-NE34502		200 (7.9)	3.0 (6.61)
MPAR-NE34504		320 (12.6)	3.4 (7.50)
MPAR-NE150291		400 (15.7)	3.7 (8.16)
MPAR-NE34505		500 (19.7)	4.0 (8.82)
MPAR-NE34514	63	100 (3.9)	5.9 (13.01)
MPAR-NE34516		200 (7.9)	6.4 (14.11)
MPAR-NE34518		320 (12.6)	7.0 (15.43)
MPAR-NE34519		400 (15.7)	7.4 (16.31)
MPAR-NE34520		500 (19.7)	7.9 (17.42)

MP-Series and TL-Series Electric Cylinders Motor Brake Specifications

Electric Cylinder Cat. No.	Holding Force N (lb)	Coil Current at 24V DC A	Brake Response Time		
			Release ms	Engage (using external arc suppression device)	
				MOV ms	Diode ms
TLAR-A1xxxB	300 (67)	0.18...0.22	21	7	40
TLAR-A1xxxE	350 (79)	0.333...0.407	22	13	73
TLAR-A2xxxC	525 (118)				
TLAR-A2xxxF	552 (124)				
TLAR-A3xxxE	1414 (318)	0.351...0.429	42	14	86
TLAR-A3xxxH	707 (159)				
MPAR-A/B1xxxB	300 (67)	0.43...0.53	23	9	18
MPAR-A/B1xxxE	350 (79)				
MPAR-A/B2xxxC	525 (118)				
MPAR-A/B2xxxF	800 (180)	0.46...0.56	58	20	42
MPAR-A/B3xxxE	2364 (531)	0.45...0.55	50	20	110
MPAR-A/B3xxxH	1625 (365)	0.576...0.704	110	25	160

MP-Series Electric Cylinder Dimensions

MP-Series Electric Cylinders Dimensions (frame 32 and 40)



MP-Series Electric Cylinder Dimensions (frame 32)

Electric Cylinder Cat. No.	L7 (1) mm (in.)	LB (1) mm (in.)	LE (2) mm (in.)	P mm (in.)	AD mm (in.)	HD mm (in.)	AM mm (in.)	G mm (in.)	G1 mm (in.)	L1 mm (in.)	L2 mm (in.)	ZJ (3) mm (in.)	VD mm (in.)	WH mm (in.)	E mm (in.)	RT	TG mm (in.)	K3 mm (in.)
MPAR-A/B1100B-VZA	445.7 (17.55)	126.5 (4.98)	52.4 (2.06)	55.0 (2.17)	66.5 (2.62)	94.0 (3.70)	22.0 (0.87)	24.0 (0.94)	26.0 (1.02)	18.0 (0.71)	122.0 (4.80)	148.0 (5.83)	10.0 (0.39)	26.0 (1.02)	45.5 (1.79)	M6	32.5 (1.28)	6.0 (0.24)
MPAR-A/B1200B-VZA	545.7 (21.48)																	
MPAR-A/B1300B-VZA	645.7 (25.42)																	
MPAR-A/B1400B-VZA	745.7 (29.36)	151.5 (5.96)	77.2 (3.04)	55.0 (2.17)	66.5 (2.62)	94.0 (3.70)	22.0 (0.87)	24.0 (0.94)	26.0 (1.02)	18.0 (0.71)	122.0 (4.80)	148.0 (5.83)	10.0 (0.39)	26.0 (1.02)	45.5 (1.79)	M6	32.5 (1.28)	6.0 (0.24)
MPAR-A/B1100E-VZA	470.7 (18.53)																	
MPAR-A/B1200E-VZA	570.7 (22.47)																	
MPAR-A/B1300E-VZA	670.7 (26.41)	110.6 (4.35)	85.8 (3.38)	55.0 (2.17)	66.5 (2.62)	94.0 (3.70)	22.0 (0.87)	24.0 (0.94)	26.0 (1.02)	18.0 (0.71)	122.0 (4.80)	148.0 (5.83)	10.0 (0.39)	26.0 (1.02)	45.5 (1.79)	M6	32.5 (1.28)	6.0 (0.24)
MPAR-A/B1400E-VZA	770.7 (30.34)																	

(1) If ordering MPAR-A/B1 xxx-V4A actuator with brake, add 36.1 mm (1.42 in.) to dimensions L7 and LB.

(2) If ordering MPAR-A/B1 xxx-V4A actuator with brake, add 33.4 mm (1.31 in.) to dimension LE.

(3) The tolerance for this dimension is ±1.0 mm (0.039 in.).

MP-Series Electric Cylinder Dimensions (frame 40)

Electric Cylinder Cat. No.	L7 (1) mm (in.)	LB (1) mm (in.)	LE (2) mm (in.)	P mm (in.)	AD mm (in.)	HD mm (in.)	AM mm (in.)	G mm (in.)	G1 mm (in.)	L1 mm (in.)	L2 mm (in.)	ZJ (3) mm (in.)	VD mm (in.)	WH mm (in.)	E mm (in.)	RT	TG mm (in.)	K3 mm (in.)
MPAR-A/B2100C-VZA	501.2 (19.73)	151.5 (5.96)	77.2 (3.04)	55.0 (2.17)	66.5 (2.62)	94.0 (3.70)	24.0 (0.94)	28.5 (1.12)	30.0 (1.18)	21.5 (0.85)	146.5 (5.77)	176.5 (6.95)	10.5 (0.41)	30.0 (1.18)	54.0 (2.13)	M6	38.0 (1.50)	6.0 (0.24)
MPAR-A/B2200C-VZA	601.2 (23.67)																	
MPAR-A/B2300C-VZA	701.2 (27.61)																	
MPAR-A/B2400C-VZA	801.2 (31.54)	140.1 (5.52)	65.1 (2.56)	70.0 (2.76)	74.0 (2.91)	109.0 (4.29)	24.0 (0.94)	28.5 (1.12)	30.0 (1.18)	21.5 (0.85)	146.5 (5.77)	176.5 (6.95)	10.5 (0.41)	30.0 (1.18)	54.0 (2.13)	M6	38.0 (1.50)	6.0 (0.24)
MPAR-A/B2600C-VZA	1001.2 (39.42)																	
MPAR-A/B2100F-VZA	492.1 (19.37)																	
MPAR-A/B2200F-VZA	592.1 (23.31)	140.1 (5.52)	65.1 (2.56)	70.0 (2.76)	74.0 (2.91)	109.0 (4.29)	24.0 (0.94)	28.5 (1.12)	30.0 (1.18)	21.5 (0.85)	146.5 (5.77)	176.5 (6.95)	10.5 (0.41)	30.0 (1.18)	54.0 (2.13)	M6	38.0 (1.50)	6.0 (0.24)
MPAR-A/B2300F-VZA	692.1 (27.25)																	
MPAR-A/B2400F-VZA	792.1 (31.19)																	
MPAR-A/B2600F-VZA	992.1 (39.06)	110.6 (4.35)	85.8 (3.38)	70.0 (2.76)	74.0 (2.91)	109.0 (4.29)	24.0 (0.94)	28.5 (1.12)	30.0 (1.18)	21.5 (0.85)	146.5 (5.77)	176.5 (6.95)	10.5 (0.41)	30.0 (1.18)	54.0 (2.13)	M6	38.0 (1.50)	6.0 (0.24)
MPAR-A/B2100E-VZA	492.1 (19.37)																	

(1) If ordering MPAR-A/B2 xxxC-V4A actuator with brake, add 36.1 mm (1.42 in.) to dimensions L7 and LB.

If ordering MPAR-A/B2 xxxF-V4A actuator with brake, add 39.0 mm (1.54 in.) to dimensions L7 and LB.

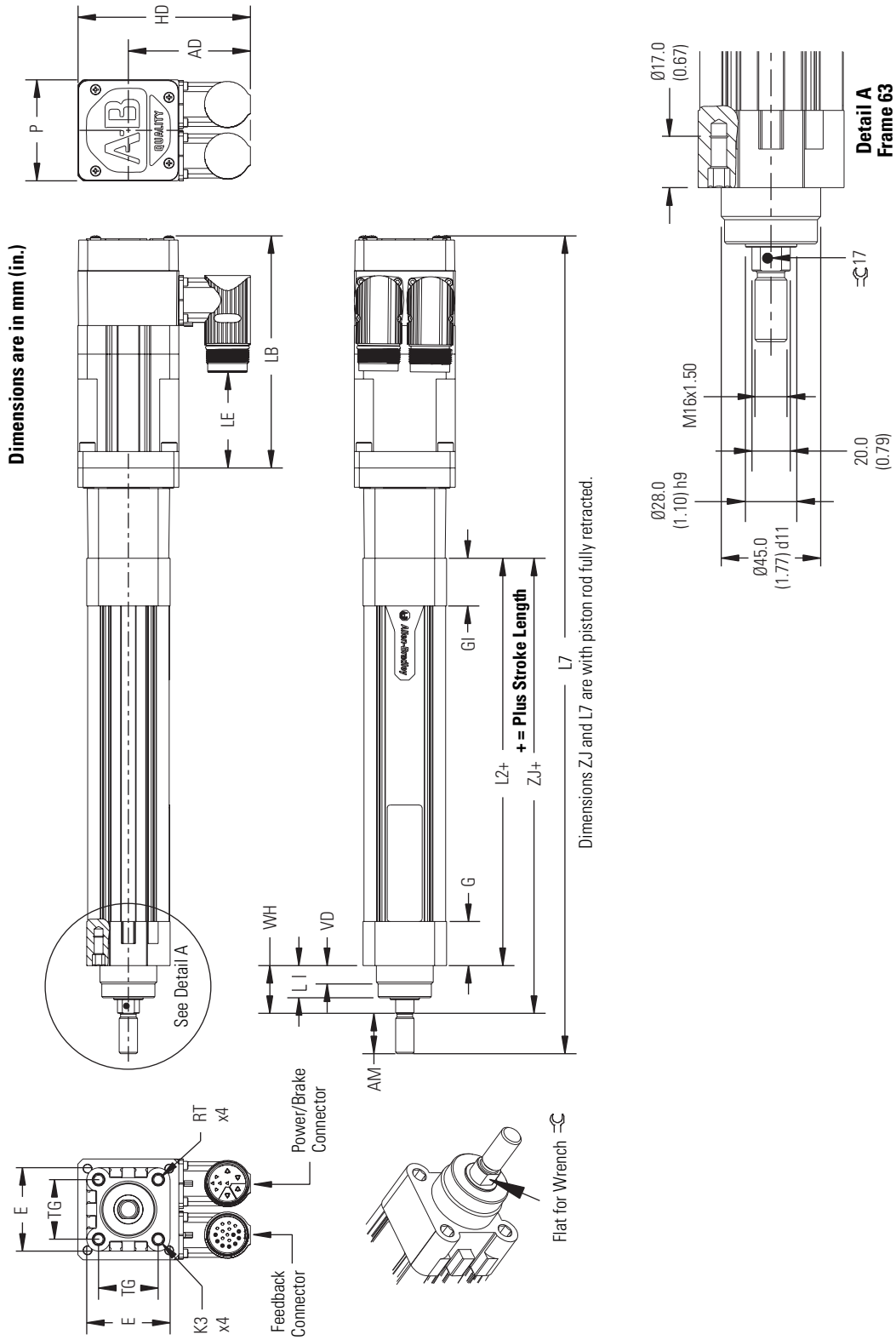
(2) If ordering MPAR-A/B2 xxxC-V4A actuator with brake, add 33.4 mm (1.31 in.) to dimension LE.

If ordering MPAR-A/B2 xxxF-V4A actuator with brake, add 24.7 mm (0.97 in.) to dimension LE.

(3) The tolerance for this dimension is ±1.0 mm (0.039 in.).

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MP-Series Electric Cylinders Dimensions (frame 63)



MP-Series Electric Cylinder Dimensions (frame 63)

Electric Cylinder Cat. No.	L7 ⁽¹⁾ mm (in.)	LB ⁽¹⁾ mm (in.)	LE ⁽²⁾ mm (in.)	P mm (in.)	AD mm (in.)	HD mm (in.)	AM mm (in.)	G mm (in.)	G1 mm (in.)	L1 mm (in.)	L2 mm (in.)	ZJ ⁽³⁾ mm (in.)	VD mm (in.)	WH mm (in.)	E mm (in.)	RT	TG mm (in.)	K3 mm (in.)
MPAR-A/B3100E-M2A	603.8 (23.77)																	
MPAR-A/B3200E-M2A	703.8 (27.71)																	
MPAR-A/B3300E-M2A	803.8 (31.65)	178.8 (7.04)	121.5 (4.78)	89.4 (3.52)	80.9 (3.19)	125.7 (4.95)												
MPAR-A/B3400E-M2A	903.8 (35.58)																	
MPAR-A/B3600E-M2A	1103.8 (43.46)																	
MPAR-A/B3800E-M2A	1303.8 (51.33)						32.0 (1.26)	34.0 (1.34)	36.0 (1.42)	28.5 (1.12)	177.0 (6.97)	214.0 (8.43)	15.0 (0.59)	37.0 (1.46)	75.5 (2.97)	M8	56.5 (2.22)	8.0 (0.31)
MPAR-A/B3100H-M2A	574.8 (22.63)																	
MPAR-A/B3200H-M2A	674.8 (26.57)																	
MPAR-A/B3300H-M2A	774.8 (30.50)	149.8 (5.90)	92.5 (3.64)	98.3 (3.87)	83.9 (3.30)	132.8 (5.23)												
MPAR-A/B3400H-M2A	874.8 (34.44)																	
MPAR-A/B3600H-M2A	1074.8 (42.31)																	
MPAR-A/B3800H-M2A	1274.8 (50.19)																	

(1) If ordering MPAR-A/B3xxxE-M4A actuator with brake, add 34.5 mm (1.36 in.) to dimensions L7 and LB.

If ordering MPAR-A/B3xxxH-M4A actuator with brake, add 48.5 mm (1.91 in.) to dimensions L7 and LB.

(2) If ordering MPAR-A/B3xxxE-M4A actuator with brake, add 34.5 mm (1.36 in.) to dimension LE.

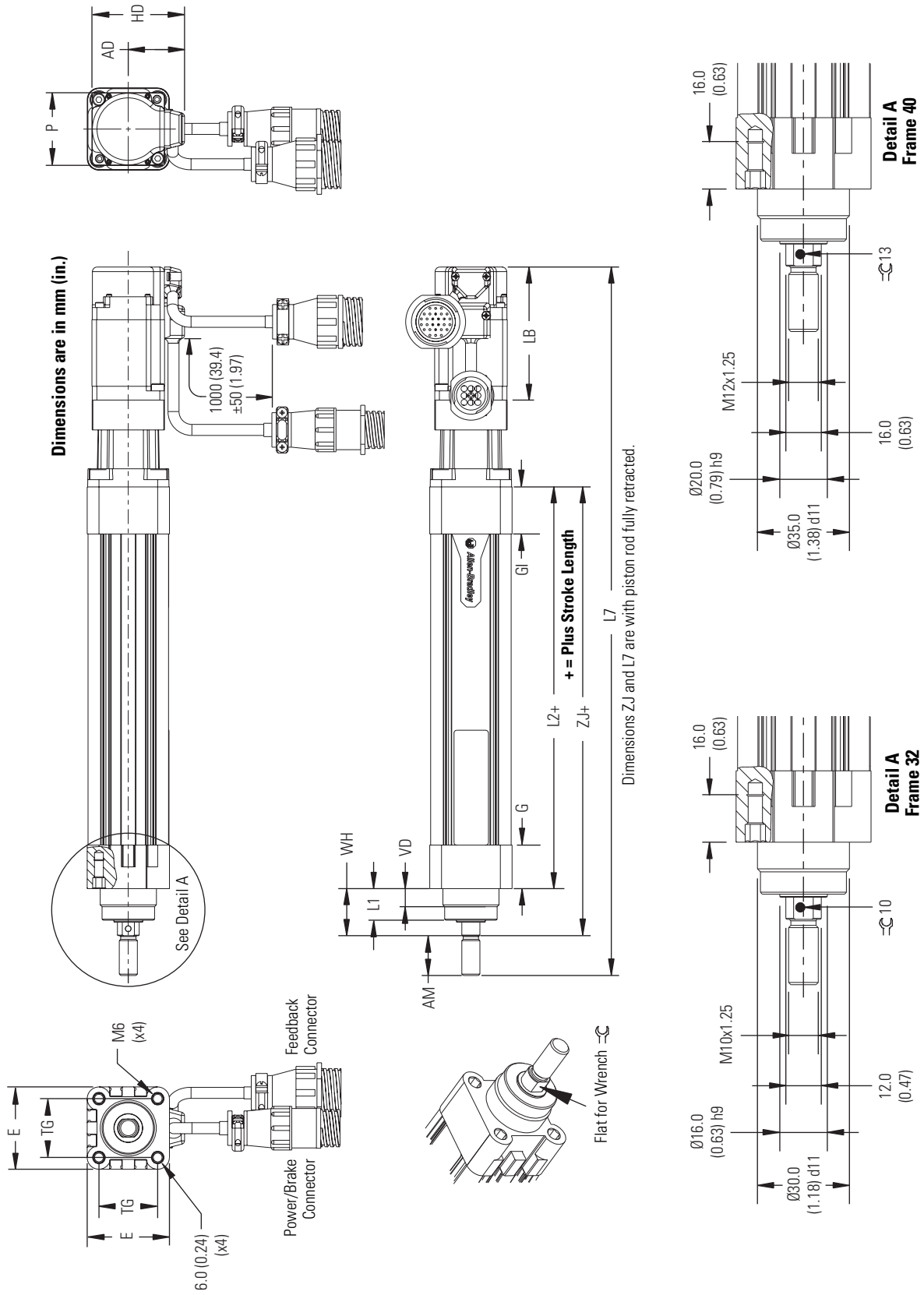
If ordering MPAR-A/B3xxxH-M4A actuator with brake, add 48.5 mm (1.91 in.) to dimension LE.

(3) The tolerance for this dimension is ±1.0 mm (0.039 in.).

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

TL-Series Electric Cylinder Dimensions

TL-Series Electric Cylinders Dimensions (frame 32 and 40)



TL-Series Electric Cylinder Dimensions (frame 32)

Electric Cylinder Cat. No.	L7 (1) mm (in.)	LB (1) mm (in.)	P mm (in.)	AD mm (in.)	HD mm (in.)	AM mm (in.)	G mm (in.)	G1 mm (in.)	L1 mm (in.)	L2 mm (in.)	ZJ (2) mm (in.)	VD mm (in.)	WH mm (in.)	E mm (in.)	RT	TG mm (in.)	K3 mm (in.)
TLAR-A1100B-B2A	391.5 (15.41)	73.5 (2.89)															
TLAR-A1200B-B2A	491.5 (19.35)		40.0 (1.57)	31.1 (1.22)	51.1 (2.01)												
TLAR-A1300B-B2A	591.5 (23.29)	76.1 (3.0)							18.0 (0.71)	122.0 (4.80)	148.0 (5.83)	10.0 (0.39)	26.0 (1.02)	45.5 (1.79)	M6	32.5 (1.28)	6.0 (0.24)
TLAR-A1400B-B2A	691.5 (27.22)																
TLAR-A1100E-B2A	405.5 (15.96)	109.1 (4.30)			73.0 (2.87)	22.0 (0.87)	24.0 (0.94)	26.0 (1.02)									
TLAR-A1200E-B2A	505.5 (19.90)		60.0 (2.36)	43.0 (1.69)													
TLAR-A1300E-B2A	605.5 (23.84)	110.7 (4.36)															
TLAR-A1400E-B2A	705.5 (27.78)																

(1) If ordering TLAR-A1 xxxB-B4A actuator with brake, add 35.6 mm (1.40 in.) to dimensions L7 and LB.

If ordering TLAR-A2 xxxE-B4A actuator with brake, add 34.6 mm (1.36 in.) to dimensions L7 and LB.

(2) The tolerance for this dimension is ±1.0 mm (0.039 in.).

TL-Series Electric Cylinder Dimensions (frame 40)

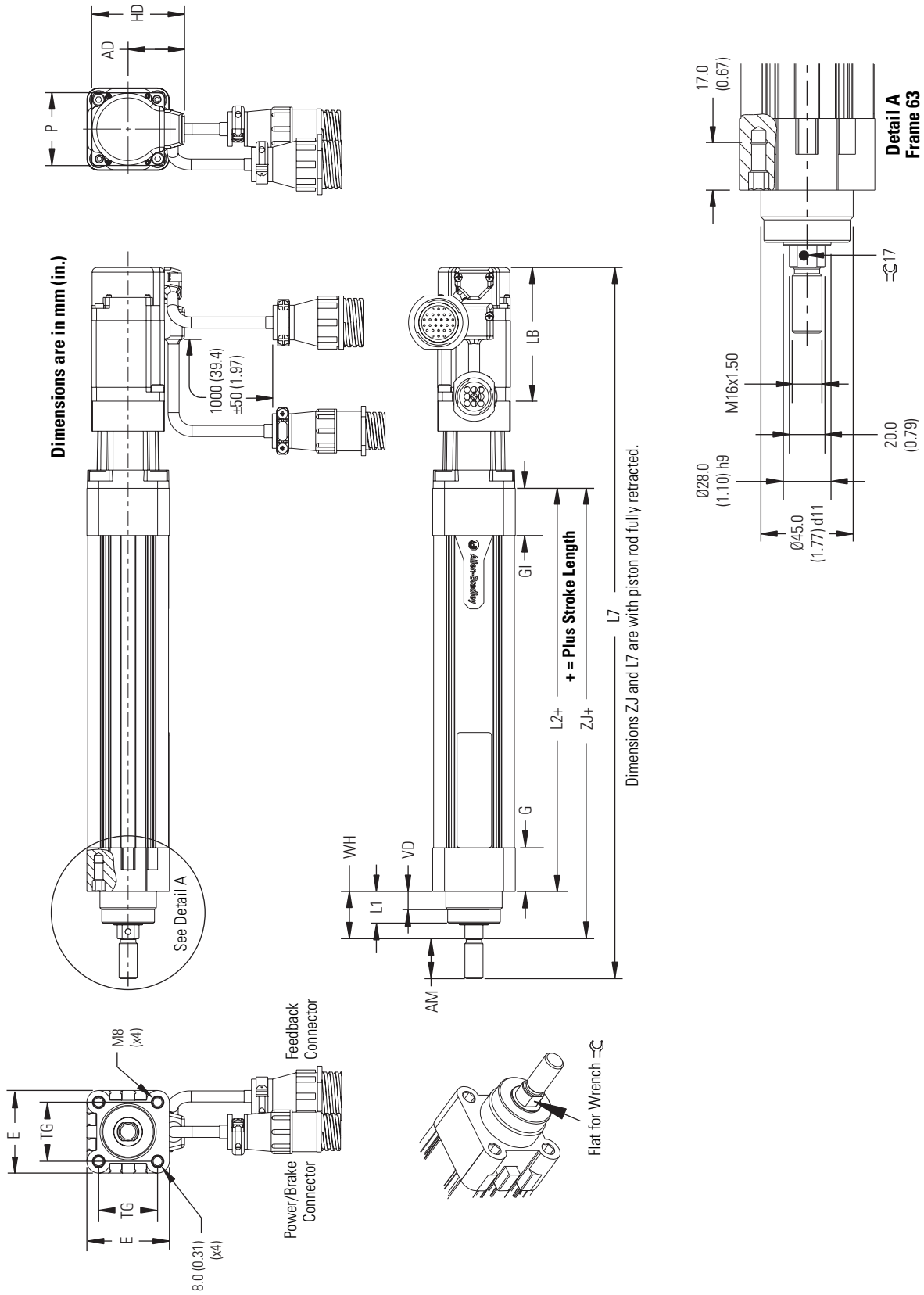
Electric Cylinder Cat. No.	L7 (1) mm (in.)	LB (1) mm (in.)	P mm (in.)	AD mm (in.)	HD mm (in.)	AM mm (in.)	G mm (in.)	G1 mm (in.)	L1 mm (in.)	L2 mm (in.)	ZJ (2) mm (in.)	VD mm (in.)	WH mm (in.)	E mm (in.)	RT	TG mm (in.)	K3 mm (in.)
TLAR-A2100C-B2A	436.0 (17.17)																
TLAR-A2200C-B2A	536.0 (21.10)																
TLAR-A2300C-B2A	636.0 (25.04)	76.1 (3.0)															
TLAR-A2400C-B2A	736.0 (28.98)																
TLAR-A2600C-B2A	936.0 (36.85)																
TLAR-A2100F-B2A	457.9 (18.03)		60.0 (2.36)	43.0 (1.69)	73.0 (2.87)	24.0 (0.94)	28.5 (1.12)	30.0 (1.18)	21.5 (0.85)	146.5 (5.77)	176.5 (6.95)	10.5 (0.41)	30.0 (1.18)	54.0 (2.13)	M6	38.0 (1.50)	6.0 (0.24)
TLAR-A2200F-B2A	557.9 (21.96)																
TLAR-A2300F-B2A	657.9 (25.90)	98.1 (3.86)															
TLAR-A2400F-B2A	757.9 (29.84)																
TLAR-A2600F-B2A	957.9 (37.71)																

(1) If ordering TLAR-A2 xxxC-B4A actuator with brake, add 36.1 mm (1.42 in.) to dimensions L7 and LB.

(2) The tolerance for this dimension is ±1.0 mm (0.039 in.).

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

TL-Series Electric Cylinders Dimensions (frame 63)



TL-Series Electric Cylinder Dimensions (frame 63)

Electric Cylinder Cat. No.	L7 (1) mm (in.)	LB (1) mm (in.)	P mm (in.)	AD mm (in.)	HD mm (in.)	AM mm (in.)	G mm (in.)	G1 mm (in.)	L1 mm (in.)	L2 mm (in.)	ZJ (2) mm (in.)	VD mm (in.)	WH mm (in.)	E mm (in.)	RT	TG mm (in.)	K3 mm (in.)
TLAR-A3100E-B2A	564.6 (22.23)																
TLAR-A3200E-B2A	664.6 (26.17)																
TLAR-A3300E-B2A	764.6 (30.10)																
TLAR-A3400E-B2A	864.6 (34.04)																
TLAR-A3600E-B2A	1064.6 (41.91)																
TLAR-A3800E-B2A	1264.6 (49.79)	144.2 (5.68)	86.0 (3.39)	56.0 (2.20)	99.0 (3.90)	32.0 (1.26)	34.0 (1.34)	36.0 (1.42)	28.5 (1.12)	177.0 (6.97)	214.0 (8.43)	15.0 (0.59)	37.0 (1.46)	75.5 (2.97)	M8	56.5 (2.22)	8.0 (0.31)
TLAR-A3100H-B2A	564.6 (22.23)																
TLAR-A3200H-B2A	664.6 (26.17)																
TLAR-A3300H-B2A	764.6 (30.10)																
TLAR-A3400H-B2A	864.6 (34.04)																
TLAR-A3600H-B2A	1064.6 (41.91)																
TLAR-A3800H-B2A	1264.6 (49.79)																

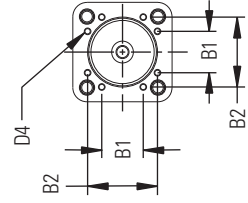
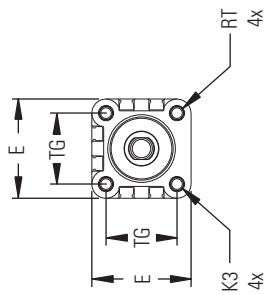
(1) If ordering TLAR-A3xxx-B4A actuator with brake, add 23.0 mm (0.91 in.) to dimensions L7 and LB.

(2) The tolerance for this dimension is ±1.0 mm (0.039 in.).

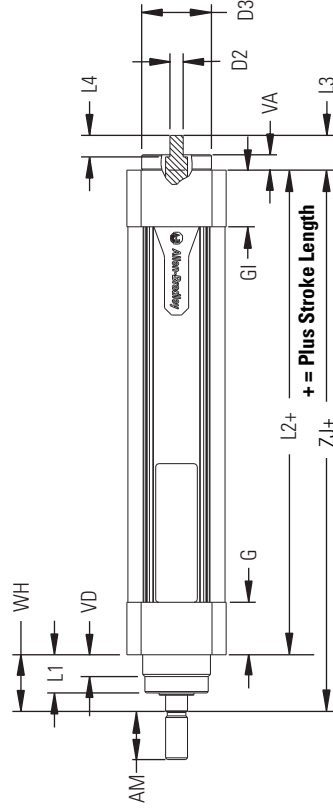
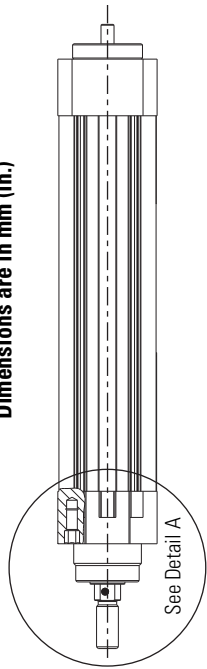
Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

Electric Cylinder Dimensions (replacement components)

Electric Cylinder Dimensions (frame 32, 40, and 63)

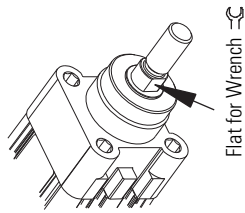


Dimensions are in mm (in.)

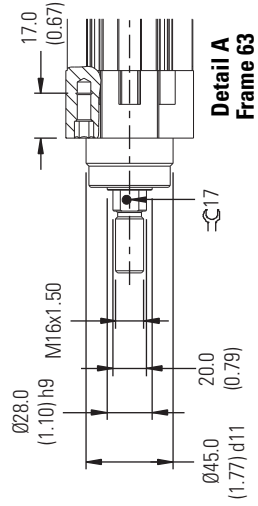
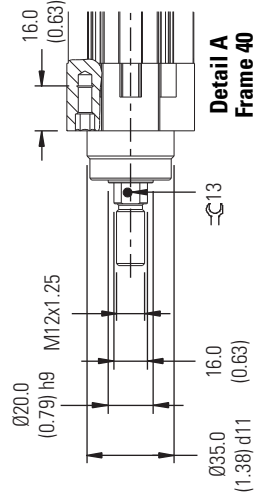
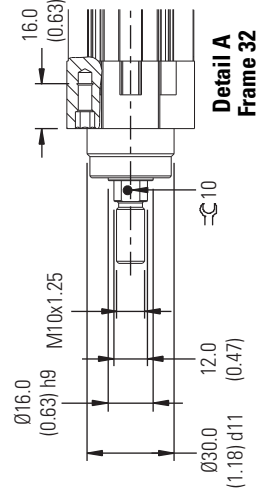


+ = Plus Stroke Length

Dimension ZJ is with piston rod fully retracted.



Flat for Wrench \approx C



Electric Cylinder Replacement Components

Electric Cylinder Cat. No. (1)	T _{Frame}	AM mm (in.)	G mm (in.)	G1 mm (in.)	L1 mm (in.)	L2 mm (in.)	L3 mm (in.)	L4 mm (in.)	ZJ (2) mm (in.)	VA mm (in.)	VD mm (in.)	WH mm (in.)	D2 mm (in.) h6	D3 mm (in.) f7	D4	B1 mm (in.)	B2 mm (in.)	E mm (in.)	RT	TG mm (in.)	K3 mm (in.)	
MPAR-X1xxB	32	22.0 (0.87)	24.0 (0.94)	26.0 (1.02)	18.0 (0.71)	122.0 (4.80)	15.9 (0.63)	8.0 (0.31)	148.0 (5.83)	7.0 (0.28)	10.0 (0.39)	26.0 (1.02)	6.0 (0.24)	32.0 (1.26)	M3	19.0 (0.75)	32.0 (1.26)	45.5 (1.79)	M6	32.5 (1.28)	6.0 (0.24)	
MPAR-X1xxE																						
MPAR-X2xxC	40	24.0 (0.94)	28.5 (1.12)	30.0 (1.18)	21.5 (0.85)	146.5 (5.77)	18.4 (0.72)	14.0 (0.55)	176.5 (6.95)	7.0 (0.28)	10.5 (0.41)	30.0 (1.18)	8.0 (0.31)	40.0 (1.57)	M4	20.0 (0.79)	42.0 (1.65)	54.0 (2.13)	M6	38.0 (1.50)	6.0 (0.24)	
MPAR-X2xxF																						
MPAR-X3xxE	63	32.0 (1.26)	34.0 (1.34)	36.0 (1.42)	28.5 (1.12)	177.0 (6.97)	23.5 (0.93)	17.0 (0.67)	214.0 (8.43)	9.0 (0.35)	15.0 (0.59)	37.0 (1.46)	12.0 (0.47)	60.0 (2.36)	M5	31.0 (1.22)	62.0 (2.44)	75.5 (2.97)	M8	56.5 (2.22)	8.0 (0.31)	
MPAR-X3xxH																						

(1) These catalog numbers apply to both MP-Series and TL-Series electric cylinders.

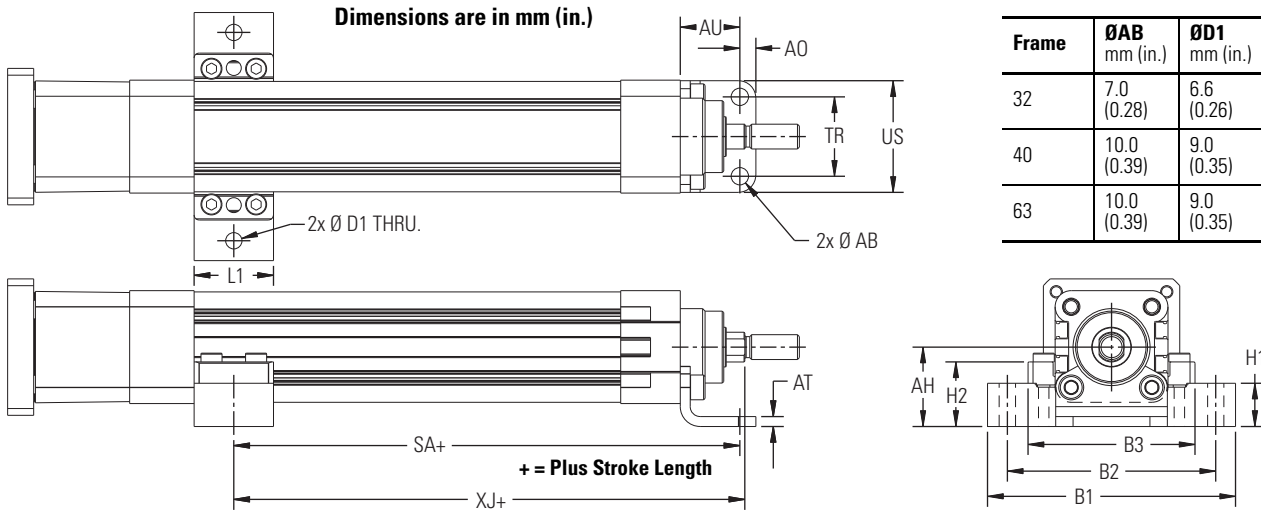
(2) The tolerance for this dimension is ±1.0 mm (0.039 in.).

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MP-Series and TL-Series Electric Cylinder Mounting Accessories

These accessories apply to MP-Series and TL-Series electric cylinders. Components are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

Foot Mounting for Axial Motor Attachment

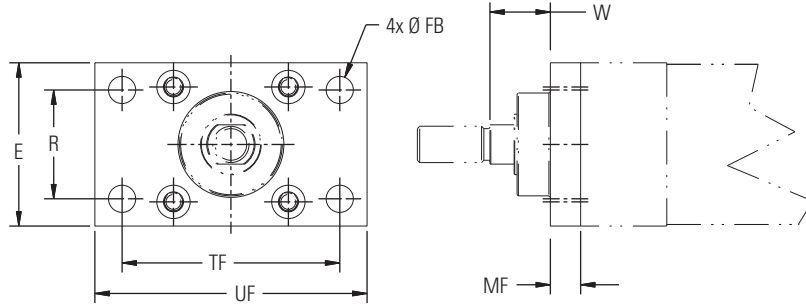


Frame	ØAB mm (in.)	ØD1 mm (in.)
32	7.0 (0.28)	6.6 (0.26)
40	10.0 (0.39)	9.0 (0.35)
63	10.0 (0.39)	9.0 (0.35)

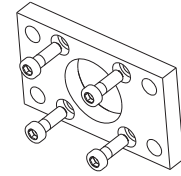
Cat. No. ⁽¹⁾	Frame	AH mm (in.)	A0 mm (in.)	AT mm (in.)	AU mm (in.)	B1 mm (in.)	B2 mm (in.)	B3 mm (in.)	H1 mm (in.)	H2 mm (in.)	TR mm (in.)	US mm (in.)	XJ mm (in.)	SA mm (in.)	L1 mm (in.)
MPAR-NA174991	32	32.0 (1.26)	6.5 (0.26)	4.0 (0.16)	24.0 (0.94)	100 (3.94)	84.0 (3.31)	66.1 (2.60)	17.5 (0.69)	26.1 (1.03)	32.0 (1.26)	45.0 (1.77)	106 (4.17)	111 (4.37)	32.0 (1.26)
MPAR-NA174992	40	36.0 (1.42)	9.0 (0.35)	4.0 (0.16)	28.0 (1.10)	130 (5.12)	108 (4.25)	85.2 (3.35)	15.7 (0.62)	23.3 (0.92)	36.0 (1.42)	54.0 (2.13)	129.5 (5.10)	133.8 (5.27)	34.0 (1.34)
MPAR-NA174993	63	50.0 (1.97)	12.5 (0.49)	5.0 (0.20)	32.0 (1.26)	150 (5.91)	128 (5.04)	104.8 (4.13)	22.9 (0.90)	30.4 (1.20)	50.0 (1.97)	75.0 (2.95)	157.5 (6.20)	158.8 (6.25)	41.0 (1.61)

(1) Material is galvanized steel and subject to low corrosion stress. Contains no copper, PTFE, or silicone.

Flange Mounting Attachment



Dimensions are in mm (in.)



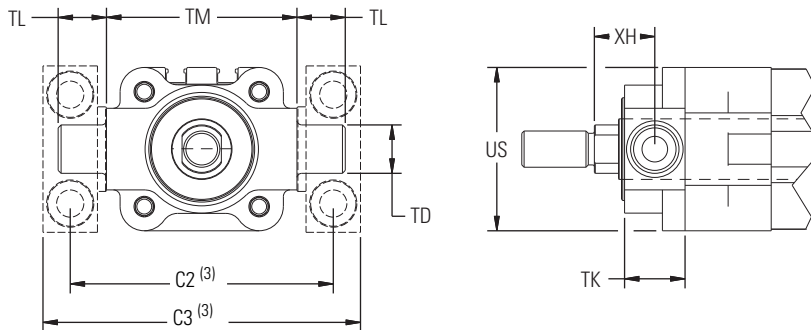
Attachment includes:
 • 1 Flange mounting
 • 4 Mounting bolts

Cat. No. (1)	Cat. No. (2) Corrosion Resistant	Frame	E mm (in.)	FB mm (in.) H13	MF mm (in.)	R mm (in.)	TF mm (in.)	UF mm (in.)	W mm (in.)
MPAR-NA174376	MPAR-NA161846	32	45.0 (1.77)	7.0 (0.28)	10.0 (0.39)	32.0 (1.26)	64.0 (2.52)	80.0 (3.15)	16.0 (0.63)
MPAR-NA174377	MPAR-NA161847	40	54.0 (2.13)	9.0 (0.35)	10.0 (0.39)	36.0 (1.42)	72.0 (2.83)	90.0 (3.54)	20.0 (0.79)
MPAR-NA174379	MPAR-NA161849	63	75.0 (2.95)	9.0 (0.35)	12.0 (0.47)	50.0 (1.97)	100 (3.94)	120 (4.72)	25.0 (0.98)

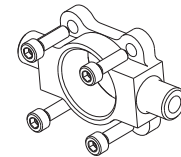
(1) Material is galvanized steel and subject to moderate corrosion stress. Contains no copper, PTFE, or silicone.

(2) Material is high-alloy steel for environments requiring higher corrosion resistance. Contains no copper, PTFE, or silicone.

Trunnion Flange Attachment



Dimensions are in mm (in.)



Attachment includes:
 • 1 Trunnion mounting
 • 4 Mounting bolts

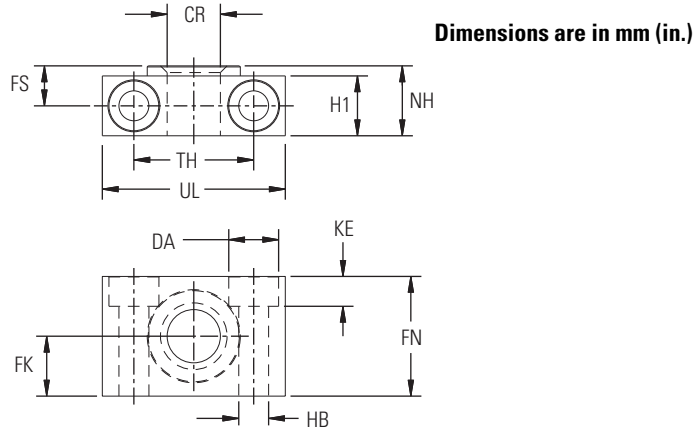
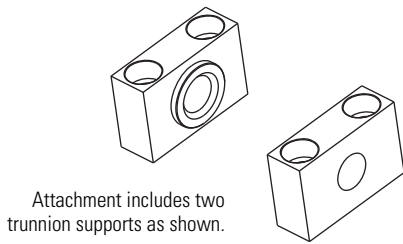
Cat. No. (1)	Cat. No. (2) Corrosion Resistant	Frame	C2 mm (in.)	C3 mm (in.)	TD mm (in.) e9	TK mm (in.)	TL mm (in.)	TM mm (in.)	US mm (in.)	XH mm (in.)
MPAR-NA174411	MPAR-NA161852	32	71.0 (2.80)	86.0 (3.39)	12.0 (0.47)	12.0 (0.47)	12.0 (0.47)	50.0 (1.97)	45.0 (1.77)	18.0 (0.71)
MPAR-NA174412	MPAR-NA161853	40	87.0 (3.43)	105 (4.13)	16.0 (0.63)	20.0 (0.79)	16.0 (0.63)	63.0 (2.48)	54.0 (2.13)	20.0 (0.79)
MPAR-NA174414	MPAR-NA161855	63	116 (4.57)	136 (5.35)	20.0 (0.79)	24.0 (0.94)	20.0 (0.79)	90.0 (3.54)	75.0 (2.95)	25.0 (0.98)

(1) Material is special steel casting and subject to moderate corrosion stress. Contains no copper, PTFE, or silicone.

(2) Material is electrolytically-polished special steel casting for environments requiring higher corrosion resistance. Contains no copper, PTFE, or silicone.

(3) These dimensions are drawn to the trunnion support attachment as shown on [page 158](#) (not included with the trunnion flange attachment).

Trunnion Support Attachments



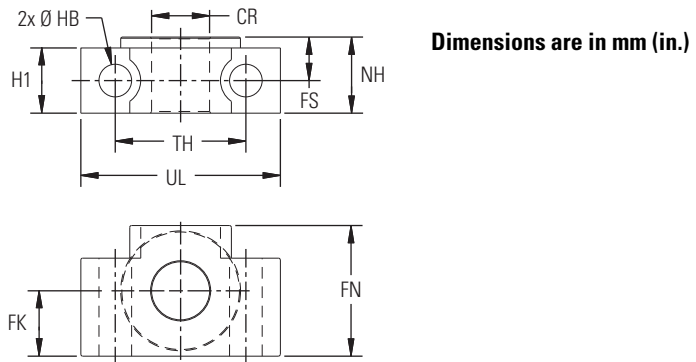
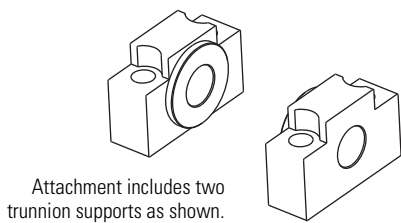
Cat. No. ⁽¹⁾	Frame	CR mm (in.) D11	DA mm (in.) H13	FK ⁽²⁾ mm (in.)	FN mm (in.)	FS mm (in.)	H1 mm (in.)	HB mm (in.) H13	KE mm (in.)	NH mm (in.)	TH ⁽³⁾ mm (in.)	UL mm (in.)
MPAR-NA32959	32	12.0 (0.47)	11.0 (0.43)	15.0 (0.59)	30.0 (1.18)	10.5 (0.41)	15.0 (0.59)	6.6 (0.26)	6.8 (0.27)	18.0 (0.71)	32.0 (1.26)	46.0 (1.81)
MPAR-NA32960	40	16.0 (0.63)	15.0 (0.59)	18.0 (0.71)	36.0 (1.42)	12.0 (0.47)	18.0 (0.71)	9.0 (0.35)	9.0 (0.35)	21.0 (0.83)	36.0 (1.42)	55.0 (2.17)
MPAR-NA32961	63	20.0 (0.79)	18.0 (0.71)	20.0 (0.79)	40.0 (1.57)	13.0 (0.51)	20.0 (0.79)	11.0 (0.43)	11.0 (0.43)	23.0 (0.91)	42.0 (1.65)	65.0 (2.56)

(1) Material is anodized aluminum and subject to moderate corrosion stress. Plain bearing: Polymer. Contains no copper, PTFE, or silicone.

(2) Tolerance for this dimension is ±0.1 mm (±0.0039 in.).

(3) Tolerance for this dimension is ±0.2 mm (±0.0079 in.).

Trunnion Support (corrosion resistant) Attachments



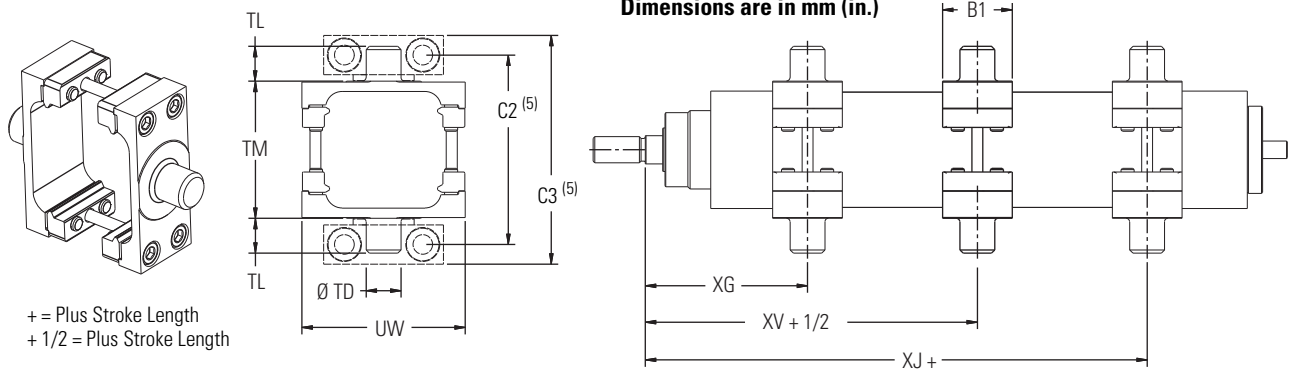
Cat. No. ⁽¹⁾	Frame	CR mm (in.) D11	FK ⁽²⁾ mm (in.)	FN mm (in.)	FS mm (in.)	H1 mm (in.)	HB mm (in.) H13	NH mm (in.)	TH ⁽³⁾ mm (in.)	UL mm (in.)
MPAR-NA161874	32	12.0 (0.47)	15.0 (0.59)	30.0 (1.18)	10.5 (0.41)	15.0 (0.59)	6.6 (0.26)	6.8 (0.27)	18.0 (0.71)	32.0 (1.26)
MPAR-NA161875	40	16.0 (0.63)	18.0 (0.71)	36.0 (1.42)	12.0 (0.47)	18.0 (0.71)	9.0 (0.35)	9.0 (0.35)	21.0 (0.83)	36.0 (1.42)
MPAR-NA161876	63	20.0 (0.79)	20.0 (0.79)	40.0 (1.57)	13.0 (0.51)	20.0 (0.79)	11.0 (0.43)	11.0 (0.43)	23.0 (0.91)	42.0 (1.65)

(1) Material is high-alloy steel for environments requiring higher corrosion resistance. Contains no copper, PTFE, or silicone.

(2) Tolerance for this dimension is ±0.1 mm (±0.0039 in.).

(3) Tolerance for this dimension is ±0.2 mm (±0.0079 in.).

Trunnion Mounting Kit

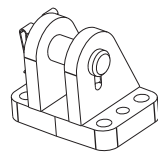


+ = Plus Stroke Length
+ 1/2 = Plus Stroke Length

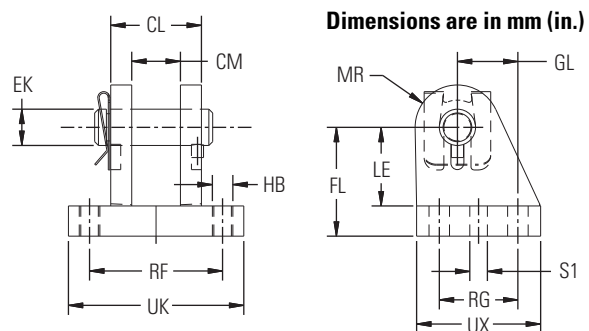
Cat. No. (1) (2)	Frame	B1 mm (in.)	C2 mm (in.)	C3 mm (in.)	TD mm (in.) e9	TL mm (in.)	TM mm (in.)	UW mm (in.)	XG mm (in.)	XJ mm (in.)	XV mm (in.)	Tightening Torque Nm (lb-in)
MPAR-NA163525	32	30.0 (1.18)	71.0 (2.80)	86.0 (3.39)	12.0 (0.47)	12.0 (0.47)	50.0 (1.97)	65.0 (2.56)	65.0 (2.56)	107 (4.21)	86.0 (3.39)	4.0 (35.4) (3)
MPAR-NA163526	40	32.0 (1.26)	87.0 (3.43)	105 (4.13)	16.0 (0.63)	16.0 (0.63)	63.0 (2.48)	75.0 (2.95)	74.5 (2.93)	130.5 (5.14)	102.5 (4.04)	8.0 (70.7) (3)
MPAR-NA163528	63	41.0 (1.61)	116 (4.57)	136 (5.35)	20.0 (0.79)	20.0 (0.79)	90.0 (3.54)	105 (4.13)	91.5 (3.60)	157.5 (6.20)	124.5 (4.90)	18.0 (159) (4)

- (1) Material is tempered steel and subject to moderate corrosion stress.
- (2) You can attach the trunnion mounting kit anywhere along the cylinder barrel.
- (3) Tolerance for this tightening torque value is +1.0 Nm (+8.8 lb-in).
- (4) Tolerance for this tightening torque value is +2.0 Nm (+17.7 lb-in).
- (5) These dimensions are drawn to the trunnion support attachment as shown on [page 158](#) (not included with the trunnion flange attachment).

Clevis Foot Attachment



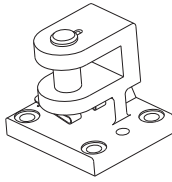
- Attachment includes:
- 1 Clevis foot
 - 1 Pivot pin (2)
 - 1 Retaining clips



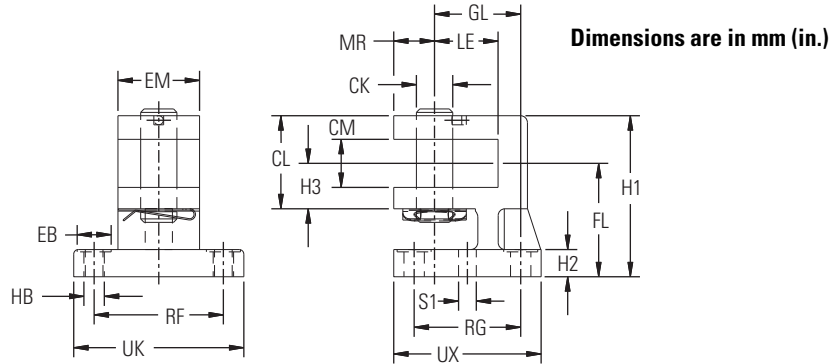
Cat. No. (1)	Frame	CL mm (in.)	CM mm (in.)	EK mm (in.)	FL mm (in.)	GL mm (in.)	HB mm (in.)	LE mm (in.)	MR mm (in.)	RF mm (in.)	RG mm (in.)	S1 mm (in.)	UK mm (in.)	UX mm (in.)
MPAR-NA31761	32	28.0 (1.10)	14.1 (0.56)	10.0 (0.39)	32.0 (1.26)	16.0 (0.63)	6.8 (0.27)	24.0 (0.94)	12.0 (0.47)	42.0 (1.65)	20.0 (0.79)	4.8 (0.19)	56.0 (2.20)	36.0 (1.42)
MPAR-NA31762	40	30.0 (1.18)	16.1 (0.63)	12.0 (0.47)	36.0 (1.42)	20.0 (0.79)	6.8 (0.27)	26.0 (1.02)	14.0 (0.55)	44.0 (1.73)	26.0 (1.02)	5.8 (0.23)	58.0 (2.28)	41.5 (1.63)
MPAR-NA31764	63	40.0 (1.57)	21.1 (0.83)	16.0 (0.63)	50.0 (1.97)	25.0 (0.98)	9.0 (0.35)	38.0 (1.50)	17.0 (0.67)	56.0 (2.20)	31.0 (1.22)	7.8 (0.31)	70.0 (2.76)	47.0 (1.85)

- (1) Material is nodular graphite cast iron for environments requiring moderate corrosion resistance. Contains no copper, PTFE, or silicone.
- (2) The pivot pin is secured against rotation with a dowel pin.

Clevis Foot (right-angle) Attachment



- Attachment includes:
- 1 Clevis foot
 - 1 Pivot pin ⁽⁵⁾
 - 1 Retaining clip



Cat. No. ⁽¹⁾	Frame	CK mm (in.) h9	CL mm (in.)	CM ⁽²⁾ mm (in.)	EB mm (in.)	EM mm (in.)	FL ⁽³⁾ mm (in.)	GL ⁽³⁾ mm (in.)	H1 ⁽⁴⁾ mm (in.)	H2 mm (in.)	H3 mm (in.)	HB mm (in.)	LE mm (in.)
MPAR-NA31768	32	10.0 (0.39)	27.0 (1.06)	14.2 (0.56)	11.0 (0.43)	25.0 (0.98)	32.0 (1.26)	22.0 (0.87)	45.0 (1.77)	9.0 (0.35)	14.0 (0.55)	6.6 (0.26)	18.0 (0.71)
MPAR-NA31769	40	12.0 (0.47)	31.0 (1.22)	16.2 (0.64)	11.0 (0.43)	25.0 (0.98)	36.0 (1.42)	22.0 (0.87)	52.0 (2.05)	9.0 (0.35)	15.0 (0.59)	6.6 (0.26)	22.0 (0.87)
MPAR-NA31771	63	16.0 (0.63)	41.0 (1.61)	21.2 (0.83)	15.0 (0.59)	36.0 (1.42)	50.0 (1.97)	38.0 (1.50)	71.0 (2.80)	12.0 (0.47)	20.0 (0.79)	9.0 (0.35)	28.0 (1.10)

- (1) Material is nodular graphite cast iron for environments requiring moderate corrosion resistance.
 (2) Tolerance for this dimension is +0.2 mm (+0.008 in.).
 (3) Tolerance for this dimension is ±0.3 mm (±0.012 in.) for Frame 32. Tolerance is js14 for Frame 40 and Frame 63.
 (4) Tolerance for this dimension is ±0.5 mm (±0.019 in.) for Frame 32 and Frame 40.
 (5) The pivot pin is secured against rotation with a dowel pin.

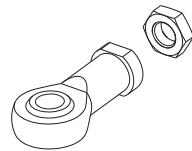
Cat. No.	Frame	MR mm (in.)	RF ⁽¹⁾ mm (in.)	RG ⁽¹⁾ mm (in.)	S1 mm (in.)	UK mm (in.)	UX mm (in.)
MPAR-NA31768	32	12.5 (0.49)	40.0 (1.57)	29.0 (1.14)	4.8 (0.19)	56.0 (2.20)	45.0 (1.77)
MPAR-NA31769	40	15.0 (0.59)	40.0 (1.57)	29.0 (1.14)	5.8 (0.23)	56.0 (2.20)	45.0 (1.77)
MPAR-NA31771	63	18.0 (0.71)	57.0 (2.24)	47.0 (1.85)	7.8 (0.31)	75.0 (2.95)	65.0 (2.56)

- (1) Tolerance for this dimension is ±0.3 mm (±0.012 in.) for Frame 32. Tolerance is js14 for Frame 40 and Frame 63.

MP-Series and TL-Series Electric Cylinder Rod-end Accessories

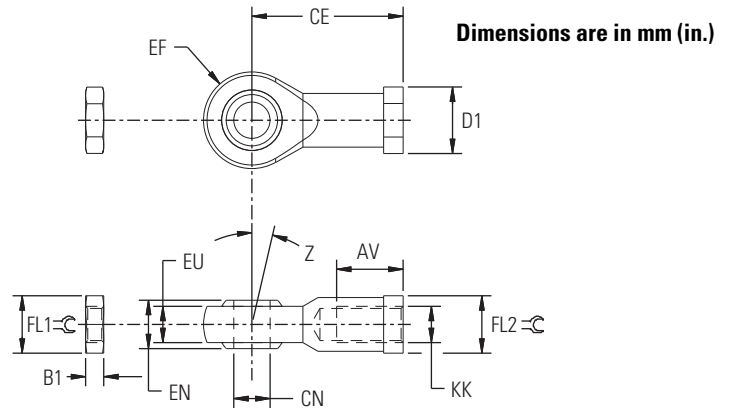
These accessories apply to MP-Series and TL-Series electric cylinders. Components are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

Rod-eye Attachment



Attachment includes:

- 1 Rod eye
- 1 Hex nut



Cat. No. ⁽¹⁾	Cat. No. ⁽²⁾ Corrosion Resistant	Frame	AV ⁽³⁾ mm (in.)	B1 mm (in.)	CE mm (in.)	CN mm (in.)	D1 mm (in.)	EF ⁽⁴⁾ mm (in.)	EN mm (in.)	EU mm (in.)	Z angle	FL1 mm ≅	FL2 mm ≅	KK
MPAR-NE9261	MPAR-NE195582	32	20.0 (0.79)	5.0 (0.20)	43.0 (1.69)	10.0 (0.39)	19.0 (0.75)	14.0 (0.55)	14.0 (0.55)	10.5 (0.41)	13°	17	17	M10x1.25
MPAR-NE9262	MPAR-NE195583	40	22.0 (0.87)	6.0 (0.24)	50.0 (1.97)	12.0 (0.47)	22.0 (0.87)	16.0 (0.63)	16.0 (0.63)	12.0 (0.47)	13°	19	19	M12x1.25
MPAR-NE9263	MPAR-NE195584	63	28.0 (1.10)	8.0 (0.31)	64.0 (2.52)	16.0 (0.63)	27.0 (1.06)	21.0 (0.83)	21.0 (0.83)	15.0 (0.59)	15°	24	22	M16x1.50

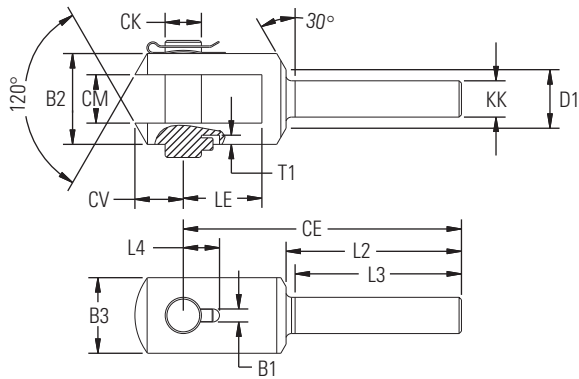
(1) Material is galvanized steel and subject to moderate corrosion stress. Contains no copper, PTFE, or silicone.

(2) Material is high-alloy steel for environments requiring higher corrosion resistance. Contains no copper, PTFE, or silicone.

(3) Tolerance for this dimension is -2.0 mm (-0.079 in.).

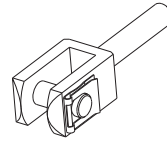
(4) Tolerance for this dimension is ±0.5 mm (±0.020 in.).

Rod Clevis Attachment

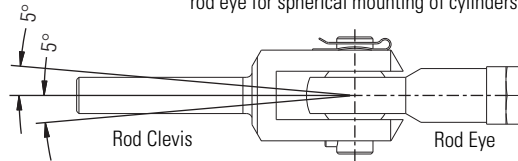


Dimensions are in mm (in.)

- Attachment includes:
- 1 Rod clevis
 - 1 Pivot pin ⁽²⁾
 - 1 Retaining clip



Use the rod clevis in combination with the rod eye for spherical mounting of cylinders.

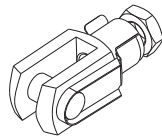


Cat. No. ⁽¹⁾	Frame	B1 mm (in.)	B2 mm (in.) d12	B3 mm (in.)	CE mm (in.)	CK mm (in.) F7/h9	CM mm (in.) B12	CV mm (in.)	D1 mm (in.)	L2 mm (in.)	L3 mm (in.)	L4 mm (in.)	LE mm (in.)	T1 mm (in.)	KK
MPAR-NE32954	32	3.3 (0.13)	28.0 (1.10)	20.0 (0.79)	78.0 (3.07)	10.0 (0.39)	14.0 (0.55)	12.0 (0.47)	18.0 (0.71)	53.0 (2.09)	50.0 (1.97)	11.0 (0.43)	20.0 (0.79)	3.0 (0.12)	M10x1.25
MPAR-NE10767	40	4.3 (0.17)	30.0 (1.18)	25.0 (0.98)	92.0 (3.62)	12.0 (0.47)	16.0 (0.63)	16.0 (0.63)	19.0 (0.75)	58.0 (2.28)	55.0 (2.17)	12.0 (0.47)	26.0 (1.02)	3.0 (0.12)	M12x1.25
MPAR-NE10768	63	4.3 (0.17)	40.0 (1.57)	35.0 (1.38)	108 (4.25)	16.0 (0.63)	21.0 (0.83)	21.0 (0.83)	24.0 (0.94)	65.0 (2.56)	62.0 (2.44)	14.0 (0.55)	31.0 (1.22)	3.0 (0.12)	M16x1.50

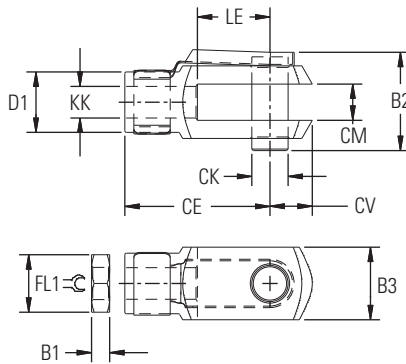
(1) Material is galvanized steel and subject to moderate corrosion stress. Contains no copper, PTFE, or silicone.

(2) The pivot pin is secured against rotation with a dowel pin.

Rod Clevis Attachment



- Attachment includes:
- 1 Rod clevis
 - 1 Hinged spring pin
 - 1 Hex nut



Dimensions are in mm (in.)

Cat. No. ⁽¹⁾	Frame	B1 mm (in.)	B2 mm (in.)	B3 mm (in.)	CE ⁽²⁾ mm (in.)	CK ⁽³⁾ mm (in.)	CM mm (in.)	CV mm (in.)	D1 mm (in.)	LE ⁽⁴⁾ mm (in.)	FL1 mm ⌀	KK
MPAR-NE6144	32	5.0 (0.20)	26.0 (1.02)	20.0 (0.79)	40.0 (1.57)	10.0 (0.39)	10.0 ⁽⁵⁾ (0.39)	12.0 (0.47)	18.0 (0.71)	20.0 (0.79)	17	M10x1.25
MPAR-NE6145	40	6.0 (0.24)	31.0 (1.22)	24.0 (0.94)	48.0 (1.89)	12.0 (0.47)	12.0 ⁽⁶⁾ (0.47)	14.0 (0.55)	20.0 (0.79)	24.0 (0.94)	19	M12x1.25
MPAR-NE6146	63	8.0 (0.31)	39.0 (1.54)	32.0 (1.26)	64.0 (2.52)	16.0 (0.63)	16.0 ⁽⁶⁾ (0.63)	19.0 (0.75)	26.0 (1.02)	32.0 (1.26)	24	M16x1.50

(1) Material is galvanized steel and subject to moderate corrosion stress. Contains no copper, PTFE, or silicone.

(2) Tolerance for this dimension is ±0.4 (0.016 in.).

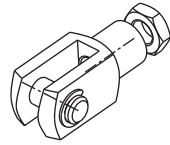
(3) Tolerance for this dimension is H9.

(4) Tolerance for this dimension is ±0.5 (0.019 in.).

(5) Tolerance for this dimension is B13.

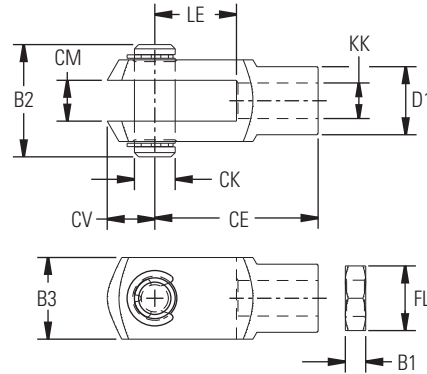
(6) Tolerance for this dimension is a range between +0.7...+0.15 mm (+0.027...0.006 in.).

Rod Clevis Attachment (corrosion resistant)



Attachment includes:

- 1 Rod clevis
- 1 Pivot pin
- 1 Hex nut



Dimensions are in mm (in.)

Cat. No. (1)	Frame	B1 mm (in.)	B2 mm (in.)	B3 mm (in.)	CE (2) mm (in.)	CK mm (in.) H9	CM mm (in.)	CV mm (in.)	D1 mm (in.)	LE (3) mm (in.)	FL1 mm ⌀	KK
MPAR-NE13569	32	5.0 (0.20)	27.0 (1.06)	20.0 (0.79)	40.0 (1.57)	10.0 (0.39)	10.0 (4) (0.39)	12.0 (0.47)	18.0 (0.71)	20.0 (0.79)	16	M10x1.25
MPAR-NE13570	40	6.0 (0.24)	33.0 (1.30)	24.0 (0.94)	48.0 (1.89)	12.0 (0.47)	12.0 (5) (0.47)	14.0 (0.55)	20.0 (0.79)	24.0 (0.94)	18	M12x1.25
MPAR-NE13571	63	8.0 (0.31)	43.0 (1.69)	32.0 (1.26)	64.0 (2.52)	16.0 (0.63)	16.0 (5) (0.63)	19.0 (0.75)	26.0 (1.02)	32.0 (1.26)	24	M16x1.50

(1) Material is high-alloy steel for environments requiring higher corrosion resistance. Contains no copper, PTFE, or silicone.

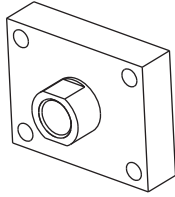
(2) Tolerance for this dimension is ±0.4 (0.016 in.).

(3) Tolerance for this dimension is ±0.5 (0.019 in.).

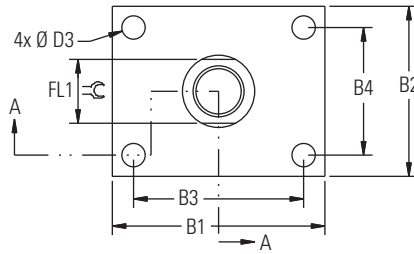
(4) Tolerance for this dimension is B13.

(5) Tolerance for this dimension is a range between +0.7...+0.15 mm (+0.027...0.006 in.).

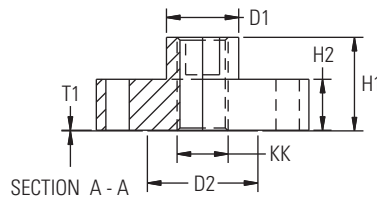
Coupling Piece Attachment



- Attachment includes:
- 1 Flange plate
 - 1 Threaded coupling



Dimensions are in mm (in.)



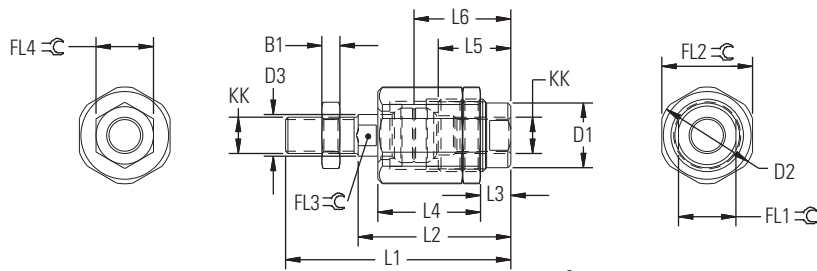
Cat. No. (1) (2)	Frame	B1 mm (in.)	B2 mm (in.)	B3 mm (in.)	B4 mm (in.)	D1 (3) mm (in.)	D2 mm (in.)	D3 mm (in.) H13	H1 mm (in.)	H2 mm (in.)	T1 mm (in.)	FL1 mm ⌀	KK
MPAR-NE36125	32	40.0 (1.57)	35.0 (1.38)	30.0 (1.18)	25.0 (0.98)	17.0 (0.67)	26.0 (1.02)	5.5 (0.22)	20.0 (0.79)	10.0 (0.39)	0.10 (0.004)	15	M10x1.25
MPAR-NE36126	40	50.0 (1.97)	40.0 (1.57)	40.0 (1.57)	30.0 (1.18)	17.0 (0.67)	26.0 (1.02)	5.5 (0.22)	22.0 (0.87)	12.0 (0.47)	0.10 (0.004)	15	M12x1.25
MPAR-NE36127	63	60.0 (2.36)	45.0 (1.77)	48.0 (1.89)	33.0 (1.30)	22.0 (0.87)	34.0 (1.34)	6.6 (0.26)	25.0 (0.98)	12.0 (0.47)	0.10 (0.004)	19	M16x1.50

(1) Material is galvanized steel and subject to moderate corrosion stress. Contains no copper, PTFE, or silicone.

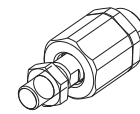
(2) Coupling is for non-rotating piston rods with male threads. You can use these coupling pieces to connect a cylinder with a non-rotating piston rod to another component with a defined orientation, without rotating either the cylinder or the other component.

(3) Tolerance for this dimension is -0.2 mm (-0.008 in.).

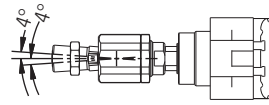
Self-aligning Rod Coupler Attachment



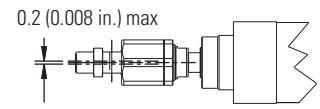
Dimensions are in mm (in.)



- Attachment includes:
- 1 Self-aligning rod coupler
 - 1 Hex nut



Angular Compensation



Radial Compensation of Central Axis

Cat. No. (1)	Frame	B1 mm (in.)	D1 mm (in.)	D2 mm (in.)	D3 mm (in.)	L1 mm (in.)	L2 mm (in.)	L3 mm (in.)	L4 mm (in.)	L5 mm (in.)	L6 mm (in.)
MPAR-NE6140	32	5.0 (0.20)	21.4 (0.84)	32.0 (1.26)	13.8 (0.54)	69.5 (2.74)	49.5 (1.95)	9.0 (0.35)	34.0 (1.34)	23.0 (0.91)	31.0 (1.22)
MPAR-NE6141	40	6.0 (0.24)	21.4 (0.84)	32.0 (1.26)	13.8 (0.54)	74.5 (2.93)	50.5 (1.99)	10.0 (0.39)	34.0 (1.34)	24.0 (0.94)	32.0 (1.26)
MPAR-NE6142	63	8.0 (0.31)	33.8 (1.33)	45.0 (1.77)	22.0 (0.87)	103 (4.06)	71.0 (2.80)	10.0 (0.39)	53.0 (2.09)	32.0 (1.26)	44.5 (1.75)

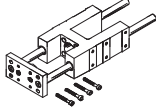
Cat. No. (1)	Frame	FL1 mm ⌀	FL2 mm ⌀	FL3 mm ⌀	FL4 mm ⌀	Radial Deviation mm (in.)	KK
MPAR-NE6140	32	19	30	12	17	±0.7 (±0.027)	M10x1.25
MPAR-NE6141	40	19	30	12	19	±0.7 (±0.027)	M12x1.25
MPAR-NE6142	63	30	41	19	24	±1.0 (±0.039)	M16x1.50

(1) Material is galvanized steel and subject to moderate corrosion stress. Contains no copper, PTFE, or silicone.

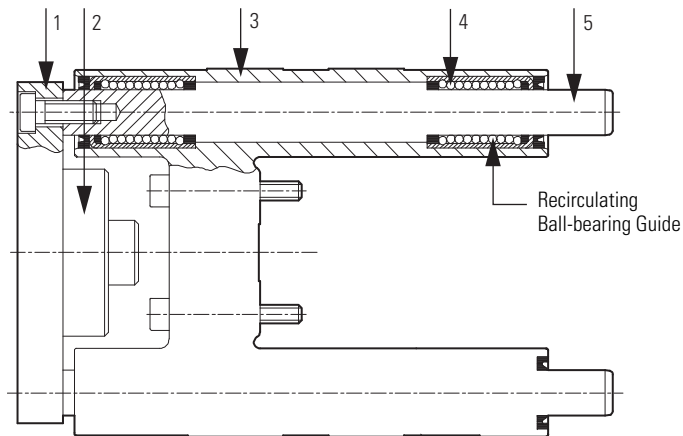
MP-Series and TL-Series Electric Cylinder Rod Guide Specifications

Rod guides protect ISO standard cylinders from torsion when subjected to radial or torsional side loads. They provide high-precision guidance for workpiece handling and other handling applications.

Rod Guides for Fixed Strokes

Rod Guide	Cat. No. Frame 32	Stroke mm (in.)	Cat. No. Frame 40	Stroke mm (in.)	Cat. No. Frame 63	Stroke mm (in.)
	MPAR-NE34494	10...100 (0.39...3.94)	MPAR-NE34500	10...100 (0.39...3.94)	MPAR-NE34514	10...100 (0.39...3.94)
	MPAR-NE34496	10...200 (0.39...7.87)	MPAR-NE34502	10...200 (0.39...7.87)	MPAR-NE34516	10...200 (0.39...7.87)
	MPAR-NE34497	10...320 (0.39...12.60)	MPAR-NE34504	10...320 (0.39...12.60)	MPAR-NE34518	10...320 (0.39...12.60)
	MPAR-NE150290	10...400 (0.39...15.75)	MPAR-NE150291	10...400 (0.39...15.75)	MPAR-NE34519	10...400 (0.39...15.75)
			MPAR-NE34505	10...500 (0.39...19.68)	MPAR-NE34520	10...500 (0.39...19.68)

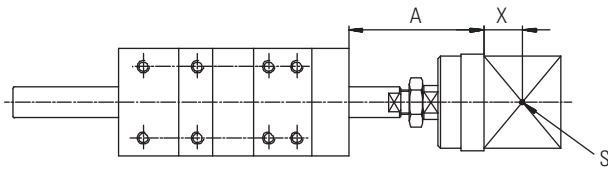
Material Specifications



Item	Attribute	Value ⁽¹⁾
1	Yoke Plate	Aluminium
2	Coupling	Steel
3	Guide	Aluminium
4	Bearing	Steel
5	Guide Rods	Steel

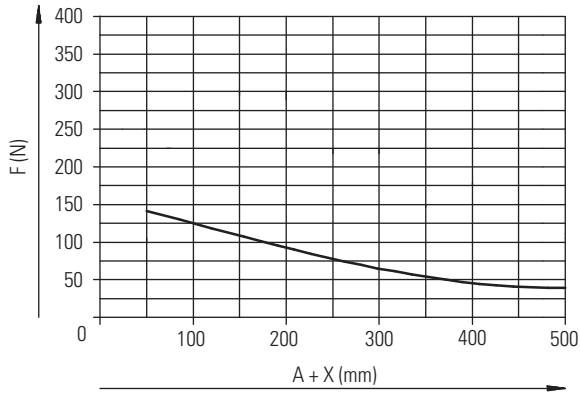
(1) Contains no copper, PTFE, or silicone.

Maximum Working Load (F) as a Function of Cantilever Extension A

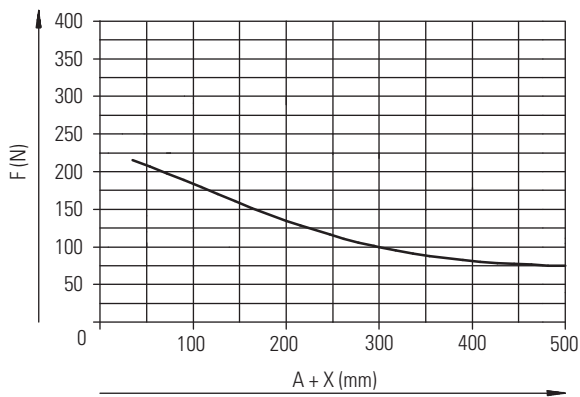


A = Cantilever Extension
 X = Distance for Center of Gravity of Working Load
 S = Center of Gravity of Working Load

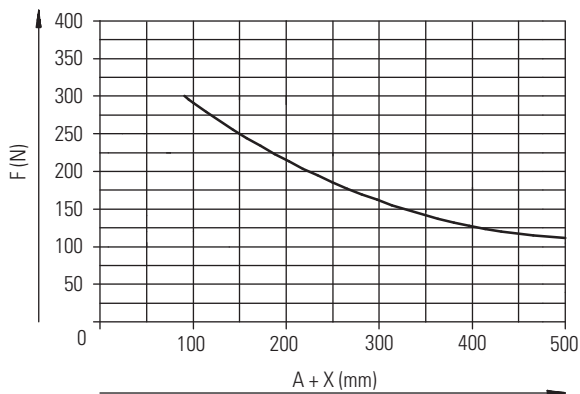
Maximum Load Forces (frame 32)



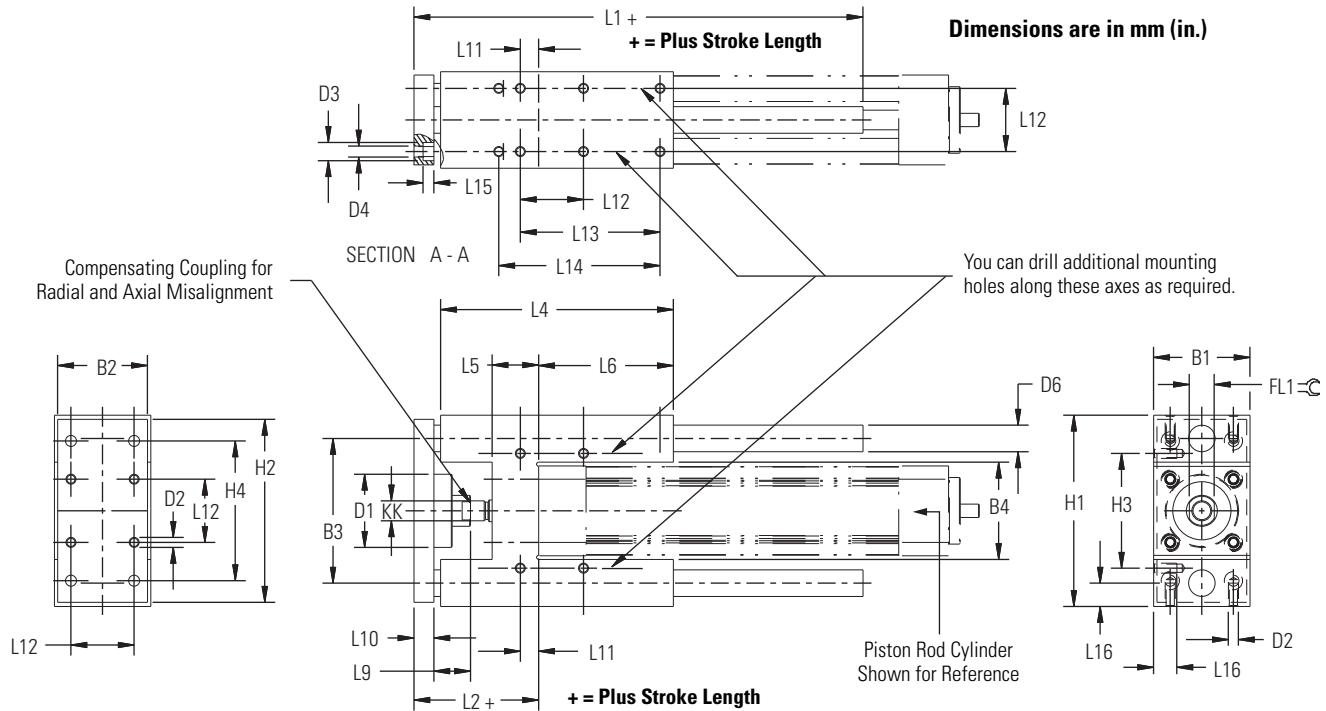
Maximum Load Forces (frame 40)



Maximum Load Forces (frame 63)



Rod Guide Dimensions



Frame	B1 (1) mm (in.)	B2 mm (in.)	B3 (2) mm (in.)	B4 (3) mm (in.)	D1 mm (in.)	D2	D3 mm (in.)	D4 mm (in.)	D6 mm (in.) h6	H1 mm (in.)	H2 mm (in.)	H3 (2) mm (in.)	H4 (2) mm (in.)	KK
32	50.0 (1.97)	45.0 (1.77)	74.0 (2.91)	50.5 (1.99)	44.0 (1.73)	M6	11.0 (0.43)	6.6 (0.26)	12.0 (0.47)	97.0 (4) (3.82)	90.0 (3.54)	61.0 (2.40)	78.0 (3.07)	M10x1.25
40	58.0 (2.28)	54.0 (2.13)	87.0 (3.43)	58.5 (2.30)	44.0 (1.73)	M6	11.0 (0.43)	6.6 (0.26)	16.0 (0.63)	115 (4) (4.53)	110 (4.33)	69.0 (2.72)	84.0 (3.31)	M12x1.25
63	85.0 (3.35)	80.0 (3.15)	119 (4.69)	85.5 (3.37)	60.0 (2.36)	M8	15.0 (0.59)	9.0 (0.35)	20.0 (0.79)	152 (5) (5.98)	145 (5.71)	100 (3.94)	105 (4.13)	M16x1.50

- (1) Tolerance for this dimension is -0.3 mm (-0.012 in.).
- (2) Tolerance for this dimension is ±0.2 mm (±0.008 in.).
- (3) Tolerance for this dimension is ±0.3 mm (±0.012 in.).
- (4) Tolerance for this dimension is -0.4 mm (-0.016 in.).
- (5) Tolerance for this dimension is -0.5 mm (-0.019 in.).

Frame	L1 mm (in.)	L2 mm (in.)	L4 mm (in.)	L5 mm (in.)	L6 mm (in.)	L9 mm (in.)	L10 mm (in.)	L11 mm (in.)	L12 (1) mm (in.)	L13 (1) mm (in.)	L14 (1) mm (in.)	L15 mm (in.)	L16 mm (in.)	FL1 mm C
32	155 (6.10)	67.0 (2) (2.64)	125 (4.92)	24.0 (0.94)	76.0 (2.99)	20.0 (0.79)	12.0 (0.47)	4.3 (0.17)	32.5 (1.28)	70.3 (2.77)	78.0 (3.07)	6.5 (0.26)	12.0 (0.47)	15
40	170 (6.69)	75.0 (2) (2.95)	140 (5.51)	28.0 (1.10)	81.0 (3.19)	22.0 (0.87)	12.0 (0.47)	11.0 (0.43)	38.0 (1.50)	84.0 (3.31)	—	6.5 (0.26)	14.0 (0.55)	15
63	220 (8.66)	89.0 (3) (3.50)	182 (7.17)	34.0 (1.34)	111 (4.37)	25.0 (0.98)	15.0 (0.59)	15.3 (0.60)	56.5 (2.22)	105 (4.13)	—	9.0 (0.35)	16.0 (0.63)	19

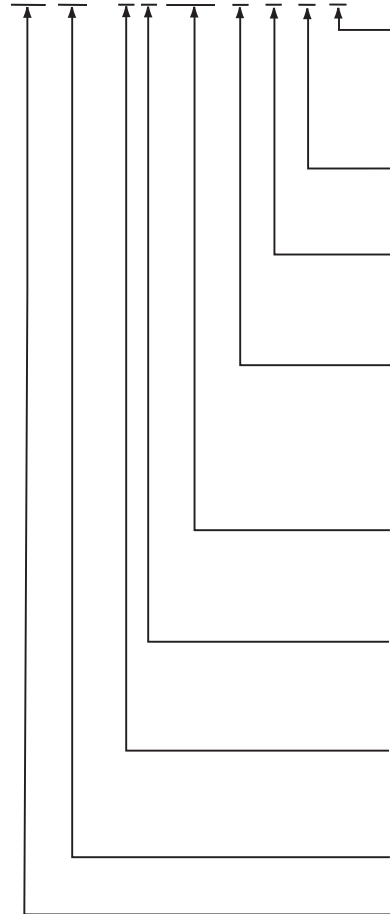
- (1) Tolerance for this dimension is ±0.2 mm (±0.008 in.).
- (2) Tolerance for this dimension is +5.0 mm (+0.197 in.).
- (3) Tolerance for this dimension is +10.0 mm (+0.394 in.).

MP-Series and TL-Series Electric Cylinder Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your actuator. For questions regarding product availability, contact your Allen-Bradley distributor.

MP-Series and TL-Series Electric Cylinder Catalog Numbers

xx AR - xx xxx x-x x A



Motor Mounting ⁽¹⁾

- A = Axial (in-line)
- B = Top, Bulletin MPAR parallel
- D = Left, Bulletin MPAR parallel
- E = Right, Bulletin MPAR parallel

Holding Brake ⁽¹⁾

- 2 = No Brake
- 4 = 24V DC Brake

Feedback ⁽¹⁾

- B = Multi-turn, absolute 17-bit encoder, battery backed (TL-Series, all frame sizes)
- M = Multi-turn, (absolute) high-resolution encoder (MP-Series, frame size 63)
- V = Multi-turn, (absolute) high-resolution encoder (MP-Series, frame size 32 and 40)

Mechanical Drive/Screw Lead, Motor Type ⁽²⁾

- B = 3.0 mm/rev (0.118 in./rev)
- C = 5.0 mm/rev (0.197 in./rev)
- E = 10.0 mm/rev (0.394 in./rev)
- F = 12.7 mm/rev (0.50 in./rev)
- H = 20.0 mm/rev (0.787 in./rev)

Rod Stroke Length ⁽²⁾

- 100 = 100 mm (3.94 in.)
- 200 = 200 mm (7.87 in.)
- 300 = 300 mm (11.81 in.)
- 400 = 400 mm (15.75 in.)
- 600 = 600 mm (23.62 in.)
- 800 = 800 mm (31.50 in.)

Actuator Frame Size

- 1 = 32
- 2 = 40
- 3 = 63

Voltage Class/Designator

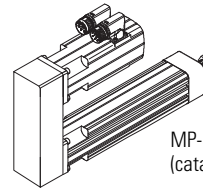
- A = 200V (applies to MP-Series and TL-Series actuators)
- B = 400V (applies to MP-Series actuators)
- X = Actuator cylinder replacement part (refer to Actuator Cylinders on [page 143](#) for ordering examples)

Actuator Type

- AR = Actuator Rod

Actuator Series

- MP = MP-Series
- TL = TL-Series



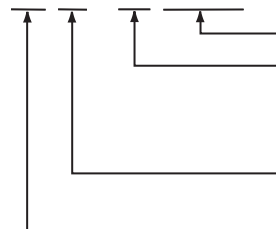
MP-Series Electric Cylinder Parallel Mounting (catalog number MPAR-A1100B-V2B is shown)

(1) This field does not apply to actuator cylinder replacement parts. Refer to your Rockwell Automation sales representative for parallel mount availability.

(3) Not all combinations are available. Only the configurations as listed in MP-Series Electric Cylinders Performance Specifications, on [page 141](#), and TL-Series Electric Cylinders Performance Specifications, on [page 141](#), are available.

MP-Series and TL-Series Electric Cylinder Accessory Catalog Numbers

MP AR - xx xxxxxx



Accessory Item Number

Accessory Type

- NA = Axial (in-line) Mounting Accessory
- NP = Parallel Mounting Accessory
- NE = Rod-end Accessory

Actuator Type

- AR = Actuator Rod

Actuator Series

- MP = MP-Series or TL-Series Actuator Accessory

MP-Series Heavy Duty Electric Cylinders



The MP-Series (Bulletin MPAI) heavy-duty electric cylinders are compact, lightweight, high-force actuators that serve as a cost-effective alternative to fluid power solutions. These ready-to-install electric cylinders are energy efficient and provide machine flexibility, including precise, multi-point (positioning or force) motion profiles, which can be customized for movements with smooth startup and soft stops.

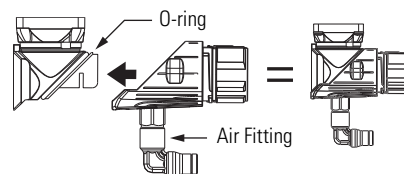
For drive compatibility, refer to Servo Drives on [page 14](#).

MP-Series Heavy Duty Electric Cylinder Features

- Fully integrated servo motor and mechanics, these ready to install cylinders contribute to reductions in mechanical design engineering, assembly, wiring, and commissioning time.
- Standard and front trunnion mount configurations are available in 83 mm and 110 mm frames sizes.
- State-of-the-art design features ballscrew or roller screw construction with linear stroke lengths up to 450 mm (18 in.), absolute high-resolution feedback, and speeds up to 559 mm/s (22 in./s).
- Lower operating costs... energy efficient actuators for 230V or 460V motion control systems.
- Extend and retract accurately. End with a soft touch.
- Linear feed force of up to 8896 N (2000 lb).
- Sizing and engineering with compatible servo drives is made easy with Motion Analyzer software and online CAD files.
- Commissioning is simplified by the use of standard Allen-Bradley motor power and feedback cables.
- Full set-up and programming support by using Allen-Bradley Logix controller platforms. RSLogix 5000 and Ultraware software make setup and commissioning fast and easy.
- Closed loop control (absolute encoder feedback, standard).
- IP67 environmental rating, standard.

MP-Series Heavy Duty Electric Cylinder Accessories and Options

- 24V DC holding brake.
- Rod-end attachments, mounting attachments, and anti-rotation guide accessories.
- Positive Air Pressure kit (catalog number MPF-7-AIR-PURGE) is mounted on the feedback connector to provide positive air pressure to further reduce the chance of contamination inside the electric cylinder.



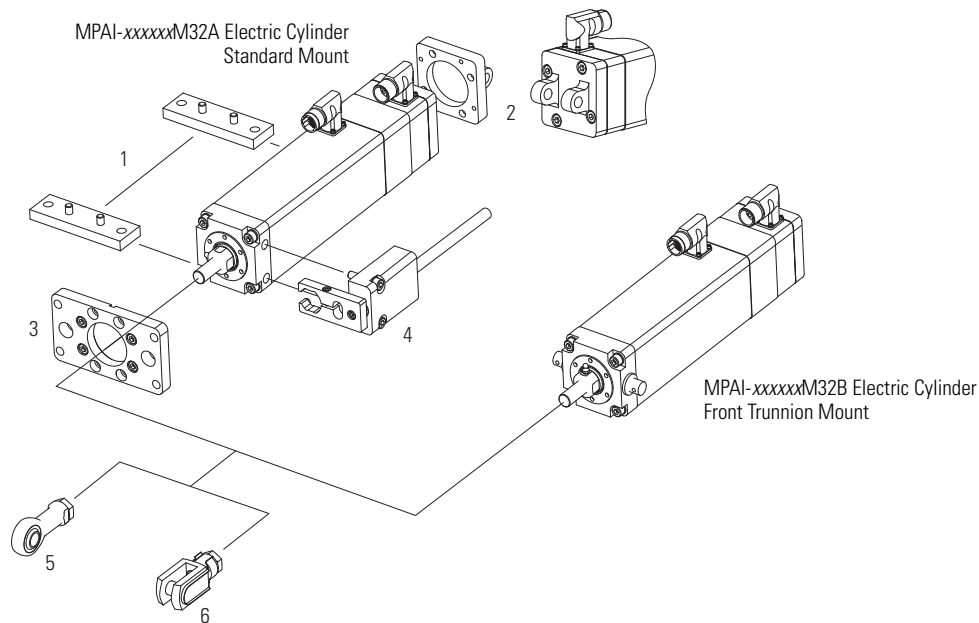
Refer to the MP-Series Heavy Duty Electric Cylinders Installation Instructions, publication [MPAI-IN001](#), for more information on the positive air pressure kit.

MP-Series Heavy Duty Electric Cylinders and Accessories

The Bulletin MPAI electric cylinders are available in standard and front trunnion mount configurations. The standard mount cylinders provide tapped holes for mounting attachments. The front trunnion mount cylinders are compatible only with the rod-end attachments.

Mounting Attachments

Accessory Item	Description	Dimensions
14	Mounting plates	page 156
15	Rear clevis mounting kit	page 157
16	Front flange mount	page 157
17	Anti-rotation guide	page 168



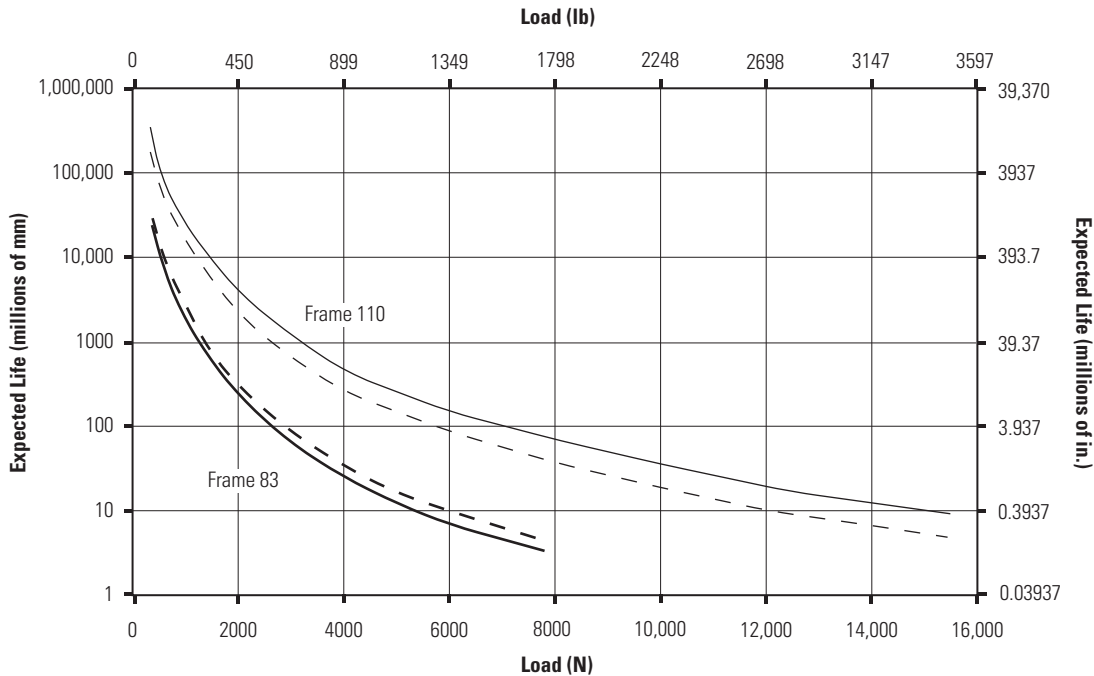
Rod-end Attachments

Accessory Item	Description	Dimensions
5	Rod eye	page 161
6	Rod clevis	page 162

MP-Series Heavy Duty Electric Cylinders Life Specifications

Electric cylinder life specifications, the total running performance (L), are based on a combination of tested and calculated data. If the parameters of your application are different, your results could be different. The achievable running performance (L) is a function of mean feed force (F), according to DIN 69051-4 as illustrated below. Refer to Motion Analyzer software, version 4.8 or later, for assistance when making these calculations for determining the running performance for your application.

Ball Screw Expected Life Specifications



Load = Mean cubic feed force.
 Life = Accumulated total travel running performance.
 All curves represent properly lubricated and maintained actuators.

The L_{10} expected life of a ball-screw linear actuator is expressed as the linear travel distance that 90% of properly maintained ball-screws are expected to meet or exceed. This is not a guarantee and this graph should be used only for estimation purposes.

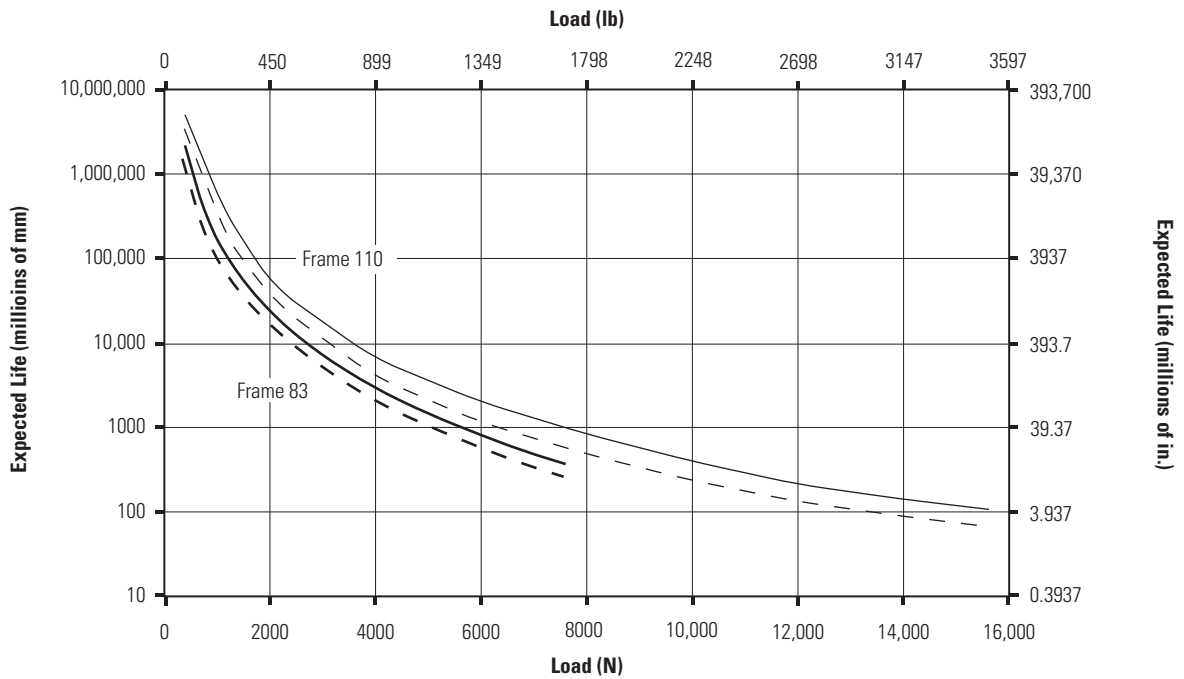
Legend	
Frame 110	— 10 mm Lead
	- - - 5 mm Lead
Frame 83	— 10 mm Lead
	- - - 5 mm Lead

The underlying formula that defines this value is:

$$L_{10} = (P) \left(\frac{C}{F} \right)^3$$

Where:
 L_{10} = Travel life in m (in.)
 C = Dynamic load rating N (lb)
 F = Cubic mean applied load N (lb)
 P = Screw lead mm (in.)

Roller Screw Expected Life Specifications



Load = Mean cubic feed force.
 Life = Accumulated total travel running performance.
 All curves represent properly lubricated and maintained actuators.

The L_{10} expected life of a roller-screw linear actuator is expressed as the linear travel distance that 90% of properly maintained roller-screws are expected to meet or exceed. This is not a guarantee and this graph should be used only for estimation purposes.

Legend	
Frame 110	— 10 mm Lead
	- - - 5 mm Lead
Frame 83	— 10 mm Lead
	- - - 5 mm Lead

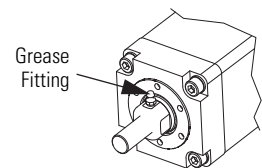
The underlying formula that defines this value is:

$$L_{10} = \left(P \right) \left(\frac{C}{F} \right)^3$$

Where:
 L_{10} = Travel life in millions of mm (in.)
 C = Dynamic load rating N (lb)
 F = Cubic mean applied load N (lb)
 P = Screw lead mm (in.)

Application Guidelines

All Loads must be separately supported and guided ⁽¹⁾. Loads should align along the line-of-thrust rod motion. Actuators have been lubricated at the factory and are ready for installation. For moderate to light use, no lubrication is required for the life of the actuator. For more severe duty use (higher loads and/or higher duty cycles), periodic lubrication is necessary to achieve actuator expected life ⁽²⁾. Grease should be added via the built-in grease fitting. Removing the cylinder from the machine is seldom necessary ⁽³⁾.



⁽¹⁾ Bulletin MPAl actuators are not meant for use where side loading occurs.

⁽²⁾ Refer to the MP-Series Heavy Duty Electric Cylinders Installation Instructions, publication MPAl-IN001, for lubrication guidelines and specifications.

⁽³⁾ You can extend or retract the rod to a point where the grease fitting is more accessible.

MP-Series Heavy Duty Electric Cylinders Specifications

General Specifications

Attribute	Frame 83	Frame 110
Construction design	Ball screw or roller screw servo-driven actuator	
Piston rod thread	M16 x 1.50	M20 x 1.50
Working stroke length	152.4 mm (6.0 in.) 304.8 mm (12.0 in.) 457.2 mm (18.0 in.)	
Protection against torsion/guide	Plain bearing guide	
Stroke reserve	0 mm	
Positioning repeatability, max	±0.02 mm (0.0008 in.)	
Reversing backlash, max ⁽¹⁾		
Ball screw	0.10 mm (0.004 in.)	0.13 mm (0.005 in.)
Roller screw	0.03 mm (0.001 in.)	0.03 mm (0.001 in.)
Duty cycle	100%	
Position sensing (feedback)	Multi-turn absolute encoder	
Mounting position	Any	
Materials	<ul style="list-style-type: none"> • Black anodized aluminum body, feedback housing, and end caps • Stainless steel helicoils in tapped holes • Melonited carbon steel thrust rod • Clear zinc carbon steel rod end • Black oxide high strength steel hardware 	

(1) In new condition.

Performance Specifications (Ball Screw)

Electric Cylinder ⁽¹⁾ Cat. No.	Frame	Max Feed Force N (lb)	System Continuous ⁽²⁾ Stall Force N (lb)		Max Speed mm/s (in./s)	Ball Screw Pitch mm/rev (in./rev)	Stroke Lengths mm (in.)	Dynamic Load Rating (1 million revs) N (lb)
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-x3xxxCM32x	83	4448 (1000)	4003 (900)	3176 (714)	279 (11)	5.0 (0.197)	152.4 mm (6.0 in.) 304.8 mm (12.0 in.)	7602 (1709)
MPAI-x3xxxEM32x		4003 (900)	2002 (450)	1588 (357)	559 (22)	10.0 (0.394)		5400 (1214)
MPAI-x4xxxCM32x	110	8896 (2000)	7784 (1750)	6179 (1389)	279 (11)	5.0 (0.197)	457.2 mm (18.0 in.) ⁽³⁾	15,100 (3395)
MPAI-x4xxxEM32x		7784 (1750)	3892 (875)	3092 (695)	559 (22)	10.0 (0.394)		15,000 (3372)

(1) MPAI-A (230V) or MPAI-B (460V) replaces x in catalog number. Stroke length replaces xxx in catalog number.

(2) Characteristics when mounted to 279 x 279 x 12.7 mm (11 x 11 x 0.5 in.) aluminum mounting surface.

(3) For this stroke length, maximum speed is reduced by 33% for the 83 mm frame and by 12% for the 110 mm frame.

Performance Specifications (Roller Screw)

Electric Cylinder ⁽¹⁾ Cat. No.	Frame	Max Feed Force N (lb)	System Continuous ⁽²⁾ Stall Force N (lb)		Max Speed mm/s (in./s)	Ball Screw Pitch mm/rev	Stroke Lengths mm (in.)	Dynamic Load Rating (1 million revs) N (lb)
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-x3xxxRM32x	83	7562 (1700)	3781 (850)	3003 (675)	279 (11)	5.0 (0.197)	152.4 mm (6.0 in.) 304.8 mm (12.0 in.)	29,198 (6564)
MPAI-x3xxxSM32x ⁽⁴⁾		3781 (850)	1891 (425)	1499 (337)	559 (22)	10.0 (0.394)		26,013 (5848)
MPAI-x4xxxRM32x	110	14,679 (3300)	7340 (1650)	5827 (1310)	279 (11)	5.0 (0.197)	457.2 mm (18.0 in.) ⁽³⁾	36,831 (8280)
MPAI-x4xxxSM32x ⁽⁴⁾		7340 (1650)	3670 (825)	2914 (655)	559 (22)	10.0 (0.394)		34,193 (7687)

(1) MPAI-A (230V) or MPAI-B (460V) replaces x in catalog number. Stroke length replaces xxx in catalog number.

(2) Characteristics when mounted to 279 x 279 x 12.7 mm (11 x 11 x 0.5 in.) aluminum mounting surface.

(3) For this stroke length, maximum speed is reduced by 37% for the 83 mm frame and by 30% for the 110 mm frame.

(4) Refer to your Rockwell Automation sales representative for availability.

MP-Series Heavy Duty Electric Cylinders System Combinations

For Bulletin MPAI electric cylinders and	Refer to
Kinetix 300 (240V and 480V) drives	page 646
Kinetix 6000 (230V and 460V) drives and Kinetix 6200/Kinetix 6500 (460V) drives	page 661
Kinetix 2000 (230V) drives	page 689
Ultra3000 (230V and 460V) drives	page 713

MP-Series Heavy Duty Electric Cylinder Weight Specifications

Standard Mount and Trunnion Mount Electric Cylinders

Electric Cylinder (frame 83) Cat. No.	Weight, approx. kg (lb)
MPAI-x3150xM32x	8.3 (18.3)
MPAI-x3300xM32x	10.1 (22.2)
MPAI-x3450xM32x	11.9 (26.2)
MPAI-x3150xM34x	9.3 (20.5)
MPAI-x3300xM34x	11.1 (24.4)
MPAI-x3450xM34x	12.9 (28.4)

Electric Cylinder (frame 110) Cat. No.	Weight, approx. kg (lb)
MPAI-x4150xM32x	15.8 (34.8)
MPAI-x4300xM32x	18.8 (41.4)
MPAI-x4450xM32x	21.8 (48.0)
MPAI-x4150xM34x	17.3 (38.1)
MPAI-x4300xM34x	20.3 (44.7)
MPAI-x4450xM34x	23.3 (51.4)

Mounting Accessories

Accessory	Frame	Cat. No.	Weight, approx. g (oz)
Mounting plates	83	MPAI-NA306	920 (32.5)
	110	MPAI-NA406	1150 (40.6)
Rear clevis mount	83	MPAI-NA303	110 (3.88)
	110	MPAI-NA403	350 (12.3)

Accessory	Frame	Cat. No.	Weight, approx. g (oz)
Front flange mount	83	MPAI-NA301	1070 (37.7)
	110	MPAI-NA401	1740 (61.4)

Rod-end Accessories

Accessory	Frame	Cat. No.	Weight, approx. g (oz)
Rod eye	83	MPAI-NE303	255 (8.99)
	110	MPAI-NE403	497 (17.5)

Accessory	Frame	Cat. No.	Weight, approx. g (oz)
Rod clevis	83	MPAI-NE304	350 (12.3)
	110	MPAI-NE404	710 (25.0)

Anti-rotation Guide Accessories

Accessory	Frame	Cat. No.	Weight, approx. g (oz)
Anti-rotation guide	83	MPAI-NE30215	870 (30.7)
		MPAI-NE30230	1020 (36.0)
		MPAI-NE30245	1170 (41.3)

Accessory	Frame	Cat. No.	Weight, approx. g (oz)
Anti-rotation guide	110	MPAI-NE40215	950 (33.5)
		MPAI-NE40230	1110 (39.2)
		MPAI-NE40245	1260 (44.4)

MP-Series Heavy Duty Electric Cylinder Motor Brake Specifications

Electric Cylinder Cat. No.	Static Torque N•m (lb•in)	Coil Current at 24V DC A_{peak}	Brake Response Time		
			Release ms	Engage (using external arc suppression device)	
				MOV ms	Diode ms
MPAI-x3xxxxM34x	4.0 (35.4)	0.43	50	40	80
MPAI-x4xxxxM34x	10.0 (88.5)	0.67	35	25	50

Estimated Brake Holding Force

Electric Cylinder Cat. No.	MPAI-xxxxxCM34x ⁽¹⁾ N (lb)	MPAI-xxxxxEM34x ⁽¹⁾ N (lb)	MPAI-xxxxxRM34x ⁽²⁾ N (lb)	MPAI-xxxxxSM34x ⁽²⁾ N (lb)
MPAI-x3xxxxM34x	5494 (1235)	2745 (617)	6423 (1444)	3212 (722)
MPAI-x4xxxxM34x	13,736 (3088)	6868 (1544)	16,063 (3611)	8029 (1805)

(1) MPAI-xxxxxCM34x is a 5 mm ball-screw actuator and MPAI-xxxxxEM34x is a 10 mm ball-screw actuator.

(2) MPAI-xxxxxRM34x is a 5 mm roller-screw actuator and MPAI-xxxxxSM34x is a 10 mm roller-screw actuator.

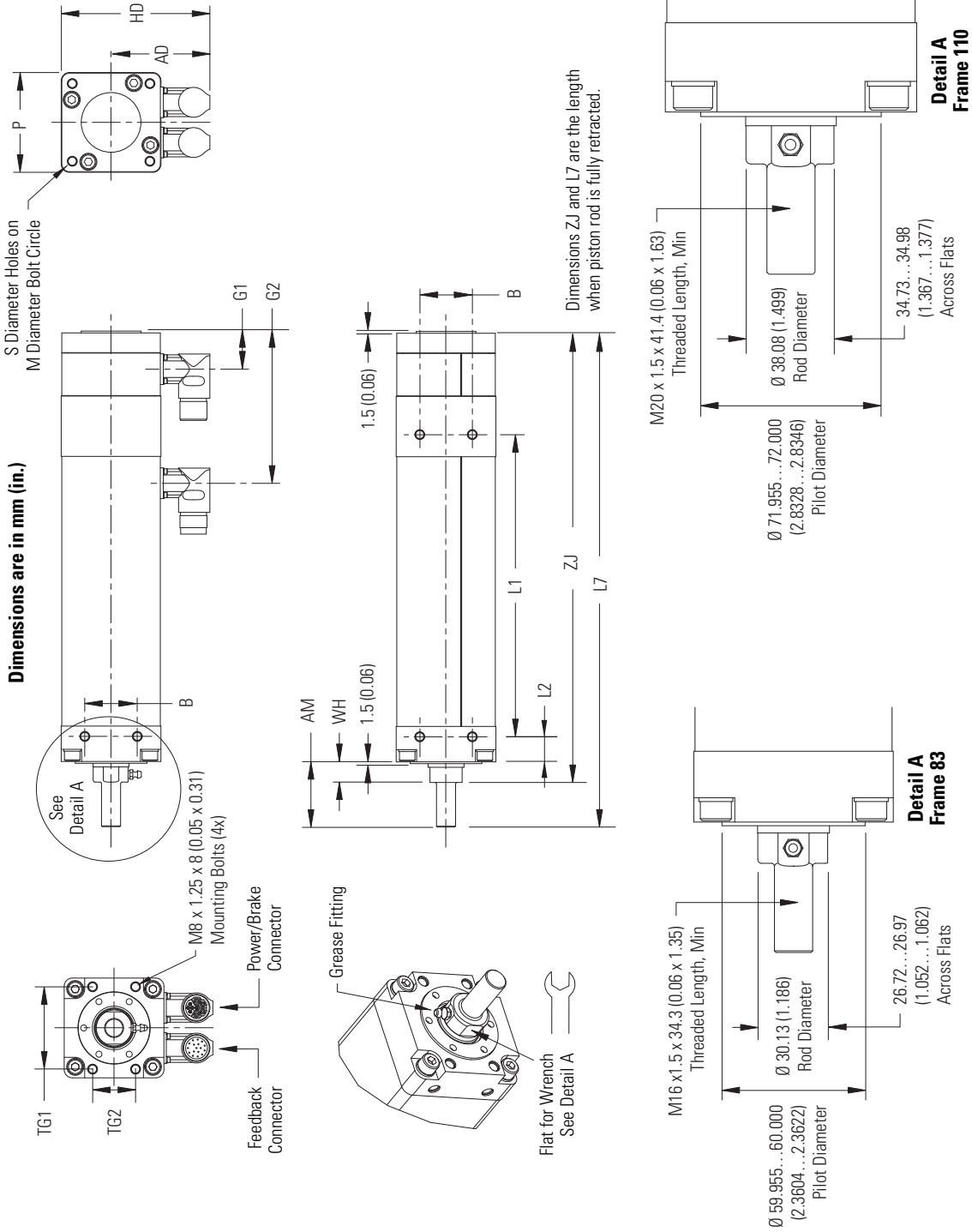
In vertical applications, an unpowered Bulletin MPAI electric cylinder requires a holding brake to maintain position if the load on the actuator exceeds these values.

Back Drive Force

Electric Cylinder Cat. No.	MPAI-xxxxxCM34x N (lb)	MPAI-xxxxxEM34x N (lb)	MPAI-xxxxxRM34x N (lb)	MPAI-xxxxxSM34x N (lb)
MPAI-x3xxxxM34x	0.54 (4.8)	0.54 (4.8)	0.60 (5.3)	Refer to your Rockwell Automation sales representative for availability of these actuators.
MPAI-x4xxxxM34x	0.63 (5.6)	0.63 (5.6)	0.70 (6.2)	

MP-Series Electric Cylinder Dimensions

MP-Series Heavy Duty Electric Cylinder Dimensions (frame 83 and 110)



MP-Series Heavy Duty Electric Cylinder Dimensions (frame 83)

Electric Cylinder Cat. No.	AD mm (in.)	AM mm (in.)	B mm (in.)	G1 mm (in.)	G2 (1) mm (in.)	HD mm (in.)	L1 mm (in.)	L2 mm (in.)	L7 (1) mm (in.)	M (2) mm (in.)	P mm (in.)	S mm (in.)	TG1 mm (in.)	TG2 mm (in.)	WH mm (in.)	ZJ (1) mm (in.)
MPAI-A/B3150xM32x							253.1 (9.97)		413.6 (16.29)							376.3 (14.81)
MPAI-A/B3300xM32x	82.8 (3.26)	54.6 (2.15)	44.0 (1.73)	30.4 (1.20)	127.5 (5.02)	124.6 (4.90)	405.5 (15.97)	21.0 (0.83)	566.0 (22.29)	92.0 (3.622)	83.6 (3.29)	M8 x 1.25 x12 (0.05 x 0.47)	69.0 (2.72)	36.0 (1.42)	17.3 (0.68)	528.7 (20.81)
MPAI-A/B3450xM32x							557.9 (21.97)		718.4 (28.29)							681.1 (26.81)

(1) If ordering MPAI-A/B3-xxxxM34A actuator with brake, add 47.7 mm (1.88 in.) to dimensions G2, L7, and ZJ.

(2) The tolerance for this dimension is +0.0, -0.038 mm (+0.0, -0.0015 in.).

MP-Series Heavy Duty Electric Cylinder Dimensions (frame 110)

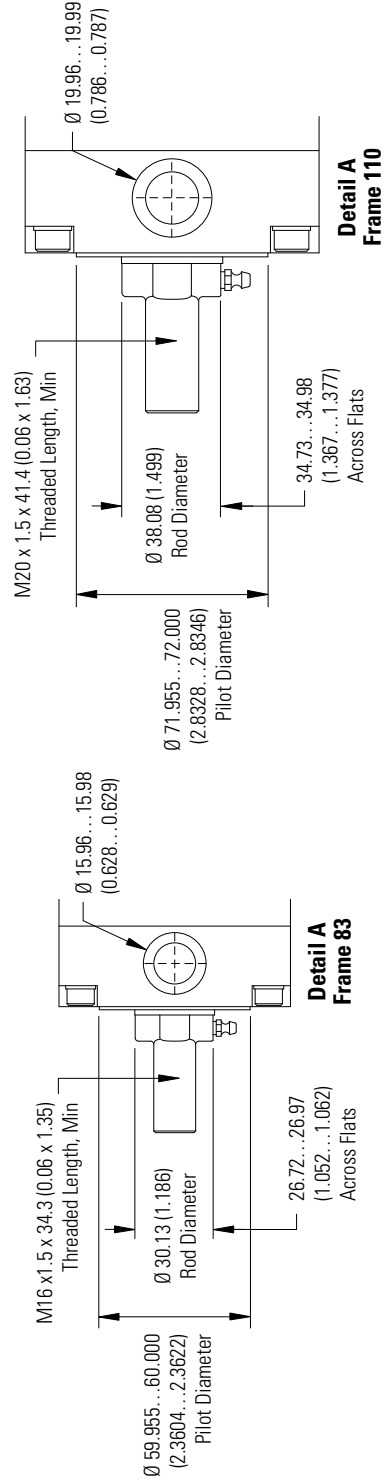
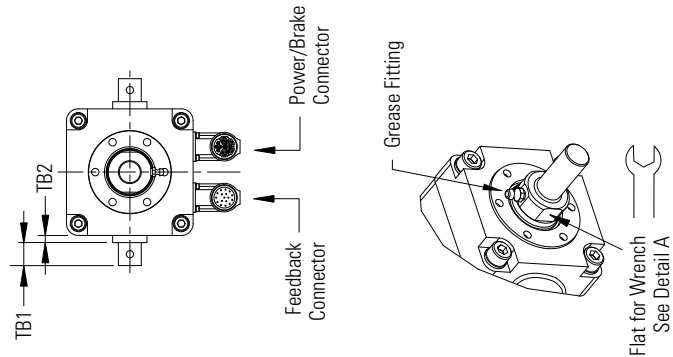
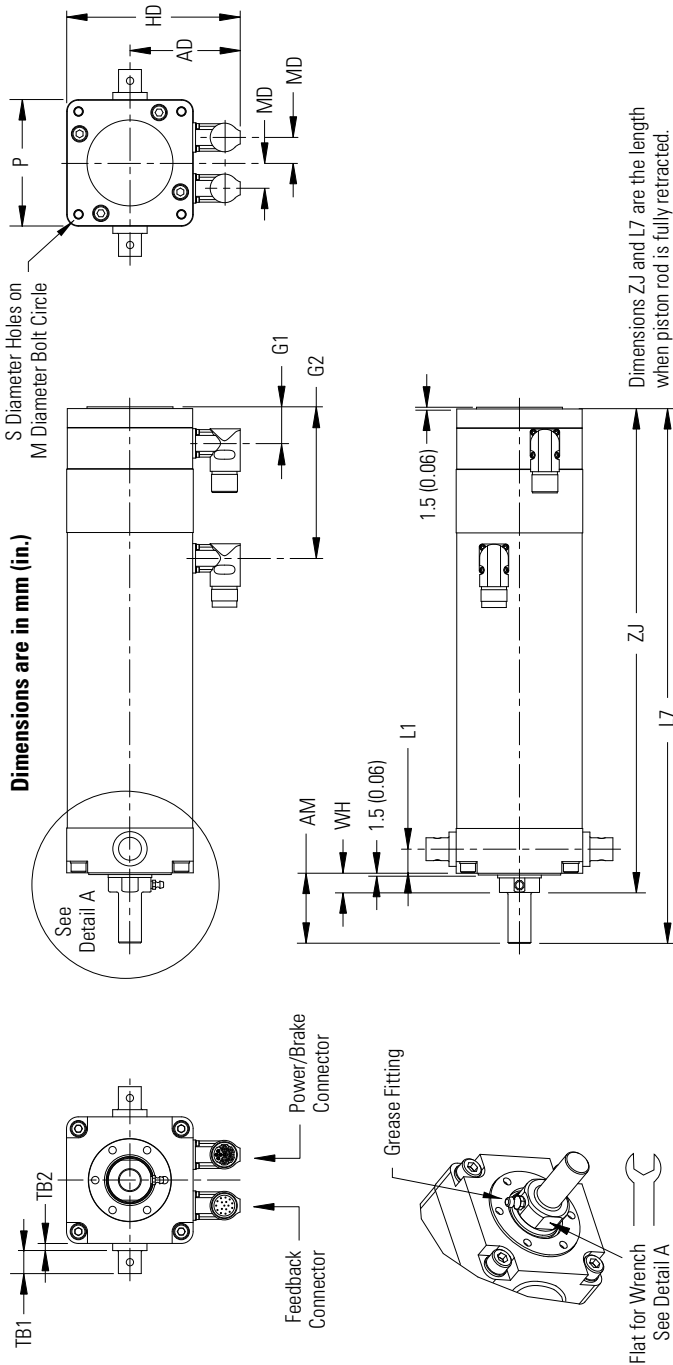
Electric Cylinder Cat. No.	AD mm (in.)	AM mm (in.)	B mm (in.)	G1 mm (in.)	G2 (1) mm (in.)	HD mm (in.)	L1 mm (in.)	L2 mm (in.)	L7 (1) mm (in.)	M (2) mm (in.)	P mm (in.)	S mm (in.)	TG1 mm (in.)	TG2 mm (in.)	WH mm (in.)	ZJ (1) mm (in.)
MPAI-A/B4150xM32x							295.4 (11.63)		466.6 (18.37)							422.1 (16.62)
MPAI-A/B4300xM32x	96.3 (3.79)	61.3 (2.41)	50.0 (1.97)	30.4 (1.20)	130.7 (5.15)	151.5 (5.96)	447.8 (17.63)	25.0 (0.98)	619.0 (24.37)	127.0 (5.0)	110.5 (4.35)	M8 x 1.25 x12 (0.05 x 0.47)	85.0 (3.35)	55.0 (2.17)	16.8 (0.66)	574.5 (22.62)
MPAI-A/B4450xM32x							600.2 (23.63)		771.4 (30.37)							726.9 (28.62)

(1) If ordering MPAI-A/B4-xxxxM34A actuator with brake, add 47.7 mm (1.88 in.) to dimensions G2, L7, and ZJ.

(2) The tolerance for this dimension is +0.0, -0.038 mm (+0.0, -0.0015 in.).

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

MP-Series Heavy Duty Electric Cylinder Trunnion Mount Dimensions (frame 83 and 110)



MP-Series Heavy Duty Electric Cylinder Trunnion Mount Dimensions (frame 83)

Electric Cylinder Cat. No.	AD mm (in.)	AM mm (in.)	G1 mm (in.)	G2 (1) mm (in.)	HD mm (in.)	L7 (1) mm (in.)	M (2) mm (in.)	MD mm (in.)	P mm (in.)	S mm (in.)	TB1 mm (in.)	TB2 mm (in.)	WH mm (in.)	ZJ (1) mm (in.)
MPAI-A/B3150xM32x						413.6 (16.29)								376.3 (14.81)
MPAI-A/B3300xM32x	82.8 (3.26)	54.6 (2.15)	30.4 (1.20)	127.5 (5.02)	124.6 (4.90)	566.0 (22.29)	92.0 (3.622)	16.8 (0.66)	83.6 (3.29)	M8 x 1.25 x 12 (0.05 x 0.47)	16.0 (0.63)	3.2 (0.13)	17.3 (0.68)	528.7 (20.81)
MPAI-A/B3450xM32x						718.4 (28.29)								681.1 (26.81)

(1) If ordering MPAI-A/B3-xxxxM34B actuator with brake, add 47.7 mm (1.88 in.) to dimensions G2, L7, and ZJ.

(2) The tolerance for this dimension is +0.0, -0.038 mm (+0.0, -0.0015 in.).

MP-Series Heavy Duty Electric Cylinder Trunnion Mount Dimensions (frame 110)

Electric Cylinder Cat. No.	AD mm (in.)	AM mm (in.)	G1 mm (in.)	G2 (1) mm (in.)	HD mm (in.)	L7 (1) mm (in.)	M (2) mm (in.)	MD mm (in.)	P mm (in.)	S mm (in.)	TB1 mm (in.)	TB2 mm (in.)	WH mm (in.)	ZJ (1) mm (in.)
MPAI-A/B4150xM32x						466.6 (18.37)								422.1 (16.62)
MPAI-A/B4300xM32x	96.3 (3.79)	61.3 (2.41)	30.4 (1.20)	130.7 (5.15)	151.5 (5.96)	619.0 (24.37)	127.0 (5.0)	22.2 (0.87)	110.5 (4.35)	M8 x 1.25 x 12 (0.05 x 0.47)	20.05 (0.79)	6.25 (0.25)	16.8 (0.66)	574.5 (22.62)
MPAI-A/B4450xM32x						771.4 (30.37)								726.9 (28.62)

(1) If ordering MPAI-A/B4-xxxxM34B actuator with brake, add 47.7 mm (1.88 in.) to dimensions G2, L7, and ZJ.

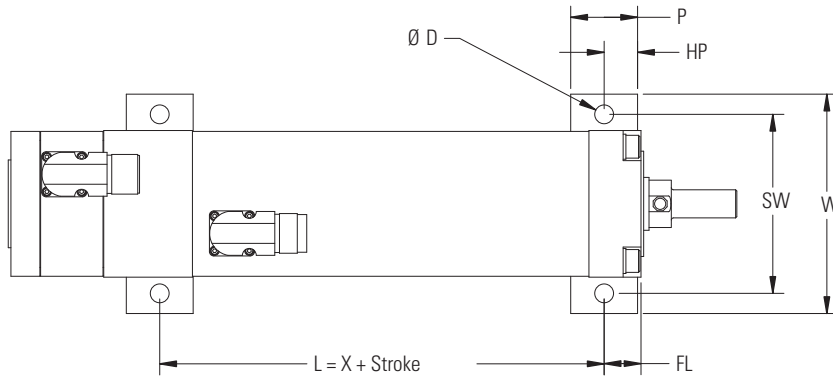
(2) The tolerance for this dimension is +0.0, -0.038 mm (+0.0, -0.0015 in.).

Actuators are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

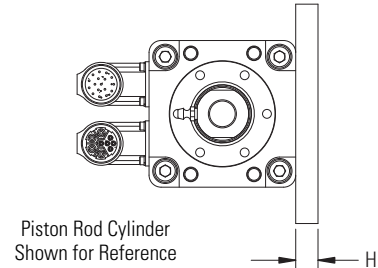
MP-Series Heavy Duty Electric Cylinder Mounting Accessories

These accessories apply to standard-mount electric cylinders. Components are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

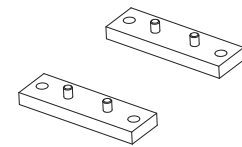
Mounting Plates Attachment



Dimensions are in mm (in.)



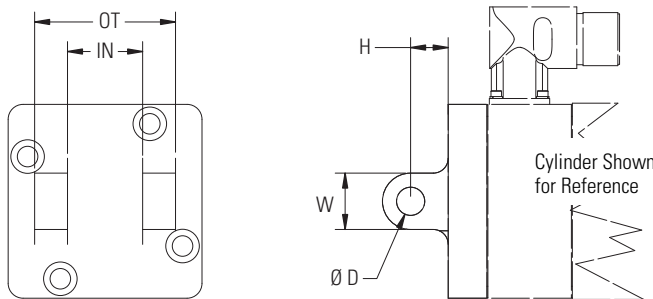
Cat. No. (1)	Frame	X mm (in.)	FL mm (in.)	D mm (in.)	P mm (in.)	HP mm (in.)	SW mm (in.)	W mm (in.)	H mm (in.)
MPAI-NA306	83	100.7 (3.96)	21.0 (0.83)	10.7 (0.42)	38.1 (1.50)	19.05 (0.75)	102 (4.02)	125 (4.92)	12.7 (0.50)
MPAI-NA406	110	143 (5.63)	25.0 (0.98)				130 (5.12)	155 (6.10)	



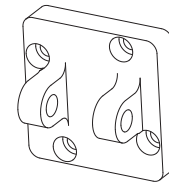
- Attachment includes:
- 2 mounting plates
 - Mounting hardware

(1) Material is carbon steel and finish is melonite. Contains no copper, PTFE, or silicone.

Rear Clevis Mount Attachment



Dimensions are in mm (in.)



Attachment includes replacement gasket.

Cat. No. (1)	Frame	D (2) mm (in.)	IN (3) mm (in.)	OT (4) mm (in.)	W mm (in.)	H mm (in.)
MPAI-NA303	83	12.0 (0.47)	32.0 (1.26)	60.0 (2.36)	24.0 (0.94)	16.0 (0.63)
MPAI-NA403	110	16.0 (0.63)	50.0 (1.97)	90.0 (3.54)	36.0 (1.42)	22.0 (0.87)

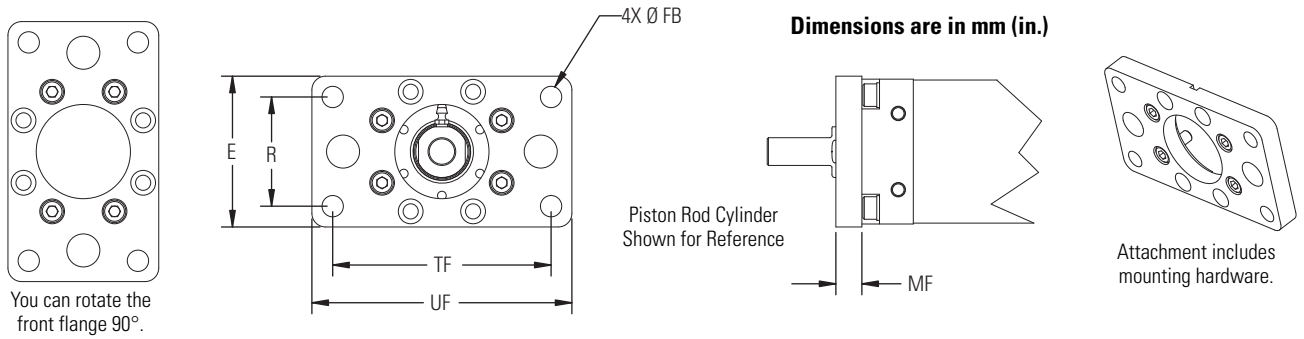
(1) Material is carbon steel and finish is melonite. Contains no copper, PTFE, or silicone.

(2) Tolerance for this dimension is +0.043, -0 mm (+0.017, -0 in.).

(3) Tolerance for this dimension is +0.62, -0 mm (+0.024, -0 in.).

(4) Tolerance for this dimension is +0, -0.62 mm (+0, -0.024 in.).

Front Flange Attachment



Cat. No. (1)	Frame	E mm (in.)	FB mm (in.)	MF mm (in.)	R mm (in.)	TF mm (in.)	UF mm (in.)
MPAI-NA301	83	87.0 (3.43)	12.3 (0.48)	15.0 (0.59)	63.0 (2.48)	126 (4.96)	150 (5.90)
MPAI-NA401	110	110.5 (4.35)	14.7 (0.58)	16.0 (0.63)	75.0 (2.95)	150 (5.90)	170 (6.69)

(1) Material is carbon steel and finish is melonite. Contains no copper, PTFE, or silicone.

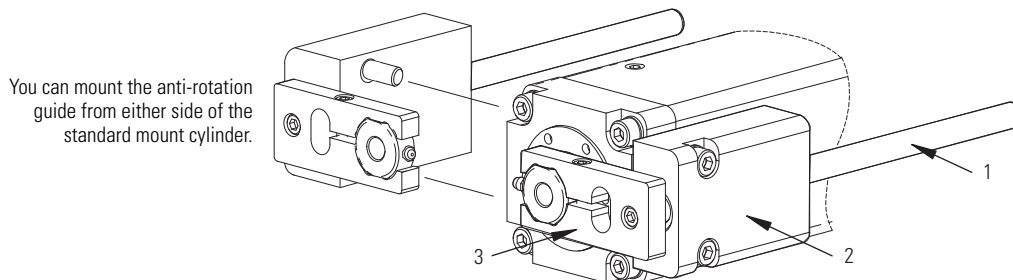
MP-Series Heavy Duty Electric Cylinder Anti-rotation Guide Accessory

Anti-rotation guides protect standard cylinders from torsion when subjected to radial or torsional side loads. They provide high-precision guidance for workpiece handling and other loading applications.

Anti-rotation Guides for Fixed Strokes

Cat. No. Frame 83	Stroke mm (in.)	Cat. No. Frame 110	Stroke mm (in.)
MPAI-NE30215	152.4 (6.0)	MPAI-NE40215	152.4 (6.0)
MPAI-NE30230	304.8 (12.0)	MPAI-NE40230	304.8 (12.0)
MPAI-NE30245	457.2 (18.0)	MPAI-NE40245	457.2 (18.0)

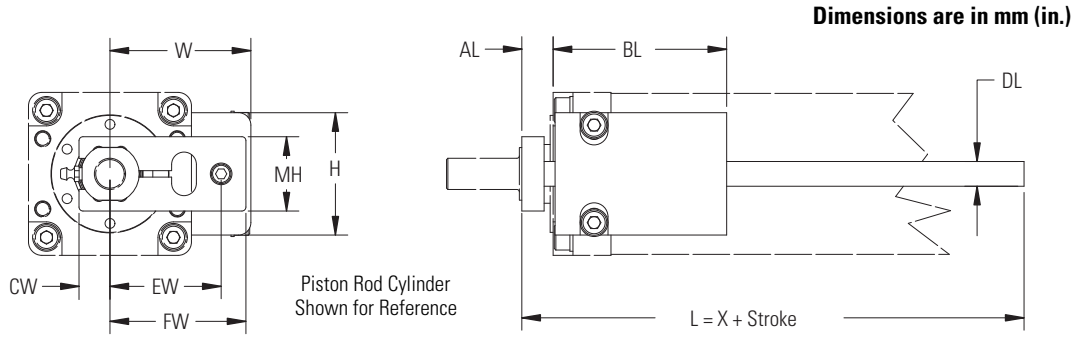
Material Specifications



Item	Attribute	Value (1)
1	Rod	C1060 ground hardened steel
2	Bearing block	Anodized aluminium
3	Clamp	Zinc-plated carbon steel

(1) Contains no copper, PTFE, or silicone.

Anti-rotation Guide Dimensions

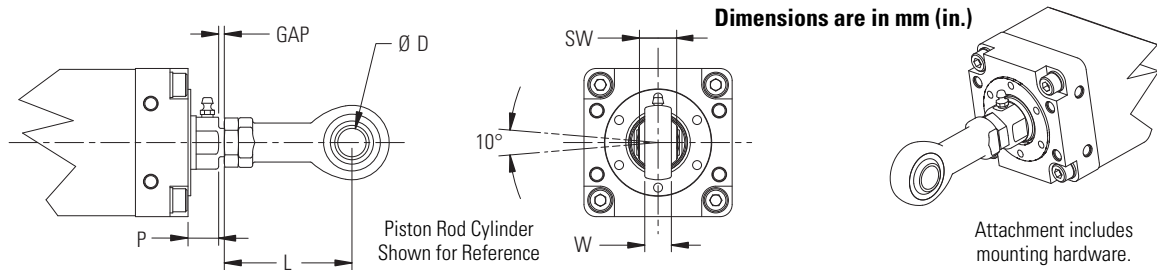


Cat. No.	Frame	X mm (in.)	L mm (in.)	AL mm (in.)	BL mm (in.)	DL mm (in.)	W mm (in.)	CW mm (in.)	EW mm (in.)	FW mm (in.)	H mm (in.)	MH mm (in.)
MPAI-NE30215	83	105.2 (4.14)	257.6 (10.14)	16.1 (0.63)	89.0 (3.50)	12.7 (0.50)	72.3 (2.85)	15.9 (0.63)	57.0 (2.24)	69.7 (2.74)	62.7 (2.47)	38.1 (1.50)
MPAI-NE30230			410.0 (16.14)									
MPAI-NE30245			562.4 (22.14)									
MPAI-NE40215	110	108.5 (4.27)	260.9 (10.27)	15.5 (0.61)	93.0 (3.66)	12.7 (0.50)	85.7 (3.37)	19.8 (0.78)	70.5 (2.78)	83.2 (3.28)	62.7 (2.47)	45.9 (1.81)
MPAI-NE40230			413.3 (16.27)									
MPAI-NE40245			565.7 (22.27)									

MP-Series Heavy Duty Electric Cylinder Rod-end Accessories

These accessories apply to standard and front trunnion-mount electric cylinders. Components are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

Rod-eye Attachment



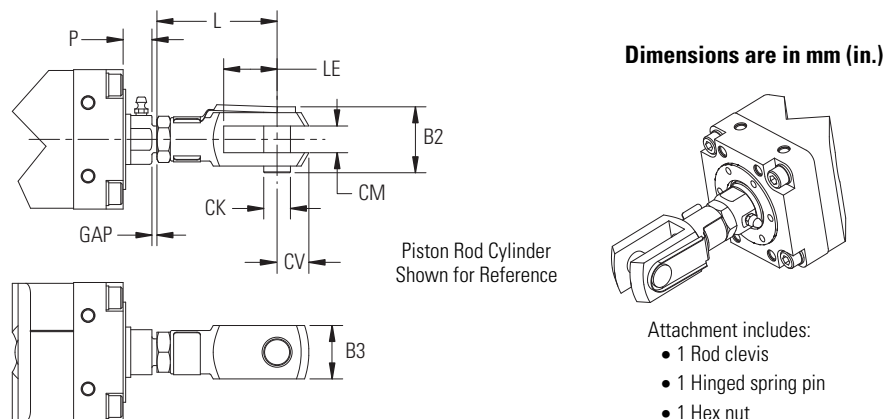
Cat. No. (1)	Frame	D mm (in.)	P mm (in.)	L mm (in.)	W mm (in.)	SW mm (in.)	GAP mm (in.)
MPAI-NE303	83	16.0 (0.63)	17.3 (0.68)	72.0 (2.83)	15.0 (0.59)	21.0 (0.83)	3.0...19.0 (0.12...0.75)
MPAI-NE403	110	20.0 (0.79)	16.8 (0.66)	87.0 (3.43)	18.0 (0.71)	25.0 (0.98)	3.0...24.5 (0.12...0.96)

(1) Material is steel and finish is clear zinc.

IMPORTANT

The spherical rod-eye attachment must be used with an anti-rotation guide or the load that the actuator is attached to must be kept from rotating. Without one of these two methods, the spherical rod-eye will let the actuator rod rotate and result in inaccurate positioning due to lost rotational motion.

Rod Clevis Attachment



Cat. No. (1)	Frame	B2 mm (in.)	B3 mm (in.)	CK mm (in.) H9	CM mm (in.)	CV mm (in.)	LE mm (in.)	L mm (in.)	P mm (in.)	GAP mm (in.)
MPAI-NE304	83	40.0 (1.57)	32.0 (1.26)	16.0 (0.63)	16.0 (0.63)	19.0 (0.75)	32.0 (1.26)	72.0 (2.83)	17.3 (0.68)	3.0...19.0 (0.12...0.75)
MPAI-NE404	110	48.0 (1.89)	40.0 (1.57)	20.0 (0.79)	20.0 (0.79)	25.0 (0.98)	40.0 (1.57)	90.0 (3.54)	16.8 (0.66)	3.0...24.5 (0.12...0.96)

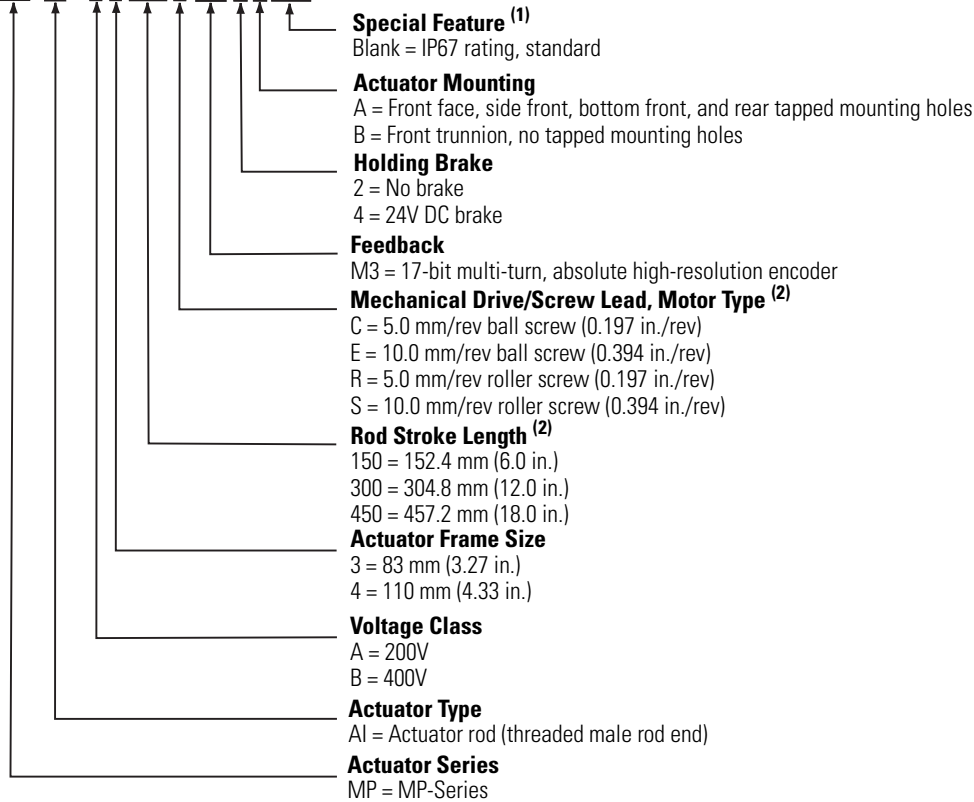
(1) Material is galvanized steel.

MP-Series Heavy Duty Electric Cylinder Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your actuator. For questions regarding product availability, contact your Allen-Bradley distributor.

MP-Series Heavy Duty Electric Cylinder Catalog Numbers

MP AI - x x xxx x M3 x x xxx



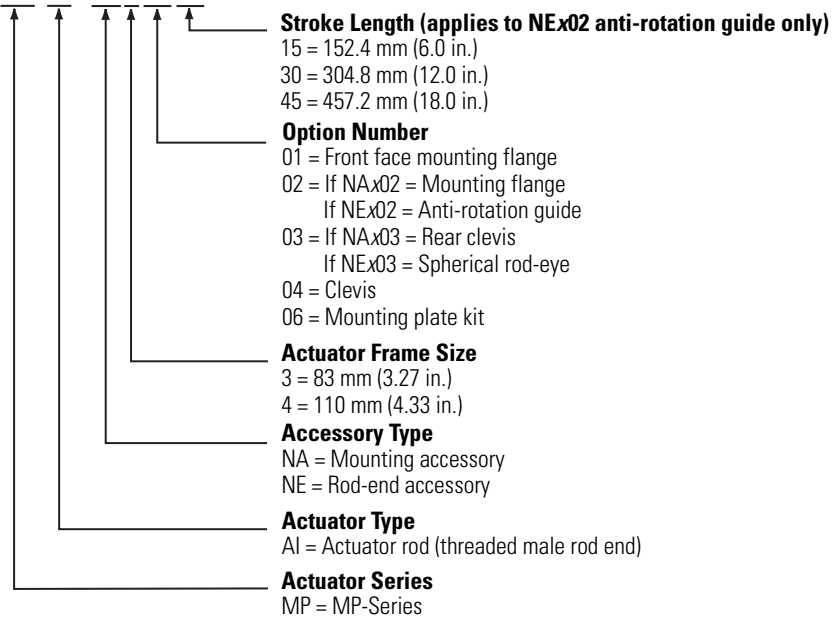
(1) The Special Feature field is used for customer-specific coding.

(2) Not all combinations are available. Only the configurations as listed in MP-Series Electric Cylinders Performance Specifications and Performance Specifications (Roller Screw), on [page 175](#), are available.

Refer to your Rockwell Automation sales representative for the availability of MP AI -xxxxxRM3 and MP AI -xxxxxSM3 (roller screw) electric cylinders.

MP-Series Heavy Duty Electric Cylinder Accessory Catalog Numbers

MP AI - xx x xx xx



LDC-Series Iron Core Linear Servo Motors



The LDC-Series iron core linear motors address a growing interest in linear motor technology as it becomes more affordable and is increasingly recognized as a practical means of improving machine performance. With the iron core product design, you now have cost-effective options to help you improve machine throughput while reducing maintenance and downtime.

For drive compatibility, refer to Servo Drives on [page 14](#).

LDC-Series Iron Core Linear Motor Features

- High thrust force to cost ratio lets you use smaller, less expensive motors.
- Cogging torque less than 5% of continuous force.
- Very high acceleration and speeds up to 10 m/s (32.8 ft/s) greatly increase the throughput of your machine.
- No limits to travel distance. Ability to achieve high speeds over short and long travels.
- Direct drive technology for extreme servo responsiveness.
- No-wear, high reliability parts increase productivity.
- Peak forces to 5246 N (1179 lb).
- Ability to size and optimize LDC-Series linear motors and corresponding servo drives by using Motion Analyzer software reduces product selection time and minimizes cost.
- Full set-up and programming support through RSLogix 5000 software reduces set-up time.

LDC-Series Iron Core Linear Motor Accessories

- Cooling plates.
- Bulk head connector kit.
- Encoder connector kit.
- Hall effect replacement module for connectorized coil.
- Hall effect replacement module for flying-lead coil.

Accessories for LDC-Series Iron Core Linear Motors

Cat. No.	Accessory	Description
LDC-BULK-HD	Bulk head connector kit	For easy mounting of flex cable to non-flex cables. Kit includes flange for feedback and power connectors, o-rings, and nut. Refer to Bulk Head Connector Flange Dimensions on page 207 .
LDC-ENC-CNCT	Encoder connector kit	Adapts your encoder to the feedback cable on the Hall effect module.
LDC-HALL-C	Hall effect module	Replacement module for use with connectorized coil.
LDC-HALL-F		Replacement module for use with flying-lead coil.

Cooling Plate Accessories for LDC-Series Iron Core Linear Motors

Cat. No. Coil	Cat. No. Cooling Plate
LDC-C030100-xxxxx	LDC-030-100-CP
LDC-C030200-xxxxx	LDC-030-200-CP
LDC-C050100-xxxxx	LCC-050-100-CP
LDC-C050200-xxxxx	LDC-050-200-CP
LDC-C050300-xxxxx	LCC-050-300-CP
LDC-C075200-xxxxx	LDC-075-200-CP
LDC-C075300-xxxxx	LDC-075-300-CP
LDC-C075400-xxxxx	LDC-075-400-CP
LDC-C100300-xxxxx	LDC-100-300-CP
LDC-C100400-xxxxx	LDC-100-400-CP
LDC-C100600-xxxxx	LDC-100-600-CP
LDC-C150400-xxxxx	LDC-150-400-CP
LDC-C150600-xxxxx	LDC-150-600-CP

LDC-Series Iron Core Linear Motor Performance Specifications

These performance specifications apply to all LDC-Series iron core linear motors.

Common Performance Specifications

Attribute	Value
Motor type	3 phase, wye winding, synchronous permanent magnet stator, non-ventilated linear motor
Operating speed, max	10 m/s (32.8 ft/s)
Operating voltage, (not for direct connection to AC line)	460V AC rms
Dielectric rating of motor power connections (U,V,W), to ground for 1.0 s ⁽¹⁾	2500V AC rms 50/60 Hz
Cogging torque	< 5% of the continuous force
Applied bus voltage, max ⁽²⁾	650V DC
Electrical cycle length	50 mm (1.9685 in.)
Coil temperature, max	130 °C (266 °F)
Insulation class	130 °C (266 °F) Class B
Thermal time constant, Ref, winding to ambient	45 min
Paint color	Black

(1) Tested during manufacturing process. Do not re-apply test voltage. Contact Application Engineering (631.344.6600) for advice on testing coils post production.

(2) Maximum cable length is 10 m (32.8 ft). Consult Application Engineering (631.344.6600) for applications requiring longer cables.

Motor performance specifications are with sinusoidal commutation. Cooling options include NC (no cooling), AC (air cooling), and WC (water cooling).

LDC-Series Iron Core Linear Motors (30 mm frame size)

Attribute	Units	Symbol	LDC-C030100-DxTxx			LDC-C030200-DxTxx			LDC-C030200-ExTxx		
			NC	AC	WC	NC	AC	WC	NC	AC	WC
Force, continuous ^{(1) (2) (3)}	N (lbf)	F_c	74 (17)	93 (21)	111 (25)	148 (33)	185 (42)	222 (50)	148 (33)	185 (42)	222 (50)
Force, peak ⁽⁴⁾	N (lbf)	F_p	188 (42)			375 (84)					
Thermal resistance	°C/W	R_{th}	2.24	1.43	1.00	1.12	0.72	0.50	1.12	0.72	0.50
Force constant ^{(5) (6) (7)}	N/A _{pk} (lbf/A _{pk})	K_f	18.2 (4.1)			18.2 (4.1)			36.4 (8.2)		
Back EMF constant p-p ^{(5) (6) (7)}	V _p /m/s (V _p /in/s)	K_e	21.5 (0.55)			21.5 (0.55)			43.0 (1.09)		
Current, peak ^{(4) (6)}	A _{pk} (A _{rms})	I_p	12.1 (8.6)			24.3 (17.1)			12.1 (8.6)		
Current, continuous ^{(1) (2) (3) (6)}	A _{pk} (A _{rms})	I_c	4.1 (2.88)	5.1 (3.6)	6.1 (4.3)	8.1 (5.8)	10.2 (7.2)	12.2 (8.6)	4.1 (2.9)	5.1 (3.6)	6.1 (4.3)
Resistance p-p @ 20 °C (68 °F) ^{(5) (7)}	Ohms	R_{20}	2.256			1.128			4.51		
Inductance p-p ^{(5) (7)}	mH	L	21.6			10.8			43.0		
Magnetic attraction ⁽⁸⁾	N (lbf)	F_a	393 (88)			786 (177)					

(1) Coils at maximum temperature, 130 °C (266 °F), mounted to an aluminium heat sink whose area is noted in table on [page 196](#), and at 40 °C (104 °F) ambient.

(2) Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.

(3) For standstill conditions, multiply continuous force and continuous current by 0.9.

(4) Calculated at 20% duty cycle for 1.0 second max. Some applications may produce significantly higher peak forces. Call Applications Engineering (631.344.6600) for details.

(5) Winding parameters listed are measured line-to-line (phase-to-phase).

(6) Currents and voltages listed are measured 0-peak of the sine wave unless noted as rms.

(7) Specifications are ±10%. Phase-to-phase inductance is ±30%.

(8) All specifications are at the standard reference air gap as shown in the drawing on [page 198](#) and [page 200](#).

LDC-Series Iron Core Linear Motors (50 mm frame size)

Attribute	Units	Symbol	LDC-C050100-DxTx			LDC-C050200-DxTx			LDC-C050300-DxTx			LDC-C050300-ExTx					
			NC	AC	WC	NC	AC	WC	NC	AC	WC	NC	AC	WC			
Force, continuous ^{(1) (2) (3)}	N (lbf)	F _c	119 (27)	149 (34)	179 (40)	240 (54)	299 (67)	359 (81)	240 (54)	299 (67)	359 (81)	363 (82)	453 (102)	544 (122)			
Force, peak ⁽⁴⁾	N (lbf)	F _p	302 (68)	600 (135)			941 (212)			941 (212)			941 (212)				
Thermal resistance	°C/W	R _{th}	1.44	0.92	0.64	0.71	0.46	0.32	0.71	0.46	0.32	0.48	0.31	0.21	0.48	0.31	0.21
Force constant ^{(5) (6) (7)}	N/A _{pk} (lbf/A _{pk})	K _f	30.3 (6.8)	30.3 (6.8)			60.7 (13.6)			60.7 (13.6)			92.4 (20.8)				
Back EMF constant p-p ^{(5) (6) (7)}	V _p /m/s (V _p /in/s)	K _e	35.8 (0.91)	35.8 (0.91)			71.7 (1.82)			71.7 (1.82)			109.1 (2.77)				
Current, peak ^{(4) (6)}	A _{pk} (A _{rms})	I _p	11.7 (8.3)	23.3 (16.5)			35.9 (25.4)			35.9 (25.4)			12.0 (8.5)				
Current, continuous ^{(1) (2) (3) (6)}	A _{pk} (A _{rms})	I _c	3.9 (2.8)	4.9 (3.5)	5.9 (4.2)	7.9 (5.6)	9.9 (7.0)	11.8 (8.4)	3.9 (2.8)	4.9 (3.5)	5.9 (4.2)	11.8 (8.3)	14.7 (10.4)	17.7 (12.5)	3.9 (2.8)	4.9 (3.5)	5.9 (4.2)
Resistance p-p @ 20 °C (68 °F) ^{(5) (7)}	Ohms	R ₂₀	3.76	1.88			7.52			7.52			11.28				
Inductance p-p ^{(5) (7)}	mH	L	36	18			72			72			108				
Magnetic attraction ⁽⁸⁾	N (lbf)	F _a	690 (155)	1379 (310)			2069 (465)			2069 (465)			2069 (465)				

- (1) Coils at maximum temperature, 130 °C (266 °F), mounted to an aluminium heat sink whose area is noted in table on [page 196](#), and at 40 °C (104 °F) ambient.
- (2) Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
- (3) For standstill conditions, multiply continuous force and continuous current by 0.9.
- (4) Calculated at 20% duty cycle for 1.0 second max. Some applications may produce significantly higher peak forces. Call Applications Engineering (631.344.6600) for details.
- (5) Winding parameters listed are measured line-to-line (phase-to-phase).
- (6) Currents and voltages listed are measured 0-peak of the sine wave unless noted as rms.
- (7) Specifications are ±10%. Phase-to-phase inductance is ±30%.
- (8) All specifications are at the standard reference air gap as shown in the drawing on [page 198](#) and [page 200](#).

LDC-Series Iron Core Linear Motors (75 mm frame size)

Attribute	Units	Symbol	LDC-C075200-DxTx			LDC-C075200-ExTx			LDC-C075300-DxTx			LDC-C075300-ExTx			LDC-C075400-DxTx			LDC-C075400-ExTx			
			NC	AC	WC	NC	AC	WC	NC	AC	WC	NC	AC	WC	NC	AC	WC	NC	AC	WC	
Force, continuous ⁽¹⁾⁽²⁾⁽³⁾	N (lbf)	F _c	348 (78)	435 (98)	523 (117)	348 (78)	435 (98)	523 (117)	523 (117)	653 (147)	784 (176)	523 (117)	653 (147)	784 (176)	697 (157)	871 (196)	1045 (235)	697 (157)	871 (196)	1045 (235)	
Force, peak ⁽⁴⁾	N (lbf)	F _p	882 (198)	1368 (308)			1368 (308)			1824 (410)			1824 (410)			1824 (410)			1824 (410)		
Thermal resistance	°C/W	R _{th}	0.58	0.37	0.26	0.58	0.37	0.26	0.39	0.25	0.17	0.39	0.25	0.17	0.29	0.19	0.13	0.29	0.19	0.13	
Force constant ⁽⁵⁾⁽⁶⁾⁽⁷⁾	N/A _{pk} (lbf/A _{pk})	K _f	45.5 (10.2)	91.0 (20.5)			91.0 (20.5)			45.5 (10.2)			45.5 (10.2)			91.0 (20.5)			91.0 (20.5)		
Back EMF constant p-p ⁽⁵⁾⁽⁶⁾⁽⁷⁾	V _p /m/s (V _p /in/s)	K _e	53.7 (1.37)	107.5 (2.73)			107.5 (2.73)			53.7 (1.37)			53.7 (1.37)			107.5 (2.73)			107.5 (2.73)		
Current, peak ⁽⁴⁾⁽⁶⁾	A _{pk} (A _{rms})	I _p	22.9 (16.2)	11.5 (8.1)			11.5 (8.1)			35.6 (25.1)			11.9 (8.4)			47.4 (33.5)			23.7 (16.8)		
Current, continuous ⁽¹⁾⁽²⁾⁽³⁾⁽⁶⁾	A _{pk} (A _{rms})	I _c	7.7 (5.4)	9.6 (6.8)	11.5 (8.1)	3.8 (2.7)	4.8 (3.4)	5.7 (4.1)	11.5 (8.1)	14.4 (10.2)	17.2 (12.2)	3.8 (2.7)	4.8 (3.4)	5.7 (4.1)	15.3 (10.8)	19.1 (13.5)	23.0 (16.2)	7.7 (5.4)	9.6 (6.8)	11.5 (8.1)	
Resistance p-p @ 20 °C (68 °F) ⁽⁵⁾⁽⁷⁾	Ohms	R ₂₀	2.47	9.88			9.88			1.65			14.82			1.24			4.94		
Inductance p-p ⁽⁵⁾⁽⁷⁾	mH	L	24	95			95			16			142			12			47		
Magnetic attraction ⁽⁸⁾	N (lbf)	F _a	2000 (450)	2999 (674)			2999 (674)			3999 (899)			3999 (899)			3999 (899)			3999 (899)		

- (1) Coils at maximum temperature, 130 °C (266 °F), mounted to an aluminium heat sink whose area is noted in table on [page 196](#), and at 40 °C (104 °F) ambient.
- (2) Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
- (3) For standstill conditions, multiply continuous force and continuous current by 0.9.
- (4) Calculated at 20% duty cycle for 1.0 second max. Some applications may produce significantly higher peak forces. Call Applications Engineering (631.344.6600) for details.
- (5) Winding parameters listed are measured line-to-line (phase-to-phase).
- (6) Currents and voltages listed are measured 0-peak of the sine wave unless noted as rms.
- (7) Specifications are ±10%. Phase-to-phase inductance is ±30%.
- (8) All specifications are at the standard reference air gap as shown in the drawing on [page 198](#) and [page 200](#).

LDC-Series Iron Core Linear Motors (100 mm frame size)

Attribute	Units	Symbol	LDC-C100300-DxTx.xx			LDC-C100300-ExTx.xx			LDC-C100400-DxTx.xx			LDC-C100400-ExTx.xx			LDC-C100600-DxTx.xx			LDC-C100600-ExTx.xx		
			NC	AC	WC	NC	AC	WC	NC	AC	WC	NC	AC	WC	NC	AC	WC	NC	AC	WC
Force, continuous ⁽¹⁾⁽²⁾⁽³⁾	N (lbf)	F _c	674 (152)	843 (190)	1012 (227)	674 (152)	843 (190)	1012 (227)	899 (202)	1124 (253)	1349 (303)	899 (202)	1124 (253)	1349 (303)	1686 (379)	2023 (455)	1349 (303)	1686 (379)	2023 (455)	
Force, peak ⁽⁴⁾	N (lbf)	F _p	1767 (397)			2356 (530)			3534 (794)			3534 (794)			3534 (794)			3534 (794)		
Thermal resistance	°C/W	R _{th}	0.33	0.21	0.15	0.33	0.21	0.15	0.25	0.16	0.11	0.25	0.16	0.11	0.11	0.07	0.17	0.11	0.07	
Force constant ⁽⁵⁾⁽⁶⁾⁽⁷⁾	N/A _{pk} (lbf/A _{pk})	K _f	60.7 (13.6)			182.0 (40.9)			60.7 (13.6)			121.3 (27.3)			60.7 (13.6)		121.3 (27.3)			
Back EMF constant p-p ⁽⁵⁾⁽⁶⁾⁽⁷⁾	V _p /m/s (V _p /m/s)	K _e	71.7 (1.82)			215.0 (5.46)			71.7 (1.82)			143.3 (3.64)			71.7 (1.82)		143.3 (3.64)			
Current, peak ⁽⁴⁾⁽⁶⁾	A _{pk} (A _{rms})	I _p	34.3 (24.2)			11.4 (8.1)			45.7 (32.3)			22.8 (16.1)			68.5 (48.4)		34.3 (24.2)			
Current, continuous ⁽¹⁾⁽²⁾⁽³⁾⁽⁶⁾	A _{pk} (A _{rms})	I _c	11.1 (7.9)	13.9 (9.8)	16.7 (11.8)	3.7 (2.6)	4.6 (3.3)	5.6 (3.9)	14.8 (10.5)	18.5 (13.1)	22.2 (15.7)	7.4 (5.2)	9.3 (6.5)	11.1 (7.9)	27.8 (19.7)	33.3 (23.6)	11.1 (7.9)	13.9 (9.8)	16.7 (11.8)	
Resistance p-p @ 20 °C (68 °F) ⁽⁵⁾⁽⁷⁾	Ohms	R ₂₀	2.04			18.36			1.53			6.12			1.02			4.08		
Inductance p-p ⁽⁵⁾⁽⁷⁾	mH	L	20			184			15			61			10			41		
Magnetic attraction ⁽⁸⁾	N (lbf)	F _a	3930 (883)			5240 (1178)			7860 (1767)			7860 (1767)			7860 (1767)			7860 (1767)		

- (1) Coils at maximum temperature, 130 °C (266 °F), mounted to an aluminium heat sink whose area is noted in table on [page 196](#), and at 40 °C (104 °F) ambient.
- (2) Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
- (3) For standstill conditions, multiply continuous force and continuous current by 0.9.
- (4) Calculated at 20% duty cycle for 1.0 second max. Some applications may produce significantly higher peak forces. Call Applications Engineering (631.344.6600) for details.
- (5) Winding parameters listed are measured line-to-line (phase-to-phase).
- (6) Currents and voltages listed are measured 0-peak of the sine wave unless noted as rms.
- (7) Specifications are ±10%. Phase-to-phase inductance is ±30%.
- (8) All specifications are at the standard reference air gap as shown in the drawing on [page 198](#) and [page 200](#).

LDC-Series Iron Core Linear Motors (150 mm frame size)

Attribute	Units	Symbol	LDC-C150400-DxTx			LDC-C150400-ExTx			LDC-C150600-DxTx			LDC-C150600-ExTx		
			NC	AC	WC	NC	AC	WC	NC	AC	WC	NC	AC	WC
Force, continuous ⁽¹⁾ (2) (3)	N (lbf)	F _c	1281 (288)	1601 (360)	1922 (432)	1281 (288)	1601 (360)	1922 (432)	1281 (288)	1601 (360)	1922 (432)	1281 (288)	1601 (360)	1922 (432)
Force, peak ⁽⁴⁾	N (lbf)	F _p	5246 (1179)											
Thermal resistance	°C/W	R _{th}	0.20	0.13	0.09	0.20	0.13	0.09	0.13	0.09	0.06	0.13	0.09	0.06
Force constant ⁽⁵⁾ (6) (7)	N/A _{pk} (lbf/A _{pk})	K _f	91.0 (20.5)			182.0 (40.9)			91.0 (20.5)			182.0 (40.9)		
Back EMF constant p-p ⁽⁵⁾ (6) (7)	V _p /m/s (V _p /in/s)	K _e	107.5 (2.73)			215.0 (5.46)			107.5 (2.73)			215.0 (5.46)		
Current, peak ⁽⁴⁾ (6)	A _{pk} (A _{rms})	I _p	45.2 (32.0)			22.6 (16.0)			67.8 (47.9)			33.9 (24.0)		
Current, continuous ⁽¹⁾ (2) (3) (6)	A _{pk} (A _{rms})	I _c	14.1 (10.0)	17.6 (12.4)	21.1 (14.9)	7.0 (5.0)	8.8 (6.2)	10.6 (7.5)	21.1 (14.9)	26.4 (18.7)	31.7 (22.4)	10.6 (7.5)	13.2 (9.3)	15.8 (11.2)
Resistance p-p @ 20 °C (68 °F) ⁽⁵⁾ (7)	Ohms	R ₂₀	2.12			8.48			1.41			5.65		
Inductance p-p ⁽⁵⁾ (7)	mH	L	22			86			14			58		
Magnetic attraction ⁽⁸⁾	N (lbf)	F _a	7860 (1768)						11790 (2652)					

- (1) Coils at maximum temperature, 130 °C (266 °F), mounted to an aluminium heat sink whose area is noted in table on [page 196](#), and at 40 °C (104 °F) ambient.
- (2) Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.
- (3) For standstill conditions, multiply continuous force and continuous current by 0.9.
- (4) Calculated at 20% duty cycle for 1.0 second max. Some applications may produce significantly higher peak forces. Call Applications Engineering (631.344.6600) for details.
- (5) Winding parameters listed are measured line-to-line (phase-to-phase).
- (6) Currents and voltages listed are measured 0-peak of the sine wave unless noted as rms.
- (7) Specifications are ±10%. Phase-to-phase inductance is ±30%.
- (8) All specifications are at the standard reference air gap as shown in the drawing on [page 198](#) and [page 200](#).

LDC-Series Linear Motors System Combinations

For LDC-Series linear motors and	Refer to
Kinetix 6000 (460V) drives	page 668
Kinetix 6000 (460V) drives and Kinetix 6200/Kinetix 6500 (460V) drives	page 672

For LDC-Series linear motors and	Refer to
Kinetix 2000 (230V drives)	page 695
Ultra3000 (230V drives)	page 717
Ultra3000 (460V) drives	page 721

LDC-Series Iron Core Linear Motor General Specifications

Weight Specifications - Motor Coil with Flying Leads and Cooling Plate

Cat. No. Coil	Weight, approx. kg (lb)	Cat. No. Cooling Plate	Weight, approx. kg (lb)	Coil and Cooling Plate (combined) Weight, approx. kg (lb)
LDC-C030100-DHT20	1.41 (3.1)	LDC-030-100-CP	0.12 (0.26)	1.53 (3.4)
LDC-C030200-xHT20	2.27 (5.0)	LDC-030-200-CP	0.20 (0.44)	2.47 (5.4)
LDC-C050100-DHT20	2.05 (4.5)	LDC-050-100-CP	0.15 (0.32)	2.19 (4.8)
LDC-C050200-xHT20	3.18 (7.0)	LDC-050-200-CP	0.25 (0.55)	3.43 (7.6)
LDC-C050300-xHT20	4.55 (10.0)	LDC-050-300-CP	0.36 (0.79)	4.91 (10.8)
LDC-C075200-xHT20	4.55 (10.0)	LDC-075-200-CP	0.39 (0.85)	4.93 (10.9)
LDC-C075300-xHT20	6.36 (14.0)	LDC-075-300-CP	0.56 (1.23)	6.92 (15.2)
LDC-C075400-xHT20	8.18 (18.0)	LDC-075-400-CP	0.73 (1.60)	8.91 (19.6)
LDC-C100300-xHT20	7.73 (17.0)	LDC-100-300-CP	0.73 (1.60)	8.46 (18.6)
LDC-C100400-xHT20	10.0 (22.0)	LDC-100-400-CP	0.96 (2.10)	10.96 (24.1)
LDC-C100600-xHT20	15.45 (34.0)	LDC-100-600-CP	1.39 (3.05)	16.84 (37.0)
LDC-C150400-xHT20	14.55 (32.0)	LDC-150-400-CP	1.93 (4.24)	16.47 (36.2)
LDC-C150600-xHT20	21.36 (47.0)	LDC-150-600-CP	2.86 (6.29)	24.22 (53.3)

Weight Specifications - Motor Coil with Connectors and Cooling Plate

Cat. No. Coil	Weight, approx. kg (lb)	Cat. No. Cooling Plate	Weight, approx. kg (lb)	Coil and Cooling Plate (combined) Weight, approx. kg (lb)
LDC-C030100-DHT11	1.61 (3.55)	LDC-030-100-CP	0.12 (0.26)	1.73 (3.81)
LDC-C030200-xHT11	2.47 (5.44)	LDC-030-200-CP	0.20 (0.44)	2.67 (5.89)
LDC-C050100-DHT11	2.25 (4.96)	LDC-050-100-CP	0.15 (0.32)	2.40 (5.29)
LDC-C050200-xHT11	3.38 (7.45)	LDC-050-200-CP	0.25 (0.55)	3.63 (8.00)
LDC-C050300-xHT11	4.75 (10.47)	LDC-050-300-CP	0.36 (0.79)	5.11 (11.3)
LDC-C075200-xHT11	4.75 (10.47)	LDC-075-200-CP	0.39 (0.85)	5.14 (11.33)
LDC-C075300-xHT11	6.56 (14.46)	LDC-075-300-CP	0.56 (1.23)	7.12 (15.70)
LDC-C075400-xHT11	8.38 (18.47)	LDC-075-400-CP	0.73 (1.60)	9.11 (20.08)
LDC-C100300-xHT11	7.91 (17.4)	LDC-100-300-CP	0.73 (1.60)	8.64 (18.6)
LDC-C100400-xHT11	10.2 (22.5)	LDC-100-400-CP	0.96 (2.10)	11.16 (24.60)
LDC-C100600-xHT11	15.65 (34.5)	LDC-100-600-CP	1.39 (3.05)	17.04 (37.57)
LDC-C150400-xHT11	14.75 (32.5)	LDC-150-400-CP	1.93 (4.24)	16.19 (35.69)
LDC-C150600-xHT11	21.56 (47.5)	LDC-150-600-CP	2.86 (6.29)	23.69 (52.23)

Weight Specifications - Motor Magnet Track

Cat. No. Magnet Track	Weight, approx. kg (lb)
LDC-M030100	0.47 (1.02)
LDC-M050100	0.66 (1.46)
LDC-M075100	0.90 (1.98)
LDC-M100100	1.14 (2.51)
LDC-M150100	1.62 (3.57)
LDC-M030500	2.35 (5.12)
LDC-M050500	3.32 (7.28)
LDC-M075500	4.5 (9.92)
LDC-M100500	5.7 (12.57)
LDC-M150500	8.08 (17.81)

Carriage Weight and Heat Sink Area Requirements

Cat. No.	Required Heat Sink Area cm² (in.²)	Required Carriage Plate Weight, approx. kg (lb)
LDC-C030100-DHT _{xx}	150 X 200 (6 X 8)	1.1 (2.6)
LDC-C030200-xHT _{xx}	150 X 300 (6 X 12)	1.6 (3.6)
LDC-C050100-DHT _{xx}	200 X 200 (8 X 8)	1.8 (4)
LDC-C050200-xHT _{xx}	200 X 300 (8 X 12)	2.7 (6)
LDC-C050300-xHT _{xx}	200 X 400 (8 X 16)	3.6 (8)
LDC-C075200-xHT _{xx}	250 X 300 (10 X 12)	5.4 (12)
LDC-C075300-xHT _{xx}	250 X 400 (10 X 16)	7.3 (16)
LDC-C075400-xHT _{xx}	250 X 500 (10 X 20)	9.1 (20)
LDC-C100300-xHT _{xx}	300 X 400 (12 X 16)	8.7 (19.2)
LDC-C100400-xHT _{xx}	300 X 500 (12 X 20)	10.9 (24)
LDC-C100600-xHT _{xx}	300 X 750 (12 X 30)	19.6 (43.2)
LDC-C150400-xHT _{xx}	400 X 500 (16 X 20)	21.8 (48)
LDC-C150600-xHT _{xx}	400 X 750 (16 X 30)	32.7 (72)

Cooling Plate Flow Rate Specifications

Cat. No. Coil	Cat. No. Cooling Plate	Air Flow Rate ⁽¹⁾ L/min (ft ³ /hr)	Water Flow Rate ⁽²⁾ bar (psi)
LDC-C030100-xxxxx	LDC-030-100-CP	N/A ⁽³⁾	N/A ⁽³⁾
LDC-C030200-xxxxx	LDC-030-200-CP	N/A ⁽³⁾	N/A ⁽³⁾
LDC-C050100-xxxxx	LCC-050-100-CP	N/A ⁽³⁾	0.41 (6)
LDC-C050200-xxxxx	LDC-050-200-CP	N/A ⁽³⁾	0.48 (7)
LDC-C050300-xxxxx	LCC-050-300-CP	N/A ⁽³⁾	0.55 (8)
LDC-C075200-xxxxx	LDC-075-200-CP	N/A ⁽³⁾	0.48 (7)
LDC-C075300-xxxxx	LDC-075-300-CP	N/A ⁽³⁾	0.55 (8)
LDC-C075400-xxxxx	LDC-075-400-CP	N/A ⁽³⁾	0.69 (10)
LDC-C100300-xxxxx	LDC-100-300-CP	61.4 (130)	0.69 (10)
LDC-C100400-xxxxx	LDC-100-400-CP	N/A ⁽³⁾	0.83 (12)
LDC-C100600-xxxxx	LDC-100-600-CP	47.2 (100)	0.97 (14)
LDC-C150400-xxxxx	LDC-150-400-CP	N/A ⁽³⁾	0.83 (12) ⁽⁴⁾
LDC-C150600-xxxxx	LDC-150-600-CP	N/A ⁽³⁾	0.93 (13.5) ⁽⁴⁾

(1) These are the flow rates required to maintain air pressure at 0.689 bar (10 lb/in.²).

(2) These are the flow rates required to maintain water pressure at 3.8 L/min (1 gal/min).

(3) This flow rate is not available. Call Application Engineering (631-344-6600) for assistance.

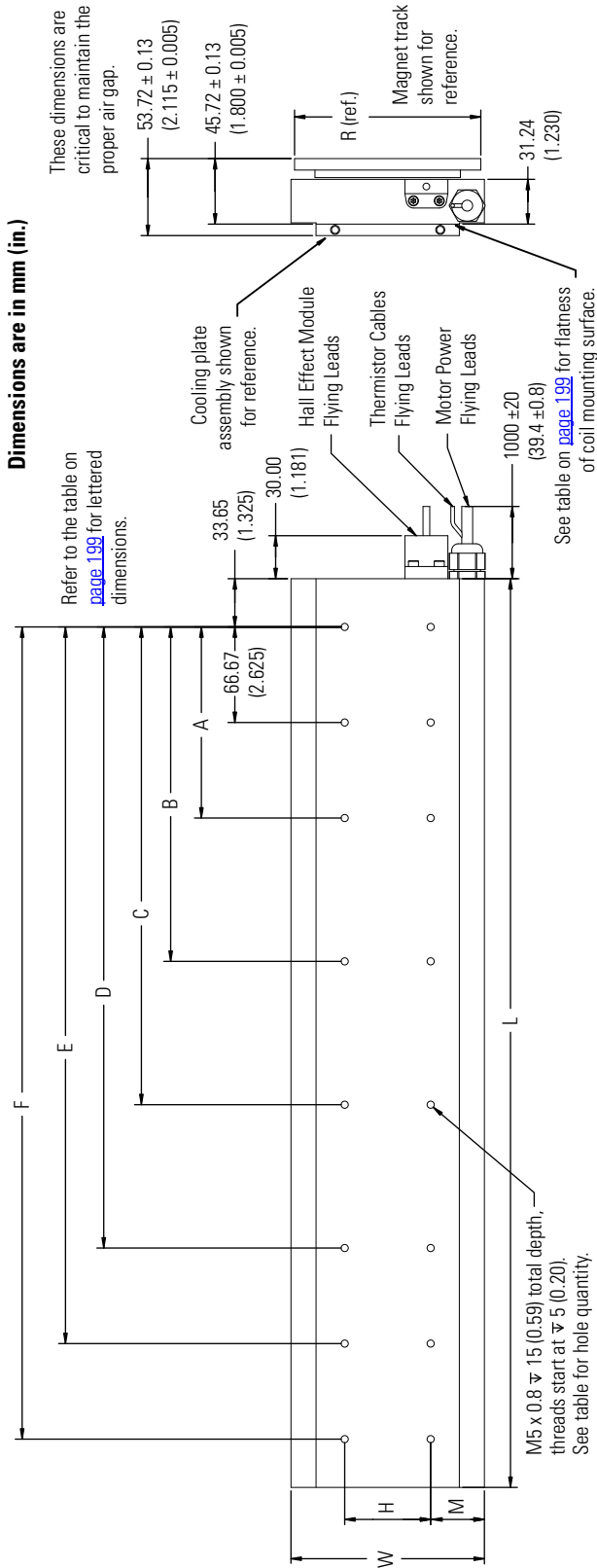
(4) These are the flow rates required to maintain water pressure at 7.57 L/min (2 gal/min).

LDC-Series Iron Core Linear Motor Component Dimensions

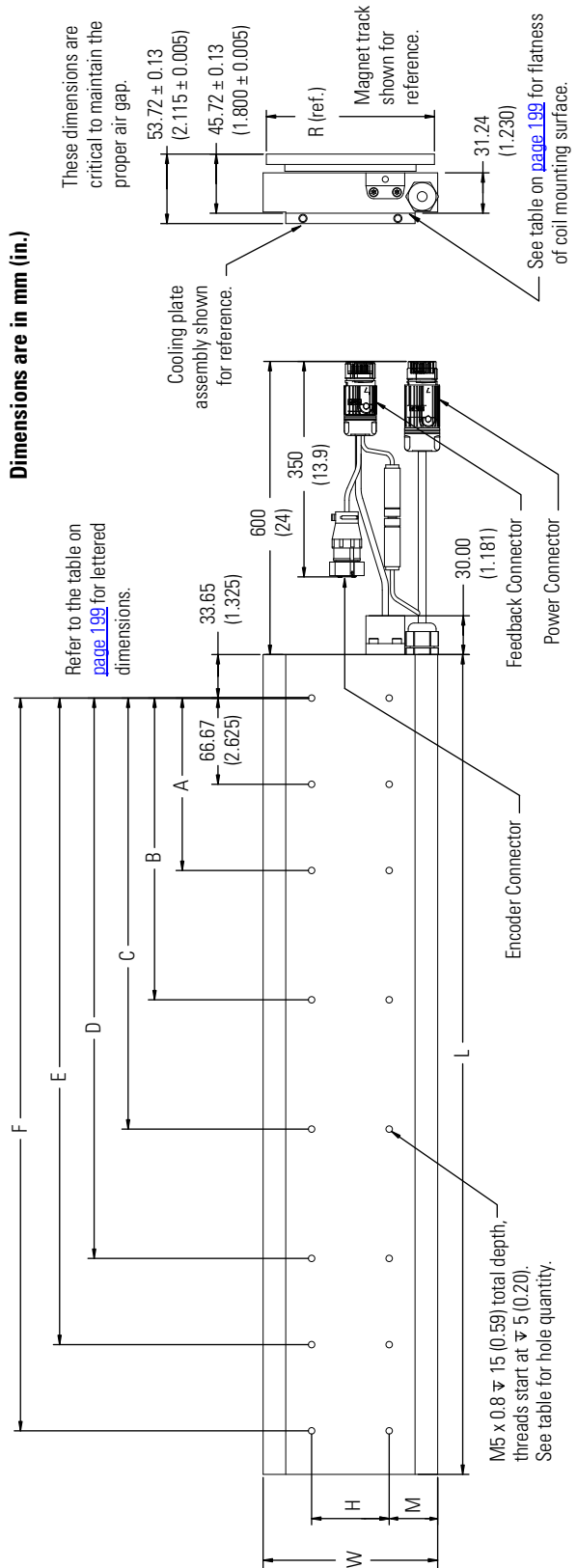
LDC-Series iron core linear motor components are designed to metric dimensions. Inch dimensions are conversions from millimeters. Untoleranced dimensions are for reference.

LDC-Series Iron Core Linear Motor Coil Dimensions

LDC-C030/050/075/100xxx-xHT20 Motor Coil Dimensions (flying leads)



LDC-C030/050/075/100xxx-xHT11 Motor Coil Dimensions (connectors)



LDC-C030/050/075/100xxx-xHT-xx Motor Coil Dimensions

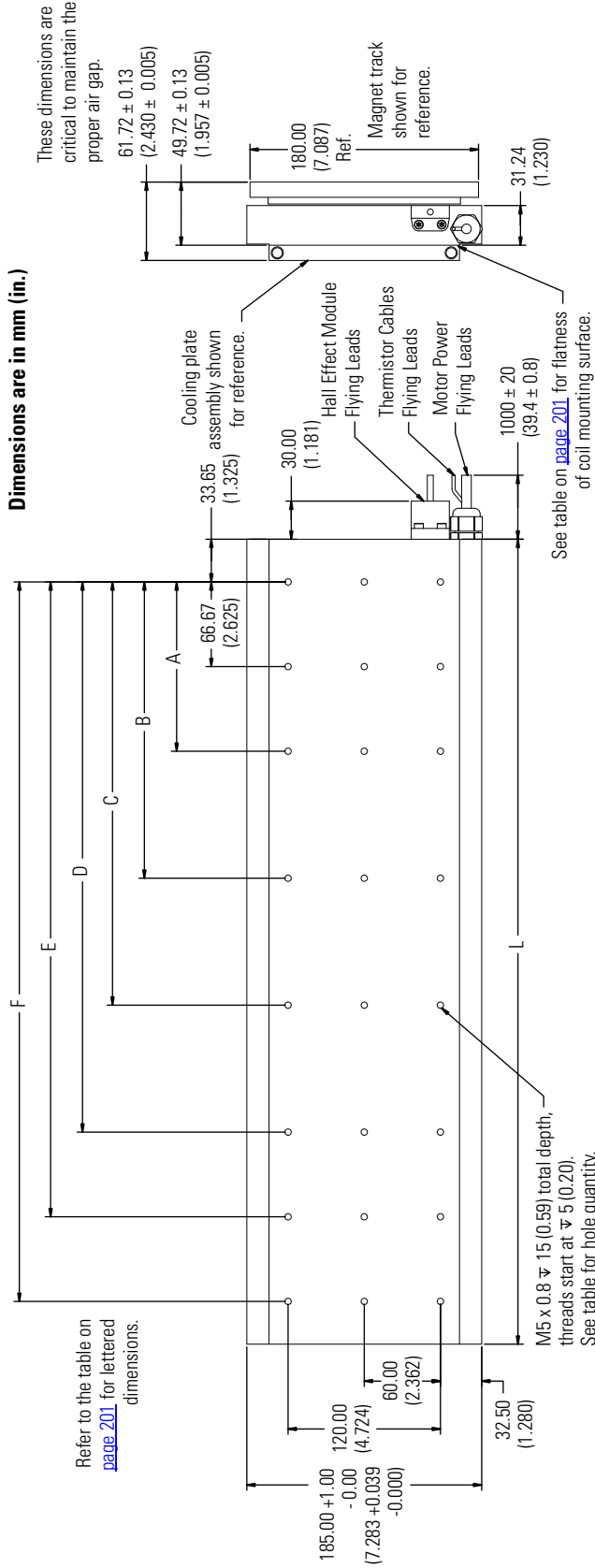
Cat. No.	L mm (in.)	W ⁽¹⁾ mm (in.)	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	H mm (in.)	M mm (in.)	R mm (in.)	Hole Qty
LDC-C030100-DHT-xx	134.0 (5.28)	65.00 (2.559)	-	-	-	-	-	-	15.00 (0.591)	25.00 (0.984)	60.00 (2.362)	4
LDC-C030200-xHT-xx	234.0 (9.21)	-	100.00 (3.937)	166.67 (6.562)	-	-	-	-	-	-	-	8
LDC-C050100-DHT-xx	134.0 (5.28)	-	-	-	-	-	-	-	-	-	-	4
LDC-C050200-xHT-xx	234.0 (9.21)	85.00 (3.346)	100.00 (3.937)	166.67 (6.562)	-	-	-	-	25.00 (0.984)	30.00 (1.181)	80.00 (3.150)	8
LDC-C050300-xHT-xx	334.0 (13.15)	-	133.33 (5.249)	200.00 (7.874)	266.67 (10.499)	-	-	-	-	-	-	10
LDC-C075200-xHT-xx	234.0 (9.21)	-	100.00 (3.937)	166.67 (6.562)	-	-	-	-	-	-	-	8
LDC-C075300-xHT-xx	334.0 (13.15)	110.00 (4.331)	133.33 (5.249)	200.00 (7.874)	266.67 (10.499)	-	-	-	40.00 (1.575)	35.00 (1.378)	105.00 (4.134)	10
LDC-C075400-xHT-xx	434.0 (17.09)	-	133.33 (5.249)	233.33 (9.186)	300.00 (11.811)	366.67 (14.436)	-	-	-	-	-	12
LDC-C100300-xHT-xx	334.0 (13.15)	-	133.33 (5.249)	200.00 (7.874)	266.67 (10.499)	-	-	-	-	-	-	10
LDC-C100400-xHT-xx	434.0 (17.09)	135.00 (5.315)	133.33 (5.249)	233.33 (9.186)	300.00 (11.811)	366.67 (14.436)	-	-	60.00 (2.362)	37.50 (1.476)	130.00 (5.118)	12
LDC-C100600-xHT-xx	634.0 (25.31)	-	133.33 (5.249)	233.33 (9.186)	333.33 (13.123)	433.33 (17.060)	500.00 (19.686)	566.66 (22.310)	-	-	-	16

(1) Tolerance for W dimension is +1.00 mm (+0.039 in.), -0.00 mm (-0.000 in.)

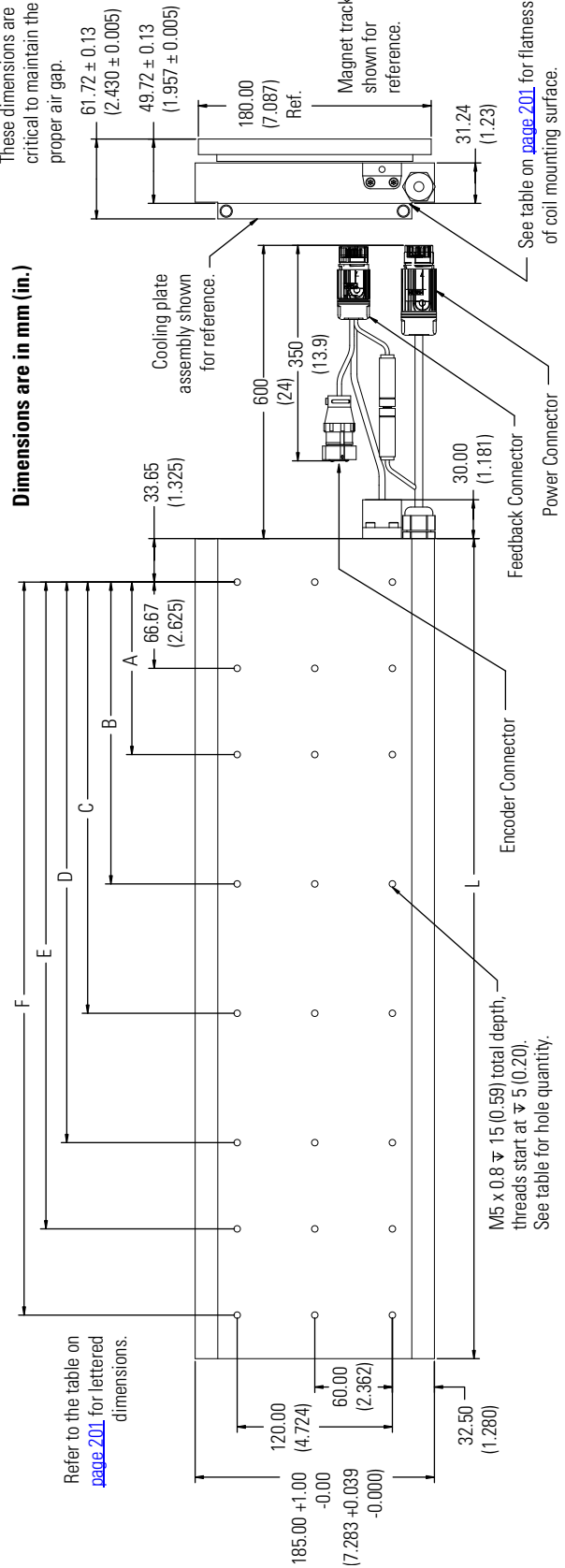
Cat. No.	Power Cable Gauge ⁽¹⁾ mm ² (AWG)	Cat. No.	Flatness mm/300 x 300 (in./12 x 12)
LDC-C030xxx-xHT-xx		LDC-C030xxx-xHT-xx	
LDC-C050xxx-xHT-xx		LDC-C050100-DHT-xx	0.25 (0.01)
LDC-C075xxx-xHT-xx	0.75 (18)	LDC-C050200-xHT-xx	
LDC-C100300-xHT-xx		LDC-C050300-xHT-xx	0.38 (0.15)
LDC-C100400-xHT-xx		LDC-C075200-xHT-xx	0.25 (0.01)
LDC-C100600-DHT-xx	1.5 (16)	LDC-C075300-xHT-xx	0.38 (0.015)
LDC-C100600-EHT-xx	0.75 (18)	LDC-C075400-xHT-xx	0.64 (0.25)
		LDC-C100300-xHT-xx	0.38 (0.015)
		LDC-C100400-xHT-xx	0.64 (0.25)
		LDC-C100600-xHT-xx	0.89 (0.035)

(1) Refer to Cable Specifications on [page 201](#) for additional cable specifications.

LDC-C0150xxx-xHT20 Motor Coil Dimensions (flying leads)



LDC-C150xxx-xHT11 Motor Coil Dimensions (connectors)



LDC-C150xxx-xHTxx Motor Coil Dimensions

Cat. No.	L mm (in.)	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	Hole Qty
LDC-C150400-xHTxx	434.0 (17.09)	133.33 (5.249)	233.33 (9.186)	300.00 (11.811)	366.67 (14.436)	—	—	18
LDC-C150600-xHTxx	634.0 (25.31)	133.33 (5.249)	233.33 (9.186)	333.33 (13.123)	433.33 (17.060)	500.00 (19.686)	566.66 (22.310)	24

Cable Specifications

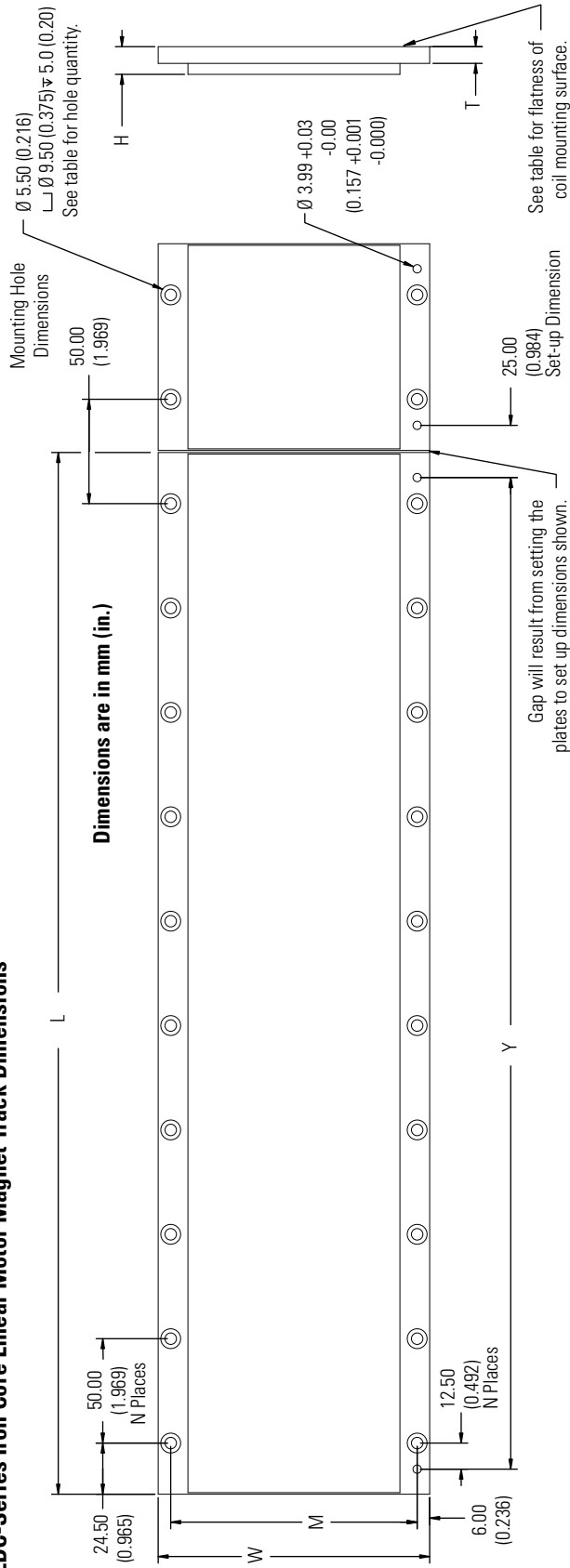
Cable (1)	Conductors	Gauge mm ² (AWG)	Shield Type	Cable Dia. mm (in.)	Static Bend Radius mm (in.)
Power (2)	4	0.75 (18)	Braid	7.0 (0.28)	18.0 (0.70)
Power (2)	4	1.5 (16)	Braid	8.0 (0.32)	17.0 (0.67)
Power (2)	4	0.50 (20)	Braid	6.4 (0.25)	17.0 (0.67)
Thermistor	2	0.14 (26)	None	4.0 (0.16)	10.0 (0.40)
Hall Module	6	0.25 (24)	Foil	5.0 (0.20)	15.0 (0.59)

(1) All cables are non-flex.

(2) Power cable specification is dependent on coil used. See Power Cable Gauge tables on [page 199](#) and [page 201](#).

Cat. No.	Power Cable Gauge mm ² (AWG)	Flatness mm/300 x 300 (in./12 x 12)
LDC-C150400-xHTxx	0.82 (18)	0.64 (0.025)
LDC-C150600-DHTxx		
LDC-C150600-EHTxx	1.31 (16)	0.89 (0.035)

LDC-Series Iron Core Linear Motor Magnet Track Dimensions



Cat. No.	L (1) mm (in.)	Y (2) mm (in.)	W mm (in.)	M mm (in.)	H (3) mm (in.)	T mm (in.)	N	Hole Qty	Flatness (4) mm/300 x 300 (in./12 x 12)
LDC-M030100	99.0 (3.90)	75.00 (2.953)	60.0 (2.36)	48.00 (1.890)	13.26 (0.522)	8.00 (0.315)	1	4	0.06 (0.002)
LDC-M050100			80.0 (3.15)	68.00 (2.677)					0.13 (0.005)
LDC-M075100			105.0 (4.13)	93.00 (3.661)					
LDC-M100100	499.0 (19.65)	475.00 (18.70)	130.0 (5.12)	118.00 (4.646)	17.26 (0.680)	12.00 (0.472)	9	20	0.50 (0.20)
LDC-M150100			180.0 (7.09)	168.00 (6.614)					0.90 (0.035)
LDC-M030500			60.0 (2.36)	48.00 (1.890)					
LDC-M050500	499.0 (19.65)	475.00 (18.70)	80.0 (3.15)	68.00 (2.677)	13.26 (0.522)	8.00 (0.315)	9	20	0.50 (0.20)
LDC-M075500			105.0 (4.13)	93.00 (3.661)					0.90 (0.035)
LDC-M100500			130.0 (5.12)	118.00 (4.646)					
LDC-M150500	180.0 (7.09)	168.00 (6.614)	180.0 (7.09)	168.00 (6.614)	17.26 (0.680)	12.00 (0.472)			0.90 (0.035)

(1) Tolerance for L dimension is ± 0.25 mm (± 0.010 in.).

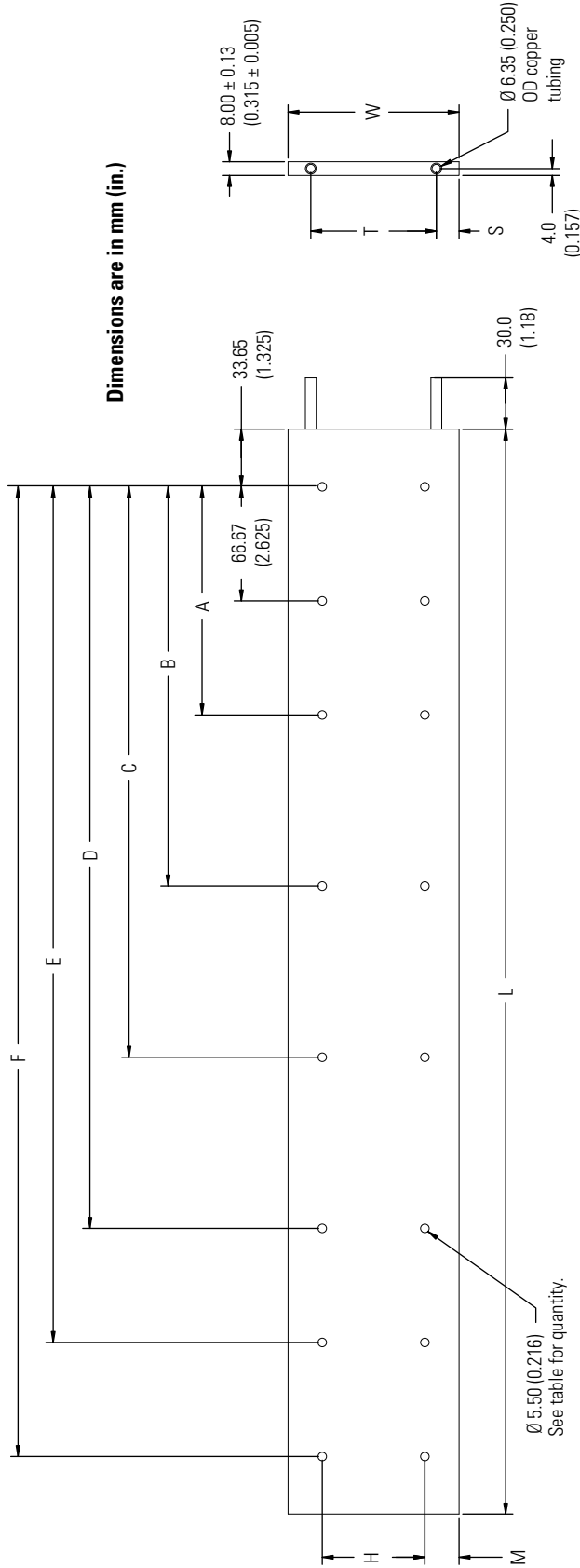
(2) Tolerance for Y dimension is ± 0.08 mm (± 0.003 in.).

(3) Tolerance for H dimension is ± 0.16 mm (± 0.006 in.).

(4) Specified flatness is in the free state.

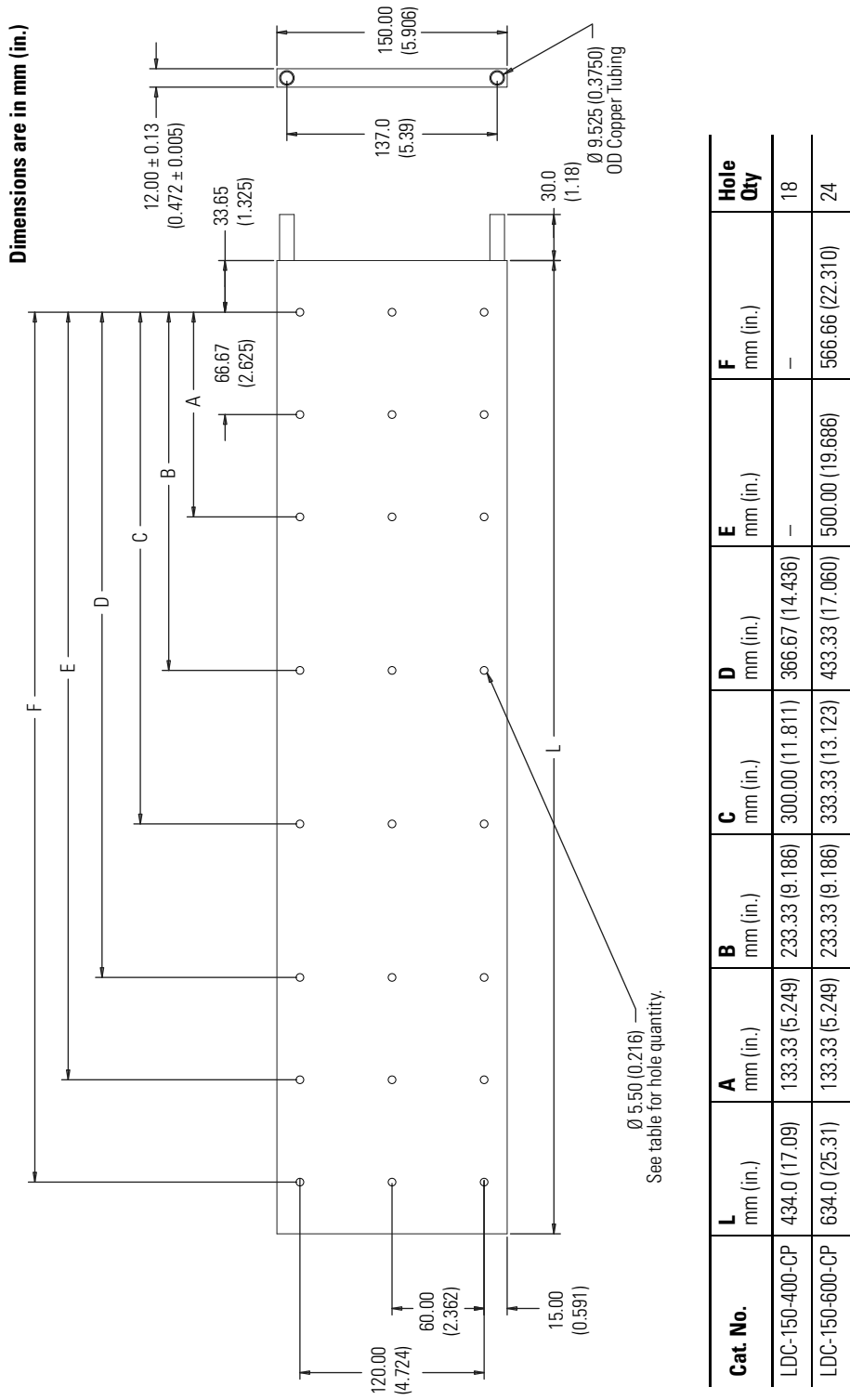
LDC-Series Iron Core Linear Motor Coil Cooling Plate Dimensions

LDC-030/050/075/100-xxx-CP Motor Coil Cooling Plate Dimensions



Cat. No.	L mm (in.)	W mm (in.)	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	H mm (in.)	M mm (in.)	T mm (in.)	S mm (in.)	Hole Qty
LDC-030-100-CP	134.0 (5.28)	38.00 (1.496)	-	-	-	-	-	-	15.00 (0.591)	11.50 (0.453)	27.5 (1.08)	5.25 (0.207)	4
LDC-030-200-CP	234.0 (9.21)	100.00 (3.937)	166.67 (6.562)	166.67 (6.562)	-	-	-	-	25.00 (0.984)	12.50 (0.492)	38.1 (1.50)	5.95 (0.234)	8
LCC-050-100-CP	134.0 (5.28)	50.00 (1.969)	-	-	-	-	-	-	40.00 (1.575)	17.50 (0.689)	50.8 (2.00)	12.10 (0.476)	4
LDC-050-200-CP	234.0 (9.21)	100.00 (3.937)	166.67 (6.562)	166.67 (6.562)	-	-	-	-	60.00 (2.362)	20.00 (0.787)	73.4 (2.89)	13.30 (0.524)	8
LCC-050-300-CP	334.0 (13.15)	100.00 (3.937)	133.33 (5.249)	200.00 (7.874)	266.67 (10.499)	-	-	-	500.00 (19.686)	333.33 (13.123)	433.33 (17.060)	566.66 (22.310)	10
LDC-075-200-CP	234.0 (9.21)	75.00 (2.953)	100.00 (3.937)	166.67 (6.562)	-	-	-	-	60.00 (2.362)	20.00 (0.787)	73.4 (2.89)	13.30 (0.524)	8
LDC-075-300-CP	334.0 (13.15)	75.00 (2.953)	133.33 (5.249)	200.00 (7.874)	266.67 (10.499)	-	-	-	60.00 (2.362)	20.00 (0.787)	73.4 (2.89)	13.30 (0.524)	10
LDC-075-400-CP	434.0 (17.09)	100.00 (3.937)	133.33 (5.249)	233.33 (9.186)	300.00 (11.811)	366.67 (14.436)	-	-	60.00 (2.362)	20.00 (0.787)	73.4 (2.89)	13.30 (0.524)	12
LDC-100-300-CP	334.0 (13.15)	100.00 (3.937)	133.33 (5.249)	200.00 (7.874)	266.67 (10.499)	-	-	-	60.00 (2.362)	20.00 (0.787)	73.4 (2.89)	13.30 (0.524)	10
LDC-100-400-CP	434.0 (17.09)	100.00 (3.937)	133.33 (5.249)	233.33 (9.186)	300.00 (11.811)	366.67 (14.436)	-	-	60.00 (2.362)	20.00 (0.787)	73.4 (2.89)	13.30 (0.524)	12
LDC-100-600-CP	634.0 (25.31)	100.00 (3.937)	133.33 (5.249)	233.33 (9.186)	333.33 (13.123)	433.33 (17.060)	500.00 (19.686)	566.66 (22.310)	60.00 (2.362)	20.00 (0.787)	73.4 (2.89)	13.30 (0.524)	16

LDC-150-xxx-CP Motor Coil Cooling Plate Dimensions

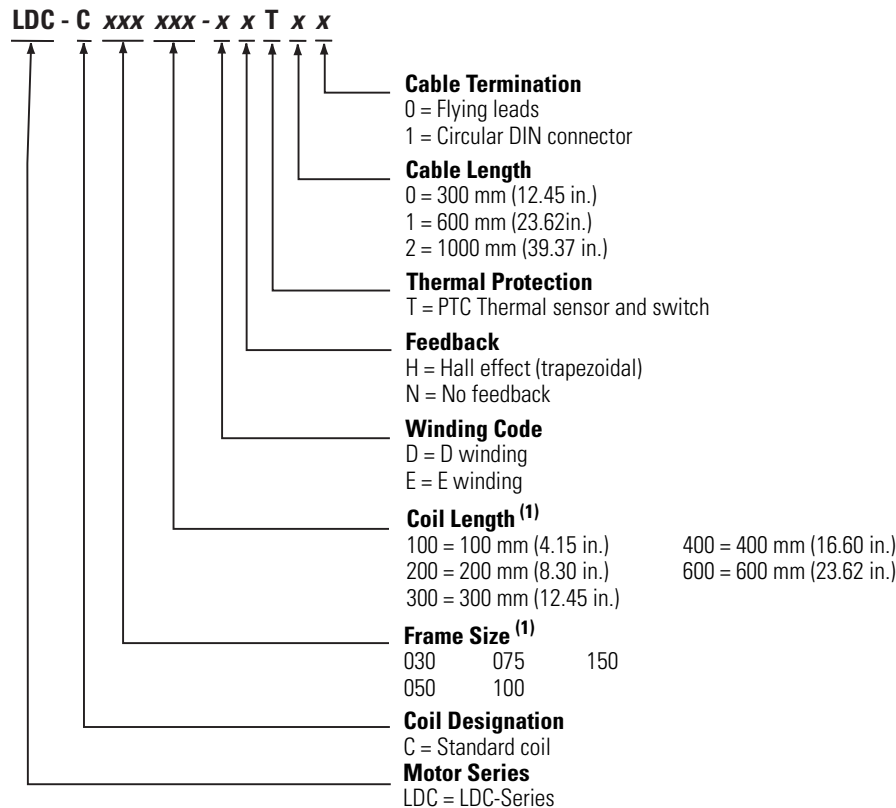


Cat. No.	L mm (in.)	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	Hole Qty
LDC-150-400-CP	434.0 (17.09)	133.33 (5.249)	233.33 (9.186)	300.00 (11.811)	366.67 (14.436)	-	-	18
LDC-150-600-CP	634.0 (25.31)	133.33 (5.249)	233.33 (9.186)	333.33 (13.123)	433.33 (17.060)	500.00 (19.686)	566.66 (22.310)	24

LDC-Series Iron Core Linear Motor Catalog Numbers

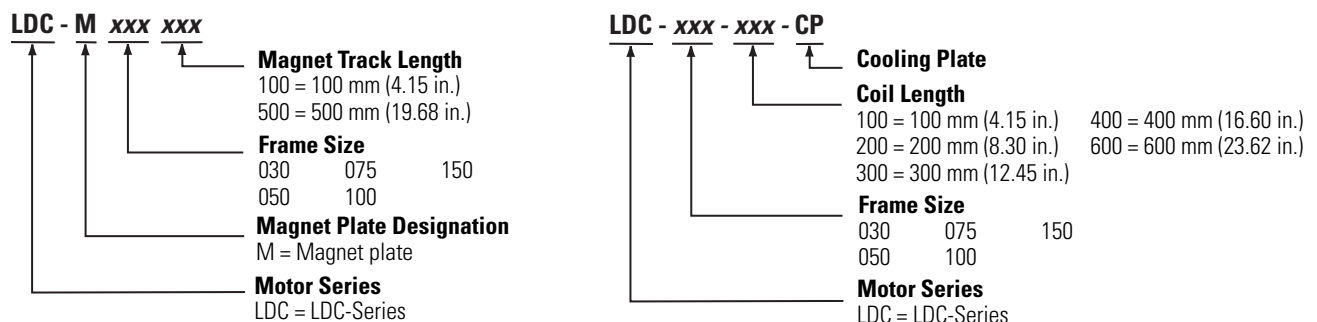
Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your actuator. For questions regarding product availability, contact your Allen-Bradley distributor.

LDC-Series Iron Core Linear Motor Catalog Numbers



(1) Not all combinations are available. Only the configurations as listed in LDC-Series Iron Core Linear Motor Performance Specifications on [page 189](#) are available.

LDC-Series Iron Core Linear Motor Magnet Track and Cooling Plate Catalog Numbers



LDL-Series Ironless Linear Servo Motors



The LDL-Series ironless linear motors address a growing interest in linear motor technology as it becomes more affordable and is increasingly recognized as a practical means of improving machine performance. With the ironless product design, you now have cost-effective options to help you improve machine throughput while reducing maintenance and downtime.

For drive compatibility, refer to Servo Drives on [page 14](#).

LDL-Series Ironless Linear Motor Features

- No magnetic attraction between the coil and magnet channel allows for the use of smaller, less expensive linear bearings.
- No external magnetic field to have to shield in magnetic sensitive applications.
- Non-cogging technology for super smooth motion.
- Very high acceleration and speeds up to 10 m/s (32.8 ft/s) greatly increase the throughput of your machine.
- No limits to travel distance. Ability to achieve high speeds over short and long travels.
- Direct drive technology for extreme servo responsiveness.
- No-wear, high reliability parts increase productivity.
- Peak forces to 1977 N (444 lb).
- Ability to size and optimize LDC-Series linear motors and corresponding servo drives by using Motion Analyzer software reduces product selection time and minimizes cost.
- Full set-up and programming support through RSLogix 5000 software reduces set-up time.

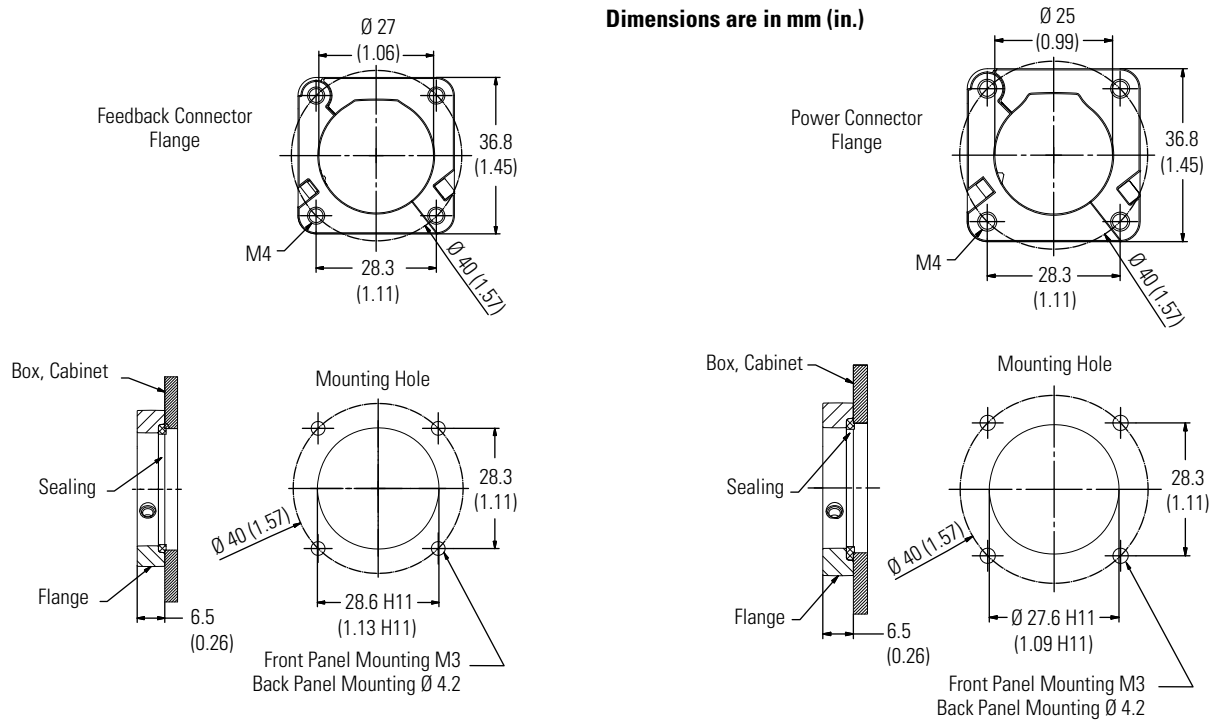
LDL-Series Ironless Linear Motor Accessories

- Bulk head connector kit.
- Encoder connector kit.
- Hall effect replacement module for connectorized coil.
- Hall effect replacement module for flying-lead coil.

Accessories for LDL-Series Ironless Linear Motors

Cat. No.	Accessory	Description
LDC-BULK-HD	Bulk head connector kit	For easy mounting of flex cable to non-flex cables. Kit includes flange for feedback and power connectors, o-rings, and nut.
LDC-ENC-CNCT	Encoder connector kit	Adapts your encoder to the feedback cable on the Hall effect module.
LDL-HALL-C	Hall effect module	Replacement module for use with connectorized coil.
LDL-HALL-F		Replacement module for use with flying-lead coil.

Bulk Head Connector Flange Dimensions



LDL-Series Ironless Linear Motor Performance Specifications

These performance specifications apply to all LDL-Series ironless linear motors.

Common Performance Specifications

Attribute	Value
Motor type	3 phase, wye winding, synchronous permanent magnet stator, non-ventilated linear motor.
Operating speed, max	10 m/s (32.8 ft/s)
Operating voltage, (not for direct connection to AC line)	230V AC rms
Dielectric rating of motor power connections (U,V,W), to ground for 1.0 s ⁽¹⁾	1500V AC rms, 50/60 Hz
Cogging torque	Zero
Applied bus voltage, max ⁽²⁾	325V DC
Electrical cycle length	60 mm (2.36 in.)
Coil temperature, max	130 °C (266 °F)
Insulation class	130 °C (266 °F) Class B
Thermal time constant, Ref, winding to ambient	35 min
Paint color	Black

(1) Tested during manufacturing process. Do not re-apply test voltage. Contact Application Engineering (631.344.6600) for advice on testing coils post production.

(2) Maximum cable length 10 m (32.8 ft). Contact Application Engineering (631.344.6600) for applications requiring longer cables.

LDL-Series Ironless Linear Motor (standard 30 mm frame size)

Attribute	Units	Symbol	LDL-N030120-DxTxx	LDL-N030240-DxTxx	LDL-N030240-ExTxx
Force, continuous ^{(1) (2) (3) (4)}	N (lbf)	F_c	63 (14)	126 (28)	
Force, peak ⁽⁵⁾	N (lbf)	F_p	209 (47)	417 (94)	
Thermal resistance	°C/W	R_{th}	1.73	0.86	
Force constant ^{(6) (7) (8)}	N/A _{pk} (lbf/A _{pk})	K_f	21.0 (4.7)	21.0 (4.7)	42.0 (9.4)
Back EMF constant p-p ^{(6) (7) (8)}	V _p /m/s (V _p /in/s)	K_e	24.8 (0.6)	24.8 (0.6)	49.6 (1.3)
Current, peak ^{(5) (7)}	A _{pk} (A _{rms})	I_p	9.9 (7.0)	19.9 (14.0)	9.9 (7.0)
Current, continuous ^{(1) (2) (3) (4)}	A _{pk} (A _{rms})	I_c	3.0 (2.1)	6.0 (4.2)	3.0 (2.1)
Resistance p-p @ 20 °C (68 °F) ^{(6) (8)}	Ohms	R_{20}	5.41	2.70	10.82
Inductance p-p ^{(6) (8)}	mH	L	8.43	4.22	16.86
Magnetic attraction	N (lbf)	F_a	0 (0)		

LDL-Series Ironless Linear Motor (thick 30 mm frame size)

Attribute	Units	Symbol	LDL-T030120-DxTxx	LDL-T030240-DxTxx	LDL-T030240-ExTxx
Force, continuous ^{(1) (2) (3) (4)}	N (lbf)	F_c	72 (16)	144 (32)	
Force, peak ⁽⁵⁾	N (lbf)	F_p	239 (54)	479 (108)	
Thermal resistance	°C/W	R_{th}	1.31	0.65	
Force constant ^{(6) (7) (8)}	N/A _{pk} (lbf/A _{pk})	K_f	24.1 (5.4)	24.1 (5.4)	48.2 (10.8)
Back EMF constant p-p ^{(6) (7) (8)}	V _p /m/s (V _p /in/s)	K_e	28.5 (0.7)	28.5 (0.7)	56.9 (1.4)
Current, peak ^{(5) (7)}	A _{pk} (A _{rms})	I_p	9.9 (7.0)	19.9 (14.0)	9.9 (7.0)
Current, continuous ^{(1) (2) (3) (4)}	A _{pk} (A _{rms})	I_c	3.0 (2.1)	6.0 (4.2)	3.0 (2.1)
Resistance p-p @ 20 °C (68 °F) ^{(6) (8)}	Ohms	R_{20}	7.15	3.57	14.29
Inductance p-p ^{(6) (8)}	mH	L	13.40	6.70	26.80
Magnetic attraction	N (lbf)	F_a	0 (0)		

(1) Coils at maximum temperature, 130 °C (266 °F), mounted to an aluminium heat sink whose area is noted in table on [page 213](#), and at 40 °C (104 °F) ambient.

(2) Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.

(3) For standstill conditions, multiply continuous force and continuous current by 0.9.

(4) Coil mountings on either of the two narrow sides reduces continuous force by 10%.

(5) Calculated at 11% duty cycle for 1.0 second max. Some applications may produce significantly higher peak forces. Call Applications Engineering (631.344.6600) for details.

(6) Winding parameters listed are measured line-to-line (phase-to-phase).

(7) Currents and voltages listed are measured 0-peak of the sine wave unless noted as rms.

(8) Specifications are ±10%. Phase-to-phase inductance is ±30%.

LDL-Series Ironless Linear Motor (standard 50 mm frame size)

Attribute	Units	Symbol	LDL-N050120-DxTxx	LDL-N050240-DxTxx	LDL-N050240-ExTxx
Force, continuous ^{(1) (2) (3) (4)}	N (lbf)	F_c	96 (22)	191 (43)	
Force, peak ⁽⁵⁾	N (lbf)	F_p	317 (71)	635 (143)	
Thermal resistance	°C/W	R_{th}	1.58	0.79	
Force constant ^{(6) (7) (8)}	N/A _{pk} (lbf/A _{pk})	K_f	35.0 (7.9)	35.0 (7.9)	70.0 (15.7)
Back EMF constant p-p ^{(6) (7) (8)}	V _p /m/s (V _p /in/s)	K_e	41.3 (1.1)	41.3 (1.1)	82.7 (2.1)
Current, peak ^{(5) (7)}	A _{pk} (A _{rms})	I_p	9.1 (6.4)	18.1 (12.8)	9.1 (6.4)
Current, continuous ^{(1) (2) (3) (4)}	A _{pk} (A _{rms})	I_c	2.7 (1.9)	5.5 (3.9)	2.7 (1.9)
Resistance p-p @ 20 °C (68 °F) ^{(6) (8)}	Ohms	R_{20}	7.11	3.56	14.22
Inductance p-p ^{(6) (8)}	mH	L	11.08	5.54	22.16
Magnetic attraction	N (lbf)	F_a	0 (0)		

Attribute	Units	Symbol	LDL-N050360-DxTxx	LDL-N050360-ExTxx	LDL-N050480-DxTxx	LDL-N050480-ExTxx
Force, continuous ^{(1) (2) (3) (4)}	N (lbf)	F_c	287 (65)		383 (86)	
Force, peak ⁽⁵⁾	N (lbf)	F_p	952 (214)		1269 (285)	
Thermal resistance	°C/W	R_{th}	0.53		0.39	
Force constant ^{(6) (7) (8)}	N/A _{pk} (lbf/A _{pk})	K_f	35.0 (7.9)	105.0 (23.6)	35.0 (7.9)	70.0 (15.7)
Back EMF constant p-p ^{(6) (7) (8)}	V _p /m/s (V _p /in/s)	K_e	41.3 (1.1)	124.0 (3.2)	41.3 (1.1)	82.7 (2.1)
Current, peak ^{(5) (7)}	A _{pk} (A _{rms})	I_p	27.2 (19.2)	9.1 (6.4)	36.3 (25.6)	18.1 (12.8)
Current, continuous ^{(1) (2) (3) (4)}	A _{pk} (A _{rms})	I_c	8.2 (5.8)	2.7 (1.9)	10.9 (7.7)	5.5 (3.9)
Resistance p-p @ 20 °C (68 °F) ^{(6) (8)}	Ohms	R_{20}	2.37	21.33	1.78	7.11
Inductance p-p ^{(6) (8)}	mH	L	3.69	33.25	2.77	11.08
Magnetic attraction	N (lbf)	F_a	0 (0)			

(1) Coils at maximum temperature, 130 °C (266 °F), mounted to an aluminium heat sink whose area is noted in table on [page 213](#), and at 40 °C (104 °F) ambient.

(2) Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.

(3) For standstill conditions, multiply continuous force and continuous current by 0.9.

(4) Coil mountings on either of the two narrow sides reduces continuous force by 10%.

(5) Calculated at 11% duty cycle for 1.0 second max. Some applications may produce significantly higher peak forces. Call Applications Engineering (631.344.6600) for details.

(6) Winding parameters listed are measured line-to-line (phase-to-phase).

(7) Currents and voltages listed are measured 0-peak of the sine wave unless noted as rms.

(8) Specifications are ±10%. Phase-to-phase inductance is ±30%.

LDL-Series Ironless Linear Motor (thick 50 mm frame size)

Attribute	Units	Symbol	LDL-T050120-DxTxx	LDL-T050240-DxTxx	LDL-T050240-ExTxx
Force, continuous ^{(1) (2) (3) (4)}	N (lbf)	F_c	110 (25)	220 (49)	
Force, peak ⁽⁵⁾	N (lbf)	F_p	364 (82)	728 (164)	
Thermal resistance	°C/W	R_{th}	1.19	0.60	
Force constant ^{(6) (7) (8)}	N/A _{pk} (lbf/A _{pk})	K_f	40.2 (9.0)	40.2 (9.0)	80.4 (18.1)
Back EMF constant p-p ^{(6) (7) (8)}	V _p /m/s (V _p /in/s)	K_e	47.4 (1.2)	47.4 (1.2)	94.9 (2.4)
Current, peak ^{(5) (7)}	A _{pk} (A _{rms})	I_p	9.1 (6.4)	18.1 (12.8)	9.1 (6.4)
Current, continuous ^{(1) (2) (3) (4)}	A _{pk} (A _{rms})	I_c	2.7 (1.9)	5.5 (3.9)	2.7 (1.9)
Resistance p-p @ 20 °C (68 °F) ^{(6) (8)}	Ohms	R_{20}	9.42	4.71	18.83
Inductance p-p ^{(6) (8)}	mH	L	18	9	35.31
Magnetic attraction	N (lbf)	F_a	0 (0)		

Attribute	Units	Symbol	LDL-T050360-DxTxx	LDL-T050360-ExTxx	LDL-T050480-DxTxx	LDL-T050480-ExTxx
Force, continuous ^{(1) (2) (3) (4)}	N (lbf)	F_c	329 (74)		439 (99)	
Force, peak ⁽⁵⁾	N (lbf)	F_p	1093 (246)		1457 (327)	
Thermal resistance	°C/W	R_{th}	0.40		0.30	
Force constant ^{(6) (7) (8)}	N/A _{pk} (lbf/A _{pk})	K_f	40.2 (9.0)	120.5 (27.1)	40.2 (9.0)	80.4 (18.1)
Back EMF constant p-p ^{(6) (7) (8)}	V _p /m/s (V _p /in/s)	K_e	47.4 (1.2)	142.3 (3.6)	47.4 (1.2)	94.9 (2.4)
Current, peak ^{(5) (7)}	A _{pk} (A _{rms})	I_p	27.2 (19.2)	9.1 (6.4)	36.3 (25.6)	18.1 (12.8)
Current, continuous ^{(1) (2) (3) (4)}	A _{pk} (A _{rms})	I_c	8.2 (5.8)	2.7 (1.9)	10.9 (7.7)	5.5 (3.9)
Resistance p-p @ 20 °C (68 °F) ^{(6) (8)}	Ohms	R_{20}	3.14	28.25	2.35	9.42
Inductance p-p ^{(6) (8)}	mH	L	5.88	52.96	4.41	17.65
Magnetic attraction	N (lbf)	F_a	0 (0)			

(1) Coils at maximum temperature, 130 °C (266 °F), mounted to an aluminium heat sink whose area is noted in table on [page 213](#), and at 40 °C (104 °F) ambient.

(2) Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.

(3) For standstill conditions, multiply continuous force and continuous current by 0.9.

(4) Coil mountings on either of the two narrow sides reduces continuous force by 10%.

(5) Calculated at 11% duty cycle for 1.0 second max. Some applications may produce significantly higher peak forces. Call Applications Engineering (631.344.6600) for details.

(6) Winding parameters listed are measured line-to-line (phase-to-phase).

(7) Currents and voltages listed are measured 0-peak of the sine wave unless noted as rms.

(8) Specifications are ±10%. Phase-to-phase inductance is ±30%.

LDL-Series Ironless Linear Motor (standard 75 mm frame size)

Attribute	Units	Symbol	LDL-N075480-DxTxx	LDL-N075480-ExTxx
Force, continuous ^{(1) (2) (3) (4)}	N (lbf)	F_c	519 (117)	
Force, peak ⁽⁵⁾	N (lbf)	F_p	1723 (387)	
Thermal resistance	°C/W	R_{th}	0.37	
Force constant ^{(6) (7) (8)}	N/A _{pk} (lbf/A _{pk})	K_f	52.5 (11.8)	105.0 (23.6)
Back EMF constant p-p ^{(6) (7) (8)}	V _p /m/s (V _p /in/s)	K_e	62.0 (1.6)	124.0 (3.2)
Current, peak ^{(5) (7)}	A _{pk} (A _{rms})	I_p	32.8 (23.2)	16.4 (11.6)
Current, continuous ^{(1) (2) (3) (4)}	A _{pk} (A _{rms})	I_c	9.9 (7.0)	4.9 (3.5)
Resistance p-p @ 20 °C (68 °F) ^{(6) (8)}	Ohms	R_{20}	2.31	9.24
Inductance p-p ^{(6) (8)}	mH	L	3.60	14.40
Magnetic attraction	N (lbf)	F_a	0 (0)	

LDL-Series Ironless Linear Motor (thick 75 mm frame size)

Attribute	Units	Symbol	LDL-T075480-DxTxx	LDL-T075480-ExTxx
Force, continuous ^{(1) (2) (3) (4)}	N (lbf)	F_c	596 (134)	
Force, peak ⁽⁵⁾	N (lbf)	F_p	1977 (444)	
Thermal resistance	°C/W	R_{th}	0.28	
Force constant ^{(6) (7) (8)}	N/A _{pk} (lbf/A _{pk})	K_f	60.3 (13.5)	120.5 (27.1)
Back EMF constant p-p ^{(6) (7) (8)}	V _p /m/s (V _p /in/s)	K_e	71.2 (1.8)	142.3 (3.6)
Current, peak ^{(5) (7)}	A _{pk} (A _{rms})	I_p	32.8 (23.2)	16.4 (11.6)
Current, continuous ^{(1) (2) (3) (4)}	A _{pk} (A _{rms})	I_c	9.9 (7.0)	4.9 (3.5)
Resistance p-p @ 20 °C (68 °F) ^{(6) (8)}	Ohms	R_{20}	3.06	12.25
Inductance p-p ^{(6) (8)}	mH	L	5.74	22.97
Magnetic attraction	N (lbf)	F_a	0 (0)	

(1) Coils at maximum temperature, 130 °C (266 °F), mounted to an aluminium heat sink whose area is noted in table on [page 213](#), and at 40 °C (104 °F) ambient.

(2) Continuous force and current based on coil moving with all phases sharing the same load in sinusoidal commutation.

(3) For standstill conditions, multiply continuous force and continuous current by 0.9.

(4) Coil mountings on either of the two narrow sides reduces continuous force by 10%.

(5) Calculated at 11% duty cycle for 1.0 second max. Some applications may produce significantly higher peak forces. Call Applications Engineering (631.344.6600) for details.

(6) Winding parameters listed are measured line-to-line (phase-to-phase).

(7) Currents and voltages listed are measured 0-peak of the sine wave unless noted as rms.

(8) Specifications are ±10%. Phase-to-phase inductance is ±30%.

LDL-Series Linear Motors System Combinations

For LDL-Series linear motors and	Refer to
Kinetix 6000 (230V) drives	page 679
Kinetix 2000 (230V) drives	page 699
Ultra3000 (230V) drives	page 727

LDL-Series Ironless Linear Motor General Specifications

Weight Specifications - Motor Coil with Flying Leads

Cat. No.	Weight, approx. kg (lb)	Cat. No.	Weight, approx. kg (lb)
LDL-N030120-DHT20	0.63 (1.38)	LDL-T050240-xHT20	1.71 (3.77)
LDL-T030120-DHT20	0.74 (1.64)	LDL-N050360-xHT20	2.03 (4.47)
LDL-N030240-xHT20	1.14 (2.51)	LDL-T050360-xHT20	2.50 (5.52)
LDL-T030240-xHT20	1.37 (3.02)	LDL-N050480-xHT20	2.67 (5.88)
LDL-N050120-DHT20	0.75 (1.66)	LDL-T050480-xHT20	3.30 (7.28)
LDL-T050120-DHT20	0.91 (2.01)	LDL-N075480-xHT20	3.32 (7.32)
LDL-N050240-xHT20	1.39 (3.07)	LDL-T075480-xHT20	4.16 (9.18)

Weight Specifications - Motor Coil with Connectors

Cat. No.	Weight, approx. kg (lb)	Cat. No.	Weight, approx. kg (lb)
LDL-N030120-DHT11	0.83 (1.83)	LDL-T050240-xHT11	1.91 (4.21)
LDL-T030120-DHT11	0.94 (2.07)	LDL-N050360-xHT11	2.23 (4.92)
LDL-N030240-xHT11	1.34 (2.95)	LDL-T050360-xHT11	2.70 (5.95)
LDL-T030240-xHT11	1.57 (3.46)	LDL-N050480-xHT11	3.50 (7.72)
LDL-N050120-DHT11	0.95 (2.09)	LDL-T050480-xHT11	4.36 (9.61)
LDL-T050120-DHT11	1.01 (2.22)	LDL-N075480-xHT11	3.52 (7.76)
LDL-N050240-xHT11	1.41 (3.11)	LDL-T075480-xHT11	4.36 (9.61)

Weight Specifications - Motor Magnet Channel

Cat. No.	Weight, approx. kg (lb)	Cat. No.	Weight, approx. kg (lb)
LDL-NM030120	1.37 (3.02)	LDL-TM050120	1.89 (4.17)
LDL-NM030480	5.51 (12.15)	LDL-TM050480	7.57 (16.69)
LDL-TM030120	1.40 (3.08)	LDL-NM075120	2.91 (6.42)
LDL-TM030480	5.60 (12.35)	LDL-NM075480	11.64 (25.66)
LDL-NM050120	1.87 (4.12)	LDL-TM075120	2.94 (6.48)
LDL-NM050480	7.48 (16.49)	LDL-TM075480	11.76 (25.93)

Carriage Weight and Heat Sink Area Requirements

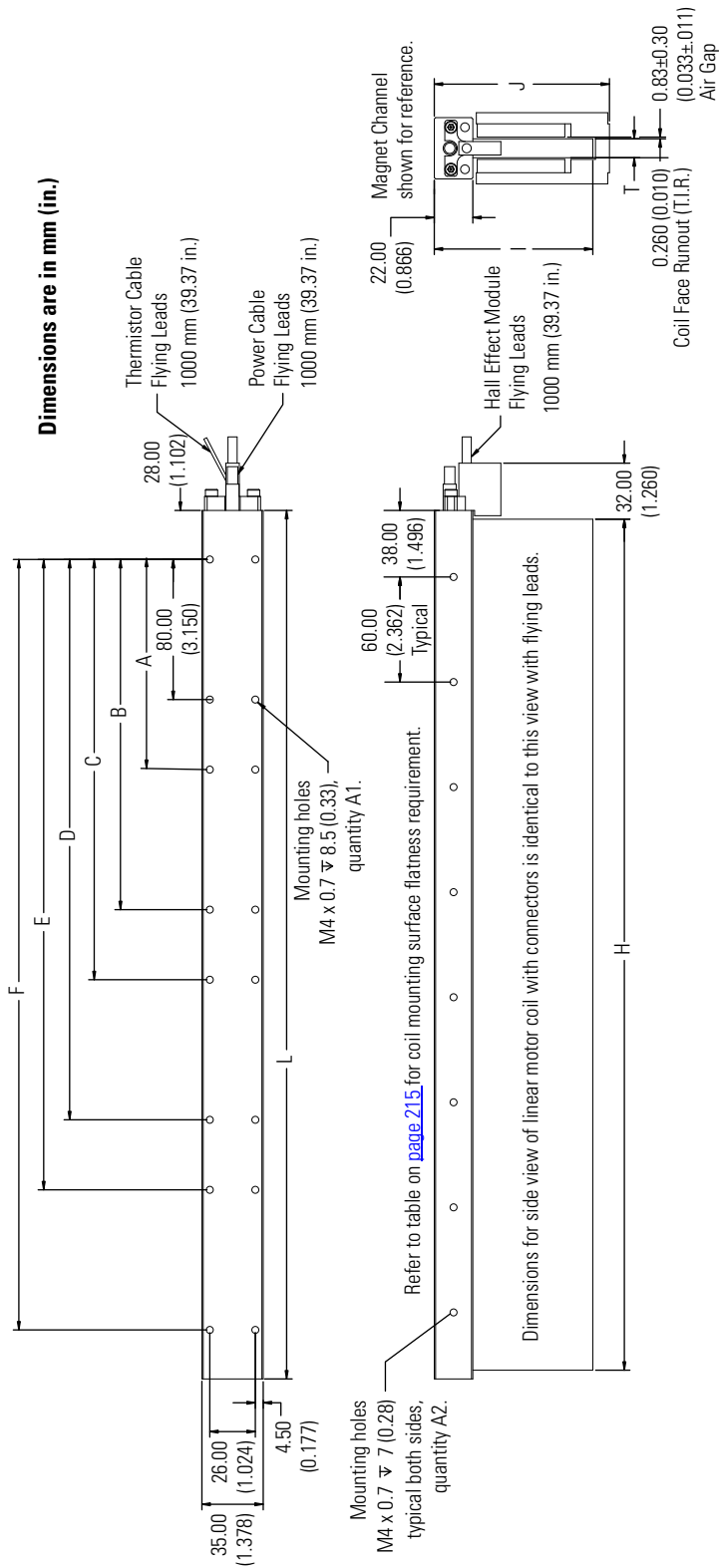
Cat. No.	Required Heat Sink Area cm ² (in. ²)	Required Carriage Plate Weight kg (lb)
LDL-x030120-DHT _{xx}	774 (120)	1.4 (3)
LDL-x030240-xHT _{xx}	1160 (180)	2.0 (4.5)
LDL-x050120-DHT _{xx}	774 (120)	2.7 (6)
LDL-x050240-DHT _{xx}	1160 (180)	4.0 (9)
LDL-x050360-DHT _{xx}	1680 (260)	5.9 (13)
LDL-x050480-DHT _{xx}	2060 (320)	7.3 (16)
LDL-x075480-xHT _{xx}	2060 (320)	7.3 (16)

LDL-Series Ironless Linear Motor Component Dimensions

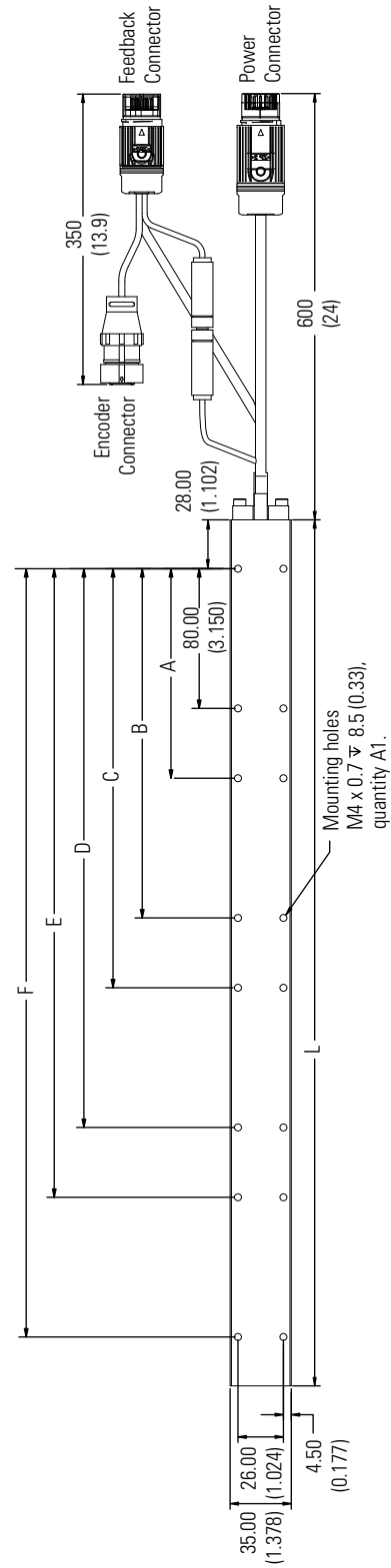
LDL-Series ironless linear motor components are designed to metric dimensions. Inch dimensions are conversions from millimeters. Untoleranced dimensions are for reference.

LDL-Series Ironless Linear Motor Coil Dimensions

LDL-xxxxxxx-xHT20 Motor Coil Dimensions (flying leads)



LDL-xxxxxxx-xHT11 Motor Coil Dimensions (connectors)



LDL-xxxx-xHTxx Motor Coil Dimensions

Cat. No.	L mm (in.)	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	G mm (in.)	H mm (in.)	I mm (in.)	J ⁽¹⁾ mm (in.)	T mm (in.)	A1 Qty	A2 Qty	Power Cable Gauge mm ² (AWG)	Flatness mm/300 x 300 (in./12 x 12)
LDL-N030120-DHTxx	136.0 (5.35)	-	-	-	-	-	-	60.00 (2.362)	126.00 (4.961)	70.50 (2.776)	80.00 (3.149)	8.30 (0.33) 10.80 (0.43)	4	2		
LDL-T030120-DHTxx																
LDL-N030240-xHTxx	256.0 (10.08)	120.00 (4.724)	200.00 (7.874)	-	-	-	-	180.00 (7.087)	246.00 (9.685)			8.30 (0.33) 10.80 (0.43)	8	4		0.25 (0.010)
LDL-T030240-xHTxx																
LDL-N050120-DHTxx	136.0 (5.35)	-	-	-	-	-	-	60.00 (2.362)	126.00 (4.961)			8.30 (0.33) 10.80 (0.43)	4	2	0.50 (20)	
LDL-T050120-DHTxx																
LDL-T050240-xHTxx	256.0 (10.08)	120.0 (4.724)	200 (7.874)	-	-	-	-	180.00 (7.087)	246.00 (9.685)			8.30 (0.33) 10.80 (0.43)	8	4		
LDL-N050240-xHTxx																
LDL-T050360-xHTxx	376.0 (14.80)	120.00 (4.724)	200 (7.874)	240.00 (9.449)	320.00 (12.598)	-	-	300.00 (11.811)	366.00 (14.409)	90.50 (3.563)	100.00 (3.937)	8.30 (0.33) 10.80 (0.43)	12	6		0.38 (0.015)
LDL-N050360-xHTxx																
LDL-N050480-DHTxx																
LDL-N050480-EHTxx																
LDL-T050480-xHTxx																
LDL-N075480-DHTxx	496.0 (19.53)	120.00 (4.724)	200 (7.874)	240.00 (9.449)	320.00 (12.598)	360.00 (14.173)	440.00 (17.323)	420.00 (16.535)	486.00 (19.134)			8.30 (0.33) 10.80 (0.43)	16	8		0.64 (0.025)
LDL-N075480-EHTxx																
LDL-T075480-DHTxx																
LDL-T075480-EHTxx																

(1) Tolerance for J dimension is ±0.26 mm (0.010 in.).

Cable Specifications

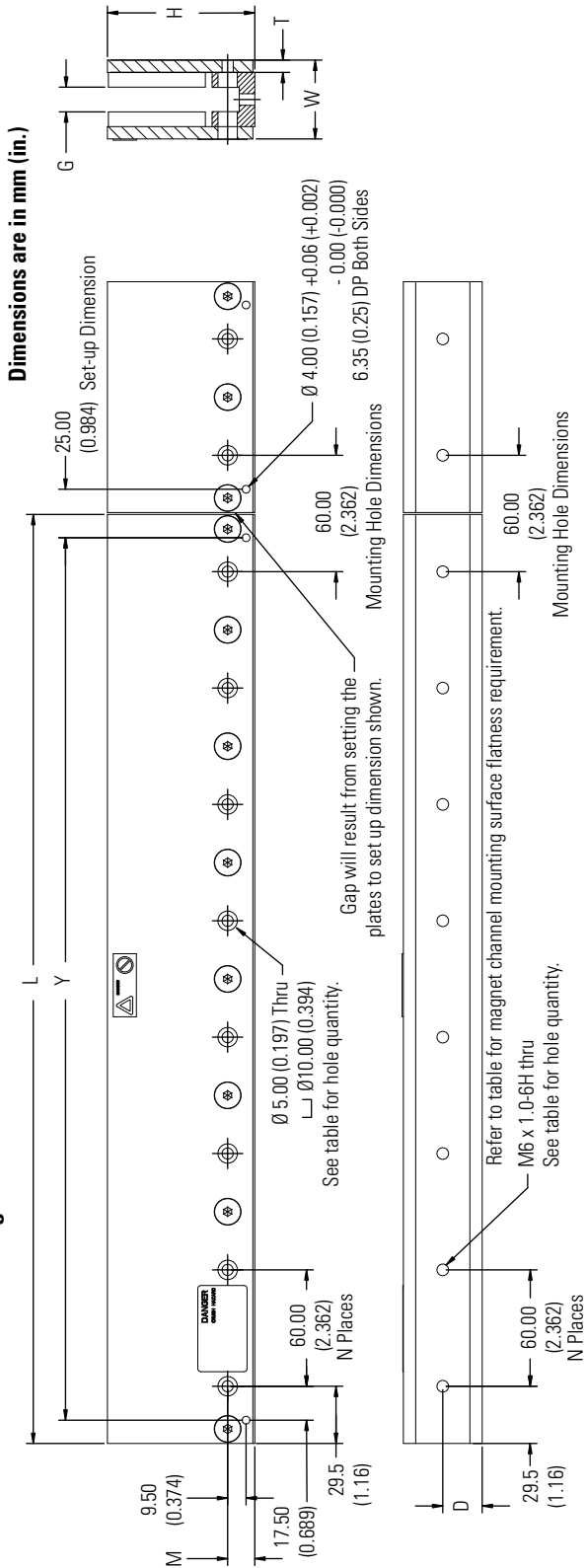
Cable ⁽¹⁾	Conductors	Gauge mm ² (AWG)	Shield Type	Cable Dia. mm (in.)	Static Bend Radius mm (in.)
Power ⁽²⁾	4	0.82 (18)	Braid	7.0 (0.28)	18.0 (0.70)
Power ⁽²⁾	4	0.52 (20)	Braid	6.4 (0.25)	17.0 (0.67)
Thermistor	2	0.20 (26)	None	4.0 (0.16)	10.0 (0.40)
Hall Module	6	0.13 (24)	Foil	5.0 (0.20)	15.0 (0.59)

(1) All cables are non-flex.

(2) Power cable specification is dependent on coil used. See [Power Cable Gauge](#) table on this page.

LDL-Series Ironless Linear Motor Magnet Channel Dimensions

LDL-Series Ironless Linear Motor Magnet Channel Dimensions



Cat. No.	W mm (in.)	H mm (in.)	T mm (in.)	G (1) mm (in.)	D mm (in.)	L (2) mm (in.)	M mm (in.)	N	Hole Qty	Y (3) mm (in.)	Flatness mm/300 x 300 (in./12 x 12)
LDL-NM030120	37.80 (1.488)	56.00 (2.205)	6.35 (0.250)	9.86 (0.388)	18.90 (0.744)	119.00 (4.685)	14.00 (0.551)	1	2	95.00 (3.740)	0.13 (0.005)
LDL-NM030480	40.65 (1.600)			12.57 (0.494)	20.33 (0.800)	479.00 (18.858)		7	8	455.00 (17.913)	0.26 (0.010)
LDL-TM030120	37.80 (1.488)	76.00 (2.992)	6.35 (0.250)	9.86 (0.388)	18.90 (0.744)	119.00 (4.685)	14.00 (0.551)	1	2	95.00 (3.740)	0.13 (0.005)
LDL-TM030480				12.57 (0.494)	20.33 (0.800)	479.00 (18.858)		7	8	455.00 (17.913)	0.26 (0.010)
LDL-NM050120	41.1 (1.62)	106.0 (4.173)	8.00 (0.315)	9.86 (0.388)	20.55 (0.809)	119.00 (4.685)	19.00 (0.748)	1	2	95.00 (3.740)	0.13 (0.005)
LDL-NM050480				12.57 (0.494)	21.85 (0.860)	479.00 (18.858)		7	8	455.00 (17.913)	0.26 (0.010)
LDL-TM050120	43.7 (1.72)			9.86 (0.388)	20.55 (0.809)	119.00 (4.685)		1	2	95.00 (3.740)	0.13 (0.005)
LDL-TM050480				12.57 (0.494)	21.85 (0.860)	479.00 (18.858)		7	8	455.00 (17.913)	0.26 (0.010)

(1) Tolerance for G dimension is +0.35 mm (+0.012 in.), -0.12 mm (-0.004 in.)

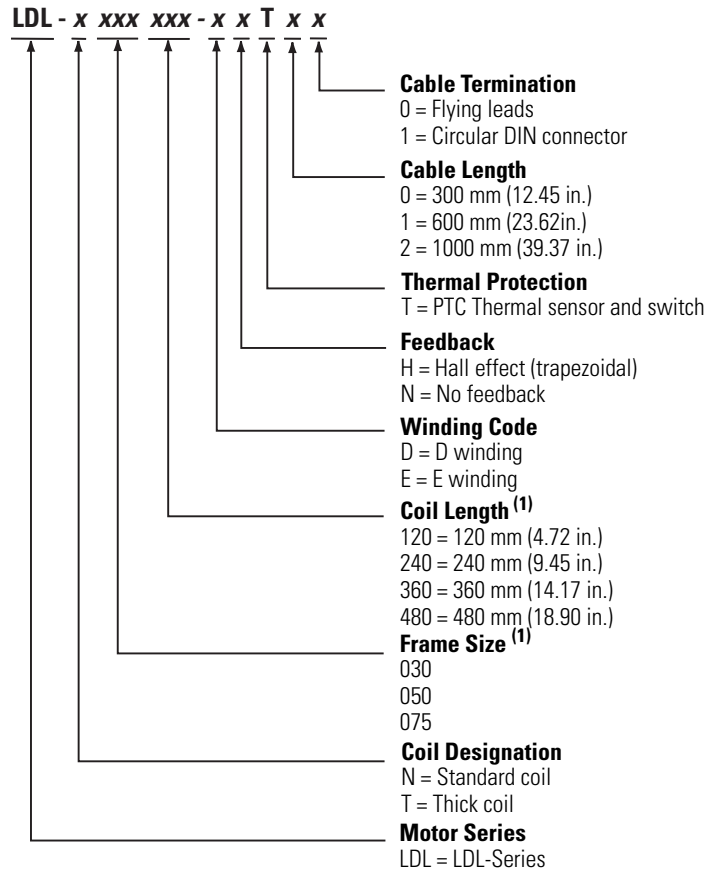
(2) Tolerance for L dimension is ±0.25 mm (±0.010 in.)

(3) Tolerance for Y dimension is ±0.05 mm (±0.002 in.)

LDL-Series Ironless Linear Motor Catalog Numbers

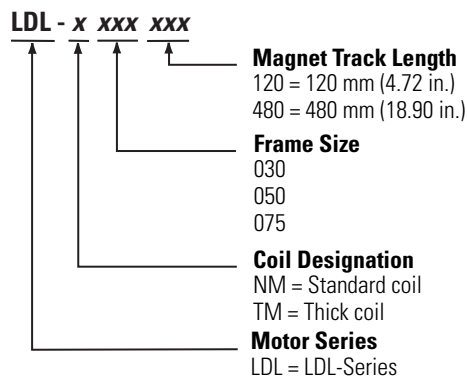
Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your actuator. For questions regarding product availability, contact your Allen-Bradley distributor.

LDL-Series Ironless Linear Motor Catalog Numbers



(1) Not all combinations are available. Only the configurations as listed in LDL-Series Ironless Linear Motor Performance Specifications on [page 207](#) are available.

LDL-Series Ironless Linear Motor Magnet Channel Catalog Numbers



Notes:

Logix Controller Platforms

The Logix platforms that support your SERCOS interface and EtherNet/IP network motion applications include ControlLogix and CompactLogix controllers. Analog motion applications are supported by the ControlLogix platform.

Topic	Page
ControlLogix System Overview	219
CompactLogix System Overview	221
SERCOS interface Modules	223
Analog Servo Modules	226

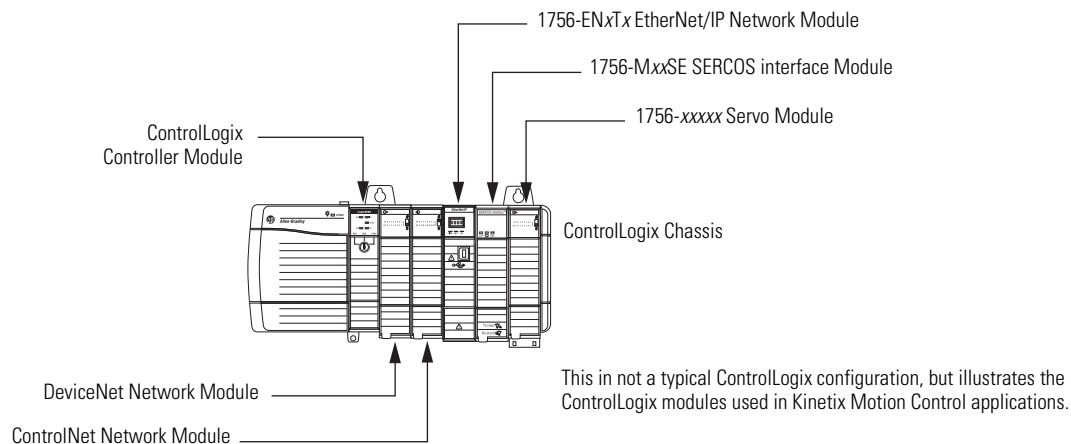
ControlLogix System Overview

The ControlLogix platform is a modular system capable of handling your most intensive applications. Modules are inserted into slots on the ControlLogix chassis. The ControlLogix products available for your motion control application include:

- 1756-EN2T, 1756-EN2F, 1756-EN2TR, and 1756-EN3TR EtherNet/IP network modules.
- 1756-M03SE, 1756-M08SE, and 1756-M16SE SERCOS interface modules.
- 1756-M02AE, 1756-HYD02, and 1756-M02AS analog servo modules.

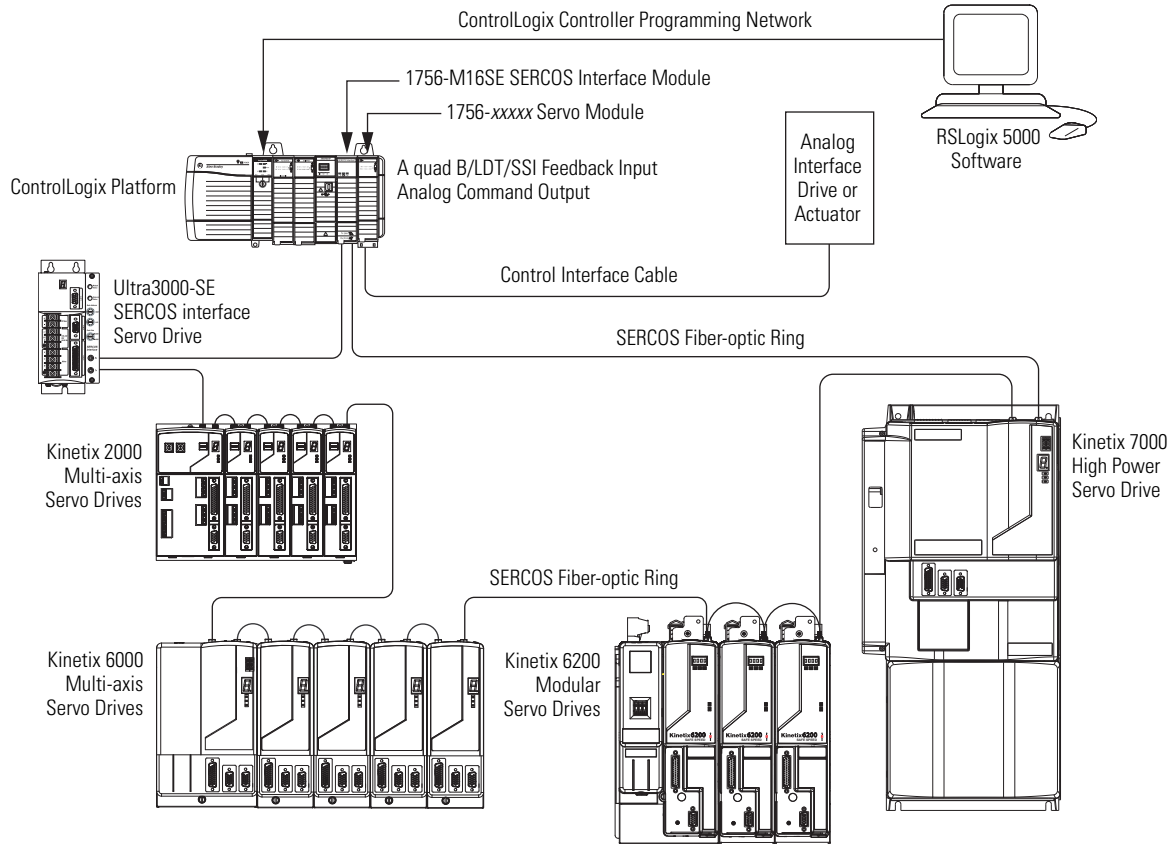
For more information regarding the ControlLogix platform, including the 1756-ENxTx EtherNet/IP modules, refer to the ControlLogix Selection Guide, publication [1756-SG001](#).

ControlLogix Platform

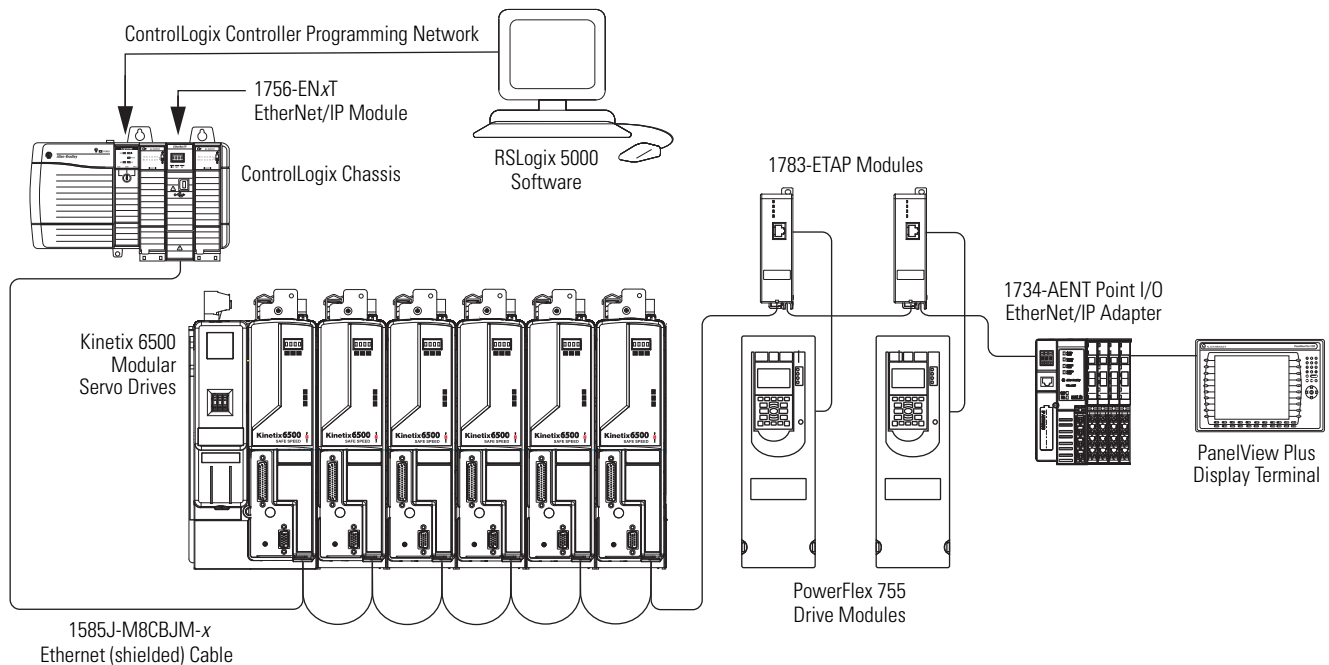


Select the network module and number of controllers based on the needs of your application. This flexibility lets you share system resources and divide applications across multiple controllers.

ControlLogix System (SERCOS)



ControlLogix System (EtherNet/IP)



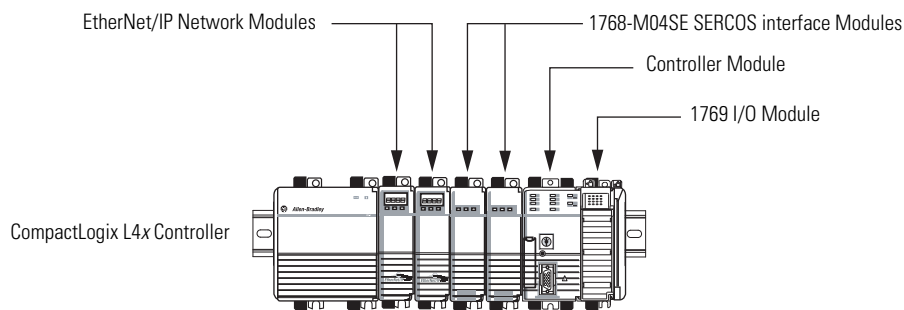
CompactLogix System Overview

The CompactLogix platform is a modular system that provides cost-effective control for smaller applications. Modules snap together side-by-side on a DIN rail. The CompactLogix products available for your motion control application include:

- 1768-L4x controller with 1768-M04SE SERCOS interface module.
- 1769-L23x controller with an EtherNet/IP network.

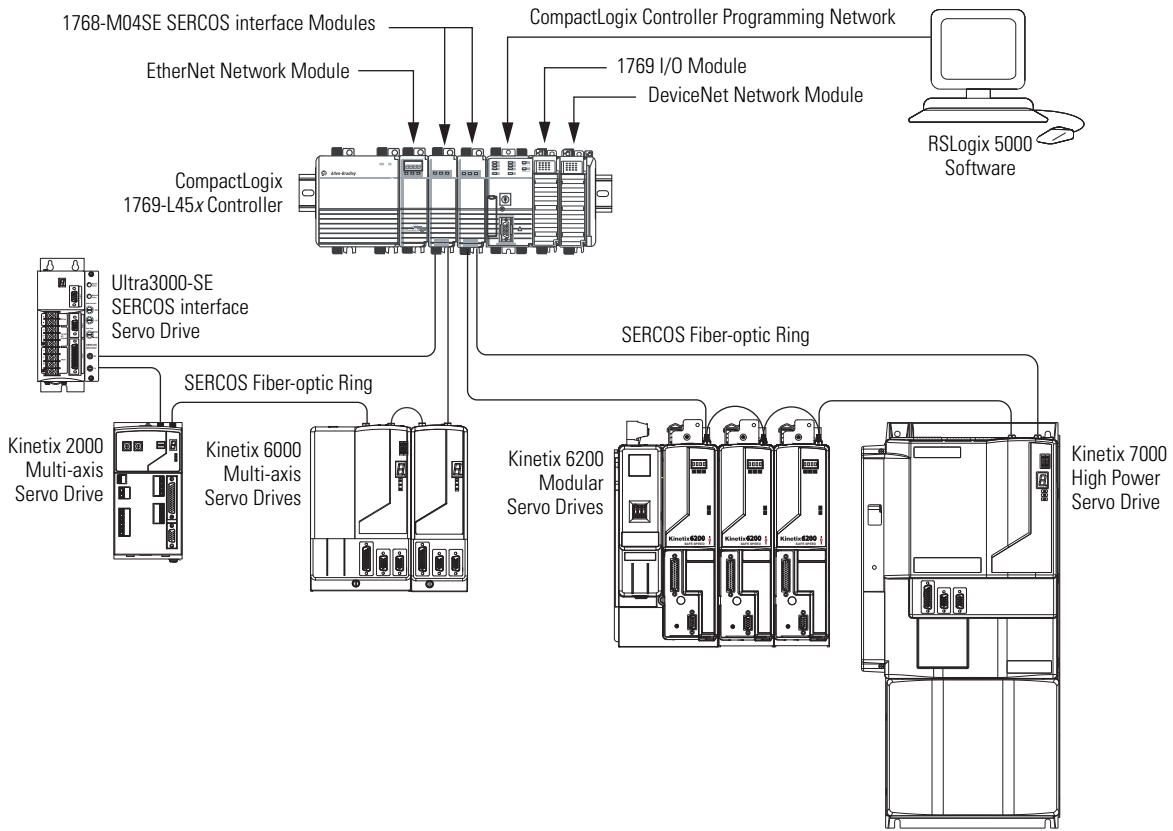
For more information regarding the CompactLogix platform, refer to the CompactLogix Selection Guide, publication [1769-SG001](#).

CompactLogix Platform

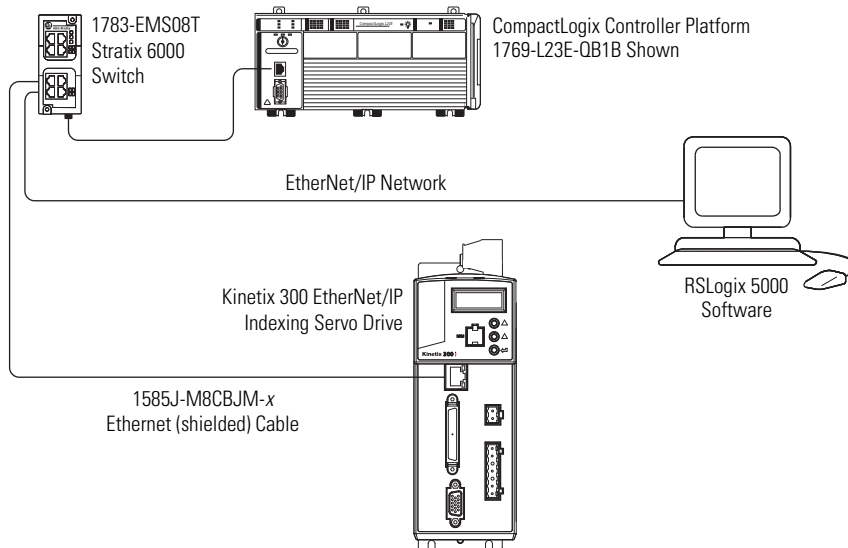


This is not a typical CompactLogix configuration, but illustrates the CompactLogix modules used in Kinetix Motion Control applications.

CompactLogix System (SERCOS)



CompactLogix System (EtherNet/IP)



SERCOS interface Modules

The SERCOS interface modules/PCI cards provide a fiber-optic link between the Logix platforms and servo drives. The communication link between the module and the drive is via IEC/EN-61491 Serial Real-time Communication System (SERCOS) using a fiber-optic medium. This fiber-optic medium ensures reliable high-speed data transmission with excellent noise immunity, improved communication speed, and simplified interconnect wiring between the drive and motion module.



ControlLogix
1756-M03SE, 1756-M08SE and
1756-M16SE
SERCOS interface Module



CompactLogix
1768-M04SE
SERCOS interface Module

SERCOS interface Module Features

- Drive, motor setup, and configuration by using RSLogix 5000 software.
- Real-time optical serial interface from the ControlLogix controller to Kinetix 2000, Kinetix 6200, Kinetix 6000, Kinetix 7000, and Ultra3000-SE drives for parameter updates.
- Support for up to 16 servo drive axes for greater application flexibility.
- Support for up to 32 m (105 ft) of plastic fiber-optic cable and 200 m (657 ft) of glass fiber-optic cable for distributed, convenient drive support and an overall reduction of wiring.
- Support for high-resolution motor position feedback for superior performance.
- Support for single-turn and multi-turn absolute feedback for elimination of costly downtime and homing as a result of power outages.

Certifications

- ControlLogix and CompactLogix SERCOS interface modules are UL Listed for U.S. and Canada. ControlLogix SERCOS interface combination module is UL Listed and CSA Certified. Refer to <http://www.ab.com> for more information.
- CE marked for all applicable directives.

SERCOS Interface Module Specifications

This section contains general, communication, and environmental specifications for the ControlLogix and CompactLogix SERCOS interface modules.

General Specifications

Attribute	1756-M03SE	1756-M08SE	1756-M16SE	1768-M04SE
Number of nodes	3 axes max	8 axes max	16 axes max	4 axes max 2 additional feedback axes.
Module location	1756 ControlLogix chassis			1768 CompactLogix DIN rail mounted
Module keying	Electronic			
Power dissipation	5 W			5.04 W
Backplane current	<ul style="list-style-type: none"> 760 mA @ 5.1V DC 2.5 mA @ 24V DC 			969 mA @ 5.2V DC
Fiber-optic cable	Refer to Chapter 12 for fiber-optic cable descriptions, dimensions, and specifications.			

SERCOS Communication Specifications

Number of Axes and Data Rate

Description	Logix SERCOS Module	Number of Axes	Data Rate
Logix module specifications	1756-M03SE	Up to 3	4 or 8 Mbps
	1756-M08SE	Up to 8	
	1756-M16SE	Up to 16	
	1768-M04SE	Up to 4	

SERCOS Interface Cycle Time

Description	Data Rate ⁽¹⁾	Number of Axes	Cycle Time ⁽²⁾
SERCOS interface cycle time	4 Mbps	Up to 2	0.5 ms
		Up to 4	1 ms
		Up to 8	2 ms
		No support for 9...16 axes	
	8 Mbps	Up to 4	0.5 ms
		Up to 8	1 ms
Up to 16		2 ms	

(1) Software selectable.

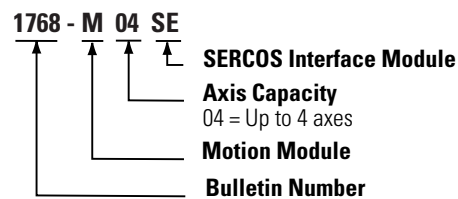
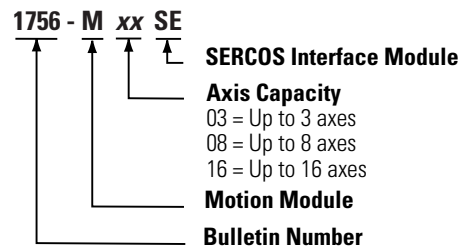
(2) Only Kinetix 2000, Kinetix 6200, Kinetix 6000, and Kinetix 7000 drives support the 0.5 ms cycle time.

Environmental Specifications

Attribute	Value			
	1756-M03SE	1756-M08SE	1756-M16SE	1768-M04SE
Ambient temperature (operating)	0...60 °C (32...140 °F)			
Ambient temperature (storage)	-40...85 °C (-40...185 °F)			
Relative humidity	5...95% noncondensing			
Vibration	2 g @ 10...500 Hz			5 g @ 10...500 Hz
Shock (operating)	30 g			
Shock (nonoperating)	50 g			

SERCOS Interface Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering chart below to understand the configuration of your interface module. For questions regarding product availability, contact your Allen-Bradley distributor.



Analog Servo Modules

The ControlLogix family of analog servo modules is a cost effective option for closed or open-loop motion control devices that support an analog interface. The analog servo modules provide a $\pm 10\text{V}$ analog output command reference and support a variety of different position feedback devices. As many as two axes can be controlled per module, and multiple modules can be used to provide as many as 32 axes of control per ControlLogix controller.

ControlLogix
1756-M02AE
1756-HYD02
1756-M02AS
Analog Servo Module



Analog Servo Module Features

Module	Features
1756-M02AE	The 1756-M02AE and 1756-PM02AE modules are two-axis servo modules/PCI cards optimized for control of drives or actuators that require an $\pm 10\text{V}$ velocity or torque reference input. Both provide a quadrature position feedback input and are compatible with a wide range of quadrature output rotary and linear transducers.
1756-HYD02	<p>The 1756-HYD02 module is a two-axis servo module optimized for control of hydraulic actuators that require an $\pm 10\text{V}$ velocity reference input. The 1756-HYD02 module provides a LDT feedback input. Typical actuators include hydraulic motors and hydraulic cylinders. The 1756-HYD02 module is compatible with a wide range of magnostriuctive linear transducers (LDT) feedback devices.</p> <p>Compatible LDTs include the following:</p> <ul style="list-style-type: none"> • Temposonics II: RPM or DPM • Santest: GYRP or GYRG • Balluff: BTL-2-L2 or BTL-2-M2 • Gemco Quick-Stick II: 951 VP or 951 RS
1756-M02AS	<p>The 1756-M02AS module is a two-axis servo module optimized for control of drives/actuators that require an $\pm 10\text{V}$ velocity or torque reference input. The 1756-M02AS module provides a Serial Synchronous Input (SSI) position feedback input and is compatible with a wide range of SSI output rotary and linear transducers.</p> <p>SSI devices are available in many versions.</p> <ul style="list-style-type: none"> • Linear absolute and incremental encoders • Linear magnostriuctive • Rotary absolute and incremental encoders • Linear laser distance • Linear absolute glass scales

Certifications

- ControlLogix modules are UL Listed and CSA Certified. Refer to <http://www.ab.com> for more information.
- CE marked for all applicable directives.

IMPORTANT

The servo module must be in the same chassis as the ControlLogix controller that controls the servo module. If you distribute motion control across different locations, place a ControlLogix controller in each chassis that has a servo module.

Analog Servo Module Specifications

This section contains general, input, output, servo loop, and environmental specifications for the ControlLogix analog servo modules.

General Specifications

Attribute	Value		
	1756-M02AE	1756-HYD02	1756-M02AS
Number of axes per controller	32 axes max (that is, 16 cards controlled by 1 ControlLogix controller)		
Number of axes per module	2 axes max		
Module location	1756 ControlLogix chassis		
Module keying	Electronic		
Power dissipation	5.5 W max		
Backplane current	<ul style="list-style-type: none"> • 700 mA @ 5.1V DC • 2.5 mA@ 24V DC 		

Input Specifications

Attribute	Value		
	1756-M02AE	1756-HYD02	1756-M02AS
Encoder input Type	Incremental AB quadrature with marker	Linear displacement transducer	Synchronous serial interface
Number of inputs	2 per module		
Electrical interface	Optically isolated 5V differential		
Registration inputs Type	Optically isolated, current sinking input		
Number of inputs	2 per module		
24V input voltage	+24V DC, nom		
5V input voltage	+5V DC, nom		
Response time (position latched)	1 μ s	1 servo update period (250...2000 μ s)	
Drive faults and home inputs Type	Optically isolated, current sinking input		
Number of inputs	2 per module		
Input voltage	+24V DC, nom		

Output Specifications

Attribute	Value		
	1756-M02AE	1756-HYD02	1756-M02AS
Servo output Type Number of inputs Voltage range Voltage resolution	Analog voltage 2 per module \pm 10V 16 bits		
Drive enable Type Number of inputs Operating voltage	Solid-state isolated relay contacts 2 per module +24V DC, nom (Class 2 source)		

Servo Loop Specifications

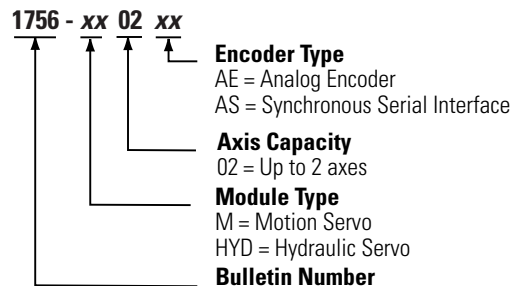
Attribute	Value		
	1756-M02AE	1756-HYD02	1756-M02AS
Servo loop type External drive = torque	Position Loop: PID with Velocity Feedforward. Velocity Loop: PI with Accel Feedforward (nested) with directional Scaling and Friction Compensation.	N/A	Position Loop: PID with Velocity Feedforward. Velocity Loop: PI with Accel Feedforward (nested) with directional Scaling and Friction Compensation.
External drive = velocity or hydraulic	Position Loop: PID with Velocity Feedforward and Accel Feedforward with directional Scaling and Friction Compensation. Velocity Loop: N/A (handled by drive or valve).	Proportional, Integral, and Differential (PID) with feed-forwards and directional scale.	Position Loop: PID with Velocity Feedforward and Accel Feedforward with directional Scaling and Friction Compensation. Velocity Loop: N/A (handled by drive or valve).

Environmental Specifications

Attribute	Value		
	1756-M02AE	1756-HYD02	1756-M02AS
Ambient temperature (operating)	0...60 °C (32...140 °F)		
Ambient temperature (storage)	-40...85 °C (-40...185 °F)		
Relative humidity	5...95% noncondensing		
Vibration	2 g @ 10...500 Hz		
Shock (operating)	30 g		
Shock (nonoperating)	50 g		

Analog Servo Module Catalog Number

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering chart below to understand the configuration of your servo module. For questions regarding product availability, contact your Allen-Bradley distributor.

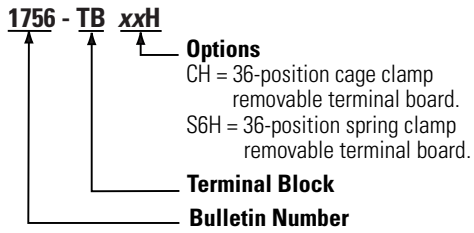


Analog Servo Module Terminal Block

One 1756-TBxxH servo module terminal block is required for each 1756-M02AE, 1756-M02AS, or 1756-HYD02 module. The terminal block provides wire terminations so that performance can be controlled. It is removable and can be installed by opening the servo module door and sliding it into place.

Terminal Block Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering chart below to understand the configuration of your terminal block. For questions regarding product availability, contact your Allen-Bradley distributor.



Kinetix 300 EtherNet/IP Indexing Servo Drives



The Kinetix 300 EtherNet/IP indexing drive provides a cost-effective single-axis solution for low axis count motion control applications. Using one standard Ethernet/IP network for an entire machine - including Motion, Control, I/O, and HMI simplifies wiring, reduces panel layout costs, and allows easy integration into manufacturing and enterprise systems. In addition, safe torque-off functionality helps protect personnel while increasing machine productivity.

Topic	Page
Kinetix 300 Servo Drive Components	231
Kinetix 300 Drive Power Specifications	233
Kinetix 300 Drive Accessory Specifications	235
Kinetix 300 General System Specifications	239
Kinetix 300 Connector and Indicator Locations	244
Kinetix 300 Drive Catalog Numbers	244

Kinetix 300 Servo Drive Components

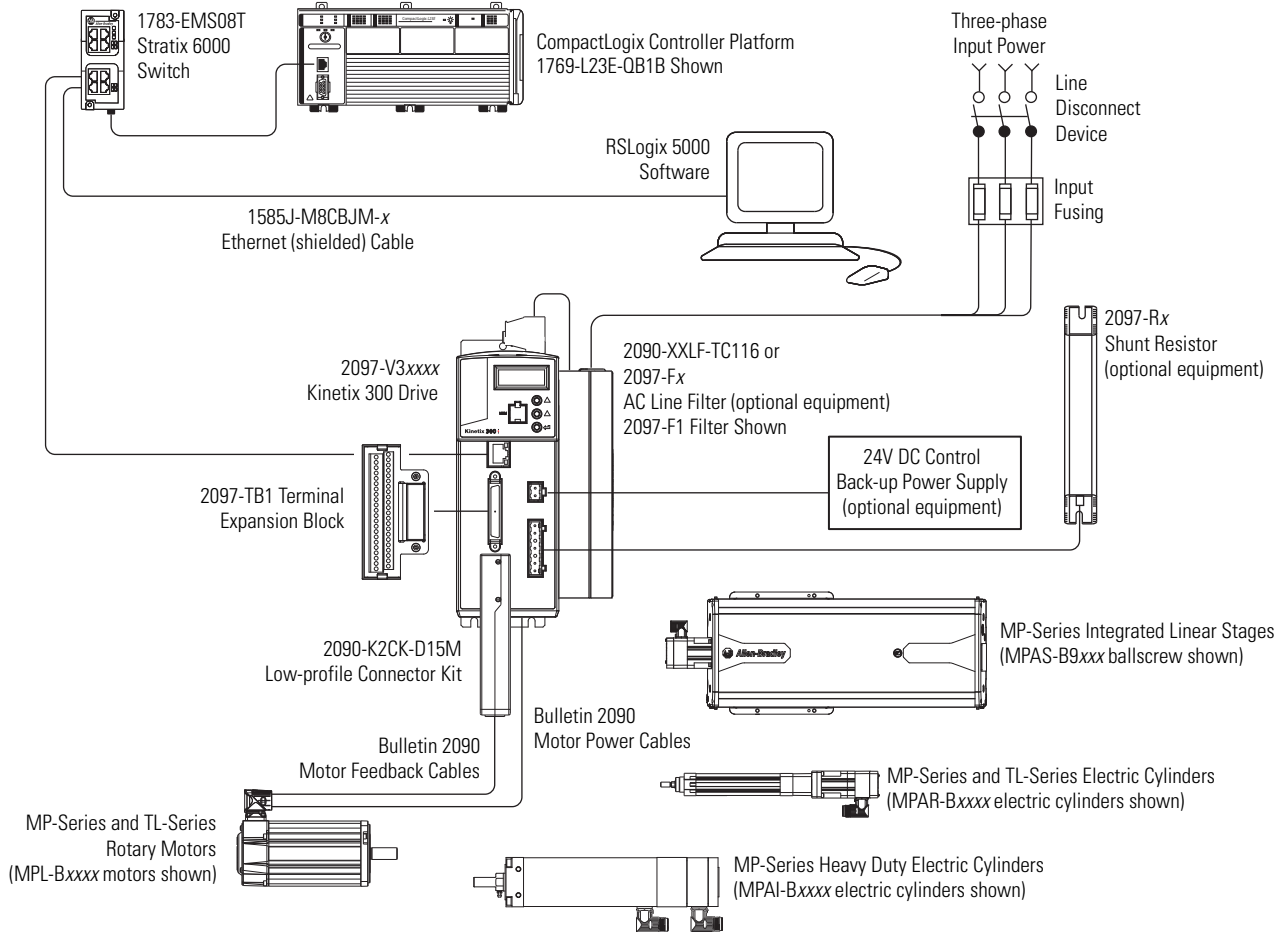
Kinetix 300 servo drive systems consist of these required components:

- One 2097-V3xxxx indexing drive
- One MP-Series or TL-Series servo motor or linear actuator
- One motor power and motor feedback cable
- One 2090-K2CK-D15M low-profile connector kit for motor feedback
- One 2097-TB1 I/O terminal expansion block
- 1585J-M8CBJM-x (shielded) Ethernet cable

Kinetix 300 servo drive systems may also include any of these optional components:

- One 2097-Fx or 2090-XXLF-TC116 AC line filter
- One 2097-Rx shunt resistor

Typical Configuration - Kinetix 300 Drive System



Kinetix 300 Drive Power Specifications

The 2097-V31PRx drives are capable of driving 240V motors at full speed.

Kinetix 300 Drive (single-phase) Power Specifications

Attribute	2097-V31PR0	2097-V31PR2	2097-V32PR0	2097-V32PR2	2097-V32PR4
AC input voltage	120/240V rms single-phase		240V rms single-phase		
AC input frequency	48...62 Hz				
Main AC input current ⁽¹⁾ Nom (rms) 120V input Max inrush (0-pk) 120V input	9.7 A 2.3 A	16.8 A 2.3A			
Nom (rms) 240V input Max inrush (0-pk) 240V input	5.0 A 1.1 A	8.6 A 1.1 A	5.0 A 136 A	8.6 A 2.3 A	15.0 A 2.3 A
Integrated AC line filter	No	No	Yes	Yes	Yes
Control power back-up input voltage	20...26V DC				
Control power back-up input current Nom Max inrush (0-pk)	500 mA 30 A				
Continuous output current (rms)	2.0 A	4.0 A	2.0 A	4.0 A	8.0 A
Continuous output current (0-pk)	2.8 A	5.7 A	2.8 A	5.7 A	11.3 A
Peak output current (rms) ⁽²⁾	6.0 A	12.0 A	6.0 A	12.0 A	24.0 A
Peak output current (0-pk)	8.5 A	17.0 A	8.5 A	17.0 A	33.9 A
Continuous power output	0.40 kW	0.80 kW	0.40 kW	0.80 kW	1.70 kW
Shunt On	390V DC				
Shunt Off	375V DC				
Overvoltage	430V DC				
Short circuit current rating	100,000 A (rms) symmetrical				

(1) Kinetix 300 drive modules are limited to 1 AC mains power cycling per minute.

(2) Peak RMS current allowed for up to 2 seconds with a 50% duty cycle.

Kinetix 300 Drive (single-phase and three-phase) Power Specifications

Attribute	2097-V33PR1	2097-V33PR3	2097-V33PR5	2097-V33PR6
AC input voltage	120/240V rms single-phase or three-phase			
AC input frequency	48...62 Hz			
Main AC input current ⁽¹⁾ Nom (rms) 120V input Max inrush (0-pk) 120V input	5.0 A 136 A	8.6 A 2.3 A	15.0 A 2.3 A	24.0 A 11.3 A
Nom (rms) 240V input Max inrush (0-pk) 240V input	3.0A 136 A	5.0A 2.3 A	8.7A 2.3 A	13.9 A 11.3 A
Integrated AC line filter	No	No	No	No
Control power back-up input voltage	20...26V DC			
Control power back-up input current Nom Max inrush (0-pk)	500 mA 30 A			
Continuous output current (rms)	2.0 A	4.0 A	8.0 A	12.0 A
Continuous output current (0-pk)	2.8 A	5.7 A	11.3 A	17.0 A
Peak output current (rms) ⁽²⁾	6.0 A	12.0 A	24.0 A	36.0 A
Peak output current (0-pk)	8.5 A	17.0 A	33.9 A	50.9 A
Continuous power output	0.50 kW	1.00 kW	2.00 kW	3.00 kW
Shunt On	390 V DC			
Shunt Off	375V DC			
Overvoltage	430V DC			
Short circuit current rating	100,000 A (rms) symmetrical			

(1) Kinetix 300 drive modules are limited to 1 AC mains power cycling per minute.

(2) Peak RMS current allowed for up to 2 seconds with a 50% duty cycle.

Kinetix 300 Drive (three-phase) Power Specifications

Attribute	2097-V34PR3	2097-V34PR5	2097-V34PR6
AC input voltage	480V rms three-phase		
AC input frequency	48...62 Hz		
Main AC input current ⁽¹⁾ Nom (rms) Max inrush (0-pk)	2.7A 4.5 A	5.5 A 4.5 A	7.9 A 22.6 A
Integrated AC line filter	No	No	No
Control power back-up input voltage	20...26V DC		
Control power back-up input current Nom Max inrush (0-pk)	500 mA 30 A		
Continuous output current (rms)	2.0 A	4.0 A	6.0 A
Continuous output current (0-pk)	2.8 A	5.7 A	8.5 A
Peak output current (rms) ⁽²⁾	6.0 A	12.0 A	18.0 A
Peak output current (0-pk)	8.5 A	17.0 A	25.5 A
Continuous power output	1.00 kW	2.00 kW	3.00 kW
Shunt On	780V DC		
Shunt Off	750V DC		
Overvoltage	850V DC		
Short circuit current rating	100,000 A (rms) symmetrical		

(1) Kinetix 300 drive modules are limited to 1 AC mains power cycling per minute.

(2) Peak RMS current allowed for up to 2 seconds with a 50% duty cycle.

Kinetix 300 Drive Accessory Specifications

Kinetix 300 drive accessories include the I/O terminal block, memory module programmer, memory modules, AC line filters, and shunt resistors.

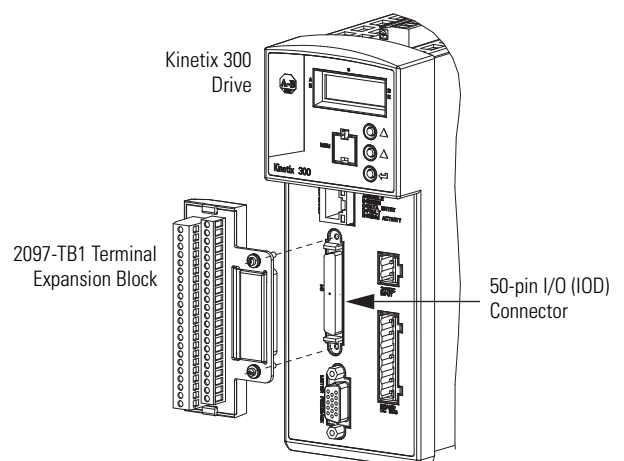
I/O Terminal Expansion Block

The 2097-TB1 I/O terminal expansion block is a drive-mounted breakout board for making flying-lead cable connections to the 50-pin IOD connector.

I/O Terminal Block Specifications (2097-TB1)

Wire Size	Change in Width ⁽¹⁾	Change in Depth ⁽¹⁾
1.5...0.2 mm ² (16...24 AWG)	10 mm (0.38 in.)	11 mm (0.42 in.)

(1) Add this value to the dimensions of your Kinetix 300 drive.

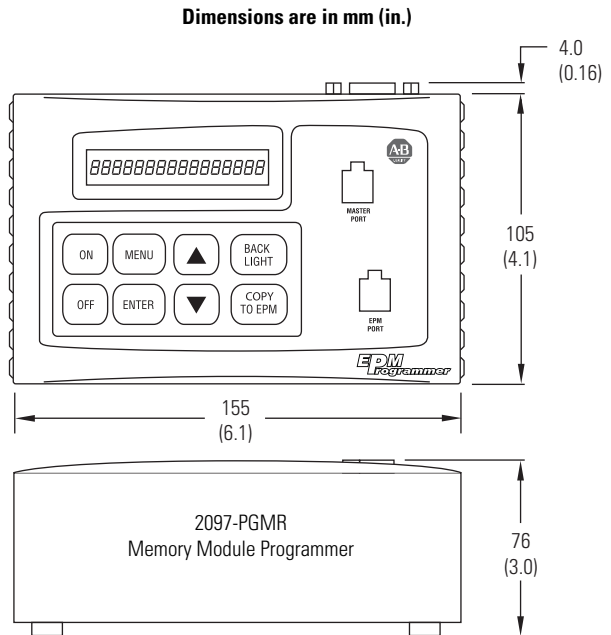


Memory Module Programmer

The 2097-PGMR memory module programmer is a hand-held device for duplicating your Kinetix 300 drive configuration to reduce down-time and troubleshooting.

Memory Module Programmer Specifications (2097-PGMR)

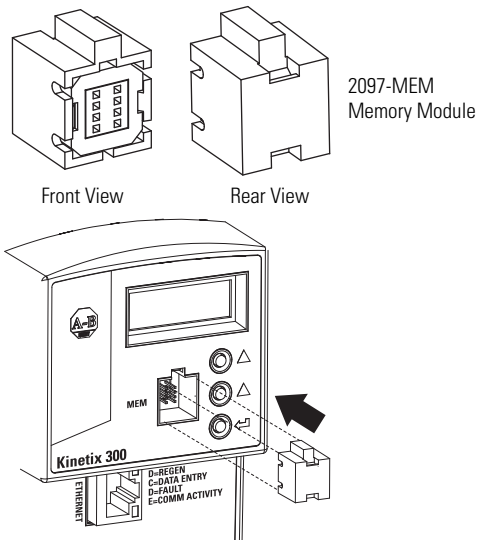
Attribute	Value	
DC supply	Internal batteries	+ 6V DC, min 150 mA supply 4 mono-cells (type D), 1.5V DC each
	External power supply unit	+ 6V DC, 300 mA, stabilized
Display	Type	LCD
	Display format	Text
	Lines x characters	1 x 16
	Contrast setting	Via menu
Memory	Data memory	Up to 120 parameter files for inverter drive controllers
Serial interface	DB9 connector	RS-232
Weight	2097-PGMR	1.3 kg (2.87 lb), with batteries



Memory Module 12-packs

The 2097-MEM memory modules use EEPROM technology in a plastic casing for protection and ruggedness to safe-guard your Kinetix 300 drive configuration.

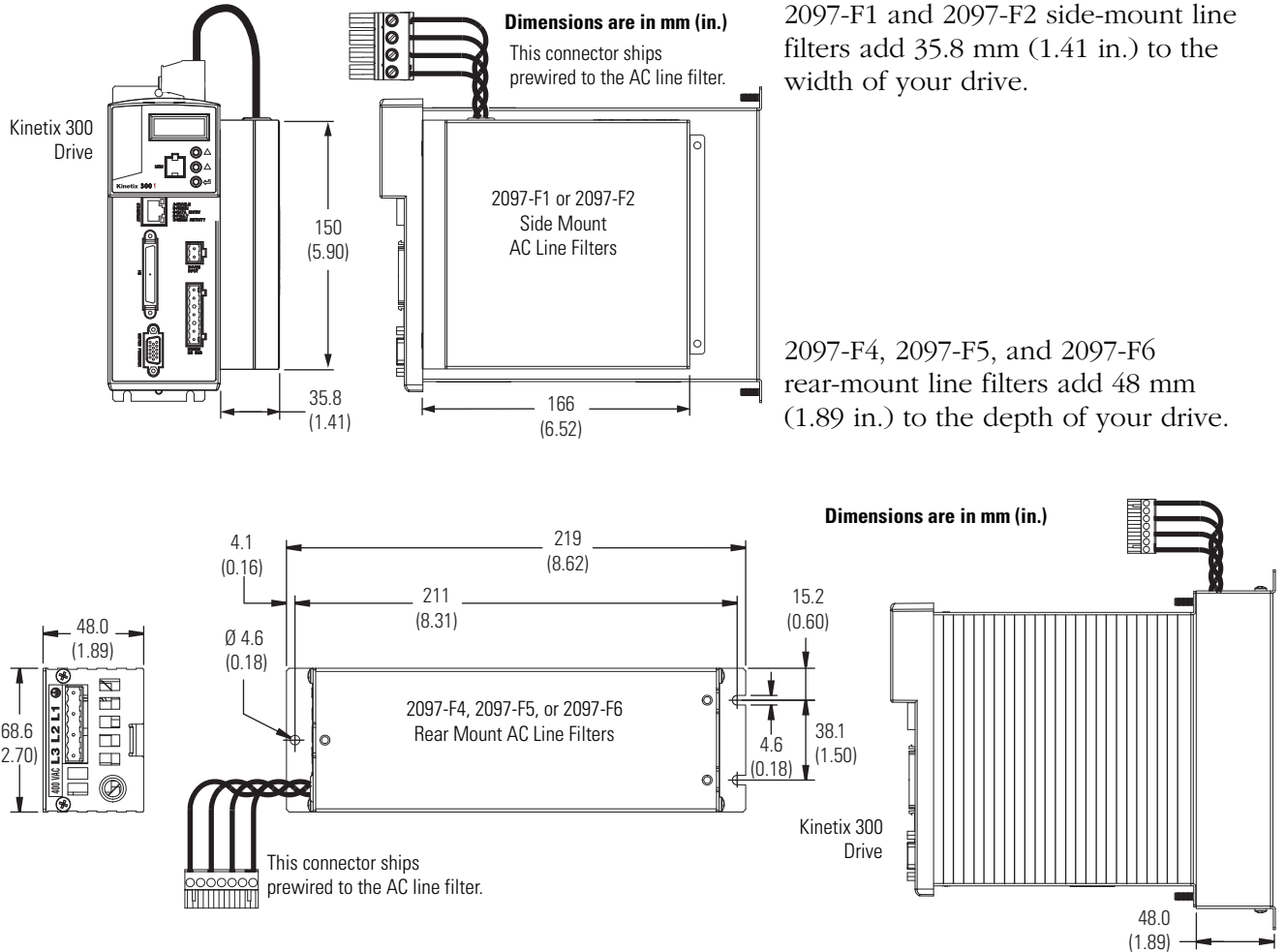
Use the 2097-MEM memory modules to back up your drive configuration for easy Automatic Device Replacement (ADR).



AC Line Filters

The Kinetix 300 drives were tested by using recommended line filters. Use of these filters is also needed to meet CE requirements. 2097-V32PR0, 2097-V32PR2, 2097-V32PR4 drives have integrated AC line filters.

AC Line Filter Dimensions



AC Line Filter Specifications

AC Line Filter Cat. No.	Mount	Voltage 50/60 Hz	Phase	Current A @ 40 °C (104 °F)	Power Loss W	Leakage Current mA	Weight, approx. kg (lb)	Kinetix 300 Drive (1) Cat. No.
2097-F1	Side	120/240V AC	1 or 3	24.0	5.2	9.0	0.6 (0.13)	2097-V33PR6
2097-F2		480V AC	3	10.0	2.8			2097-V34PR6
2097-F4 (2)	Rear	120/240V AC	1 or 3	4.40	1.2	1.0	0.8 (0.18)	2097-V33PR1
2097-F5 (2)		480V AC	3		1.3			2097-V34PR3
		2097-F6 (2)	120/240V AC	1 or 3	15.0			4.1

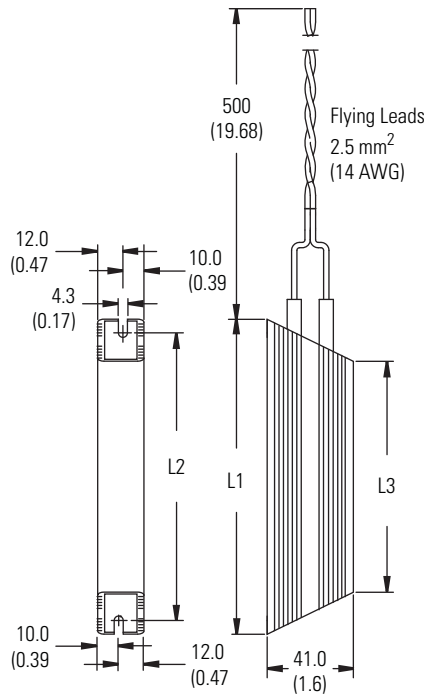
(1) Use 2090-XXLF-TC116 line filter for 2097-V31PR0 and 2097-V31PR2 drives. Refer to AC Line Filter Specifications on page 463 for more information.

(2) This filter is rated for multiple voltage/phase line conditions.

Shunt Resistor Specifications

The Bulletin 2097 passive shunt resistor wires directly to the Kinetix 300 drive.

Shunt Resistor Dimensions



Dimensions are in mm (in.)

Shunt Resistor Cat. No.	L1	L2	L3
2097-R2	210 (8.3)	197 (7.7)	170 (6.7)
2097-R3	210 (8.3)	197 (7.7)	170 (6.7)
2097-R4	150 (5.9)	137 (5.4)	110 (4.3)
2097-R6	210 (8.3)	197 (7.7)	170 (6.7)
2097-R7	150 (5.9)	137 (5.4)	110 (4.3)

Shunt Resistor Power Specifications

Shunt Module Cat. No.	Specifications						Kinetix 300 Drive Cat. No.
	Resistance Ω	Continuous Power W	Peak Power kW	Peak Current A	D _{Application} , Max ⁽¹⁾ %	Weight kg (lb)	
2097-R2	20	150	7.6	19.5	1.97	0.3 (0.7)	2097-V32PR4 2097-V33PR5
2097-R3	30		5.1	13.0	2.96		2097-V33PR6
2097-R4	40	80	3.8	9.8	2.10	0.2 (0.4)	2097-V31PRO 2097-V31PR2 2097-V32PRO 2097-V32PR2 2097-V33PR1 2097-V33PR3
2097-R6	75	150	7.9	10.3	1.90	0.3 (0.7)	2097-V34PR5 2097-V34PR6
2097-R7	150	80	4.0	5.1	2.02	0.2 (0.4)	2097-V34PR3

(1) D_{Application} is the application duty cycle in percent. For the intermittent regeneration applications, use $D_{Application} = t/T$, where t is the duration when regeneration is needed and T is the time interval between two regenerations. Both t and T must use the same time units, for example, seconds.

Kinetix 300 General System Specifications

This section contains environmental, weight, power dissipation, circuit breaker/fuse, transformer, and contactor specifications. Also included are maximum feedback cable length specifications and dimensions for mounting your Kinetix 300 drive.

Environmental Specifications

Attribute	Operational Range	Storage Range (nonoperating)
Ambient temperature	0...40 °C (32...104 °F)	-10...70 °C (14...158 °F)
Relative humidity	5...95% noncondensing	5...95% noncondensing
Altitude	De-rate by 1% per 300 m (1000 ft) above 1500 m (5000 ft)	3000 m (9842 ft) during transport
Vibration	5...2000 Hz @ 2.5 g peak, 0.015 mm (.0006 in.) maximum displacement	
Shock	15 g, 11 ms half-sine pulse (3 pulses in each direction of 3 mutually perpendicular directions)	

Weight Specifications

Drive Cat. No.	Weight, approx. kg (lb)
2097-V31PRO	1.3 (2.9)
2097-V31PR2	1.5 (3.3)
2097-V32PRO	1.4 (3.1)
2097-V32PR2	1.7 (3.7)
2097-V32PR4	2.2 (4.9)
2097-V33PR1	1.3 (2.9)

Drive Cat. No.	Weight, approx. kg (lb)
2097-V33PR3	1.5 (3.3)
2097-V33PR5	2.0 (4.4)
2097-V33PR6	1.9 (4.2)
2097-V34PR3	1.5 (3.3)
2097-V34PR5	2.0 (4.4)
2097-V34PR6	1.8 (4.0)

Power Dissipation Specifications

Use this table to size an enclosure and calculate required ventilation for your Kinetix 300 drive system.

Drive Cat. No.	Loss, Max W
2097-V31PRO	28
2097-V31PR2	39
2097-V32PRO	28
2097-V32PR2	39
2097-V32PR4	67
2097-V33PR1	28

Drive Cat. No.	Loss, Max W
2097-V33PR3	39
2097-V33PR5	67
2097-V33PR6	117
2097-V34PR3	39
2097-V34PR5	58
2097-V34PR6	99

Circuit Breaker/Fuse Specifications

While circuit breakers offer some convenience, there are limitations for their use. Circuit breakers do not handle high current inrush as well as fuses.

Make sure the selected components are properly coordinated and meet acceptable codes including any requirements for branch circuit protection. Evaluation of the short-circuit available current is critical and must be kept below the short-circuit current rating of the circuit breaker.

Use class CC or T fast-acting current-limiting type fuses, 200,000 AIC, preferred. Use Bussman KTK-R, JKN, JJS or equivalent. Thermal-magnetic type breakers preferred. The following fuse examples and Allen-Bradley circuit breakers are recommended for use with Kinetix 300 drives.

Fuse and Circuit Breaker Specifications

Drive Cat. No.	Mains VAC		
	Bussman Fuse	Allen Bradley Circuit Breaker ⁽¹⁾	
		Disconnect ⁽²⁾	Magnetic Contactor ⁽³⁾
2097-V31PR0	KTK-R-20 (20 A)	1492-SP3D300	140M-F8T-C32
2097-V31PR2			
2097-V32PR0			
2097-V32PR2			
2097-V32PR4	LPJ-45SP (45 A)	1492-SP3D400	140M-F8E-C45
2097-V33PR1	KTK-R-20 (20 A)	1492-SP3D300	140M-D8T-C20
2097-V33PR3			
2097-V33PR5			
2097-V33PR6	KTK-R-30 (30 A)	N/A	140U-F8T-C32
2097-V34PR3	KTK-R-20 (20 A)	1492-SP3D400	140M-F8T-C32
2097-V34PR5			
2097-V34PR6			

(1) When using Bulletin 1492 circuit protection devices, the maximum short circuit current available from the source is limited to 5000 A.

(2) Use fully-rated short-circuit protection circuit breaker for device branch circuit protection only when there is an upstream fully-rated breaker.

(3) Fully-rated breaker for overload current and short circuit rating.

Contactor Ratings

This table lists the recommended contactor ratings for Kinetix 300 Drive.

Kinetix 300 Drive (120/240V) Cat. No.	Contactor
2097-V31PR0	100-C30x10 (AC coil) 100-C30Zx10 (DC coil)
2097-V31PR2	
Kinetix 300 Drive (240V) Cat. No.	
2097-V32PR0	100-C30x10 (AC coil) 100-C30Zx10 (DC coil)
2097-V32PR2	
2097-V32PR4	100-C37x10 (AC coil) 100-C23Zx10 (DC coil)
2097-V33PR1	100-C23x10 (AC coil) 100-C23Zx10 (DC coil)
2097-V33PR3	
2097-V33PR5	
2097-V33PR6	100-C30x10 (AC coil) 100-C30x10 (DC coil)
Kinetix 300 Drive (480V) Cat. No.	
2097-V34PR3	100-C37x10 (AC coil) 100-C23Zx10 (DC coil)
2097-V34PR5	
2097-V34PR6	

Transformer Specifications for Control Input Power

Attribute	Value (460V system)
Input volt-amperes	750VA
Input voltage	460V AC
Output voltage	120...240V AC

Maximum Feedback Cable Lengths

Although motor power and feedback cables are available in standard lengths up to 90 m (295.3 ft), Kinetix 300 drive maximum feedback cable length is 20 m (65.6 ft). These tables assume the use of recommended cables as shown in the Motor/Actuator Cable Selection table on [page 380](#).

Cable Lengths for Compatible Rotary Motors

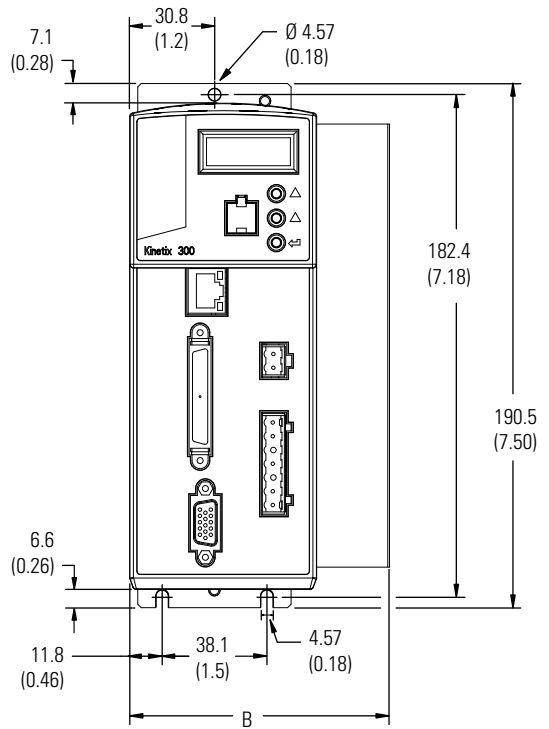
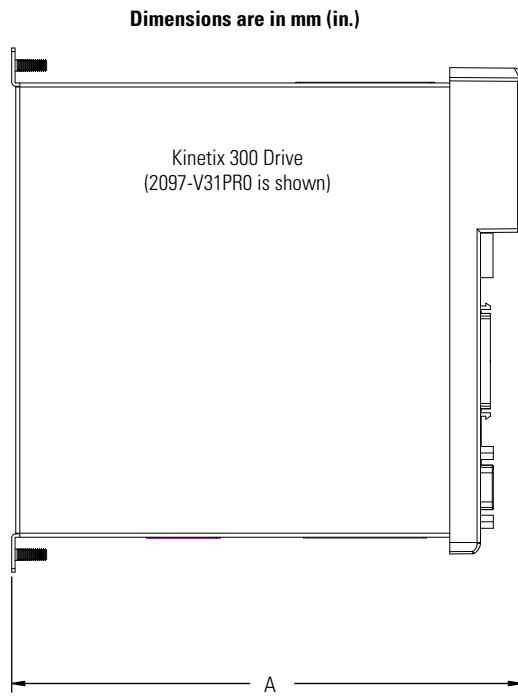
Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)	Absolute High-resolution (5V) 17-bit Encoder m (ft)
MPL-A3xxx... MPL-A5xxx-S/M ⁽¹⁾	20 (65.6)			
MPL-A15xxx... MPL-A2xxx-E/V	20 (65.6)			
MPL-B3xxx... MPL-B9xxx-S/M		20 (65.6)		
MPL-B15xxx... MPL-B2xxx-E/V		20 (65.6)		
MPL-A/B15xxx... MPL-A/B45xxx-H			20 (65.6)	
MPM-Axxxx-S/M	20 (65.6)			
MPM-Bxxxx-S/M		20 (65.6)		
MPF-Axxxx-S/M ⁽¹⁾	20 (65.6)			
MPF-Bxxxx-S/M		20 (65.6)		
MPS-Axxxx-S/M	20 (65.6)			
MPS-Bxxxx-S/M		20 (65.6)		
TLY-Axxxx-B				20 (65.6)
TLY-Axxxx-H			20 (65.6)	

(1) MPL-A5xxx and MPF-A5xxx motor encoders are rated for 9V, the remaining Bulletin MPL and MPF (230V) motor encoders are rated for 5V.

Cable Lengths for Compatible Linear Actuators

Actuator Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)	Absolute High-resolution (5V) 17-bit Encoder m (ft)
MPMA-Axxxx or MPAS-Axxxx-V (ballscrew)	20 (65.6)		
MPMA-Bxxxx or MPAS-Bxxxx-V (ballscrew)		20 (65.6)	
MPAR-Axxxx-V/M	20 (65.6)		
MPAR-Bxxxx-V/M		20 (65.6)	
TLAR-Axxxx-B			20 (65.6)
MPAI-AxxxxM3	20 (65.6)		
MPAI-BxxxxM3		20 (65.6)	

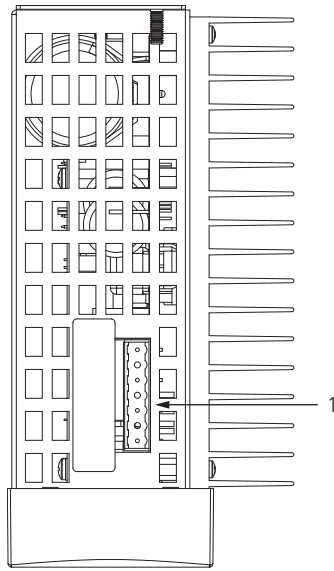
Kinetix 300 Drive Dimensions



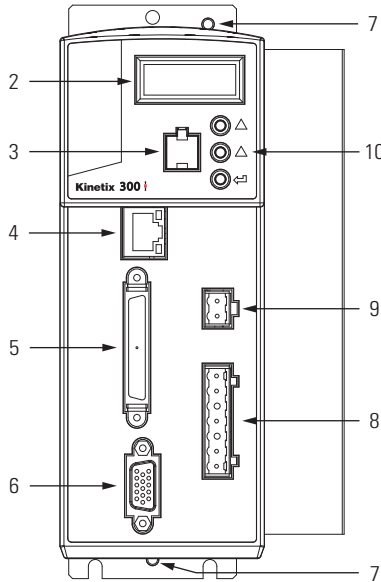
Cat. No.	A mm (in.)	B mm (in.)
2097-V31PR0	185.1 (7.29)	68.0 (2.68)
2097-V31PR2	185.1 (7.29)	68.5 (2.70)
2097-V32PR0	229.6 (9.04)	68.0 (2.68)
2097-V32PR2	229.6 (9.04)	68.5 (2.70)
2097-V32PR4	229.6 (9.04)	86.8 (3.42)
2097-V33PR1	185.1 (7.29)	68.0 (2.68)

Cat. No.	A mm (in.)	B mm (in.)
2097-V33PR3	185.1 (7.29)	68.5 (2.70)
2097-V33PR5	185.1 (7.29)	94.4 (3.72)
2097-V33PR6	229.6 (9.04)	68.0 (2.68)
2097-V34PR3	185.1 (7.29)	68.5 (2.70)
2097-V34PR5	185.1 (7.29)	94.4 (3.72)
2097-V34PR6	229.6 (9.04)	68.0 (2.68)

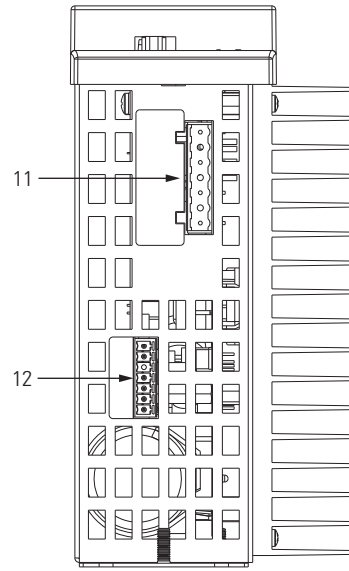
Kinetix 300 Connector and Indicator Locations



Kinetix 300 Drive, Top View
(2097-V33PR5 drive is shown)



Kinetix 300 Drive, Front View
(2097-V33PR5 drive is shown)



Kinetix 300 Drive, Bottom View
(2097-V33PR5 drive is shown)

Item	Description
1	Mains (IPD) connector
2	Status and diagnostic display
3	Memory module socket
4	Ethernet communication port (Port 1)
5	I/O (IOD) connector
6	Motor feedback (MF) connector ⁽¹⁾

Item	Description
7	Ground lug
8	Shunt resistor and DC bus (BC) connector
9	Back-up power (BP) connector
10	Display control push buttons (3)
11	Motor power (MP) connector
12	Safe torque-off (STO) connector

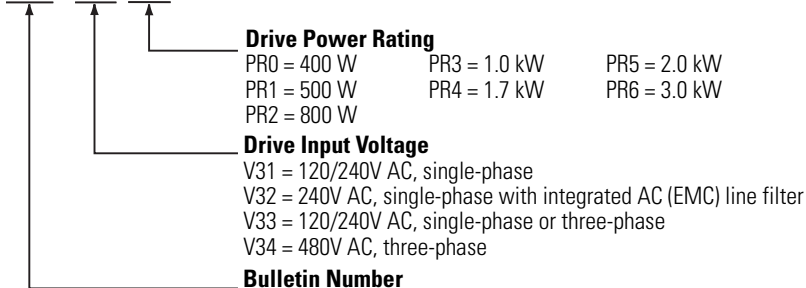
(1) The MF (15-pin) connector requires the 2090-K2CK-D15M low-profile connector kit.

For connector kit options, refer to Breakout Components and Connector Kits beginning on [page 418](#).

Kinetix 300 Drive Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your drive. For questions regarding product availability, contact your Allen-Bradley distributor.

2097 - V3x PRx



Kinetix 6200 and Kinetix 6500 Modular Multi-axis Servo Drives



The Kinetix 6500 servo drives provide Integrated Motion capability over the EtherNet/IP network by using CIP Motion and CIP Sync technology from ODVA, all built on the Common Industrial Protocol (CIP).

The Kinetix 6200 servo drives provide Integrated Motion capability through SERCOS interface and compatibility with Kinetix 6000 drives, letting you migrate to the enhanced features exactly when and where you need them.

The Kinetix 6200 and Kinetix 6500 drive families are part of the Kinetix Integrated Motion solution.

These modular safe-speed servo drives help increase productivity and protect personnel with embedded safety features. Modular design and control provides ease of maintenance and greater flexibility as the drive easily transitions from safe torque-off to safe speed.

Topic	Page
Kinetix 6200 and Kinetix 6500 Servo Drive Components	245
Kinetix 6000 Drive Component Compatibility	246
Kinetix 6200 and Kinetix 6500 Integrated Axis Modules	254
Kinetix 6200 and Kinetix 6500 Axis Modules	257
Kinetix 6200 and Kinetix 6500 Control Modules	259
Kinetix 6200 and Kinetix 6500 General System Specifications	260
Kinetix 6200 and Kinetix 6500 Features and Indicators	264

Kinetix 6200 and Kinetix 6500 Servo Drive Components

Kinetix 6200 and Kinetix 6500 modular servo drive systems consist of these required components:

- One integrated axis power module (IAM or leader IAM), 2094-BCxx-Mxx-M (460V)
- Up to seven axis power modules (AM), 2094-BMxx-M (460V)
- Up to eight control modules, 2094-SE02F-M00-Sx (SERCOS interface) or 2094-EN02D-M01-Sx (EtherNet/IP network)
- One power rail, 2094-PRS1, 2094-PRS2, 2094-PRS3, 2094-PRS4, 2094-PRS5, 2094-PRS6, 2094-PRS7, or 2094-PRS8

- One to eight MP-Series, RDD-Series, or LDC-Series rotary/linear motors or linear actuators (support for Heidenhain EnDat high-resolution feedback on RDD-Series motors has not been implemented)
- One to eight motor power and feedback cables
- Two to nine SERCOS fiber-optic cables
- Ethernet cables for Logix control and programming the safety configuration

Kinetix 6200 and Kinetix 6500 systems may also include any of these optional components:

- One or more IAM power modules used as a follower IAM, 2094-BCxx-Mxx-M (460V) and associated axis modules, power rails, motors, and cables as required for the application.
- One shunt module, 2094-BSP2 with optional Bulletin 1394 external passive shunt module
- Slot-filler modules, 2094-PRF
- Bulletin 2094 Line Interface Module (LIM)
- Bulletin 2090 Resistive Brake Module (RBM)

Kinetix 6000 Drive Component Compatibility

The 2094-BCxx-Mxx-M and 2094-BMxx-M power modules contain the same power structure as the 2094-BCxx-Mxx-S and 2094-BMxx-S drive modules. Because of this, the 2094-BSP2 shunt module, 2094-PRF slot-filler module, and 2094-PRsx power rails are supported by both drive families.

In addition, 2094-BMxx-M AM power modules with SERCOS interface are supported on power rails with a 2094-BCxx-Mxx-S IAM drive module. Conversely, 2094-BMxx-S AM drive modules are supported on power rails with a 2094-BCxx-Mxx-M IAM power module with SERCOS interface.

IMPORTANT Kinetix 6500 EtherNet/IP control modules (catalog numbers 2094-EN02D-M01-Sx) are not compatible with IAM/AM modules on the same Bulletin 2094 power rail where SERCOS interface is used.

IAM/AM Module Compatibility

IAM Module	Control Module	2094-xMxx-S Kinetix 6000 AM Module	2094-BMxx-M AM Power Modules	
			2094-SE02F-M00-Sx Kinetix 6200 Control Module	2094-EN02D-M01-Sx Kinetix 6500 Control Module
2094-xCxx-Mxx-S	N/A			
2094-BCxx-Mxx-M (IAM power module)	2094-SE02F-M00-Sx SERCOS interface	Fully compatible	Fully compatible	Not compatible
	2094-EN02D-M01-Sx EtherNet/IP network	Not compatible	Not compatible	Fully compatible

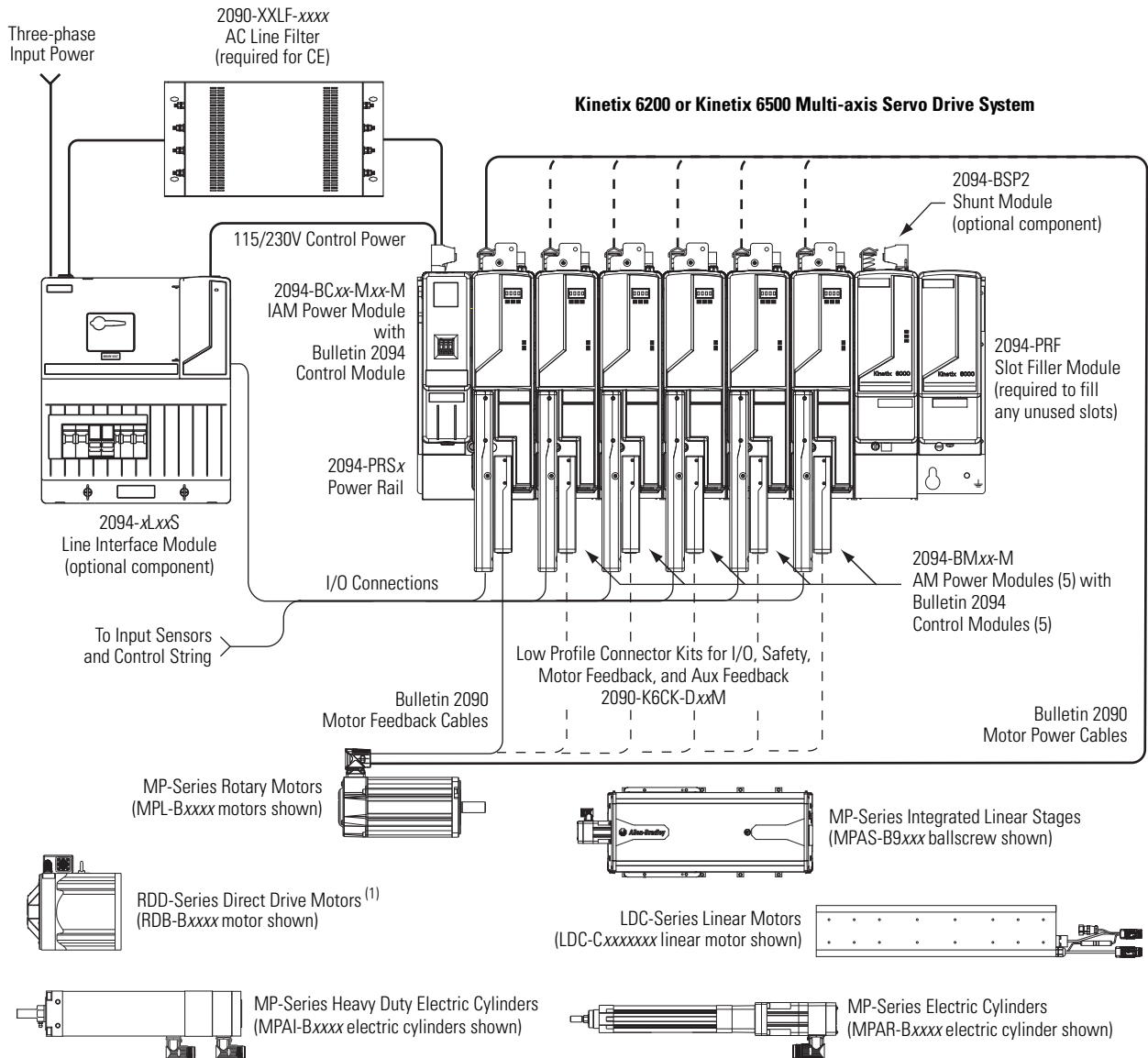
For more information on the Kinetix 6000 IAM and AM modules, catalog numbers 2094-xCxx-Mxx-S and 2094-xMxx-S, refer to Kinetix 6000 Multi-axis Servo Drives in [Chapter 6](#).

For more information on the Bulletin 2094 power rails, shunt module, slot-filler module, RBM and LIM modules, refer to Motion Control Accessories in [Chapter 12](#).

Typical Hardware Configurations

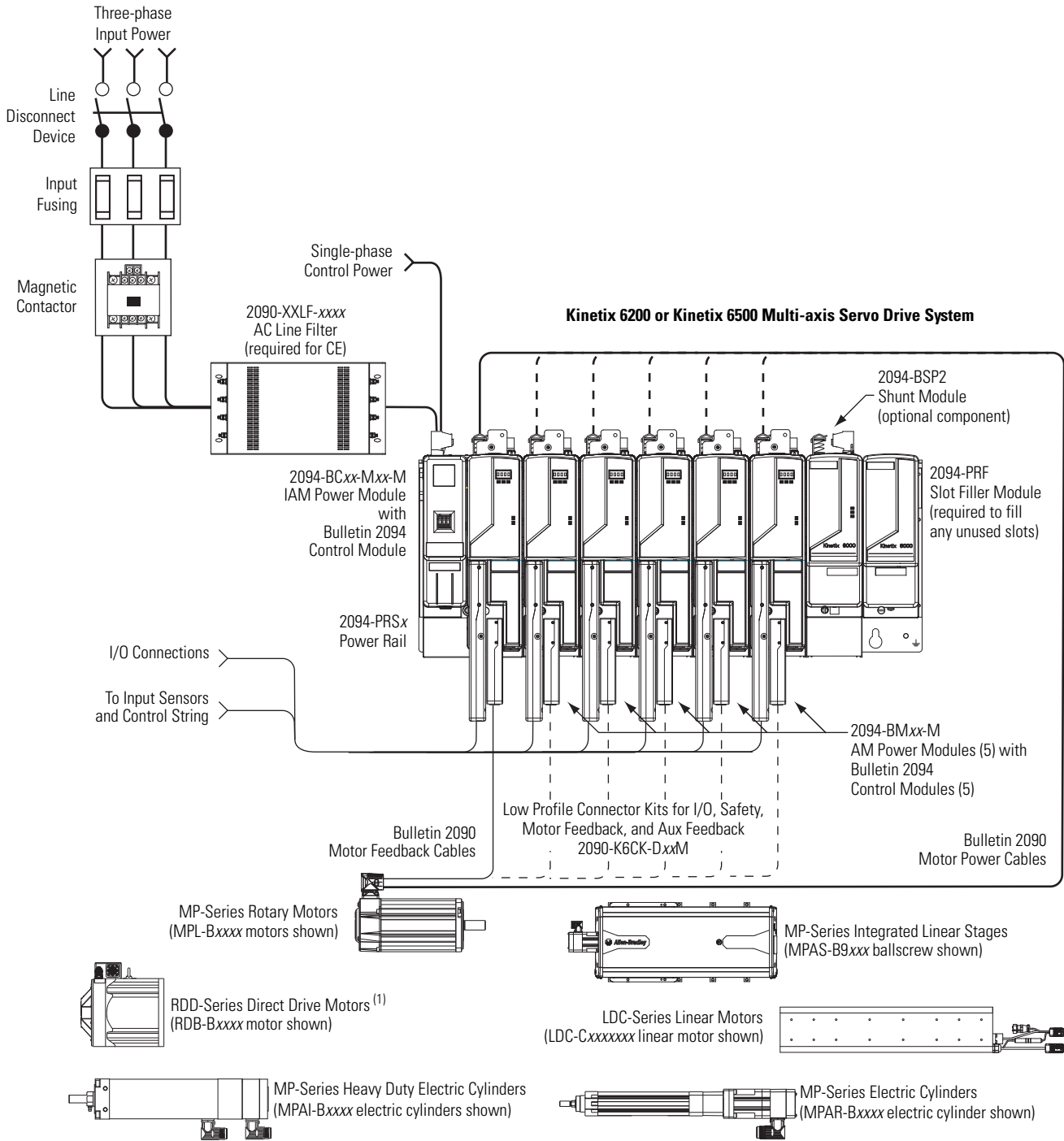
These are typical hardware configurations for Kinetix 6200 and Kinetix 6500 modular drive systems.

Modular Drive System (with LIM module)



(1) Kinetix 6200/6500 support for Heidenhain EnDat high-resolution feedback has not been implemented.

Modular Drive System (without LIM module)



(1) Kinetix 6200/6500 support for Heidenhain EnDat high-resolution feedback has not been implemented.

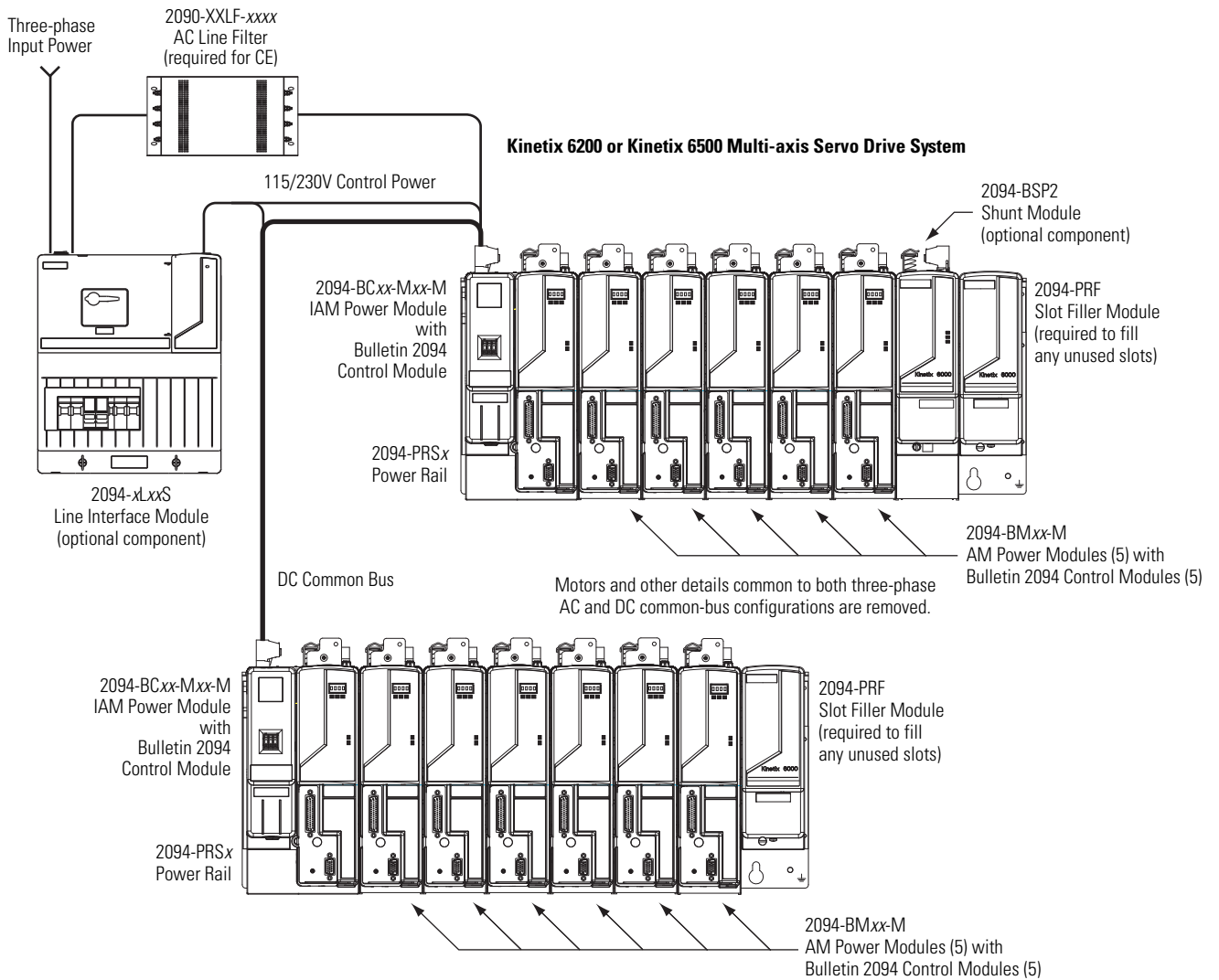
In the system configuration below, the leader IAM power module is connected to the follower IAM module via the DC common bus. When planning your panel layout, you must calculate the total bus capacitance of your DC common bus system to make sure that the leader IAM power module is sized sufficiently to pre-charge the entire system. Refer to the Kinetix 6200 and Kinetix 6500 Modular Servo Drive User Manual, publication [2094-UM002](#), when making this calculation.

IMPORTANT

If total bus capacitance of your system exceeds the leader IAM power module pre-charge rating, the IAM module four-character display scrolls a power cycle user limit condition. If input power is applied, the display scrolls a power cycle fault limit condition.

To correct this condition, you must replace the leader IAM power module with a larger module or decrease the total bus capacitance by removing AM power modules.

Modular Drive System (DC Common Bus)



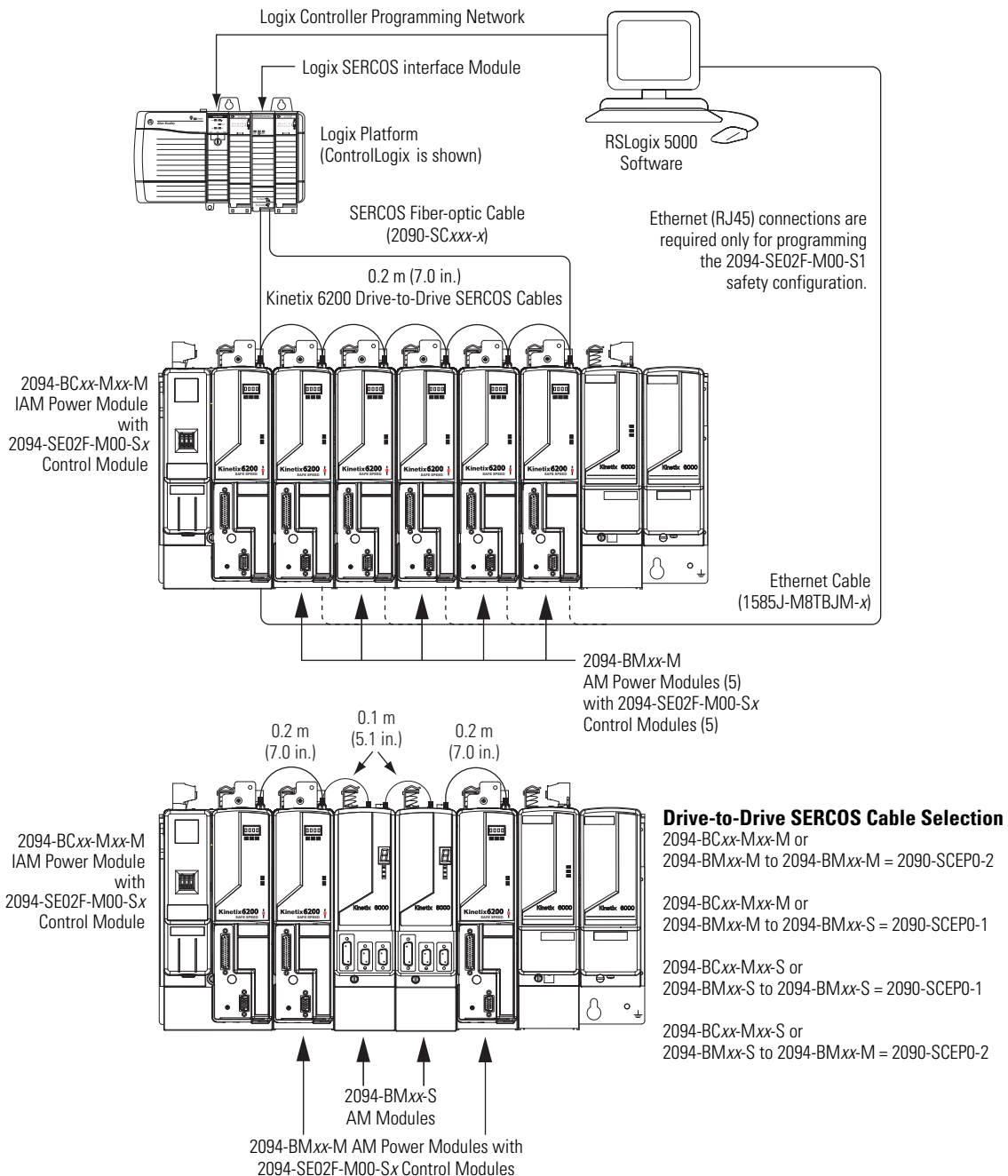
Motors and other details common to both three-phase AC and DC common-bus configurations are removed.

Typical Communication Configurations

The Kinetix 6200 control modules use SERCOS interface for configuring the Logix module and EtherNet/IP network for access to the safety configuration tool.

In this example, an ethernet cable is connected to each control module when programming the safety configuration. EtherNet/IP network connectivity is not required during runtime. Also shown are drive-to-drive SERCOS cable lengths and catalog numbers when Kinetix 6000 and Kinetix 6200 drive modules exist on the same power rail.

Kinetix 6200 Drive Communication (SERCOS)



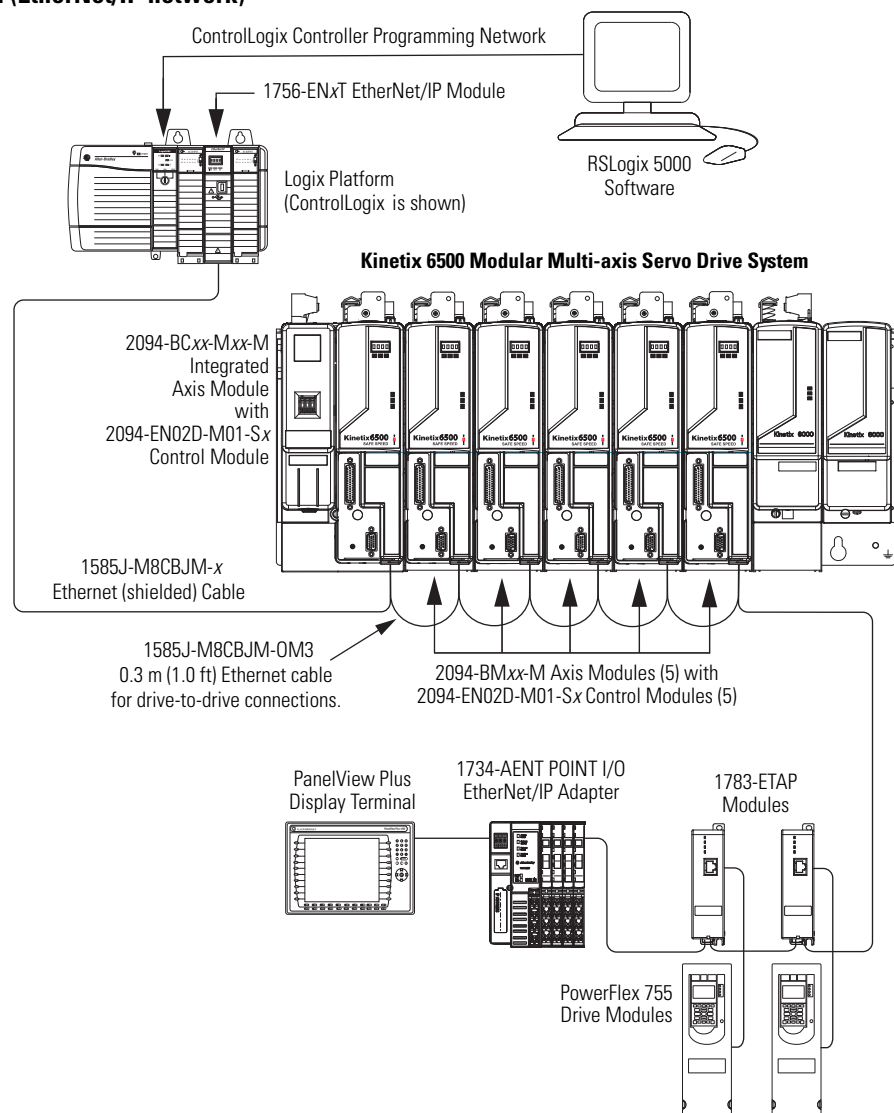
The Kinetix 6500 control modules can use any Ethernet topology including star, linear, and device-level ring (DLR). DLR is an ODVA standard and provides fault tolerant connectivity.

IMPORTANT

Shielded Ethernet cable, catalog number 1585J-M8CBJM-x, is available in lengths up to 78 m (256 ft). However, the total length of Ethernet cable connecting drive-to-drive, drive-to-controller, or drive-to-switch must not exceed 100 m (328 ft).

In this example, all devices are connected in linear topology. The Kinetix 6500 control module includes dual-port connectivity. Devices without dual ports should include the 1783-ETAP module or be connected at the end of the line.

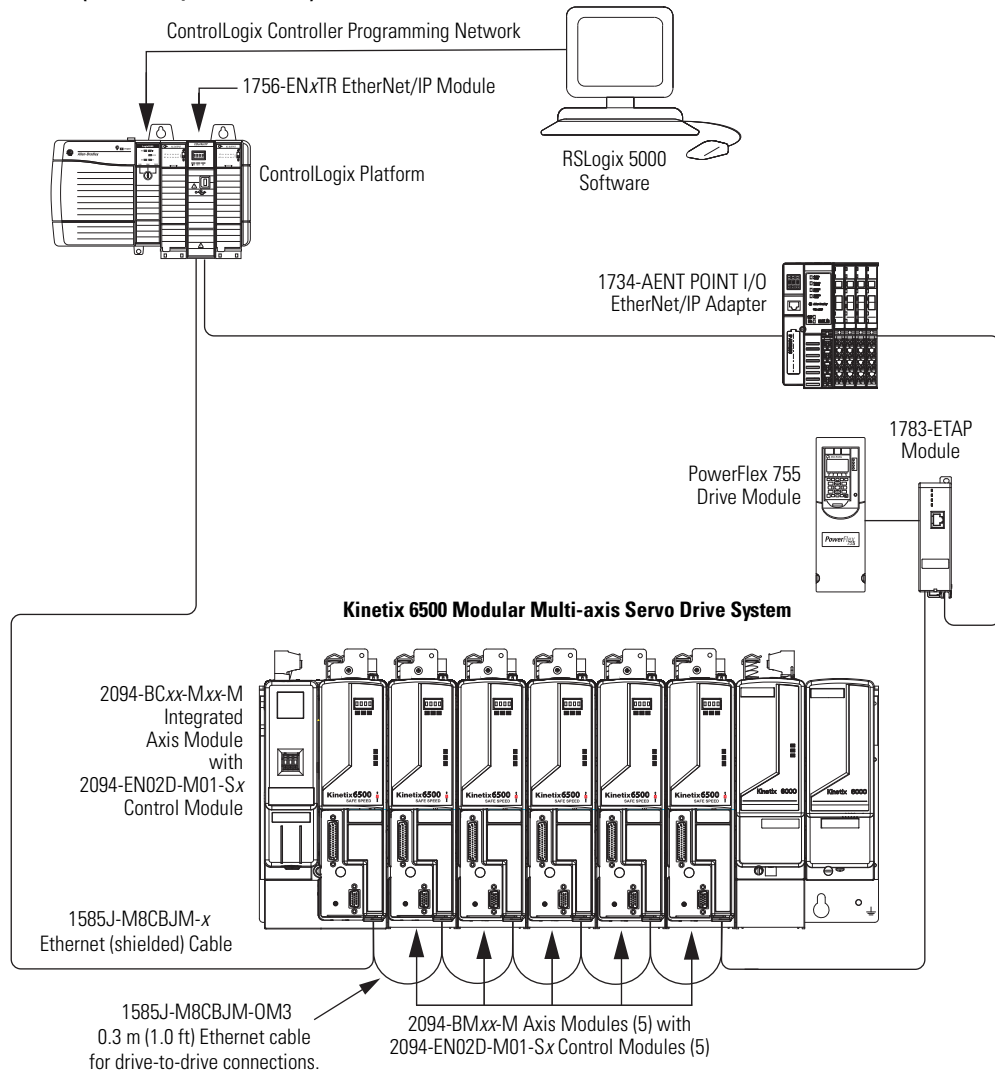
- Linear configurations support up to 64 devices.
- No redundancy. If any device becomes disconnected, all the devices downstream lose communication.

Kinetix 6500 Linear Communication (EtherNet/IP network)

In this example, the devices are connected by using device-level ring (DLR) topology. DLR topology is fault tolerant. For example, if a device in the ring is disconnected, the rest of the devices in the ring continue to maintain communication.

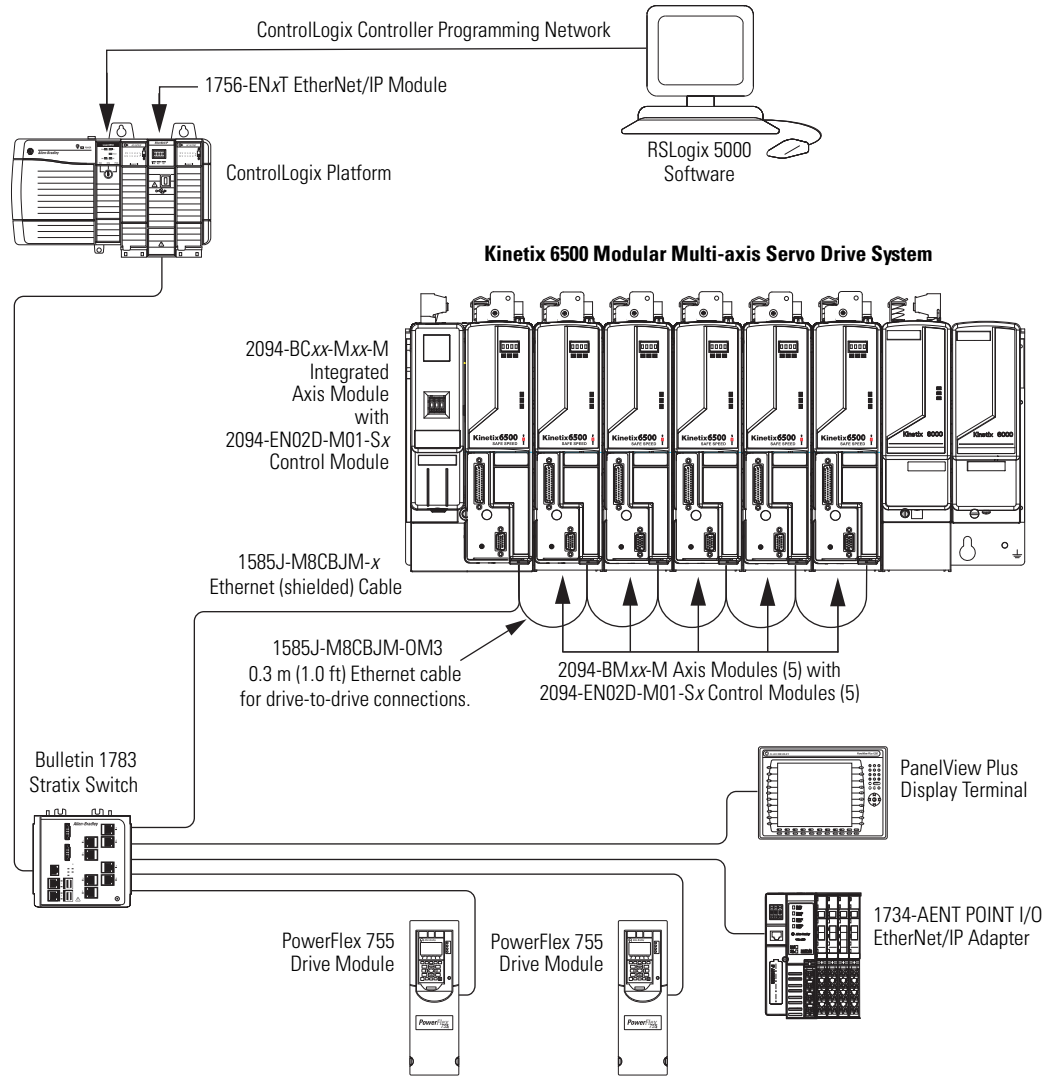
- DLR configurations support up to 64 devices.
- All devices in a DLR ring should have dual-port connectivity or be connected in the ring by using a 1783-ETAP module.

Kinetix 6500 Ring Communication (EtherNet/IP network)



In this example, the devices are connected by using star topology. Each device is connected directly to the switch, making this topology fault tolerant. The 2094 power rail modules and other devices operate independently. The loss of one device does not impact the operation of the other devices.

Kinetix 6500 Star Communication (EtherNet/IP network)



Kinetix 6200 and Kinetix 6500 Integrated Axis Modules

This section contains power specifications, mounting dimensions, and catalog numbers for the modular Bulletin 2094 (460V) IAM power modules. Choose your IAM power module based on the converter and inverter power requirements of your application.

Integrated Axis Module (converter) Power Specifications

IAM Module (460V) Power Specifications

Attribute	2094-BC01-MP5-M	2094-BC01-M01-M	2094-BC02-M02-M	2094-BC04-M03-M	2094-BC07-M05-M
AC input voltage	324...528V rms three-phase (360...480V nom)				
AC input frequency	47...63 Hz				
Main AC input current Nom (rms) Max inrush (0-pk) ⁽¹⁾	10.0 A 11.0 A		24.0 A 22.0 A		
DC input voltage (common bus follower)	458...747V DC				
DC input current (common-bus follower)	9.0 A		22.6 A		
Control power AC input voltage	95...264V rms single-phase (230V nom)				
Control power AC input current Nom (@ 220/230V AC) rms Nom (@ 110/115V AC) rms Max inrush (0-pk)	3 A 6 A 98 A ⁽²⁾				
Nominal bus output voltage	650V DC				
Line loss ride through	20 ms				
Continuous output current to bus (A _{dc})	9.0 A		22.6 A		
Peak output current to bus (A _{dc}) ⁽³⁾	22.6 A		56.4 A		
Bus overvoltage	825V DC				
Bus undervoltage	275V DC				
Internal shunt Continuous power Peak power	50 W 5.6 kW				
Internal shunt resistor	115 Ω				
Shunt on	805V DC				
Shunt off	765V DC				
Continuous power output to bus	6 kW		15 kW		
Peak power output at 480V ⁽³⁾	15 kW		37.5 kW		
Efficiency	97%				
Converter inductance	500 μH				
Converter capacitance	110 μF		220 μF		
Short circuit current rating	200,000 A (rms) symmetrical				

Contact your Rockwell Automation sales representative for the availability of this IAM power module.

Contact your Rockwell Automation sales representative for the availability of this IAM power module.

(1) All IAM power modules are limited to 2 contactor cycles per minute (with up to 4 axes), or 1 contactor cycle per minute (with 5...8 axes). The cycle capability also depends on the converter power rating and the total system capacitance. To calculate cycle capability, refer to the Kinetix 6200 and Kinetix 6500 Modular Multi-axis Servo Drives User Manual, publication [2094-UM002](#).

(2) For eight axis systems with 230V AC control input voltage and 50 °C (122°F) ambient temperature the maximum inrush duration is less than 1/2 line cycle. To calculate the maximum inrush duration for other configurations, refer to the Kinetix 6200 and Kinetix 6500 Modular Multi-axis Servo Drives User Manual, publication [2094-UM002](#).

(3) Converter peak output duration equals 400 ms with a duty cycle of 16%.

Control Power Current Requirements

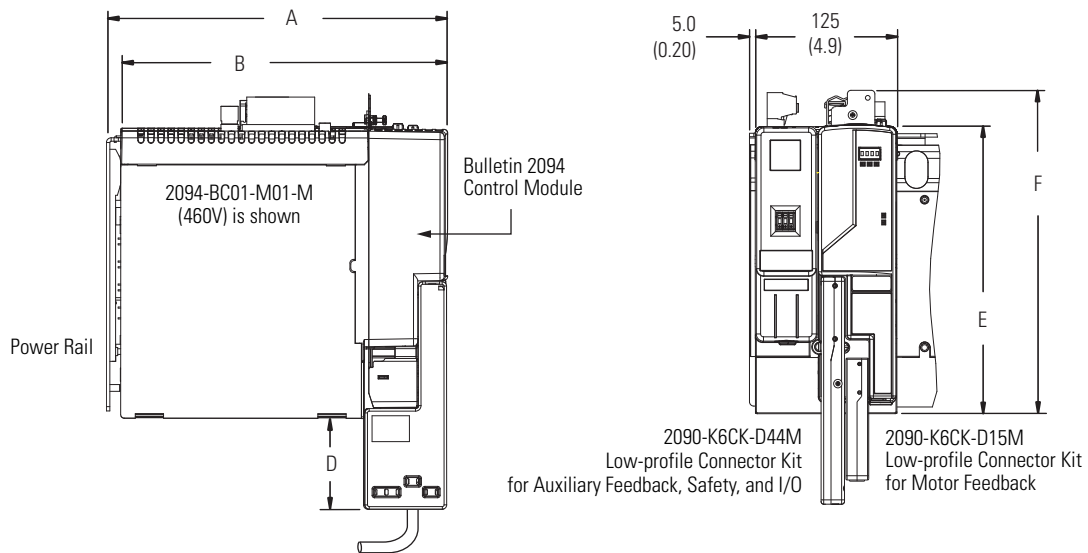
Power Modules on Power Rail	110/115V AC Input A	220/230V AC Input A	Input VA VA
IAM only	0.75	0.35	150
IAM, 1 AM	1.50	0.70	200
IAM, 2 AM	2.25	1.0	275
IAM, 3 AM	3.0	1.35	350

Power Modules on Power Rail	110/115V AC Input A	220/230V AC Input A	Input VA VA
IAM, 4 AM	3.75	1.70	450
IAM, 5 AM	4.50	2.0	550
IAM, 6 AM	5.25	2.40	650
IAM, 7 AM	6.0	3.0	750

Integrated Axis Module Dimensions

2094-BC01-MP5-M, 2094-BC01-M01-M, and 2094-BC02-M02-M IAM Modules

Dimensions are in millimeters (inches)



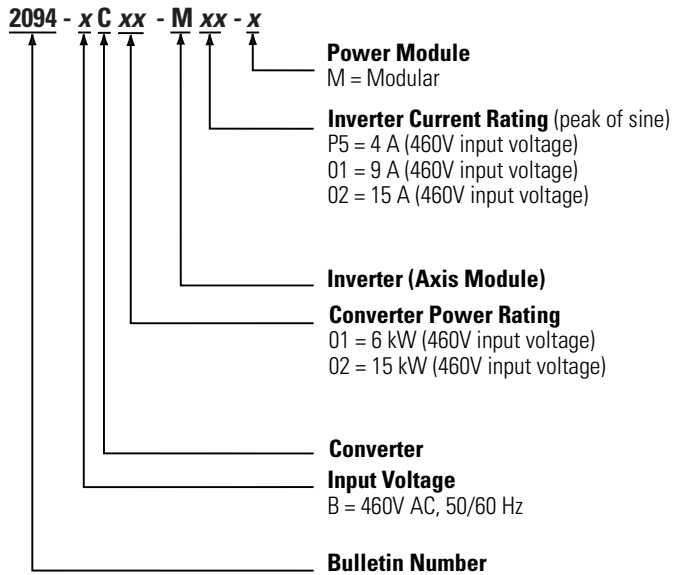
The IAM power module is shown mounted to the power rail with the control module attached.

IAM Power Module Dimensions

IAM Power Module Cat. No.	A mm (in.)	B mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)
2094-BC01-MP5-M	302 (11.9)	290 (11.4)	80.0 (3.2)	260 (10.25)	290 (11.4)
2094-BC01-M01-M					
2094-BC02-M02-M					

Integrated Axis Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.



Kinetix 6200 and Kinetix 6500 Axis Modules

This section contains power specifications, mounting dimensions, and catalog numbers for the modular Bulletin 2094 (460V) axis modules (AM). Choose your AM power module based on the inverter power requirements of your application.

Axis Module (inverter) Power Specifications

These specifications apply to the axis module specified in the column heading by catalog number and the same axis module (inverter section) that resides within an IAM power module.

AM Module (inverter) 460V Power Specifications

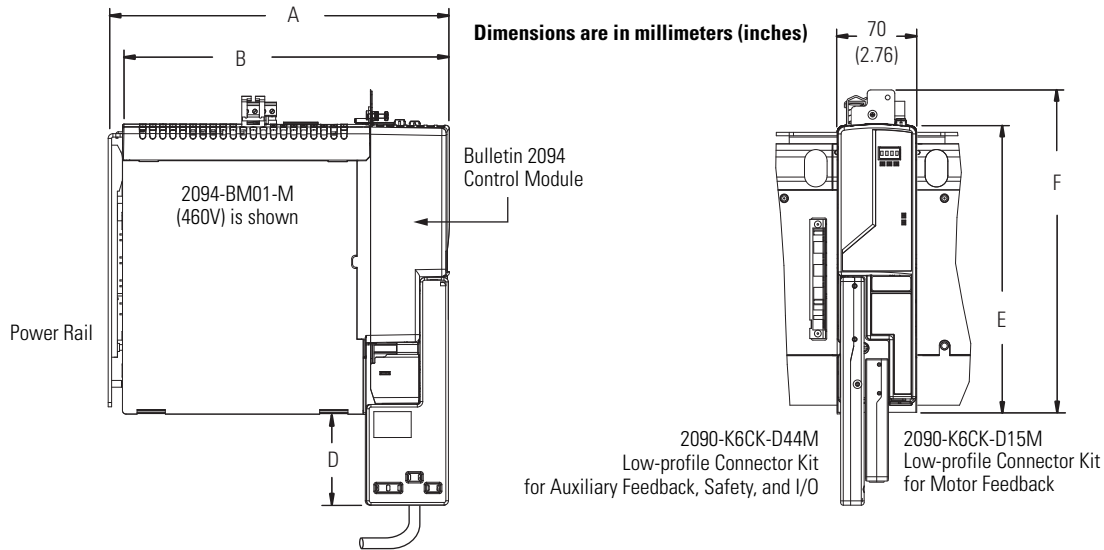
Attribute	2094-BMP5-M (2094-BC01-MP5-M)	2094-BM01-M (2094-BC01-M01-M)	2094-BM02-M (2094-BC02-M02-M)	2094-BM03-M (2094-BC04-M03-M)	2094-BM05-M (2094-BC07-M05-M)
Bandwidth ⁽¹⁾ Velocity loop Current loop	500 Hz 1300 Hz			Contact your Rockwell Automation sales representative for the availability of this AM power module.	Contact your Rockwell Automation sales representative for the availability of this AM power module.
PWM frequency	8 kHz		4 kHz		
Nominal input voltage	650V DC				
Continuous current (rms)	2.8 A	6.1 A	10.3 A		
Continuous current (sine) 0-pk	4.0 A	8.6 A	14.6 A		
Peak current (rms) ⁽²⁾	7.0 A	15.3 A	25.8 A		
Peak current (0-pk) ⁽²⁾	9.9 A	21.6 A	36.4 A		
Continuous power out (nom)	1.8 kW	3.9 kW	6.6 kW		
Internal shunt Continuous power Peak power	50 W 5.6 kW				
Internal shunt resistor	115 Ω				
Shunt on	805V DC				
Shunt off	765V DC				
Efficiency	98%				
Capacitance	75 μ F	150 μ F	270 μ F		
Capacitive energy absorption	10 J	19 J	35 J		
Short circuit current rating	200,000 A (rms) symmetrical				

(1) Bandwidth values vary based on tuning parameters and mechanical components.

(2) Refer to the Kinetix 6200 and Kinetix 6500 Modular Multi-axis Servo Drives User Manual, publication [2094-UM002](#), for duty cycle capability information.

Axis Module Dimensions

2094-BMP5-M, 2094-BM01-M, and 2094-BM02-M AM Modules



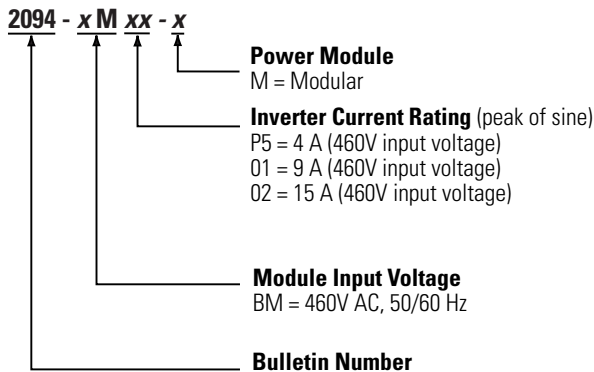
The AM power module is shown mounted to the power rail with the control module attached.

AM Power Module Dimensions

AM Power Module Cat. No.	A mm (in.)	B mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)
2094-BMP5-M	302 (11.9)	290 (11.4)	80.0 (3.2)	260 (10.25)	290 (11.4)
2094-BM01-M					
2094-BM02-M					

Axis Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.



Kinetix 6200 and Kinetix 6500 Control Modules

This section contains specifications and catalog numbers for the modular Bulletin 2094 SERCOS interface and EtherNet/IP network control modules. Choose your control module based on the communication and safety requirements of your application.

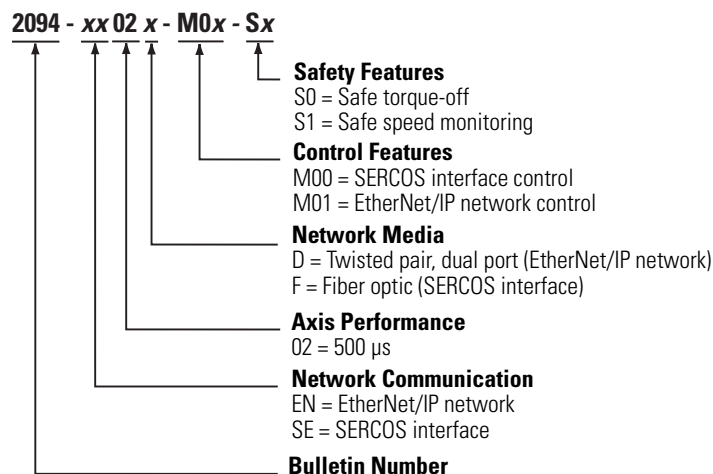
Control Module Specifications

Control modules couple with IAM and AM power modules to provide drive status indicators and an interface to I/O, communication, safety functionality, and feedback.

Feature	Safe Torque-off		Safe Speed Monitoring	
	2094-EN02D-M01-S0	2094-SE02F-M00-S0	2094-EN02D-M01-S1	2094-SE02F-M00-S1
Ethernet ports	2	1	2	1
SERCOS ports	–	Rx/Tx	–	Rx/Tx
DC Bus status indicator	√	√	√	√
Network status indicator	√	–	√	–
Module status indicator	√	–	√	–
Drive status indicator	–	√	–	√
Comm status indicator	–	√	–	√
Safety lock status indicator	–	–	√	√
PORT 1 status indicator	√	√	√	√
PORT 2 status indicator	√	–	√	–
IOD connector for I/O, safety, and auxiliary feedback	√	√	√	√
MF connector for motor feedback	√	√	√	√

Control Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.



Kinetix 6200 and Kinetix 6500 General System Specifications

This section contains environmental, weight, power dissipation, circuit breaker/fuse, transformer, and contactor specifications.

Environmental Specifications

Attribute	Operational Range	Storage Range (nonoperating)
Ambient temperature	0...50 °C (32...122 °F)	-40...70 °C (-40...158 °F)
Relative humidity	5...95% noncondensing	5...95% noncondensing
Altitude	1000 m (3281 ft) 3000 m (9843 ft) with derating	3000 m (9843 ft) during transport
Vibration	5...55 Hz @ 0.35 mm (0.014 in.) double amplitude, continuous displacement; 55...500 Hz @ 2.0 g peak constant acceleration (10 sweeps in each of 3 mutually perpendicular directions)	
Shock	15 g, 11 ms half-sine pulse (3 pulses in each direction of 3 mutually perpendicular directions)	

Weight Specifications

IAM Power Module	Cat. No.	Weight, approx. kg (lb)
IAM (460V)	2094-BC01-MP5-M	5.67 (12.5)
	2094-BC01-M01-M	5.67 (12.5)
	2094-BC02-M02-M	5.90 (13.0)

Kinetix 6200 Control Module	Cat. No.	Weight, approx. kg (lb)
SERCOS interface	2094-SE02F-M00-S0	0.68 (1.5)
	2094-SE02F-M00-S1	

AM Power Module	Cat. No.	Weight, approx. kg (lb)
AM (460V)	2094-BMP5-M	3.18 (7.0)
	2094-BM01-M	3.18 (7.0)
	2094-BM02-M	3.40 (7.5)

Kinetix 6500 Control Module	Cat. No.	Weight, approx. kg (lb)
EtherNet/IP network	2094-EN02D-M01-S0	0.68 (1.5)
	2094-EN02D-M01-S1	

Maximum Feedback Cable Lengths

Although motor feedback cables are available in standard lengths up to 90 m (295.3 ft), the drive/motor/feedback combination may limit the maximum feedback cable length. These tables assume the use of recommended cables as shown in the Motor/Actuator Cable Selection table on [page 380](#).

Cable Lengths for Compatible Rotary Motors

Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)
MPL-B15xxx... MPL-B2xxx-E/V		90 (295.3)	
MPL-B3xxx... MPL-B5xxx-S/M		90 (295.3)	
MPL-B15xxx... MPL-B45xxx-H			30 (98.4)
MPM-Bxxxx-S/M		90 (295.3)	
MPF-Bxxx-S/M		90 (295.3)	
MPS-Bxxx-S/M		90 (295.3)	
RDB-B215xx-7/3 ⁽¹⁾	30 (98.4)		
RDB-B290xx-7/3 or ⁽¹⁾ RDB-B410xx-7/3	90 (295.3)		

(1) Support for Heidenhain EnDat high-resolution feedback has not been implemented.

Cable Lengths for Compatible Linear Actuators

Actuator Cat. No.	Absolute High-resolution (9V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)
MPMA-Bxxxx or MPAS-Bxxxx-V (ballscrew)	90 (295.3)	
MPMA-Bxxxx or MPAS-Bxxxx-A (direct drive)		30 (98.4)
MPAR-Bxxxx-V/M	90 (295.3)	
MPAI-BxxxxM3	90 (295.3)	

Cable Lengths for Compatible Linear Motors

Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)
LDC-Series	30 (98.4)	30 (98.4)

Maximum Power Cable Length

Although motor power cables are available in standard lengths up to 90 m (295.3 ft) and the Kinetix 6000 power rail is available in sizes up to eight axes, to meet CE requirements and improve system performance the combined motor power length for all axes on the same DC bus must not exceed 240 m (787 ft) for 460V systems.

Circuit Breaker/Fuse Specifications

While circuit breakers offer some convenience, there are limitations for their use. Circuit breakers do not handle high current inrush as well as fuses.

Make sure the selected components are properly coordinated and meet acceptable codes including any requirements for branch circuit protection. Evaluation of the short-circuit available current is critical and must be kept below the short-circuit current rating of the circuit breaker.

Use class CC, J, L, or R fuses, with current rating as indicated in the table below. The following fuse examples and Allen-Bradley circuit breakers are recommended for use with 2094-BCxx-Mxx-M IAM power modules when the Line Interface Module (LIM) is not used.

IMPORTANT

LIM Modules (catalog numbers 2094-BLxxS and 2094-XL75S-C.x) provide branch circuit protection to the IAM power module. Follow all applicable NEC and local codes.

IAM Power Module Cat. No.	V AC Input Power			Control Input Power		DC Common Bus Fuse	
	Bussmann Fuse	Allen-Bradley Circuit Breaker		Bussmann Fuse	Allen-Bradley Circuit Breaker	Bussmann Fuse	Ferraz Shawmut Fuse
		Disconnect	Magnetic Contactor				
2094-BC01-MP5-M	KTK-R-20 (20 A)	1492-SP3D300	140M-F8E-C32	FNO-R-10 (10 A)	1492-SP2D060	N/A	A100P20-1
2094-BC01-M01-M							
2094-BC02-M02-M	KTK-R-30 (30 A)	1492-SP3D400	140M-F8E-C45			FWJ-40A	A100P40-1

Contactors Ratings

This table provides the recommended contactor ratings for IAM power modules installed without a LIM module.

IAM Power Module Cat. No.	Contactors
2094-BC01-MP5-M	100-C23x10 (AC coil)
2094-BC01-M01-M	100-C23Zx10 (DC coil)
2094-BC02-M02-M	100-C37x10 (AC coil) 100-C37Zx10 (DC coil)

Input Transformer for Control Power

Attribute	Value
Input volt-amperes	750VA
Input voltage	460V AC
Output voltage	120...240V AC

Power Dissipation Specifications

Use this table to size an enclosure and calculate required ventilation for your Kinetix 6200 and Kinetix 6500 drive system.

Kinetix 6200 and Kinetix 6500 ⁽¹⁾ Drive Modules	Usage as % of Rated Power Output (watts)				
	20%	40%	60%	80%	100%
IAM (converter) module ⁽²⁾					
2094-BC01-MP5-M	18	21	25	29	34
2094-BC01-M01-M					
2094-BC02-M02-M	36	44	54	64	75
IAM (inverter) module or AM module ⁽²⁾					
2094-BC01-MP5-M or 2094-BMP5-M	46	54	61	69	77
2094-BC01-M01-M or 2094-BM01-M	57	73	90	108	126
2094-BC02-M02-M or 2094-BM02-M	53	72	93	116	142
Shunt module					
2094-BSP2	68	121	174	227	280

(1) Power dissipation for the Bulletin 2094 control modules, catalog numbers 2094-SE02F-M00-Sx and 2094-EN02D-M01-Sx, is included in the IAM and AM power module specifications.

(2) Internal shunt power is not included in the calculations and must be added based on utilization.

Power dissipation specifications are based on these calculations. For example:

2094-BC02-M02-M with 4.52 A_{dc} (=20%) converter DC current and 10.3 A_{rms} (=100%) inverter output current.

Converter loss (36 W) + Inverter loss (142 W) = 178 W total power dissipation.

Kinetix 6200 and Kinetix 6500 Features and Indicators

These are the features and indicators for the Kinetix 6200 and Kinetix 6500 IAM and AM power modules and control modules.

2094-BCxx-Mxx-M IAM Power Module Features and Indicators

Kinetix 6200 or Kinetix 6500
IAM Power Module, Top View
(2094-BC01-MP5-M module is shown)

Kinetix 6200 or Kinetix 6500
IAM Power Module, Front View
(2094-BC01-MP5-M module is shown)

Item	Description
1	Control power (CPD) connector
2	DC bus/AC input power (IPD) connector
3	Contactora Enable (CED) connector
4	Motor cable shield clamp
5	Motor power (MP) connector
6	Motor/resistive brake (BC) connector
7	Node address switch
8	Power-applied indicator
9	Mounting screw

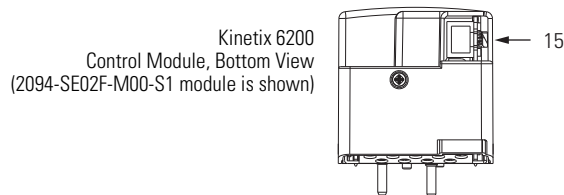
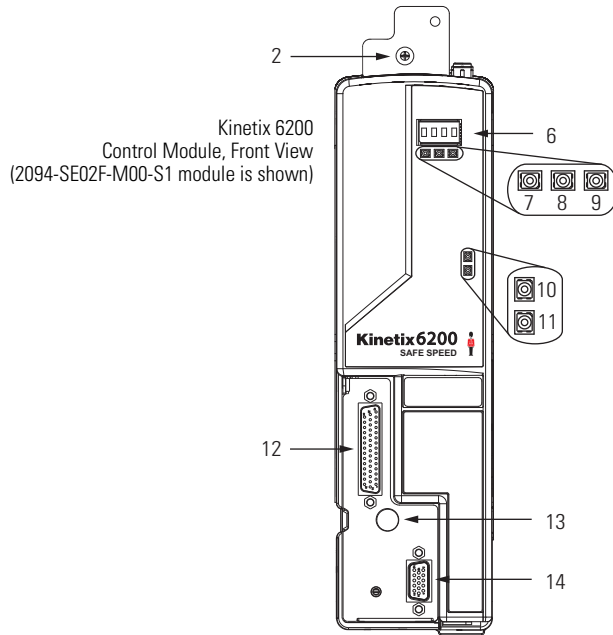
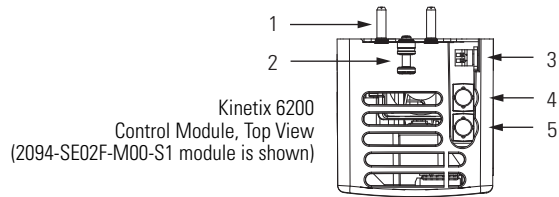
2094-BMxx-M AM Power Module Features and Indicators

Kinetix 6200 or Kinetix 6500
AM Power Module, Top View
(2094-BMP5-M module is shown)

Kinetix 6200 or Kinetix 6500
AM Power Module, Front View
(2094-BMP5-M module is shown)

Item	Description
1	Motor cable shield clamp
2	Motor power (MP) connector
3	Motor/resistive brake (BC) connector
4	Power-applied indicator
5	Mounting screw

Control Module Features and Indicators (SERCOS)



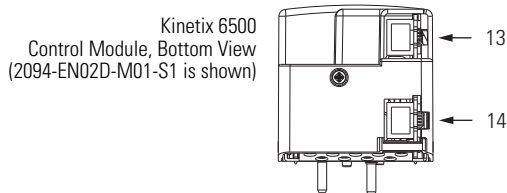
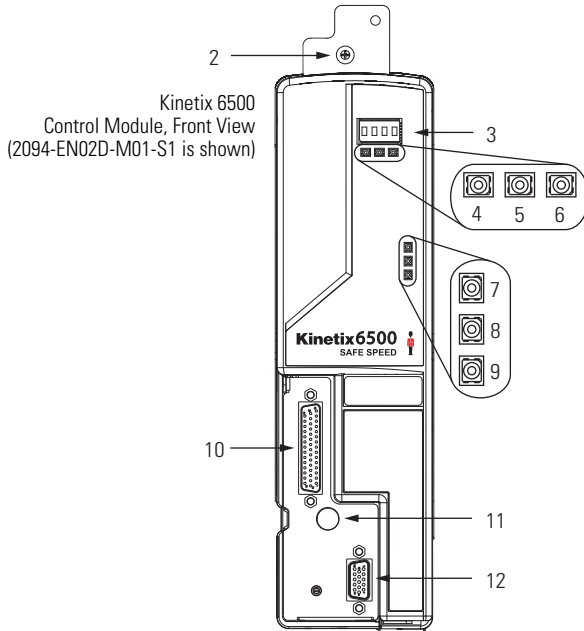
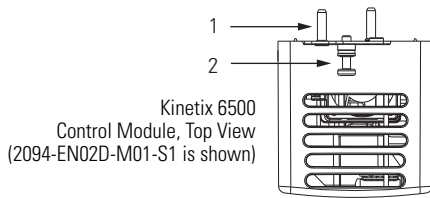
Item	Description
1	Guide pins (2x)
2	Captive screw
3	SERCOS communication rate and optical power switches
4	SERCOS transmit (Tx) connector
5	SERCOS receive (Rx) connector

Item	Description
6	Four-character status display
7	PORT 1 status Indicator
8	Drive status indicator
9	Comm status indicator
10	DC bus status indicator
11	Safety lock status indicator (2094-SE02F-M00-S1 modules only)
12	I/O, safety, and aux feedback (IOD) connector
13	Power module mounting screw access hole
14	Motor feedback (MF) connector

Item	Description
15	Ethernet (PORT1) connector

For connector kit options, refer to Breakout Components and Connector Kits beginning on [page 418](#).

Control Module Features and Indicators (EtherNet/IP network)



Item	Description
1	Guide pins (2x)
2	Captive screw

Item	Description
3	Four-character status display
4	PORT 1 status indicator
5	PORT 2 status indicator
6	Module status indicator
7	Network status indicator
8	DC bus status indicator
9	Safety lock status indicator (2094-EN02D-M01-S1 modules only)
10	I/O, safety, and aux feedback (IOD) connector
11	Power module mounting screw access hole
12	Motor feedback (MF) connector

Item	Description
13	Ethernet (PORT1) connector
14	Ethernet (PORT2) connector

Kinetix 6000 Multi-axis Servo Drives



The Kinetix 6000 multi-axis servo drives provide powerful simplicity to handle even the most demanding applications quickly, easily, and cost-effectively. By providing advanced control capability along with innovative design and installation features, the Kinetix 6000 drives significantly improve system performance while saving time and money. The compact size, simplified wiring, and easy-to-use components make the Kinetix 6000 drives an ideal choice for both OEMs and end-users. Target applications for the Kinetix 6000 drives include packaging, material handling, converting, and assembly.

The Kinetix 6000 multi-axis servo drives are part of the Kinetix Integrated Motion solution.

Topic	Page
Kinetix 6000 Servo Drive Components	267
Kinetix 6000 Integrated Axis Modules	274
Kinetix 6000 Axis Modules	279
Kinetix 6000 General System Specifications	283
Kinetix 6000 Connector, Indicator, and Switch Locations	289

Kinetix 6000 Servo Drive Components

Kinetix 6000 servo drive systems consist of these required components:

- One integrated axis module (IAM or leader IAM), 2094-ACxx-Mxx-S (230V) or 2094-BCxx-Mxx-S (460V)
- Up to seven axis modules, 2094-AMxx-S (230V) or 2094-BMxx-S (460V)
- One power rail, 2094-PRS1, 2094-PRS2, 2094-PRS3, 2094-PRS4, 2094-PRS5, 2094-PRS6, 2094-PRS7, or 2094-PRS8
- One to eight MP-Series, TL-Series, LDC-Series, LDL-Series, or RDD-Series rotary servo motors or linear motors/actuators. RDD-Series motors require the 2090-K6CK-KENDAT low-profile feedback module, all others require the 2090-K6CK-D15M low-profile connector kit for flying-lead feedback cables.
- One to eight motor power and feedback cables
- Two to nine SERCOS fiber-optic cables

Kinetix 6000 systems may also include any of these optional components:

- One or more integrated axis modules used as follower IAM, 2094-ACxx-Mxx-S (230V) or 2094-BCxx-Mxx-S (460V) and associated axis modules, power rails, motors, and cables as required for the application
- One shunt module, 2094-BSP2 with optional Bulletin 1394 external passive shunt module
- Slot-filler modules, 2094-PRF
- Bulletin 2094 Line Interface Module (LIM)
- Bulletin 2090 Resistive Brake Module (RBM)
- Bulletin 1336 external active shunt module (dynamic brake)

Kinetix 6000 IAM/AM Module Series Change

The peak current ratings of the Kinetix 6000 AM modules (series A and B) are configured at the factory as 150% of continuous current. You can program 460V (series B) AM modules and the equivalent IAM (inverter) modules, for up to 250% of continuous inverter current.

Kinetix 6000 Series Change

IAM Module ⁽¹⁾ Cat. No.	AM Module ⁽¹⁾ Cat. No.	Peak Current Rating	
		Series A (inverter)	Series B (inverter)
2094-BC01-MP5-S	2094-BMP5-S	150%	250%
2094-BC01-M01-S	2094-BM01-S	150%	250%
2094-BC02-M02-S	2094-BM02-S	150%	250%

(1) Contact your Rockwell Automation sales representative for availability of 2094-BC04-M03-S, 2094-BM03-S, 2094-BC07-M05-S, and 2094-BM05-S series-B drive modules.

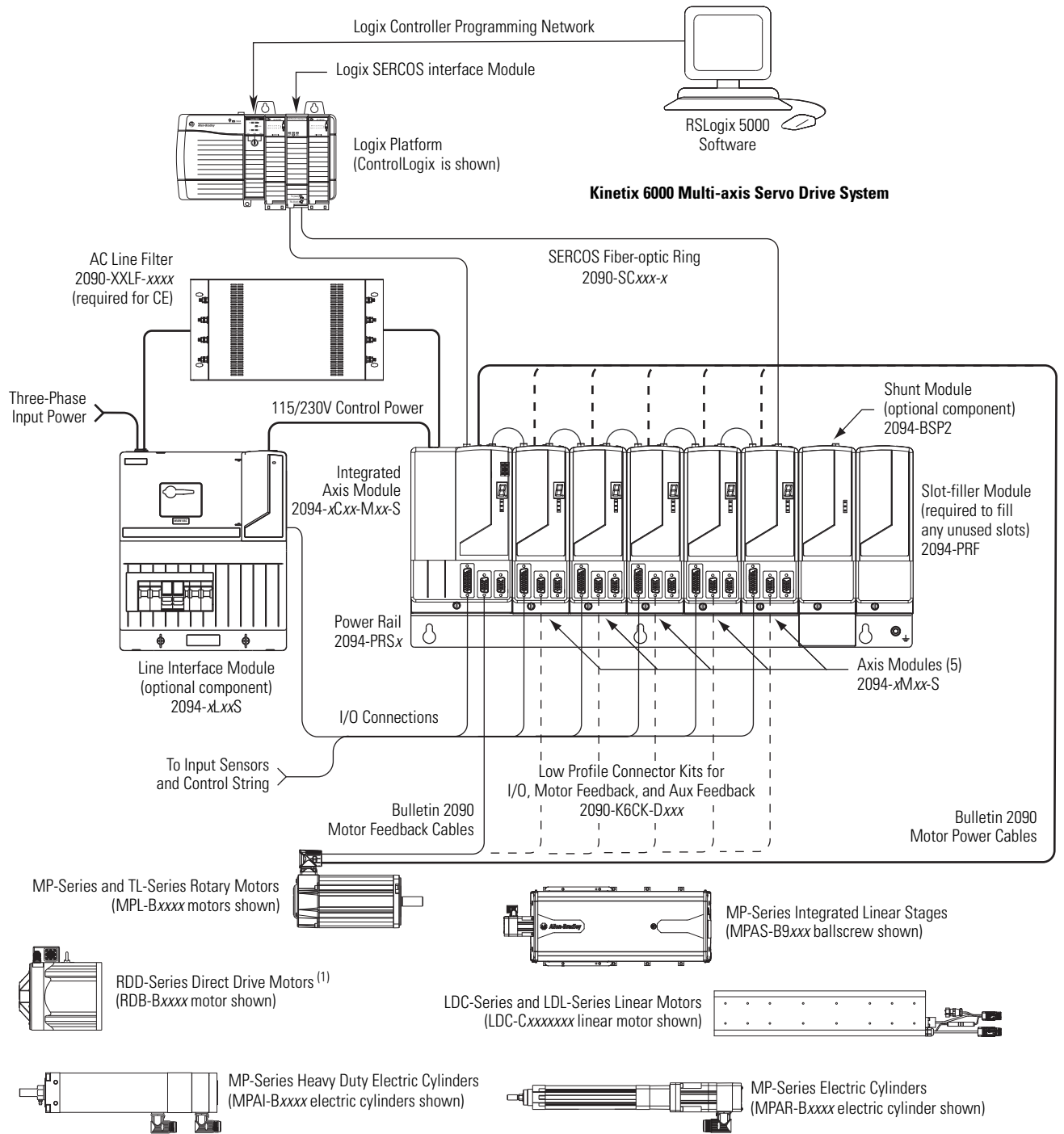
IMPORTANT

Before your drive will deliver 250% peak performance, you must enable the peak enhancement feature by configuring your drive by using DriveExplorer or RSLogix 5000 software.

Refer to the interactive Peak Enhancement Configuration Utility to recalculate torque and accel/decel limit values, and paste them into the appropriate Axis Properties dialog box in RSLogix 5000 software. To download the utility, go to <http://ab.com/motion/software/peak.html>.

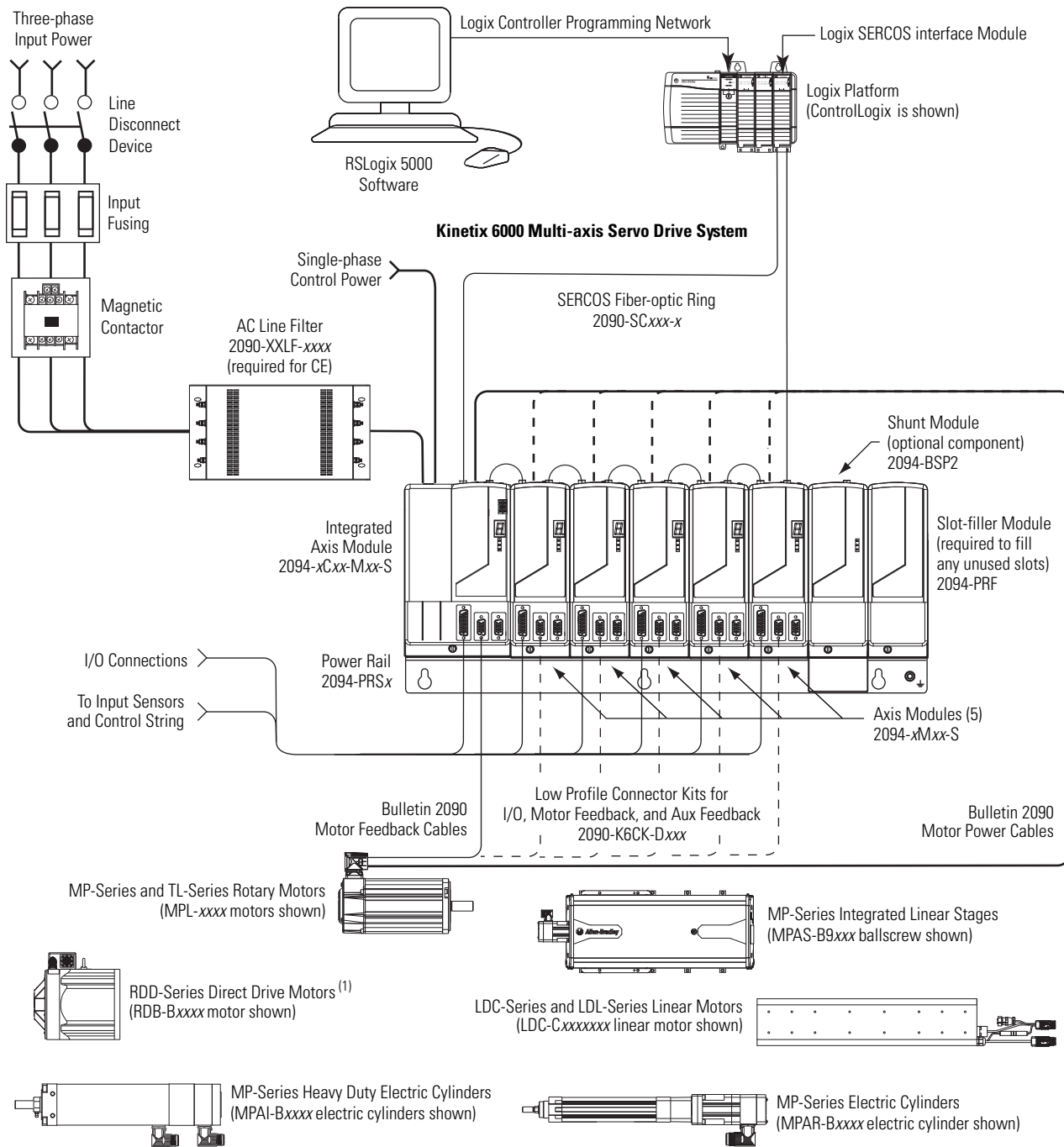
For sizing your drive/motor combination by using series-B drives and the peak enhancement feature, use Motion Analyzer software, version 4.6 or later.

Typical Configuration - Kinetix 6000 System (with LIM module)



(1) RDD-Series direct-drive motors require the 2090-K6CK-KENDAT low-profile feedback module for Kinetix 6000 drive applications.

Typical Configuration - Kinetix 6000 System (without LIM module)



(1) RDD-Series direct-drive motors require the 2090-K6CK-KENDAT low-profile feedback module for Kinetix 6000 drive applications.

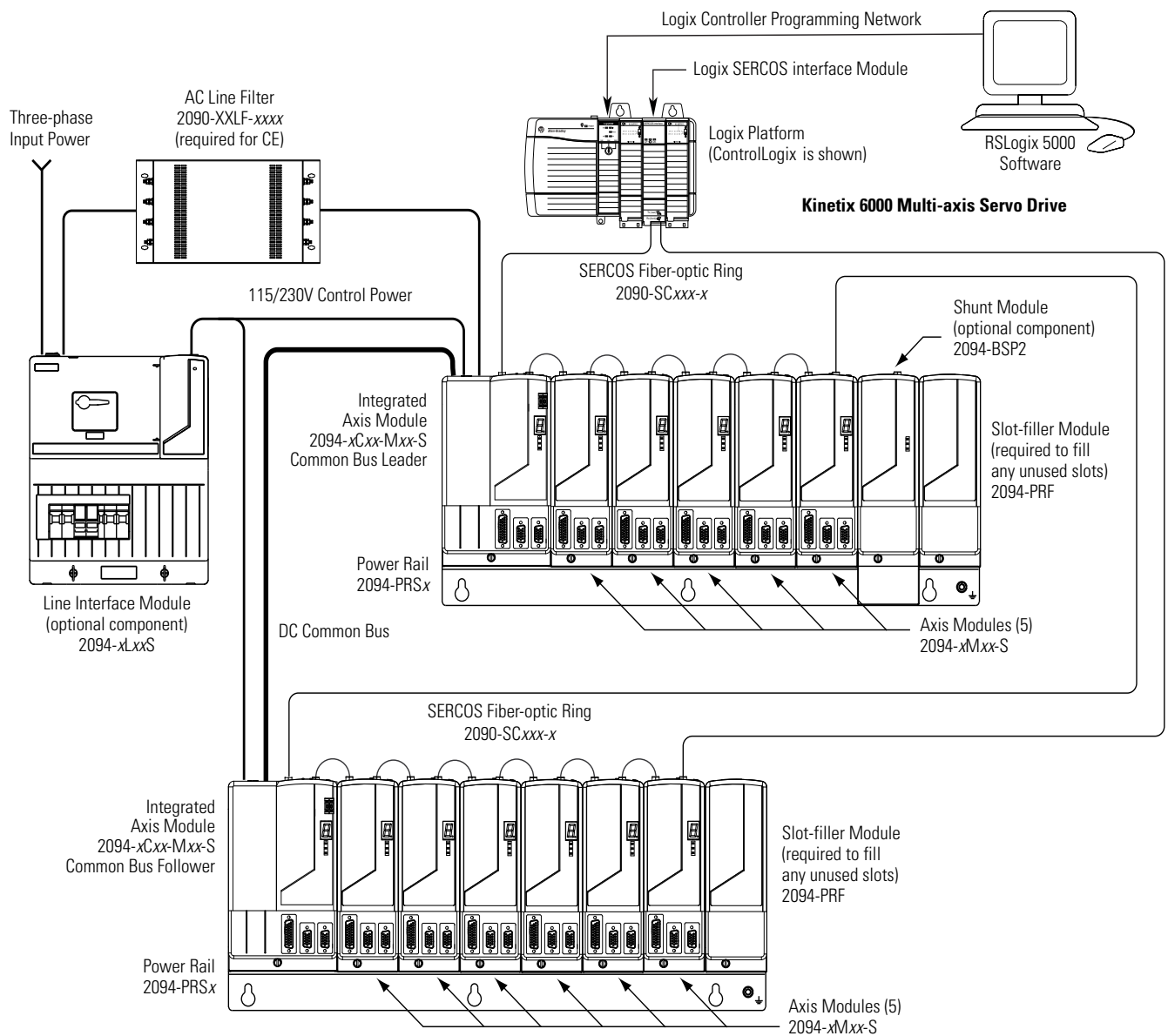
In the Kinetix 6000 system configuration below, the leader IAM module is connected to the follower IAM module via the DC common bus. When planning your panel layout, you must calculate the total bus capacitance of your DC common bus system to make sure that the leader IAM module is sized sufficiently to pre-charge the entire system. Refer to the Kinetix 6000 Servo Drive User Manual, publication [2094-UM001](#), when making this calculation.

IMPORTANT

If total bus capacitance of your system exceeds the leader IAM module pre-charge rating, the IAM module seven-segment status will display error code E90 (pre-charge timeout fault) if input power is applied.

To correct this condition, you must replace the leader IAM module with a larger module or decrease the total bus capacitance by removing axis modules.

Typical Configuration - Kinetix 6000 System (DC common bus)



Motors and other details common to both three-phase AC and DC common-bus configurations are removed.

Peak Enhancement Specifications

Drives that support the Peak Enhanced mode have the capability of increasing the maximum inverter peak current to achieve greater overload performance.

IMPORTANT

The Peak Enhancement feature requires use of RSLogix 5000 software version 16 and drive firmware revision 1.111 or later.

Kinetix 6000 Peak Overload Support

IAM/AM Module Cat. No.	Module	Safe-off Drive	Series A	Series B
2094-BCxx-Mxx	IAM	Non safe-off	Standard	Standard
2094-BMxx	AM			
2094-BCxx-Mxx-S	IAM	Safe-off	Standard	Standard or Peak enhanced ⁽¹⁾
2094-BMxx-S	AM			

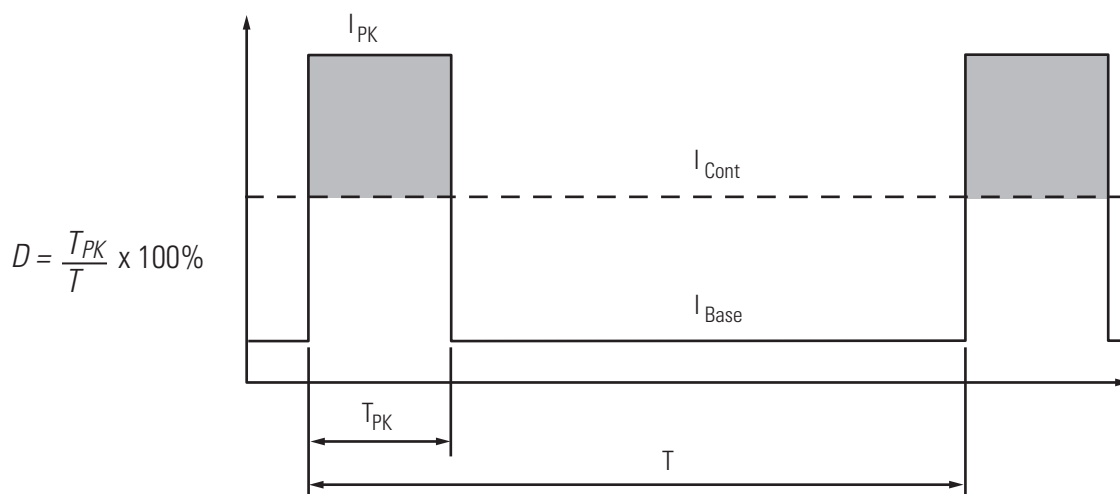
(1) Standard mode is enabled by default to preserve backward compatibility, but you can enable the Peak Enhanced mode to achieve increased peak current performance. Refer to Kinetix 6000 IAM/AM Module Series Change on [page 268](#) for information on enabling the Peak Enhanced mode.

Kinetix 6000 Peak Current Ratings

IAM/AM Module ⁽¹⁾ Cat. No.	Peak Inverter Current Rating		Peak Enhanced Converter Current Rating
	Standard	Peak Enhanced	
2094-BC01-MP5-S	150%	250%	250%
2094-BC01-M01-S	150%	250%	250%
2094-BC02-M02-S	150%	250%	250%
2094-BMP5-S	150%	250%	N/A
2094-BM01-S	150%	250%	N/A
2094-BM02-S	150%	250%	N/A

(1) Contact your Rockwell Automation sales representative for availability of 2094-BC04-M03-S, 2094-BM03-S, 2094-BC07-M05-S, and 2094-BM05-S series-B drive modules.

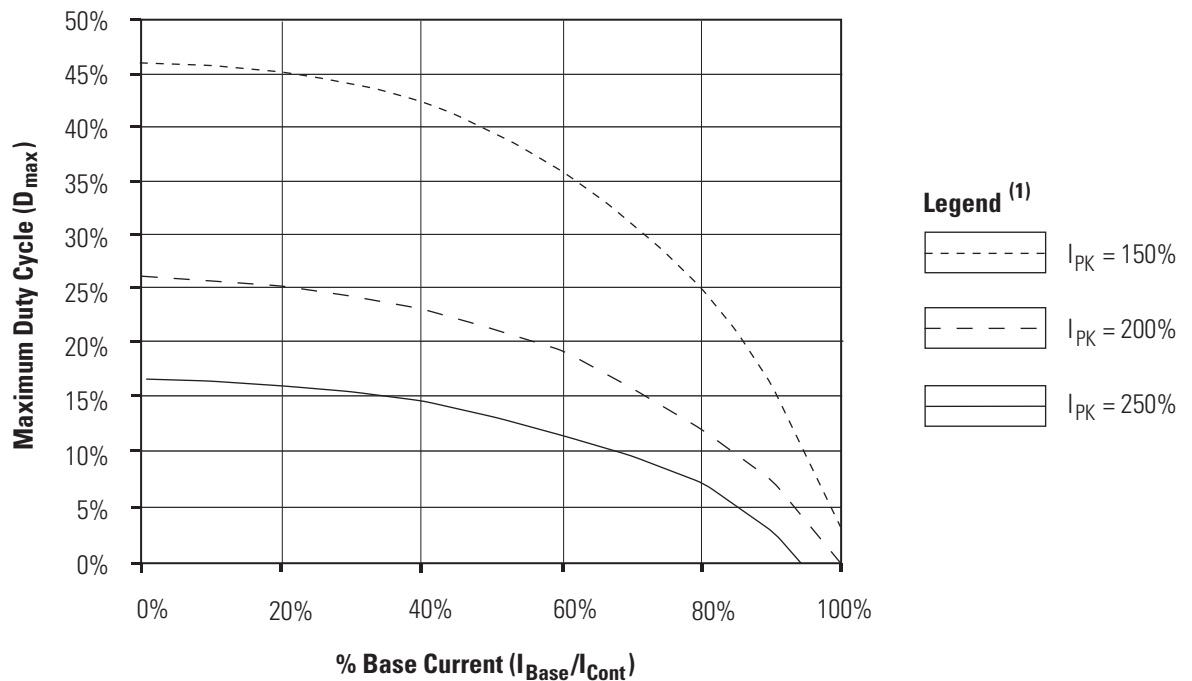
Load Duty-cycle Profile Example



Peak Enhanced Mode Definition of Terms

Term	Definition
Continuous current rating (I_{Cont})	The maximum value of current that can be output continuously.
Peak current rating (I_{PKmax})	The maximum value of peak current that the drive can output. This rating is valid only for short periods of time.
Duty cycle (D)	The ratio of time at peak to the Application Period and is defined as: $D = \frac{T_{PK}}{T} \times 100\%$
Time at peak (T_{PK})	The time at peak current (I_{PK}) for a given loading profile.
Peak current (I_{PK})	The level of peak current for a given loading profile. I_{PK} must be less than or equal to the Peak Current Rating of the drive.
Base current (I_{Base})	The level of current between the pulses of peak current for a given loading profile. I_{Base} must be less than or equal to the continuous current rating (I_{Cont}) of the drive.
Loading profile	The loading profile is comprised of I_{PK} , I_{Base} , T_{PK} , and D (or T) values and completely specify the operation of the drive in an overload situation. These values are collectively defined as the Loading Profile of the drive.
Application period (T)	The sum of the times at I_{PK} (T_{PK}) and I_{Base} .

Kinetix 6000 Peak Enhanced Inverter Mode ($T_{PK} < 2.0$ s)



(1) Base current (I_{Base}) and peak current (I_{PK}) are a percentage of the continuous drive current rating (I_{Cont}).

Kinetix 6000 Integrated Axis Modules

This section contains power specifications, mounting dimensions, and catalog numbers for the Bulletin 2094 (230V and 460V) integrated axis modules (IAM). Choose your IAM module based on the converter and inverter power requirements of your application.

Integrated Axis Module (converter) Power Specifications

IAM Module (230V) Power Specifications

Attribute	2094-AC05-MP5-S	2094-AC05-M01-S	2094-AC09-M02-S	2094-AC16-M03-S	2094-AC32-M05-S
AC input voltage	195...264V rms three-phase (230V nom)				
AC input frequency	47...63 Hz				
Main AC input current ⁽¹⁾ Nom (rms) Max inrush (0-pk)	10 A 19 A	19 A 37 A	36 A 73 A	71 A 138 A	
DC input voltage (common-bus follower)	275...375V DC				
DC input current (common-bus follower)	10 A	19 A	36 A	71 A	
Control power AC input voltage	95...264V rms single-phase (230V nom)				
Control power AC input current Nom (@ 220/230V AC) rms Nom (@ 110/115V AC) rms Max inrush (0-pk)	3 A 6 A 20 A		3 A 6 A 83 A ⁽²⁾		
Nominal bus output voltage	325V DC				
Line loss ride through	20 ms				
Continuous output current to bus (A_{dc})	10 A	19 A	36 A	71 A	
Peak output current to bus (A_{dc}) ⁽³⁾	20 A	38 A	72 A	142 A	
Bus overvoltage	415V DC				
Bus undervoltage	138V DC				
Internal shunt Continuous power Peak power	N/A N/A	50 W 8200 W	200 W 5700 W	200 W 5700 W	
Internal shunt resistor	N/A	20 Ω	28.75 Ω	28.75 Ω	
Shunt on	N/A	405V DC			
Shunt off	N/A	375V DC			
Continuous power output to bus	3 kW	6 kW	11.3 kW	22.5 kW	
Peak power output	6 kW	12 kW	22.6 kW	45.0 kW	
Efficiency	95%				
Converter inductance	N/A		150 μ H	75 μ H	
Converter capacitance	270 μ F	540 μ F	1320 μ F	1980 μ F	
Short circuit current rating	200,000 A (rms) symmetrical				

(1) All 2094-xCxx IAM modules are limited to 2 contactor cycles per minute (with up to 4 axis modules), or 1 contactor cycle per minute (with 5 to 8 axis modules).

(2) Maximum inrush duration is less than 1/2 line cycle.

(3) Peak output current duration equals 250 ms.

IAM Module (460V) Power Specifications (series A and B)

Attribute	2094-BC01-MP5-S	2094-BC01-M01-S	2094-BC02-M02-S	2094-BC04-M03-S	2094-BC07-M05-S
AC input voltage	324...528V rms three-phase (360...480V nom)				
AC input frequency	47...63 Hz				
Main AC input current Nom (rms) Max inrush (0-pk) ⁽¹⁾	10.0 A 11.0 A		24.0 A 22.0 A	44.0 A 31.1 A	71.0 A 62.2 A
DC input voltage (common bus follower)	458...747V DC				
DC input current (common-bus follower)	9.0 A		22.6 A	41.5 A	67.7 A
Control power AC input voltage	95...264V rms single-phase (230V nom)				
Control power AC input current Nom (@ 220/230V AC) rms Nom (@ 110/115V AC) rms Max inrush (0-pk)	3 A 6 A 30 A ⁽²⁾				
Nominal bus output voltage	650V DC				
Line loss ride through	20 ms				
Continuous output current to bus (A_{dc})	9.0 A		22.6 A	41.5 A	67.7 A
Peak output current to bus (A_{dc}) Series A drives ⁽³⁾ Series B drives ⁽⁴⁾	18.1 A ⁽³⁾ 22.6 A ⁽⁴⁾		45.2 A ⁽³⁾ 56.4 A ⁽⁴⁾	83.1 A ⁽³⁾	135.4 A ⁽³⁾
Bus overvoltage	825V DC				
Bus undervoltage	275V DC				
Internal shunt Continuous power Peak power	50 W 5.6 kW		200 W 22.5 kW		
Internal shunt resistor	115 Ω		28.75 Ω		
Shunt on	805V DC				
Shunt off	755V DC				
Continuous power output to bus	6 kW		15 kW	27.6 kW	45 kW
Peak power output Series A drives ⁽³⁾ Series B drives ⁽⁴⁾	12 kW ⁽³⁾ 15 kW ⁽⁴⁾		30 kW ⁽³⁾ 37.5 kW ⁽⁴⁾	55.2 kW ⁽³⁾	90 kW ⁽³⁾
Efficiency	97%				
Converter inductance	500 μ H			125 μ H	75 μ H
Converter capacitance	110 μ F		220 μ F	940 μ F	1410 μ F
Short circuit current rating	200,000 A (rms) symmetrical				

(1) All 2094-xCxx IAM modules are limited to 2 contactor cycles per minute (with up to 4 axis modules), or 1 contactor cycle per minute (with 5 to 8 axis modules).

(2) Maximum inrush duration is less than 1/2 line cycle.

(3) Peak output current duration equals 250 ms.

(4) Converter peak output duration equals 400 ms with a duty cycle of 16%.

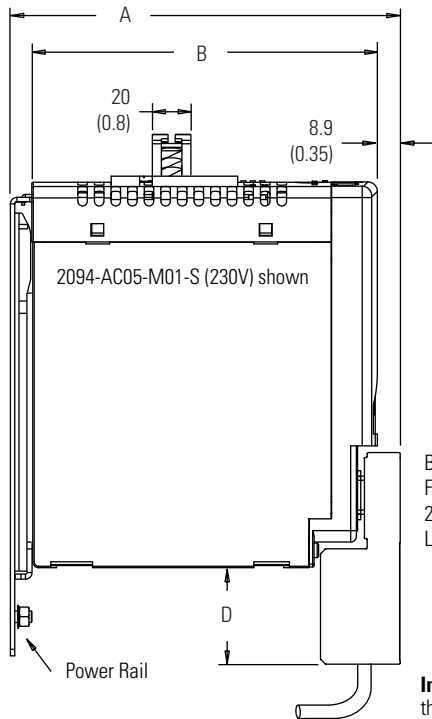
Control Power Current Requirements

Modules on Power Rail	110/115V AC Input A	220/230V AC Input A	Input VA VA
IAM only	0.75	0.35	150
IAM, 1 AM	1.50	0.70	200
IAM, 2 AM	2.25	1.0	275
IAM, 3 AM	3.0	1.35	350

Modules on Power Rail	110/115V AC Input A	220/230V AC Input A	Input VA VA
IAM, 4 AM	3.75	1.70	450
IAM, 5 AM	4.50	2.0	550
IAM, 6 AM	5.25	2.40	650
IAM, 7 AM	6.0	3.0	750

Integrated Axis Module Dimensions

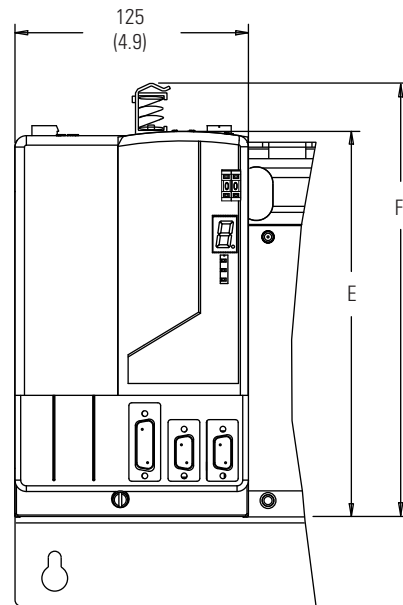
2094-AC05-MP5-S, 2094-AC05-M01-S, and 2094-AC09-M02-S Dimensions (230V)
2094-BC01-MP5-S, 2094-BC01-M01-S, and 2094-BC02-M02-S Dimensions (460V)



Bulletin 2090 (flying lead) Feedback Cable with 2090-K6CK-D15M Low Profile Connector Kit

Important: Additional clearance below the connector is necessary to provide the recommended cable bend radius.

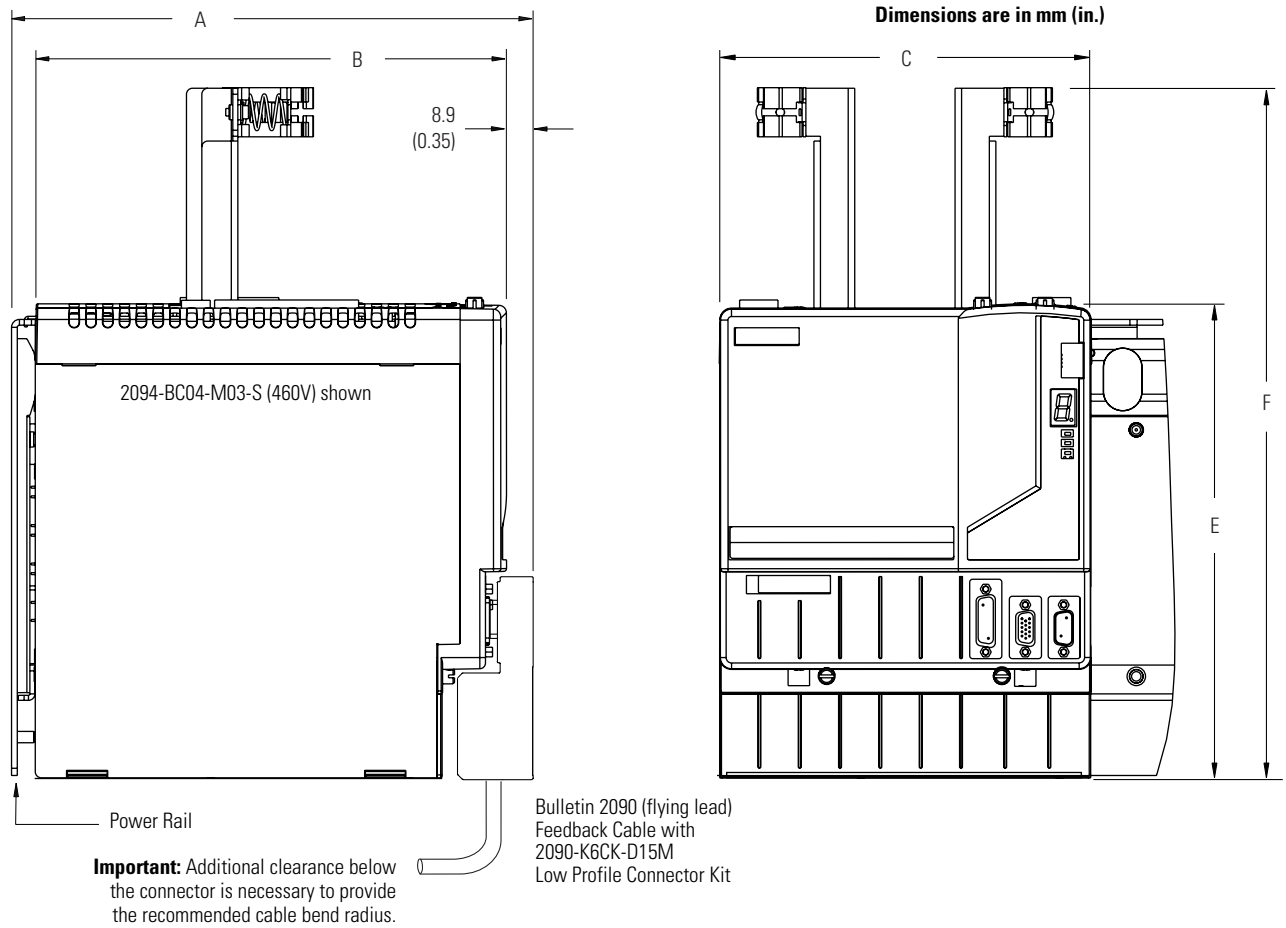
Dimensions are in mm (in.)



Modules are shown mounted to the power rail and the dimensions reflect that in the depth of the module.

IAM Module Cat. No.	A mm (in.)	B mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)
2094-AC05-MP5-S	198 (7.8)	176 (7.0)	51 (2.0)	206 (8.2)	231 (9.1)
2094-AC05-M01-S					
2094-AC09-M02-S					
2094-BC01-MP5-S	272 (10.7)	249 (9.8)	0 (0)	256 (10.1)	281 (11.0)
2094-BC01-M01-S					
2094-BC02-M02-S					

2094-AC16-M03-S and 2094-AC32-M05-S Dimensions (230V)
2094-BC04-M03-S and 2094-BC07-M05-S Dimensions (460V)

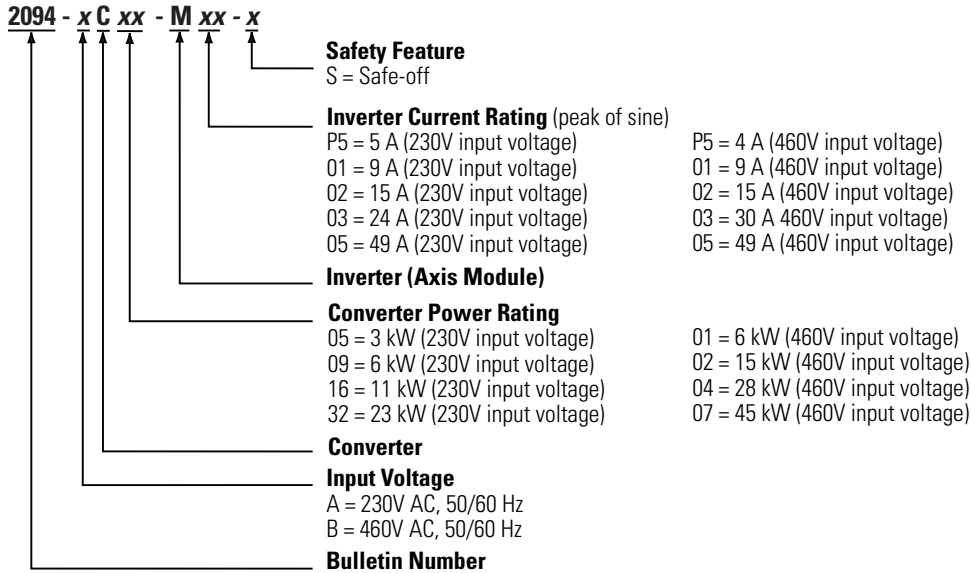


Modules are shown mounted to the power rail and the dimensions reflect that in the depth of the module.

IAM Module Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	E mm (in.)	F mm (in.)
2094-AC16-M03-S	198 (7.8)	176 (7.0)	125 (4.9)	302 (11.9)	420 (16.5)
2094-AC32-M05-S			196 (7.7)		
2094-BC04-M03-S	272 (10.7)	249 (9.8)	196 (7.7)	256 (10.1)	374 (14.7)
2094-BC07-M05-S				318 (12.5)	436 (17.2)

Integrated Axis Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.



Kinetix 6000 Axis Modules

This section contains power specifications, mounting dimensions, and catalog numbers for the Bulletin 2094 (230V and 460V) axis modules (AM). Choose your AM module based on the inverter power requirements of your application.

Axis Module (inverter) Power Specifications

These specifications apply to the axis module specified in the column heading by catalog number and the same axis module (inverter section) that resides within an IAM module.

AM Module (inverter) 230V Power Specifications

Attribute	2094-AMP5-S (2094-AC05-MP5-S)	2094-AM01-S (2094-AC05-M01-S)	2094-AM02-S (2094-AC09-M02-S)	2094-AM03-S (2094-AC16-M03-S)	2094-AM05-S (2094-AC32-M05-S)
Bandwidth ⁽¹⁾ Velocity loop Current loop	500 Hz 1300 Hz				
PWM frequency	8 kHz		4 kHz		
Input voltage (nom)	325V DC				
Continuous current (rms)	3.7 A	6.0 A	10.6 A	17.3 A	34.6 A
Continuous current (0-pk)	5.2 A	8.5 A	15.0 A	24.5 A	48.9 A
Peak current (rms) ⁽²⁾	7.4 A	12.0 A	21.2 A	34.6 A	51.9 A
Peak current (0-pk) ⁽²⁾	10.5 A	17.0 A	30.0 A	48.9 A	73.4 A
Continuous power out (nom)	1.2 kW	1.9 kW	3.4 kW	5.5 kW	11.0 kW
Internal shunt Continuous power Peak power	N/A N/A			50 W 1400 W	
Internal shunt resistor	N/A			115 Ω	
Shunt on	N/A			405V DC	
Shunt off	N/A			375V DC	
Efficiency	98%				
Capacitance	390 μ F	660 μ F	780 μ F	1320 μ F	2640 μ F
Capacitive energy absorption	15 J	25 J	29 J	50 J	99 J
Short circuit current rating	200,000 A (rms) symmetrical				

(1) Bandwidth values vary based on tuning parameters and mechanical components.

(2) Peak current duration equals 2.5 seconds.

IMPORTANT

The peak current ratings of the Kinetix 6000 AM modules (series A and B) are configured at the factory as 150% of continuous current. You can program 2094-BMP5-S, 2094-BM01-S, and 2094-BM02-S series-B drives and their equivalent IAM (inverter) modules, up to 250% of continuous inverter current.

AM Module (inverter) 460V Power Specifications (series A and B)

Attribute	2094-BMP5-S (2094-BC01-MP5-S)	2094-BM01-S (2094-BC01-M01-S)	2094-BM02-S (2094-BC02-M02-S)	2094-BM03-S (2094-BC04-M03-S)	2094-BM05-S (2094-BC07-M05-S)
Bandwidth ⁽¹⁾ Velocity loop Current loop	500 Hz 1300 Hz				
PWM frequency	8 kHz		4 kHz		
Nominal input voltage	650V DC				
Continuous current (rms)	2.8 A	6.1 A	10.3 A	21.2 A	34.6 A
Continuous current (sine) 0-pk	4.0 A	8.6 A	14.6 A	30.0 A	48.9 A
Peak current (rms)	4.2 A ⁽²⁾ 7.0 A ⁽³⁾	9.2 A ⁽²⁾ 15.3 A ⁽³⁾	15.5 A ⁽²⁾ 25.8 A ⁽³⁾	31.8 A ⁽²⁾	51.9 A ⁽²⁾
Peak current (0-pk)	5.9 A ⁽²⁾ 9.9 A ⁽³⁾	12.9 A ⁽²⁾ 21.6 A ⁽³⁾	21.8 A ⁽²⁾ 36.4 A ⁽³⁾	45.0 A ⁽²⁾	73.4 A ⁽²⁾
Continuous power out (nom)	1.8 kW	3.9 kW	6.6 kW	13.5 kW	22.0 kW
Internal shunt Continuous power Peak power	50 W 5.6 kW			200 W 22.5 kW	
Internal shunt resistor	115 Ω			28.75 Ω	
Shunt on	805V DC				
Shunt off	755V DC				
Efficiency	98%				
Capacitance	75 μ F	150 μ F	270 μ F	840 μ F	1175 μ F
Capacitive energy absorption	10 J	19 J	35 J	108 J	152 J
Short circuit current rating	200,000 A (rms) symmetrical				

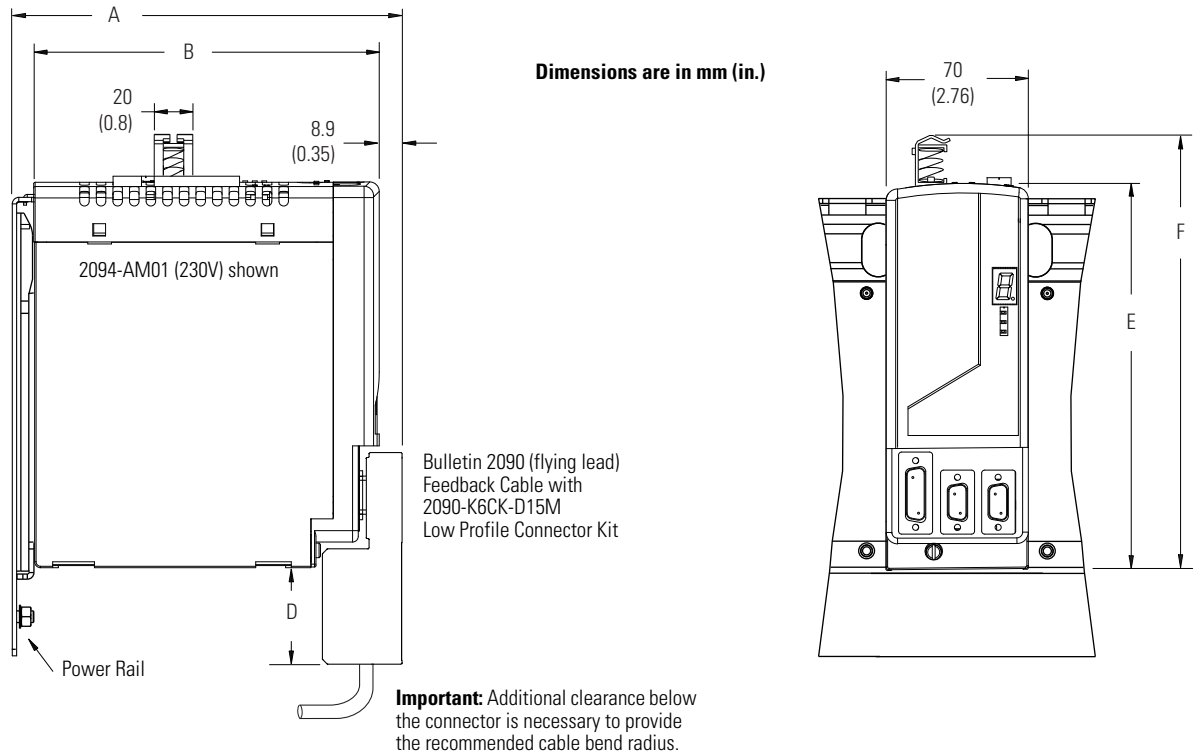
(1) Bandwidth values vary based on tuning parameters and mechanical components.

(2) Applies to Series A drives.

(3) Applies to Series B drives when configured for Peak-enhanced mode. For more information on drive performance in the Peak-enhanced mode, refer to [Peak Enhancement Specifications](#) on [page 272](#).

Axis Module Dimensions

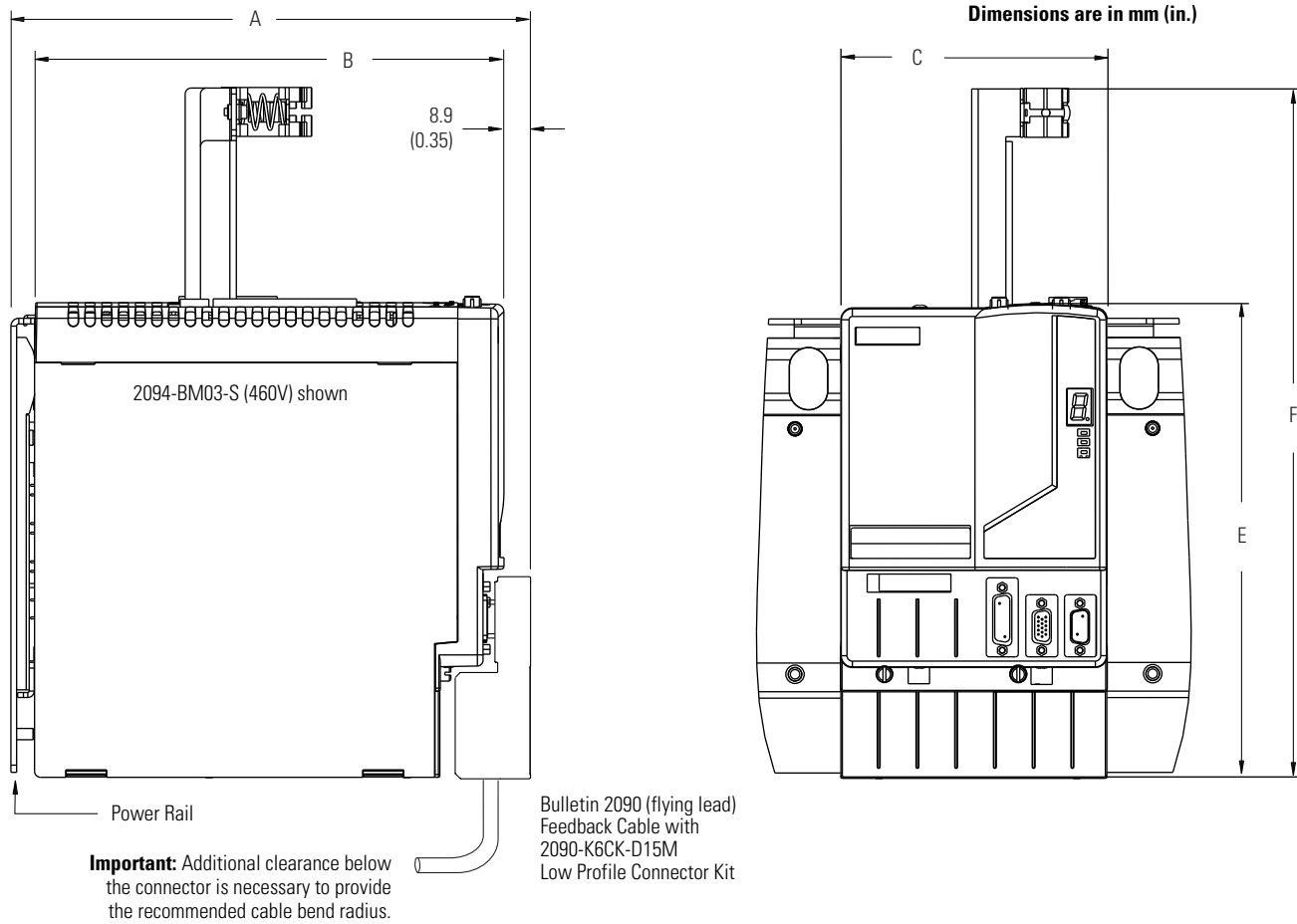
2094-AMP5-S, 2094-AM01-S, and 2094-AM02-S Dimensions (230V)
2094-BMP5-S, 2094-BM01-S, and 2094-BM02-S Dimensions (460V)



Modules are shown mounted to the power rail and the dimensions reflect that in the depth of the module.

AM Module Cat. No.	A mm (in.)	B mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)
2094-AMP5-S	198 (7.8)	176 (7.0)	51 (2.0)	206 (8.2)	231 (9.1)
2094-AM01-S					
2094-AM02-S					
2094-BMP5-S	272 (10.7)	249 (9.8)	0 (0)	256 (10.1)	281 (11.0)
2094-BM01-S					
2094-BM02-S					

2094-AM03-S and 2094-AM05-S Dimensions (230V)
2094-BM03-S and 2094-BM05-S Dimensions (460V)

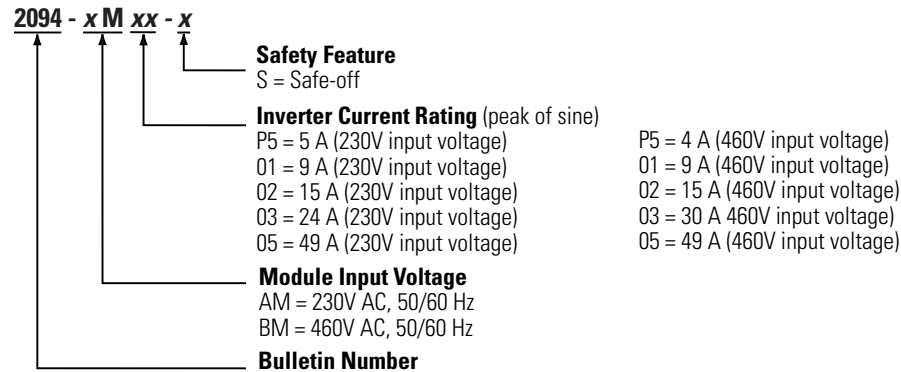


Modules are shown mounted to the power rail and the dimensions reflect that in the depth of the module.

AM Module Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	E mm (in.)	F mm (in.)
2094-AM03-S	198 (7.8)	176 (7.0)	70 (2.8)	302 (11.9)	420 (16.5)
2094-AM05-S					
2094-BM03-S	272 (10.7)	249 (9.8)	141 (5.5)	256 (10.1)	374 (14.7)
2094-BM05-S				318 (12.5)	436 (17.2)

Axis Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.



Kinetix 6000 General System Specifications

This section contains Kinetix 6000 drive environmental, weight, power dissipation, circuit breaker/fuse, transformer, and contactor specifications.

Environmental Specifications

Attribute	Operational Range	Storage Range (nonoperating)
Ambient temperature	0...50 °C (32...122 °F)	-40...70 °C (-40...158 °F)
Relative humidity	5...95% noncondensing	5...95% noncondensing
Altitude	1000 m (3281 ft) 3000 m (9843 ft) with derating	3000 m (9843 ft) during transport
Vibration	5...55 Hz @ 0.35 mm (0.014 in.) double amplitude, continuous displacement; 55...500 Hz @ 2.0 g peak constant acceleration (10 sweeps in each of 3 mutually perpendicular directions).	
Shock	15 g, 11 ms half-sine pulse (3 pulses in each direction of 3 mutually perpendicular directions)	

Weight Specifications

Kinetix 6000 Module	Cat. No.	Weight, approx. kg (lb)
IAM (230V)	2094-AC05-MP5-S	2.23 (4.9)
	2094-AC05-M01-S	2.27 (5.0)
	2094-AC09-M02-S	2.31 (5.1)
	2094-AC16-M03-S	4.71 (10.4)
	2094-AC32-M05-S	7.43 (16.4)
AM (230V)	2094-AMP5-S	1.46 (3.2)
	2094-AM01-S	1.50 (3.3)
	2094-AM02-S	1.54 (3.4)
	2094-AM03-S	3.13 (6.9)
	2094-AM05-S	3.18 (7.0)
Power rails (Slim)	2094-PRS1	1.05 (2.3)
	2094-PRS2	1.59 (3.5)
	2094-PRS3	2.14 (4.7)
	2094-PRS4	2.67 (5.9)
	2094-PRS5	3.11 (6.8)
	2094-PRS6	3.55 (7.8)
	2094-PRS7	3.99 (8.8)
	2094-PRS8	4.43 (9.7)

Kinetix 6000 Module	Cat. No.	Weight, approx. kg (lb)
IAM (460V)	2094-BC01-MP5-S	4.98 (11.0)
	2094-BC01-M01-S	5.03 (11.1)
	2094-BC02-M02-S	5.08 (11.2)
	2094-BC04-M03-S	9.60 (21.1)
	2094-BC07-M05-S	10.1 (22.3)
AM (460V)	2094-BMP5-S	2.44 (5.4)
	2094-BM01-S	2.49 (5.5)
	2094-BM02-S	2.54 (5.6)
	2094-BM03-S	4.58 (10.1)
	2094-BM05-S	4.98 (11.0)
Shunt module	2094-BSP2	3.10 (6.8)
Slot-filler module	2094-PRF	0.45 (1.0)

Maximum Feedback Cable Lengths

Although motor feedback cables are available in standard lengths up to 90 m (295.3 ft), the drive/motor/feedback combination may limit the maximum feedback cable length. These tables assume the use of recommended cables as shown in the Motor/Actuator Cable Selection table on [page 380](#).

Cable Lengths for Compatible Rotary Motors

Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)	Resolver m (ft)
MPL-A15xxx... MPL-A2xxx-E/V	30 (98.4)			
MPL-A3xxx... MPL-A5xxx-S/M ⁽¹⁾	30 (98.4)			
MPL-B15xxx... MPL-B2xxx-E/V		90 (295.3)		
MPL-B3xxx... MPL-B5xxx-S/M		90 (295.3)		
MPL-A/B15xxx... MPL-A/B45xxx-H			30 (98.4)	
MPL-Bxxx-R				90 (295.3)
MPM-Axxxxx-S/M	30 (98.4)			

Cable Lengths for Compatible Rotary Motors (continued)

Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)	Resolver m (ft)
MPM-Bxxxx-S/M		90 (295.3)		
MPM-A/Bxxxx-2				90 (295.3)
MPF-Axxx-S/M ⁽¹⁾	30 (98.4)			
MPF-Bxxx-S/M		90 (295.3)		
MPS-Axxx-S/M	30 (98.4)			
MPS-Bxxx-S/M		90 (295.3)		
RDB-B215xx-7/3	30 (98.4)			
RDB-B290xx-7/3 or RDB-B410xx-7/3	90 (295.3)			
TLY-Axxx-H			30 (98.4)	

(1) MPL-A5xxx and MPF-A5xxx motor encoders are rated for 9V, the remaining Bulletin MPL and MPF (230V) motor encoders are rated for 5V.

Cable Lengths for Compatible Linear Actuators

Actuator Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)	Absolute High-resolution (5V) 17-bit Encoder m (ft)
MPMA-Axxxx or MPAS-Axxxx-V (ballscrew)	30 (98.4)			
MPMA-Axxxx or MPAS-Axxxx-A (direct drive)			30 (98.4)	
MPMA-Bxxxx or MPAS-Bxxxx-V (ballscrew)		90 (295.3)		
MPMA-Bxxxx or MPAS-Bxxxx-A (direct drive)			30 (98.4)	
MPAR-Axxxx-V/M	30 (98.4)			
MPAR-Bxxxx-V/M		90 (295.3)		
TLAR-Axxxx-B				30 (98.4)
MPAI-AxxxxM3	30 (98.4)			
MPAI-BxxxxM3		90 (295.3)		

Cable Lengths for Compatible Linear Motors

Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)
LDC-Series or LDL-Series	30 (98.4)	30 (98.4)

Maximum Power Cable Length

Although motor power cables are available in standard lengths up to 90 m (295.3 ft) and the Kinetix 6000 power rail is available in sizes up to eight axes, to meet CE requirements and improve system performance the combined motor power length for all axes on the same DC bus must not exceed 160 m (525 ft) for 230V systems and 240 m (787 ft) for 460V systems.

Circuit Breaker/Fuse Specifications

While circuit breakers offer some convenience, there are limitations for their use. Circuit breakers do not handle high current inrush as well as fuses.

Make sure the selected components are properly coordinated and meet acceptable codes including any requirements for branch circuit protection. Evaluation of the short-circuit available current is critical and must be kept below the short-circuit current rating of the circuit breaker.

Use class CC, J, L, or R fuses, with current rating as indicated in the table below. The following fuse examples and Allen-Bradley circuit breakers are recommended for use with 2094-xCxx-Mxx-S IAM modules when the Line Interface Module (LIM) is not used.

IMPORTANT

LIM Modules (catalog numbers 2094-ALxxS, 2094-BLxxS, and 2094-XL75S-Cx) provide branch circuit protection to the IAM module. Follow all applicable NEC and local codes.

IAM Module Cat. No.	V AC Input Power			Control Input Power		DC Common Bus Fuse		
	Bussmann Fuse	Allen-Bradley Circuit Breaker		Bussmann Fuse	Allen-Bradley Circuit Breaker	Bussmann Fuse	Ferraz Shawmut Fuse	
		Disconnect	Magnetic Contactor					
2094-AC05-MP5-S	KTK-R-20 (20 A)	1492-SP3D300	140M-F8E-C16	FNQ-R-10 (10 A)	1492-SP2D060	N/A	A50P20-1	
2094-AC05-M01-S								
2094-AC09-M02-S	KTK-R-30 (30 A)	1492-SP3D400	140M-F8E-C20		1492-SP2D200	FWH-35B	A50P35-4	
2094-AC16-M03-S	LPJ-45SP (45 A)	N/A	140U-H6C3-C50		1492-SP2D200	FWH-60B	A50P60-4	
2094-AC32-M05-S	LPJ-80SP (80 A)	N/A	140U-H6C3-C90			FWH-125B	A50P125-4	
2094-BC01-MP5-S	KTK-R-20 (20 A)	1492-SP3D300	140M-F8E-C32		FNQ-R-10 (10 A)	1492-SP2D060	N/A	A100P20-1
2094-BC01-M01-S								
2094-BC02-M02-S	KTK-R-30 (30 A)	1492-SP3D400	140M-F8E-C45			1492-SP2D060	FWJ-40A	A100P40-1
2094-BC04-M03-S	LPJ-45SP (45 A)	N/A	140U-H6C3-C50				FWJ-70A	A100P70-1
2094-BC07-M05-S	LPJ-80SP (80 A)		140U-H6C3-C90				FWJ-125A	A100P125-1

Contactor Ratings

The table below lists the recommended contactor ratings for integrated axis modules installed without a line interface module.

IAM Module (230V) Cat. No.	Contactor
2094-AC05-MP5-S	100-C23x10 (AC coil)
2094-AC05-M01-S	100-C23Zx10 (DC coil)
2094-AC09-M02-S	100-C37x10 (AC coil) 100-C37Zx10 (DC coil)
2094-AC16-M03-S	100-C72x10 (AC coil) 100-C72Zx10 (DC coil)
2094-AC32-M05-S	100-C85x10 (AC coil) 100-C85Zx10 (DC coil)

IAM Module (460V) Cat. No.	Contactor
2094-BC01-MP5-S	100-C23x10 (AC coil)
2094-BC01-M01-S	100-C23Zx10 (DC coil)
2094-BC02-M02-S	100-C37x10 (AC coil) 100-C37Zx10 (DC coil)
2094-BC04-M03-S	100-C60x10 (AC coil) 100-C60Zx10 (DC coil)
2094-BC07-M05-S	100-C72x10 (AC coil) 100-C72Zx10 (DC coil)

Input Transformer for Control Power

Attribute	Value
Input volt-amperes	750VA
Input voltage	460V AC
Output voltage	120...240V AC

Power Dissipation Specifications

Use this table to size an enclosure and calculate required ventilation for your Kinetix 6000 drive system..

Kinetix 6000 Modules	Usage as % of Rated Power Output (watts)				
	20%	40%	60%	80%	100%
IAM (converter) module ⁽¹⁾					
2094-AC05-MP5-S	9	12	16	20	25
2094-AC05-M01-S					
2094-AC09-M02-S	14	20	28	36	46
2094-AC16-M03-S	19	30	43	58	74
2094-AC32-M05-S	41	68	100	136	176
2094-BC01-MP5-S	18	21	25	29	34
2094-BC01-M01-S					
2094-BC02-M02-S	36	44	54	64	75
2094-BC04-M03-S	50	67	87	110	135
2094-BC07-M05-S	71	101	137	179	226
IAM (inverter) module or AM module ⁽¹⁾					
2094-AC05-MP5-S or 2094-AMP5-S	28	32	37	41	46
2094-AC05-M01-S or 2094-AM01-S	31	38	46	54	62
2094-AC09-M02-S or 2094-AM02-S	34	45	57	70	84
2094-AC16-M03-S or 2094-AM03-S	48	68	91	116	144
2094-AC32-M05-S or 2094-AM05-S	104	156	212	274	342
2094-BC01-MP5-S or 2094-BMP5-S	46	54	61	69	77
2094-BC01-M01-S or 2094-BM01-S	57	73	90	108	126
2094-BC02-M02-S or 2094-BM02-S	53	72	93	116	142
2094-BC04-M03-S or 2094-BM03-S	94	130	169	211	255
2094-BC07-M05-S or 2094-BM05-S	121	183	252	326	407
Shunt module					
2094-BSP2	68	121	174	227	280

(1) Internal shunt power is not included in the calculations and must be added based on utilization.

Power dissipation specifications are based on these calculations. For example:

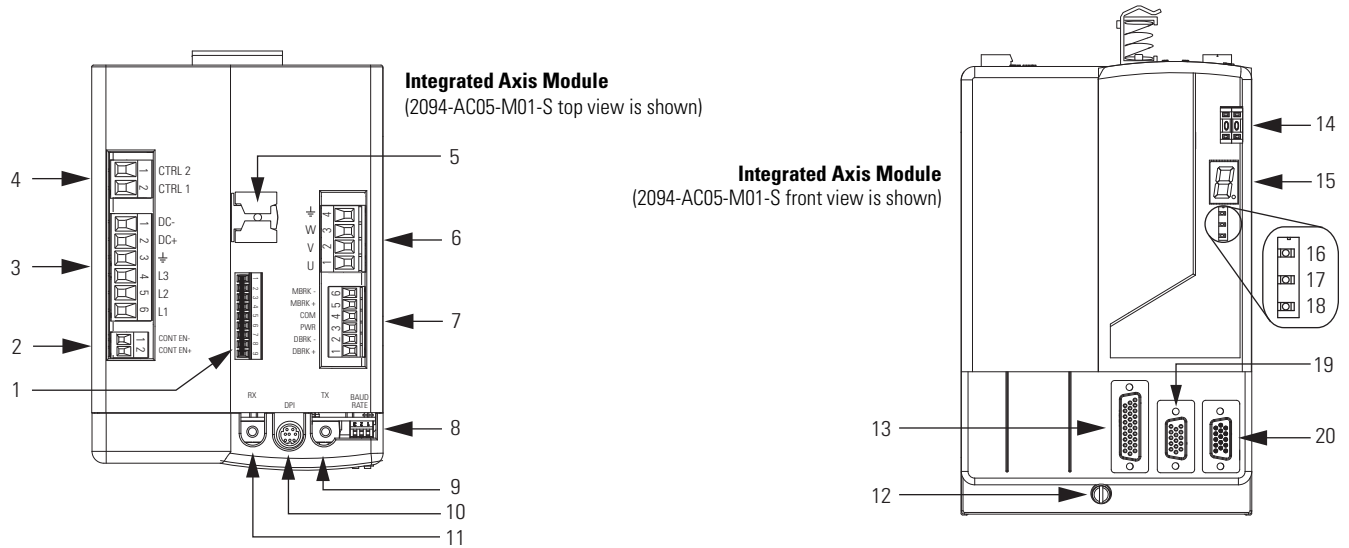
2094-BC02-M02-S with 4.52 A_{dc} (=20%) converter DC current and 10.3 A_{rms} (=100%) inverter output current.

Converter loss (36 W) + Inverter loss (142 W) = 178 W total power dissipation.

Kinetix 6000 Connector, Indicator, and Switch Locations

This section contains connector, indicator, and switch locations for the Kinetix 6000 IAM and AM modules.

2094-ACxx-Mxx-S and 2094-BCxx-Mxx-S IAM Connectors

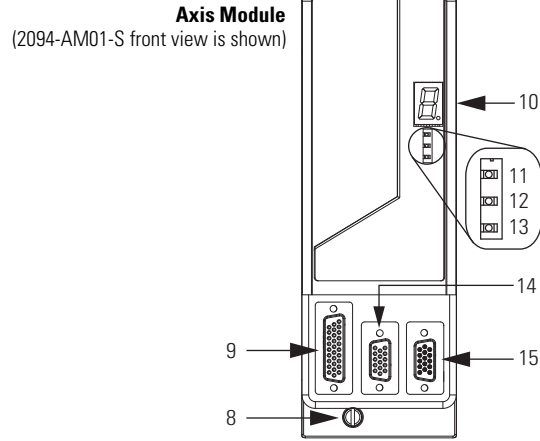
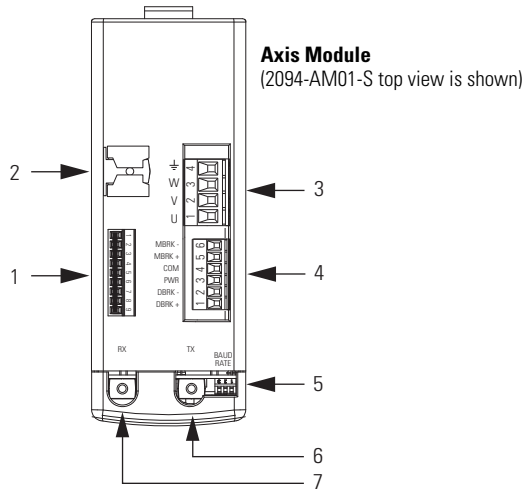


Item	Description
1	Safe-off (SO) connector
2	Contactorm enable (CED) connector
3	DC bus/AC input power (IPD) connector
4	Control power (CPD) connector
5	Motor cable shield clamp
6	Motor power (MP) connector
7	Motor/resistive brake (BC) connector
8	SERCOS communication rate and optical power switches
9	SERCOS transmit (Tx) connector
10	DPI connector

Item	Description
11	SERCOS receive (Rx) connector
12	Mounting screw
13	I/O (IOD) connector
14	SERCOS node address switch
15	Seven-segment fault status indicator
16	Drive status indicator
17	COMM status indicator
18	Bus status indicator
19	Motor feedback (MF) connector
20	Auxiliary feedback (AF) connector

For connector kit options, refer to Breakout Components and Connector Kits beginning on [page 418](#).

2094-AMxx-S and 2094-BMxx-S AM Connectors



Item	Description
1	Safe-off (SO) connector
2	Motor cable shield clamp
3	Motor power (MP) connector
4	Motor/resistive brake (BC) connector
5	SERCOS communication rate and optical power switches

Item	Description
6	SERCOS transmit (Tx) connector
7	SERCOS receive (Rx) connector
8	Mounting screw
9	I/O (IOD) connector
10	Seven-segment fault status indicator

Item	Description
11	Drive status indicator
12	COMM status indicator
13	Bus status indicator
14	Motor feedback (MF) connector
15	Auxiliary feedback (AF) connector

For connector kit options, refer to Breakout Components and Connector Kits beginning on [page 418](#).

Kinetix 2000 Multi-axis Servo Drives



Extend the benefits of Kinetix Integrated Motion to low-power motion control applications with the Kinetix 2000 servo drive. This multi-axis servo drive provides simplicity at its best, letting you save time and money from initial wiring and programming to operation and diagnostics. With a continuous output current (rms) from 1.0...9.5 amps, the Kinetix 2000 offers the same compact design, exceptional performance, and cost saving features as the Kinetix 6000 servo drives. The commonality among the Kinetix drives will let you to learn once and reuse your product knowledge. Paired with the CompactLogix 1768-L4x controller, the Kinetix 2000 is ideal for small and mid-sized applications looking to improve productivity, quality, and time to market while reducing the total cost of ownership.

The Kinetix 2000 multi-axis servo drives are part of the Kinetix Integrated Motion solution.

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Kinetix 2000 Servo Drive Components

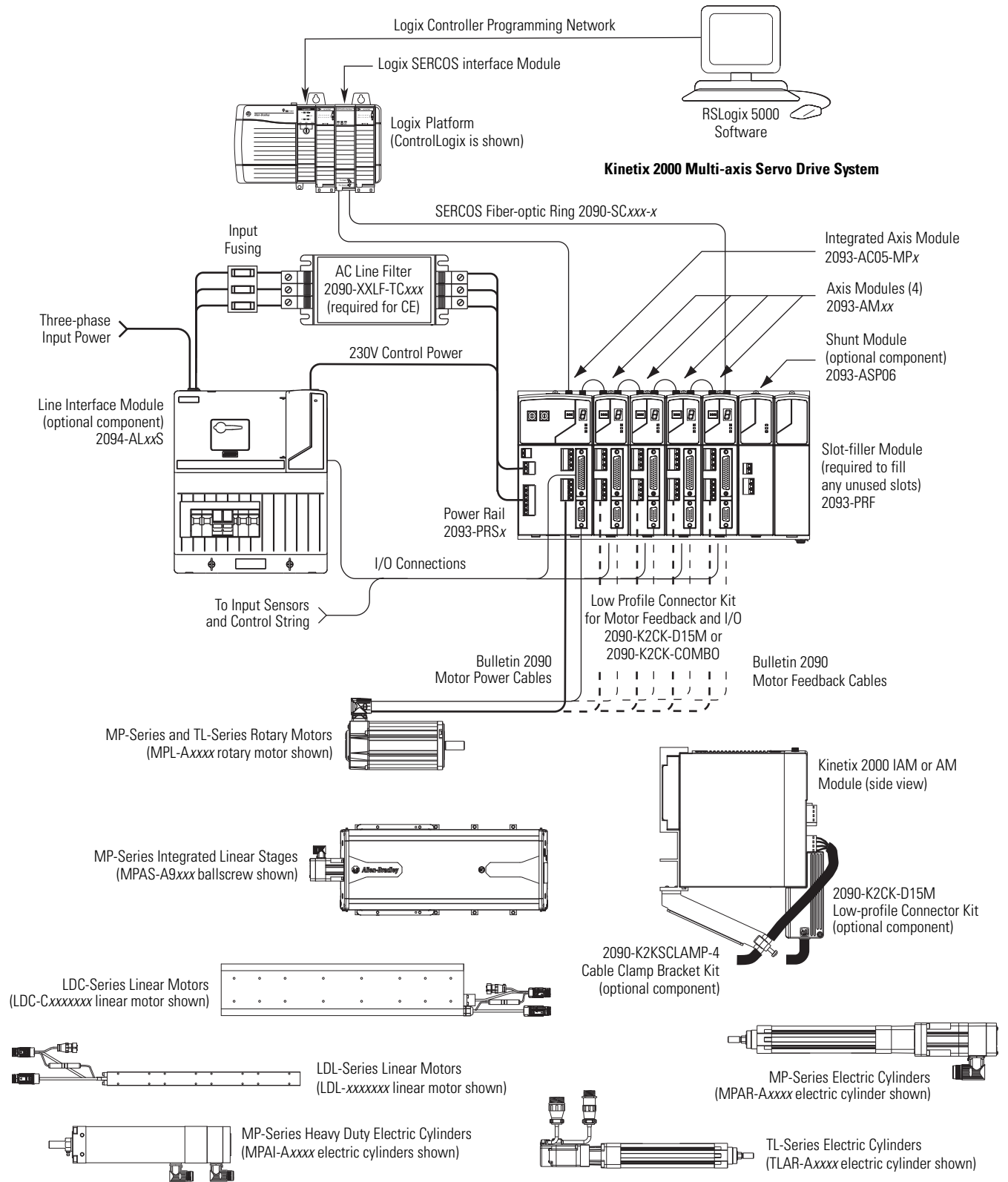
Kinetix 2000 servo drive systems consist of these required components:

- One integrated axis module (IAM or leader IAM), 2093-AC05-MP*x*
- Up to seven axis modules, 2093-AM*xx*
- One power rail, 2093-PRS1, 2093-PRS2, 2093-PRS3, 2093-PRS4, 2093-PRS5, 2093-PRS7, or 2093-PRS8S
- One to eight rotary/linear motors or linear actuators (MP-Series, TL-Series, LDC-Series, or LDL-Series)
- One to eight motor power and feedback cables
- Two to nine SERCOS fiber-optic cables

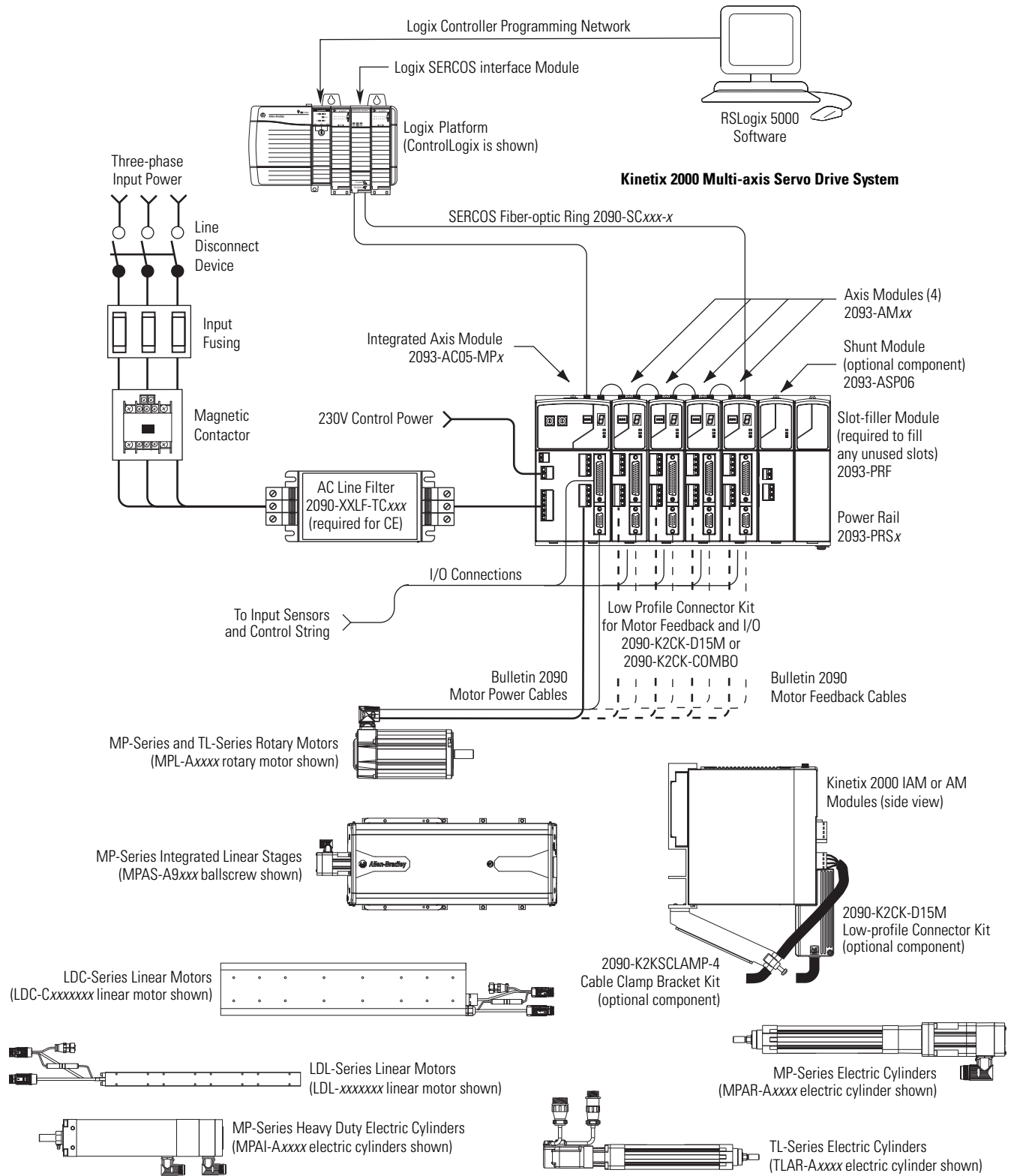
Kinetix 2000 systems may also include any of these optional components:

- One or more integrated axis modules used as a follower IAM (2093-AC05-MP*x*) and associated axis modules, power rails, motors, and cables as required for the application
- One shunt module, 2093-ASP06
- Slot-filler modules, 2093-PRF
- Bulletin 2094 Line Interface Module (LIM), 2094-AL*xx*S, 2094-XL75S-C2, or 2094-AL09

Typical Configuration - Kinetix 2000 System (with LIM module)



Typical Configuration - Kinetix 2000 System (without LIM module)



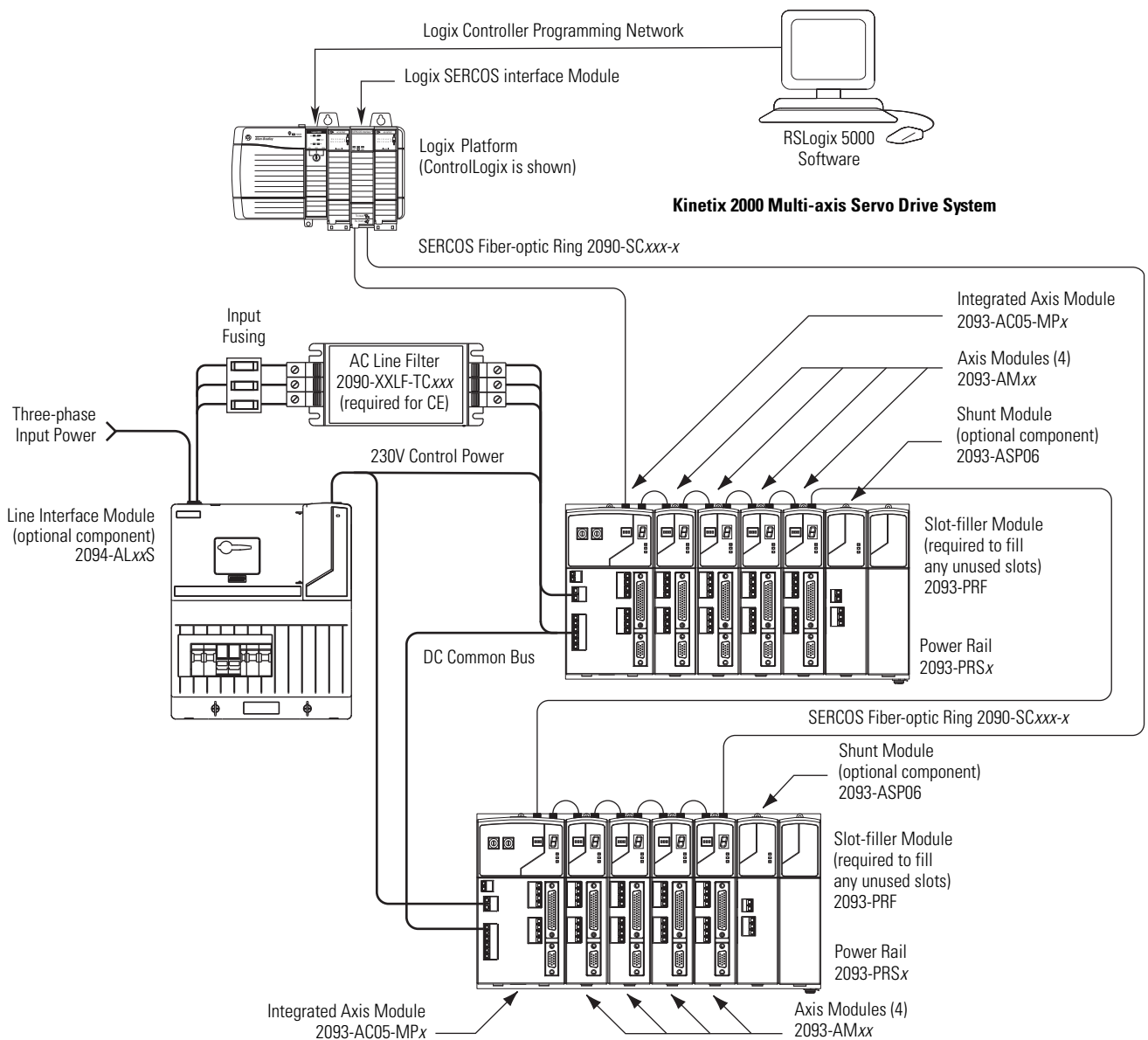
In the Kinetix 2000 drive configuration below, the leader IAM is connected to the follower IAM via the DC common bus. When planning your panel layout, you must calculate the total bus capacitance of your DC common bus system to make sure that the leader IAM is sized sufficiently to pre-charge the entire system. Refer to the Kinetix 2000 Servo Drive User Manual, publication [2093-UM001](#), when making this calculation.

IMPORTANT

If total bus capacitance of your system exceeds the leader IAM pre-charge rating, the IAM seven-segment status indicator will display error code E90 (pre-charge timeout fault) if input power is applied.

To correct this condition, you must remove axis modules from the power rail to decrease the total bus capacitance.

Typical Configuration - Kinetix 2000 System (DC Common Bus)



Motors and other details common to both three-phase AC and DC common-bus configurations are removed.

Kinetix 2000 Integrated Axis Modules

This section contains power specifications, mounting dimensions, and catalog numbers for the 2093-AC05-MP1, 2093-AC05-MP2, and 2093-AC05-MP5 integrated axis modules (IAM). The converter section of these modules is identical. Choose your IAM module based on the inverter requirements of your application.

Integrated Axis Module (converter) Power Specifications

IAM (three-phase and single-phase) Power Specifications

Attribute	Value	
	2093-AC05-MP x Three-phase Input (230V nom)	2093-AC05-MP x Single-phase Input (230V nom)
AC input voltage	170...264V rms	
AC input frequency	47...63 Hz	
Main AC input current ⁽¹⁾ Nom (rms) Max inrush (0-pk)	11.66 A 34.0 A	10.95 A 34.0 A
DC input voltage (common bus follower)	240...375V DC	
DC input current (common bus follower)	9.76 A	6.42 A
Control power AC input voltage	170...264V rms single-phase (230V nom)	
Control power AC input current Nom (@ 230V AC) rms Max inrush (0-pk)	1.25 A 93.0 A ⁽²⁾	
Nominal bus output voltage	325V DC	
Line loss ride through	20 ms	
Continuous output current to bus (A_{dc})	9.67 A	6.42 A
Peak output current to bus (A_{dc}) ⁽³⁾	19.34 A	12.84 A
Bus overvoltage	415V DC	
Bus undervoltage	135.5V DC	
Internal shunt Continuous power Peak power	15 W 3000 W	
Internal shunt resistor	50 Ω	
Shunt on	405V	
Shunt off	375V	
Continuous power output to bus	3.0 kW	2.0 kW
Peak power output	6.0 kW	4.0 kW
Efficiency	95%	
Converter inductance	N/A	
Converter capacitance	540 μ F	
Converter leakage current (max)	2.0 mA	

(1) All 2093-AC05 integrated axis modules are limited to 2 contactor cycles per minute (with up to 4 axis modules), or 1 contactor cycle per minute (with 5...8 axis modules).

(2) Maximum inrush duration is less than 1/2 line cycle.

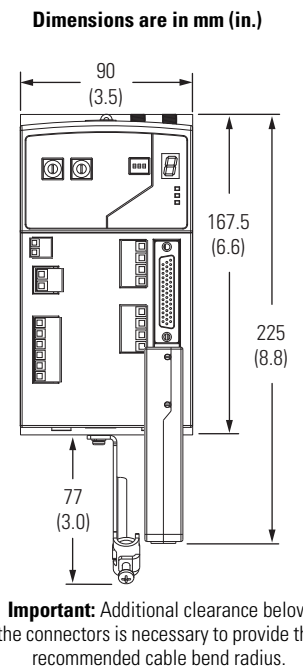
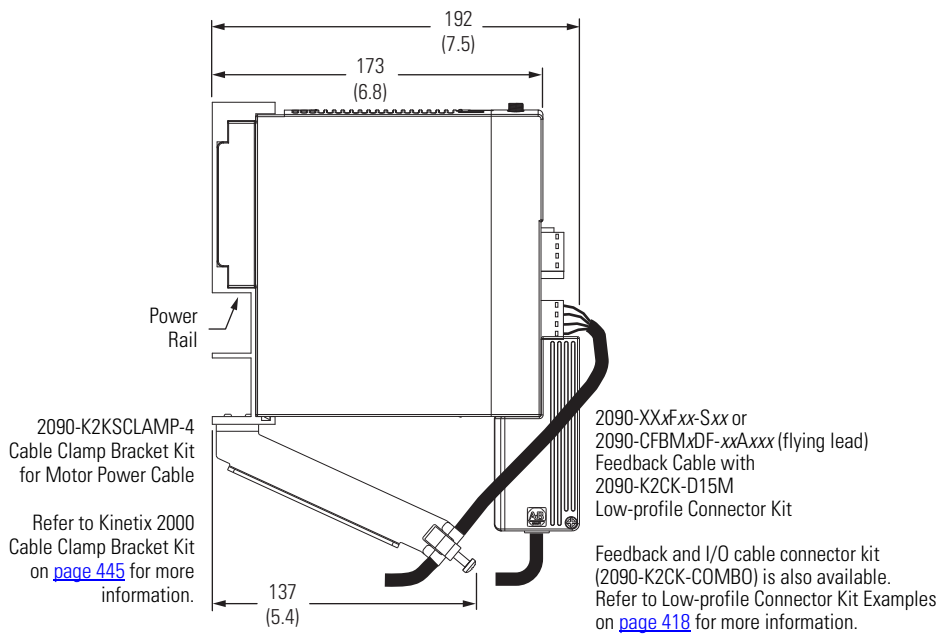
(3) Peak output current duration equals 250 ms.

Control Power Current Requirements

Modules on Power Rail	220/230V AC Input A	Input VA VA
IAM only	0.15	50
IAM, 1 AM	0.30	99
IAM, 2 AM	0.45	148
IAM, 3 AM	0.60	197
IAM, 4 AM	0.75	247
IAM, 5 AM	0.90	296
IAM, 6 AM	1.05	345
IAM, 7 AM	1.20	395
IAM, 7 AM, 1 Shunt module	1.25	410

Integrated Axis Module Dimensions

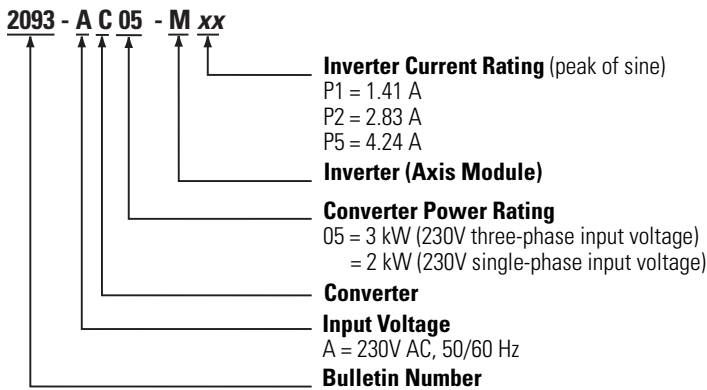
2093-AC05-MP1, 2093-AC05-MP2, and 2093-AC05-MP5 Dimensions



Modules are shown mounted to the power rail and the dimensions reflect that in the height and depth of the module.

Integrated Axis Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.



Kinetix 2000 Axis Modules

This section contains power specifications, mounting dimensions, and catalog numbers for the 2093-AMxx axis modules (AM). Choose your AM based on the inverter power requirements of your application.

Axis Module (inverter) Power Specifications

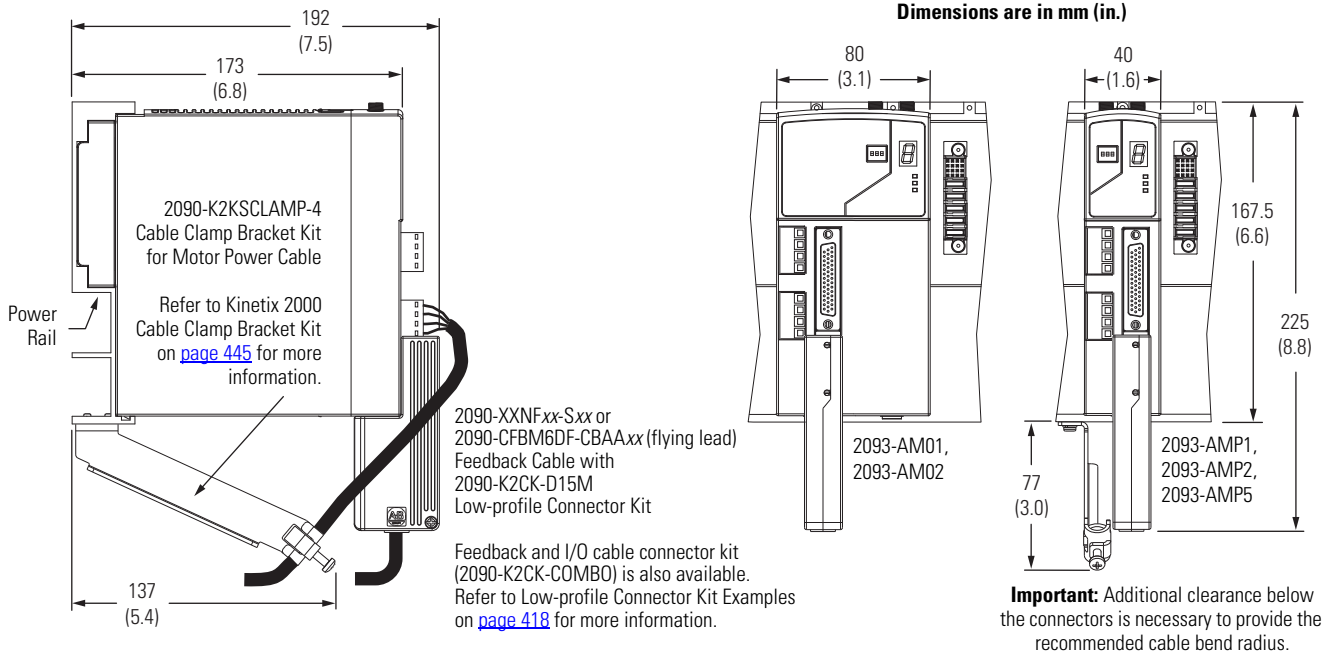
These specifications apply to the axis module specified in the column heading by catalog number and the same axis module (inverter section) that resides within an integrated axis module.

Attribute	Value				
	2093-AMP1 (2093-AC05-MP1)	2093-AMP2 (2093-AC05-MP2)	2093-AMP5 (2093-AC05-MP5)	2093-AM01	2093-AM02
Bandwidth ⁽¹⁾ Velocity Loop Current Loop	500 Hz 1300 Hz				
PWM frequency	8 kHz				
Nominal input voltage	325V DC				
Continuous current (rms)	1.0 A	2.0 A	3.0 A	6.0 A	9.5 A
Continuous current (0-pk)	1.41 A	2.83 A	4.24 A	8.48 A	13.4 A
Peak current (rms)	3.0 A	6.0 A	9.0 A	18.0 A	28.5 A
Peak current (0-pk)	4.20 A	8.48 A	12.7 A	25.5 A	40.3 A
Peak output current time (max)	3 s from 0% drive utilization (0% soak)				
Continuous power out (nom)	0.3 kW	0.6 kW	0.9 kW	1.9 kW	3.0 kW
Efficiency	98%				
Capacitance	200 μF			540 μF	
Capacitive energy absorption	7.5 J			20 J	
Inverter PCB leakage current	1 mA				

(1) Bandwidth values vary based on tuning parameters and mechanical components.

Axis Module Dimensions

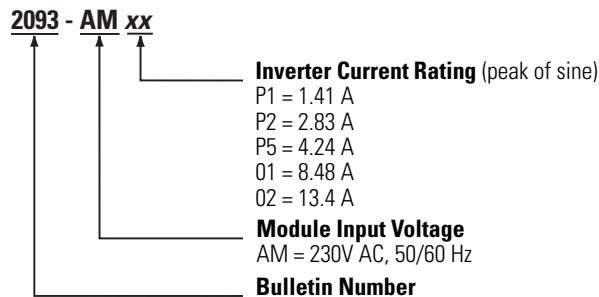
Dimensions 2093-AMP1, 2093-AMP2, 2093-AMP5, 2093-AM01, and 2093-AM02



Modules are shown mounted to the power rail and the dimensions reflect that in the depth of the module.

Axis Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.



Kinetix 2000 Power Rail

This section contains selection information, mounting dimensions, and catalog numbers for the 2093-PRSx power rails.

Kinetix 2000 IAM, AM, and Shunt Module Slot Requirements

IAM Cat. No.	Converter Slot Used	Inverter Slots Used
2093-AC05-MP1	1	1
2093-AC05-MP2		1
2093-AC05-MP5		1

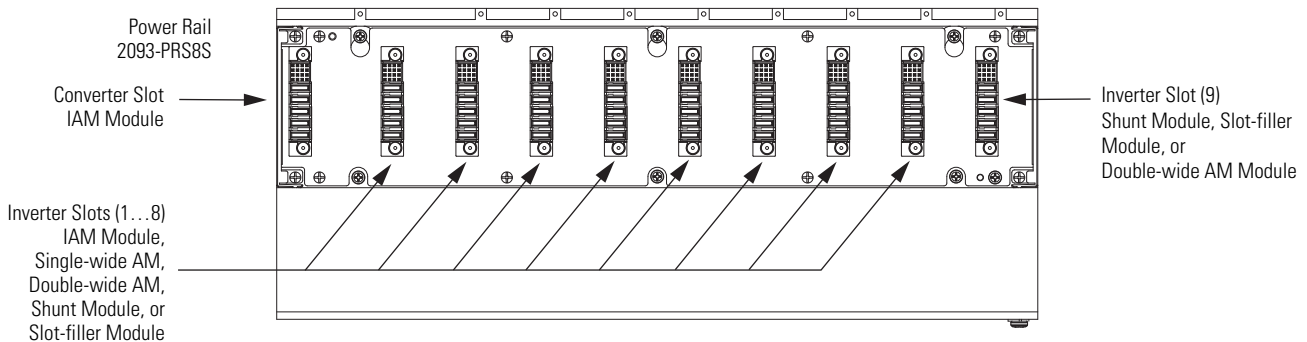
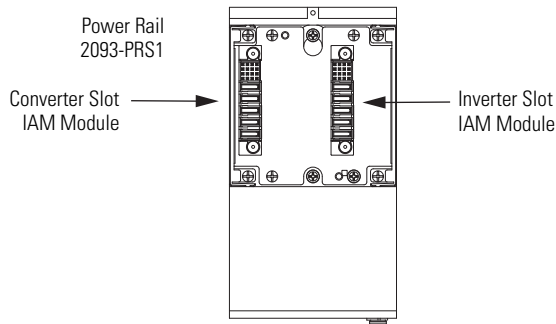
AM Cat. No.	Converter Slot Used	Inverter Slots Used
2093-AMP1	0	1
2093-AMP2		1
2093-AMP5		1
2093-AM01		2
2093-AM02		2

Shunt Module Cat. No.	Converter Slot Used	Inverter Slots Used
2093-ASP06	0	1

2093-AM01 and 2093-AM02 axis modules are double-wide modules and require two slots on the power rail.

The far-left slot on each power rail is the converter slot and used only by the IAM. All other slots are inverter slots and are used by the IAM, AM, or shunt module (refer to the figure below). The power rail catalog number indicates the maximum number axes that each power rail will hold.

Power Rail Slots



For example, the 2093-PRS1 power rail contains one inverter slot. This limits the use of this power rail to systems requiring only one inverter slot. Similarly, the 2093-PRS2 power rail contains two inverter slots. This limits the use of this power rail to systems requiring up to two inverter slots. When selecting a power rail, determine the number of inverter slots required by all rail-mounted modules and choose a power rail with that minimum number of inverter slots.

IMPORTANT

If you select a power rail with slots exceeding the minimum required for your system, you must install a 2093-PRF slot-filler module in each unused slot.

The 2093-PRS8S power rail is unique in that it accommodates eight axes, but has nine inverter slots. The far-right (ninth) inverter slot is reserved for a shunt module, but could also be occupied by a slot-filler module or double-wide axis module. These power rail configurations are supported.

2093-PRS8S Configurations

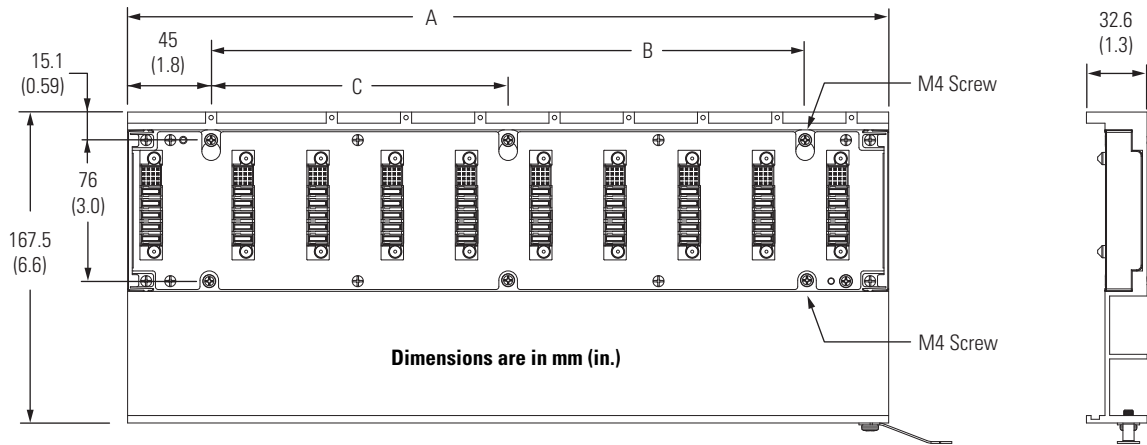
8-axis		7-axis		6-axis		5-axis		
IAM	IAM	IAM	IAM	IAM	IAM	IAM	IAM	IAM
AM	AM	AM (double-wide)	AM (double-wide)	AM (double-wide)	AM (double-wide)	AM (double-wide)	AM (double-wide)	AM (double-wide)
AM	AM							
AM	AM	AM	AM	AM (double-wide)	AM (double-wide)	AM (double-wide)	AM (double-wide)	AM (double-wide)
AM	AM	AM	AM					
AM	AM	AM	AM	AM	AM	AM (double-wide)	AM (double-wide)	AM (double-wide)
AM	AM	AM	AM	AM	AM			
AM	AM	AM	AM	AM	AM	AM (double-wide)	AM	AM
Shunt module	Slot-filler module	Shunt module	Slot-filler module	Shunt module	Slot-filler module			

IMPORTANT

The maximum number of axes supported by the 2093-PRS8S power rail is eight axes. Do not install an axis module (AM) in the far-right (ninth) inverter slot.

Power Rail Dimensions

2093-PRS1, 2093-PRS2, 2093-PRS3, 2093-PRS4, 2093-PRS5, 2093-PRS7, and 2093-PRS8S Dimensions

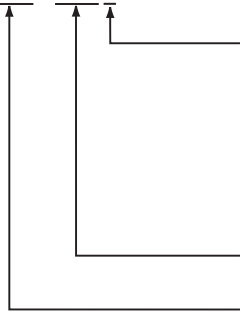


Power Rail Cat. No.	Description	Dimension A mm (in.)	Dimension B mm (in.)	Dimension C mm (in.)
2093-PRS1	1 axis power rail	90 (3.54)	N/A	N/A
2093-PRS2	2 axis power rail	130 (5.12)	40 (1.57)	N/A
2093-PRS3	3 axis power rail	170 (6.69)	80 (3.15)	N/A
2093-PRS4	4 axis power rail	210 (8.26)	120 (4.72)	N/A
2093-PRS5	5 axis power rail	250 (9.84)	160 (6.30)	N/A
2093-PRS7	7 axis power rail	330 (12.99)	240 (9.45)	120 (4.72)
2093-PRS8S	8 axis power rail	410 (16.14)	320 (12.60)	160 (6.30)

Power Rail Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your power rail. For questions regarding product availability, contact your Allen-Bradley distributor.

2093 - PRS x



Module Capacity

- 1 = IAM and no additional modules
- 2 = IAM and 1 additional module
- 3 = IAM and up to 2 additional modules
- 4 = IAM and up to 3 additional modules
- 5 = IAM and up to 4 additional modules
- 7 = IAM and up to 6 additional modules
- 8S = IAM and up to 8 additional modules

Power Rail

PRS = Power Rail (slim), available in 1, 2, 3, 4, 5, 7, and 8 axis capacity

Bulletin Number

Kinetix 2000 Shunt Module

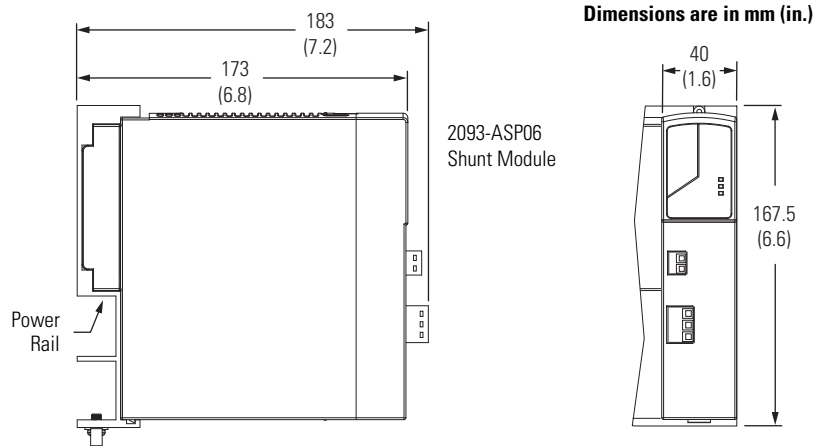
This section contains specifications, mounting dimensions, and catalog numbers for the 2093-ASP06 Shunt Module.

Shunt Module Power Specifications

Drive Cat. No.	Shunt Module Cat. No.	Specifications						Fuse Replacement
		Drive Voltage V AC	Resistance Ω	Peak Power kW	Peak Current A	Continuous Power W	Capacitance μF	
2093-AC05-MP1	2093-ASP06	230	15.0	10.9	27.0	50	164	N/A (no internal fuse)
2093-AC05-MP2								
2093-AC05-MP5								

For specifications and dimensions of external shunt resistors compatible with the Kinetix 2000 drive, refer to External Shunt Modules beginning on [page 471](#).

Shunt Module Dimensions

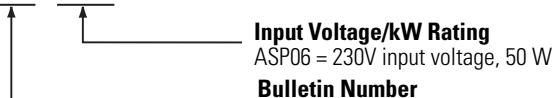


Modules are shown mounted to the power rail and the dimensions reflect that.

Shunt Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.

2093 - ASP06



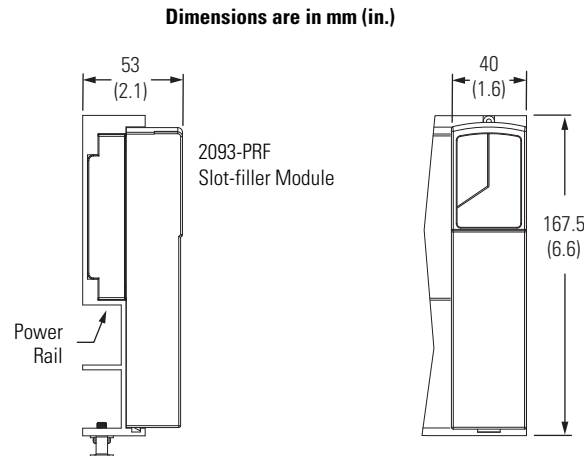
Kinetix 2000 Slot-filler Module

This section contains dimensions and catalog numbers for the 2093-PRF slot-filler module.

IMPORTANT

The Kinetix 2000 slot-filler module (catalog number 2093-PRF) is compatible with all Kinetix 2000 systems. Power rail slots not occupied by an IAM, AM, or shunt module, must have a slot-filler module installed.

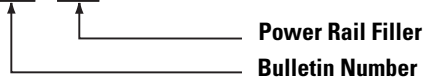
Slot-filler Module Dimensions



Slot-filler Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.

2093 - PRF



Kinetix 2000 General System Specifications

This section contains Kinetix 2000 environmental, weight, power dissipation, circuit breaker/fuse, transformer, and contactor specifications.

Environmental Specifications

Attribute	Operational Range	Storage Range (nonoperating)
Ambient temperature	0...50 °C (32...122 °F)	-40...85 °C (-40...185 °F)
Relative humidity	5...95% noncondensing	5...95% noncondensing
Altitude	1000 m (3281 ft) 3000 m (9843 ft) with derating	3000 m (9843 ft) during transport
Vibration	5...55 Hz @ 0.35 mm (0.014 in.) double amplitude, continuous displacement; 55...500 Hz @ 2.0 g peak constant acceleration (10 sweeps in each of 3 mutually perpendicular directions)	
Shock	15 g, 11 ms half-sine pulse (3 pulses in each direction of 3 mutually perpendicular directions)	

Weight Specifications

Kinetix 2000 Module	Cat. No.	Weight, approx. kg (lb)
IAM	2093-AC05-MP1	1.32 (2.9)
	2093-AC05-MP2	
	2093-AC05-MP5	
AM	2093-AMP1	0.67 (1.5)
	2093-AMP2	
	2093-AMP5	
	2093-AM01	0.95 (2.1)
	2093-AM02	
Shunt module	2093-ASP06	0.59 (1.3)

Kinetix 2000 Module	Cat. No.	Weight, approx. kg (lb)
Power Rails (Slim)	2093-PRS1	0.27 (0.6)
	2093-PRS2	0.38 (0.8)
	2093-PRS3	0.51 (1.1)
	2093-PRS4	0.64 (1.4)
	2093-PRS5	0.77 (1.7)
	2093-PRS7	1.03 (2.3)
	2093-PRS8S	1.28 (2.8)
Slot-filler module	2093-PRF	0.15 (0.3)

Maximum Feedback Cable Length

Although motor feedback cables are available in standard lengths up to 90 m (295.3 ft), the Kinetix 2000 drive maximum feedback cable length is 30 m (98.4 ft). These tables assume the use of recommended cables as shown in the Motor/Actuator Cable Selection table on [page 380](#).

Cable Lengths for Compatible Rotary Motors

Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)	Absolute High-resolution (5V) 17-bit Encoder m (ft)
MPL-A3xxx... MPL-A5xxx-S/M ⁽¹⁾	30 (98.4)		
MPL-A15xxx... MPL-A2xxx-E/V	30 (98.4)		
MPL-A15xxx... MPL-A45xxx-H		30 (98.4)	
MPM-Axxxx-S/M	30 (98.4)		
MPF-Axxxx-S/M ⁽¹⁾	30 (98.4)		
MPS-Axxxx-S/M	30 (98.4)		
TLY-Axxxx-B			30 (98.4)
TLY-Axxxx-H		30 (98.4)	

(1) MPL-A5xxx and MPF-A5xxx motor encoders are rated for 9V, the remaining Bulletin MPL and MPF (230V) motor encoders are rated for 5V.

Cable Lengths for Compatible Linear Actuators

Actuator Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)	Absolute High-resolution (5V) 17-bit Encoder m (ft)
MPMA-Axxxx or MPAS-Axxxx-V (ballscrew)	30 (98.4)		
MPMA-Axxxx or MPAS-Axxxx-A (direct drive)		30 (98.4)	
MPAR-Axxxx-V/M	30 (98.4)		
TLAR-Axxxx-B			30 (98.4)
MPAI-AxxxxM3	30 (98.4)		

Cable Lengths for Compatible Linear Motors

Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)
LDC-Series or LDL-Series	30 (98.4)	30 (98.4)

Maximum Power Cable Length

Although motor power cables are available in standard lengths up to 90 m (295.3 ft) and the Kinetix 2000 power rail is available in sizes up to eight axes, to meet CE requirements and improve system performance the combined motor power length for all axes on the same DC bus must not exceed 160 m (525 ft).

IMPORTANT

Operating the Kinetix 2000 drive at maximum temperature with maximum cable length may necessitate derating of the drive.

Circuit Breaker/Fuse Specifications

While circuit breakers offer some convenience, there are limitations for their use. Circuit breakers do not handle high current inrush as well as fuses.

Make sure the selected components are properly coordinated and meet acceptable codes including any requirements for branch circuit protection. Evaluation of the short-circuit available current is critical and must be kept below the short-circuit current rating of the circuit breaker.

Use class CC, J, L, or R fuses, with current rating as indicated in the table below. The following fuse examples and Allen-Bradley circuit breakers are recommended for use with the 2093- α Cxx-Mxx IAM modules when the Line Interface Module (LIM) is not used.

IMPORTANT

2094-ALxxS and 2094-XL75S-C2 LIM modules provide branch circuit protection to the IAM module. Follow all applicable NEC and local codes.

Fuse Specifications

Drive Cat. No.	V AC Input Power			Control Input Power		DC Common Bus Ferraz Shawmut Fuse	
	Input Voltage	Bussmann Fuse	Allen-Bradley Circuit Breaker		Bussmann Fuse		Allen-Bradley Circuit Breaker
2093-AC05-MP1	170...264 AC three-phase	KTK-R-20 (20 A)	1492-SP3D300	140M-F8E-C16	FNQ-R-10 (10 A) Class CC or LPJ-10SP (10 A) Class J	1492-CB2H060	A50P20-1
2093-AC05-MP2							
2093-AC05-MP5							
2093-AC05-MP1	170...264 AC single-phase	KTK-R-20 (20 A)	1492-SP2D300	N/A			A50P20-1
2093-AC05-MP2							
2093-AC05-MP5							

Power Dissipation Specifications

Use this table to size an enclosure and calculate required ventilation for your Kinetix 2000 drive system.

Kinetix 2000 Modules		Usage as % of Rated Power Output (watts)				
		20%	40%	60%	80%	100%
Integrated Axis Module (IAM Converter) ⁽¹⁾						
2093-AC05-MP1	Three-phase input	7.0	10.5	14.0	17.4	20.9
2093-AC05-MP2						
2093-AC05-MP5						
2093-AC05-MP1	Single-phase input	5.8	8.0	10.3	12.6	14.8
2093-AC05-MP2						
2093-AC05-MP5						
Integrated Axis Module (IAM Inverter) or Axis Module (AM) ⁽¹⁾						
2093-AC05-MP1 or 2093-AMP1		31.6	33.6	35.6	37.6	39.6
2093-AC05-MP2 or 2093-AMP2		33.0	36.4	39.8	43.3	46.8
2093-AC05-MP5 or 2093-AMP5		36.2	42.9	49.8	56.8	63.9
2093-AM01		38.3	46.7	55.3	64.1	73.1
2093-AM02		44.3	55.6	67.3	79.2	91.4
Shunt Module						
2093-ASP06		35.8	45.8	55.8	65.8	75.8

(1) Internal shunt power is not included in the calculations and must be added based on utilization.

Transformer Specifications for Control Power Input

You can use any general purpose transformer with these ratings.

Attribute	Value
Input volt-amperes	500VA
Output voltage	200...240V AC

Contactors Ratings

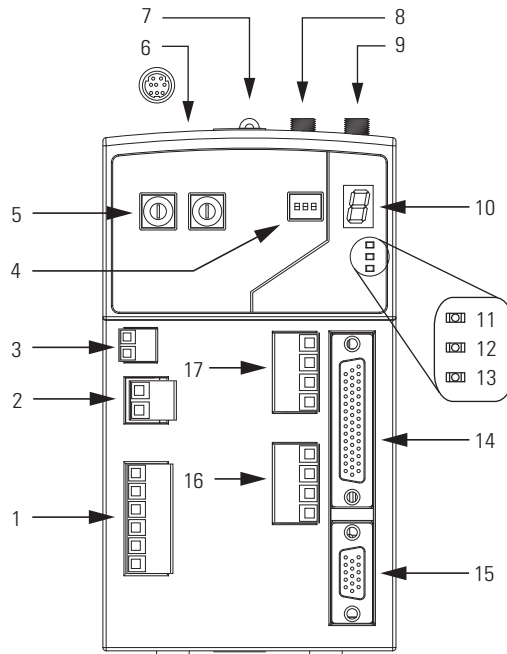
The table below lists the recommended contactor ratings for integrated axis modules installed without a line interface module.

IAM Cat. No.	Input Voltage	Contactors
2093-AC05-MP1	170...264 AC single-phase or three-phase operation	100-C23x10 (AC coil) 100-C23Zx10 (DC coil)
2093-AC05-MP2		
2093-AC05-MP5		

Kinetix 2000 Connector, Indicator, and Switch Locations

This section contains connector, indicator, and switch locations for the Kinetix 2000 Integrated Axis Module (IAM), Axis Module (AM), and Shunt Module.

IAM Connectors (2093-AC05-MPx)

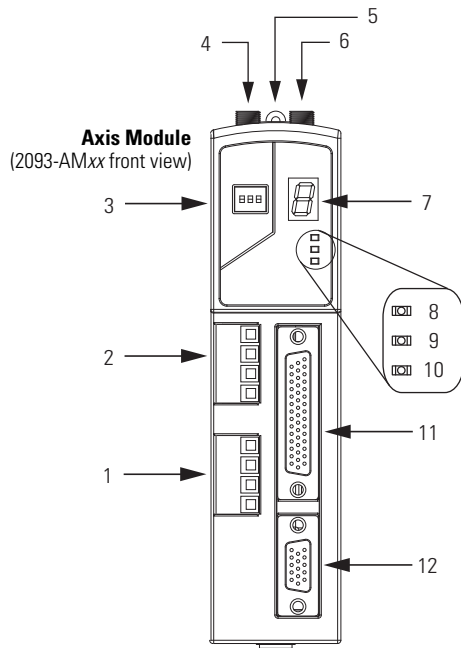


Integrated Axis Module
(2093-AC05-MPx front view)

Item	Description
1	DC Bus / AC input power (IPD) connector
2	Control power (CPD) connector
3	Contactor enable (CED) connector
4	SERCOS communication rate and optical power switches
5	SERCOS node address switch
6	DPI connector (facing up)
7	Mounting screw
8	SERCOS receive (Rx) connector
9	SERCOS transmit (Tx) connector
10	Seven-segment fault status indicator
11	Drive status indicator
12	COMM status indicator
13	Bus status indicator
14	I/O and auxiliary feedback (IOD/AF) connector
15	Motor feedback (MF) connector
16	Motor power (MP) connector
17	Motor brake (BC) connector

For motor feedback connector kit catalog numbers, refer to Low-profile Connector Kit Components on [page 419](#). For replacement connector sets, refer to Connector Sets on [page 442](#).

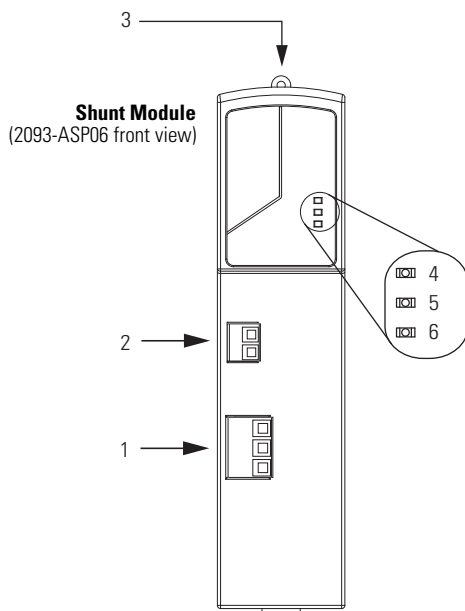
2093-AMxx AM Connectors



Item	Description
1	Motor power (MP) connector
2	Motor brake (BC) connector
3	SERCOS communication rate and optical power switches
4	SERCOS receive (Rx) connector
5	Mounting screw
6	SERCOS transmit (Tx) connector
7	Seven-segment fault status indicator
8	Drive status indicator
9	COMM status indicator
10	Bus status indicator
11	I/O and auxiliary feedback (IOD/AF) connector
12	Motor feedback (MF) connector

For motor feedback connector kit catalog numbers, refer to Low-profile Connector Kit Components on [page 419](#). For replacement connector sets, refer to Connector Sets on [page 442](#).

2093-ASP06 Shunt Module Connectors



Item	Description
1	External shunt resistor (RC) connector
2	External thermal switch (TS) connector
3	Mounting screw
4	Shunt fault status indicator
5	Over-temp fault status indicator
6	Bus status indicator

For replacement connector sets, refer to Connector Sets on [page 442](#).

Kinetix 7000 High Power Servo Drives



The Kinetix 7000 high power servo drive is designed to accommodate the most demanding requirements and extends the benefits of Kinetix Integrated Motion to applications up to 149 kW. The Kinetix 7000 high power drive supports three-phase AC input power (380...480V AC) and DC input for common bus applications. In addition, the safe-off capability integrated into this drive increases productivity by allowing manufacturers and machine builders to implement machine solutions that provide both safety and maximum machine availability.

The Kinetix 7000 high power servo drives are part of the Kinetix Integrated Motion solution.

Topic	Page
Kinetix 7000 Servo Drive Components	312
Kinetix 7000 System Component Compatibility Charts	318
Kinetix 7000 High Power Drive Specifications	321
Kinetix 7000 High Power Drive Dimensions	325
Kinetix 7000 Connector, Indicator, and Switch Locations	328
Kinetix 7000 High Power Drive Catalog Numbers	329

Kinetix 7000 Servo Drive Components

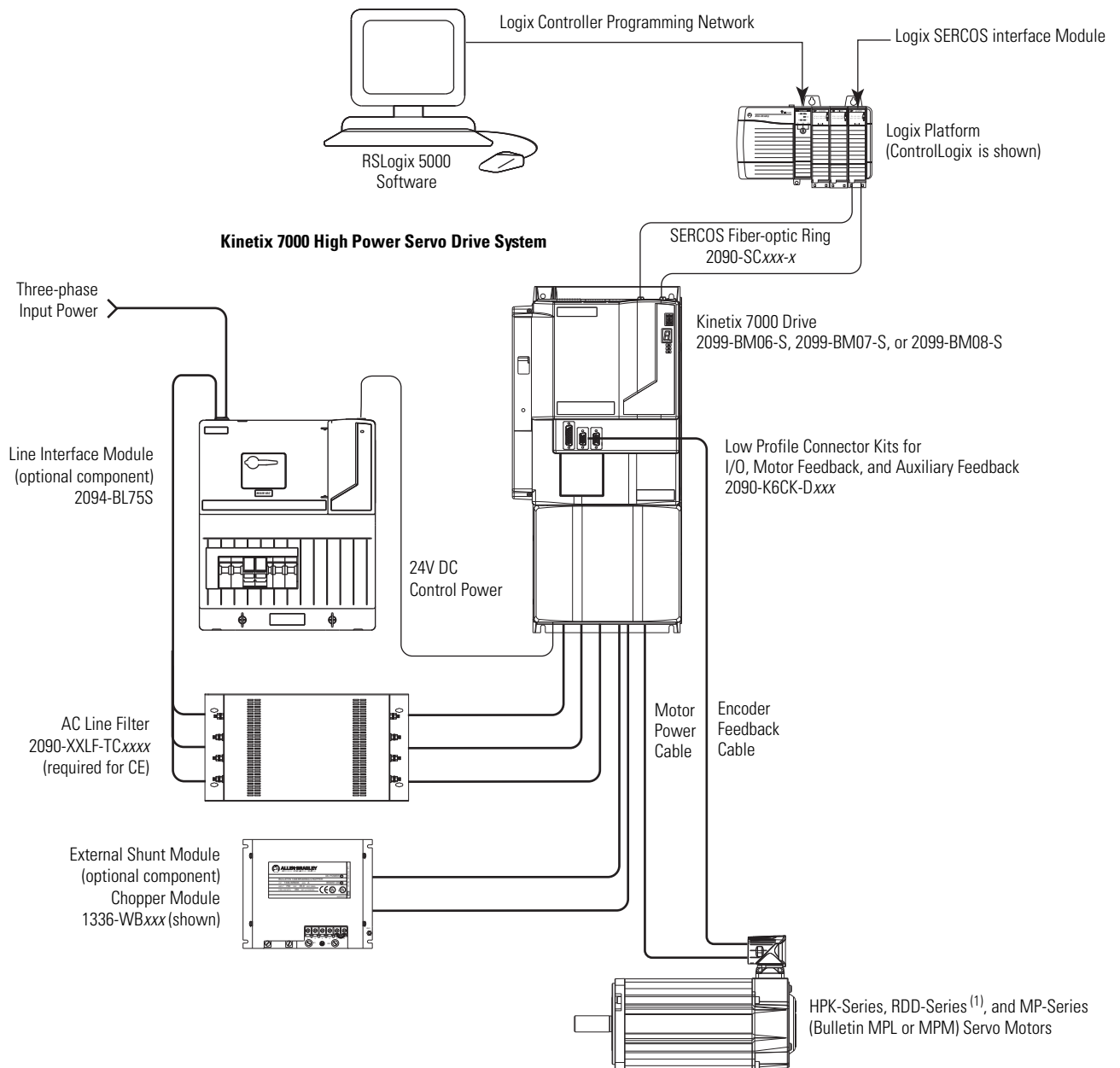
Kinetix 7000 Servo Drive systems consist of these required components:

- One Kinetix 7000 high power drive, 2099-BMxx-S
- One HPK-Series, MP-Series (Bulletin MPL or Bulletin MPM), or RDD-Series motor. RDD-Series motors require the 2090-K7CK-KENDAT low-profile feedback module, all others require the 2090-K6CK-D15M low-profile connector kit for flying-lead feedback cables.
- One motor power and feedback cable
- Two SERCOS fiber-optic cables, 2090-SCxxx-x

Kinetix 7000 systems may also include any of these optional components:

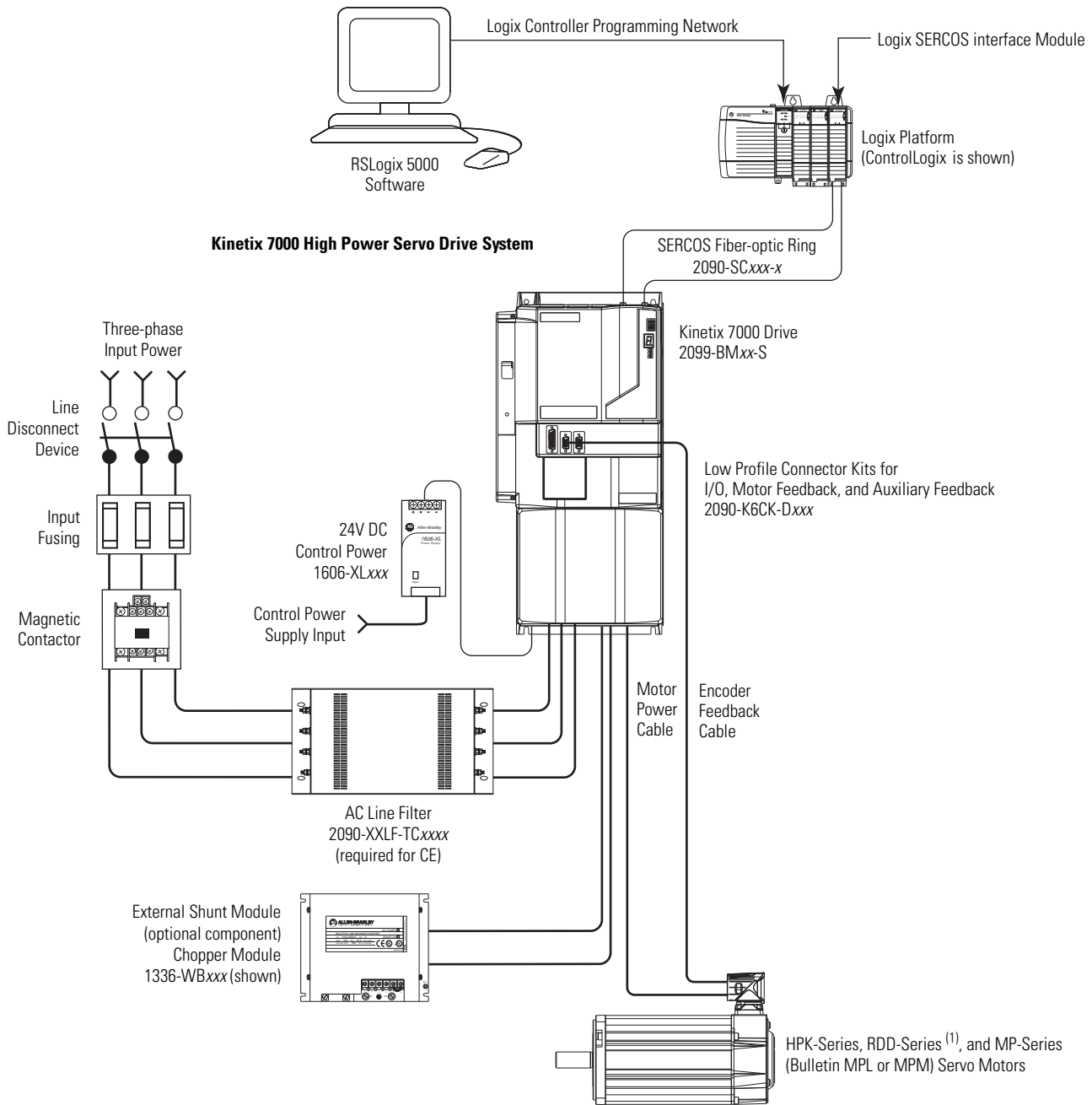
- Bulletin 8720MC Regenerative Power Supply (RPS), 8720MC-RPSxxx (DC common bus operation) with harmonic filter and varistor
- Bulletin 8720MC-LRxx-xxxx line reactor
- Bulletin 1336-MOD-KBxxx external active shunt module (dynamic brake)
- Bulletin 1336-WBxxx brake chopper module
- Bulletin 2094-BL75S (460V) Line Interface Module (LIM)

Typical Configuration - Kinetix 7000 (AC input) System (with LIM module)



(1) RDD-Series direct-drive motors require the 2090-K7CK-KENDAT low-profile feedback module for Kinetix 7000 drive applications.

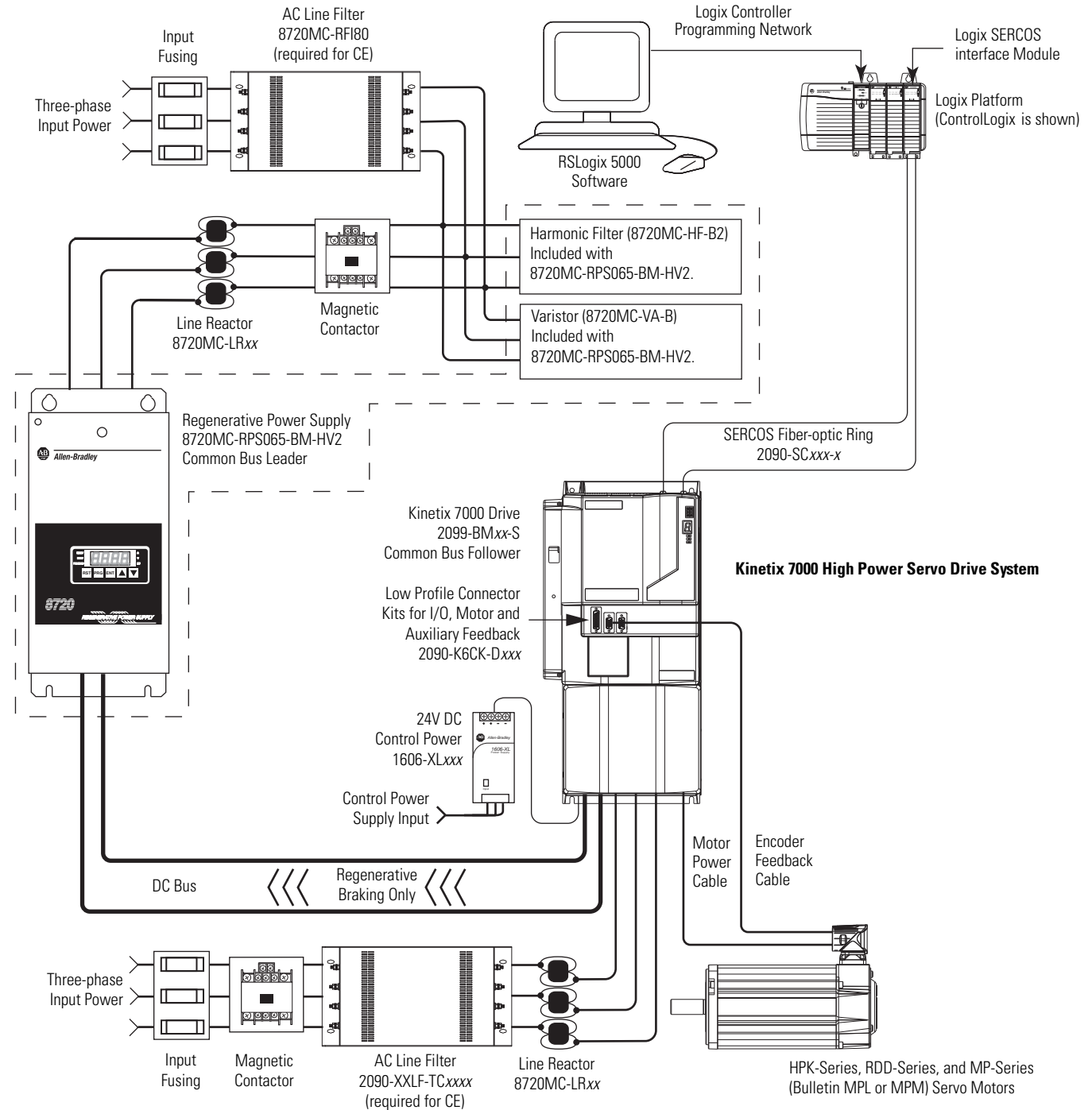
Typical Configuration - Kinetix 7000 (AC input) System (without LIM module)



(1) RDD-Series direct-drive motors require the 2090-K7CK-KENDAT low-profile feedback module for Kinetix 7000 drive applications.

In the figure below, the Kinetix 7000 drive system is shown with the 8720MC Regenerative Power Supply (RPS) in a regenerative braking configuration. Harmonic filter and varistor are available separately, but are included with the RPS unit when ordering catalog number 8720MC-RPS065-BM-HV2. In this configuration, the Kinetix 7000 drive provides motoring power and the RPS unit provides regenerative braking.

Typical Configuration - Kinetix 7000 (AC input) System (with regenerative braking)

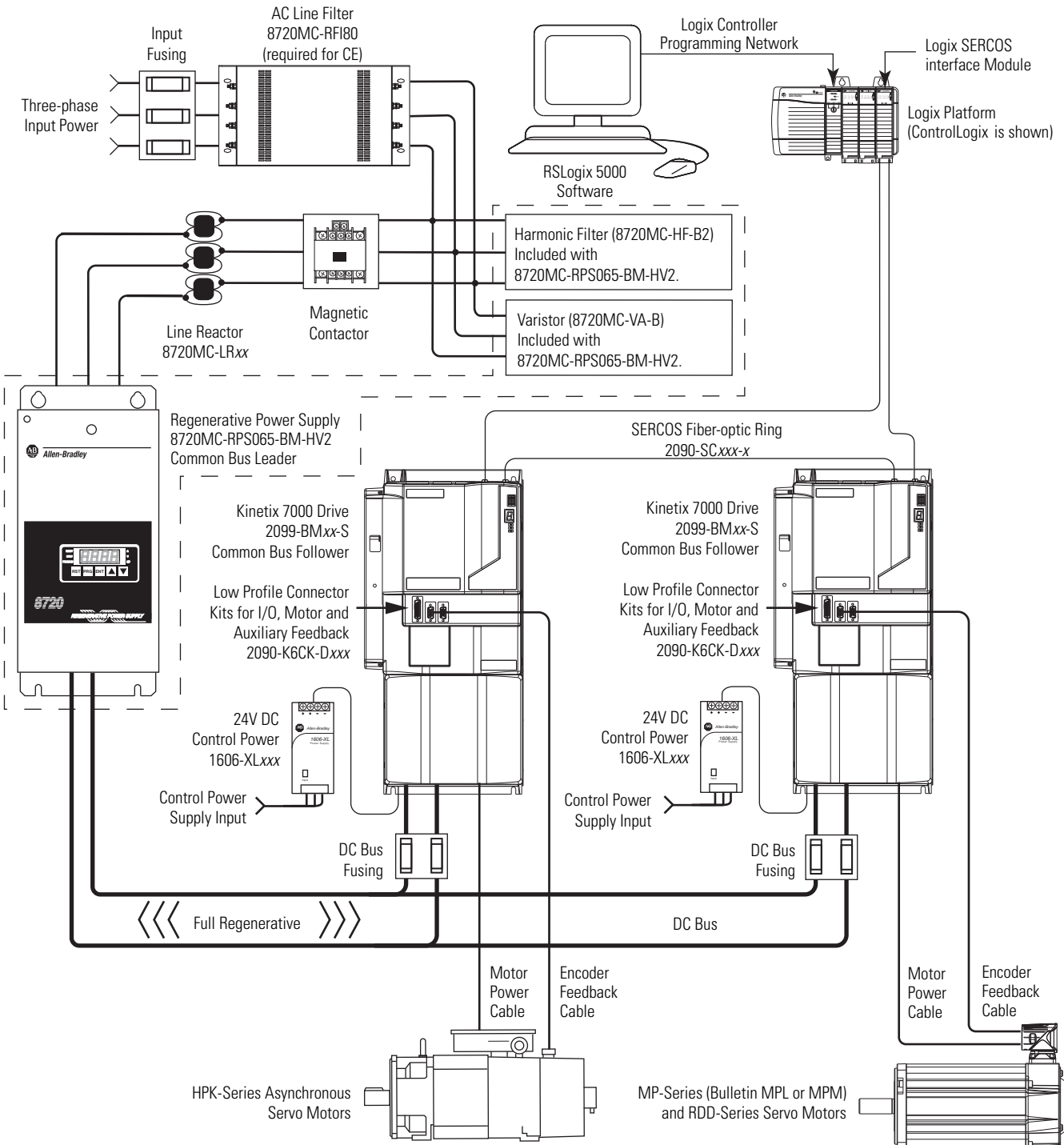


IMPORTANT Regenerative braking applications are limited to only one Kinetix 7000 common bus follower drive.

In the figure below, the Kinetix 7000 drive system is shown with the 8720MC Regenerative Power Supply (RPS) in DC common bus configuration with two follower Kinetix 7000 drives. Harmonic filter and varistor are available separately, but are included with the when ordering the 8720MC-RPS065-BM-HV2 RPS unit.

In Full-line Regenerative mode the 8720MC-RPS065 unit provides motoring power and regenerative braking.

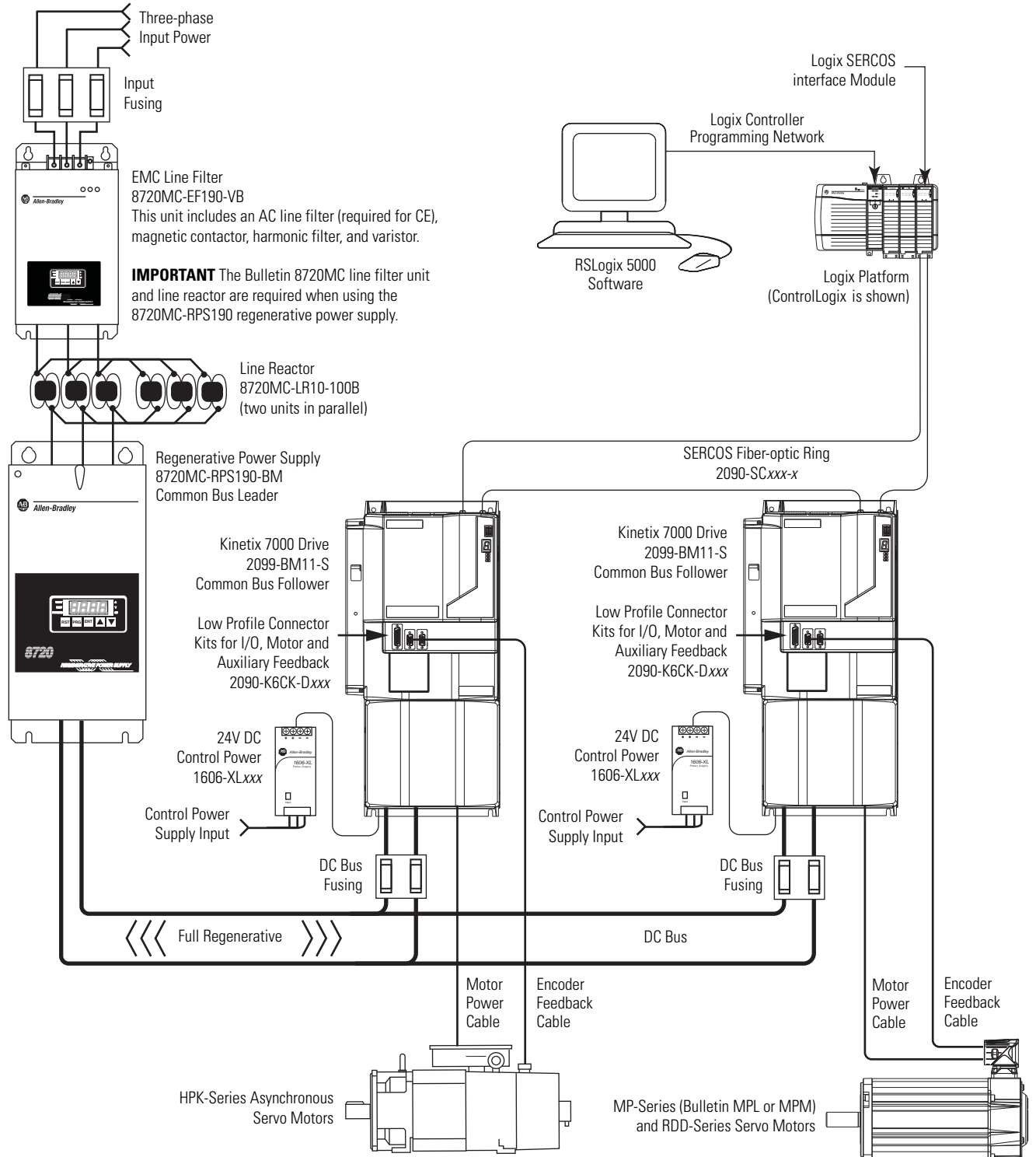
Typical Configuration - Kinetix 7000 (DC input from RPS unit) System (with full-line regeneration)



In the figure below, the Kinetix 7000 drive system is shown with the 8720MC Regenerative Power Supply (RPS) in DC common bus configuration with two follower 2099-BM11-S drives. Harmonic filter, varistor, and magnetic contactor are included when ordering the 8720MC-EF190-VB EMC line filter.

In Full-line Regenerative mode the 8720MC-RPS190 unit provides motoring power and regenerative braking.

Typical Configuration - Kinetix 7000 (DC input from RPS unit) System (with full-line regeneration)



Kinetix 7000 System Component Compatibility Charts

These tables provide input power component combinations with Kinetix 7000 compatible motors. Combinations are designed to provide peak performance.

Input Power Components with HPK-B (460V) Motors

Kinetix 7000 Drive Cat. No.	Common Bus Accessories		Compatible Motors
	8720MC Regenerative Power Supply ⁽¹⁾ 8720MC-RPS	8720MC Line Reactor ⁽¹⁾	
2099-BM07-S	8720MC-RPS065BM	8720MC-LR05-048B	HPK-B1307C
2099-BM08-S			HPK-B1308C
			HPK-B1307E
			HPK-B1310C
2099-BM09-S	8720MC-LR10-062B	HPK-B1308E	
2099-BM11-S	8720MC-RPS065BM and 8720MC-RPS065BS	8720MC-LR05-048B (two units)	HPK-B1609E
		HPK-B1613C	
	8720MC-LR10-062B (two units)	HPK-B1611E	
		HPK-B1815C	
2099-BM12-S	8720MC-RPS190BM	8720MC-LR10-100B (two units)	HPK-B1613E
			HPK-B2010C
			HPK-B2010E
			HPK-B2212C
			HPK-B2010E
			HPK-B2212C
HPK-B2510C			

(1) Regenerative Power Supply (RPS) selection is for this single motor/drive combination. When combining multiple drives on the same RPS module, the selection will change.

Input Power Components with HPK-E (400V) Motors

Kinetix 7000 Drive Cat. No.	Common Bus Accessories		Compatible Motors
	8720MC Regenerative Power Supply ⁽¹⁾	8720MC Line Reactor ⁽¹⁾ 8720MC-LRxx-xxxB	
2099-BM08-S	8720MC-RPS065BM	8720MC-LR05-048B	HPK-E1307C
2099-BM09-S		8720MC-LR14-070B	HPK-E1308E
		8720MC-LR10-062B	HPK-E1310C
2099-BM11-S	8720MC-RPS065BM and 8720MC-RPS065BS	8720MC-LR05-048B (two units)	HPK-E1613C
		8720MC-LR10-062B (two units)	HPK-E1609E
	8720MC-RPS190BM		8720MC-LR10-100B (two units)
		HPK-E1815C	
			HPK-E1613E
			HPK-E2010C

(1) Regenerative Power Supply (RPS) selection is for this single motor/drive combination. When combining multiple drives on the same RPS module, the selection will change.

Input Power Components with MPL-B (460V) Motors

Kinetix 7000 Drive Cat. No.	Common Bus Accessories		Compatible Motors
	8720MC Regenerative Power Supply ⁽¹⁾	8720MC Line Reactor ⁽¹⁾	
2099-BM06-S	8720MC-RPS065BM	8720MC-LR05-048B	HPK-B540K
			HPK-B560F
			HPK-B580F
			HPK-B580J
			HPK-B640F
			HPK-B660F
			HPK-B680D
			HPK-B680F
			HPK-B860D
			HPK-B960B
2099-BM07-S			HPK-B980B
			HPK-B880C
2099-BM08-S		8720MC-LR10-062B	HPK-B880D
			HPK-B960C
			HPK-B960D
			HPK-B980C
			HPK-B980D

(1) Regenerative Power Supply (RPS) selection is for this single motor/drive combination. When combining multiple drives on the same RPS module, the selection will change.

Input Power Components with MPM-B (480V) Motors

Kinetix 7000 Drive Cat. No.	Common Bus Accessories		Compatible Motors
	8720MC Regenerative Power Supply ⁽¹⁾	8720MC Line Reactor ⁽¹⁾	
2099-BM06-S	8720MC-RPS065BM	8720MC-LR05-048B	MPM-B1651M
2099-BM06-S			MPM-B1652E
2099-BM06-S			MPM-B1652F
2099-BM06-S			MPM-B1653C
2099-BM06-S			MPM-B1653E
2099-BM06-S			MPM-B1653F
2099-BM06-S			MPM-B2152C
2099-BM07-S			MPM-B2152F
2099-BM06-S			MPM-B2152M
2099-BM06-S			MPM-B2153B
2099-BM07-S			MPM-B2153E
2099-BM07-S			MPM-B2153F
2099-BM07-S			MPM-B2154B
2099-BM07-S			MPM-B2154E
2099-BM06-S			MPM-B2154F

(1) Regenerative Power Supply (RPS) selection is for this single motor/drive combination. When combining multiple drives on the same RPS module, the selection will change.

Input Power Components with RDB-B (480V) Motors

Kinetix 7000 Drive Cat. No.	Common Bus Accessories		Compatible Motors
	8720MC Regenerative Power Supply ⁽¹⁾	8720MC Line Reactor ⁽¹⁾	
2099-BM06-S	8720MC-RPS065BM	8720MC-LR05-048B	RDB-B2152C
2099-BM06-S			RDB-B2153C
2099-BM07-S			RDB-B29029
2099-BM06-S			RDB-B29036
2099-BM08-S			RDB-B29039
2099-BM06-S			RDB-B41016
2099-BM08-S			RDB-B41018
2099-BM06-S			RDB-B41024
2099-BM09-S			RDB-B41026
2099-BM09-S			RDB-B41035

(1) Regenerative Power Supply (RPS) selection is for this single motor/drive combination. When combining multiple drives on the same RPS module, the selection will change.

Kinetix 7000 High Power Drive Specifications

This section contains specifications, mounting dimensions, and catalog numbers for the Kinetix 7000 (2099-BMxx-S) drives.

Power Specifications

Attribute	Value						
	2099-BM06-S	2099-BM07-S	2099-BM08-S	2099-BM09-S	2099-BM10-S	2099-BM11-S	2099-BM12-S
AC input voltage	342...528V AC rms three-phase (380...480V nom)						
AC input frequency	47...63 Hz						
Bandwidth ⁽¹⁾ Velocity loop Current loop	500 Hz 1300 Hz						500 Hz 500 Hz
PWM frequency	4 kHz						2 kHz
Main AC input current Nom (rms) Max inrush (A peak)	36.7 A 18.0 A	47.7 A 18.0 A	59.6 A 18.0 A	90.1 A 96.0 A	117 A 118 A	169 A 141 A	233 A 141 A
DC input voltage	450...750V DC						
DC input current	42.9 A	55.7 A	69.7 A	105 A	137 A	204 A	281 A
Control power input Voltage	18...30V DC (24V DC, nom)						
Control power DC input current Nom (rms) Maximum inrush (rms)	3.3 A 6.0 A						
Continuous output current (rms)	40.0 A	52.0 A	65.0 A	96.0 A	125 A	180 A	248 A
Continuous output current (0-pk)	56.0 A	73.0 A	92.0 A	135 A	176 A	254 A	351 A
Peak output current (rms) 3 s duration 60 s duration	68.0 A 51.0 A	80.0 A 60.0 A	104 A 78.0 A	154 A 115 A	163 A 138 A	312 A 234 A	372 A 273 A
Peak output current (0-pk) 3 s duration 60 s duration	96.0 A 72.0 A	113 A 84.8 A	147 A 110 A	217.7 A 162.6 A	230.5 A 195 A	441 A 331 A	526 A 386 A
Bus overvoltage	800V DC						
Bus undervoltage	275...560V DC ⁽²⁾						
Continuous power output, nom	22 kW	30 kW	37 kW	56 kW	75 kW	112 kW	149 kW
Continuous power output (Hp)	30 Hp	40 Hp	50 Hp	75 Hp	100 Hp	150 Hp	200 Hp
Maximum power cycles/minute AC line DC bus	4 per minute (pre-charge provided by drive) 2 per minute (DC pre-charge provided by the regenerative power supply)						
DC bus discharge time	3 minutes after removal of main AC power						
Efficiency	97.5%						
Total capacitance ⁽³⁾	1800 μ F	2400 μ F	3000 μ F	4500 μ F	6000 μ F	8400 μ F	8400 μ F
Short circuit current rating	200,000 A (rms) symmetrical						

(1) Bandwidth values vary based on tuning parameters and mechanical components.

(2) Bus undervoltage will vary based on input line voltage.

(3) If DC input is supplied to 2099-BM09-S, 2099-BM10-S, or 2099-BM11-S drives, the precharge capability must be provided at the system level. Disconnect switches must not be used between the input of the drive and a common DC bus without the use of an external precharge device.

Environmental Specifications

Attribute	Operational Range	Storage Range (nonoperating)
Ambient temperature	0...50 °C (32...122 °F)	-40...70 °C (-40...158 °F)
Relative humidity	5...95% noncondensing	5...95% noncondensing
Altitude	1000 m (3281 ft) 3000 m (9843 ft) with derating	3000 m (9843 ft) during transport
Vibration	5...55 Hz @ 0.35 mm (0.014 in.) double amplitude, continuous displacement; 55...500 Hz @ 2.0 g peak constant acceleration (10 sweeps in each of 3 mutually perpendicular directions).	
Shock	15 g, 11 ms half-sine pulse (3 pulses in each direction of 3 mutually perpendicular directions)	

Weight Specifications

Drive Cat. No.	Weight, approx. kg (lb)
2099-BM06-S	18.55 (40.9)
2099-BM07-S	
2099-BM08-S	
2099-BM09-S	37.2 (82.0)
2099-BM10-S	
2099-BM11-S	71.4 (157.5)
2099-BM12-S	

Power Dissipation Specifications

Use this table to size an enclosure and calculate required ventilation for your Kinetix 7000 drive system.

Drive Cat. No.	Usage as % of Rated Power Output W	
	50%	100%
2099-BM06-S	294	465
2099-BM07-S	388	619
2099-BM08-S	452	730
2099-BM09-S	645	1072
2099-BM10-S	882	1479
2099-BM11-S	1275	2125
2099-BM12-S	1438	2437

Circuit Breaker/Fuse Specifications

While circuit breakers offer some convenience, there are limitations for their use. Circuit breakers do not handle high current inrush as well as fuses.

Make sure the selected components are properly coordinated and meet acceptable codes including any requirements for branch circuit protection. Evaluation of the short-circuit available current is critical and must be kept below the short-circuit current rating of the circuit breaker.

Use class CC, T, RK1, or J fuses, with current rating as indicated in the table below. The following fuse examples and short-circuit current ratings are recommended for use with the 2099-BMxx-S drives when the Line Interface Module (LIM) is not used.

IMPORTANT

LIM modules (catalog numbers 2094-BLxxS and 2094-XL75S-Cx) provide branch circuit protection to the Kinetix 7000 drive. Follow all applicable NEC and local codes.

Fuse Specifications

Drive Cat. No.	Bussmann Fuse	Dual Element Time Delay Fuse (min/max) A rms	Non-Time Delay Fuse (min/max) A rms	Motor Circuit Protector (max) A rms
2099-BM06-S	LPJ-90SP	50/90	50/150	50
2099-BM07-S	LPJ-110SP	60/110	60/200	70
2099-BM08-S	LPJ-125SP	80/125	80/250	100
2099-BM09-S	LPJ-200SP	125/200	125/300	125
2099-BM10-S	LPJ-250SP	150/250	150/500	150
2099-BM11-S	LPJ-400SP	225/400	225/600	250
2099-BM12-S	LPJ-500SP	300/550	300/700	400

Contactors Ratings

The table below lists the recommended contactor ratings for Kinetix 7000 drives installed without a Line Interface Module.

Drive Cat. No.	Contactors	Safety Contactors	Coil Type	Coil Voltage Requirements
2099-BM06-S	100-C43DJ01	100S-C43-DJD4C	Standard with Diode	24V DC
2099-BM07-S	100-D95EN11	100S-D95EN22C	Electronic Coil ⁽¹⁾	24V DC for control and 480V AC for coil power
2099-BM08-S				
2099-BM09-S				
2099-BM10-S				
2099-BM11-S	100-D180EN11	100S-D180EN22C		
2099-BM12-S	100-D250EN11	100S-D250EN22C		

(1) Electronic coil control power requirements = 24V DC @ 15 mA.

Maximum Feedback Cable Lengths

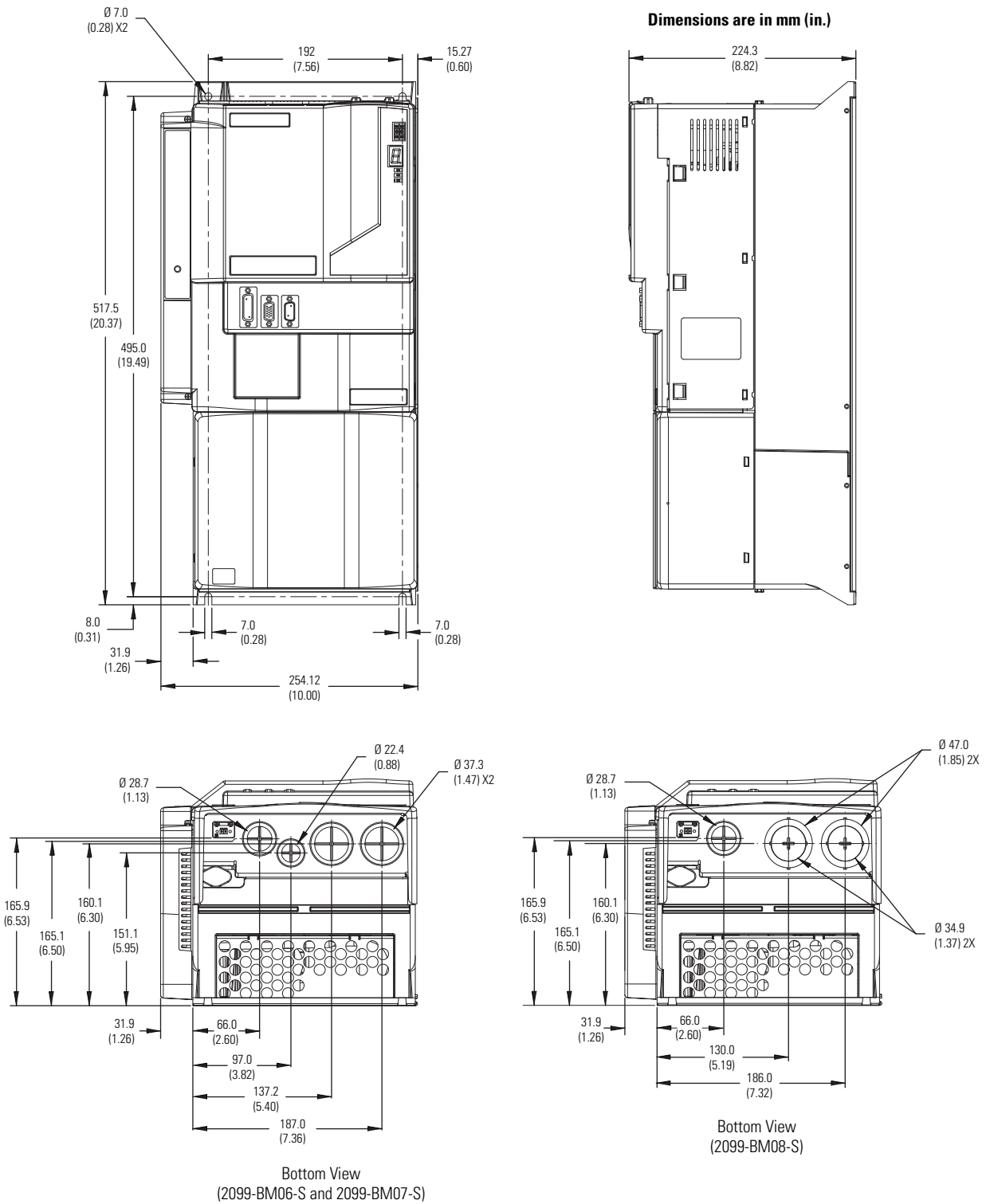
Although motor power and feedback cables are available in standard lengths up to 90 m (295.3 ft), the drive/motor/feedback combination may limit the maximum feedback cable length. This table assumes the use of recommended cables as shown in the Motor/Actuator Cable Selection table on [page 380](#).

Cable Lengths for Compatible Rotary Motors

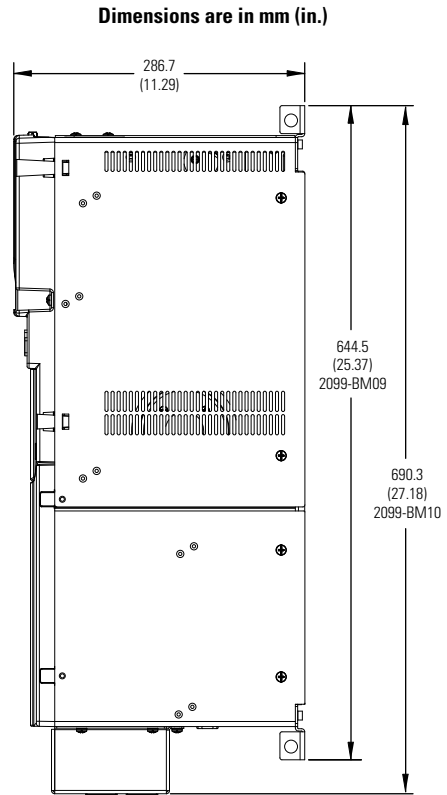
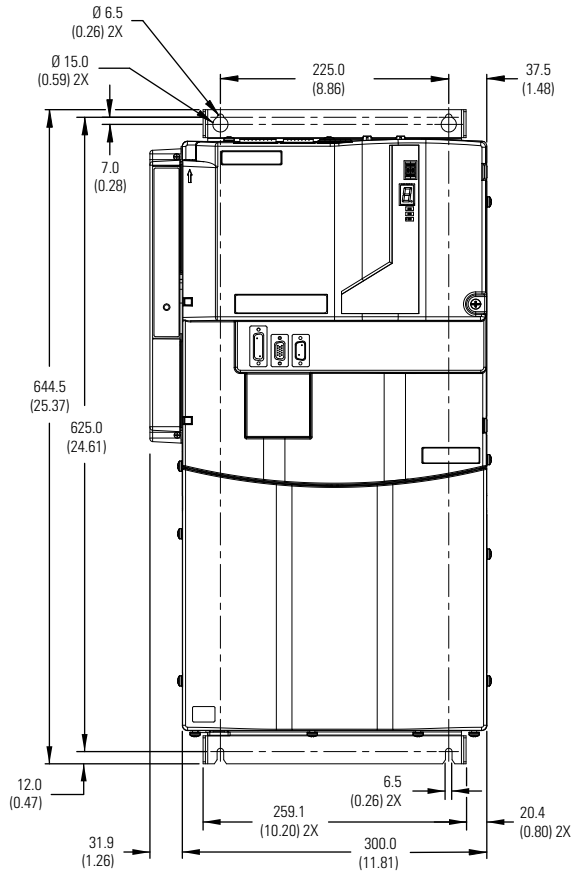
Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)
MPL-B5xxx... MPL-B9xxx-S/M		90 (295.3)
MPM-B165xx... MPM-B215xx-S/M		90 (295.3)
RDB-B215xx-7/3	30 (98.4)	
RDB-B290xx-7/3 or RDB-B410xx-7/3	90 (295.3)	
HPK-Bxxxx-S/M or HPK-Exxxx-S/M		90 (295.3)

Kinetix 7000 High Power Drive Dimensions

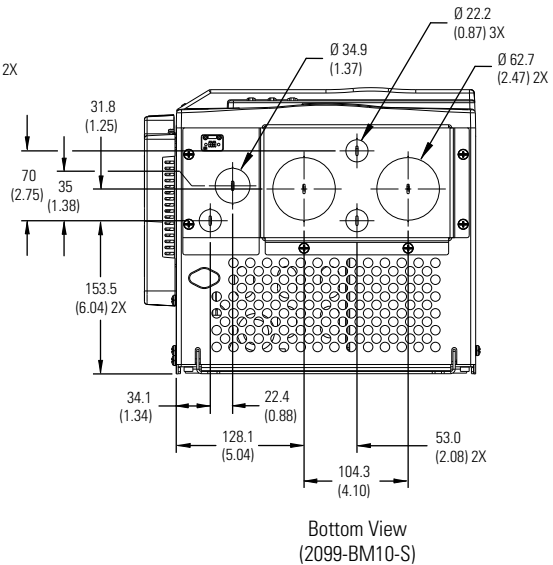
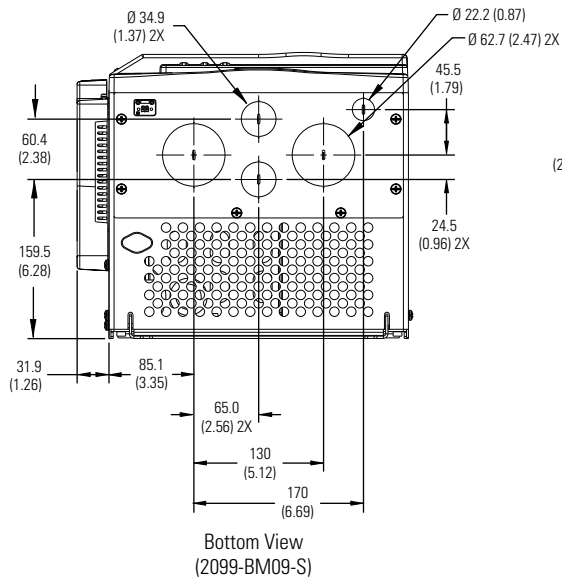
2099-BM06-S, 2099-BM07-S, and 2099-BM08-S Dimensions



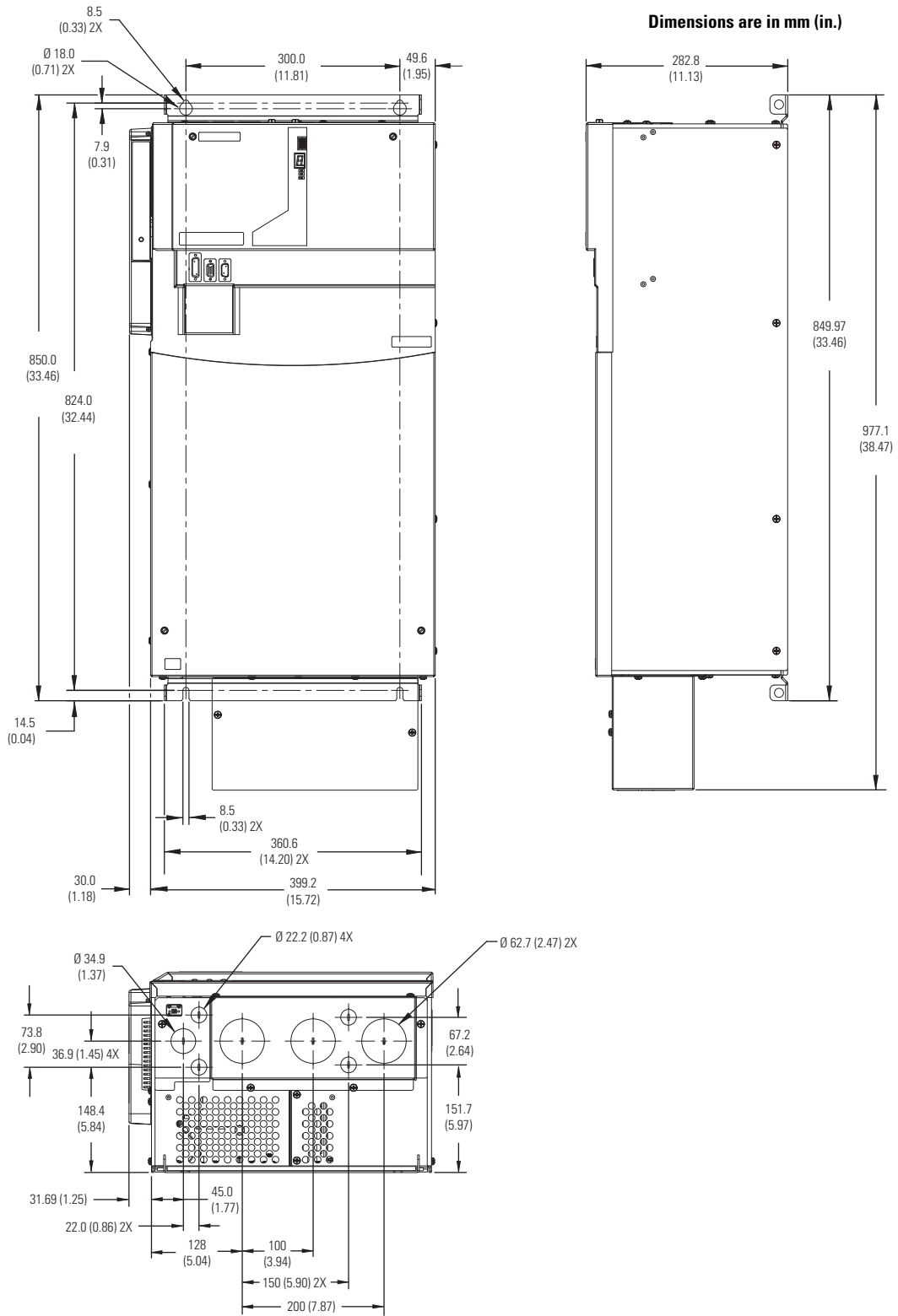
2099-BM09-S and 2099-BM10-S Dimensions



Some Components are Removed for Clarity



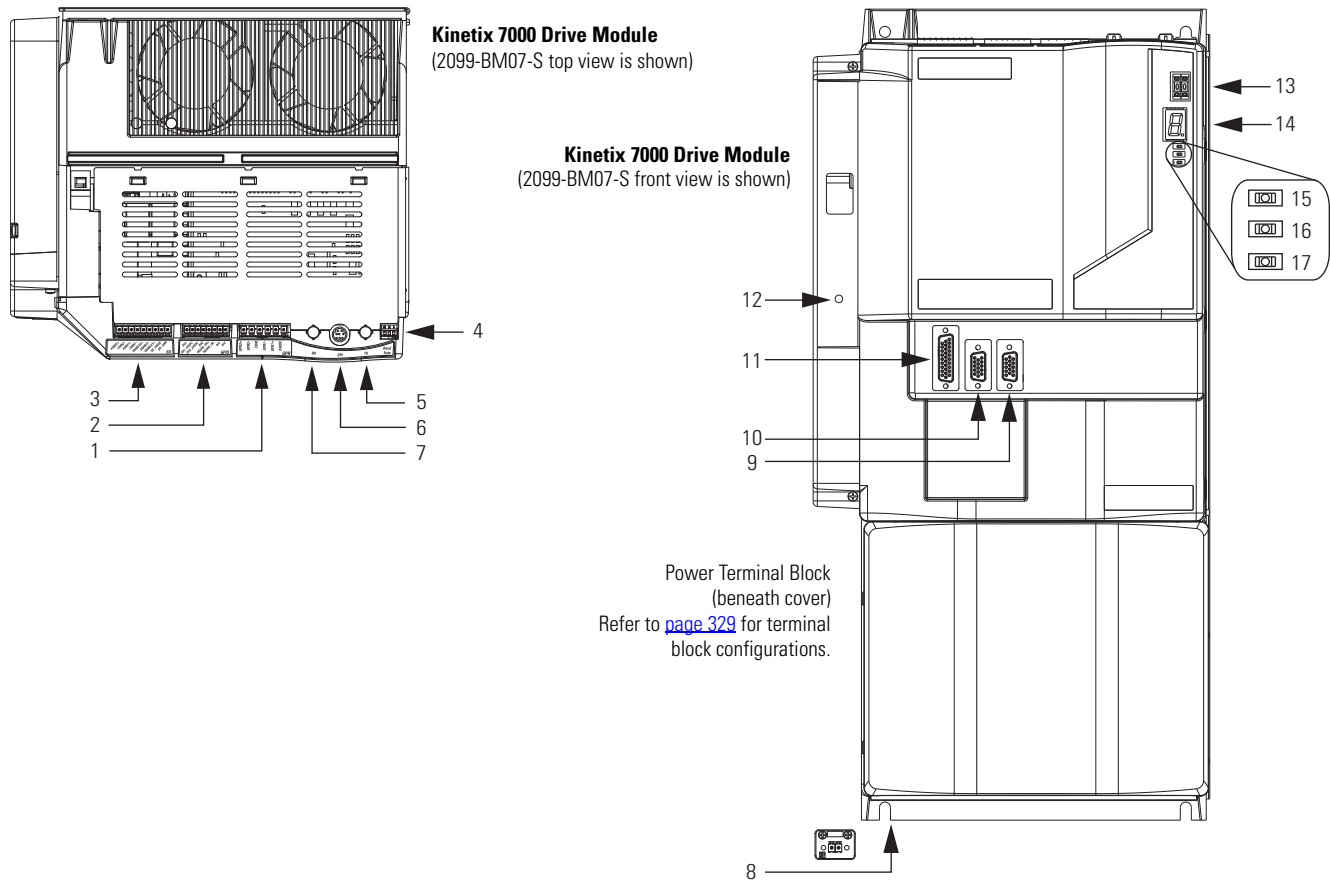
2099-BM11-S and 2099-BM12-S Dimensions



Kinetix 7000 Connector, Indicator, and Switch Locations

This section contains connector, indicator, switch, and terminal block locations for the Kinetix 7000 drive modules.

Kinetix 7000 Connectors



Item	Description
1	General purpose (GPR) connector
2	General purpose (GPIO) connector
3	Safe-off (SO) connector
4	SERCOS communication rate and optical power switches
5	SERCOS transmit (Tx) connector
6	DPI connector

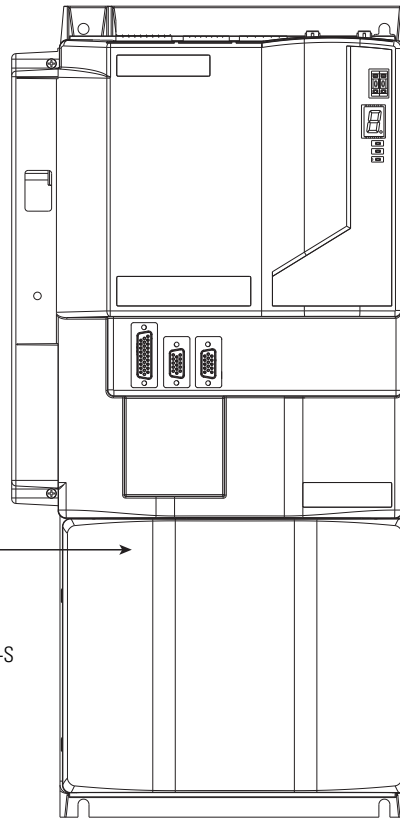
Item	Description
7	SERCOS receive (Rx) connector
8	Control power (CP) connector (facing down)
9	Auxiliary feedback (AF) connector
10	Motor feedback (MF) connector
11	I/O (IOD) connector
12	Control power status indicator

Item	Description
13	SERCOS node address switches
14	Seven-segment fault status indicator
15	Drive status indicator
16	COMM status indicator
17	Bus status indicator

For connector kit options, refer to Breakout Components and Connector Kits beginning on [page 418](#).

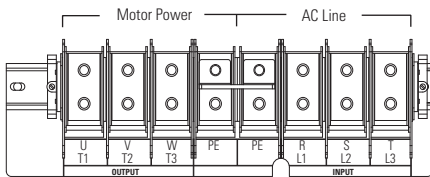
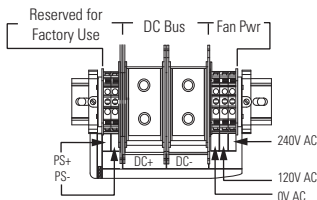
Kinetix 7000 Power Terminal Blocks

Kinetix 7000 Drive Module, front view
(2099-BM07-S is shown)

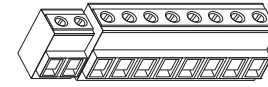


Power Terminal Block
(beneath cover)

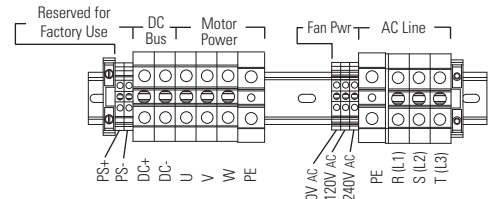
Power Terminal Block
2099-BM11-S and 2099-BM12-S



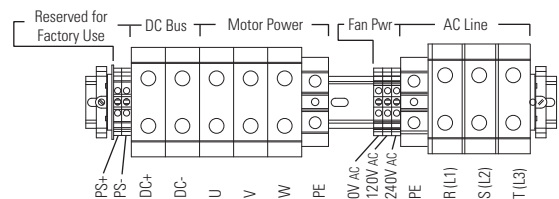
Power Terminal Block
2099-BM06-S, 2099-BM07-S, and 2099-BM08-S



Power Terminal Block
2099-BM09-S



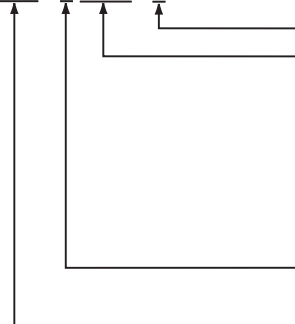
Power Terminal Block
2099-BM10-S



Kinetix 7000 High Power Drive Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.

2099 - BM xx - S



Safe-off Feature

Inverter Current Rating Continuous

BM06 = 056 A 0-pk	040 A rms	22 kW
BM07 = 073 A 0-pk	052 A rms	30 kW
BM08 = 092 A 0-pk	065 A rms	37 kW
BM09 = 135 A 0-pk	096 A rms	56 kW
BM10 = 176 A 0-pk	125 A rms	75 kW
BM11 = 254 A 0-pk	180 A rms	112 kW
BM12 = 351 A 0-pk	248 A rms	149 kW

Input Voltage

B = 380...480V AC or 450...750V DC

Bulletin Number

Notes:

Ultra3000 Digital Servo Drives



The Ultra3000, Ultra3000i, Ultra3000-SE, Ultra3000-DN, and Ultra3000X-DN drives make up a family of flexible, high-performance digital servo drives for a variety of motion control applications and architectures. The wide range of power platforms, connectivity options and functions makes the Ultra3000 digital servo drive family an attractive solution for a variety of machine control architectures including Logix, SLC, and third-party machine and motion control systems. In addition, the Ultra3000i indexing, Ultra3000-SE, Ultra3000-DN, Ultra3000X-DN drives are positioning drives designed for applications requiring either simple or complex motion profiles.

Only the 2098-DSD-xxx-SE and 2098-DSD-HVxxx-SE (SERCOS interface) drives are part of the Kinetix Integrated Motion solution.

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Ultra3000 Digital Servo Drive Architectures

Drive Type	Drive Cat. No.	Command Interface
SERCOS interface drive	2098-DSD-xxx-SE and 2098-DSD-HVxxx-SE	Fiber-optic SERCOS ring
Analog drive	2098-DSD-xxx and 2098-DSD-HVxxx	Analog command interface
Digital drive with DeviceNet interface	2098-DSD-xxx-DN and 2098-DSD-HVxxx-DN	DeviceNet communication interface
Indexing drive	2098-DSD-xxxX and 2098-DSD-HVxxxX	Standalone control
Indexing DeviceNet interface drives	2098-DSD-xxxX-DN and 2098-DSD-HVxxxX-DN	

Ultra3000 Digital Servo Drive Components

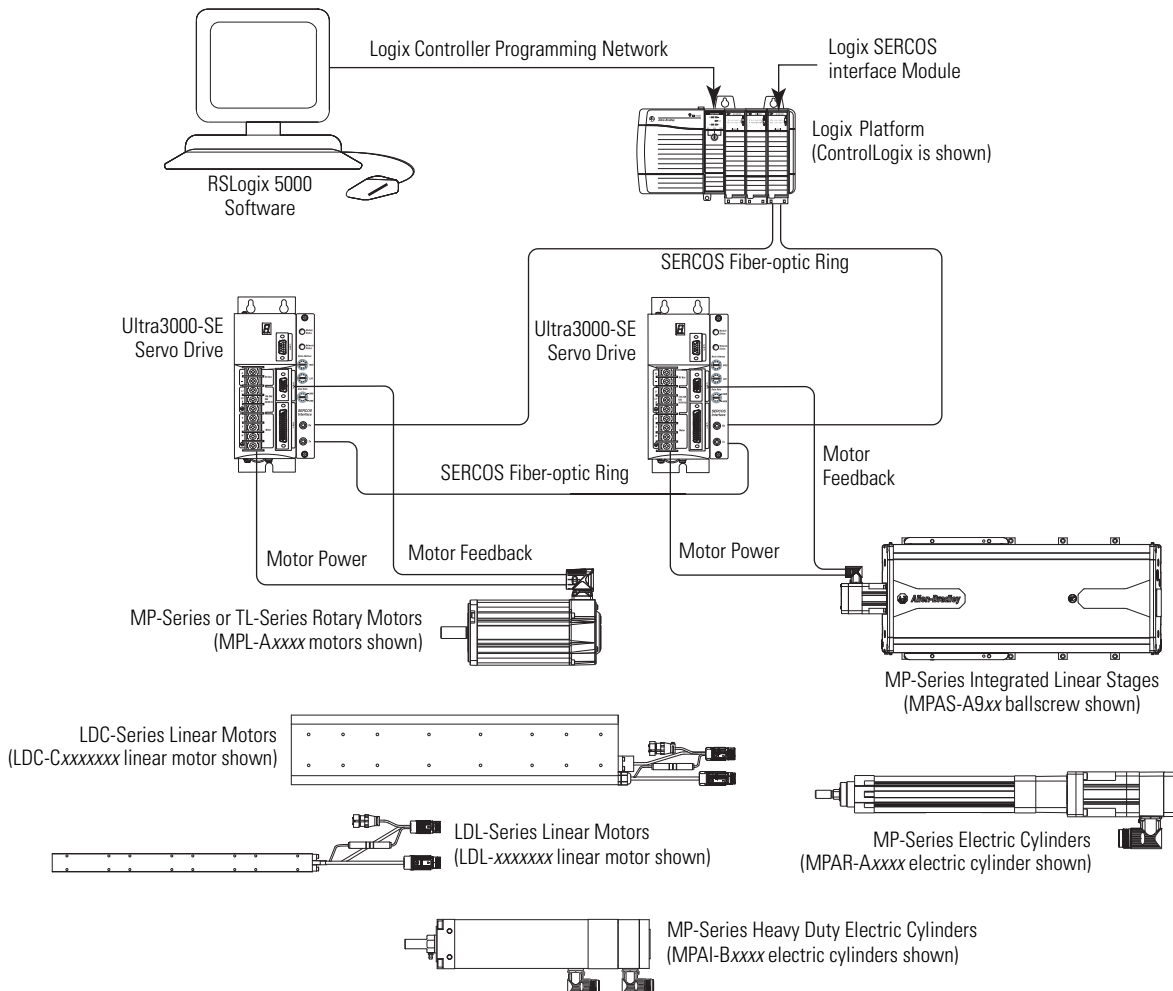
Ultra3000 digital servo drive systems consist of these required components:

- One Ultra3000 digital servo drive
- One rotary servo motor or linear motor/actuator (MP-Series, TL-Series, LDC-Series, or LDL-Series)
- One motor power and feedback cable
- Two SERCOS fiber-optic cables for Ultra3000-SE drives

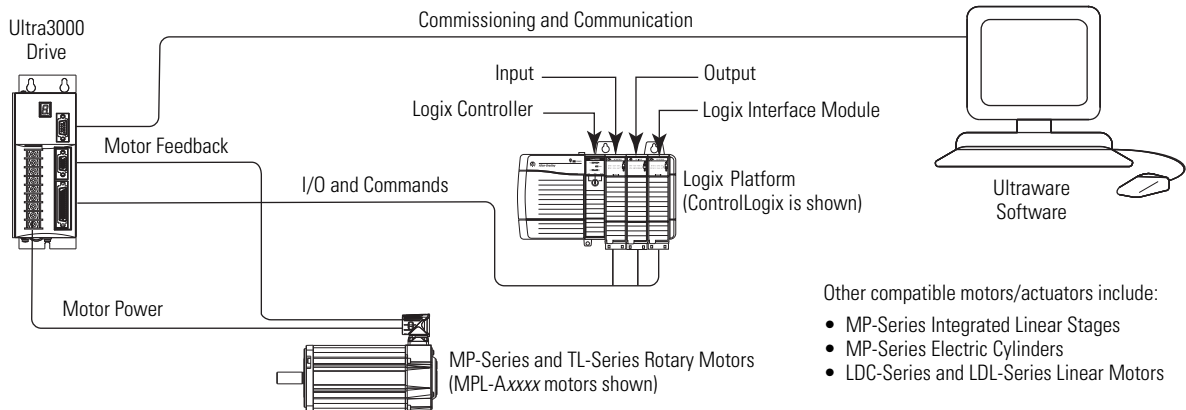
Ultra3000 systems may also include any of these optional components:

- Bulletin 2090 external active or passive shunt module
- Bulletin 2090 Resistive Brake Module (RBM)

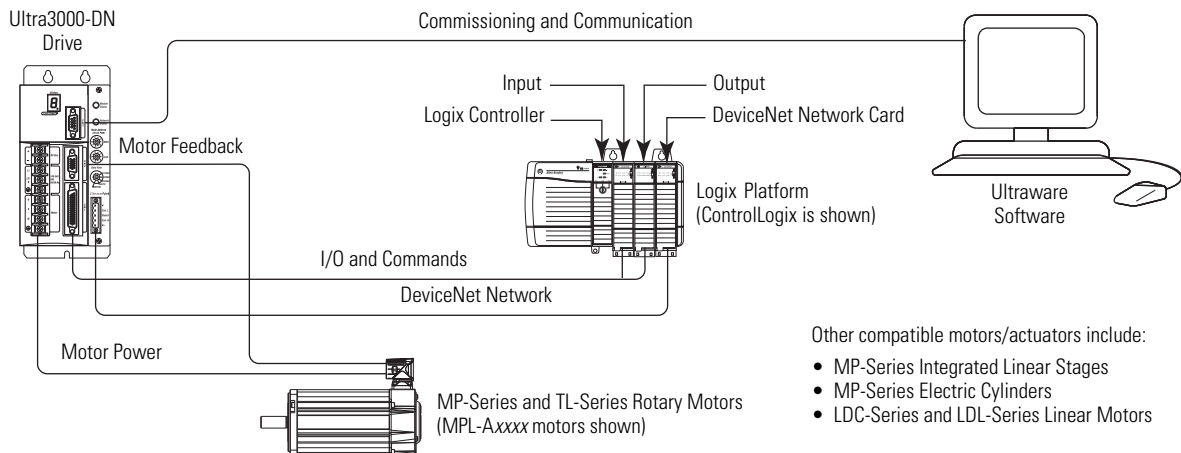
Typical Configuration - Ultra3000-SE (SERCOS) Digital Servo Drive System



Typical Configuration - Ultra3000 Digital Servo Drive System



Typical Configuration - Ultra3000-DN (DeviceNet) Digital Servo Drive System



Ultra3000 Digital Servo Drive Specifications

This section contains general power, physical/environmental, power dissipation, controller, I/O, operating modes command sources, serial communication, network communication, feedback, and connector specifications for the Ultra3000 digital servo drives.

Specifications apply to these Ultra3000 drive models:

- SE indicates the 2098-DSD-xxx-SE SERCOS interface drive
- DN indicates the 2098-DSD-xxx-DN DeviceNet interface drive
- X indicates the 2098-DSD-xxxX indexing drive
- X-DN indicates the 2098-DSD-xxxX-DN indexing DeviceNet interface drive

Power Specifications

2098-DSD-005x-xx, 2098-DSD-010x-xx, and 2098-DSD-020x-xx Ultra3000 (230V) Drives

Attribute	Value		
	2098-DSD-005	2098-DSD-010	2098-DSD-020
AC input voltage ⁽¹⁾	100...240V rms Single-phase		
AC input frequency	47...63 Hz		
AC input current ^{(2) (3)} Nom (rms) 230V AC (0-pk) max inrush ⁽⁴⁾	5 A 100 A - Series A or B 20 A - Series C	9 A 100 A - Series A or B 20 A - Series C	18 A 100 A - Series A or B 20 A - Series C
Continuous output current (rms)	1.8 A	3.5 A	7.1 A
Continuous output current (0-pk)	2.5 A	5.0 A	10 A
Peak output current (rms)	5.3 A	10.6 A	21.2 A
Peak output current (0-pk)	7.5 A	15 A	30 A
Bus capacitance	1410 μ F	1880 μ F	1880 μ F
Internal shunt resistance	N/A	N/A	N/A
Shunt on	N/A	N/A	N/A
Shunt off	N/A	N/A	N/A
Bus overvoltage	400V DC	400V DC	400V DC
Energy absorption capability 115V AC input 230V AC input	93 J 38 J	125 J 51 J	
Continuous power output 115V AC input 230V AC input	0.25 kW 0.5 kW	0.5 kW 1.0 kW	1.0 kW 2.0 kW

(1) Specification is for nominal voltage. The absolute limits are $\pm 10\%$, or 88...265V rms.

(2) The 2098-DSD-005x-xx, 2098-DSD-010x-xx, and 2098-DSD-020x-xx (230V) drives are limited to:
Series A or B - one contactor cycle every two minutes.
Series C - one contactor cycle every 10 s for up to two minutes, not to exceed 12 cycles in five minutes.

(3) Power initialization requires a short period of inrush current. Dual element time delay (slow blow) fuses are recommended (refer to Fuse Specifications on [page 337](#)).

(4) In-rush current limiting circuitry is enabled within 3 s after removal of AC line power.

2098-DSD-030x-xx, 2098-DSD-075x-xx, and 2098-DSD-150x-xx Ultra3000 (230V) Drives

Attribute	Value		
	2098-DSD-030	2098-DSD-075	2098-DSD-150
AC input voltage ⁽¹⁾	100...240V rms Single-phase	240V rms Three-phase	
AC input frequency	47...63 Hz		
Main AC input current ^{(2) (3)} Nom (rms) 230V AC (0-pk) max inrush	28 A 50 A	30 A 50 A	46 A 68 A
Auxiliary AC input current 115V AC (rms) nom 230V AC (rms) nom 115V AC (0-pk) max inrush ⁽⁴⁾ 230V AC (0-pk) max inrush ⁽⁴⁾	1.0 A 0.5 A 47 A 95 A	1.0 A 0.5 A 47 A 95 A	1.0 A 0.5 A 47 A 95 A
Continuous output current (rms)	10.6 A	24.7 A	45.9 A
Continuous output current (0-pk)	15 A	35 A	65 A
Peak output current (rms)	21.2 A	53 A	106 A
Peak output current (0-pk)	30 A	75 A	150 A
Bus capacitance	2820 μ F	4290 μ F	7520 μ F
Internal shunt resistance	35 Ω	16.5 Ω	9.1 Ω
Shunt on	420V DC	420V DC	420V DC
Shunt off	402V DC	402V DC	402V DC
Bus overvoltage	452V DC	452V DC	452V DC
Internal shunt Continuous power Peak power	50 W 4.5 kW	50 W 10 kW	180 W 18 kW
External shunt Resistance Continuous power Peak power	30 Ω (-0/+5%) 2.4 kW 6 kW	16.5 Ω (-0/+5%) 4 kW 10 kW	9 Ω (-0/+5%) 8 kW 19 kW
Energy absorption capability 115V AC input 230V AC input	251 J 139 J	381 J 211 J	669 J 370 J
Continuous power output 115V AC input 230V AC input	1.5 kW 3 kW	N/A 7.5 kW	N/A 15 kW

(1) Specification is for nominal voltage. The absolute limits are $\pm 10\%$, or 88...265V rms.

(2) The 2098-DSD-030x-xx, 2098-DSD-075x-xx, and 2098-DSD-150x-xx (230V) drives are limited to one contactor cycles per two minutes.

(3) Power initialization requires a short period of inrush current. Dual element time delay (slow blow) fuses are recommended (refer to Fuse Specifications on [page 337](#)).

(4) 400 μ s half wave sine.

Ultra3000 460V Drives

Attribute	Value				
	2098-DSD-HV030	2098-DSD-HV050	2098-DSD-HV100	2098-DSD-HV150	2098-DSD-HV220
AC input voltage ⁽¹⁾ ⁽²⁾	230/480V rms Three-phase				
AC input Frequency	47...63 Hz				
Main AC input current ⁽³⁾ ⁽⁴⁾ 460V AC (rms) nom 460V AC (rms) max inrush	4 A 6 A	7 A 6 A	14 A 6 A	20 A 6 A	28 A 6 A
Auxiliary AC input current 230V AC (rms) nom 360V AC (rms) nom 480V AC (rms) nom 230V AC (0-pk) max inrush ⁽⁵⁾ 480V AC (0-pk) max inrush ⁽⁵⁾	0.55 A 0.35 A 0.25 A 47 A 68 A				
Continuous output current (rms)	5.0 A	7.8 A	16.3 A	24.0 A	33.2 A
Continuous output current (0-pk)	7.0 A	11 A	23 A	34 A	47 A
Peak output current (rms)	9.9 A	15.6 A	32.5 A	48.1 A	66.5 A
Peak output current (0-pk)	14 A	22 A	46 A	68 A	94 A
Bus capacitance	470 µF		705 µF	940 µF	1880 µF
Internal shunt resistance	120 Ω		40 Ω	25 Ω	20 Ω
Shunt on 230V AC input 480V AC input	400V DC 800V DC				
Shunt off 230V AC input 480V AC input	375V DC 750V DC				
Bus overvoltage 230V AC input 480V AC input	410V DC 810V DC				
Internal shunt Continuous power Peak power	100 W 5.3 kW		200 W 16 kW	200 W 25.6 kW	400 W 32 kW
External shunt Resistance (-0/+5%) Continuous power Peak power	120 Ω 3 kW 5.3 kW		40 Ω 10 kW 16 kW	25 Ω 15 kW 25.6 kW	20 Ω 22 kW 32 kW
Energy absorption capability 230V AC input with 230V motor 230V AC input with 460V motor 480V AC input	15 J 129 J 55 J		22 J 194 J 82 J	29 J 259 J 109 J	59 J 517 J 219 J
Continuous power output 230V AC input 480V AC input	1.5 kW 3.0 kW	2.5 kW 5.0 kW	5.0 kW 10 kW	7.5 kW 15 kW	11 kW 22 kW

(1) Specification is for nominal voltage. The absolute limits are ±10%, or 207...264V rms and 324...528V rms.

(2) The 2098-DSD-HVxxx-xx drives can be powered with 230V rms and used with motors designed for 230V operation. In such cases, the voltage levels used for shunting and DC bus overvoltage limits are adjusted to be compatible with the voltage limit of the motor.
The 2098-DSD-HVxxx-xx drives can be powered with 480V rms and used with motors designed for 480V operation. In such cases, the voltage levels used for shunting and DC bus overvoltage limits are adjusted to be compatible with the voltage limit of the motor.

(3) The 2098-DSD-HVxxx-xx (460V) drives are limited to three contactor cycles per minute.

(4) Power initialization requires a short period of inrush current (processor controlled via soft start circuitry). Dual element time delay (slow blow) fuses are recommended (refer to Fuse Specifications on [page 337](#)).

(5) 400 µs half wave sine.

Fuse Specifications

Use class CC, G, J, L, R, or T fuses, with current ratings as indicated in the table below. The table below lists fuse examples recommended for use with the Ultra3000 (230V and 460V) drives.

Fuse Examples for Ultra3000 Drives

Drive Cat. No.	Input Voltage	Input Type	Recommended Fuse	
			Class CC ⁽¹⁾	Class J ⁽¹⁾
2098-DSD-005	230V AC	Input Power	FNQ-R-6	LPJ-6SP
2098-DSD-010			FNQ-R-10	LPJ-10SP
2098-DSD-020			FNQ-R-20	LPJ-20SP
2098-DSD-030			FNQ-R-30	LPJ-30SP
2098-DSD-075			FNQ-R-30	LPJ-30SP
2098-DSD-150			N/A	LPJ-60SP
2098-DSD-xxx		Auxiliary Input Power	FNQ-R-10	LPJ-10SP
2098-DSD-HV030	460V AC	Input Power	KTK-R-5	LPJ-5SP
2098-DSD-HV050			KTK-R-8	LPJ-8SP
2098-DSD-HV100			KTK-R-20	LPJ-17-1/2SP
2098-DSD-HV150			KTK-R-30	LPJ-30SP
2098-DSD-HV220			N/A	LPJ-35SP
2098-DSD-HVxxx		Auxiliary Input Power	FNQ-R-10	LPJ-10SP

(1) Part numbers shown are examples of Bussmann fuses.

Circuit Breaker Specifications

While circuit breakers offer some convenience, there are limitations for their use. Circuit breakers do not handle high current inrush as well as fuses.

Make sure the selected components are properly coordinated and meet acceptable codes including any requirements for branch circuit protection. Evaluation of the short-circuit available current is critical and must be kept below the short-circuit current rating of the circuit breaker.

Circuit Breaker Examples for Ultra3000 (460V) Drives

Drive Cat. No.	Input Voltage	Circuit Breakers
2098-DSD-HV030	460V	140M-F8E-C16
2098-DSD-HV050		140M-F8E-C20
2098-DSD-HV100		140M-F8E-C32
2098-DSD-HV150		140M-F8E-C45
2098-DSD-HV220		N/A

Contactors Ratings

Drive Cat. No.	Input Voltage	Contactors
2098-DSD-HV030	460V	100-C23x10 (AC coil) 100-C23Zx10 (DC coil)
2098-DSD-HV050		100-C30x10 (AC coil) 100-C30Zx10 (DC coil)
2098-DSD-HV100		100-C37x10 (AC coil) 100-C37Zx10 (DC coil)
2098-DSD-HV150		100-C43x10 (AC coil) 100-C43Zx10 (DC coil)
2098-DSD-HV220		100-C60x10 (AC coil) 100-C60Zx10 (DC coil)

Power Dissipation Specifications

Drive Cat. No.	Max Loss W
2098-DSD-005	48
2098-DSD-010	48
2098-DSD-020	50
2098-DSD-030	150 + dissipative shunt
2098-DSD-075	300 + dissipative shunt
2098-DSD-150	500 + dissipative shunt

Drive Cat. No.	Max Loss W
2098-DSD-HV030	175 + dissipative shunt
2098-DSD-HV050	175 + dissipative shunt
2098-DSD-HV100	350 + dissipative shunt
2098-DSD-HV150	350 + dissipative shunt
2098-DSD-HV220	600 + dissipative shunt

Communication Specifications

Attribute	Value
SERCOS (option)	
Communication rates	4 and 8 Mbps
Node addresses	01...99
DeviceNet (option)	
Power consumption from network	60 mA
Data rates	125, 250, and 500 kps, and auto-baud
Node addresses	00...63
Messaging capabilities	Explicit, Polled I/O, Change of State, and Cyclic Messaging
Serial	
Ports	One RS-232/RS-422/RS-485
Communication rates	1200, 2400, 4800, 9600, 19,200, and 38,400 bps

Inputs/Outputs Specifications

Attribute	Value
Digital inputs	8 optically isolated, 12...24V, active high, current sinking
Digital outputs	4 optically isolated, 12...24V, active high, current sourcing
Relay output	One normally open relay, 30V DC, max, 1 A, max
I/O response	100 μ s
Digital I/O firmware scan period	1 ms
Analog inputs COMMAND ILIMIT	14-bit A/D, \pm 10V 10-bit A/D, 0 to 10V
Analog output	\pm 10V, 8 bits, 2 mA max

Auxiliary Feedback Specifications

Attribute	Value
Input modes	A quad B, Step/Direction, CW/CCW
Maximum input frequency	2.5 MHz
Input types	Differential, single-ended, open collector ⁽¹⁾

(1) Differential input types are recommended.

Physical and Environmental Specifications

Attribute	Value	Attribute	Value
Weight, approx.		Weight, approx.	
2098-DSD-005	1.80 kg (4.1 lb)	2098-DSD-HV030	8.55 kg (18.8 lb)
2098-DSD-010	2.10 kg (4.6 lb)	2098-DSD-HV050	8.55 kg (18.8 lb)
2098-DSD-020	2.10 kg (4.6 lb)	2098-DSD-HV100	10.44 kg (22.9 lb)
2098-DSD-030	6.20 kg (13.6 lb)	2098-DSD-HV150	10.44 kg (22.9 lb)
2098-DSD-075	9.30 kg (20.6 lb)	2098-DSD-HV220	14.1 kg (31.0 lb)
2098-DSD-150	14.1 kg (31.0 lb)		
Ambient temperature	Storage: -40...70 °C (-40...158 °F) Operation: 0...55 °C (32...131 °F)		
Relative humidity	5...95% noncondensing		
Altitude	1500 m (4921.5 ft) - Derate 3% per 300 m (984.3 ft) above 1500 m (4921.5 ft)		
Vibration	5...2000 Hz @ 2.5 g peak, 0.0006 mm (0.015 in.) max displacement		
Shock	15 g, 11 ms half-sine		

Connector Specifications

Connector	Description	Specification
CN1	User input/output	44-pin high-density female D-sub connector
CN2	Motor feedback connector	15-pin high-density female D-sub connector
CN3	Serial port connector	9-pin female D-sub connector
TB1 and TB2	Main and auxiliary AC, DC bus, motor power, and shunt connectors	Screw terminal block

Maximum Feedback Cable Lengths

Although motor feedback cables are available in standard lengths up to 90 m (295.3 ft), the drive/motor/feedback combination may limit the maximum cable length, as shown in the tables below. These tables assume the use of cables recommended in Motor/Actuator Cable Selection table on [page 380](#).

Maximum Cable Lengths for Compatible Rotary Motors

Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)
MPL-A15xxx...MPL-A2xxx-E/V	90 (295.3)		
MPL-A3xxx...MPL-A5xxx-S/M ⁽¹⁾	90 (295.3)		
MPL-B15xxx...MPL-B2xxx-E/V		90 (295.3)	
MPL-B3xxx...MPL-B9xxx-S/M		90 (295.3)	
MPL-A/B15xxx...MPL-A/B45xxx-H			45 (147.6)
MPM-Axxxx-S/M	30 (98.4)		
MPM-Bxxxx-S/M		90 (295.3)	
MPF-Axxx-S/M ⁽¹⁾	90 (295.3)		
MPF-Bxxx-S/M		90 (295.3)	
MPS-Axxx-S/M	90 (295.3)		
MPS-Bxxx-S/M		90 (295.3)	
TLY-Axxx-H			30 (98.4)

(1) MPL-A5xxx and MPF-A5xxx motor encoders are rated for 9V, the remaining Bulletin MPL and MPF (230V) motor encoders are rated for 5V.

Maximum Cable Lengths for Compatible Linear Actuators

Actuator Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)
MPMA-Axxxx or MPAS-Axxxx-V (ballscrew)	90 (295.3)		
MPMA-Axxxx or MPAS-Axxxx-A (direct drive)			45 (147.6)
MPMA-Bxxxx or MPAS-Bxxxx-V (ballscrew)		90 (295.3)	
MPMA-Bxxxx or MPAS-Bxxxx-A (direct drive)			45 (147.6)
MPAR-Axxxx-V/M	30 (98.4)		
MPAR-Bxxxx-V/M		90 (295.3)	
MPAI-AxxxxM3	30 (98.4)		
MPAI-BxxxxM3		90 (295.3)	

Maximum Cable Lengths for Compatible Linear Motors

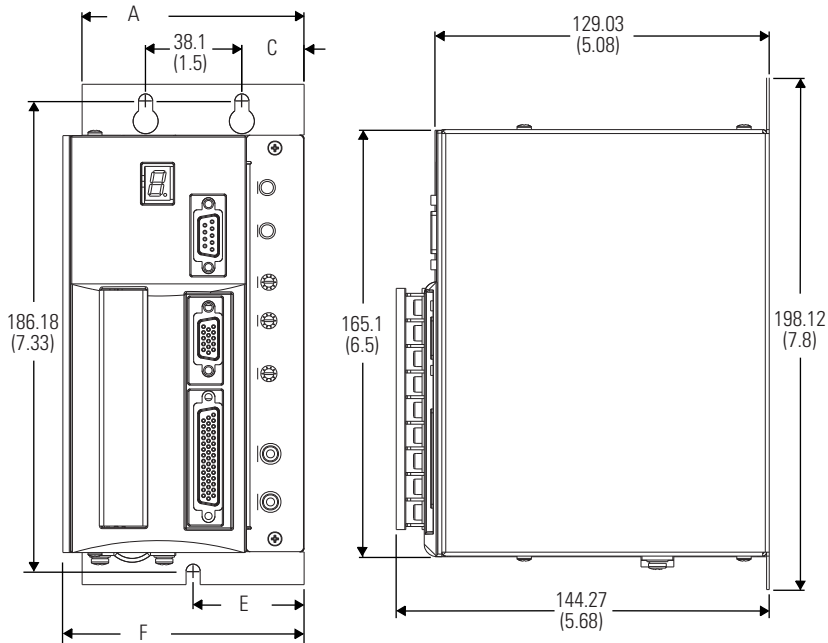
Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)
LDC-Series or LDL-Series	30 (98.4)	30 (98.4)

Ultra3000 Digital Servo Drive Dimensions

This section contains dimensions for the Ultra3000 digital servo drives (X indicates indexing, -SE indicates SERCOS interface, -DN indicates DeviceNet interface, and X-DN indicates indexing DeviceNet interface).

In the figure below, -xxx is replaced by -005, -010, or -020 to represent the Ultra3000 500 W, 1 kW, and 2 kW drives respectively.

2098-DSD-xxx, 2098-DSD-xxxX, 2098-DSD-xxx-SE, 2098-DSD-xxx-DN, 2098-DSD-xxxX-DN Dimensions (230V)



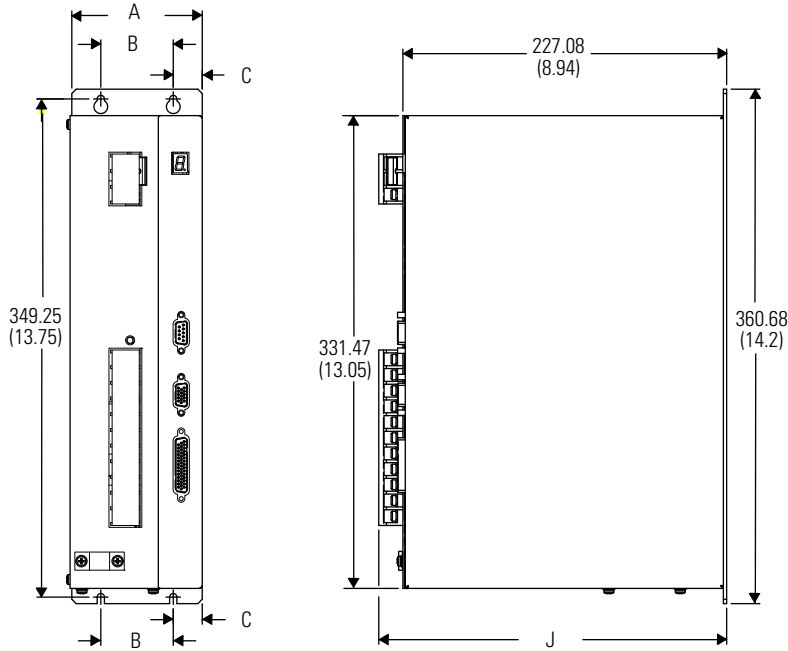
Dimensions are in mm (in.)

Unit shown is the 2098-DSD-005-SE

Ultra3000 Drives	A mm (in.)	C mm (in.)	E mm (in.)	F mm (in.)
2098-DSD-005, 2098-DSD-005X				72.64 (2.86)
2098-DSD-010, 2098-DSD-010X, 2098-DSD-020, 2098-DSD-020X	65.02 (2.56)	13.26 (0.52)	32.77 (1.29)	98.1 (3.89)
2098-DSD-005-SE, 2098-DSD-005-DN, 2098-DSD-005X-DN				95.5 (3.76)
2098-DSD-010-SE, 2098-DSD-010-DN, 2098-DSD-010X-DN, 2098-DSD-020-SE, 2098-DSD-020-DN, 2098-DSD-020X-DN	87.88 (3.46)	24.64 (0.97)	43.94 (1.73)	121.54 (4.79)

In the figure below, -xxx is replaced by -030, -075, or -150 to represent the Ultra3000 3, 7.5, and 15 kW drives respectively.

2098-DSD-xxx, 2098-DSD-xxxX, 2098-DSD-xxx-SE, 2098-DSD-xxx-DN, 2098-DSD-xxxX-DN Dimensions (230V)



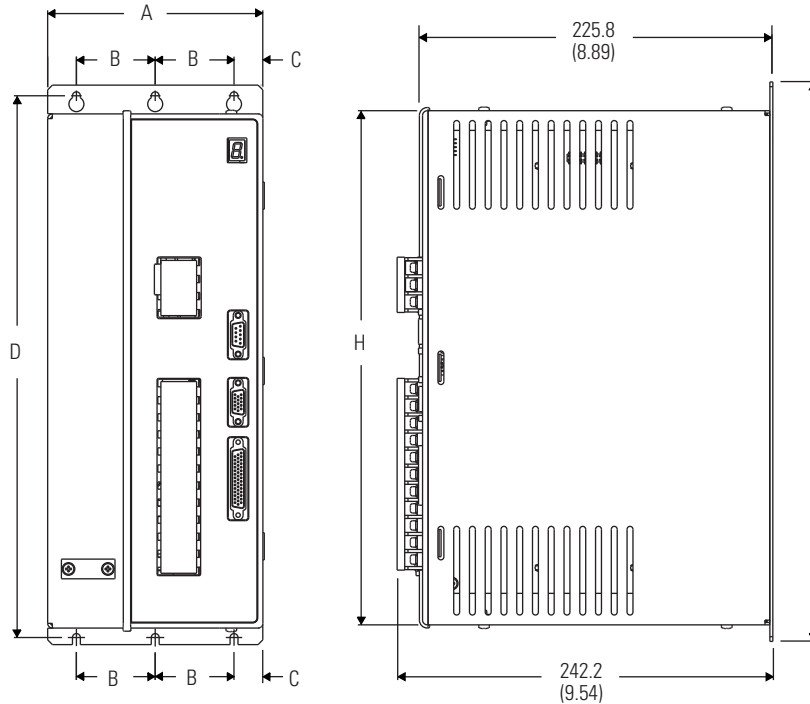
Dimensions are in mm (in.)

Unit shown is the 2098-DSD-030

Ultra3000 Drives	A mm (in.)	B mm (in.)	C mm (in.)	J mm (in.)
2098-DSD-030, 2098-DSD-030X, 2098-DSD-030-SE, 2098-DSD-030-DN, 2098-DSD-030X-DN	91.44 (3.6)	50.8 (2.0)	20.32 (0.8)	243.84 (9.6)
2098-DSD-075, 2098-DSD-075X, 2098-DSD-075-SE, 2098-DSD-075-DN, 2098-DSD-075X-DN	138.68 (5.41)	88.9 (3.5)	24.89 (0.96)	247.14 (9.73)
2098-DSD-150, 2098-DSD-150X, 2098-DSD-150-SE, 2098-DSD-150-DN, 2098-DSD-150X-DN	188.97 (7.44)	139.7 (5.5)	24.6 (0.97)	241.05 (9.49)

In the figure below, *xxx* is replaced by 030, 050, 100, 150, or 220 to represent the Ultra3000 3, 5, 10, 15, and 22 kW drives respectively.

2098-DSD-HV_{xxx}, 2098-DSD-HV_{xxx}X, 2098-DSD-HV_{xxx}-SE, 2098-DSD-HV_{xxx}-DN, 2098-DSD-HV_{xxx}X-DN Dimensions (460V)



Dimensions are in mm (in.)

Unit shown is the 2098-DSD-HV030

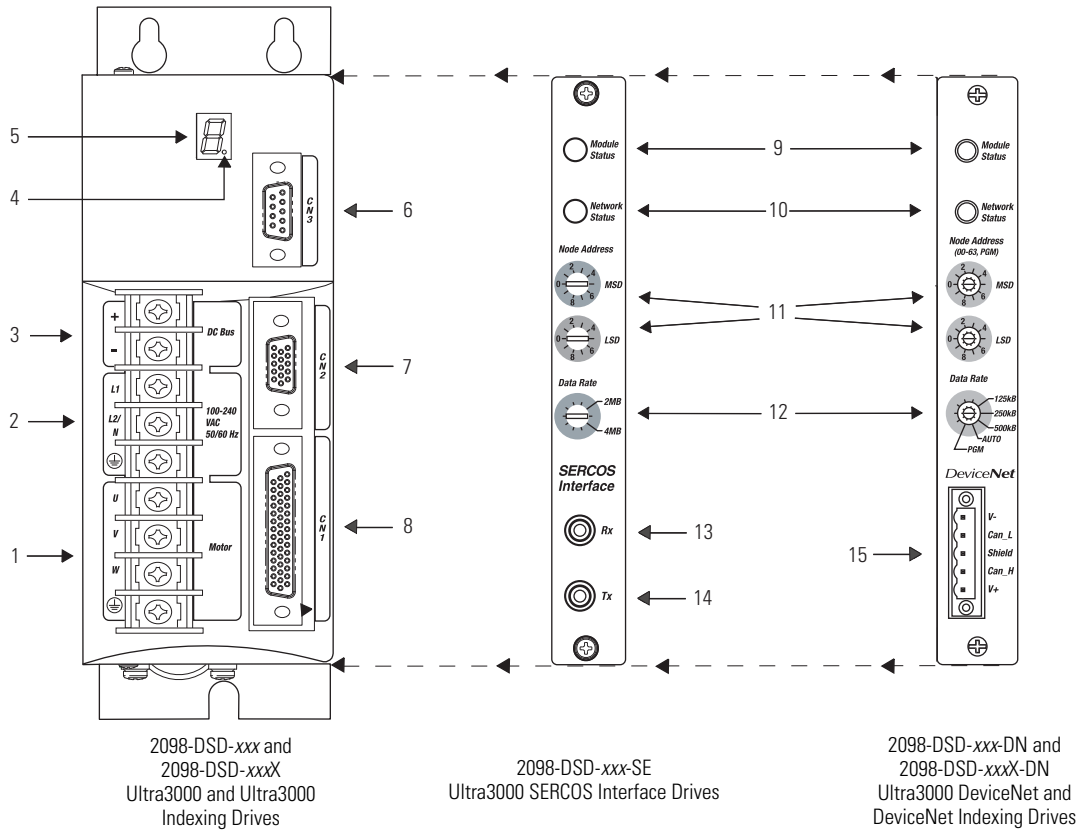
Ultra3000 Drives ⁽¹⁾	A mm (in.)	C mm (in.)	B mm (in.)	D mm (in.)	H mm (in.)	I mm (in.)
2098-DSD-HV030 _x , 2098-DSD-HV030- _{xx} , 2098-DSD-HV050 _x , 2098-DSD-HV050- _{xx}	138.7 (5.46)	18.5 (0.73)	50.8 (2.0)	349.3 (13.75)	331.5 (13.05)	360.7 (14.2)
2098-DSD-HV100 _x , 2098-DSD-HV100- _{xx} , 2098-DSD-HV150 _x , 2098-DSD-HV150- _{xx}	151.6 (5.97)	25 (0.99)				
2098-DSD-HV220 _x , 2098-DSD-HV220- _{xx}	203.2 (8.0)	25.4 (1.0)	76.2 (3.0)	380.4 (14.98)	362.6 (14.26)	391.8 (15.43)

(1) The *x* represents the indexing (X) option. The *-xx* represents the SERCOS interface (SE) or DeviceNet interface (DN) option. SERCOS interface is not available with the DeviceNet interface option.

Ultra3000 Connector, Indicator, and Switch Locations

This section provides the connector, indicator, and switch locations for the Ultra3000 Digital Servo Drives (X indicates indexing, -SE indicates SERCOS interface, -DN indicates DeviceNet interface, and X-DN indicates indexing DeviceNet interface).

2098-DSD-005, 2098-DSD-010, 2098-DSD-020 Ultra3000 (230V) Connectors



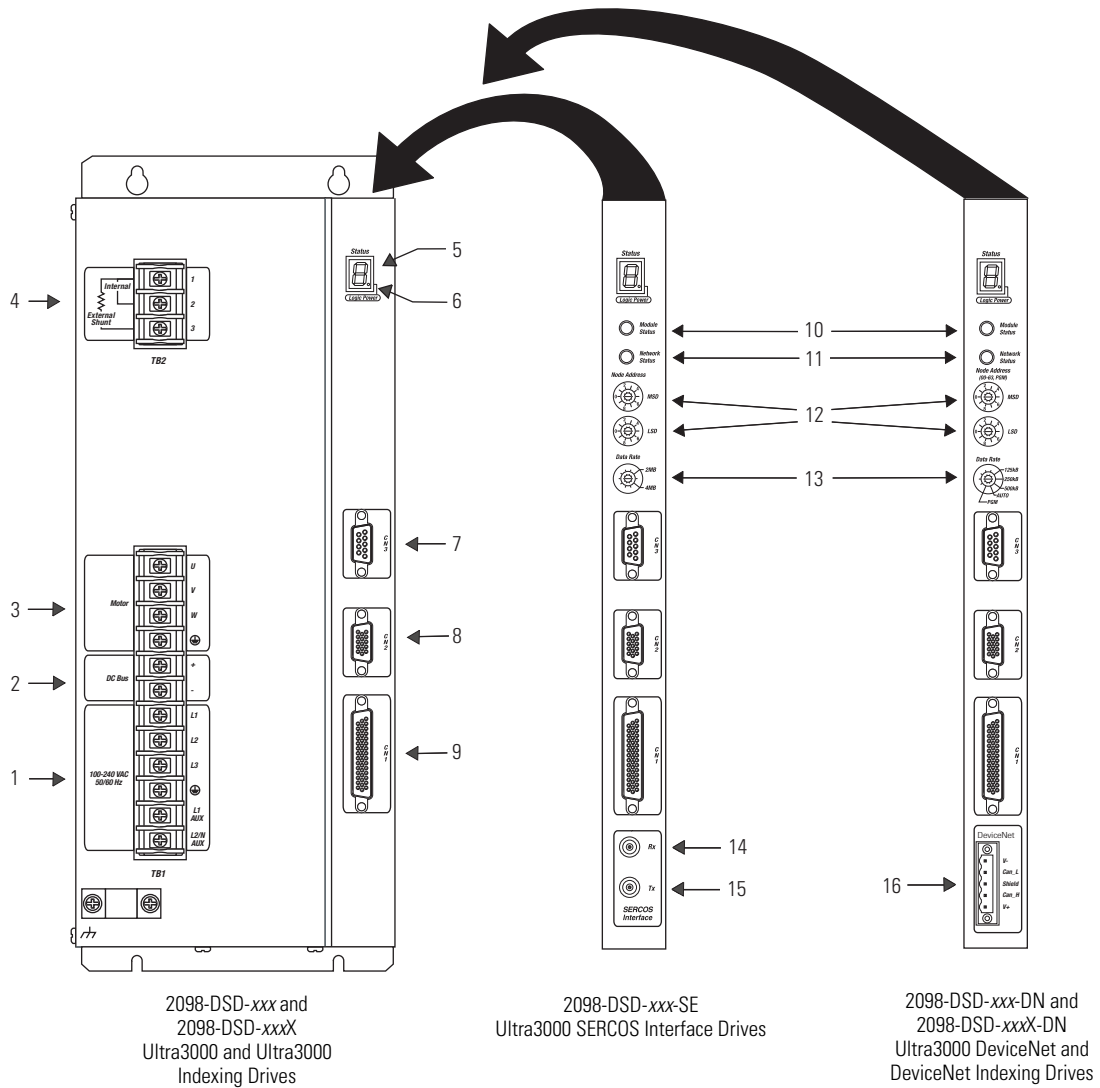
Item	Description
1	Motor power connections
2	AC input power connections
3	DC bus connections for active shunt resistor kit
4	Logic power
5	Seven-segment fault status indicator

Item	Description
6	CN3 9-pin serial port connector
7	CN2 15-pin motor feedback connector
8	CN1 44-pin user I/O connector
9	Module status indicator
10	Network status indicator

Item	Description
11	SERCOS node address switches
12	Data rate switch
13	SERCOS receive (Rx) connector
14	SERCOS transmit (Tx) connector
15	DeviceNet interface connector

For CN1, CN2, and CN3 connector options, refer to Breakout Components and Connector Kits beginning on [page 418](#).

2098-DSD-030, 2098-DSD-075, and 2098-DSD-150 Ultra3000 (230V) Connectors



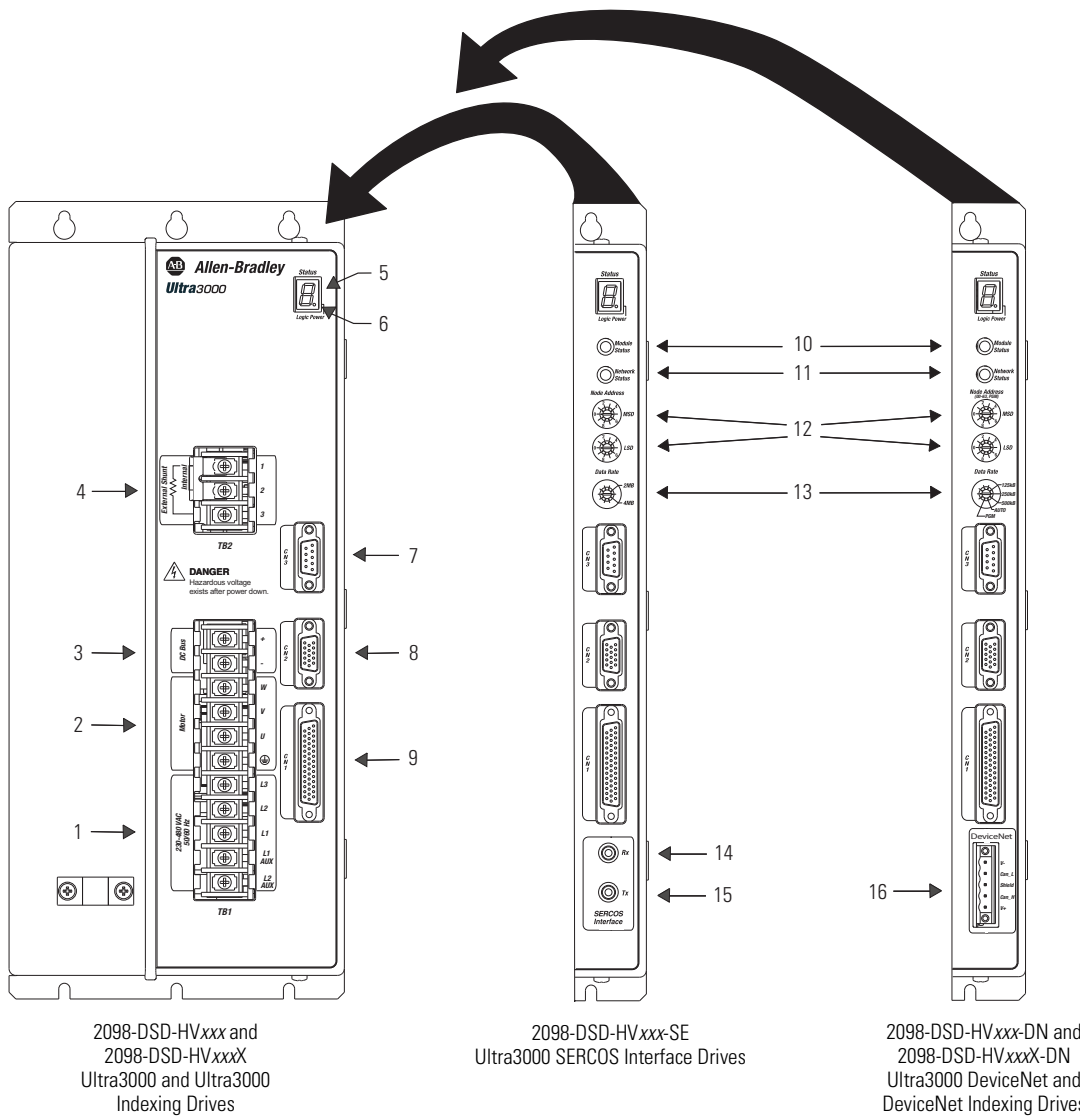
Item	Description
1	AC input power connections ⁽¹⁾
2	DC bus connections for active shunt resistor kit
3	Motor power connections
4	Passive shunt resistor connections
5	Seven-segment fault status indicator
6	Logic power
7	CN3 9-pin serial port connector
8	CN2 15-pin motor feedback connector

Item	Description
9	CN1 44-pin user I/O connector
10	Module status indicator
11	Network status indicator
12	SERCOS node address switches
13	Data rate switch
14	SERCOS receive (Rx) connector
15	SERCOS transmit (Tx) connector
16	DeviceNet interface connector

(1) The 2098-DSD-030x-xx drives do not have an L3 power terminal.

For CN1, CN2, and CN3 connector options, refer to Breakout Components and Connector Kits beginning on [page 418](#).

2098-DSD-HV030, 2098-DSD-HV050, 2098-DSD-HV100, 2098-DSD-HV150, and 2098-DSD-HV220 Ultra3000 (460V) Connectors



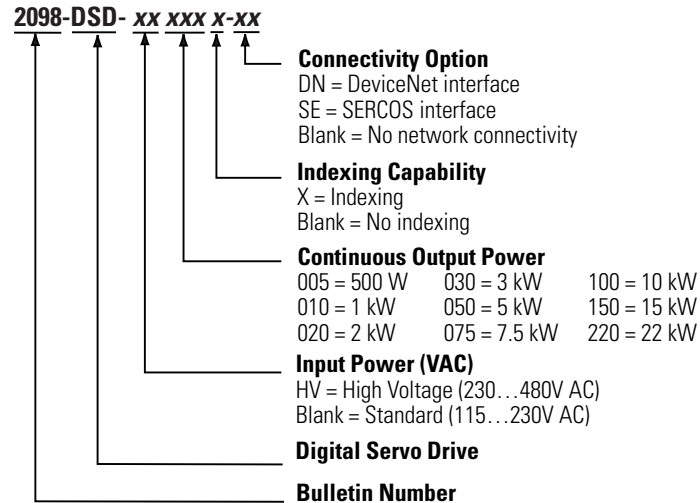
Item	Description
1	AC input power connections
2	DC bus connections for active shunt resistor kit
3	Motor power connections
4	Passive shunt resistor connections
5	Seven-segment fault status indicator
6	Logic power
7	CN3 9-pin serial port connector
8	CN2 15-pin motor feedback connector

Item	Description
9	CN1 44-pin user I/O connector
10	Module status indicator
11	Network status indicator
12	SERCOS node address switches
13	Data rate switch
14	SERCOS receive (Rx) connector
15	SERCOS transmit (Tx) connector
16	DeviceNet interface connector

For CN1, CN2, and CN3 connector options, refer to Breakout Components and Connector Kits beginning on [page 418](#).

Ultra3000 Digital Servo Drive Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering chart below to understand the configuration of your drive. For questions regarding product availability, contact your Allen-Bradley distributor.



Ultraware Software Catalog Number

Ultra3000, Ultra3000 with indexing, Ultra3000-DN, and Ultra3000-DN with indexing drives are configured by using Ultraware software (catalog number 2098-UWCPRG). The Ultra3000-SE drives are configured by using RSLogix 5000 software.

Notes:

Ultra5000 Intelligent Positioning Drives



The Ultra5000 and Ultra5000-DN Intelligent Positioning Drives make up a high-performance, fully-programmable positioning servo drive family. The Ultra5000 servo drive family incorporates a state-of-the-art DSP-based control architecture and a rugged Integrated Power Module (IPM)-based power section. Ultra5000 drives are programmed by using motion commands in an ANSI C format. The Ultra5000 design is optimized for high-speed position capturing and calculations. Position capture latency is less than 1.0 μ s, and processing time for position-based calculations can be as low as 125 μ s.

Topic	Page
Ultra5000 Intelligent Positioning Drive Architectures	349
Ultra5000 Intelligent Positioning Drive Components	350
Ultra5000 Intelligent Positioning Drive Specifications	351
Ultra5000 Intelligent Positioning Drive Dimensions	358
Ultra5000 Connector, Indicator, and Switch Locations	361
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Ultra5000 Intelligent Positioning Drive Architectures

Drive Option	Drive Cat. No.	Command Interface
Positioning drive	2098-IPD-xxx and 2098-IPD-HVxxx	Control interface
Positioning drive with DeviceNet interface	2098-IPD-xxx-DN and 2098-IPD-HVxxx-DN	Control interface with factory installed DeviceNet communication

Ultra5000 Intelligent Positioning Drive Components

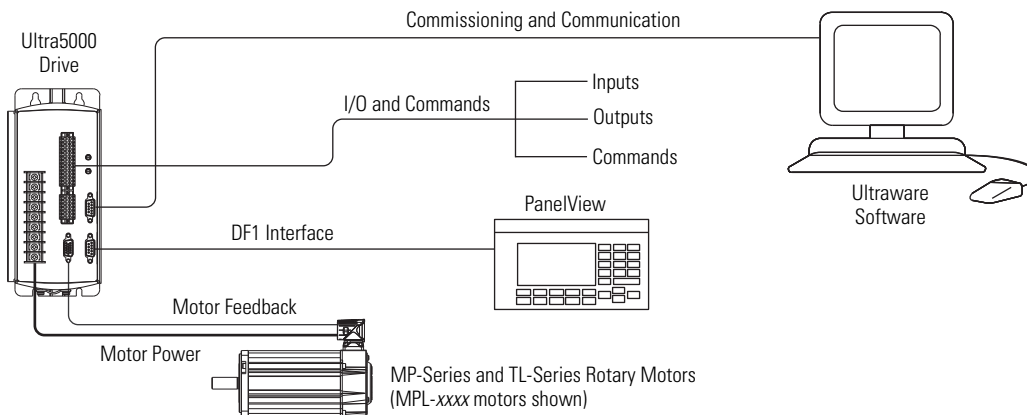
Ultra5000 intelligent positioning drive systems consist of these components:

- One Ultra5000 intelligent positioning drive
- One MP-Series or TL-Series rotary motors
- One motor power and feedback cable

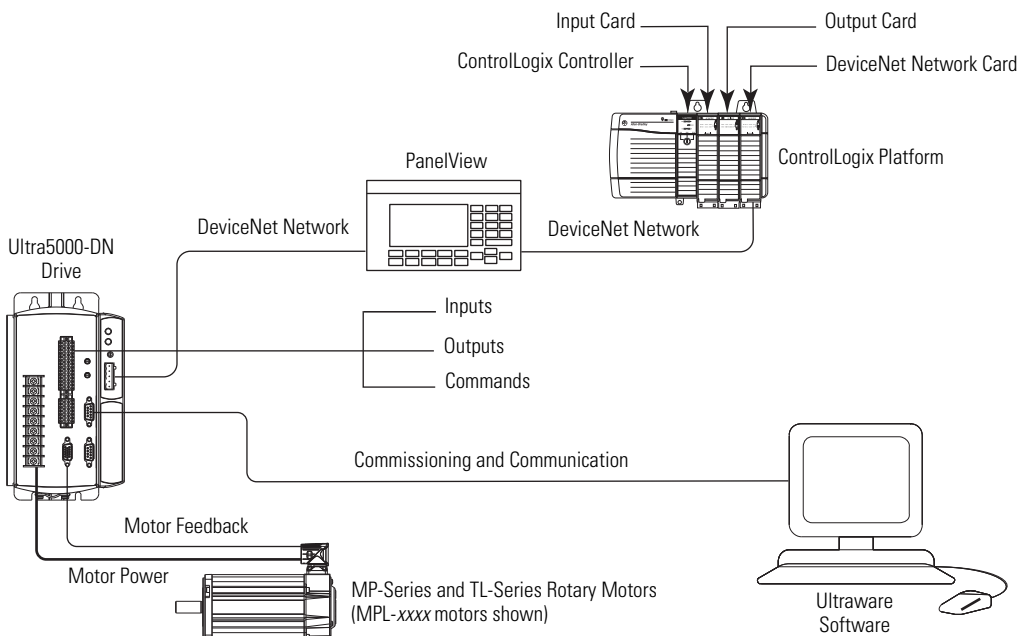
Ultra5000 systems may also include a Bulletin 2090 external active or passive shunt module.

To learn about the C programming environment or library of motion commands used to program an Ultra5000 intelligent positioning drive, refer to the Ultra5000 Programming Manual, publication [2098-PM001](#).

Typical Configuration - Ultra5000 Intelligent Positioning Drive System



Typical Configuration - Ultra5000-DN Intelligent Positioning Drive System



Ultra5000 Intelligent Positioning Drive Specifications

This section contains general power, physical and environmental, power dissipation, controller, inputs/outputs, auxiliary feedback, communication, and connector specifications for the Ultra5000 and Ultra5000-DN Intelligent Positioning Drives.

Power Specifications

2098-IPD-005-xx, 2098-IPD-010-xx, and 2098-IPD-020-xx Ultra5000 (230V) Drives

Attribute	Value		
	2098-IPD-005	2098-IPD-010	2098-IPD-020
AC input voltage ⁽¹⁾	100...240V rms single-phase		
AC input frequency	47...63 Hz		
AC input current ⁽²⁾⁽³⁾ Nom (rms) 230V AC (0-pk) max inrush ⁽⁴⁾	5 A 100 A - Series A 20 A - Series B	9 A 100 A - Series A 20 A - Series B	18 A 100 A - Series A 20 A - Series B
Continuous output current (rms)	1.8 A	3.5 A	7.1 A
Continuous output current (0-pk)	2.5 A	5.0 A	10 A
Peak output current (rms)	5.3 A	10.6 A	21.2 A
Peak output current (0-pk)	7.5 A	15 A	30 A
Bus capacitance	1410 μ F	1880 μ F	1880 μ F
Internal shunt resistance	N/A	N/A	N/A
Shunt on	N/A	N/A	N/A
Shunt off	N/A	N/A	N/A
Bus overvoltage	400V DC	400V DC	400V DC
Energy absorption capability 115V AC input 230V AC input	93 J 38 J	125 J 51 J	
Continuous power output 115V AC input 230V AC input	0.25 kW 0.5 kW	0.5 kW 1.0 kW	1.0 kW 2.0 kW

(1) Specification is for nominal voltage. The absolute limits are $\pm 10\%$, or 88...265V rms.

(2) The 2098-IPD-005x-xx, 2098-IPD-010x-xx, and 2098-IPD-020x-xx (230V) drives are limited to:
Series A - one contactor cycle every two minutes.
Series B - one contactor cycle every 10 s for up to two minutes, not to exceed 12 cycles in five minutes.

(3) Power initialization requires a short period of inrush current. Dual element time delay (slow blow) fuses are recommended (refer to Fuse Specifications on [page 354](#)).

(4) In-rush current limiting circuitry is enabled within 3 s after removal of AC line power.

2098-IPD-030-xx, 2098-IPD-075-xx, and 2098-IPD-150-xx Ultra5000 (230V) Drives

Attribute	Value		
	2098-IPD-030	2098-IPD-075	2098-IPD-150
AC input voltage ⁽¹⁾	100...240V rms Single-phase	240V rms Three-phase	
AC input frequency	47...63 Hz		
Main AC input current ^{(2) (3)} Nom (rms) 230V AC (0-pk) max inrush	28 A 50 A	30 A 50 A	46 A 68 A
Auxiliary AC input current 115V AC (rms) nom 230V AC (rms) nom 115V AC (0-pk) max inrush ⁽⁴⁾ 230V AC (0-pk) max inrush ⁽⁴⁾	1.0 A 0.5 A 47 A 95 A	1.0 A 0.5 A 47 A 95 A	1.0 A 0.5 A 47 A 95 A
Continuous output current (rms)	10.6 A	24.7 A	45.9 A
Continuous output current (0-pk)	15 A	35 A	65 A
Peak output current (rms)	21.2 A	53 A	106 A
Peak output current (0-pk)	30 A	75 A	150 A
Bus capacitance	2820 μ F	4290 μ F	7520 μ F
Internal shunt resistance	35 Ω	16.5 Ω	9.1 Ω
Shunt on	420V DC	420V DC	420V DC
Shunt off	402V DC	402V DC	402V DC
Bus overvoltage	452V DC	452V DC	452V DC
Internal shunt Continuous power Peak power	50 W 4.5 kW	50 W 10 kW	180 W 18 kW
External shunt Resistance Continuous power Peak power	30 Ω (-0/+5%) 2.4 kW 6 kW	16.5 Ω (-0/+5%) 4 kW 10 kW	9 Ω (-0/+5%) 8 kW 19 kW
Energy absorption capability 115V AC input 230V AC input	251 J 139 J	381 J 211 J	669 J 370 J
Continuous power output 115V AC input 230V AC input	1.5 kW 3 kW	N/A 7.5 kW	N/A 15 kW

(1) Specification is for nominal voltage. The absolute limits are $\pm 10\%$, or 88...265V rms.

(2) The 2098-IPD-030x-xx, 2098-IPD-075x-xx, and 2098-IPD-150x-xx (230V) drives are limited to one contactor cycles per two minutes.

(3) Power initialization requires a short period of inrush current. Dual element time delay (slow blow) fuses are recommended (refer to Fuse Specifications on [page 354](#)).

(4) 400 μ s half wave sine.

Ultra5000 (460V) Drives

Attribute	Value				
	2098-IPD-HV030	2098-IPD-HV050	2098-IPD-HV100	2098-IPD-HV150	2098-IPD-HV220
AC input voltage ⁽¹⁾ ⁽²⁾	230/480V rms Three-phase				
AC input frequency	47...63 Hz				
Main AC input current ⁽³⁾ ⁽⁴⁾ 460V AC (rms) nom 460V AC (rms) max inrush	4 A 6 A	7 A 6 A	14 A 6 A	20 A 6 A	28 A 6 A
Auxiliary AC input current 230V AC (rms) nom 360V AC (rms) nom 480V AC (rms) nom 230V AC (0-pk) max inrush ⁽⁵⁾ 480V AC (0-pk) max inrush ⁽⁵⁾	0.55 A 0.35 A 0.25 A 47 A 68 A	0.55 A 0.35 A 0.25 A 47 A 68 A	0.55 A 0.35 A 0.25 A 47 A 68 A	0.55 A 0.35 A 0.25 A 47 A 68 A	0.55 A 0.35 A 0.25 A 47 A 68 A
Continuous output current (rms)	5.0 A	7.8 A	16.3 A	24.0 A	33.2 A
Continuous output current (0-pk)	7.0 A	11 A	23 A	34 A	47 A
Peak output current (rms)	9.9 A	15.6 A	32.5 A	48.1 A	66.5 A
Peak output current (0-pk)	14 A	22 A	46 A	68 A	94 A
Bus capacitance	470 μ F	470 μ F	705 μ F	940 μ F	1880 μ F
Internal shunt resistance	120 Ω	120 Ω	40 Ω	25 Ω	20 Ω
Shunt on 230V AC input 480V AC input	400V DC 800V DC				
Shunt off 230V AC input 480V AC input	375V DC 750V DC				
Bus overvoltage 230V AC input 480V AC input	410V DC 810V DC				
Internal shunt Continuous power Peak power	100 W 5.3 kW	100 W 5.3 kW	200 W 16 kW	200 W 25.6 kW	400 W 32 kW
External shunt Resistance (-0/+5%) Continuous power Peak power	120 Ω 3 kW 5.3 kW	120 Ω 5 kW 5.3 kW	40 Ω 10 kW 16 kW	25 Ω 15 kW 25.6 kW	20 Ω 22 kW 32 kW
Energy absorption capability 230V AC input with 230V motor 230V AC input with 460V motor 480V AC input	15 J 129 J 55 J	15 J 129 J 55 J	22 J 194 J 82 J	29 J 259 J 109 J	59 J 517 J 219 J
Continuous power output 230V AC input 480V AC input	1.5 kW 3.0 kW	2.5 kW 5.0 kW	5.0 kW 10 kW	7.5 kW 15 kW	11 kW 22 kW

(1) Specification is for nominal voltage. The absolute limits are $\pm 10\%$, or 207...264V rms and 324...528V rms.

(2) The 2098-IPD-HVxxx-xx drives can be powered with 230V rms and used with motors designed for 230V operation. In such cases, the voltage levels used for shunting and DC bus overvoltage limits are adjusted to be compatible with the voltage limit of the motor.
The 2098-IPD-HVxxx-xx drives can be powered with 480V rms and used with motors designed for 480V operation. In such cases, the voltage levels used for shunting and DC bus overvoltage limits are adjusted to be compatible with the voltage limit of the motor.

(3) The 2098-IPD-HVxxx-xx (460V) drives are limited to three contactor cycles per minute.

(4) Power initialization requires a short period of inrush current (processor controlled via soft start circuitry). Dual element time delay (slow blow) fuses are recommended (refer to Fuse Specifications on [page 354](#)).

(5) 400 μ s half wave sine.

Fuse Specifications

Use class CC, G, J, L, R, or T class fuses, with current ratings as indicated in the table below. The table below lists fuse examples recommended for use with the Ultra5000 (230V and 460V) drives.

Drive Cat. No.	Input Voltage	Input Type	Recommended Fuse	
			Class CC ⁽¹⁾	Class J ⁽¹⁾
2098-IPD-005	230V AC	Input power	FNQ-R-6	LPJ-6SP
2098-IPD-010			FNQ-R-10	LPJ-10SP
2098-IPD-020			FNQ-R-20	LPJ-20SP
2098-IPD-030			FNQ-R-30	LPJ-30SP
2098-IPD-075			FNQ-R-30	LPJ-30SP
2098-IPD-150			N/A	LPJ-60SP
2098-IPD-xxx		Auxiliary input power	FNQ-R-10	LPJ-10SP
2098-IPD-HV030	460V AC	Input power	KTK-R-5	LPJ-5SP
2098-IPD-HV050			KTK-R-8	LPJ-8SP
2098-IPD-HV100			KTK-R-20	LPJ-17-1/2SP
2098-IPD-HV150			KTK-R-30	LPJ-30SP
2098-IPD-HV220			N/A	LPJ-35SP
2098-IPD-HVxxx		Auxiliary input power	FNQ-R-10	LPJ-10SP

(1) Part numbers shown are examples of Bussmann fuses.

Circuit Breaker Specifications

While circuit breakers offer some convenience, there are limitations for their use. Circuit breakers do not handle high current inrush as well as fuses.

Make sure the selected components are properly coordinated and meet acceptable codes including any requirements for branch circuit protection. Evaluation of the short-circuit available current is critical and must be kept below the short-circuit current rating of the circuit breaker.

Circuit Breaker Examples for Ultra5000 (460V) Drives

Drive Cat. No.	Input Voltage	Circuit Breakers
2098-IPD-HV030	460V	140M-F8E-C16
2098-IPD-HV050		140M-F8E-C20
2098-IPD-HV100		140M-F8E-C32
2098-IPD-HV150		140M-F8E-C45
2098-IPD-HV220		N/A

Contactors Ratings

Drive Cat. No.	Input Voltage	Contactors
2098-IPD-HV030	460V	100-C23x10 (AC coil) 100-C23Zx10 (DC coil)
2098-IPD-HV050		100-C30x10 (AC coil) 100-C30Zx10 (DC coil)
2098-IPD-HV100		100-C37x10 (AC coil) 100-C37Zx10 (DC coil)
2098-IPD-HV150		100-C43x10 (AC coil) 100-C43Zx10 (DC coil)
2098-IPD-HV220		100-C60x10 (AC coil) 100-C60Zx10 (DC coil)

Power Dissipation Specifications

Drive Cat. No.	Max Loss W
2098-IPD-005	48
2098-IPD-010	48
2098-IPD-020	50
2098-IPD-030	150 + dissipative shunt
2098-IPD-075	300 + dissipative shunt
2098-IPD-150	500 + dissipative shunt

Drive Cat. No.	Max Loss W
2098-IPD-HV030	175 + dissipative shunt
2098-IPD-HV050	175 + dissipative shunt
2098-IPD-HV100	350 + dissipative shunt
2098-IPD-HV150	350 + dissipative shunt
2098-IPD-HV220	600 + dissipative shunt

Communication Specifications

Attribute	Value
Serial	
Ports	Two RS-232/RS-422/RS-485
Communication rates	1200, 2400, 4800, 9600, 19200, and 38400 bps
DeviceNet interface (option)	
Power consumption from network	60 mA
Data rates	125, 250, and 500 kbps
Node addresses	00...63
Messaging capabilities	Explicit, polled I/O

Inputs/Outputs Specifications

Attribute	Value
General purpose digital inputs	16 optically isolated 12...24V inputs
Inputs/outputs - sinking/sourcing selection	Software selectable as a group to be active high, current sinking or active low, current sourcing
General purpose digital outputs	7 optically isolated 12...24V Outputs - 50 mA max
General purpose relay output	1 normally open relay - 30V DC max, 1 A max current
General purpose I/O response	100 μ s
High speed input response	< 1 μ s (inputs 1 and 2)
Position capture response	< 1 μ s (input 1, input 2, motor encoder index, and auxiliary encoder index)
General purpose analog inputs	2 12-Bit analog to digital converters (+/- 10V, single-ended)
General purpose analog outputs	2 12-Bit digital to analog converters (+/- 10V, +/- 2mA, single-ended)

Memory Specifications

Attribute	Value
User program memory capacity	512 Kbps
User program memory storage medium	Flash memory, 100,000 write cycles
Non-volatile memory capacity	32 Kbps (approximately 8000 nonvolatile user variables)
Non-volatile memory storage medium	nvSRAM (high-speed SRAM/EEPROM)

Auxiliary Feedback Specifications

Attribute	Value
Input modes	A quad B
Max signal frequency	2.5 MHz
Input types	Differential

Connector Specifications

Connector	Description	Specification
CN1A	Digital I/O connector	28-position plugable spring clamp terminal block
CN1B	Auxiliary feedback/analog I/O connector	14-position plugable spring clamp terminal block
CN2	Motor feedback connector	15-pin high-density female D-sub connector
CN3A and CN3B	Serial port connectors	9-pin female D-sub connector
TB1 and TB2	Main and auxiliary AC, DC bus, motor power, and shunt connectors	Screw terminal block

Physical and Environmental Specifications

Attribute	Value		Attribute	Value	
Weight, approx.	kg	(lb)	Weight, approx.	kg	(lb)
2098-IPD-005	1.77	(3.9)	2098-IPD-HV030	8.55	(18.8)
2098-IPD-010	2.07	(4.55)	2098-IPD-HV050	8.55	(18.8)
2098-IPD-020	2.05	(4.51)	2098-IPD-HV100	10.44	(22.96)
2098-IPD-030	6.16	(13.58)	2098-IPD-HV150	10.44	(22.96)
2098-IPD-075	9.23	(20.35)	2098-IPD-HV220	14.1	(31.0)
2098-IPD-150	13.96	(30.78)	2098-IPD-HV030-DN	8.89	(19.6)
2098-IPD-005-DN	2.11	(4.7)	2098-IPD-HV050-DN	8.89	(19.6)
2098-IPD-010-DN	2.41	(5.3)	2098-IPD-HV100-DN	10.78	(23.72)
2098-IPD-020-DN	2.39	(5.3)	2098-IPD-HV150-DN	10.78	(23.72)
2098-IPD-030-DN	6.55	(14.43)	2098-IPD-HV220-DN	14.44	(31.77)
2098-IPD-075-DN	9.62	(21.20)			
2098-IPD-150-DN	14.35	(31.63)			
Operating temperature	0...55 °C (32...131 °F)				
Storage temperature	-40...70 °C (-40...158 °F)				
Humidity	5...90% noncondensing				
Altitude	1500 m (5000 ft) Derate 3% for each 300 m above 1500 m				
Vibration	10...2000 Hz, 2 g peak, 0.015 in. max displacement				
Operating/Nonoperating					
Shock	15 g 11 ms half sine				
Nonoperating					
UL Listed to U.S. and Canadian safety standards	UL 508 C File E145959				

Maximum Feedback Cable Lengths

Although motor power and feedback cables are available in standard lengths up to 90 m (295.3 ft), the drive/motor/feedback combination may limit the maximum feedback cable length. This table assumes the use of cables recommended in the Motor/Actuator Cable Selection table on [page 380](#).

Cable Lengths for Compatible Rotary Motors

Motor Cat. No.	Absolute High-resolution (5V) Encoder m (ft)	Absolute High-resolution (9V) Encoder m (ft)	Incremental/TTL (5V) Encoder m (ft)
MPL-A3xxx...MPL-A5xxx-S/M ⁽¹⁾	30 (98.4)		
MPL-B3xxx...MPL-B9xxx-S/M		30 (98.4)	
MPL-A/B3xxx...MPL-A/B45xxx-H			30 (98.4)
MPM-Axxxx-S/M	30 (98.4)		
MPM-Bxxxx-S/M		30 (98.4)	
MPF-Axxx-S/M ⁽¹⁾	30 (98.4)		
MPF-Bxxx-S/M		30 (98.4)	
MPS-Axxx-S/M	30 (98.4)		
MPS-Bxxx-S/M		30 (98.4)	
TLY-Axxx-H			30 (98.4)

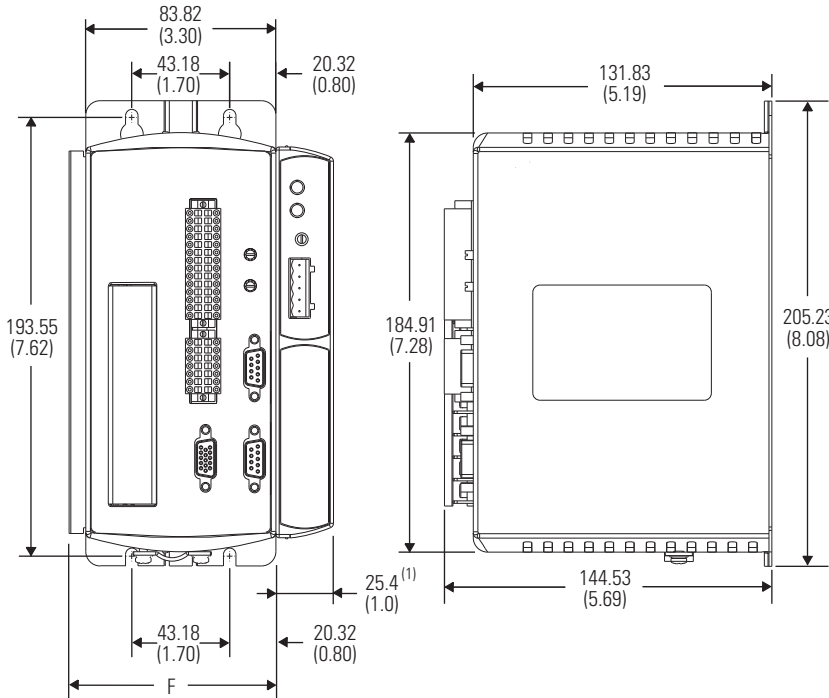
(1) MPL-A5xxx and MPF-A5xxx motor encoders are rated for 9V, the remaining Bulletin MPL and MPF (230V) motor encoders are rated for 5V.

Ultra5000 Intelligent Positioning Drive Dimensions

This section contains dimensions for the Ultra5000 and Ultra5000 DeviceNet interface drives (-DN indicates DeviceNet interface).

In the figure below, -xxx is replaced by -005, -010, or -020 to represent the Ultra5000 500 W, 1 kW, and 2 kW drives respectively.

2098-IPD-xxx and 2098-IPD-xxx-DN Dimensions (230V)



Dimensions are in mm (in.)

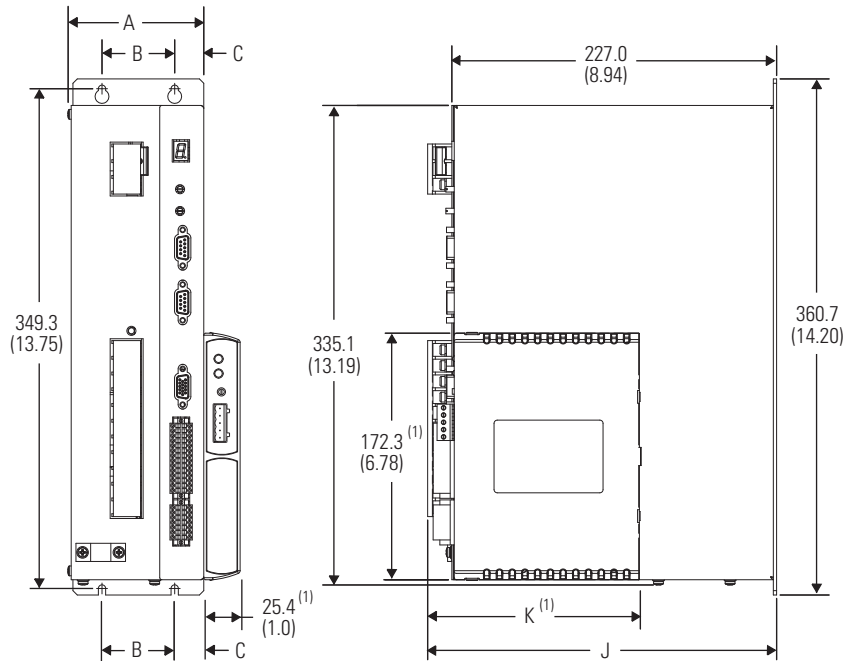
Model shown is the 2098-IPD-xxx-DN

(1) This dimension applies to only the 2098-IPD-005-DN, 2098-IPD-010-DN, and 2098-IPD-020-DN (Ultra5000 with DeviceNet interface) models.

Ultra5000 Drive	F mm (in.)
2098-IPD-005	91.19 (3.59)
2098-IPD-010-DN, 2098-IPD-020-DN	114.30 (4.50)

In the figure below, -xxx is replaced by -030, -075, or -150 to represent the Ultra5000 3, 7.5, and 15 kW drives respectively.

2098-IPD-xxx and 2098-IPD-xxx-DN Dimensions (230V)



Dimensions are in mm (in.)

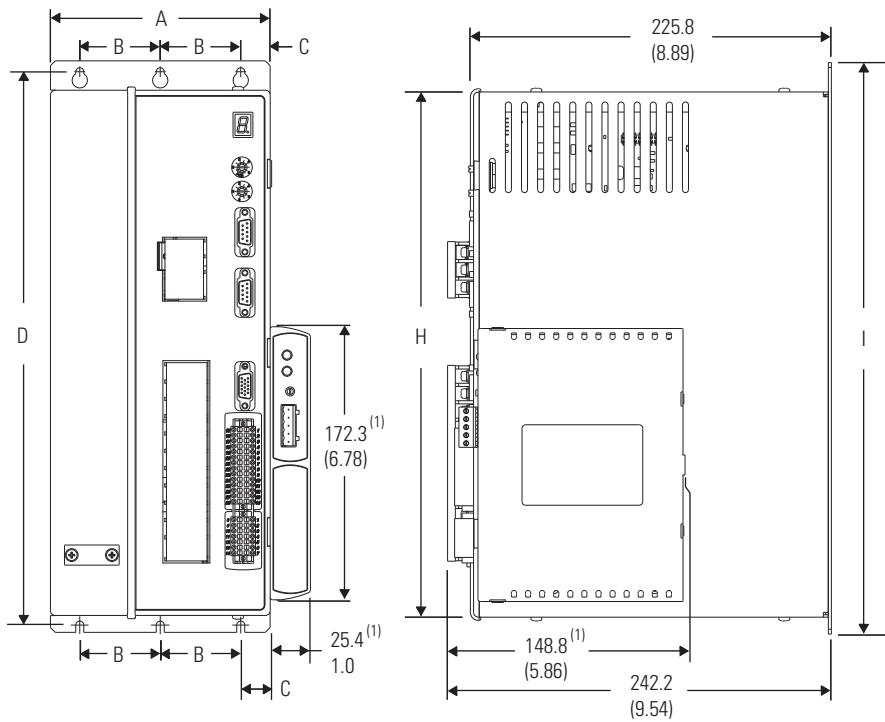
Model shown is the 2098-IPD-030-DN

(1) This dimension only applies to the 2098-IPD-030-DN, 2098-IPD-075-DN, and 2098-IPD-150-DN (Ultra5000 with DeviceNet interface) models.

Ultra5000 Drive	A mm (in.)	B mm (in.)	C mm (in.)	J mm (in.)	K mm (in.)
2098-IPD-030 2098-IPD-030-DN	92.7 (3.65)	50.8 (2.0)	20.3 (0.8)	243.9 (9.60)	149.3 (5.88)
2098-IPD-075 2098-IPD-075-DN	141.0 (5.55)	88.9 (3.50)	24.3 (0.96)	247.3 (9.73)	152.7 (6.01)
2098-IPD-150 2098-IPD-150-DN	190.5 (7.5)	69.9 (2.75)	24.9 (0.98)	245.1 (9.49)	146.5 (5.77)

In the figure below, -xxx is replaced by -030, -050, -100, -150, or -220 to represent the Ultra5000 3, 5, 10, 15, and 22 kW drives respectively.

2098-IPD-HVxxx and 2098-IPD-HVxxx-DN Dimensions (460V)



Dimensions are in mm (in.)

Model shown is the 2098-IPD-HV030-DN

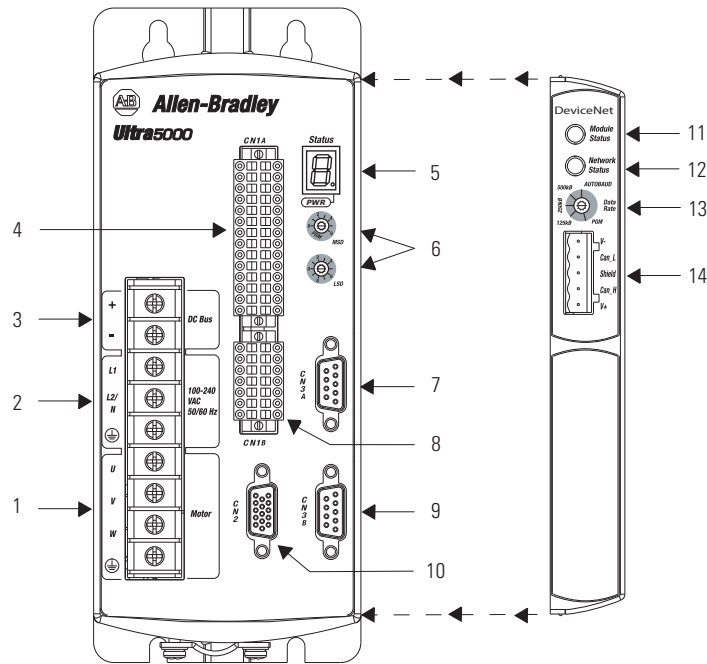
(1) This dimension applies to only the 2098-IPD-HV030-DN, 2098-IPD-HV050-DN, 2098-IPD-HV100-DN, 2098-IPD-HV150-DN, and 2098-IPD-HV220-DN (Ultra5000 with DeviceNet interface) models.

Ultra5000 Drive	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	H mm (in.)	I mm (in.)
2098-IPD-HV030, 2098-IPD-HV030-DN, 2098-IPD-HV050, 2098-IPD-HV050-DN	138.7 (5.46)	50.8 (2.0)	18.5 (0.73)	349.3 (13.75)	331.5 (13.05)	360.7 (14.20)
2098-IPD-HV100, 2098-IPD-HV100-DN, 2098-IPD-HV150, 2098-IPD-HV150-DN	151.6 (5.97)		25.0 (0.99)			
2098-IPD-HV220 2098-IPD-HV220-DN	203.2 (8.0)	76.2 (3.0)	25.4 (1.0)	380.41 (14.98)	362.6 (14.28)	391.8 (15.43)

Ultra5000 Connector, Indicator, and Switch Locations

This section provides the connector, indicator, and switch locations for the Ultra5000 and Ultra5000 DeviceNet interface drives (-DN indicates DeviceNet interface).

2098-IPD-005, 2098-IPD-010, and 2098-IPD-020 Ultra5000 (230V) Connectors



2098-IPD-005, 2098-IPD-010,
and 2098-IPD-020
Ultra5000 Drives

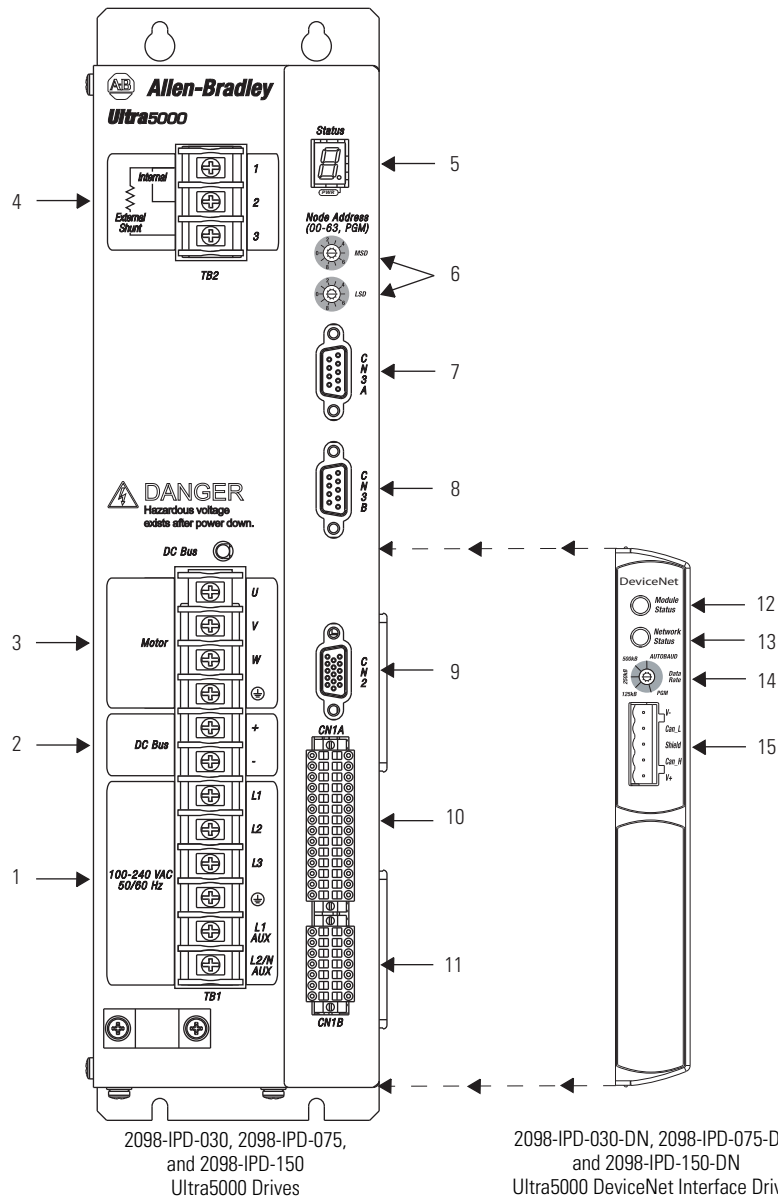
2098-IPD-005-DN, 2098-IPD-010-DN,
and 2098-IPD-020-DN
Ultra5000 DeviceNet Interface Drives

Item	Description
1	Motor power connections
2	AC input power connections
3	DC bus connections for active shunt resistor kit
4	CN1A 28-pin digital I/O connector
5	Seven-segment fault status indicator
6	Node address switches
7	CN3A 9-pin serial port connector

Item	Description
8	CN1B 14-pin auxiliary feedback and analog I/O connector
9	CN3B 9-pin auxiliary serial port connector
10	CN2 15-pin motor feedback connector
11	Module status indicator
12	Network status indicator
13	Data rate switch
14	DeviceNet interface connector

For CN1A, CN1B, CN2, and CN3 connector options, refer to Breakout Components and Connector Kits beginning on [page 418](#).

2098-IPD-030, 2098-IPD-075, and 2098-IPD-150 Ultra5000 (230V) Connectors



Item	Description
1	AC input power connections ⁽¹⁾
2	DC bus connections for active shunt resistor kit
3	Motor power connections
4	Passive shunt connections
5	Seven-segment fault status indicator

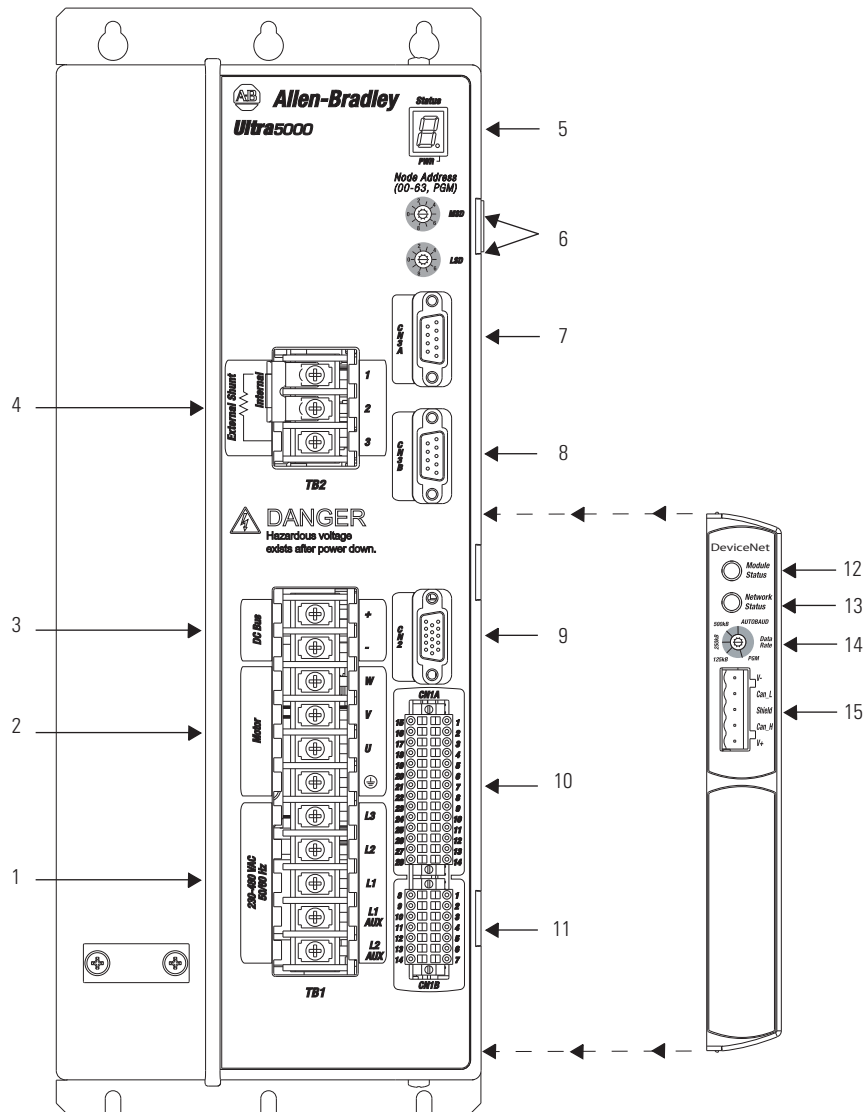
Item	Description
6	Node address switches
7	CN3A 9-pin serial port connector
8	CN3B 9-pin auxiliary serial port connector
9	CN2 15-pin motor feedback connector
10	CN1A 28-pin digital I/O connector

Item	Description
11	CN1B 14-pin auxiliary feedback and analog I/O connector
12	Module status indicator
13	Network status indicator
14	Data rate switch
15	DeviceNet interface connector

(1) The 2098-IPD-030x-xx drives do not have an L3 power terminal.

For CN1A, CN1B, CN2, and CN3 connector options, refer to Breakout Components and Connector Kits beginning on [page 418](#).

2098-IPD-HV030, 2098-IPD-HV050, 2098-IPD-HV100, 2098-IPD-HV150, and 2098-IPD-HV220 Ultra5000 (460V) Connectors



2098-IPD-HV030, 2098-IPD-HV050, 2098-IPD-HV100,
2098-IPD-HV150, and 2098-IPD-HV220
Ultra5000 Drives

2098-IPD-HV030-DN, 2098-IPD-HV050-DN,
2098-IPD-HV100-DN, 2098-IPD-HV150-DN,
and 2098-IPD-HV220-DN
Ultra5000 DeviceNet Interface Drives

Item	Description
1	AC input power connections
2	DC bus connections for active shunt resistor kit
3	Motor power connections
4	Passive shunt connections
5	Seven-segment fault status indicator

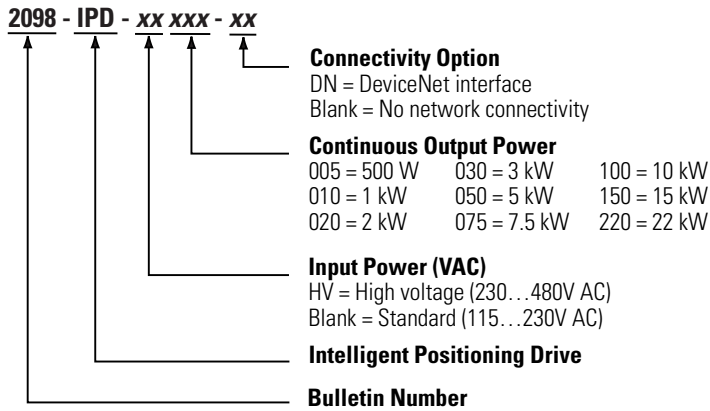
Item	Description
6	Node address switches
7	CN3A 9-pin serial port connector
8	CN3B 9-pin auxiliary serial port connector
9	CN2 15-pin motor feedback connector
10	CN1A 28-pin digital I/O connector

Item	Description
11	CN1B 14-pin auxiliary feedback and analog I/O connector
12	Module status indicator
13	Network status indicator
14	Data rate switch
15	DeviceNet interface connector

For CN1A, CN1B, CN2, and CN3 connector options, refer to Breakout Components and Connector Kits beginning on [page 418](#).

Ultra5000 Intelligent Positioning Drives Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering chart below to understand the configuration of your drive. For questions regarding product availability, contact your Allen-Bradley distributor.



Ultraware Software Catalog Number

The Ultra5000 drives are configured by using Ultraware software (catalog number 2098-UWCPRG).

Ultra1500 Digital Servo Drives



The Ultra1500 drive is an easy to use servo drive for simple servo motion control applications and architectures. The low power platform and focused function set makes the Ultra1500 servo drive family an attractive solution for simple machine control architectures including Logix, SLC, and third-party machine and motion control systems.

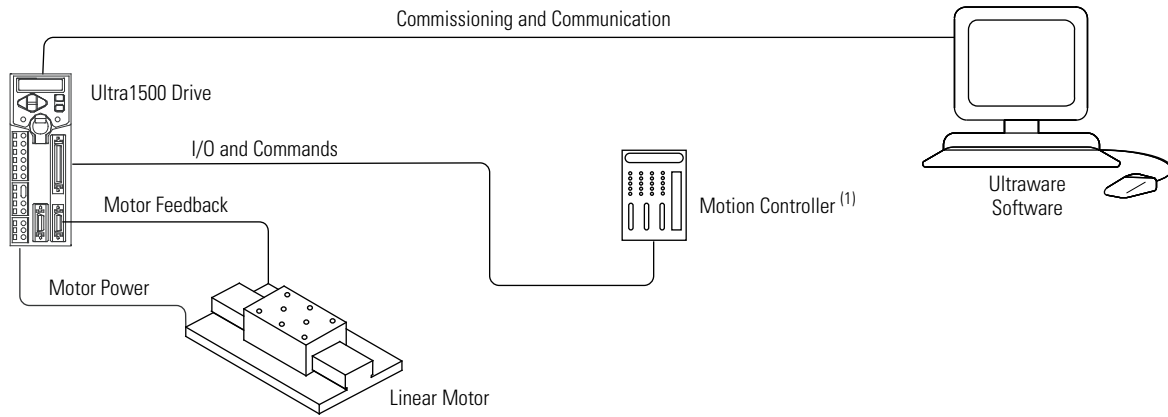
Topic	Page
Ultra1500 Servo Drive Components	365
Ultra1500 Servo Drive Specifications	367
Ultra1500 Servo Drive Dimensions	371
Ultra1500 Connector, Indicator, and Switch Locations	372
Ultra1500 Servo Drive Catalog Numbers	373

Ultra1500 Servo Drive Components

Ultra1500 servo drive systems consist of these required components:

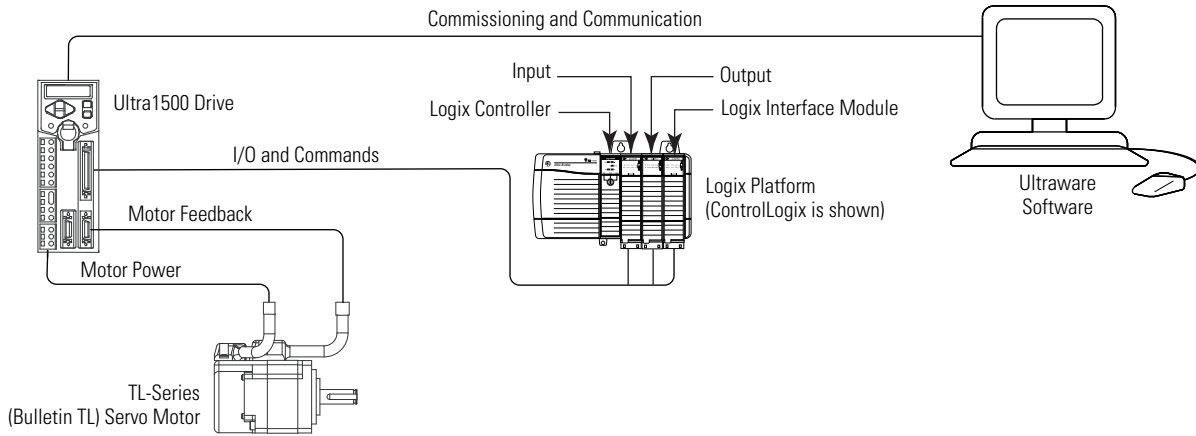
- One Ultra1500 servo drive
- One TL-Series (Bulletin TL) motor
- One motor power and feedback cable

Typical Configuration - Ultra1500 Servo Drive System (with motion controller)



(1) Third party motion controller can be used under required speed reference. Speed reference can be $\pm 10V$ or pulse train input (PTI).

Typical Configuration - Ultra1500 Servo Drive System (with Logix platform)



Ultra1500 Servo Drive Specifications

This section contains general power, physical/environmental, power dissipation, controller, I/O, operating modes command sources, serial communication, network communication, feedback, and connector specifications for the Ultra1500 digital servo drives.

Ultra1500 Servo Drive Power Specifications

Attribute	Value				
	2092-DA1	2092-DA2	2092-DA3	2092-DA4	2092-DA5
AC input voltage ⁽¹⁾ ⁽²⁾	200...240V rms single-phase			200...240V rms three-phase	
AC input frequency	50/60 Hz			50/60 Hz	
Main AC input current ⁽³⁾ Nom (rms) Max inrush (0-pk) 240V AC input	3.3 A 200 A	5.5 A 200 A	8.0 A 200 A	11 A 200 A	15 A 200 A
Control AC input current Nom (rms) 240V AC input Max inrush (0-pk) 240V AC input	2.0 A 75 A	2.0 A 75 A	2.0 A 75 A	2.0 A 75 A	2.0 A 75 A
Continuous output current (rms)	1.0 A	1.7 A	3.3 A	7.6 A	11.6 A
Continuous output current (0-pk)	1.4 A	2.4 A	4.7 A	10.7 A	16.4 A
Peak output current (rms)	2.4 A	5.1 A	8.0 A	17.5 A	30.7A
Peak output current (0-pk)	3.4 A	7.2 A	11.3 A	24.8 A	43.4 A
Bus capacitance	660 μ F			990 μ F	
Internal shunt resistance	N/A	N/A	50 Ω	50 Ω	30 Ω
Shunt on	N/A	N/A	390V DC		
Shunt off	N/A	N/A	380V DC		
Bus overvoltage	410V DC				
Internal shunt Continuous power Peak power	N/A N/A	N/A N/A	30 W 3 kW	50 W 3 kW	70 W 5 kW

(1) Specification is for nominal voltage. The absolute limits are $\pm 10\%$, or 180...264V rms.

(2) The AC input voltage between any two input power pins (L1, L2, L3, L1C, L2C, and chassis) must not exceed this rating. This note also applies to the chassis ground connection, which implies that transformer secondaries must be grounded.

(3) The 2092-DAx Ultra1500 drives are limited to one contactor cycles per two minutes.

Fuse Specifications

Drive Cat. No.	Recommended Main Power Fuses ⁽¹⁾		Recommended Control Power Fuses ⁽¹⁾		
	Group 1 ⁽²⁾	Group 2 ⁽³⁾	Group 1 ⁽⁴⁾	Group 2 ⁽²⁾	Group 3 ⁽³⁾
2092-DA1	FNQ-R-7	N/A	FRS-R-2-1/2	FNQ-R-7-1/2	LPJ-6
2092-DA2					
2092-DA3	FNQ-R-10				
2092-DA4	FNQ-R-15	LPJ-15			
2092-DA5	FNQ-R-20	LPJ-20			

(1) Part numbers shown are examples of Bussmann fuses.

(2) FNQ-R fuses are time-delay Fuses, class CC.

(3) LPJ fuses are dual-element, time-delay fuses, class J.

(4) FRS-R fuses are dual-element, time-delay fuses, class RK5.

Circuit Breaker Specifications

While circuit breakers offer some convenience, there are limitations for their use. Circuit breakers do not handle high current inrush as well as fuses.

Make sure the selected components are properly coordinated and meet acceptable codes including any requirements for branch circuit protection. Evaluation of the short-circuit available current is critical and must be kept below the short-circuit current rating of the circuit breaker.

Contactors Ratings

Drive Cat. No.	Contactors ⁽¹⁾
2092-DA1	100-M05N _{xy}
2092-DA2	100-M09N _{xy}
2092-DA3	100-M12N _{xy}
2092-DA4	100-C16 _{xy}
2092-DA5	100-C23 _{xy}

(1) For contactors: x represents coil voltage, and y represents number of contacts.

Power Dissipation Specifications

Drive Cat. No.	Max Loss W
2092-DA1	50
2092-DA2	50
2092-DA3	50 + 30 (internal shunt)
2092-DA4	100 + 50 (internal shunt)
2092-DA5	150 + 70 (internal shunt)

Communication Specifications

Attribute	Value
Serial	
Ports	One RS-232
Communication rates	38,400 bps

Inputs/Outputs Specifications

Attribute	Value
Digital inputs	7 optically isolated, 24V, active low, current sinking
Digital outputs	3 optically isolated, 24V, active low or active high, current sinking or sourcing
I/O response	100 μ s
Digital I/O firmware scan delay	6 ms
Analog inputs	Velocity command 16-bit A/D, ± 10 V
	Current command 12-bit A/D, ± 10 V
Analog output	± 10 V, 8 bits, 10 mA max

Position Command Specifications

Attribute	Value
Input modes	A quad B, step/direction, CW/CCW
Max input frequency and type	250 kHz with open collector input
	900 kHz with differential driver input

Physical and Environmental Specifications

Attribute	Value	
Weight, approx.		
2092-DA1	0.90 kg	(1.98 lb)
2092-DA2	0.90 kg	(1.98 lb)
2092-DA3	1.20 kg	(2.65 lb)
2092-DA4	2.10 kg	(4.63 lb)
2092-DA5	2.10 kg	(4.63 lb)
Ambient temperature	Storage: -20...80 °C (-4...176 °F) Operation: 0...50 °C (32...122 °F)	
Relative humidity	5...95% noncondensing	
Altitude	1500 m (4921.5 ft) - Derate 3% per 300 m (984.3 ft) above 1500 m (4,921.5 ft)	
Vibration	5...500 Hz @ 2.5 g, 0.381 mm (0.015 in.) max displacement	
Shock	15 g, 11 ms half-sine	

Connector Specifications

Connector	Description	Specification
CN1	User input/output	50-pin mini-D connector
CN2	Motor feedback connector	20-pin mini-D connector
CN3	Serial interface connector	20-pin female-D connector
Main AC input, DC bus, motor power, and shunt connections		Single-row, spring clamp connectors with 7.5 mm spacing

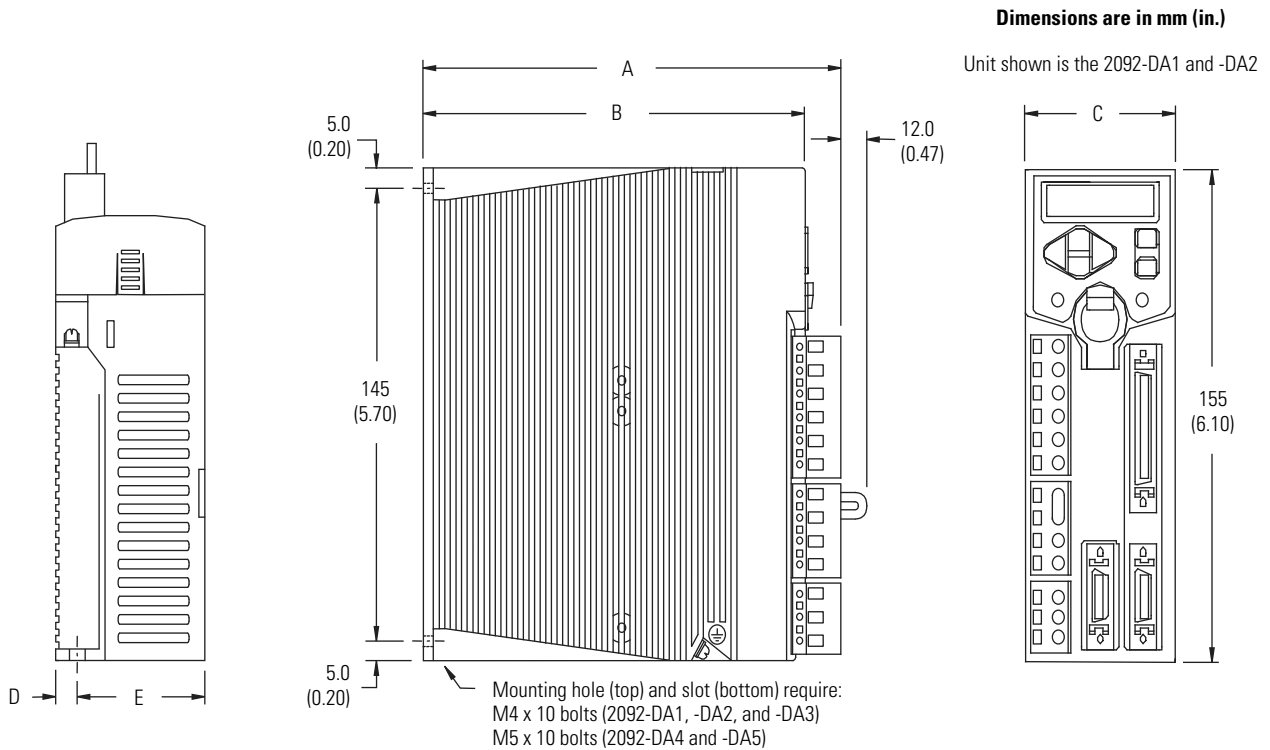
Maximum Feedback Cable Lengths

Although motor power and feedback cables are available in standard lengths up to 90 m (295.3 ft), the drive/motor/feedback combination may limit the maximum feedback cable length. This table assumes the use of cables recommended in the Motor/Actuator Cable Selection table on [page 380](#).

Cable Lengths for Compatible Rotary Motors

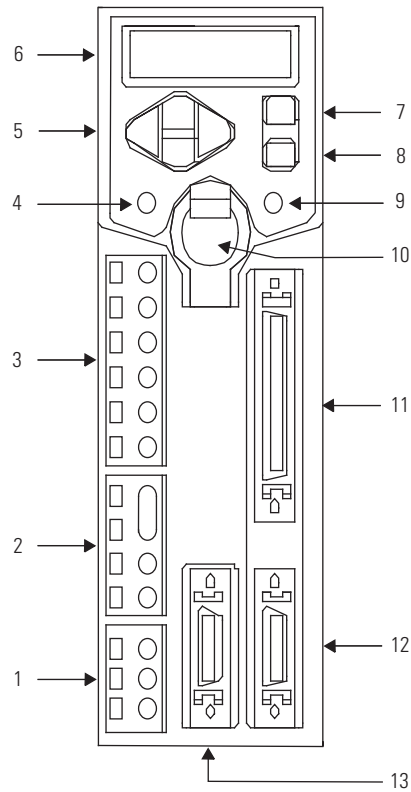
Motor Cat. No.	Absolute High-resolution (5V) 17-bit Encoder m (ft)
TL-Axxx-B	30 (98.4)

Ultra1500 Servo Drive Dimensions



Ultra1500 Drive	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2092-DA1	153 (6.02)	140 (5.51)	55 (2.17)	5.0 (0.20)	50 (1.97)
2092-DA2			70 (2.76)	20 (0.79)	
2092-DA3			90 (3.54)	27 (1.06)	
2092-DA4	198 (7.80)	185 (7.28)			63 (2.48)
2092-DA5					

Ultra1500 Connector, Indicator, and Switch Locations



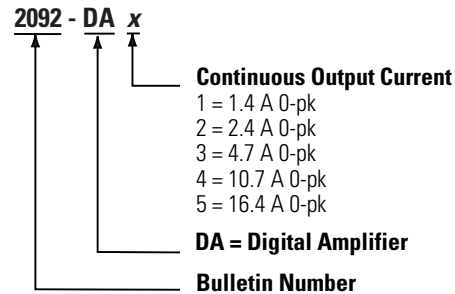
Item	Description
1	Motor power connections
2	DC Bus and shunt power connections
3	Input power connections
4	Main power indicator
5	Left/right and up/down key
6	Seven-segment status display
7	Mode/set key

Item	Description
8	Enter key
9	Control panel indicator
10	Battery compartment
11	CN1 50-pin user I/O connector
12	CN2 20-pin motor feedback connector
13	CN3 20-pin serial interface connector

For CN1, CN2, and CN3 connector options, refer to Drive-end Connector Kits on [page 414](#).

Ultra1500 Servo Drive Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering chart below to understand the configuration of your drive. For questions regarding product availability, contact your Allen-Bradley distributor.



Ultra1500 Battery Catalog Number

The Ultra1500 3.6V lithium battery (catalog number 2090-DA-BAT2) provides multi-turn encoder operation to TL-Series motors when installed in an Ultra1500 drive. Lithium batteries have special storage, shipping, and disposal requirements. Refer to the Ultra1500 Servo Drive User Manual, publication [2092-UM001](#), for more information.

Ultraware Software Catalog Number

The Ultra1500 drives are configured by using Ultraware software (catalog number 2098-UWCPRG).

Notes:

Motion Control Accessories

This chapter includes compatibility tables, dimensions, specifications, and catalog numbers for the accessories that support the Kinetix Motion Control drive families.

Motor and Interface Cables		Page
Cable Selection	Motor/Actuator Cable Descriptions and Examples	376
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	Transition Cable Dimensions	403
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Cable Specifications	Motor Power Cable Specifications	408
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Breakout Boards and Connector Kits for I/O, Safety, and Feedback Connections		Page
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	Bulletin 2094 Slot-filler Module	441

Drive Accessories Kits		Page
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	Kinetix 2000 Cable Clamp Bracket Kit	445
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	Kinetix 7000 DC-DC Converter and Control Board Kits	447
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Drive Power Components		Page
	Line Interface Modules	450
	AC Line Filters	462
	External Shunt Modules	471
	Resistive Brake Modules	479
	8720MC Regenerative Power Supplies	483
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Cables

A wide variety of cable products are available for connecting your motion control system. Motor power and feedback cables are available for all Allen-Bradley servo motors. Continuous-flex rated cables, intended for moving applications, are available for servo motors and actuators with rugged DIN connectors. Communication and interface cables are available for connecting servo drives to ControlLogix and CompactLogix controllers, and to other Allen-Bradley products.

IMPORTANT

All flying-lead feedback cables require breakout components or connector kits for drive-end terminations. Refer to Breakout Components and Connector Kits beginning on [page 418](#) for catalog numbers and descriptions.

IMPORTANT

Standard (non-flex) cables have a static or one-time bend radius of ten times (10x) the cable diameter. For flexing applications, continuous-flex cables have an operational bend radius of twelve times (12x) the cable diameter.

Feedback Cable Descriptions

Standard Cable Cat. No.	Description	Connector Style
2090-XXNFMF-Sxx	Feedback	Threaded DIN
2090-CFBM4DF-CEAAxx	Feedback (resolver)	
2090-CFBM4E2-CATR	Feedback transition ⁽¹⁾	
2090-CFBM6DF-CBAAxx	Feedback (drive-end flying-lead)	Circular Plastic
2090-CFBM6DD-CCAAxx	Feedback (drive-end connector)	
2090-DANFCT-Sxx	Feedback	Rectangular Plastic

Continuous-flex Cable Cat. No.	Description	Connector Style
2090-CFBM4DF-xxAFxx	Feedback	Threaded DIN
2090-CFBM7DF-xxAFxx		SpeedTec DIN
2090-CPBM7E7-xxAFxx	Feedback extension	

(1) Threaded DIN connector (motor end) and bayonet connector for existing 2090-XXNFMP-Sxx cable. Refer to Continuous-flex Extension Cables on [page 377](#).

Power/Brake Cable Descriptions

Standard Cable Cat. No.	Description	Connector Style
2090-XXNPMF-xxSxx	Power/brake	Threaded DIN
2090-CPBM7DF-xxAAxx		SpeedTec DIN
2090-CPBM4E2-xxTR	Power/brake transition ⁽¹⁾	Threaded DIN
2090-CPWM4E2-xxTR	Power-only transition ⁽¹⁾	
2090-CPBM6DF-16AAxx	Power/brake	Circular Plastic
2090-CPWM6DF-16AAxx	Power-only	
2090-DANPT-16Sxx	Brake	Rectangular Plastic
2090-DANBT-18Sxx		

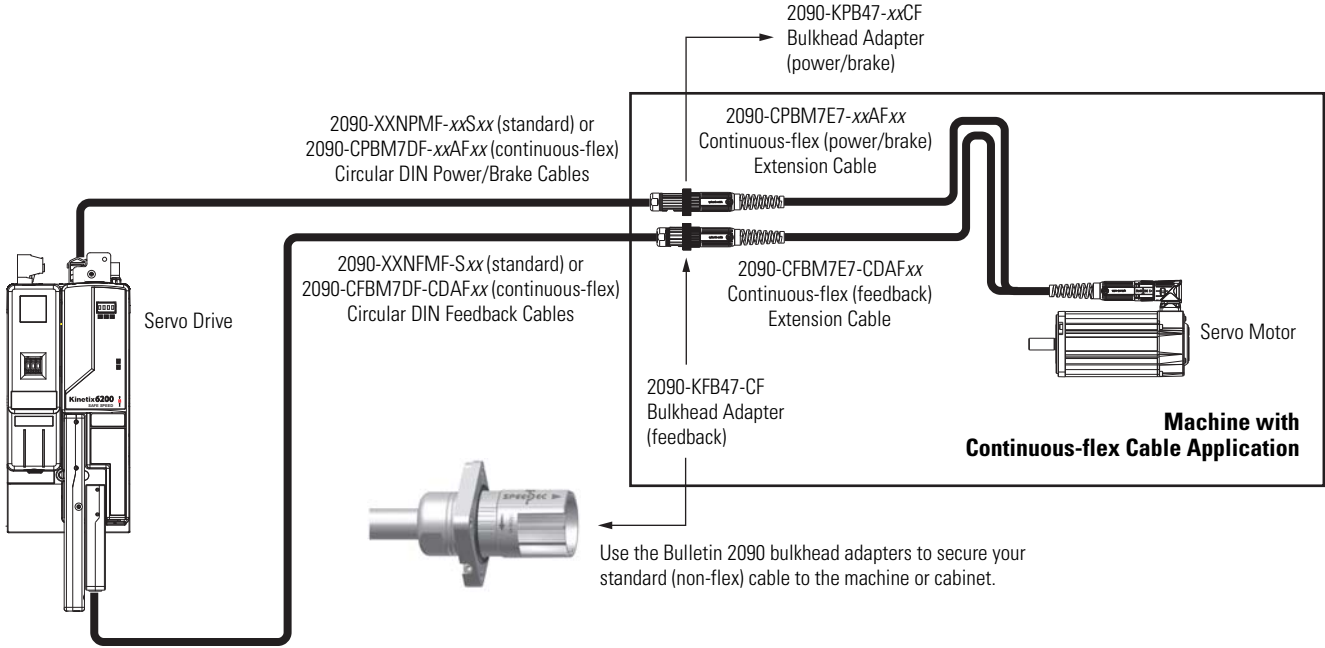
Continuous-flex Cable Cat. No.	Description	Connector Style
2090-CPBM4DF-xxAFxx	Power/brake	Threaded DIN
2090-CPWM4DF-xxAFxx	Power only	
2090-CPBM7DF-xxAFxx	Power/brake	SpeedTec DIN
2090-CPWM7DF-xxAFxx	Power only	
2090-CPBM7E7-xxAFxx	Power/brake extension	

(1) Threaded DIN connector (motor end) and bayonet connector for existing 2090-XXNPMP-xxSxx cable. Refer to Continuous-flex Extension Cables on [page 377](#).

Continuous-flex Extension Cables

Motor power and feedback extension cables provide continuous-flex cable technology between your standard cable and the continuous-flex application. Extension cables are available in lengths up to 30 m (98.4 ft). Extension power cables are available in 16, 14, and 10 AWG.

Typical Extension Cable Application with Bulkhead Adapter



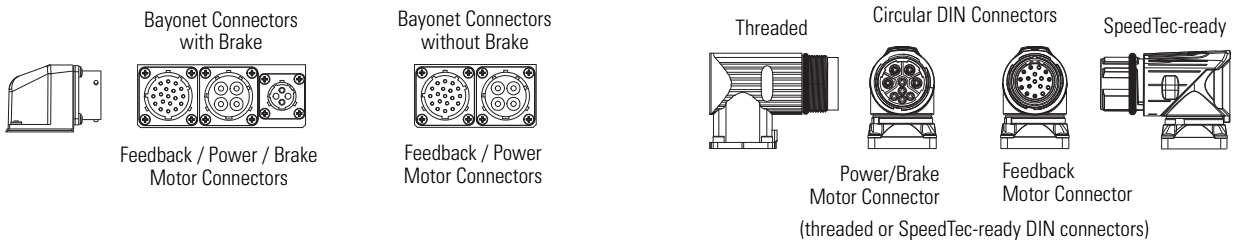
Motor Power and Feedback Transition Cables

Motor power/brake and feedback transition cables support installations where MP-Series (Bulletin MPL) motors with bayonet connectors were recently replaced by the same motor with circular DIN connectors. These 0.5 m (19.7 in.) cables provide a seamless transition between your new motor and existing power, brake, and feedback cables.

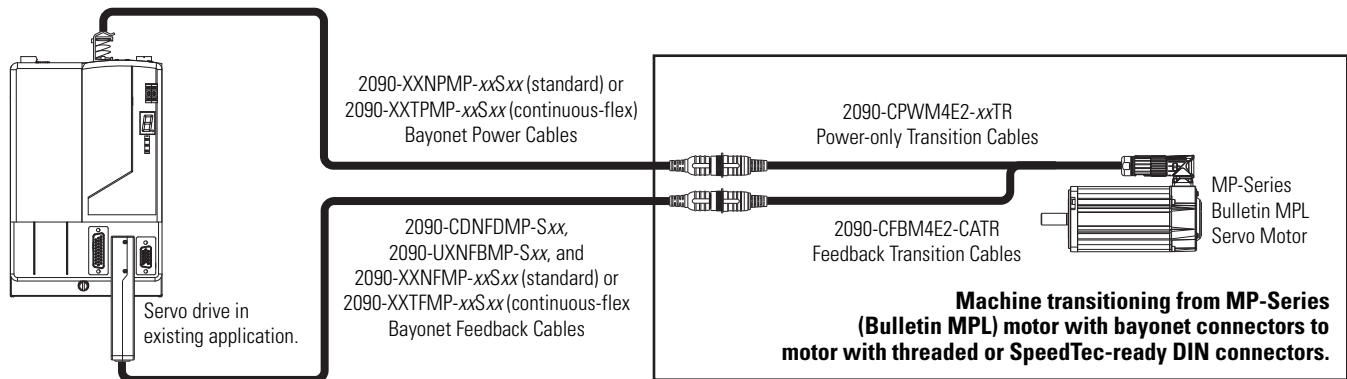
TIP

Brake contacts for motors with bayonet connectors are in a separate connector. Power/brake cables with circular DIN connectors (either threaded or SpeedTec) include brake contacts in the power/brake connector.

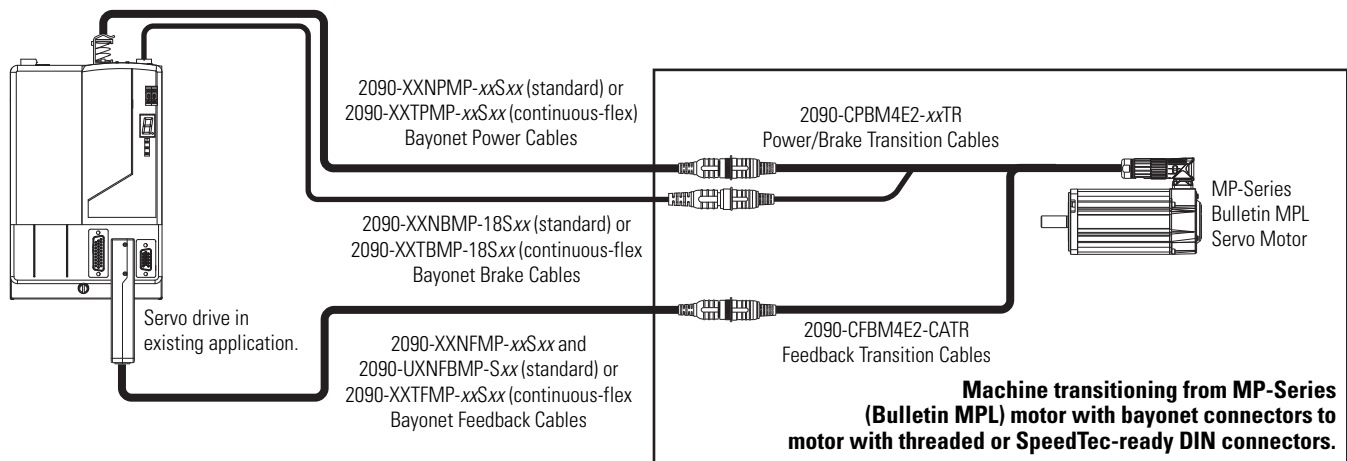
Bayonet and Circular DIN Motor Connectors



Transition Cable Application (power-only cable)



Transition Cable Application (power/brake cable)



Circular DIN Motor Connectors and Cable Plugs

Motors equipped with either threaded or SpeedTec circular DIN connectors are listed below. Circular DIN motor connectors rotate up to 180° and combine power and brake wires in the same connector.

Motor Connector/Cable Plug Compatibility

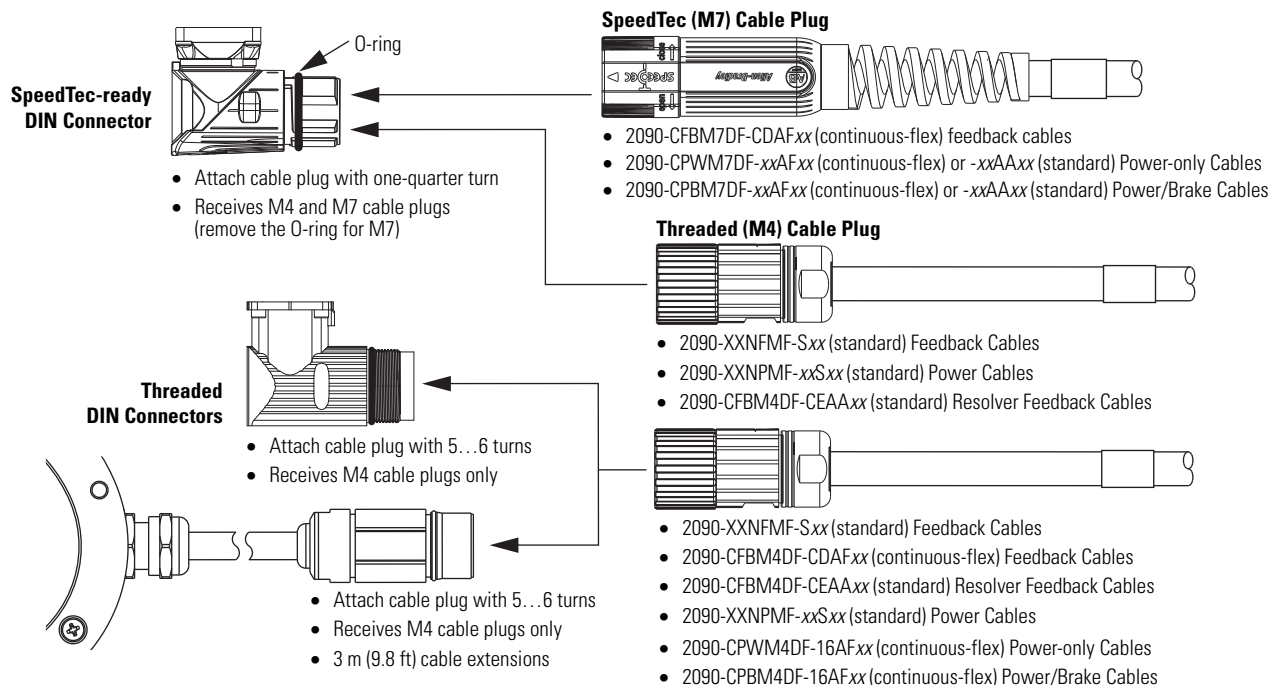
Motor/Actuator Cat. No.	Connector Type	Power-only or Power/Brake	Feedback
MPL-A/B3xxx, MPL-A/B4xxx, MPL-A/B45xxx, MPL-A/B5xxx MPL-B6xxx, MPL-B8xxx, and MPL-B9xxx MPM-A/Bxxxx MPF-A/Bxxxx RDB-Bxxxx MPAR-A/B3xxxx MPAI-A/Bxxxx LDC-Cxxxxxxx and LDL-xxxxxxx	SpeedTec-ready DIN	2090-CPxM7DF-xxAxxx <ul style="list-style-type: none"> M7 cable plugs Remove the O-ring Adapts to SpeedTec-ready connectors only 	2090-CFBM7DF-CDAFxx
MPL-A/B15xxx and MPL-A/B2xxx MPAS-A/Bxxxx MPMA-A/Bxxxx MPAR-A/B1xxxx and MPAR-A/B2xxxx HPK-B/Exxxx	Threaded DIN	2090-XXNPMF-Sxx or 2090-CPxM4DF-xxAxxx <ul style="list-style-type: none"> M4 cable plugs Adapts to threaded or SpeedTec-ready connectors 	2090-XXNFMF-Sxx or 2090-CFBM4DF-CxAFxx
MPS-A/Bxxxx	Threaded DIN with 3 m (9.8 ft) cable extensions	<ul style="list-style-type: none"> O-ring required for proper seal of the connector interface 	

IMPORTANT

Motors equipped with SpeedTec-ready DIN connectors are fully compatible with threaded (M4) cable plugs. SpeedTec-ready DIN motor connectors are also compatible with SpeedTec (M7/E7) cable plugs when the o-ring on the motor connector is removed.

Motors equipped with threaded DIN (M4) connectors are compatible only with threaded (M4) cable plugs.

Typical Circular DIN Cable Applications



Motor/Actuator Cable Selection

These tables provide flying-lead motor cable catalog numbers for drive/motor combinations. Most motor brake wires are in the power cable, so a separate brake cable is not required (except where noted).

IMPORTANT

The MP-Series low-inertia motors on this page are equipped with DIN connectors (specified by 4 or 7 in the catalog number) and are not compatible with cables designed for motors equipped with bayonet connectors (specified by 2 in the catalog number). The motors with bayonet connectors (for example, MPL-A310P-xx2xAA) are being discontinued and require 2090-XXNFMP-Sxx (bayonet) cables. For help with migration or to select bayonet cables, contact your Rockwell Automation sales representative.

MP-Series (Bulletin MPL) Motor Feedback Cables

Motor Cat. No.	Compatible Drive Cat. No.	Feedback Type	Feedback Cable Cat. No.
MPL-A15xxx-V/Ex4xAA, MPL-A2xxx-V/Ex4xAA	2093-AC05-MPx or 2093-AMxx 2094-ACxx-Mxx-S or 2094-AMxx-S 2097-V3xxxx 2098-DSD-xxx	Multi-turn High-resolution Absolute or Single-turn High-resolution Encoder Feedback	2090-XXNFMF-Sxx (standard) 2090-CFBM4DF-CDAFxx (continuous-flex)
MPL-B15xxx-V/Ex4xAA, MPL-B2xxx-V/Ex4xAA	2094-BCxx-Mxx-S or 2094-BMxx-S 2097-V3xxxx 2098-DSD-HVxxx		
MPL-A3xxx-M/Sx7xAA, MPL-A5xxx-M/Sx7xAA	2093-AC05-MPx or 2093-AMxx 2094-ACxx-Mxx-S or 2094-AMxx-S 2097-V3xxxx 2098-DSD-xxx 2098-IPD-xxx	Multi-turn High-resolution Absolute or Single-turn High-resolution Encoder Feedback	2090-XXNFMF-Sxx (standard) 2090-CFBM7DF-CDAFxx (continuous-flex)
MPL-B3xxx-M/Sx7xAA, MPL-B9xxx-M/Sx7xAA	2094-BCxx-Mxx-S or 2094-BMxx-S 2097-V3xxxx 2098-DSD-HVxxx 2098-IPD-HVxxx 2099-BMxx-S		
MPL-A15xxx-Hx4xAA, MPL-A2xxx-Hx4xAA	2093-AC05-MPx or 2093-AMxx 2094-ACxx-Mxx-S or 2094-AMxx-S 2097-V3xxxx 2098-DSD-xxx	Incremental ⁽¹⁾ Feedback	2090-XXNFMF-Sxx (standard) 2090-CFBM4DF-CDAFxx (continuous-flex)
MPL-B15xxx-Hx4xAA, MPL-B2xxx-Hx4xAA	2094-BCxx-Mxx-S or 2094-BMxx-S 2097-V3xxxx 2098-DSD-HVxxx		
MPL-A3xxx-Hx7xAA, MPL-A4xxx-Hx7xAA, MPL-A45xxx-Hx7xAA	2093-AC05-MPx or 2093-AMxx 2094-ACxx-Mxx-S or 2094-AMxx-S 2097-V3xxxx 2098-DSD-xxx 2098-IPD-xxx		
MPL-Bxxxx-Rx4xAA	2094-BCxx-Mxx-S or 2094-BMxx-S	Resolver Feedback ⁽¹⁾	2090-CFBM4DF-CEAAxx (standard)

(1) Not all MP-Series low-inertia motors are available with incremental and resolver feedback options.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

IMPORTANT

The MP-Series low-inertia motors on this page are equipped with DIN connectors (specified by 4 or 7 in the catalog number) and are not compatible with cables designed for motors equipped with bayonet connectors (specified by 2 in the catalog number). The motors with bayonet connectors (for example, MPL-A310P-xx2xAA) are being discontinued and require 2090-XXNPMP-xxSxx (bayonet) cables. For help with migration or to select bayonet cables, contact your Rockwell Automation sales representative.

MP-Series (230V) Low Inertia Motors	Power Cable Cat. No.
MPL-A15xxx-xx4xAA, MPL-A2xxx-xx4xAA	2090-XXNPMF-16Sxx (standard) 2090-CPxM4DF-16AFxx (continuous-flex)
MPL-A3xxx-xx7xAA	2090-XXNPMF-16Sxx (standard) 2090-CPxM7DF-16AFxx (continuous-flex)
MPL-A420P-xx7xAA, MPL-A430H-xx7xAA	
MPL-A4530F-xx7xAA, MPL-A4540C-xx7xAA	
MPL-A430P-xx7xAA, MPL-A4530K-xx7xAA, MPL-A4540F-xx7xAA	2090-XXNPMF-14Sxx (standard) 2090-CPxM7DF-14AFxx (continuous-flex)
MPL-A4560F-xx7xAA	2090-CPxM7DF-12AAxx (standard)
MPL-A520K-xx7xAA	2090-XXNPMF-10Sxx (standard) 2090-CPxM7DF-10AFxx (continuous-flex)
MPL-A540K-xx7xAA, MPL-A560F-xx7xAA	2090-CPBM7DF-08AAxx (standard)
MP-Series (460V) Low Inertia Motors	Power Cable Cat. No.
MPL-B15xxx-xx4xAA, MPL-B2xxx-xx4xAA	2090-XXNPMF-16Sxx (standard) 2090-CPxM4DF-16AFxx (continuous-flex)
MPL-B3xxx-xx7xAA	2090-XXNPMF-16Sxx (standard) 2090-CPxM7DF-16AFxx (continuous-flex)
MPL-B4xxx-xx7xAA	
MPL-B45xxx-xx7xAA	
MPL-B520K-xx7xAA	2090-XXNPMF-14Sxx (standard) 2090-CPxM7DF-14AFxx (continuous-flex)
MPL-B540D-xx7xAA, MPL-B540K-xx7xAA, MPL-B560F-xx7xAA	
MPL-B580F-xx7xAA, MPL-B580J-xx7xAA	2090-XXNPMF-10Sxx (standard) 2090-CPxM7DF-10AFxx (continuous-flex)
MPL-B640F-xx7xAA	2090-CPBM7DF-08AAxx (standard)
MPL-B660F-xx7xAA, MPL-B680D-xx7xAA, MPL-B960B-xx7xAA, MPL-B980B-xx7xAA	
MPL-B680F-xx7xAA, MPL-B860D-xx7xAA, MPL-B880C-xx7xAA, MPL-B960C-xx7xAA	2090-CPBM7DF-06AAxx (standard)
MPL-B880D-xx7xAA	2090-CPBM7DF-04AAxx (standard)
MPL-B960D-xx7xAA, MPL-B980C-xx7xAA, MPL-B980D-xx7xAA	

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

MP-Series Food Grade Motors

Motor Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
MPF-Axxx-M/S	2093-AC05-MP x or 2093-AM xx 2094-AC xx -M xx -S or 2094-AM xx -S 2097-V3 $xxxx$ 2098-DSD- xxx 2098-IPD- xxx	Multi-turn High Resolution Absolute or Single-turn High Resolution Encoder Feedback	2090-XXNFMF-S xx (standard) 2090-CFBM7DF-CDAF xx (continuous-flex)
MPF-Bxxx-M/S	2094-BC xx -M xx -S or 2094-BM xx -S 2097-V3 $xxxx$ 2098-DSD-HV xxx 2098-IPD-HV xxx		

MP-Series (230V) Food Grade Motors	Power Cable Cat. No.
MPF-A310P, MPF-A320H, MPF-A320P, and MPF-A330P	2090-XXNPMF-16S xx (standard) 2090-CPxM7DF-16AF xx (continuous-flex)
MPF-A430H	
MPF-A430P, MPF-A4530K and MPF-A4540F	2090-XXNPMF-14S xx (standard) 2090-CPxM7DF-14AF xx (continuous-flex)
MPF-A540K	2090-CPBM7DF-08AA xx (standard)

MP-Series (460V) Food Grade Motors	Power Cable Cat. No.
MPF-B310P, MPF-B320P, and MPF-B330P	2090-XXNPMF-16S xx (standard) 2090-CPxM7DF-16AF xx (continuous-flex)
MPF-B430P, MPF-B4530K, and MPF-B4540F	
MPF-B540K	2090-XXNPMF-10S xx (standard) 2090-CPxM7DF-10AF xx (continuous-flex)

MP-Series Stainless Steel Motors

Motor Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
MPS-Axxx-M/S	2093-AC05-MP x or 2093-AM xx 2094-AC xx -M xx -S or 2094-AM xx -S 2097-V3 $xxxx$ 2098-DSD- xxx 2098-IPD- xxx	Multi-turn High Resolution Absolute or Single-turn High Resolution Encoder Feedback	2090-XXNFMF-S xx (standard) 2090-CFBM4DF-CDAF xx (continuous-flex)
MPS-Bxxx-M/S	2094-BC xx -M xx -S or 2094-BM xx -S 2097-V3 $xxxx$ 2098-DSD-HV xxx 2098-IPD-HV xxx		

MP-Series (230V) Stainless Steel Motors	Power Cable Cat. No.
MPS-A330P	2090-XXNPMF-16S xx (standard) 2090-CPxM4DF-16AF xx (continuous-flex)
MPS-A4540F	

MP-Series (460V) Stainless Steel Motors	Power Cable Cat. No.
MPS-B330P	2090-XXNPMF-16S xx (standard) 2090-CPxM4DF-16AF xx (continuous-flex)
MPS-B4540F	
MPS-B560F	2090-XXNPMF-14S xx (standard) 2090-CPxM4DF-14AF xx (continuous-flex)

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

MP-Series Medium Inertia Motors

Motor Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
MPM-Axxxxx-M/S	2093-AC05-MP x or 2093-AM xx 2094-AC xx -M xx -S or 2094-AM xx -S 2097-V3 $xxxx$ 2098-DSD- xxx	Multi-turn High Resolution Absolute or Single-turn High Resolution Encoder Feedback	2090-XXNFMF-S xx (standard) 2090-CFBM7DF-CDAF xx (continuous-flex)
MPM-Bxxxxx-M/S	2094-BC xx -M xx -S or 2094-BM xx -S 2094-BC xx -M xx -M or 2094-BM xx -M 2097-V3 $xxxx$ 2098-DSD-HV xxx 2099-BM xx -S		
MPM-Axxxxx-2	2094-AC xx -M xx -S or 2094-AM xx -S	Resolver Feedback ⁽¹⁾	2090-CFBM4DF-CEAA xx (standard)
MPM-Bxxxxx-2	2094-BC xx -M xx -S or 2094-BM xx -S		

(1) Not all MP-Series medium-inertia motors are available with the resolver feedback option.

MP-Series (200V Class) Medium Inertia Motors	Power Cable Cat. No.
MPM-A115 xx	2090-XXNPMF-16S xx (standard) 2090-CPxM7DF-16AF xx (continuous-flex)
MPM-A1302F	2090-XXNPMF-14S xx (standard) 2090-CPxM7DF-14AF xx (continuous-flex)
MPM-A1304F	2090-CPxM7DF-12AA xx (standard)
MPM-A1651F	2090-XXNPMF-10S xx (standard) 2090-CPxM7DF-10AF xx (continuous-flex)
MPM-A1652F, MPM-A1653F	2090-CPBM7DF-08AA xx (standard)
MPM-A215 xx	2090-CPBM7DF-06AA xx (standard)

MP-Series (400V Class) Medium Inertia Motors	Power Cable Cat. No.
MPM-B1151 x , MPM-B1152 x	2090-XXNPMF-16S xx (standard) 2090-CPxM7DF-16AF xx (continuous-flex)
MPM-B1153E, MPM-B1153F	
MPM-B1302F, MPM-B1302M, MPM-B1304C, MPM-B1304E	
MPM-B1651C, MPM-B1652C	
MPM-B1153T	2090-XXNPMF-14S xx (standard) 2090-CPxM7DF-14AF xx (continuous-flex)
MPM-B1302T, MPM-B1304M	
MPM-B1651F, MPM-B1653C	
MPM-B1652E	2090-CPxM7DF-12AA xx (standard)
MPM-B1651M, MPM-B1652F, MPM-B1653E	2090-XXNPMF-10S xx (standard) 2090-CPxM7DF-10AF xx (continuous-flex)
MPM-B2152C, MPM-B2153B	
MPM-B1653F	2090-CPBM7DF-08AA xx (standard)
MPM-B2152F, MPM-B2152M, MPM-B2153E, MPM-B2153F, MPM-B2154B, MPM-B2154E, MPM-B2154F	

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

RDD-Series Direct Drive Motors

Motor Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
RDB-Bxxxx-7/3	2094-BCxx-Mxx-S or 2094-BMxx-S 2094-BCxx-Mxx-M or 2094-BMxx-M 2097-V3xxxx 2099-BMxx-S	Multi-turn High Resolution Absolute or Single-turn High Resolution Encoder Feedback	2090-XXNFMF-Sxx (standard) 2090-CFBM7DF-CDAFxx (continuous-flex) flying-lead

RDD-Series (400V Class) Direct Drive Motors	Power Cable Cat. No.
RDB-B21519, RDB-B21529	2090-XXNPMF-16Sxx (standard) 2090-CPxM7DF-16AFxx (continuous-flex)
RDB-B29014, RDB-B29016, RDB-B29024	
RDB-B2151C, RDB-B21539	2090-XXNPMF-14Sxx (standard) 2090-CPxM7DF-14AFxx (continuous-flex)
RDB-B29019, RDB-B29034	
RDB-B2152C	2090-CPxM7DF-12AAxx (standard)
RDB-B29026	
RDB-B2153C	2090-XXNPMF-10Sxx (standard) 2090-CPxM7DF-10AFxx (continuous-flex)
RDB-B29036, RDB-B41014	
RDB-B29029, RDB-B41016, RDB-B41024	2090-CPBM7DF-08AAxx (standard)
RDB-B29039, RDB-B41018, RDB-B41026, RDB-B41035	2090-CPBM7DF-06AAxx (standard)

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

HPK-Series Asynchronous Servo Motors

Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
HPK-Bxxxx-M/S HPK-Exxxx-M/S	2099-BMxx-S	Multi-turn High Resolution Absolute or Single-turn High Resolution Encoder Feedback	2090-XXNFMF-Sxx (standard) 2090-CFBM4DF-CDAFxx (continuous-flex)

HPK-Series Asynchronous Servo Motors	Power Cable Cat. No.
All HPK-Bxxxx or HPK-Exxxx motors	Customer Supplied

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

TL-Series Low Inertia Motors

Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
TLY-Axxxx-H	2093-AC05-MPx or 2093-AMxx	Incremental	2090-CFBM6DF-CBAAxx (flying lead) or 2090-CFBM6DD-CCAAxx (premolded connector)
	2094-ACxx-Mxx-S or 2094-AMxx-S 2097-V3xxxx 2098-DSD-xxx 2098-IPD-xxx		
TLY-Axxxx-B	2093-AC05-MPx or 2093-AMxx 2097-V3xxxx	Multi-turn High Resolution Absolute Encoder Feedback	2090-DANFCT-Sxx
TL-Axxxx-B	2092-DAx		

TL-Series (230V) Motors	Drive Compatibility	Power Cable Cat. No.
TLY-Axxxx-H	2093-AC05-MPx or 2093-AMxx 2094-ACxx-Mxx-S or 2094-AMxx-S 2098-DSD-xxx 2098-IPD-xxx	2090-CPBM6DF-16AAxx (power and brake) 2090-CPWM6DF-16AAxx (power without brake)
TLY-Axxxx-B	2093-AC05-MPx or 2093-AMxx	
TL-Axxxx-B	2092-DAx	2090-DANPT-16Sxx

TL-Series (230V) Motors	Brake Cable Cat. No.
TL-Axxxx-B motors	2090-DANBT-18Sxx

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#). For N-Series retrofit cable information, refer to Transition Plates for N-Series Retrofit on [page 81](#).

IMPORTANT

TL-Axxxx motors have rectangular plastic connectors and are intended for use with Ultra1500 (Bulletin 2092) servo drives. The TLY-Axxxx motors have circular plastic connectors and are intended for use with Bulletin 2093, 2094, 2097, and 2098 (230V) servo drives.

MP-Series Integrated Linear Stages

Actuator Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
MPAS-Axxxxx-V/A or MPMA-A	2093-AC05-MP x or 2093-AM xx 2094-AC xx -M xx -S or 2094-AM xx -S 2097-V3 $xxxx$ 2098-DSD- xxx	Multi-turn High Resolution Absolute Encoder Feedback	2090-XXNFMF-S xx (standard) 2090-CFBM4DF-CDAF xx (continuous-flex) flying-lead
MPAS-Bxxxxx-V/A or MPMA-B	2094-BC xx -M xx -S or 2094-BM xx -S 2094-BC xx -M xx -M or 2094-BM xx -M 2097-V3 $xxxx$ 2098-DSD-HV xxx		

MP-Series (230V) Integrated Linear Stages	Power Cable Cat. No.
MPAS-Axxxxx-V/A or MPMA-A	2090-XXNPMF-16S xx (standard) 2090-CPxM4DF-16AF xx (continuous-flex)
MP-Series (460V) Integrated Linear Stages	Power Cable Cat. No.
MPAS-Bxxxxx-V/A or MPMA-B	2090-XXNPMF-16S xx (standard) 2090-CPxM4DF-16AF xx (continuous-flex)

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

TL-Series Electric Cylinders

Actuator Cat. No.	Drive Compatibility	Feedback Type	Motor Feedback Cable
TLAR-Axxxxx	2093-AC05-MP x or 2093-AM xx 2097-V3 $xxxx$	Multi-turn High Resolution Absolute Encoder Feedback	2090-CFBM6DF-CBAA xx (flying-lead) or 2090-CFBM6DD-CCAA xx (premolded connector) standard

TL-Series (230V) Electric Cylinders	Motor Power Cable
TLAR-Axxxxx	2090-CPBM6DF-16AA xx (power and brake) standard 2090-CPWM6DF-16AA xx (power without brake) standard

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

MP-Series Electric Cylinders

Actuator Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
MPAR-A1xxxx MPAR-A2xxxx	2093-AC05-MP x or 2093-AM xx 2094-AC xx -M xx -S or 2094-AM xx -S	Multi-turn High Resolution Absolute Encoder Feedback	2090-XXNFMF-S xx (standard) 2090-CFBM4DF-CDAF xx (continuous-flex) flying-lead
MPAR-A3xxxx	2097-V3xxxx 2098-DSD- xxx		
MPAR-B1xxxx MPAR-B2xxxx	2094-BC xx -M xx -S or 2094-BM xx -S 2094-BC xx -M xx -M or 2094-BM xx -M		2090-XXNFMF-S xx (standard) 2090-CFBM7DF-CDAF xx (continuous-flex) flying-lead
MPAR-B3xxxx	2097-V3xxxx 2098-DSD-HV xxx		

MP-Series (230V) Electric Cylinders	Power Cable Cat. No.
MPAR-A1xxxx MPAR-A2xxxx	2090-XXNPMF-16S xx (standard) 2090-CPxM4DF-16AF xx (continuous-flex)
MPAR-A3xxxx	2090-XXNPMF-16S xx (standard) 2090-CPxM7DF-16AF xx (continuous-flex)

MP-Series (460V) Electric Cylinders	Power Cable Cat. No.
MPAR-B1xxxx MPAR-B2xxxx	2090-XXNPMF-16S xx (standard) 2090-CPxM4DF-16AF xx (continuous-flex)
MPAR-B3xxxx	2090-XXNPMF-16S xx (standard) 2090-CPxM7DF-16AF xx (continuous-flex)

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

MP-Series Heavy Duty Electric Cylinders

Actuator Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
MPAI-A3xxxx MPAI-A4xxxx	2093-AC05-MP x or 2093-AM xx 2094-AC xx -M xx -S or 2094-AM xx -S	Multi-turn High Resolution Absolute Encoder Feedback	2090-XXNFMF-S xx (standard) 2090-CFBM7DF-CDAF xx (continuous-flex) flying-lead
MPAI-B3xxxx MPAI-B4xxxx	2094-BC xx -M xx -S or 2094-BM xx -S 2094-BC xx -M xx -M or 2094-BM xx -M		
	2097-V3xxxx 2098-DSD-HV xxx		

MP-Series (230V) Heavy Duty Electric Cylinders	Power Cable Cat. No.
MPAI-A3xxxx MPAI-A4xxxx	2090-XXNPMF-16S xx (standard) 2090-CPxM7DF-16AF xx (continuous-flex)

MP-Series (460V) Heavy Duty Electric Cylinders	Power Cable Cat. No.
MPAI-B3xxxx MPAI-B4xxxx	2090-XXNPMF-16S xx (standard) 2090-CPxM7DF-16AF xx (continuous-flex)

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

LDC-Series Linear Motors

Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
LDC-Cxxxxxx-xxT1 (230V operation)	2093-AC05-MP x or 2093-AM xx 2094-AC xx -M xx -S or 2094-AM xx -S 2098-DSD- xxx	Sin/Cos or TTL Encoder Feedback	2090-XXNFMF-S xx (standard) 2090-CFBM7DF-CDAF xx (continuous-flex)
LDC-Cxxxxxx-xxT1 (460V operation)	2094-BC xx -M xx -S or 2094-BM xx -S 2094-BC xx -M xx -M or 2094-BM xx -M 2098-DSD-HV xxx		

LDC-Series (230V or 460V operation) Linear Motors	Power Cable Cat. No.
LDC-Cxxxxxx-xxT1	2090-XXNPMF-16S xx (standard) 2090-CPWM7DF-16AF xx (continuous-flex)

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

LDL-Series Linear Motors

Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
LDL-xxxxxx-xxT1	2093-AC05-MP x or 2093-AM xx 2094-AC xx -M xx -S or 2094-AM xx -S 2098-DSD- xxx	Sin/Cos or TTL Encoder Feedback	2090-XXNFMF-S xx (standard) 2090-CFBM7DF-CDAF xx (continuous-flex)

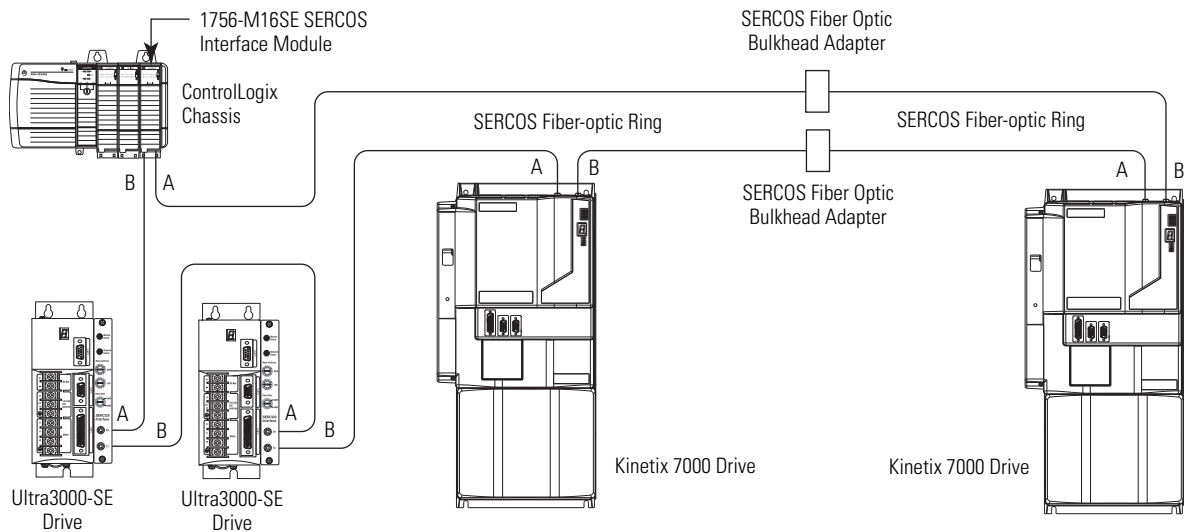
LDL-Series Linear Motors	Power Cable Cat. No.
LDL-xxxxxx-xxT1	2090-XXNPMF-16S xx (standard) 2090-CPWM7DF-16AF xx (continuous-flex)

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Fiber-optic Cable Connection Examples

The length of each transmission section (point A to B) can be up to 32 m (105 ft) for plastic cable and 50...200 m (164.2...656.7 ft) for glass cable. In this example, the second Kinetix 7000 drive is located in a separate cabinet and connected with bulkhead adapters.

Fiber-optic Cable Example for Single-axis Connections



IMPORTANT

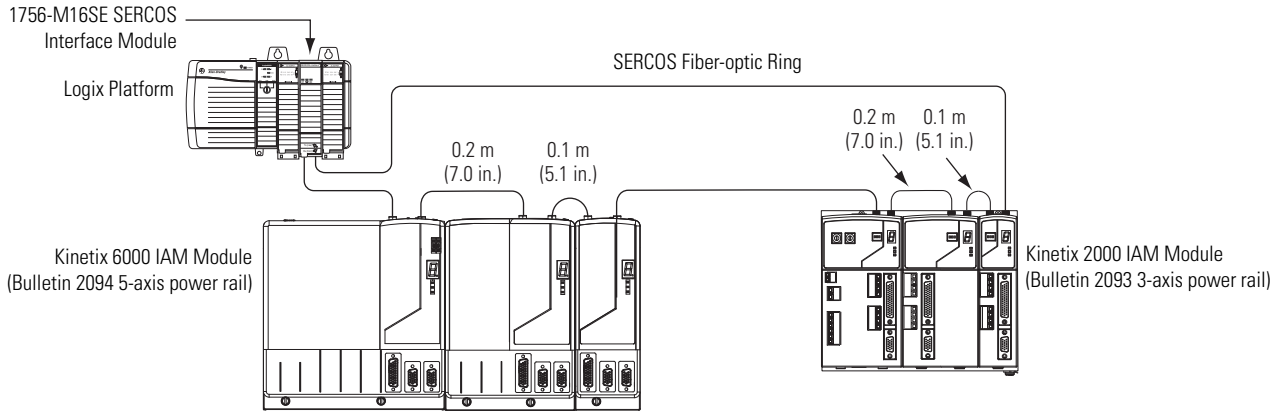
To avoid signal loss, do not use bulkhead adapters to connect glass cables. Use bulkhead adapters for making plastic-to-plastic cable connections only.

Multi-axis servo drives with SERCOS interface have specific cable lengths for making drive-to-drive connections for single-wide and double-wide modules.

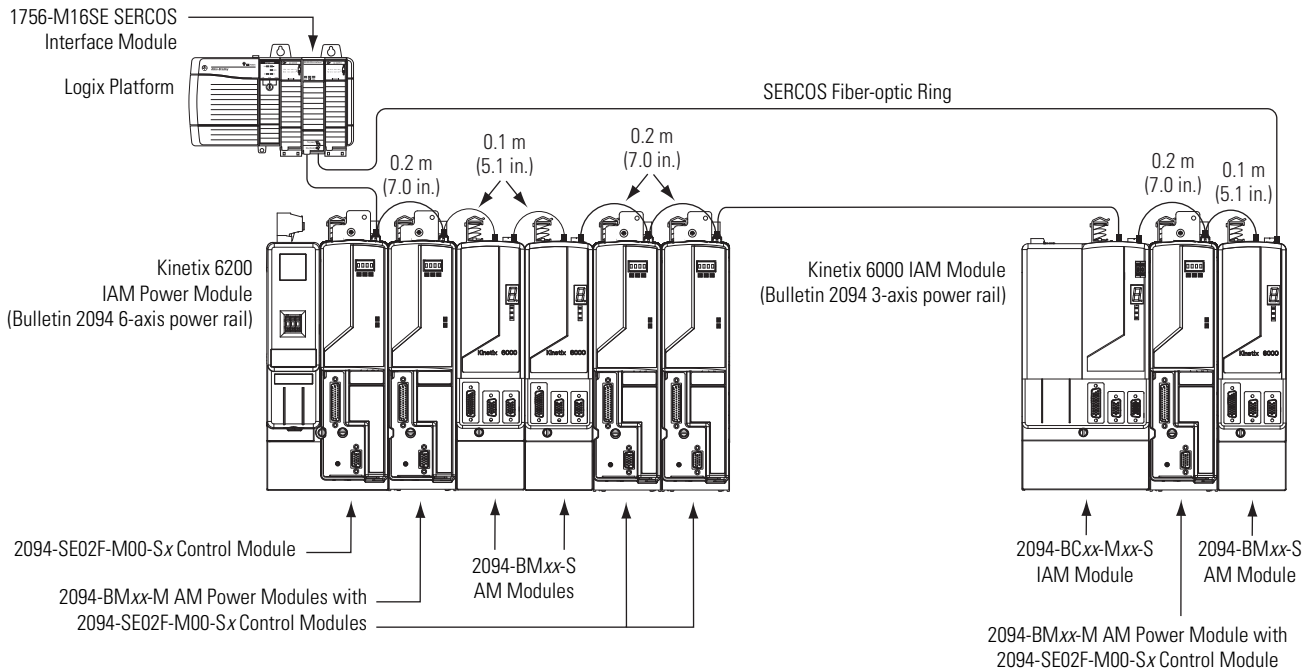
Drive-to-Drive Cable Length for Multi-axis Drive Families

IAM Module	Adjacent AM Module		Cable Cat. No.	Cable Length
Kinetix 2000	2093-AMP1, 2093-AMP2, or 2093-AMP5	Single-wide	2090-SCEP0-1	0.1 m (5.1 in.)
	2093-AM01 or 2093-AM02	Double-wide	2090-SCEP0-2	0.2 m (7.0 in.)
Kinetix 6000	2094-AMxx-S, 2094-BMP5-S, 2094-BM01-S, or 2094-BM02-S	Single-wide	2090-SCEP0-1	0.1 m (5.1 in.)
	2094-BMP5-M, 2094-BM01-M, or 2094-BM02-M		2090-SCEP0-2	0.2 m (7.0 in.)
	2094-BM03-S and 2094-BM05-S	Double-wide		
Kinetix 6200	2094-BMP5-M, 2094-BM01-M, or 2094-BM02-M	Single-wide	2090-SCEP0-2	0.2 m (7.0 in.)
	2094-AMxx-S, 2094-BMP5-S, 2094-BM01-S, or 2094-BM02-S		2090-SCEP0-1	0.1 m (5.1 in.)

Drive-to-Drive Fiber-optic Cable Length Example (Kinetix 2000 and Kinetix 6000 drives)



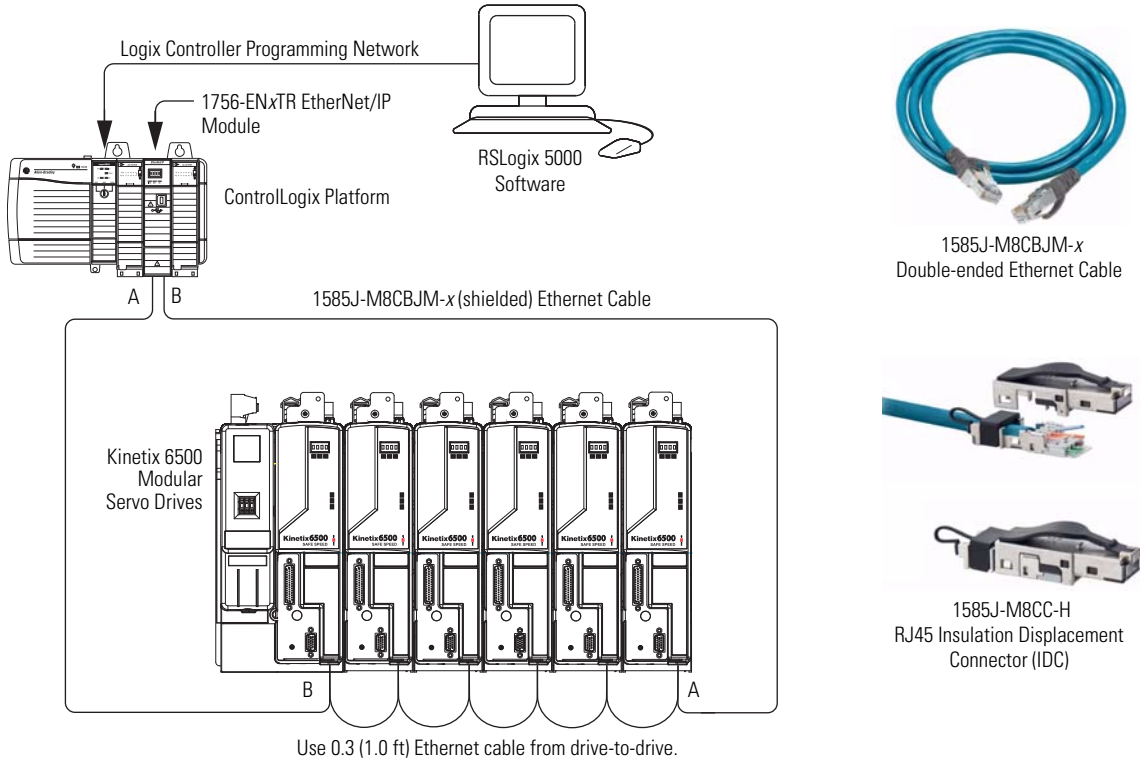
Drive-to-Drive Fiber-optic Cable Length Example (Kinetix 6000 and Kinetix 6200 drives)



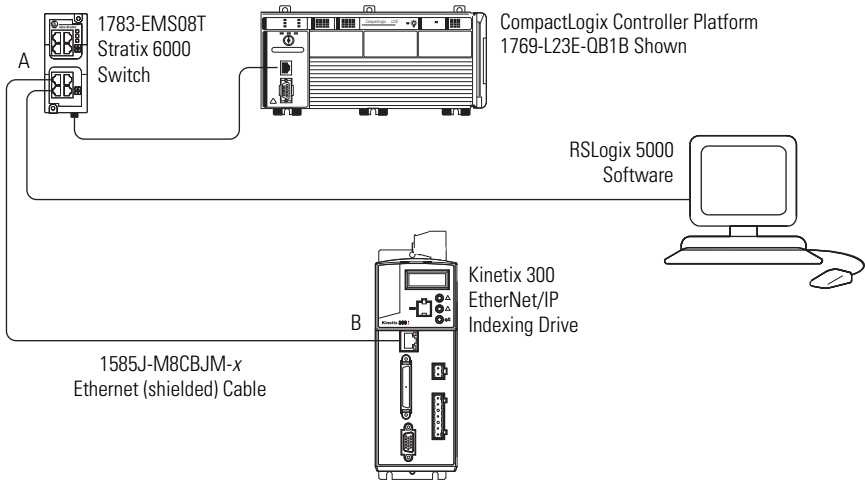
Ethernet Cable Connection Examples

Shielded Ethernet cable is available in lengths up to 78 m (256 ft). However, the total length of Ethernet cable (point A to point B) connecting drive-to-drive, drive-to-controller, or drive-to-switch must not exceed 100 m (328 ft).

Drive-to-Drive Ethernet Cable Length Example (Kinetix 6500 drives)



Ethernet Cable Example for Single-axis Connections (Kinetix 300 drives)



Interface Cable Combinations

Cat. No.	Cable Description	Drive Compatibility
2090-UXPC-D09xx	Serial cable to computer, 9-pin	Ultra3000/5000 drives
2090-U3CC-D44xx ⁽¹⁾	CN1 connector to flying leads for 1756-M02AE module, 44-pin, single-axis cable	Ultra3000, Ultra3000 with indexing drives and Ultra3000-DN, Ultra3000-DN with indexing drives
2090-U3AE-D44xx ⁽¹⁾	CN1 connector to premolded 1756-M02AE module connector, 44-pin, two-axis cable	
2090-SCEP _{x-x}	SERCOS fiber optic plastic cables suitable only for use inside an enclosure. Connectors are provided at both ends.	ControlLogix 1756-MxxSE modules to Kinetix 2000, Kinetix 6000, Kinetix 6200, Kinetix 7000, and Ultra3000-SE drives
2090-SCVP _{x-x}	SERCOS fiber optic plastic cables suitable for use outside an enclosure. Connectors are provided at both ends.	
2090-SCNP _{x-x}	SERCOS fiber optic plastic cables suitable for use outside an enclosure in harsh duty applications. Connectors are provided at both ends.	
2090-SCVG _{x-x}	SERCOS fiber optic glass cables suitable for use outside an enclosure. Connectors are provided at both ends.	
2090-S-BLHD	SERCOS fiber optic cable bulkhead adapter (2 per pack).	
1202-C02	Drive-to-drive safety cable for connecting single-wide Kinetix 6000 axis modules.	Kinetix 6000 drives with safe-off feature (2094-BCxx-Mxx-S and 2094-BMxx-S) and Kinetix 7000 drives (2099-BMxx-S)
1202-C03	Drive-to-drive safety cable for connecting double-wide Kinetix 6000 axis modules.	
1202-C10	Drive-to-drive safety cable for connections between two Kinetix 6000 power rails, two Kinetix 7000 drives, or from the Kinetix 6000 power rail to Kinetix 7000 drive.	
1585J-M8CBJM-x	Double-ended (shielded) Ethernet cables for use when programming the safety configuration and the Logix EtherNet/IP network module.	2094-SE02F-M00-S0 or 2094-SE02F-M00-S1 Kinetix 6200 control modules and 2094-EN02D-M01-S0 or 2094-EN02D-M01-S1 Kinetix 6500 control modules
1585J-M8CB-x	Single-ended (shielded) Ethernet cables for use when programming the safety configuration and the Logix EtherNet/IP network module.	
1585J-M8CC-H	RJ45 insulation displacement connector (IDC) for use when making your own cables.	
1585-C8CB-Sxxx	Shielded Ethernet (bulk) cable for use when making your own cables.	
2090-DAPC-D09xx	Ultra1500 serial interface to computer	Ultra1500 drives
2090-DAIO-D50xxx	Ultra1500 control interface to flying leads	
2090-U5PM-D09xx	Ultra5000 to PanelView 300 Micro, 1761-NET-ENI, and MicroLogix DF-1	Ultra5000 drives
2090-U5PV-D09xx	Ultra5000 to PanelView 300 Keypad 500/600/1000 Standard DF-1	
2090-XXNRB-10F0P5	Resistive Brake Module (RBM) to drive interface cable, 10 AWG	Kinetix 6000/Kinetix 6200/Kinetix 6500 drives
2090-UXNRB-10F1P3		Ultra3000 drives
2090-XXNRB-8F0P6	Resistive Brake Module (RBM) to drive interface cable, 8 AWG	Kinetix 6000/Kinetix 6200/Kinetix 6500 drives
2090-UXNRB-8F1P4		Ultra3000 drives
2090-UXNRB-6F1P5	Resistive Brake Module (RBM) to drive interface cable, 6 AWG	Ultra3000 drives

(1) This cable does not carry the unbuffered motor encoder signals (CN1 pins 10-15). Contact your Allen-Bradley sales representative if these signals are required for your application.

Cable length *xx* or *x-x* is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Standard Cable Lengths

Motor, breakout, and interface cables are available in standard lengths as shown in the tables below. For all other cable catalog numbers, refer to your local Allen-Bradley representative.

Motor Power Cable Standard Lengths

Cat. No.	Used with	Standard Cable Lengths		
		m (ft)		
2090-XXNPMF-xxSxx	MPL-A/B15xx, MPL-A/B2xx, MPS-A/Bxxx, or HPK-Bxxx, HPK-Exxx motors; and MPAS-A/Bxxx, MPAR-A/B1xx, and MPAR-A/B2xx linear actuators (threaded DIN connectors)	1 (3.2)	7 (22.9)	25 (82.0)
		2 (6.5)	9 (29.5)	30 (98.4)
		3 (9.8)	12 (39.4)	40 (131.2)
		4 (13.1)	15 (49.2)	60 (196.8)
		5 (16.4)	20 (65.6)	90 (295.3)
2090-CPBM4DF-16AFxx		1 (3.2)	9 (29.5)	40 (131.2)
2090-CPWM4DF-16AFxx		2 (6.5)	12 (39.4)	50 (164.0)
		3 (9.8)	15 (49.2)	60 (196.8)
2090-CPBM7DF-xxAFxx	MPL-A/B3xxx...MPL-B9xxx, MPM-A/Bxxx, MPF-A/Bxxx, RDB-Bxxx, rotary motors; MPAL-A/Bxxx and MPAR-A/B3xx linear actuators; and LDC-Series/LDL-Series linear motors (SpeedTec DIN connectors)	4 (13.1)	20 (65.6)	75 (264.0)
2090-CPWM7DF-xxAFxx		5 (16.4)	25 (82.0)	90 (295.3)
		7 (22.9)	30 (98.4)	
2090-CPBM7E7-xxAFxx	2090-XXNPMF-xxSxx (threaded) or 2090-CPBM7DF-xxAFxx (SpeedTec DIN) cables	1 (3.2)	5 (16.4)	15 (49.2)
2090-CPBM6DF-16AAxx	TLY-Axxx rotary motors and TLAR-Axxx linear actuators (circular plastic connectors)	2 (6.5)	7 (22.9)	20 (65.6)
2090-CPWM6DF-16AAxx		3 (9.8)	9 (29.5)	25 (82.0)
		4 (13.1)	12 (39.4)	30 (98.4)
2090-DANPT-16Sxx	TL-Axxx motors (rectangular plastic connectors)			

Motor Brake Cable Standard Lengths

Cat. No.	Used with	Standard Cable Lengths		
		m (ft)		
2090-DANBT-18Sxx	TL-Axxx motors (rectangular plastic connectors)	1 (3.2)	5 (16.4)	15 (49.2)
		2 (6.5)	7 (22.9)	20 (65.6)
		3 (9.8)	9 (29.5)	25 (82.0)
		4 (13.1)	12 (39.4)	30 (98.4)

Motor Feedback Cable Standard Lengths

Cat. No.	Used with	Standard Cable Lengths		
		m (ft)		
2090-XXNFMF-Sxx	MPL-A/B15xx, MPL-A/B2xx, MPS-A/Bxxx, or HPK-Bxxx, HPK-Exxx motors; and MPAS-A/Bxxx, MPAR-A/B1xx, and MPAR-A/B2xx linear actuators (threaded DIN connectors)	1 (3.2)	7 (22.9)	25 (82.0)
		2 (6.5)	9 (29.5)	30 (98.4)
		3 (9.8)	12 (39.4)	40 (131.2)
		4 (13.1)	15 (49.2)	60 (196.8)
		5 (16.4)	20 (65.6)	90 (295.3)
2090-CFBM4DF-CDAFxx		1 (3.2)	9 (29.5)	40 (131.2)
		2 (6.5)	12 (39.4)	50 (164.0)
2090-CFBM7DF-CDAFxx	MPL-A/B3xxx. . .MPL-B9xxx, MPM-A/Bxxx, MPF-A/Bxxx, RDB-Bxxx, rotary motors; MPAL-A/Bxxx and MPAR-A/B3xx linear actuators; and LDC-Series/LDL-Series linear motors (SpeedTec DIN connectors)	3 (9.8)	15 (49.2)	60 (196.8)
		4 (13.1)	20 (65.6)	75 (264.0)
		5 (16.4)	25 (82.0)	90 (295.3)
		7 (22.9)	30 (98.4)	
2090-CFBM7E7-CDAFxx	2090-XXNFMF-Sxx (threaded) or 2090-CFBM7DF-CDAFxx (SpeedTec DIN) cables	1 (3.2)	5 (16.4)	15 (49.2)
2090-CFBM6DF-CBAAxx	TLY-Axxx rotary motors and TLAR-Axxx linear actuators (circular plastic connectors)	2 (6.5)	7 (22.9)	20 (65.6)
2090-CFBM6DD-CCAAxx		3 (9.8)	9 (29.5)	25 (82.0)
		4 (13.1)	12 (39.4)	30 (98.4)
2090-DANFCT-Sxx	TL-Axxx motors (rectangular plastic connector)			
2090-UXNFM-Sxx ⁽¹⁾	Kinetix 300, Kinetix 2000, Kinetix 6000, Kinetix 6200, Kinetix 6500, Kinetix 7000, and Ultra3000/5000 drives	1 (3.2)	15 (49.2)	30 (98.4)
		3 (9.8)		
		9 (29.5)		
2090-CFBM4DF-CEAAxx	MPL-B3xxx-R. . .MPL-B45xxx-R and MPM-A/Bxxxxx-2 resolver motors (circular DIN connectors)	5 (16.4)		
		15 (49.2)		
		30 (98.4)		
		60 (196.8)		
		90 (295.3)		

(1) Use with 2090-KFBM4-CAAA (threaded) or 2090-KFBM7-CAAA (SpeedTec) DIN connector kit.

Breakout Cable Standard Lengths

Cat. No.	Used with	Standard Cable Lengths	
		m (ft)	
2090-UXBC-D15xx	Kinetix 2000, Kinetix 6000, and Kinetix 7000 motor feedback (MF) connectors, and Ultra3000/5000 (CN2) motor feedback connectors	1 (3.2)	
		3 (9.8)	
2090-U3BC-D44xx	Kinetix 2000 (IOD/AF), Ultra3000 (CN1) control interface connector	9 (29.5)	
		15 (49.2)	

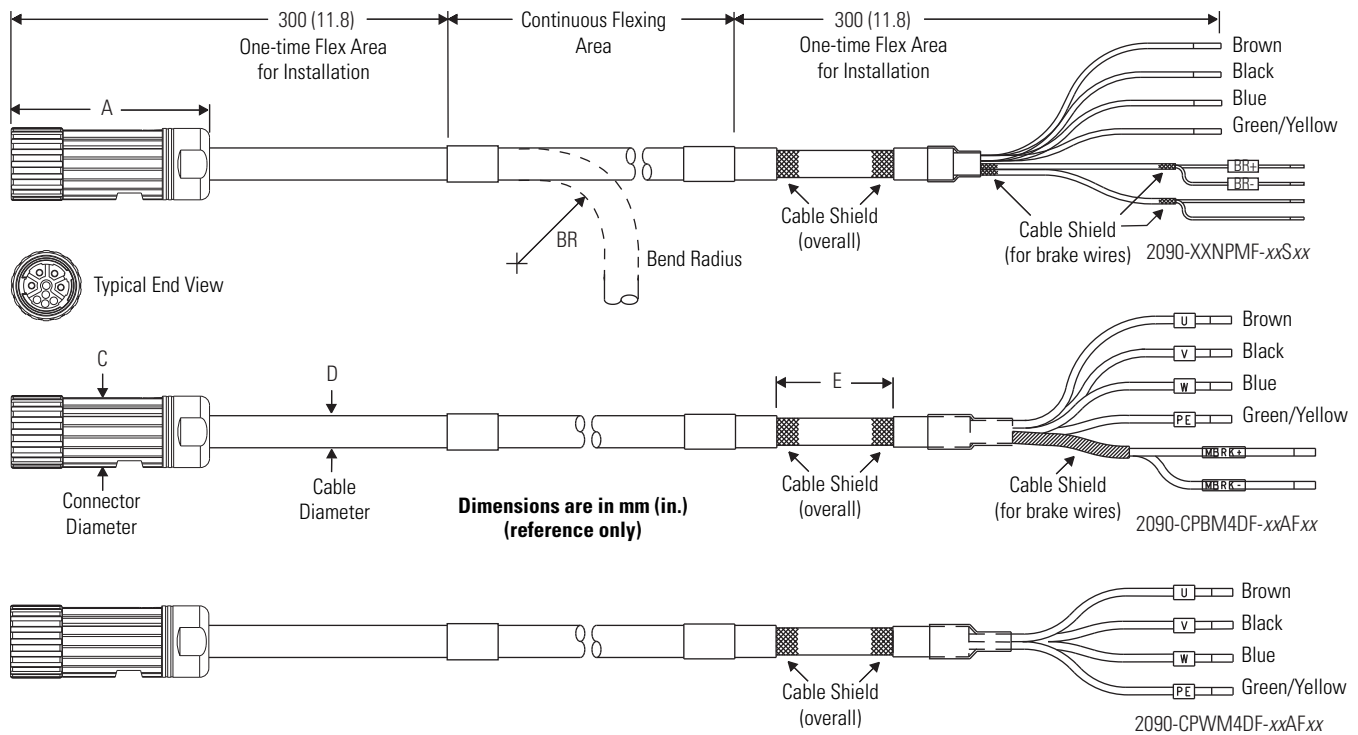
Interface Cable Standard Lengths

Cat. No.	Used with	Standard Cable Lengths m (ft)		
2090-UXPC-D09xx	Ultra3000/5000 serial interface to computer	1 (3.2) 3 (9.8)		
2090-U3CC-D44xx	Single-axis flying lead Ultra3000 drive to 1756-M02AE module	9 (29.5) 15 (49.2)		
2090-U3AE-D44xx	Two-axis pre-wired Ultra3000 drive to 1756-M02AE module	30 (98.4)		
2090-DAPC-D09xx	Ultra1500 serial interface to computer	1 (3.2) 3 (9.8) 9 (29.5)		
2090-DAIO-D50xxx	Ultra1500 control interface to flying leads	1 (3.2) 3 (9.8)		
2090-U5PM-D09xx	Ultra5000 drive to PanelView 300 Micro DF-1 terminal and MicroLogix system	1 (3.2) 3 (9.8)		
2090-U5PV-D09xx	Ultra5000 drive to PanelView Standard DF-1 terminal	9 (29.5)		
2090-SCEP _{x-x}	SERCOS interface fiber-optic cable for drive to drive connections, drive to 1756-MxxSE module, or drive to 1768-M04SE module.	0-1 (5.1 in.) ⁽¹⁾	3-0 (9.8)	15-0 (49.2)
2090-SCNP _{x-x}		0-2 (7.1 in.) ⁽¹⁾	5-0 (16.4)	20-0 (65.5)
2090-SCVP _{x-x}		0-3 (1.0) ⁽¹⁾	8-0 (26.2)	25-0 (82.0)
2090-SCVG _{x-x}		1-0 (3.2)	10-0 (32.8)	32-0 (105.0)
		50-0 (164.2) 100-0 (328.3) 150-0 (492.5) 200-0 (656.7)		
1585J-M8CBJM-x	Shielded Ethernet cable for use when programming the Kinetix 6200 and Kinetix 6500 safety configuration, and the Logix EtherNet/IP network module.	0M3 = 0.3 (1.0)		1 (3.2)
1585J-M8CB-x		0M4 = 0.4 (1.3)		2 (6.6)
1585J-C8CB-Sxxx		0M6 = 0.6 (2.0)		5 (16.4) 10 (32.8)
1202-C02	Drive-to-drive safety cable for connecting single-wide Kinetix 6000 axis modules			100 (328) 300 (984) 600 (1968)
1202-C03	Drive-to-drive safety cable for connecting double-wide Kinetix 6000 axis modules			200 mm (7.9 in.)
1202-C03	Drive-to-drive safety cable for connecting double-wide Kinetix 6000 axis modules			350 mm (13.8 in.)
1202-C10	Drive-to-drive safety cable for connections between two Kinetix 6000 power rails, two Kinetix 7000 drives, or from the Kinetix 6000 power rail to Kinetix 7000 drive			1050 mm (41.3 in.)
2090-XXNRB-10F0P5	Resistive Brake Module (RBM) to Kinetix 6000/ Kinetix 6200/Kinetix 6500 drives	10 AWG		0.5 (1.6)
2090-XXNRB-8F0P6		8 AWG		0.6 (2.0)
2090-UXNRB-10F1P3	Resistive Brake Module (RBM) to Ultra3000 drives	10 AWG		1.3 (4.3)
2090-UXNRB-8F1P4		8 AWG		1.4 (4.6)
2090-UXNRB-6F1P5		6 AWG		1.5 (5.0)

(1) Only available as 2090-SCEP_{x-x}.

Motor Power Cable Dimensions

Power Cable Dimensions (threaded DIN connector)



Power Cable Dimensions (standard)

Power Cable Cat. No.	A mm (in.)	BR (1) mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2090-XXNPMF-16Sxx	75 (2.9)	142 (5.6)	27.5 (1.1)	14 (0.55)	150 (5.9)
2090-XXNPMF-14Sxx		148 (5.8)	28.0 (1.1)	15 (0.59)	
2090-XXNPMF-10Sxx	96 (3.8)	187 (7.4)	45.0 (1.8)	19 (0.75)	90.0 (3.5)

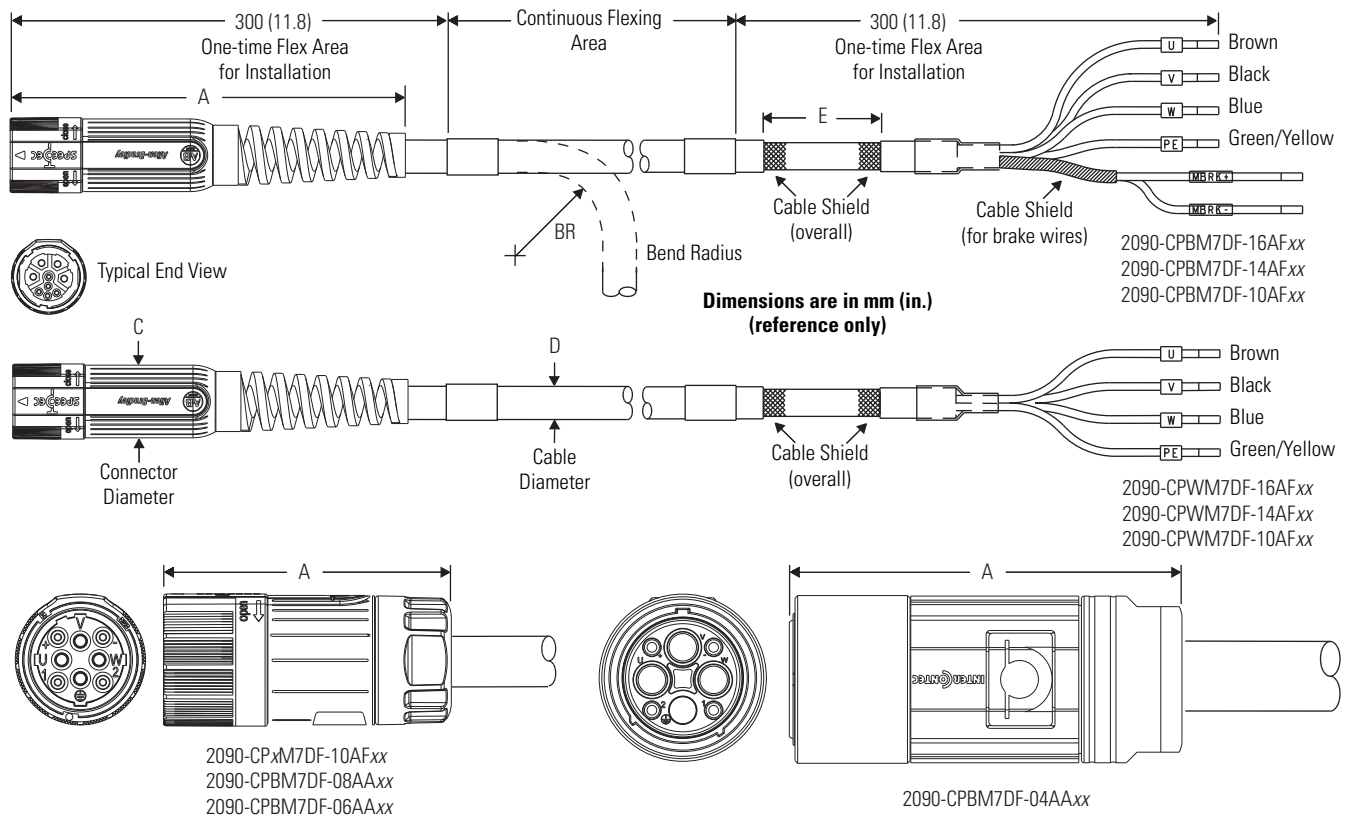
(1) Standard cables have a static or one-time bend radius of ten times (10x) the cable diameter.

Power Cable Dimensions (continuous-flex rated)

Power Cable Cat. No.	A mm (in.)	BR (1) mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2090-CPBM4DF-16AFxx	75 (2.9)	150 (6.0)	27.5 (1.1)	12.5 (0.49)	150 (5.9)
2090-CPWM4DF-16AFxx		120 (5.0)		9.7 (0.38)	

(1) Continuous-flex cables have an operational bend radius of twelve times (12x) the cable diameter. Secure the installation area, approximately 300 mm (12 in.) at both ends of the cable, with a rigid mount that prevents the cable from flexing where it connects to other components.

Power Cable Dimensions (SpeedTec DIN connector)



Power Cable Dimensions (standard)

Power Cable Cat. No.	A mm (in.)	BR ⁽¹⁾ mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2090-CPBM7DF-12AAxx	80 (3.15)	140 (5.5)	27 (1.0)	14.3 (0.56)	150 (5.9)
2090-CPWM7DF-12AAxx		115 (4.5)		11.2 (0.44)	
2090-CPBM7DF-08AAxx	97 (3.8)	205 (8.0)	45 (1.8)	20.5 (0.81)	90 (3.5)
2090-CPBM7DF-06AAxx		250 (10.0)		25.1 (0.99)	
2090-CPBM7DF-04AAxx				63 (2.5)	

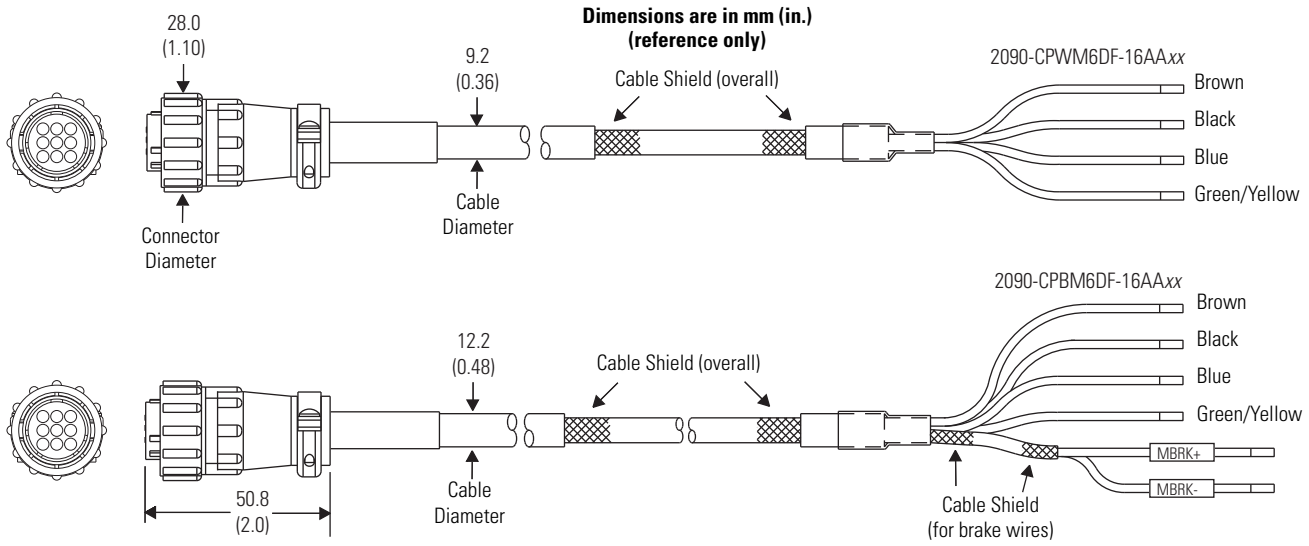
(1) Standard cables have a static or one-time bend radius of ten times (10x) the cable diameter.

Power Cable Dimensions (continuous-flex rated)

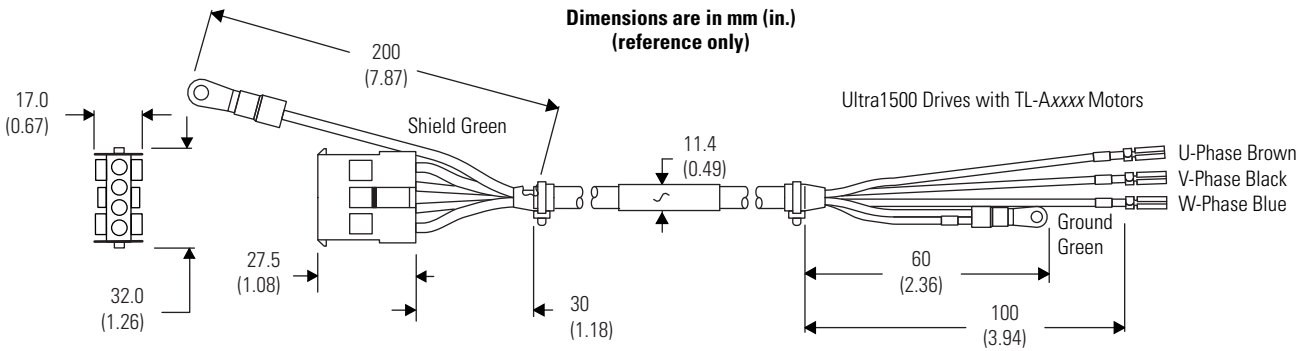
Power Cable Cat. No.	A mm (in.)	BR ⁽¹⁾ mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2090-CPBM7DF-16AFxx	146 (5.7)	150 (6.0)	28.0 (1.1)	12.5 (0.49)	150 (5.9)
2090-CPWM7DF-16AFxx		120 (5.0)		9.7 (0.38)	
2090-CPBM7DF-14AFxx		165 (6.5)		13.7 (0.54)	
2090-CPWM7DF-14AFxx		125 (5.0)		10.4 (0.41)	
2090-CPBM7DF-10AFxx	100.4 (3.9)	187 (7.4)	45.0 (1.8)	17.8 (0.70)	90 (3.5)
2090-CPWM7DF-10AFxx				15.7 (0.62)	

(1) Continuous-flex cables have an operational bend radius of twelve times (12x) the cable diameter. Secure the installation area, approximately 300 mm (12 in.) at both ends of the cable, with a rigid mount that prevents the cable from flexing where it connects to other components.

Power Cable Dimensions (catalog number 2090-CPxM6DF-16AAxx)

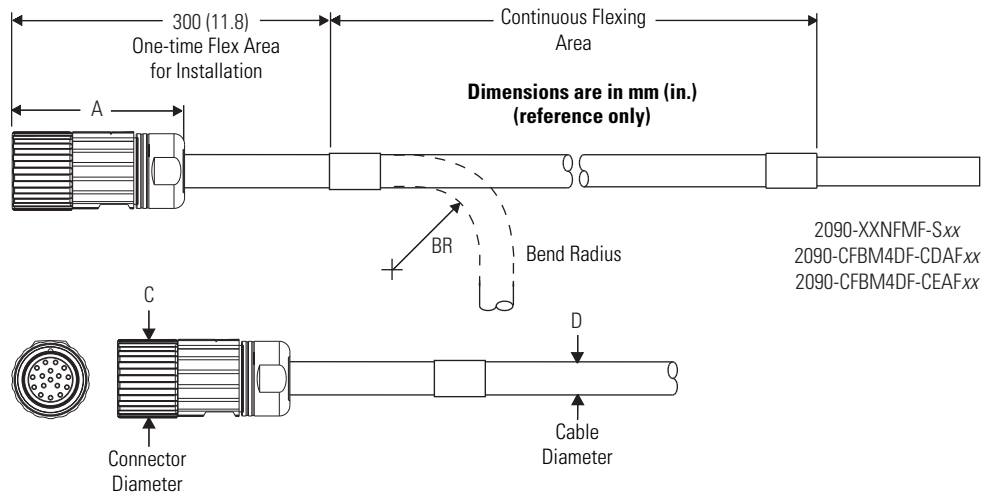


Power Cable Dimensions (catalog number 2090-DANPT-16Sxx)



Motor Feedback Cable Dimensions

Feedback Cable Dimensions (threaded DIN connector)



Feedback Cable Dimensions (standard)

Feedback Cable Cat. No.	A mm (in.)	BR ⁽¹⁾ mm (in.)	C mm (in.)	D mm (in.)
2090-XXNFMF-Sxx	57.0 (2.2)	100 (4.0)	26.0 (1.0)	10.0 (0.40)
2090-CFBM4DF-CEAAxx				

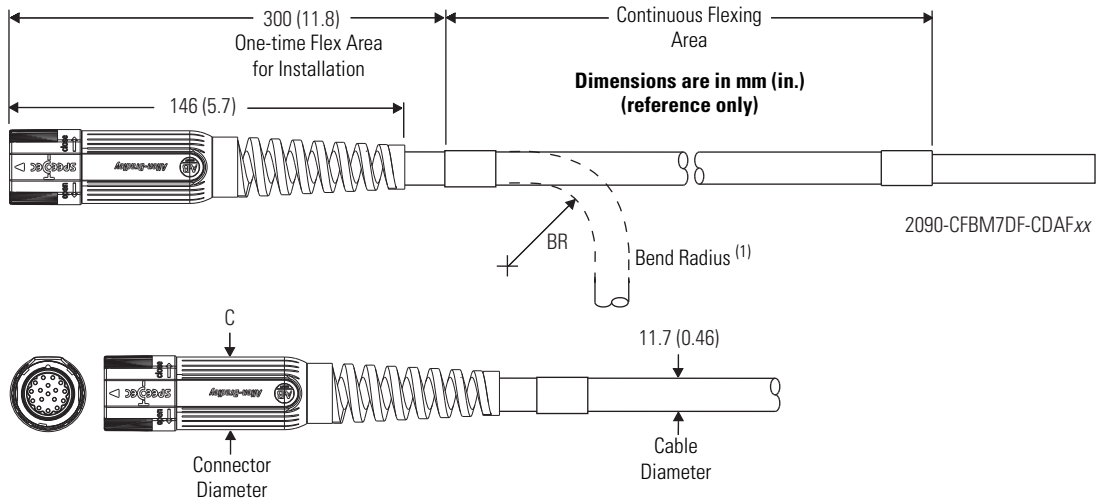
(1) Standard cables have a static or one-time bend radius of ten times (10x) the cable diameter.

Feedback Cable Dimensions (continuous-flex rated)

Feedback Cable Cat. No.	A mm (in.)	BR ⁽¹⁾ mm (in.)	C mm (in.)	D mm (in.)
2090-CFBM4DF-CDAFxx	57.0 (2.2)	140 (5.5)	26.0 (1.0)	11.7 (0.46)

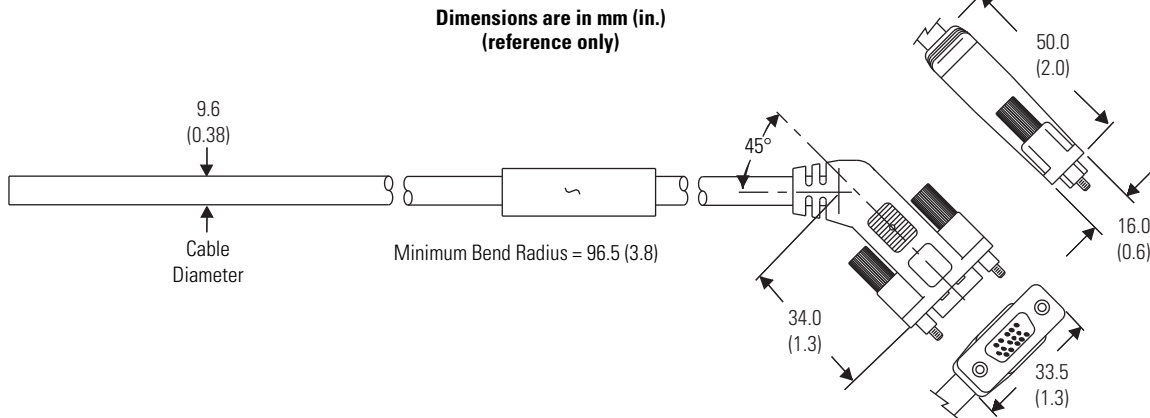
(1) Continuous-flex cables have an operational bend radius of twelve times (12x) the cable diameter. Secure the installation area, approximately 300 mm (12 in.) at both ends of the cable, with a rigid mount that prevents the cable from flexing where it connects to other components.

Feedback Cable Dimensions (SpeedTec DIN connector)

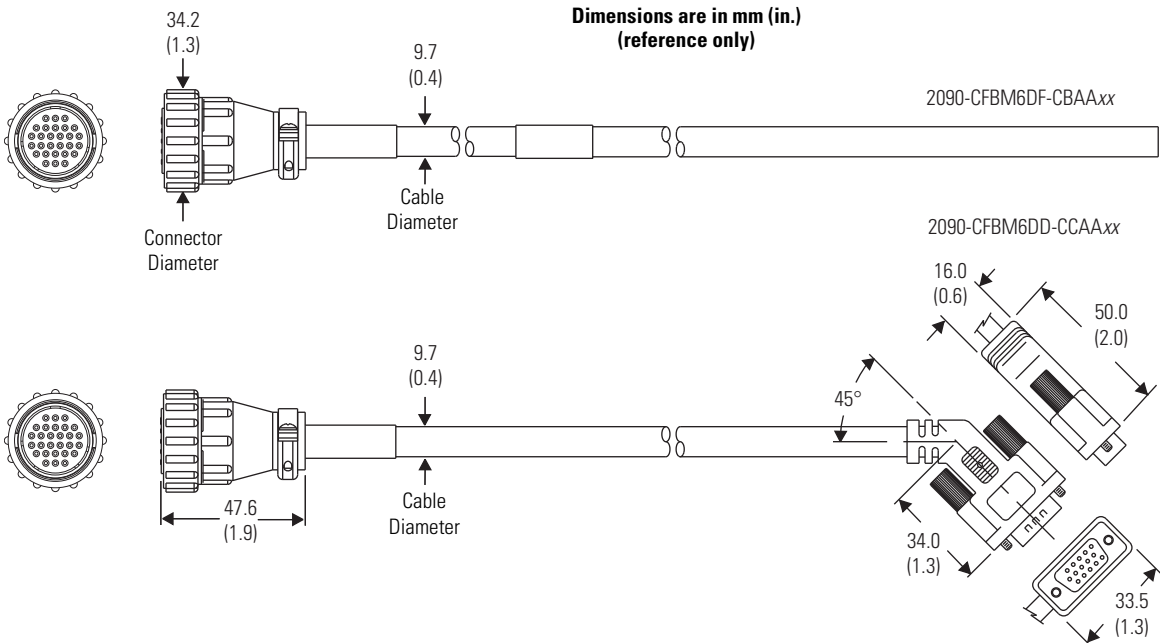


(1) Continuous-flex cables have an operational bend radius of twelve times (12x) the cable diameter. Secure the installation area, approximately 300 mm (12 in.) at both ends of the cable, with a rigid mount that prevents the cable from flexing where it connects to other components.

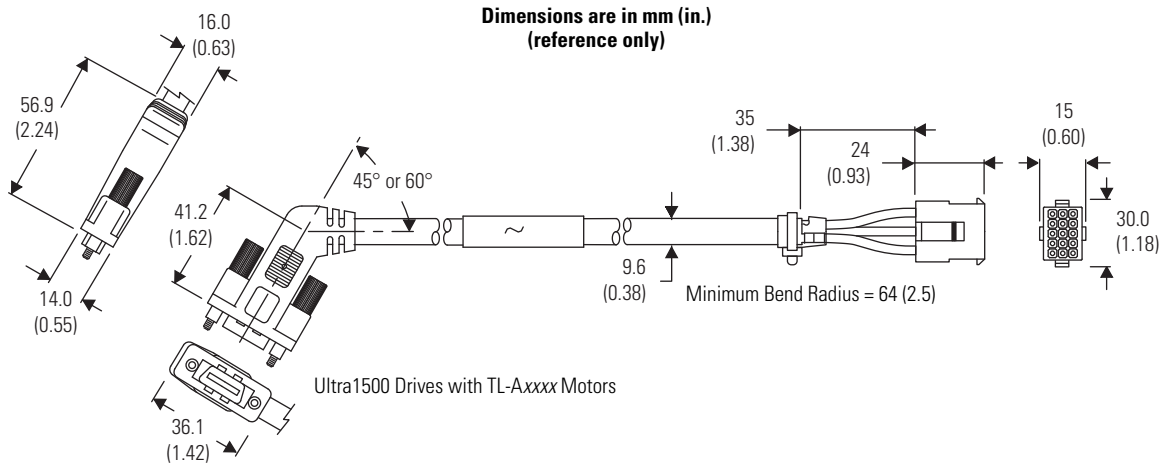
Feedback Cable Dimensions (catalog number 2090-UXNFM-Sxx)



Feedback Cable Dimensions (catalog numbers 2090-CFBM6DF-CBAAxx and 2090-CFBM6DD-CCAAxx)

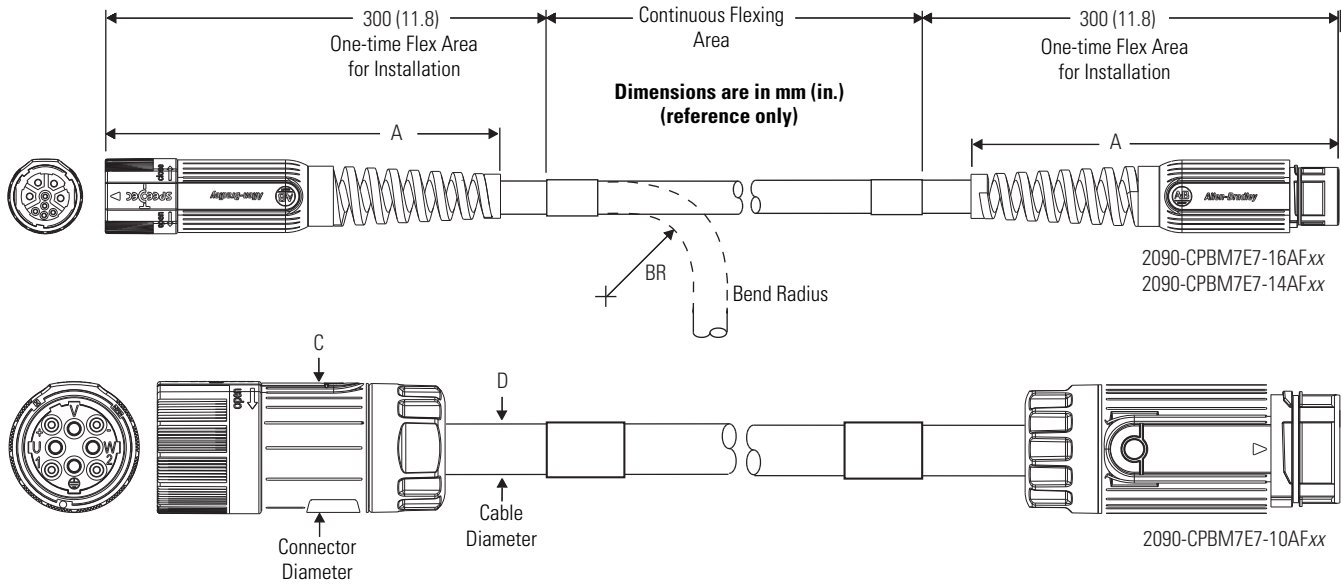


Feedback Cable Dimensions (catalog number 2090-DANFCT-Sxx)



Extension Cable Dimensions

Power Cable Dimensions (SpeedTec DIN)

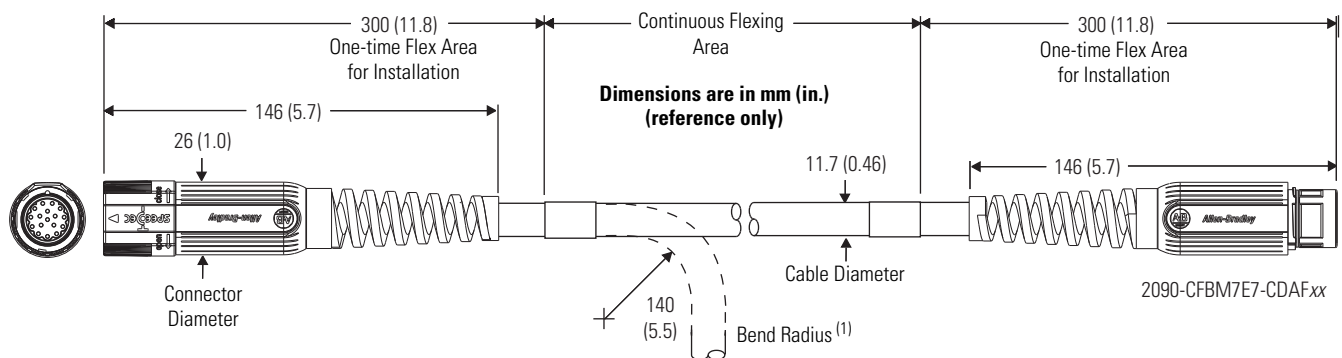


Power Cable Dimensions (continuous-flex rated)

Power Cable Cat. No.	A mm (in.)	BR ⁽¹⁾ mm (in.)	C mm (in.)	D mm (in.)
2090-CPBM7E7-16AFxx	146 (5.7)	150 (5.9)	28.0 (1.1)	12.5 (0.49)
2090-CPBM7E7-14AFxx		165 (6.5)		13.7 (0.54)
2090-CPBM7E7-10AFxx	97 (3.8)	215 (8.5)	45.0 (1.8)	17.8 (0.70)

(1) Continuous-flex cables have an operational bend radius of twelve times (12x) the cable diameter. Secure the installation area, approximately 300 mm (12 in.) at both ends of the cable, with a rigid mount that prevents the cable from flexing where it connects to other components.

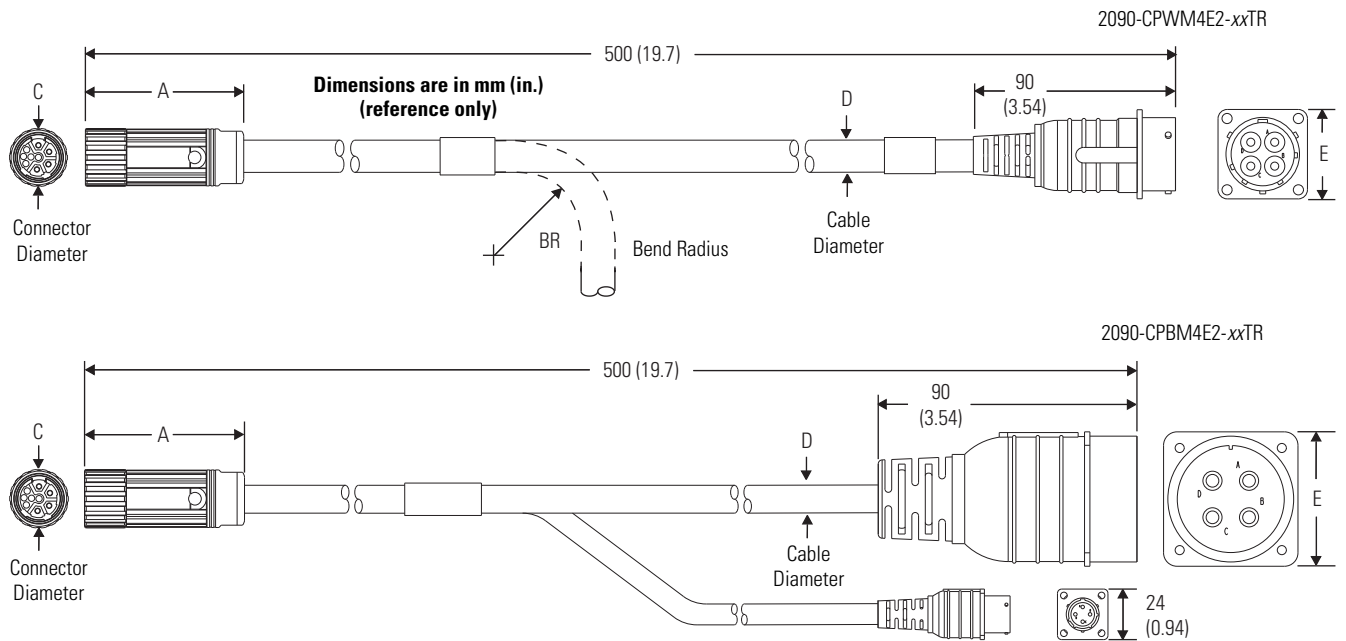
Feedback Cable Dimensions (SpeedTec DIN)



(1) Continuous-flex cables have an operational bend radius of twelve times (12x) the cable diameter. Secure the installation area, approximately 300 mm (12 in.) at both ends of the cable, with a rigid mount that prevents the cable from flexing where it connects to other components.

Transition Cable Dimensions

Power Cable Dimensions

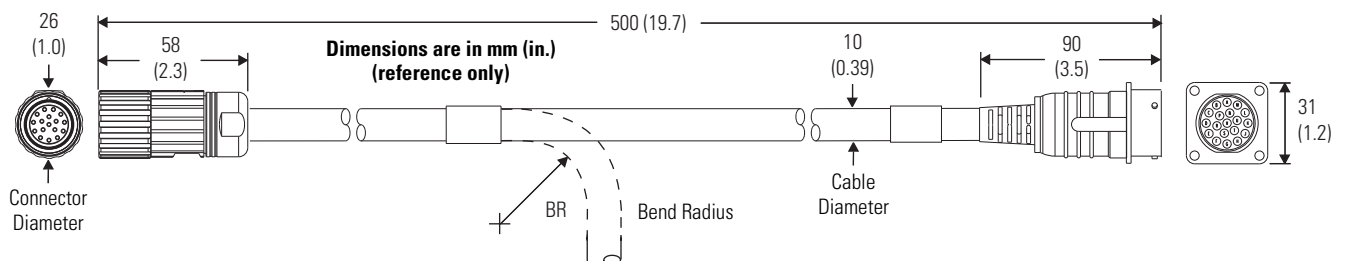


Power Cable Dimensions (standard)

Power Cable Cat. No.	A mm (in.)	BR (1) mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2090-CPBM4E2-14TR	80 (3.15)	148 (5.83)	28.0 (1.10)	14.8 (0.58)	52.3 (2.06)
2090-CPWM4E2-14TR		104 (4.09)		10.4 (0.41)	31.0 (1.22)
2090-CPBM4E2-10TR	80 (3.15)	187 (7.36)	28.0 (1.10)	18.7 (0.74)	46.0 (1.81)
2090-CPWM4E2-10TR	95 (3.74)	156 (6.14)	45.0 (1.77)	15.6 (0.61)	31.0 (1.22)
2090-CPBM4E2-08TR	80 (3.15)	205 (8.07)	28.0 (1.10)	20.5 (0.81)	46.0 (1.81)
2090-CPWM4E2-08TR	95 (3.74)	189 (7.44)	45.0 (1.77)	18.9 (0.74)	35.0 (1.38)
2090-CPBM4E2-04TR	80 (3.15)	287 (11.30)	63.4 (2.48)	28.7 (1.13)	52.3 (2.06)
2090-CPWM4E2-04TR	95 (3.74)				

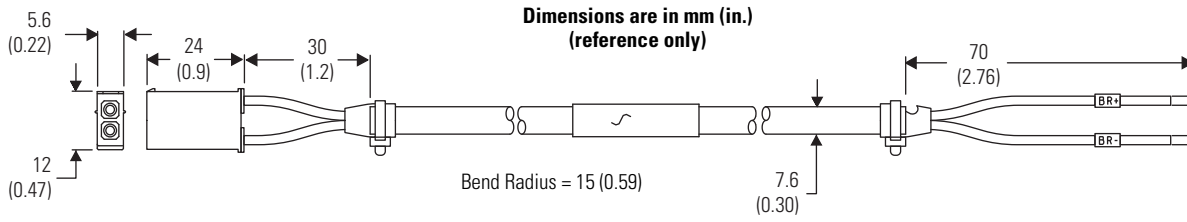
(1) Standard cables have a static or one-time bend radius of ten times (10x) the cable diameter.

Feedback Cable Dimensions (catalog number 2090-CFBM4E2-CATR)



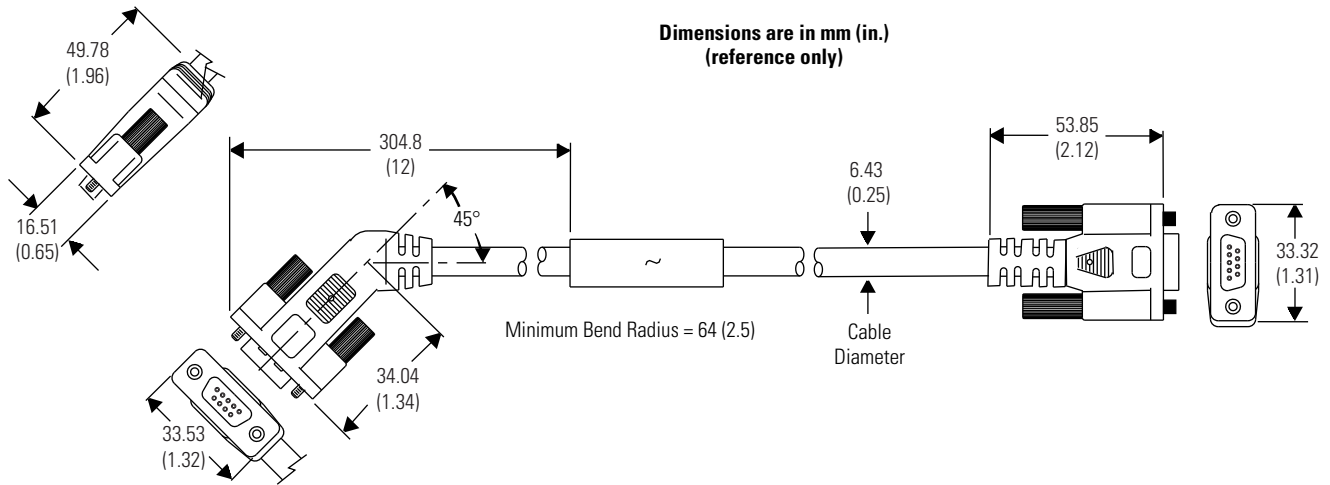
Motor Brake Cable Dimensions

Brake Cable Dimensions (catalog number 2090-DANBT-18Sxx)

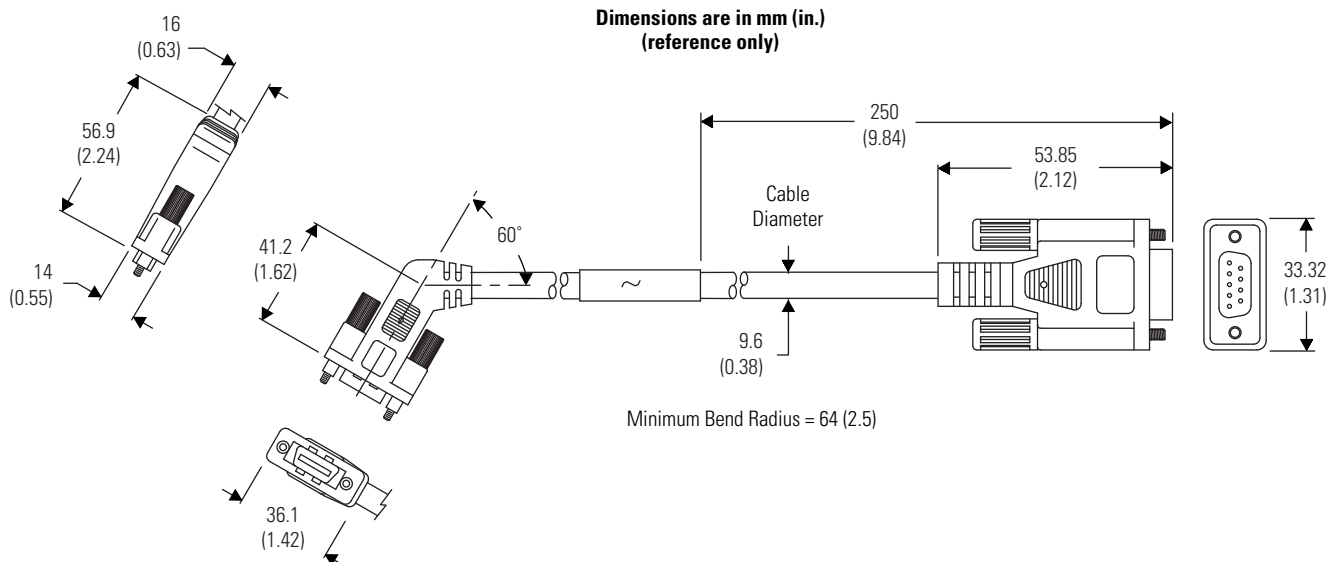


Interface Cable Dimensions

Serial Interface Cable Dimensions (catalog number 2090-UXPC-D09xx)

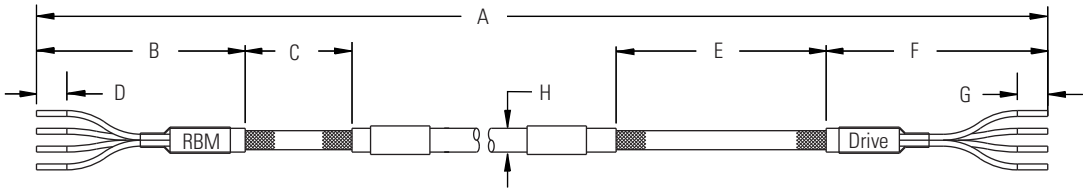


Serial Interface Cable Dimensions (catalog number 2090-DAPC-D09xx)



RBM to Drive Interface Cable Dimensions
(catalog numbers 2090-XXNRB-xxFxxx 2090-UXNRB-xxFxxx)

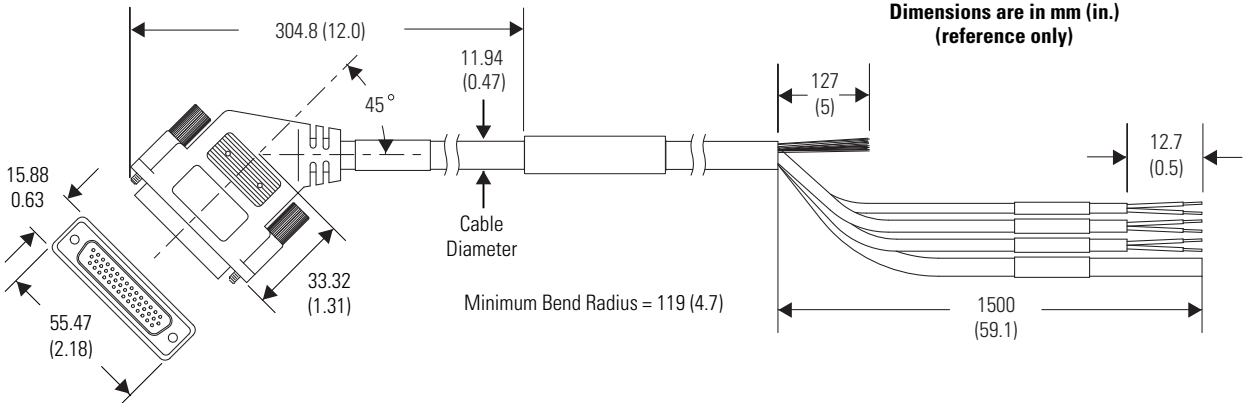
Dimensions are in mm (in.)
(reference only)



RBM Cable Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	G mm (in.)	H mm (in.)
2090-XXNRB-10F0P5	517 (20.3)	115 (4.5)	50 (1.9)	16 (0.6)	120 (4.7)	74 (2.9)	16 (0.6)	16 (0.63)
2090-UXNRB-10F1P3	1320 (52.0)					105 (4.1)		
2090-XXNRB-8F0P6	619 (24.4)	115 (4.5)	50 (1.9)	16 (0.6)	120 (4.7)	74 (2.9)	16 (0.6)	19 (0.75)
2090-UXNRB-8F1P4	1395 (54.9)					117 (4.6)		
2090-UXNRB-6F1P5	1527 (60.1)					129 (5.1)		

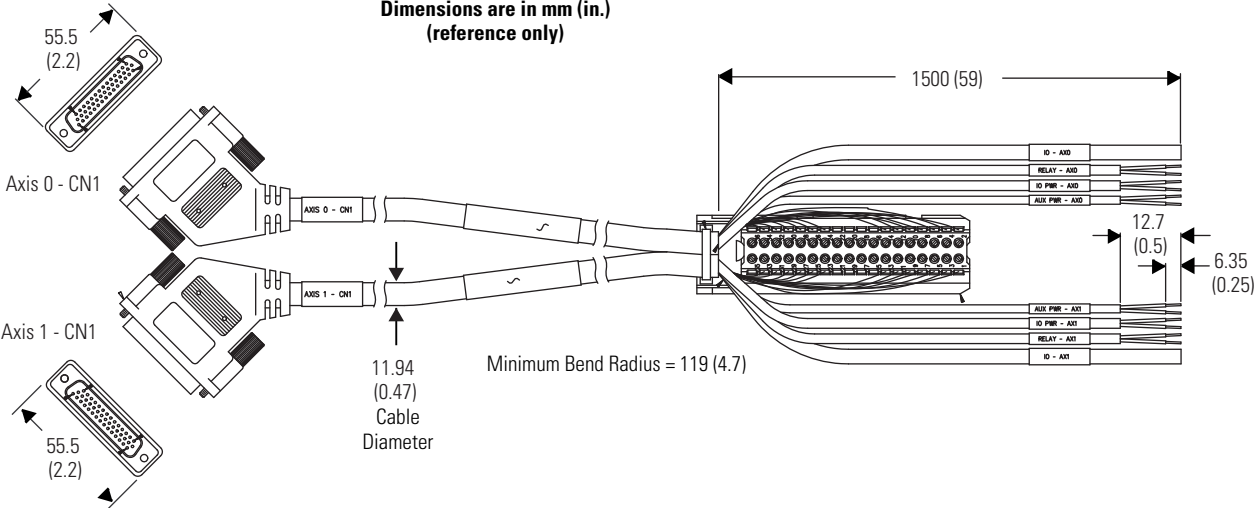
Control Interface Cable Dimensions (catalog number 2090-U3CC-D44xx)

Dimensions are in mm (in.)
(reference only)

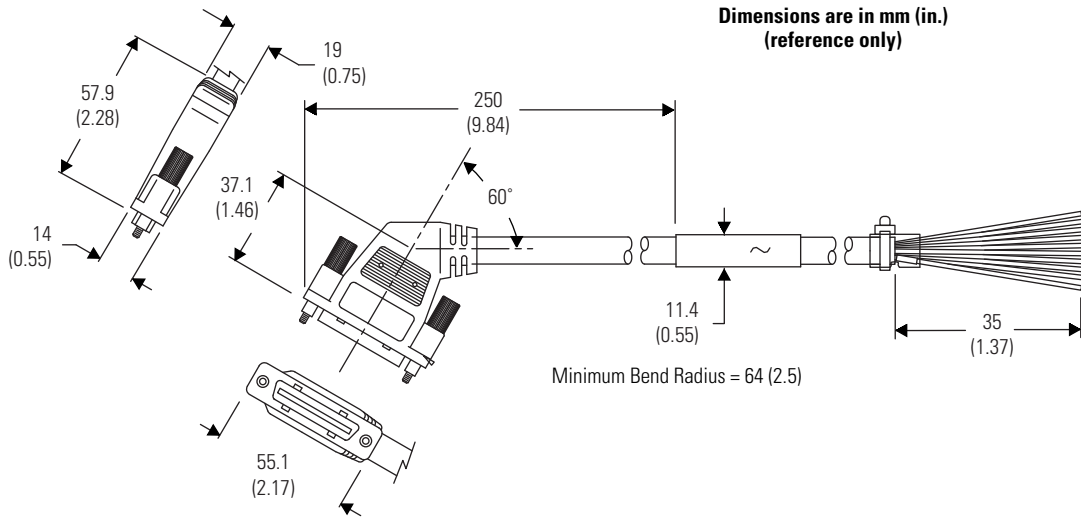


ControlLogix 1756-M02AE Card Encoder Cable Dimensions (catalog number 2090-U3AE-D44xx)

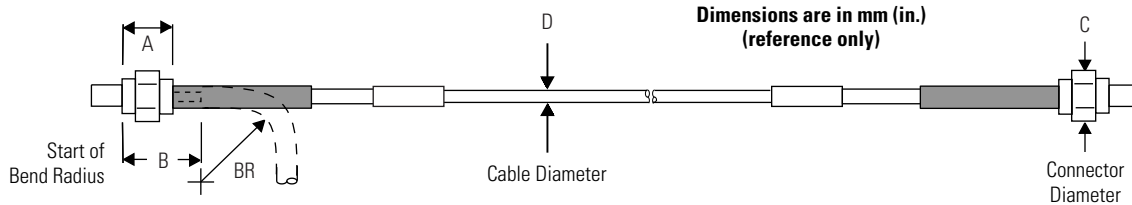
Dimensions are in mm (in.)
(reference only)



Control Interface Cable Dimensions (catalog number 2090-DAIO-D50xx)

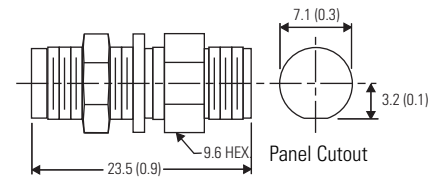


SERCOS Interface Fiber-optic Cable Dimensions (catalog number 2090-SCxxx-x)



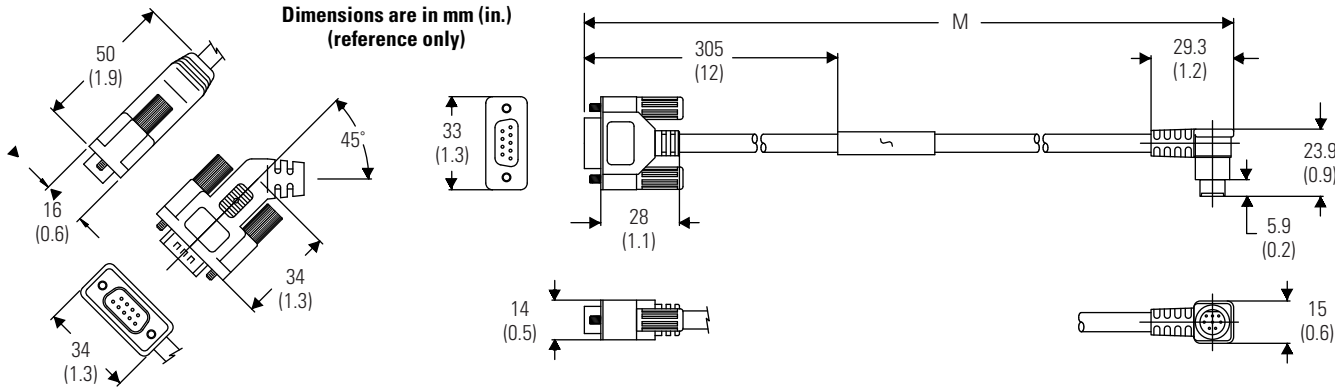
Fiber-optic Cable Cat. No.	A mm (in.)	B mm (in.)	BR ⁽¹⁾ mm (in.)	C mm (in.)	D mm (in.)
2090-SCEP _{x-x}	7 (0.27)	18 (0.71)	25 (0.98)	10 (0.39)	2.2 (0.09)
2090-SCNP _{x-x}			40 (1.6)		
2090-SCVP _{x-x}			30 (1.2)	5.0 (0.2)	
2090-SCVG _{x-x}					

Bulkhead Adapter Dimensions (2090-S-BLHD)

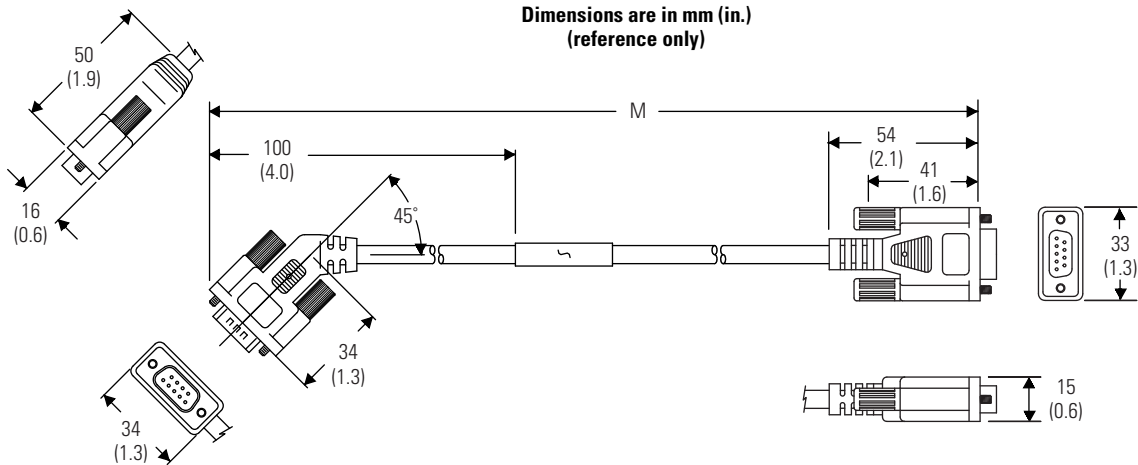


(1) Standard cables have a static or one-time bend radius of ten times (10x) the cable diameter.

Ultra5000 Drive to PanelView Terminal Cable Dimensions (catalog number 2090-U5PM-D09xx)



Ultra5000 Drive to PanelView Terminal Cable Dimensions (catalog number 2090-U5PV-D09xx)



Cable Specifications

Motor Power Cable Specifications

Power Cables ⁽¹⁾ Cat. No.	Cable Type	Description	Wire Size AWG	Jacket Color	Weight, approx. kg/m (lb/ft)		
2090-XXNPMF-16Sxx	Standard cable	Four conductor, 600V, shielded cable for three-phase power with additional four conductors, 18 AWG, shielded, for motor brake and spares.	16	Black	0.276 (0.186)		
2090-XXNPMF-14Sxx			14		0.315 (0.212)		
2090-XXNPMF-10Sxx			10		0.521 (0.350)		
2090-CPBM6DF-16AAxx		Four conductor, 600V, shielded cable for three-phase power with additional two conductors 18 AWG for motor brake.	16		0.180 (0.121)		
2090-CPBM7DF-12AAxx			12		0.349 (0.235)		
2090-CPBM7DF-08AAxx			8		0.698 (0.469)		
2090-CPBM7DF-06AAxx			6		1.038 (0.698)		
2090-CPBM7DF-04AAxx			4		1.549 (1.04)		
2090-CPWM6DF-16AAxx			Four conductor, 600V, shielded cable for three-phase power.		16	0.138 (0.093)	
2090-CPWM7DF-12AAxx		12			0.240 (0.161)		
2090-DANPT-16Sxx		16			0.138 (0.093)		
2090-CPBM4DF-16AFxx		Continuous-flex cable	Four conductor, 600V, shielded cable for three-phase power with additional two conductors 18 AWG for motor brake.		16	Industrial TPE, Orange (DESINA, RAL 2003)	0.228 (0.153)
2090-CPBM7DF-16AFxx					16		0.228 (0.153)
2090-CPBM7DF-14AFxx	14			0.289 (0.194)			
2090-CPBM7DF-10AFxx	10			0.513 (0.345)			
2090-CPWM4DF-16AFxx	Four conductor, 600V, shielded cable for three-phase power.		16	0.154 (0.104)			
2090-CPWM7DF-16AFxx			16	0.154 (0.104)			
2090-CPWM7DF-14AFxx			14	0.196 (0.132)			
2090-CPWM7DF-10AFxx			10	0.452 (0.304)			

(1) 2090-CPxM4DF and 2090-CPxM7DF power cables are UL Listed, bulk cable, type TC-ER.

Motor Brake Cable Specifications

Brake Cables Cat. No.	Cable Type	Description	Wire Size AWG	Jacket Color	Weight, approx. kg/m (lb/ft)
2090-DANBT-18Sxx	Standard cable	Two conductor, 600V, 18 AWG, shielded cable for motor brake.	18	Black	0.070 (0.047)

Motor Feedback Cable Specifications

Feedback Cables ⁽¹⁾ Cat. No.	Cable Type	Description	Wire Size AWG	Jacket Color	Weight, approx. kg/m (lb/ft)
2090-XXNFMF-Sxx	Standard cable	Threaded DIN connector (motor end) to flying leads (drive end), 30V.	28 Feedback 16 Power, 5V 22 Power, 9V	Black	0.120 (1.35)
2090-UXNFM-Sxx		Flying-leads (motor end) to premolded connector (drive end), 30V.			
2090-CFBM6DF-CBAAxx		Circular plastic connector (motor end) to premolded connector (drive end), 300V.	28 Feedback 16 Power, 5V 22 BAT+		
2090-CFBM6DD-CCAAxx		Circular plastic connector (motor end) to premolded connector (drive end), 300V.	28 Feedback 16 Power, 5V		
2090-DANFCT-Sxx		Rectangular plastic connector (motor end) to premolded connector (drive end), 30V.	28 Feedback 16 Power, 5V 22 BAT+		
2090-CFBM4DF-CEAAxx		Threaded DIN connector (motor end) to flying leads (drive end), 600V.	22 All conductors		
2090-CFBM4DF-CDAFxx	Continuous- flex cable	SpeedTec DIN connector (motor end) to flying leads (drive end), 600V.	26 Feedback 16 Power, 5V 22 Power, 9V	Green, (RAL 6018)	0.153 (0.103)
2090-CFBM7DF-CDAFxx					

(1) 2090-CFBM4DF and 2090-CFBM7DF power cables are UL Listed, bulk cable, type CM.

Continuous-flex Extension Cable Specifications

Cat. No.	Cable Type	Description	Jacket Color	Weight, approx. kg/m (lb/ft)
2090-CPBM7E7-16AFxx	Power with brake ⁽¹⁾	SpeedTec DIN connector plug on motor end to SpeedTec DIN receptacle for mating with standard 2090-XXNPMF-Sxx cable, 600V.	Industrial TPE, Orange (DESINA, RAL 2003)	0.228 (0.153)
2090-CPBM7E7-14AFxx				0.289 (0.194)
2090-CPBM7E7-10AFxx				0.513 (0.345)
2090-CFBM7E7-CDAFxx	Feedback ⁽²⁾	SpeedTec DIN connector plug on motor end to SpeedTec DIN receptacle for mating with standard 2090-XXNFMF-Sxx cable, 600V.	Green, (RAL 6018)	0.153 (0.103)

(1) 2090-CPBM7E7 extension power cables are UL Listed, bulk cable, type TC-ER.

(2) 2090-CFBM7E7 extension feedback cables are UL Listed, bulk cable, type CM.

Motor Power and Feedback Transition Cable Specifications

Cat. No.	Cable Type	Description	Jacket Color
2090-CPBM4E2-14TR	Power with brake	Threaded DIN connector on motor end to bayonet receptacle for mating with existing bayonet cable, 600V, 500 mm (19.7 in.).	Black
2090-CPBM4E2-10TR			
2090-CPBM4E2-08TR			
2090-CPBM4E2-04TR			
2090-CPWM4E2-14TR	Power (only)		
2090-CPWM4E2-10TR			
2090-CPWM4E2-08TR			
2090-CPWM4E2-04TR			
2090-CFBM4E2-CATR	Feedback	Threaded DIN connector on motor end to bayonet receptacle for mating with existing bayonet cable, 300V, 500 mm (19.7 in.).	

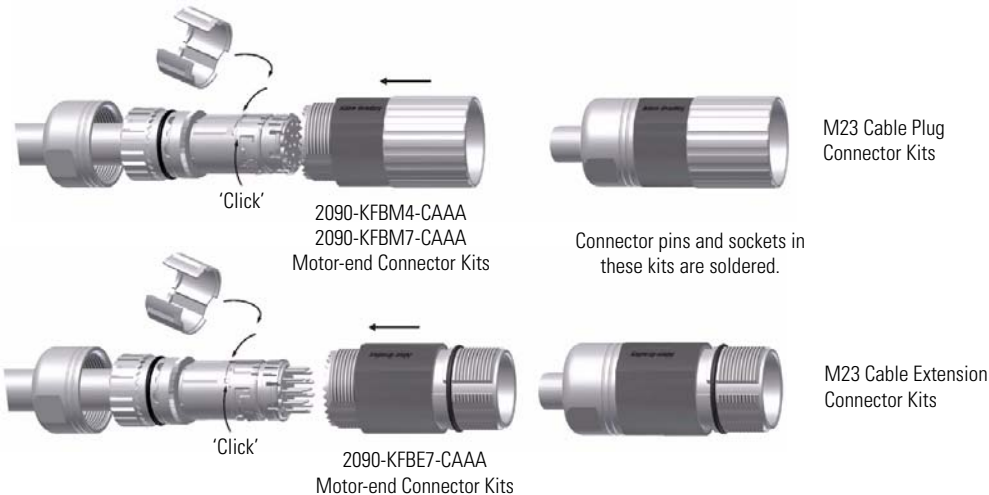
Interface Cable Specifications

Interface Cable Cat. No.	Description	Specifications		
		Ratings	Shield	Jacket Material
2090-UXPC-D09xx	Ultra3000/5000 serial interface to computer	90 °C (194 °F), 30V	Aluminum Polyester 100% coverage Braid shield coverage, 85% min	TPE
2090-DAPC-D09xx	Ultra1500 serial interface to computer			
2090-DAIO-D50xx	Ultra1500 control interface cable, flying leads			
2090-U3CC-D44xx	Single-axis flying lead Ultra3000 drive to 1756-M02AE module			
2090-U3AE-D44xx	Two-axis pre-wired Ultra3000 drive to 1756-M02AE module	80 °C (176 °F), 30V		
2090-U5PM-D09xx	Ultra5000 drive to PanelView 300 Micro DF-1 terminal and MicroLogix system	60 °C (140 °F), 30V		PVC
2090-U5PV-D09xx	Ultra5000 drive to PanelView Standard DF-1 terminal	80 °C (176 °F), 30V		TPE
2090-xXNRB-xxFxxx	Resistive Brake Module (RBM) to drive interface	105 °C (221 °F), 600V		
2090-SCEP-x-x	SERCOS interface fiber-optic cable (drive to drive, drive to 1756-MxxSE module, or drive to 1768-M04SE module)	-55...85° C (-67...185 ° F)	Chlorinated Polyethylene	
2090-SCNP-x-x			Nylon	
2090-SCVP-x-x			Polyethylene/Kevlar covered by PVC	
2090-SCVG-x-x			Kevlar and PVC	
		-20...75 °C (-4...67 ° F)		

Motor-end Connector Kits

Motor-end connector kits are available for building your own cables. Also available are the crimping tools required for properly attaching the power wires to sockets and pins. Refer to the tables beginning on [page 412](#).

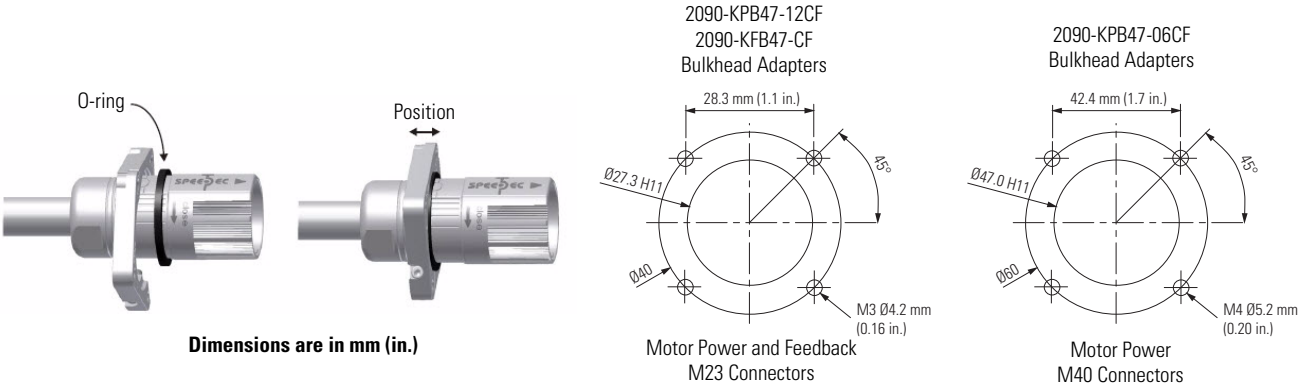
Feedback Cable Connector Kits



Power Cable Connector Kits



Bulkhead Adapter Kits



Power Cable Connector Kits (SpeedTec DIN)

Connector Kit Cat. No.	Description	Crimp Tool Cat. No.	Bulkhead Adapter Cat. No.	Motor Series
2090-KPBM7-12AA	Motor-end cable connector SpeedTec plug, M23 connector 16, 14, and 12 AWG motor power 18 AWG motor brake	2090-TCR47-M23	2090-KPB47-12CF	MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx, MPL-B520, MPL-B540, MPL-B560 MPM-A/B115xx, MPM-A/B130xx, MPM-B1651C, MPM-B1651F, MPM-B1652C, MPM-B1653C, MPM-B1652E MPF-A/B3xx, MPF-A/B4xx, MPF-A/B45xx RDB-B130xx, RDB-B165xx, RDB-B21519, RDB-B2151C, RDB-B21529, RDB-B2152C, RDB-B21539, RDB-B2901x, RDB-B29024, RDB-B29026, RDB-B29034 MPL-A5xx, MPL-B580, MPL-B6xx, MPL-B860, MPL-B880C, MPL-B960B, MPL-B980B MPM-A1651F, MPM-B1651M, MPM-B1652E, MPM-A/B1652F, MPM-B1653E, MPM-A/B1653F, MPM-A/B215xx MPF-A/B5xx RDB-B2151F, RDB-B2152E, RDB-B2153C, RDB-B2153E, RDB-B29029, RDB-B29036, RDB-B410xx MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx, MPL-B520, MPL-B540, MPL-B560 MPM-A/B115xx, MPM-A/B130xx, MPM-B1651C, MPM-B1651F, MPM-B1652C, MPM-B1653C, MPM-B1652E MPF-A/B3xx, MPF-A/B4xx, MPF-A/B45xx RDB-B130xx, RDB-B165xx, RDB-B21519, RDB-B2151C, RDB-B21529, RDB-B2152C, RDB-B21539, RDB-B2901x, RDB-B29024, RDB-B29026, RDB-B29034 MPL-A5xx, MPL-B580, MPL-B6xx, MPL-B860, MPL-B880C, MPL-B960B, MPL-B980B MPM-A1651F, MPM-B1651M, MPM-B1652E, MPM-A/B1652F, MPM-B1653E, MPM-A/B1653F, MPM-A/B215xx MPF-A/B5xx RDB-B2151F, RDB-B2152E, RDB-B2153C, RDB-B2153E, RDB-B29029, RDB-B29036, RDB-B410xx
2090-KPBM7-06AA	Motor-end cable connector SpeedTec plug, M40 connector 10, 8, and 6 AWG motor power 18 AWG motor brake	2090-TCR47-M40 (power pins) 2090-TCR47-M23 (brake pins)	2090-KPB47-06CF	MPL-A5xx, MPL-B580, MPL-B6xx, MPL-B860, MPL-B880C, MPL-B960B, MPL-B980B MPM-A1651F, MPM-B1651M, MPM-B1652E, MPM-A/B1652F, MPM-B1653E, MPM-A/B1653F, MPM-A/B215xx MPF-A/B5xx RDB-B2151F, RDB-B2152E, RDB-B2153C, RDB-B2153E, RDB-B29029, RDB-B29036, RDB-B410xx MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx, MPL-B520, MPL-B540, MPL-B560 MPM-A/B115xx, MPM-A/B130xx, MPM-B1651C, MPM-B1651F, MPM-B1652C, MPM-B1653C, MPM-B1652E MPF-A/B3xx, MPF-A/B4xx, MPF-A/B45xx RDB-B130xx, RDB-B165xx, RDB-B21519, RDB-B2151C, RDB-B21529, RDB-B2152C, RDB-B21539, RDB-B2901x, RDB-B29024, RDB-B29026, RDB-B29034 MPL-A5xx, MPL-B580, MPL-B6xx, MPL-B860, MPL-B880C, MPL-B960B, MPL-B980B MPM-A1651F, MPM-B1651M, MPM-B1652E, MPM-A/B1652F, MPM-B1653E, MPM-A/B1653F, MPM-A/B215xx MPF-A/B5xx RDB-B2151F, RDB-B2152E, RDB-B2153C, RDB-B2153E, RDB-B29029, RDB-B29036, RDB-B410xx
2090-KPBE7-12AA	Extension cable connector SpeedTec plug, M23 connector 16, 14, and 12 AWG motor power 18 AWG motor brake	2090-TCR47-M23	2090-KPB47-12CF	MPL-A5xx, MPL-B580, MPL-B6xx, MPL-B860, MPL-B880C, MPL-B960B, MPL-B980B MPM-A1651F, MPM-B1651M, MPM-B1652E, MPM-A/B1652F, MPM-B1653E, MPM-A/B1653F, MPM-A/B215xx MPF-A/B5xx RDB-B2151F, RDB-B2152E, RDB-B2153C, RDB-B2153E, RDB-B29029, RDB-B29036, RDB-B410xx MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx, MPL-B520, MPL-B540, MPL-B560 MPM-A/B115xx, MPM-A/B130xx, MPM-B1651C, MPM-B1651F, MPM-B1652C, MPM-B1653C, MPM-B1652E MPF-A/B3xx, MPF-A/B4xx, MPF-A/B45xx RDB-B130xx, RDB-B165xx, RDB-B21519, RDB-B2151C, RDB-B21529, RDB-B2152C, RDB-B21539, RDB-B2901x, RDB-B29024, RDB-B29026, RDB-B29034 MPL-A5xx, MPL-B580, MPL-B6xx, MPL-B860, MPL-B880C, MPL-B960B, MPL-B980B MPM-A1651F, MPM-B1651M, MPM-B1652E, MPM-A/B1652F, MPM-B1653E, MPM-A/B1653F, MPM-A/B215xx MPF-A/B5xx RDB-B2151F, RDB-B2152E, RDB-B2153C, RDB-B2153E, RDB-B29029, RDB-B29036, RDB-B410xx
2090-KPBE7-06AA	Extension cable connector SpeedTec plug, M40 connector 10, 8, and 6 AWG motor power 18 AWG motor brake	2090-TCR47-M40 (power pins) 2090-TCR47-M23 (brake pins)	2090-KPB47-06CF	MPL-A5xx, MPL-B580, MPL-B6xx, MPL-B860, MPL-B880C, MPL-B960B, MPL-B980B MPM-A1651F, MPM-B1651M, MPM-B1652E, MPM-A/B1652F, MPM-B1653E, MPM-A/B1653F, MPM-A/B215xx MPF-A/B5xx RDB-B2151F, RDB-B2152E, RDB-B2153C, RDB-B2153E, RDB-B29029, RDB-B29036, RDB-B410xx MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx, MPL-B520, MPL-B540, MPL-B560 MPM-A/B115xx, MPM-A/B130xx, MPM-B1651C, MPM-B1651F, MPM-B1652C, MPM-B1653C, MPM-B1652E MPF-A/B3xx, MPF-A/B4xx, MPF-A/B45xx RDB-B130xx, RDB-B165xx, RDB-B21519, RDB-B2151C, RDB-B21529, RDB-B2152C, RDB-B21539, RDB-B2901x, RDB-B29024, RDB-B29026, RDB-B29034 MPL-A5xx, MPL-B580, MPL-B6xx, MPL-B860, MPL-B880C, MPL-B960B, MPL-B980B MPM-A1651F, MPM-B1651M, MPM-B1652E, MPM-A/B1652F, MPM-B1653E, MPM-A/B1653F, MPM-A/B215xx MPF-A/B5xx RDB-B2151F, RDB-B2152E, RDB-B2153C, RDB-B2153E, RDB-B29029, RDB-B29036, RDB-B410xx

Power Cable Connector Kits (threaded DIN)

Connector Kit Cat. No.	Description	Crimp Tool Cat. No.	Bulkhead Adapter Cat. No.	Motor Series
2090-KPBM4-12AA	Motor-end cable connector Threaded plug, M23 connector 16, 14, and 12 AWG motor power 18 AWG motor brake	2090-TCR47-M23	2090-KPB47-12CF	MPL-A/B15xx, MPL-A/B2xx MPF-A/B3xx, MPF-A/B4xx, MPF-A/B45xx, MPF-A/B5xx MPS-A/B3xx, MPS-A/B45xx, MPS-B5xx
2090-KPBM4-06AA	Motor-end cable connector Threaded plug, M40 connector 10, 8, and 6 AWG motor power 18 AWG motor brake	2090-TCR47-M40 (power pins) 2090-TCR47-M23 (brake pins)	2090-KPB47-06CF	MPF-A/B5xx

Feedback Cable Connector Kits (circular DIN)

Connector Kit Cat. No.	Description	Crimp Tool Cat. No.	Bulkhead Adapter Cat. No.	Motor Series
2090-KFBM7-CAAA	Motor-end cable connector SpeedTec plug, M23 connector			MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx, MPL-A/B5xx MPL-B6xx, MPL-B8xx, MPL-B9xx MPM-A/B115xx, MPM-A/B130xx, MPM-A/B165xx, MPM-A/B215xx MPF-A/B3xx, MPF-A/B4xx, MPF-A/B45xx, MPF-A/B5xx RDB-B130xx, RDB-B165xx, RDB-B215xx, RDB-B290xx, RDB-B410xx,
2090-KFBE7-CAAA	Extension cable connector SpeedTec plug, M23 connector	N/A (soldered contacts)	2090-KFB47-CF	MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx, MPL-A/B5xx, MPL-B6xx, MPL-B8xx, MPL-B9xx MPM-A/B115xx, MPM-A/B130xx, MPM-A/B165xx, MPM-A/B215xx MPF-A/B3xx, MPF-A/B4xx, MPF-A/B45xx, MPF-A/B5xx RDB-B130xx, RDB-B165xx, RDB-B215xx, RDB-B290xx, RDB-B410xx
2090-KFBM4-CAAA	Motor-end cable connector Threaded plug, M23 connector			MPL-A/B15xx or MPL-A/B2xx MPF-A/B3xx, MPF-A/B4xx, MPF-A/B45xx, MPF-A/B5xx MPS-A/B3xx, MPS-A/B45xx, MPS-B5xx

Motor-end Cable Connector Kits (bayonet)

Motor Series	Connector Kit Cat. No.	Description
MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx MPL-A520K MPL-B520K, MPL-B540K, MPL-B540D, MPL-B560F, and MPL-B580F 1326AB-B4xxx and 1326AB-B5xxx (M2L/S2L)	2090-MPPC-S	Straight Power Connector Kit, 12 AWG max
MPL-B6xx, MPL-B8xx, MPL-B960B, MPL-B960C, MPL-B980B, MPL-B980C	2090-MPPC-08S	Straight Power Connector Kit, 8 AWG max
MPL-A/B3xx, MPL-A/B4xx, MPL-A/B45xx, MPL-A/B5xx MPL-B6xx, MPL-B8xx, MPL-B9xx	2090-MPFC-S	Straight Feedback Connector Kit
All MPL-A/Bxxx	2090-MPBC-S	Straight Brake Connector Kit
All TLY-Axxx	9106-0066	Straight Power and Feedback Connector Kit

Drive-end Connector Kits

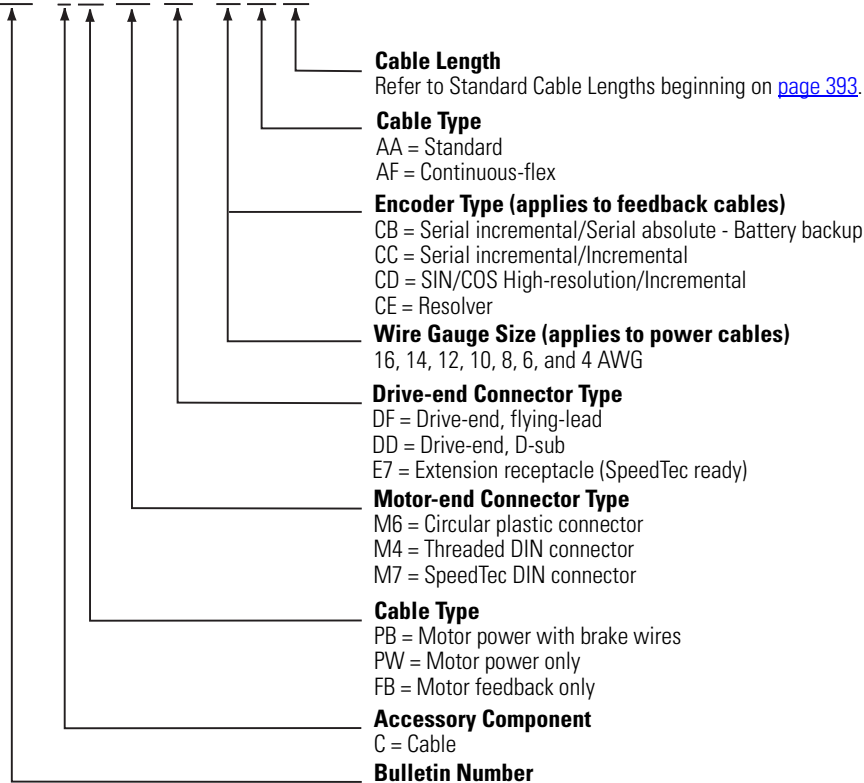
Drive Family	Kit Cat. No.	Description
Ultra3000/5000	2090-UXCK-D09	Mating Connector Kit (9-pin standard density D-shell) CN3
Ultra3000/5000	2090-UXCK-D15	Mating Connector Kit (15-pin high density D-shell) CN2
Ultra3000	2090-U3CK-D44	Mating Connector Kit (44-pin high density D-shell) CN1
Ultra1500	9101-1476	Mating Connector Kit (50-pin mini-D solder cup) CN1
Ultra1500	9101-1477	Mating Connector Kit (20-pin mini-D solder cup) CN2 and CN3
Ultra5000	2090-U5CK-TB	Mating Connector Kit (28 and 15 position spring terminal) CN1A and CN1B

Bulletin 2090 Cable Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering charts below to understand the configuration of your cables. For questions regarding product availability, contact your Allen-Bradley distributor.

Motor Power/Brake and Feedback Cables

2090 - C xx Mx Dx - Cx Ax xx

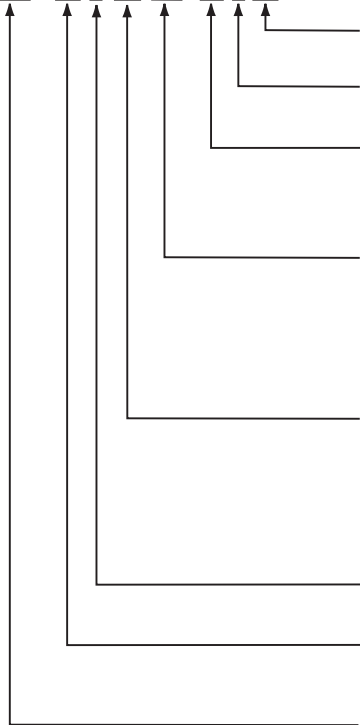


Transition Cables

Cat. No.	Cable Type	Description
2090-CPBM4E2-14TR	Power/brake	Threaded DIN connector on motor-end to bayonet receptacle for mating with existing bayonet cable, 500 mm (19.7 in.).
2090-CPBM4E2-10TR		
2090-CPBM4E2-08TR		
2090-CPBM4E2-04TR		
2090-CPWM4E2-14TR	Power (only)	
2090-CPWM4E2-10TR		
2090-CPWM4E2-08TR		
2090-CPWM4E2-04TR		
2090-CFBM4E2-CATR	Feedback	

Motor Power, Feedback, and Brake Cables

2090 - xx x xx xx - xx S xx



Cable Length

Refer to Standard Cable Lengths beginning on [page 393](#).

Motor Connector

S = Straight

Wire Gauge Size (AWG)

16 = Motor power cable
 18 = Motor brake cables
 Blank = Feedback cables

Motor/Actuator Series

MF = Threaded DIN Connectors
 MPS-A/Bxxxx (MPS-A/Bxxxx-M/S)
 HPK-B/Exxxx (HPK-B/Exxxx-M/S)
 MPAS-A/Bxxxx (MPAS-A/Bxxxx-V/A) or MPMA-A/Bxxxx
 T = TLY-Axxxx (TLY-Axxxx-B/H)

Cable Type

P = Motor power
 F = Motor feedback connector (flying-leads at drive)
 FC = Motor feedback (connectors at both ends, TL-Series)
 FM = Motor feedback (flying-leads to D-sub at drive)
 B = Motor brake

Flex Option

N = Standard cable (non-flex)

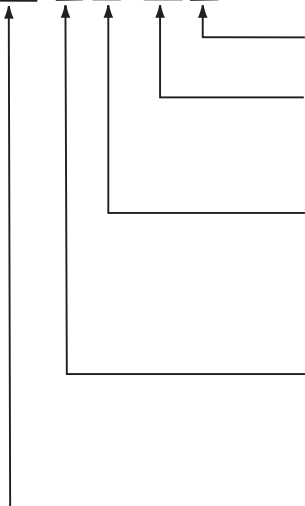
Drive Family

DA = Ultra1500 drives
 XX = All other drives

Bulletin Number

Control and Serial Interface Cables

2090 - xx xx - Dxx xx



Cable Length

Refer to Standard Cable Lengths beginning on [page 393](#).

Connector Type

D09 = 9-pin D-Shell
 D44 = 44-pin, D-Shell
 D50 = 50-pin, mini-D

Host

AE or CC = Ultra3000 to ControlLogix 1756-M02AE Cable
 IQ = Ultra1500 controller cable
 PM = Ultra5000 to PanelView 300 MicroLogix DF-1
 PV = Ultra5000 to standard PanelView DF-1
 PC = Personal computer RS232/RS485 serial interface

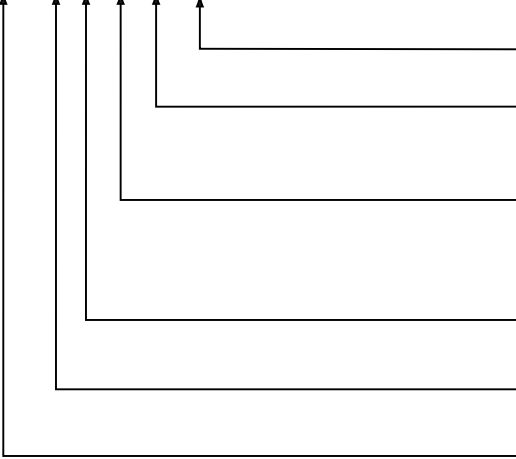
Drive

U3 = Ultra3000
 U5 = Ultra5000
 UX = Ultra3000 or Ultra5000
 DA = Ultra1500

Bulletin Number

SERCOS Interface Fiber-optic Cables

2090 - S C x x x-x



- Cable Length**
Refer to Standard Cable Lengths beginning on [page 393](#).
- Cable Option**
P = Plastic
G = Glass
- Enclosure Option**
E = Enclosure Only
V = PVC Jacket
N = Nylon Jacket
- Connector Option**
C = Mating Connectors (at both ends)
- Type**
S = SERCOS interface
- Bulletin Number**

Breakout Components and Connector Kits

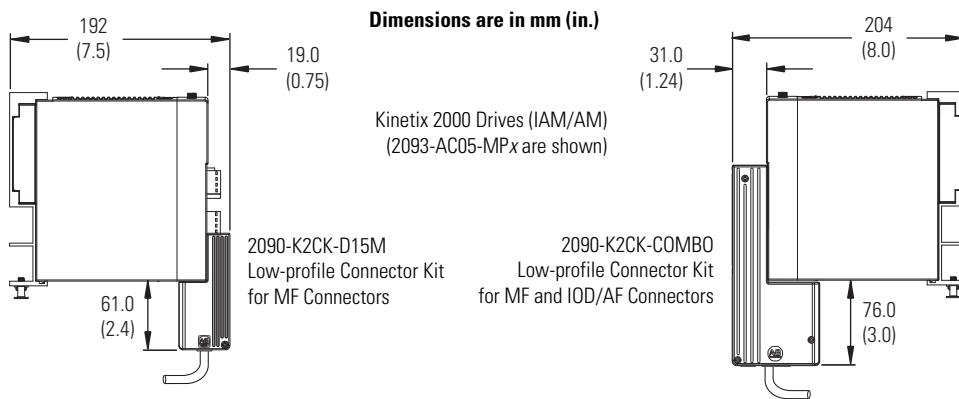
This section contains examples, descriptions, dimensions, specifications, and catalog numbers for breakout components and connector kits.

Low-profile Connector Kit Examples

Use these examples to identify the best solution for wiring flying-lead feedback and I/O cables to servo drive or Line Interface Modules (LIM).

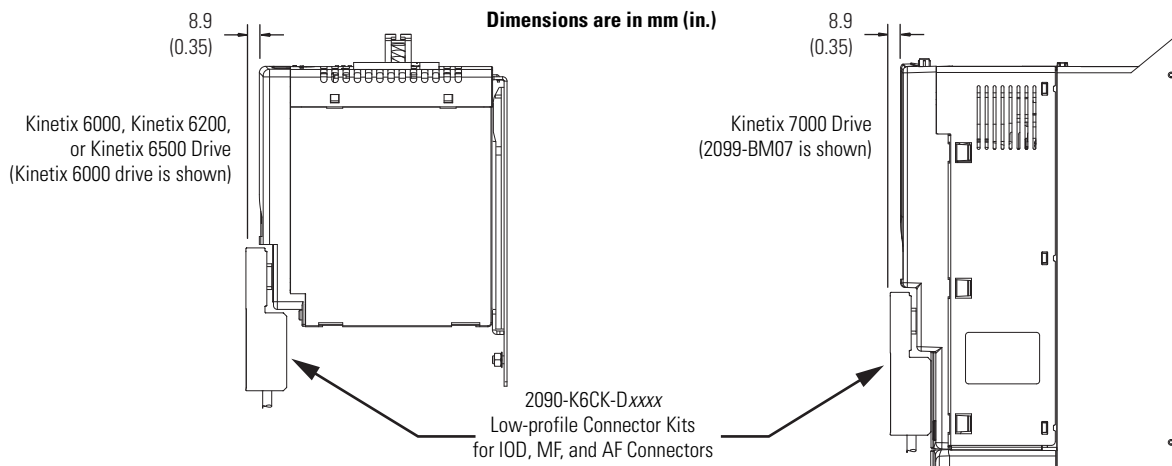
In this example, the Kinetix 2000 (IAM/AM) is shown with catalog number 2090-K2CK-D15M, for use with the motor feedback (MF) connector. Also shown is catalog number 2090-K2CK-COMBO for use with the motor feedback (MF) and I/O (IOD/AF) connectors. Refer to Low-profile Connector Kit Components on [page 419](#) for more information.

Kinetix 2000 (IAM/AM) and Kinetix 300 Examples



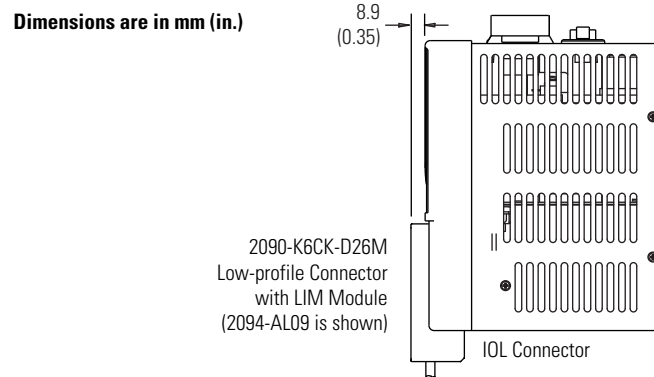
In this example, the Kinetix 6000 and Kinetix 7000 drives are shown with low-profile connector kits (catalog numbers 2090-K6CK-Dxxx). Use these kits with the I/O (IOD), motor feedback (MF), and auxiliary feedback (AF) connectors. The 2090-K6CK-Dxxx kits also apply to the Kinetix 6200 and Kinetix 6500 drives. Refer to Low-profile Connector Kit Components on [page 419](#) for more information.

Kinetix 6000, Kinetix 6200, Kinetix 6500, and Kinetix 7000 Low-profile Connector Examples



In this example, the LIM module is shown with low-profile connector kit (catalog number 2090-K6CK-D26M). Use this connector with the I/O (IOL) connector on the 2094-AL09 and 2090-BL02 LIM modules. Refer to Low-profile Connector Kit Components for more information.

LIM Module Low-profile Connector Example



Low-profile Connector Kit Components

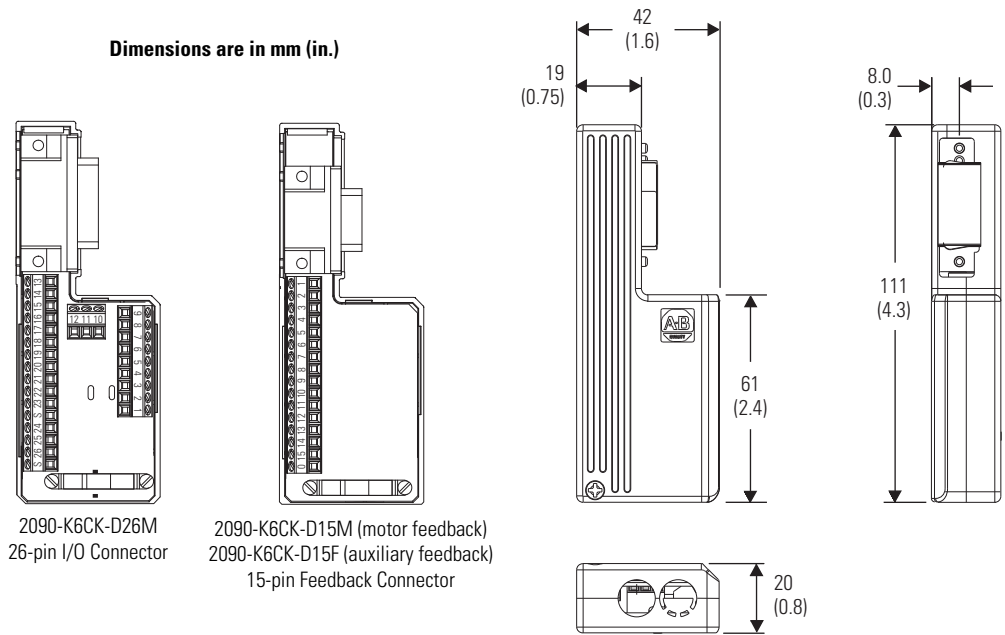
Low-profile connector kits are designed for use with the Kinetix 2000 IAM/AM, Kinetix 6000 IAM/AM, and Kinetix 7000 drives, and LIM modules. Use this table to identify the low-profile connector kit for your feedback or I/O connector.

IMPORTANT

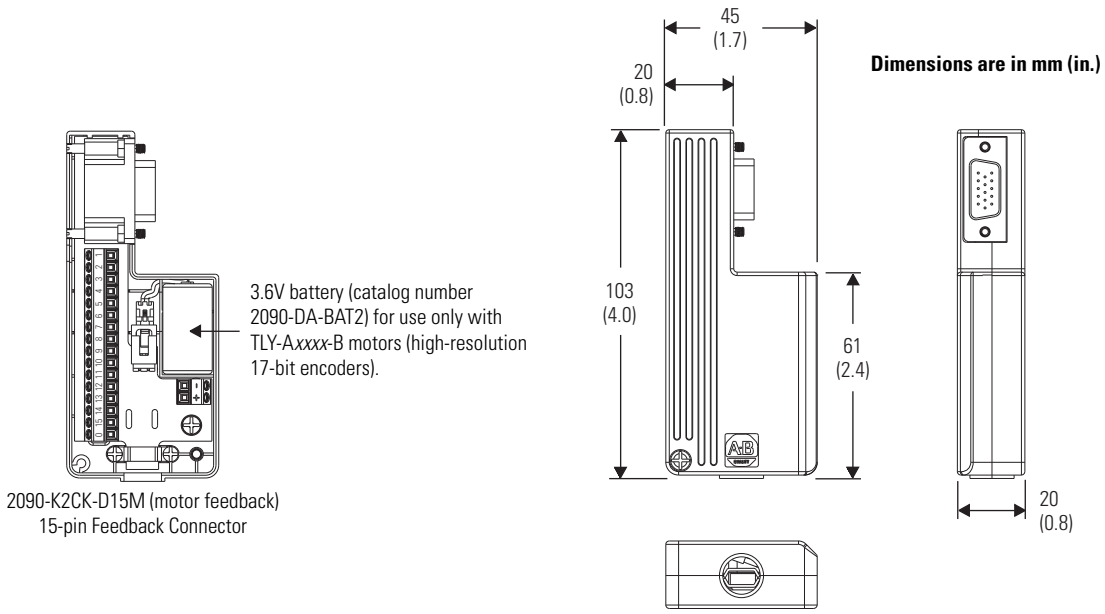
The flying-lead compatible cables listed below require connector kits to complete feedback and I/O connections to the drive.

Cat. No.	Description	Cable Compatibility
2090-K2CK-D15M	Low-profile connector kit for motor feedback (15-pin, male, D-sub). Use with any Kinetix 2000 IAM/AM module or Kinetix 300 drive and compatible motors with incremental or high-resolution feedback. Does not include 3.6V battery (catalog number 2090-DA-BAT2) required for use with TLY-Axxxx-B high-resolution motors and 17-bit encoders.	
2090-K2CK-COMBO	Low-profile connector kit for motor feedback (15-pin, male, D-sub) and IO (44-pin, male, D-sub). Use with any Kinetix 2000 IAM/AM module and compatible motors with incremental or high-resolution feedback. Does not include 3.6V battery (catalog number 2090-DA-BAT2) required for use with TLY-Axxxx-B high-resolution motors and 17-bit encoders. The 2090-K2CK-COMBO kit, mounted on the Kinetix 2000 (IAM/AM) drive, fits in a standard 10 in. enclosure.	2090-XXNFMF-Sxx 2090-CFBM4DF-CDAFxx 2090-CFBM7DF-CDAFxx 2090-CFBM6DF-CBAAXx
2090-K6CK-D15M	Low-profile connector kit for motor feedback (15-pin, male, D-sub). Use with any Kinetix 6000, Kinetix 6200, Kinetix 6500, or Kinetix 7000 drive and compatible motors with incremental or high-resolution feedback.	
	Low-profile connector kit for motor feedback (15-pin, male, D-sub). Use with any Kinetix 6000 IAM/AM module and MPL-Bxxxx-R or MPM-A/Bxxxx-2 (resolver feedback) motors.	2090-CFBM4DF-CEAAXx
2090-K6CK-D15F	Low-profile connector kit for auxiliary feedback (15-pin, female, D-sub). Use with any Kinetix 6000 IAM/AM module or Kinetix 7000 drive auxiliary feedback application.	
2090-K6CK-D26M	Low-profile connector kit for I/O (26-pin, male, D-sub). For use with any Kinetix 6000 IAM/AM module, Kinetix 7000 drive, or 2094-AL09 and 2094-BL02 LIM module.	Customer Supplied
2090-K6CK-D44M	Low-profile connector kit for I/O, safety, and auxiliary feedback (44-pin, male, D-sub). For use with any Kinetix 6200 or Kinetix 6500 control module.	

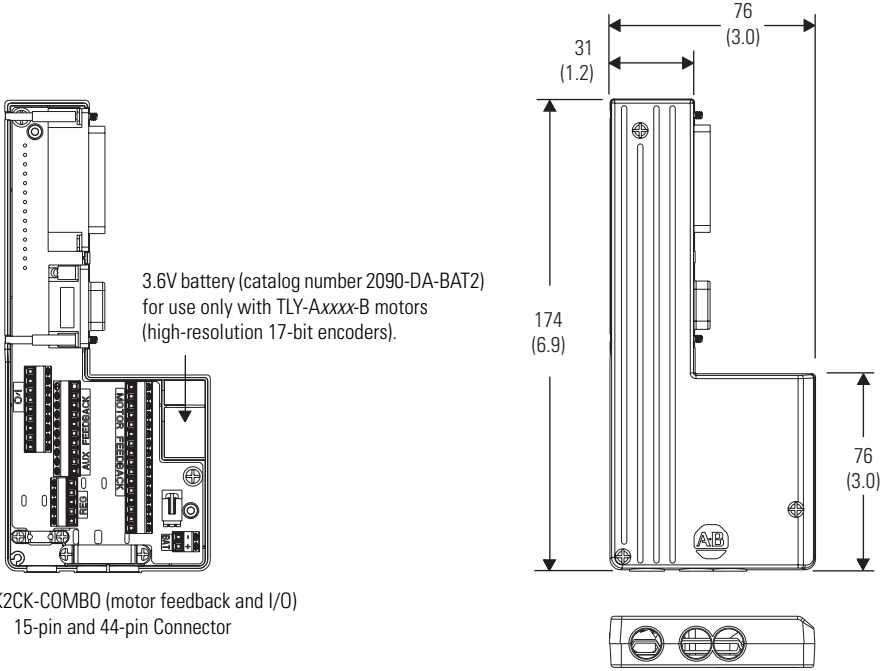
Low-profile Connector Kit Dimensions
 (catalog numbers 2090-K6CK-D26M, 2090-K6CK-D15M, 2090-K6CK-D15F)



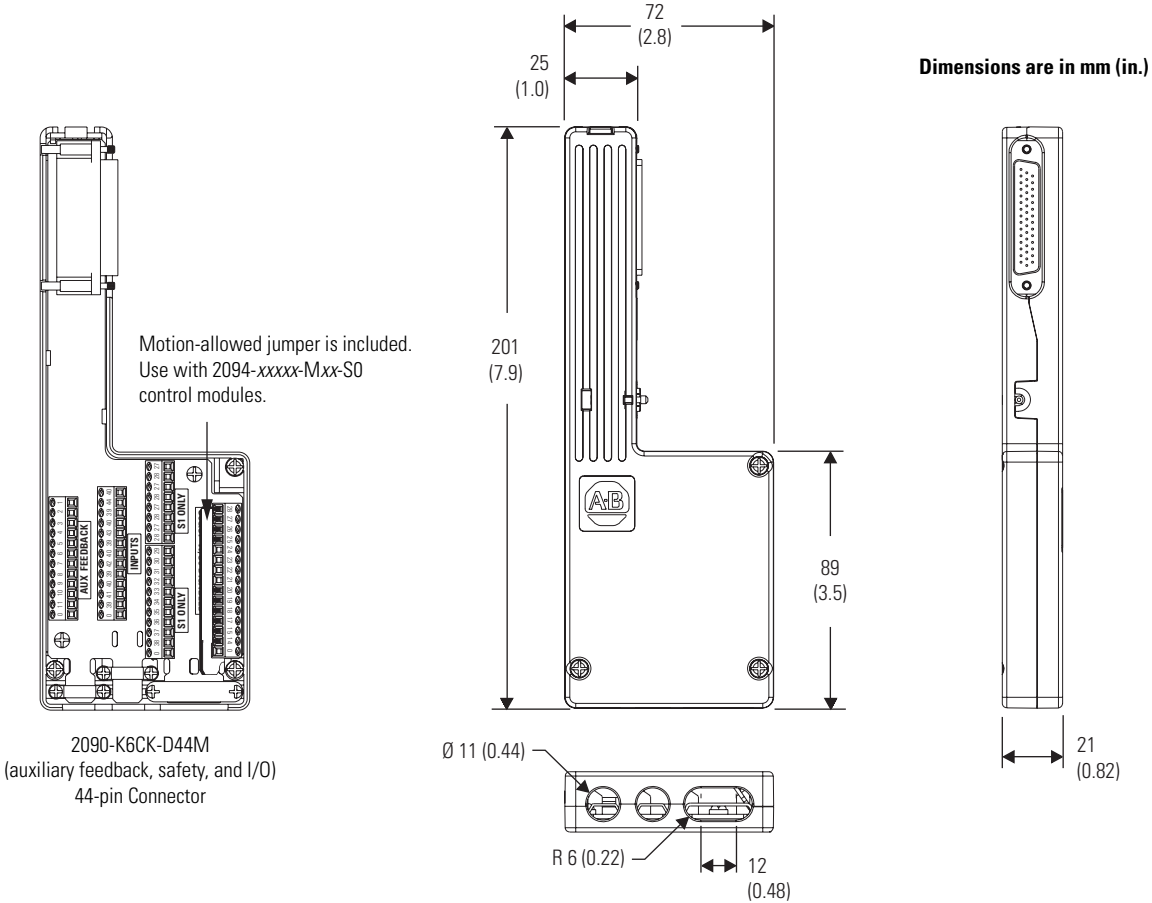
Low-profile Connector Kit Dimensions
 (catalog number 2090-K2CK-D15M)



**Low-profile Connector Kit Dimensions
(catalog number 2090-K2CK-COMBO)**



**Low-profile Connector Kit Dimensions
(catalog number 2090-K6CK-D44M)**

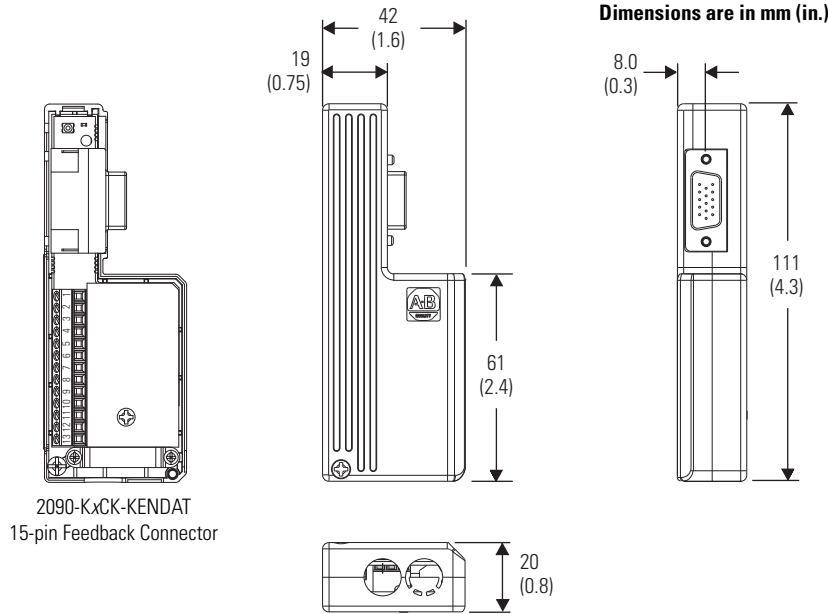


Low-profile Feedback Modules

This low-profile feedback module is designed for use with the Kinetix 6000 IAM/AM modules and Kinetix 7000 drives.

Cat. No.	Description	Cable Compatibility
2090-K6CK-KENDAT	Low-profile feedback module (15-pin, male, D-sub) for EnDat to Stegmann Hiperface encoder signal conversion. Use with any Kinetix 6000 IAM/AM module and compatible motors with Endat encoders.	2090-XXNFMF-Sxx 2090-CFBM4DF-CDAFxx 2090-CFBM7DF-CDAFxx
2090-K7CK-KENDAT	Low-profile feedback module (15-pin, male, D-sub) for EnDat to Stegmann Hiperface encoder signal conversion. Use with any Kinetix 7000 drive and compatible motors with Endat encoders.	

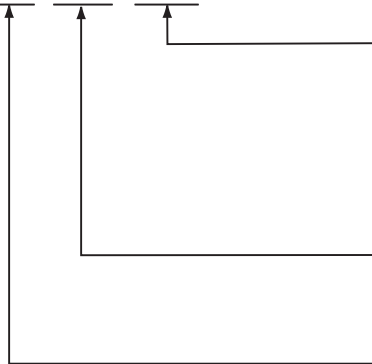
Low-profile Feedback Module Dimensions (catalog number 2090-KxCK-KENDAT)



Low-profile Connector Kit Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering charts below to understand the configuration of your component. For questions regarding product availability, contact your Allen-Bradley distributor.

2090 - KxCK - xxxxx



Connector Type

- D15M = 15-pin, male, D-sub, for motor feedback
- D15F = 15-pin, female, D-sub, for auxiliary feedback
- D15MF = 15-pin, male, with filter, D-sub, for motor feedback
- D26M = 26-pin, male, D-sub, for I/O
- D44M = 44-pin, D-sub, for I/O, safety, and auxiliary feedback
- COMBO = 15-pin and 44-pin, D-sub, for feedback and I/O
- KENDAT = 15-pin, D-sub, for EnDat to Stegmann Hiperface feedback conversion

Drive

- K2CK = Kinetix 2000 and Kinetix 300 drives
- K6CK = Kinetix 6000 or Kinetix 7000 drives, and LIM modules (2094-AL09 and 2094-BL02 only)
- K7CK = Kinetix 7000 drives

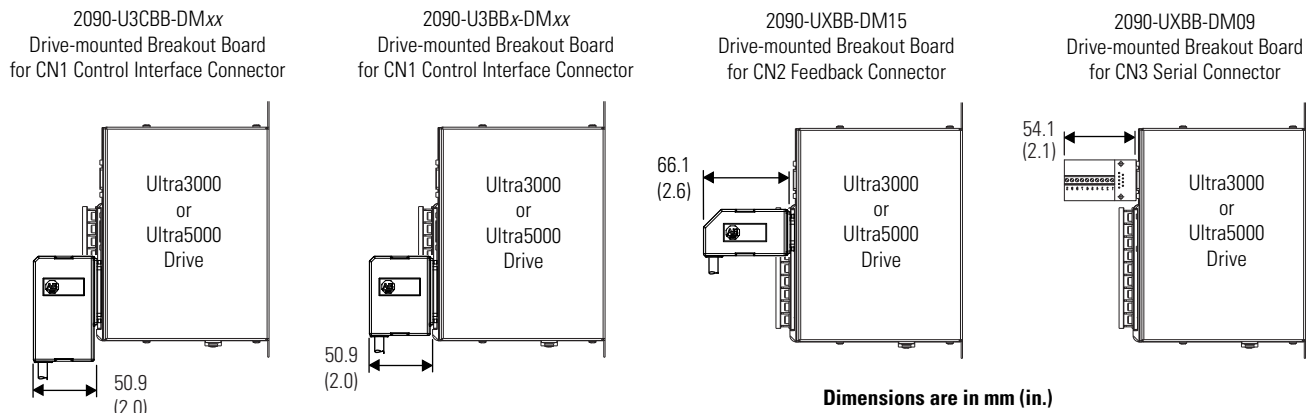
Bulletin Number

Drive-mounted Breakout Board Kit Examples

Use these examples to identify the best solution for wiring your flying-lead control interface, motor feedback, and serial cables to Ultra3000, Ultra5000, and Ultra1500 drives.

In this example, the Ultra3000/5000 drives are shown with drive-mounted breakout board kits (catalog number 2090-Uxxx-DMxx). Drive-mounted breakout board kits are available for the control interface (CN1), motor feedback (CN2), and serial interface (CN3) connectors. Refer to Drive-mounted Breakout Board Components on [page 424](#) for more information.

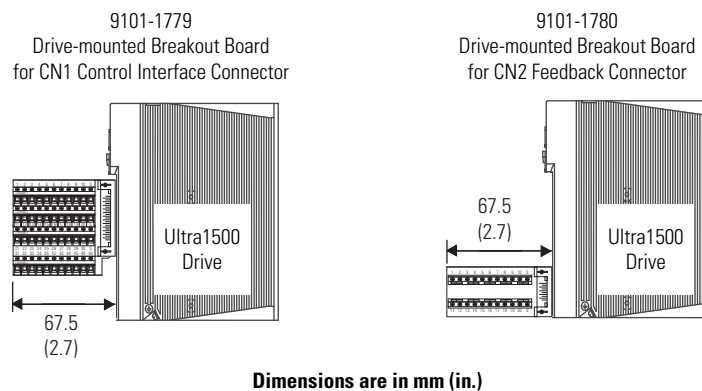
Ultra3000/5000 Drive-mounted Breakout Board Examples



The 2090-UXBB-DM15 (feedback) kit is also compatible with the Kinetix 2000 IAM/AM, Kinetix 6000 IAM/AM, and Kinetix 7000 drives (MF feedback connectors only).

In this example, the Ultra1500 drive is shown with drive-mounted breakout boards (catalog numbers 9101-1779 and 9101-1780). Drive-mounted breakout boards are available for the control interface (CN1) and motor feedback (CN2) connectors. Refer to Drive-mounted Breakout Board Components on [page 424](#) for more information.

Ultra1500 Drive-mounted Breakout Board Examples



Drive-mounted Breakout Board Components

Drive-mounted breakout boards are designed for use with Ultra3000, Ultra5000, and Ultra1500 drives. Use this table to identify the drive-mounted breakout board for your CN1, CN2, and CN3 connector.

IMPORTANT

The 2090-XXNFMF-Sxx and 2090-CFBMxDF-xxAxxx flying-lead feedback cables require either 2090-UXBB-DM15 (drive-mounted) or 2090-UXBB-D15 (panel-mounted) breakout board connector kits to complete feedback connections to the drive.

Drive-mounted Breakout Boards

Cat. No.	Description
2090-U3BB-DM12 ⁽¹⁾	12-pin, drive-mounted breakout board for Ultra3000 CN1 connector recommended for use with SERCOS interface applications.
2090-U3BB2-DM44 ⁽¹⁾⁽²⁾	44-pin, drive-mounted breakout board for Ultra3000 CN1 control interface connector.
2090-U3CBB-DM12 ⁽³⁾	12-pin, drive-mounted breakout board for Ultra3000 CN1 connector recommended for use with SERCOS interface applications with 24V to 5V auxiliary power converter.
2090-U3CBB-DM44 ⁽³⁾	44-pin, drive-mounted breakout board for Ultra3000 CN1 connector with 24V to 5V auxiliary power converter.
2090-UXBB-DM15 ⁽⁴⁾	15-pin, drive-mounted breakout board for Ultra3000/5000 CN2 feedback connector.
2090-UXBB-DM09	9-pin, drive-mounted breakout board for Ultra3000/5000 CN3 serial interface.
9101-1779	50-pin, drive-mounted breakout board for Ultra1500 CN1 I/O connector.
9101-1780	20-pin, drive-mounted breakout board for Ultra1500 CN2 feedback connector.

(1) For specifications, refer to the CN1 Control Interface Breakout Boards Installation Instructions, publication [2090-IN007](#).

(2) This breakout board accepts 1.5 to 0.14 mm² (16 to 26 AWG) wire. For applications that require a 44-pin drive-mounted breakout board that accepts 4 to 0.34 mm² (12 to 22 AWG) wire, contact your local Allen-Bradley representative.

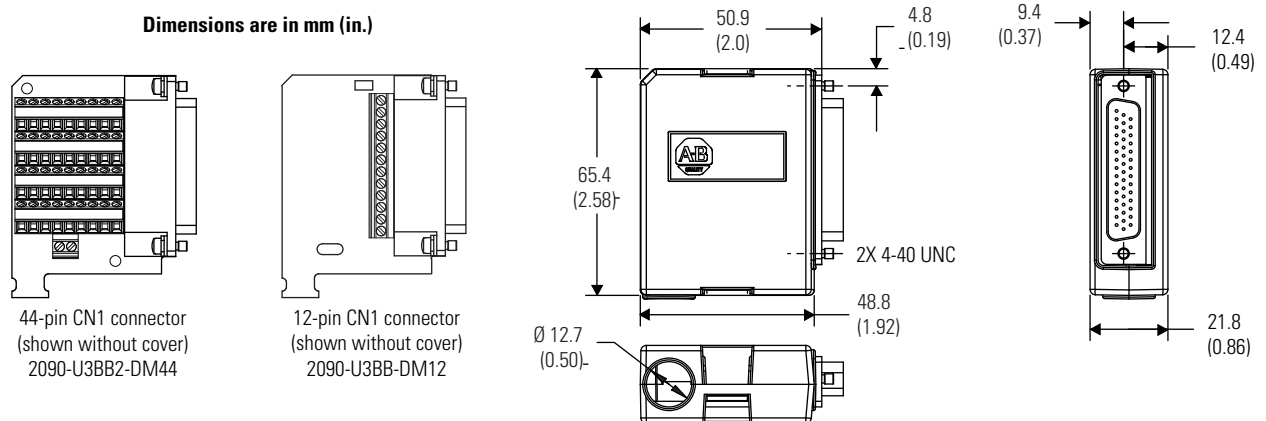
(3) Only for use with the Ultra3000 (2098-DSD-005x-xx, 2098-DSD-010x-xx, 2098-DSD-020x-xx) drives. Requires an external +24V DC power supply. For specifications, refer to the CN1 Control Interface Breakout Boards with Integral 24V to 5V Auxiliary Power Converter Installation Instructions, publication [2090-IN008](#).

(4) For specifications, refer to the CN2 Motor Feedback Breakout Board Installation Instructions, publication [2090-IN006](#).

These (CN1) breakout boards apply to Ultra3000 drives (catalog numbers 2098-DSD-005, 2098-DSD-010, and 2098-DSD-020) in applications where 5V DC control power (if required) is user-supplied. The 12-pin board is intended for use with SERCOS drives, but may be used in non-SERCOS applications with minimal I/O requirements.

IMPORTANT

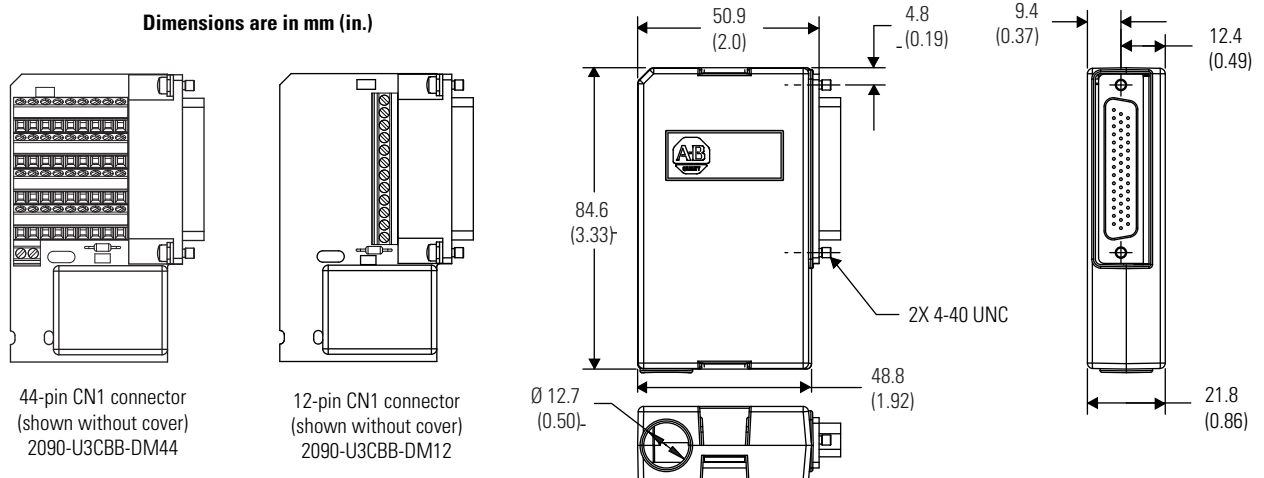
The 2090-U3BB-DMxx is required when wiring to the Ultra3000 (2098-DSD-030-SE/DN, 2098-DSD-075-SE/DN, 2098-DSD-150-SE/DN, or 2098-DSD-HVxxx-SE/DN) SERCOS/DeviceNet interface drives due to space restrictions when connecting the SERCOS or DeviceNet interface cables.

Drive-mounted Breakout Board Dimensions (catalog numbers 2090-U3BB-DM12 and 2090-U3BB2-DM44)

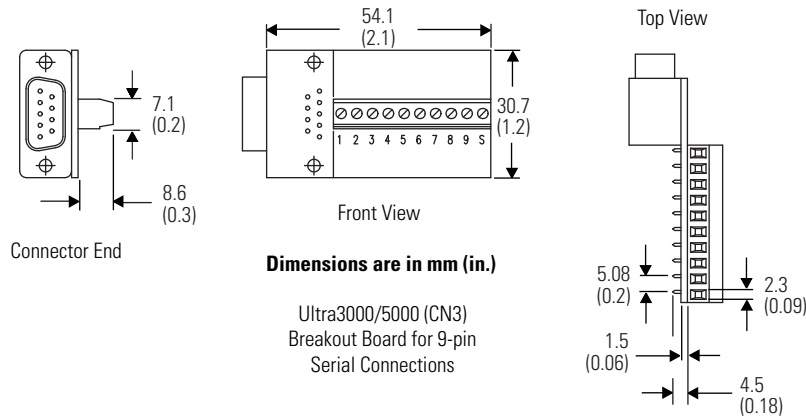
These (CN1) breakout boards apply to Ultra3000 drives (catalog numbers 2098-DSD-005, 2098-DSD-010, and 2098-DSD-020) in applications where a 24...5V DC converter for control power is required. The 12-pin board is intended for use with SERCOS drives, but may be used in non-SERCOS applications with minimal I/O requirements.

IMPORTANT

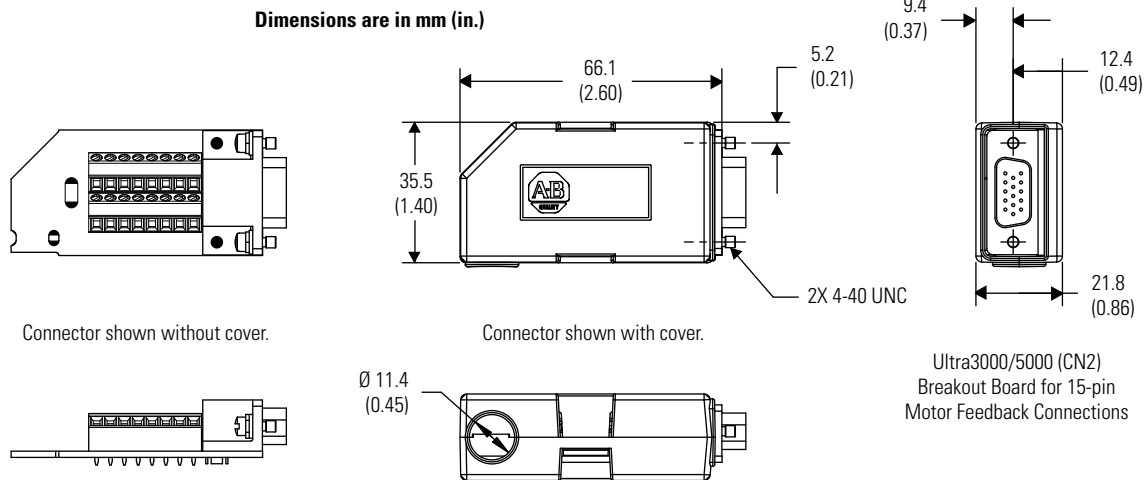
Do not use the 2090-U3CBB-DMxx when wiring to the Ultra3000 (2098-DSD-030-SE/DN, 2098-DSD-075-SE/DN, 2098-DSD-150-SE/DN, or 2098-DSD-HVxxx-SE/DN) drives.

Drive-mounted Breakout Board Dimensions (catalog numbers 2090-U3CBB-DM12 and 2090-U3CBB-DM44)

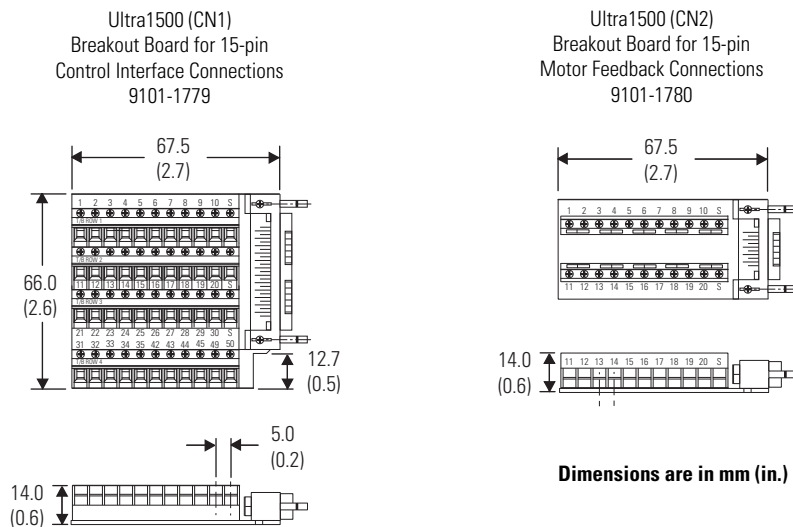
Drive-mounted Breakout Board Dimensions (catalog number 2090-UXBB-DM09)



Drive-mounted Breakout Board Dimensions (catalog number 2090-UXBB-DM15)



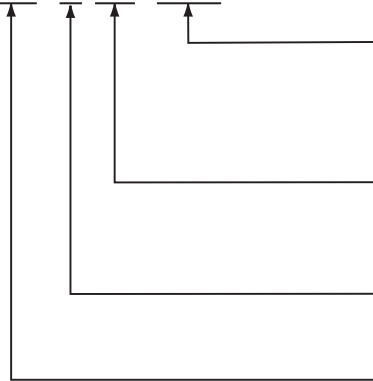
Drive-mounted Breakout Board Dimensions (catalog numbers 9101-1779 and 9101-1780)



Drive-mounted Breakout Board Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering charts below to understand the configuration of your component. For questions regarding product availability, contact your Allen-Bradley distributor.

2090 - *xx xxx - DM.xx*



Connector Type

DM44 = 44-pin, male, D-sub, 44 connections
 DM12 = 44-pin, male, D-sub, 12 connections
 DM15 = 15-pin, male, D-sub
 DM09 = 9-pin, male, D-sub

Kit Type

BB = Breakout board
 BB2 = Breakout board (applies to catalog number 2090-U3BB2-DM44 only)
 CBB = Breakout board with 24V...5V auxiliary power converter

Drive

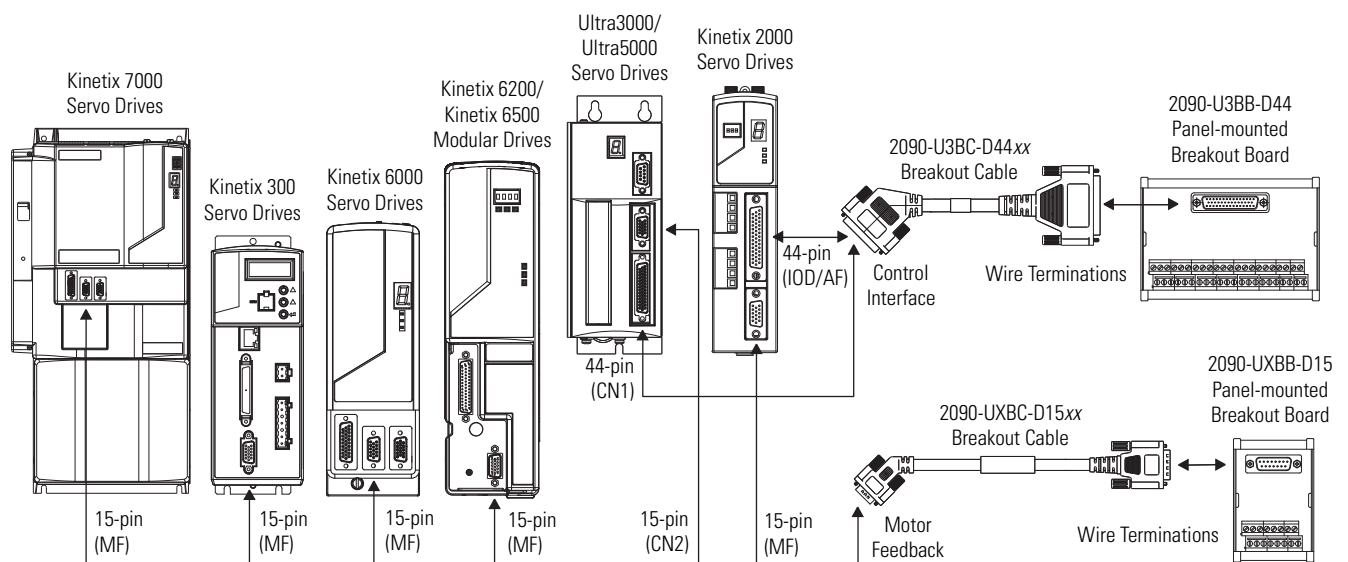
UX = Ultra3000 and Ultra5000 drives
 U3 = Ultra3000 drives

Bulletin Number

Panel-mounted Breakout Board Kit Examples

Panel-mounted breakout board kits for motor feedback (catalog number 2090-UXBK-D15:xx) and control interface (catalog number 2090-U3BK-D44:xx) are designed for use with Ultra3000, Ultra5000, Kinetix 300 Kinetix 2000, Kinetix 6000, Kinetix 6200, Kinetix 6500, and Kinetix 7000 drives. Refer to Panel-mounted Breakout Board Components on [page 428](#) for more information.

Panel-mounted Breakout Board Examples



Panel-mounted Breakout Board Components

Breakout boards, cables, and kits (designed for DIN rail mounting on the panel) and for use with Ultra3000/5000, Kinetix 2000, Kinetix 6000, and Kinetix 7000 drives are shown below. These breakout board components can be ordered separately, or as a kit containing both terminal block and cable.

Panel-mounted Breakout Board Kits

Cat. No.	Description	Cable Compatibility
2090-UXBK-D15xx	DIN rail terminal block (catalog number 2090-UxBB-Dxx) and cable (catalog number 2090-UxBC-Dxxxx) for motor feedback connector (15-pin, male, D-sub). Use with any Kinetix 300, Kinetix 2000, Kinetix 6000, Kinetix 6200, Kinetix 6500, or Kinetix 7000 drives (MF connector) or Ultra3000/5000 drives (CN2 connector) for motor feedback connections.	2090-XXNFMF-Sxx 2090-CFBM4DF-CDAFxx 2090-CFBM7DF-CDAFxx 2090-CFBM6DF-CBAAxx
	Terminal block and cable for motor feedback connector (15-pin, male, D-sub). Use with Kinetix 6000 drives, MPL-BxxxxR, and MPM-A/Bxxxx-2 (resolver feedback) motors.	2090-CFBM4DF-CEAAxx
2090-U3BK-D44xx	Terminal block and cable for control interface connector (44-pin, male, D-sub). Use with Ultra3000 drives (CN1 connector) or Kinetix 2000 drives (IOD/AF connector).	Customer Supplied

Panel-mounted Breakout Boards

Cat. No.	Description
2090-UXBB-D15	15-pin terminal block with D-sub connector. Use with any Kinetix 300, Kinetix 2000, Kinetix 6000, Kinetix 6200, Kinetix 6500, or Kinetix 7000 drives (MF connector) or Ultra3000/5000 drives (CN2 connector) for motor feedback connections.
2090-U3BB-D44	44-pin terminal block with D-sub connector. Use with Ultra3000 drives (CN1 connector) or Kinetix 2000 drives (IOD/AF connector) for control interface connections.

IMPORTANT

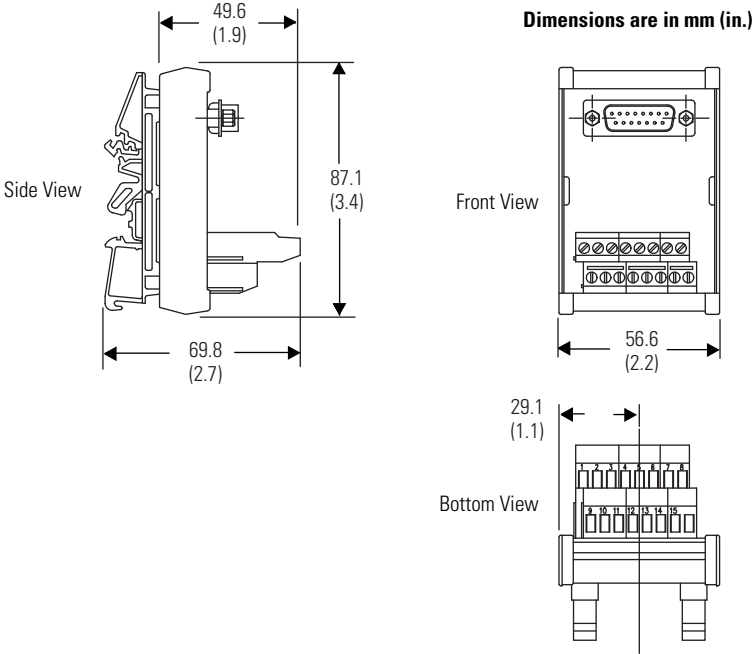
The flying-lead compatible cables listed above require either 2090-UXBB-DM15 (drive-mounted) or 2090-UXBB-D15 (panel-mounted) breakout board connector kits to complete feedback and I/O connections to the drive.

Panel-mounted Breakout Cables

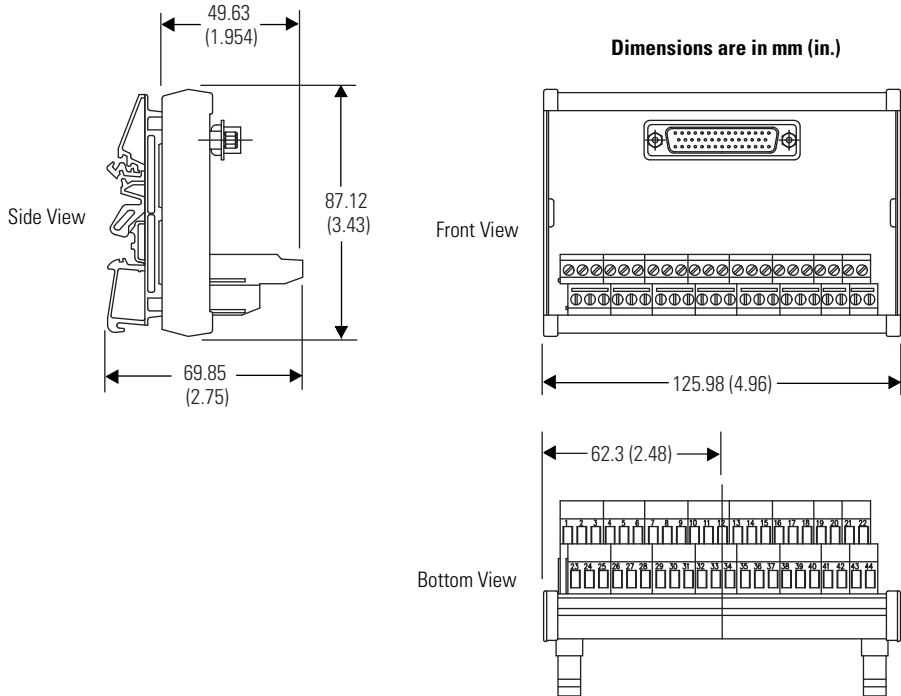
Cat. No.	Description
2090-UxBC-D15xx	15-pin cable with D-sub connector. Use with any Kinetix 300, Kinetix 2000, Kinetix 6000, Kinetix 6200, Kinetix 6500, or Kinetix 7000 drives (MF connector) or Ultra3000/5000 drives (CN2 connector) for motor feedback connections.
2090-U3BC-D44xx ⁽¹⁾	44-pin cable with D-sub connector. Use with Ultra3000 drives (CN1 connector) or Kinetix 2000 drives (IOD/AF connector) for control interface connections.

(1) This cable does not carry the unbuffered motor encoder signals (CN1 pins 10...15). Contact your Allen-Bradley sales representative if these signals are required for your application.

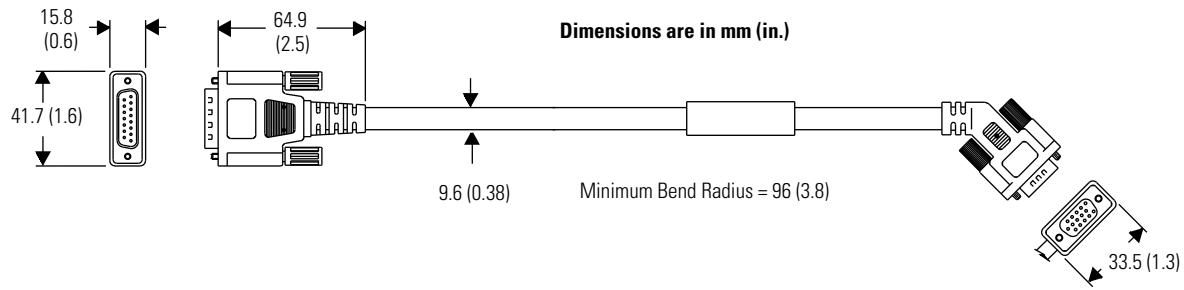
Panel-mounted Breakout Board Dimensions (catalog number 2090-UXBB-D15)



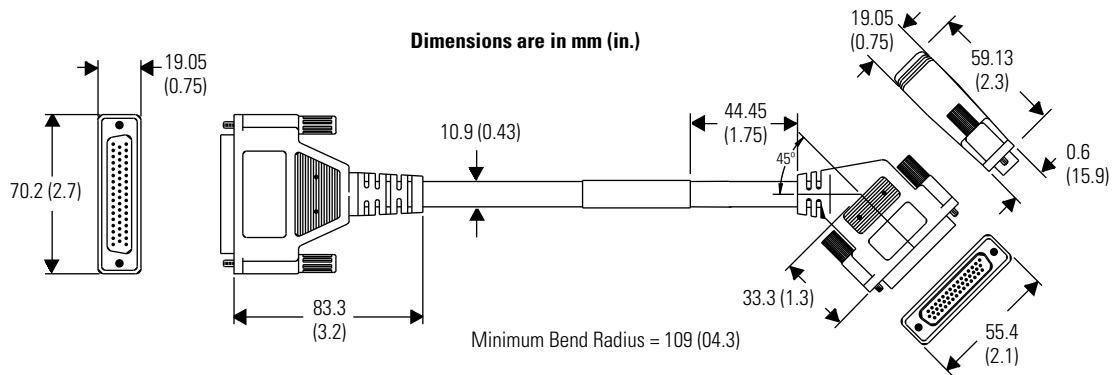
Panel-mounted Breakout Board Dimensions (catalog number 2090-U3BB-D44)



Panel-mounted Breakout Cable Dimensions (catalog number 2090-UXBC-D15xx)



Panel-mounted Breakout Cable Dimensions (catalog number 2090-U3BC-D44xx)



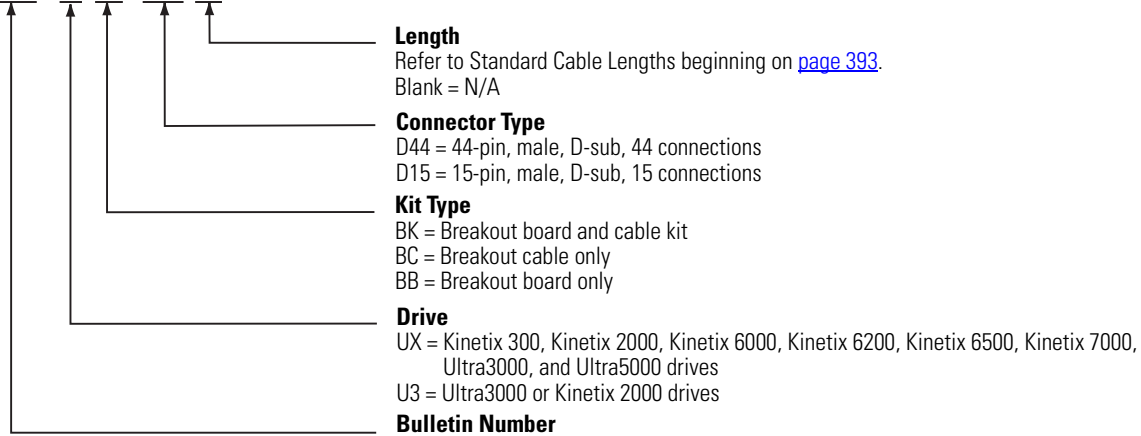
Panel-mounted Breakout Cable Specifications

Breakout Cable	Description	Specifications		
		Rating °C (°F)	Shield Coverage	Jacket Material
2090-UXBC-D15xx	15-pin, high density D-shell for Kinetix 6000 motor/auxiliary feedback and Ultra3000/5000 CN2 feedback connector	90 °C (194 °F)	100% Aluminum Foil (with 85% braid overshield)	TPE
2090-U3BC-D44xx	44-pin, high density D-shell for Ultra3000 CN1 control interface connector			

Panel-mounted Breakout Board Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering charts below to understand the configuration of your component. For questions regarding product availability, contact your Allen-Bradley distributor.

2090 - xx xx - Dxx xx



Bulletin 2094 Power Rail

The Bulletin 2094 power rail is compatible with Kinetix 6000, Kinetix 6200, and Kinetix 6500 drive families. This section contains selection information, mounting dimensions, and catalog numbers for the 2094-PR x (Slim) power rails. Bulletin 2094 power rails are compatible with all 230V and 460V drive modules.

IAM, AM, and Shunt Module Slot Requirements

IAM Module Cat. No.		Converter Slot Used	Inverter Slots Used
2094-AC05-MP5-S	230V	1	1
2094-AC05-M01-S			1
2094-AC09-M02-S			1
2094-AC16-M03-S			1
2094-AC32-M05-S			2
2094-BC01-MP5-S 2094-BC01-MP5-M	460V	1	1
2094-BC01-M01-S 2094-BC01-M01-M			1
2094-BC02-M02-S 2094-BC02-M02-M			1
2094-BC04-M03-S			2
2094-BC07-M05-S			2

AM Module Cat. No.		Converter Slot Used	Inverter Slots Used
2094-AMP5-S	230V		1
2094-AM01-S			1
2094-AM02-S			1
2094-AM03-S			1
2094-AM05-S			1
2094-BMP5-S 2094-BMP5-M	460V	0	1
2094-BM01-S 2094-BM01-M			1
2094-BM02-S 2094-BM02-M			1
2094-BM03-S			2
2094-BM05-S			2

Shunt Module Cat. No.		Converter Slot Used	Inverter Slots Used
2094-BSP2	230/ 460V	0	1

Integrated axis modules (2094-AC32-M05-S, 2094-BC04-M03-S, and 2094-BC07-M05-S) and axis modules (2094-BM03-S and 2094-BM05-S) are double-wide modules and require two slots on the power rail.

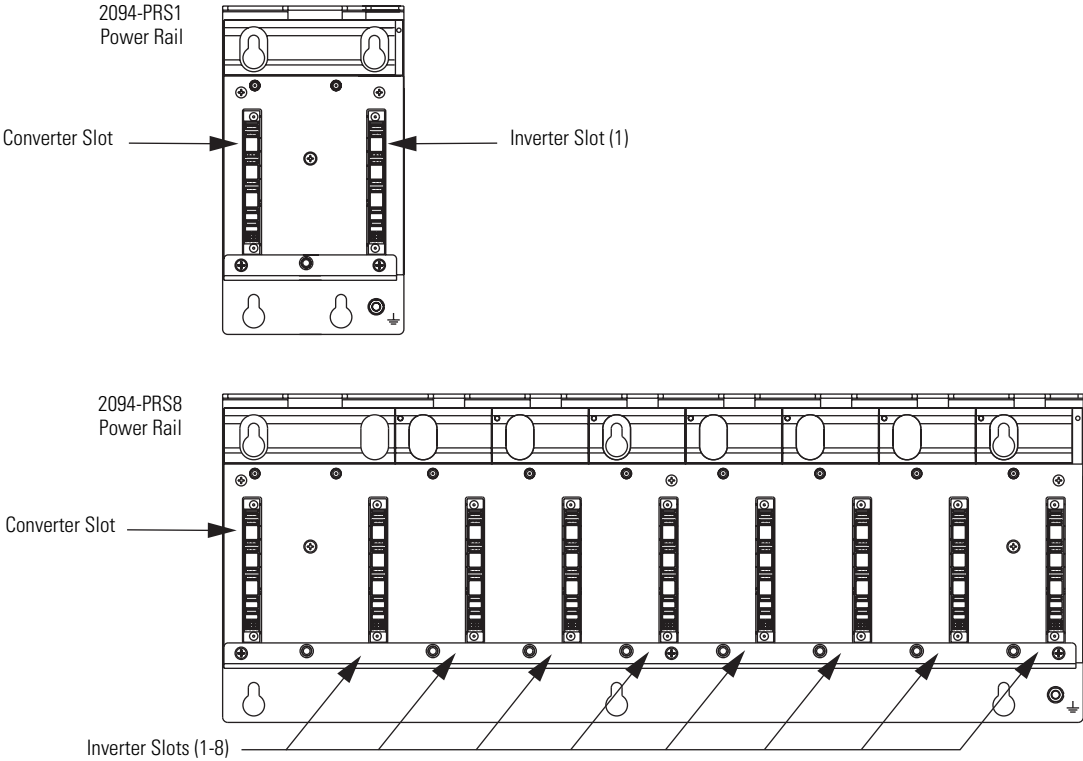
The leftmost slot on each power rail is the converter slot and only used by the IAM. All other slots are inverter slots and are used by the IAM, AM, or shunt module (refer to the figure below). The power rail catalog number indicates the number of available inverter slots.

For example, the 2094-PRS1 power rail contains one inverter slot. This limits the use of this power rail to systems requiring only one inverter slot. Similarly, the 2094-PRS8 power rail contains eight inverter slots. This limits the use of this power rail to systems requiring up to eight inverter slots.

When selecting a power rail, determine the number of inverter slots required by all rail-mounted modules and choose a power rail with that minimum number of inverter slots.

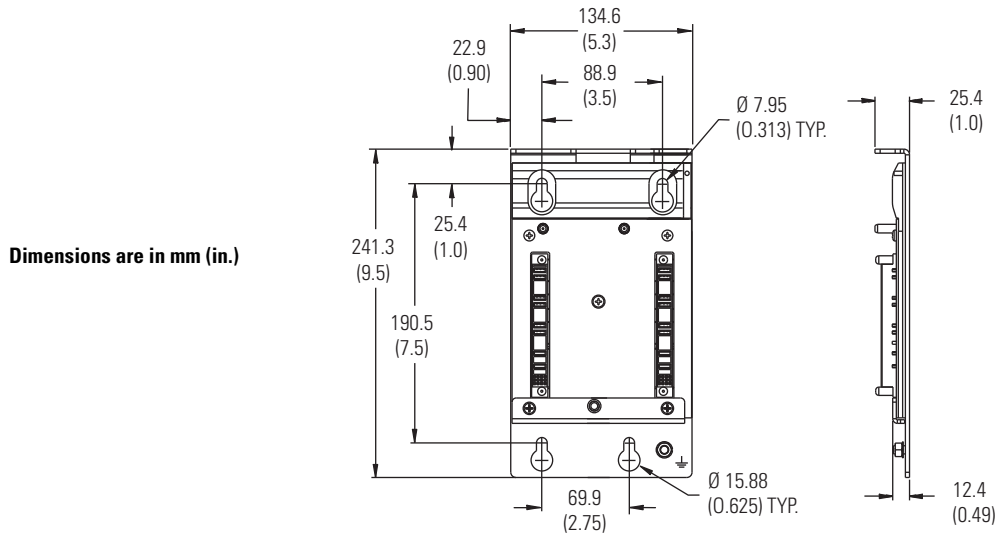
IMPORTANT If you select a power rail with slots exceeding the minimum required for your system, you must install a 2094-PRF slot-filler module in each unused slot.

Power Rail Slots

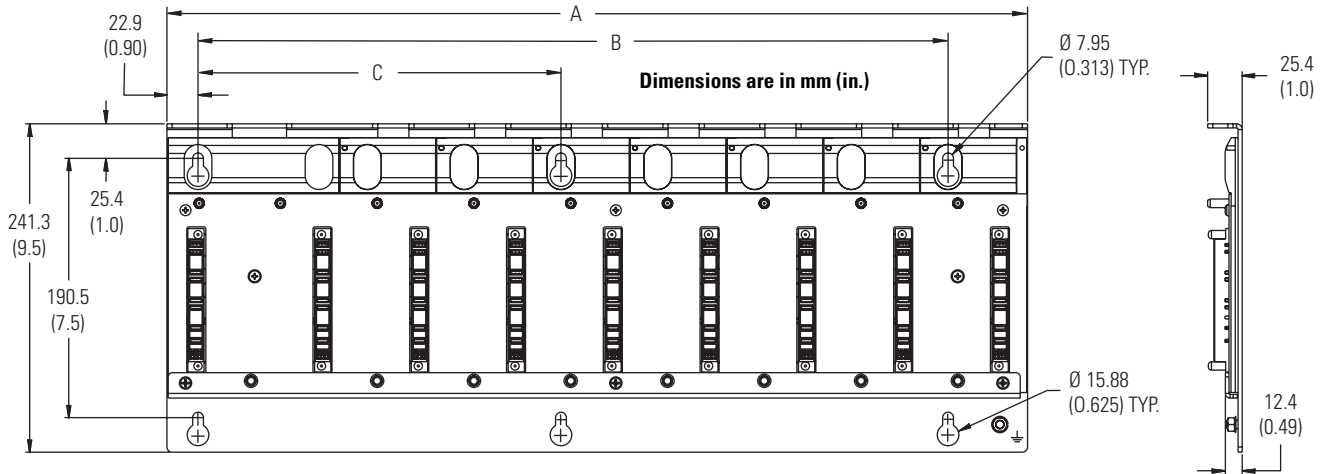


Power Rail Dimensions

Dimensions (catalog number 2094-PRS1)



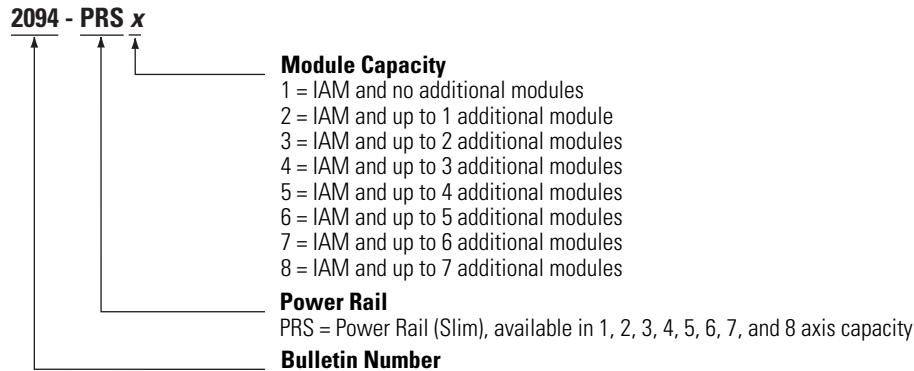
Dimensions (catalog numbers 2094-PRS2, 2094-PRS3, 2094-PRS4, 2094-PRS5, 2094-PRS6, 2094-PRS7, and 2094-PRS8)



Power Rail Cat. No.	Description	Dimension A mm (in.)	Dimension B mm (in.)	Dimension C mm (in.)
2094-PRS1	Refer to figure on page 434 .			
2094-PRS2	2 axis power rail	205.7 (8.10)	124.5 (4.90)	N/A
2094-PRS3	3 axis power rail	276.9 (10.90)	195.6 (7.70)	N/A
2094-PRS4	4 axis power rail	348.0 (13.70)	266.7 (10.50)	N/A
2094-PRS5	5 axis power rail	419.1 (16.50)	337.8 (13.30)	195.6 (7.70)
2094-PRS6	6 axis power rail	490.2 (19.30)	408.9 (16.10)	195.6 (7.70)
2094-PRS7	7 axis power rail	561.3 (22.10)	480.1 (18.90)	266.7 (10.50)
2094-PRS8	8 axis power rail	632.5 (24.90)	551.2 (21.70)	266.7 (10.50)

Power Rail Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your power rail. For questions regarding product availability, contact your Allen-Bradley distributor.



Bulletin 2094 Shunt Module

The Bulletin 2094 shunt module is compatible with Kinetix 6000, Kinetix 6200, and Kinetix 6500 drive families. This section contains specifications, mounting dimensions, and catalog numbers for the 2094-BSP2 shunt module.

IMPORTANT

The 2094-BSP2 shunt module is compatible with all 230V and 460V systems, however, the 2094-BSP2 shunt module is physically larger than the 230V drives and additional clearance is required beneath and in front of the module.

Bulletin 2094 Shunt Module Power Specifications

The table below lists the power specifications for the Bulletin 2094 shunt module. Refer to [page 436](#) for tables with the Bulletin 2094 shunt module in combination with an IAM module internal shunt (when present) and the various external passive shunt resistors available for 230V and 460V drive systems. Use these tables to determine the combination you need based on the requirements of your application.

Shunt Module Power Specifications

Shunt Module Cat. No.	Specifications						Short Circuit Current Rating A	Fuse Replacement
	Drive Voltage V AC	Resistance Ω	Peak Power kW	Peak Current A	Continuous Power W	Capacitance μF		
2094-BSP2	230	28.75	5.7	14	200	470	200,000 symmetrical	N/A (no internal fuse)
	460		22.5	28				

For specifications and dimensions of external shunt resistors compatible with your Kinetix 6000 or Kinetix 6200 drive, refer to External Shunt Modules beginning on [page 471](#).

Bulletin 2094 Shunt Module (230V) System Specifications

In this table, the 230V system specifications are given for the IAM module internal shunt resistors, the 2094-BSP2 shunt module, and the Bulletin 1394 external shunt modules.

IAM Module Cat. No. 2094-	Number of Axis Modules Qty	Shunt Module Cat. No.	Specifications				External Passive Shunt Module ⁽¹⁾	System Continuous Shunt Power W
			Resistance Ω	Peak Current A	Peak Power kW	Continuous Power W		
AC05-MP5-S	0 to 7	N/A ⁽²⁾	–	–	–	–	N/A ⁽²⁾	0
AC05-M01-S			–	–	–	–		0
AC09-M02-S			–	–	–	–		50 ⁽³⁾
AC16-M03-S			–	–	–	–		200 plus ⁽⁴⁾
AC32-M05-S			–	–	–	–		
ACxx-Mxx-S	0 to 6	2094-BSP2	28.75	14.1	5.7	200	N/A ⁽²⁾	200 plus ⁽⁵⁾
ACxx-Mxx-S	0 to 6	2094-BSP2	4	101.3	41	300	1394-SR9A	300 ⁽⁶⁾
ACxx-Mxx-S						900	1394-SR9AF	900 ⁽⁶⁾
ACxx-Mxx-S						1800	1394-SR36A	1800 ⁽⁶⁾
ACxx-Mxx-S						3600	1394-SR36AF	3600 ⁽⁶⁾

(1) Refer to External Shunt Modules beginning on [page 471](#) for shunt module specifications.

(2) Module not part of system configuration.

(3) Shunt power equals 50 or the sum of the AM module internal shunt ratings.

(4) Shunt power equals 200 plus the sum of the AM module internal shunt ratings.

(5) Shunt power equals 200 plus the sum of the IAM module (2094-AC16-M03-S and 2094-AC32-M05-S only) and AM module internal shunt ratings.

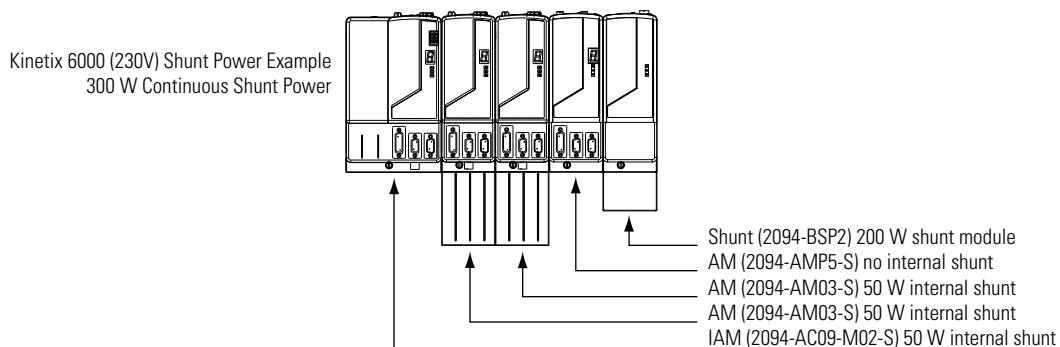
(6) Use of external shunt module disables internal IAM/AM shunt modules.

IMPORTANT

Use of the 2094-BSP2 shunt module in combination with the 2094-AC09-M02-S IAM module disables the shunt resistor internal to that IAM module. This situation is unique to the 2094-AC09-M02-S IAM module. Shunt resistors internal to adjacent AM modules are not disabled. Refer to the 230V Shunt Power Example (catalog number 2094-AC09-M02-S) shown below.

In this example, the continuous shunt power is 300 W. The 50 W resistor in the IAM module is disabled when used in combination with the 2094-BSP2 shunt module. This example is unique to the 2094-AC09-M02-S IAM module.

230V Shunt Power Example (catalog number 2094-AC09-M02-S)



Bulletin 2094 Shunt Module (460V) System Specifications

In this table, the 460V system specifications are given for the IAM module internal shunt resistors, the 2094-BSP2 shunt module, and the Bulletin 1394 external shunt modules.

IAM Module Cat. No. 2094-	Number of Axis Modules Qty	Shunt Module Cat. No.	Specifications				External Passive Shunt Module ⁽¹⁾	System Continuous Shunt Power W
			Resistance Ω	Peak Current A	Peak Power kW	Continuous Power W		
BC01-MP5-S BC01-MP5-M	0 to 7	N/A ⁽²⁾	–	–	–	–	N/A ⁽²⁾	50 plus ⁽³⁾
BC01-M01-S BC01-M01-M			–	–	–	–		50 plus ⁽³⁾
BC02-M02-S BC02-M02-M			–	–	–	–		50 plus ⁽³⁾
BC04-M03-S			–	–	–	–		200 plus ⁽⁴⁾
BC07-M05-S			–	–	–	–		
BCxx-Mxx-x	1 to 6	2094-BSP2	28.75	28	22.5	200	N/A ⁽²⁾	200 plus ⁽⁵⁾
BCxx-Mxx-x	1 to 6	2094-BSP2	4	201.3	162	300	1394-SR9A	300 ⁽⁶⁾
BCxx-Mxx-x						900	1394-SR9AF	900 ⁽⁶⁾
BCxx-Mxx-x						1800	1394-SR36A	1800 ⁽⁶⁾
BCxx-Mxx-x						3600	1394-SR36AF	3600 ⁽⁶⁾

(1) Refer to External Shunt Modules beginning on [page 471](#) for shunt module specifications.

(2) Module not part of system configuration.

(3) Shunt power equals 50 or the sum of the AM module internal shunt ratings.

(4) Shunt power equals 200 plus the sum of the AM module internal shunt ratings.

(5) Shunt power equals 200 plus the sum of the IAM and AM module internal shunt ratings.

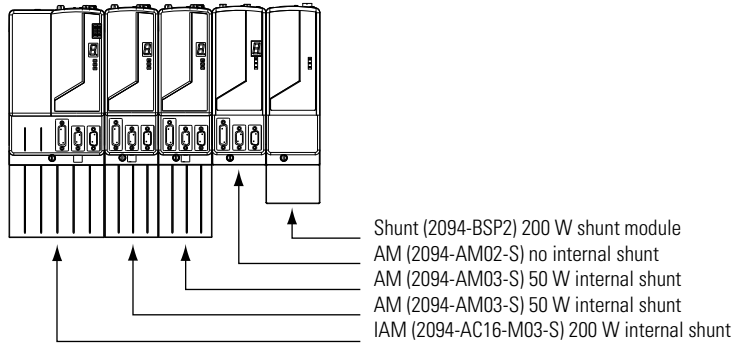
(6) Use of external shunt module disables internal IAM/AM shunt modules.

Bulletin 2094 Shunt Power Examples

In this example, the sum of the IAM, AM, and shunt modules equal 500 W of continuous shunt power. Although a 230V system is shown, a 460V IAM, AM, and shunt module power adds up the same way.

Shunt Power Example for (230V) Kinetix 6000 Drives (without external shunt)

Shunt Power Example
500 W Continuous Shunt Power
Kinetix 6000 (230V) system is shown.



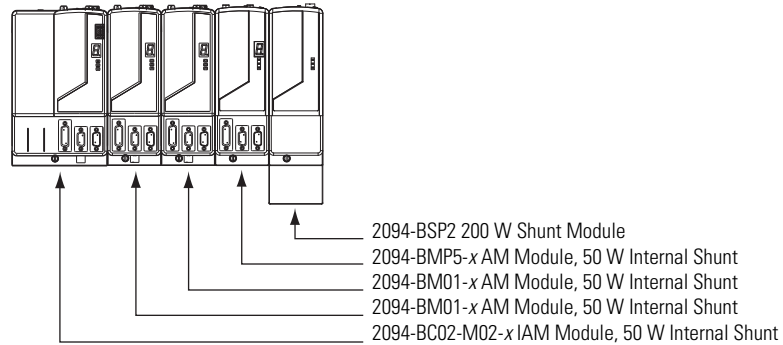
In this example, the sum of the IAM/AM modules and shunt module equal 400 W of continuous shunt power.

TIP

Shunt power adds up the same way for 230V (IAM/AM, and shunt module) systems too.

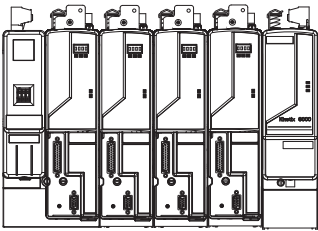
Shunt Power Example (without external shunt)

Kinetix 6000 (460V) Shunt Power Example
400 W Continuous Shunt Power



Shunt Power Example for Kinetix 6200 or Kinetix 6000 Drives (without external shunt)

Shunt Power Example
400 W Continuous Shunt Power
Kinetix 6200 (460V) system is shown.

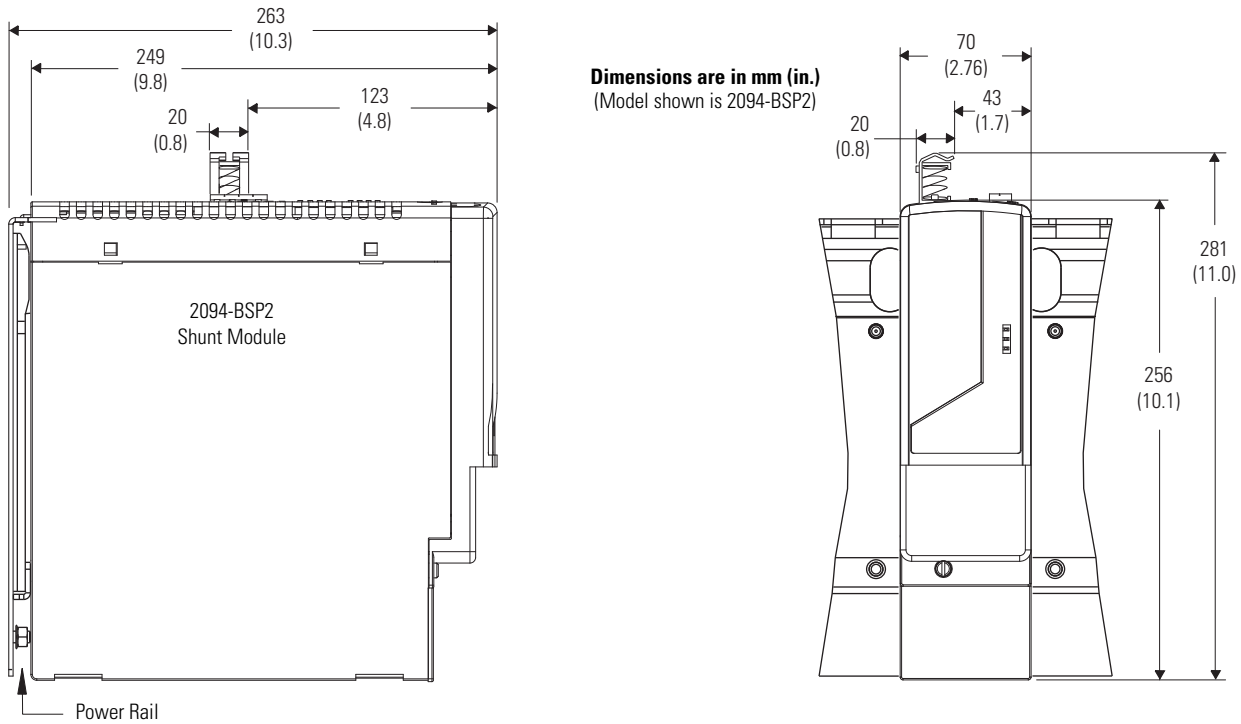


- 2094-BSP2 200 W Shunt Module
- 2094-BMP5-M AM Power Module, 50 W Internal Shunt
- 2094-BM01-M AM Power Module, 50 W Internal Shunt
- 2094-BM01-M AM Power Module, 50 W Internal Shunt
- 2094-BC02-M02-M IAM Power Module, 50 W Internal Shunt

IMPORTANT

When the 2094-BSP2 shunt module is wired to a Bulletin 1394 external shunt module, the IAM/AM (internal shunt) and 2094-BSP2 shunt module is disabled and the continuous shunt power is equal to that of the external shunt module alone.

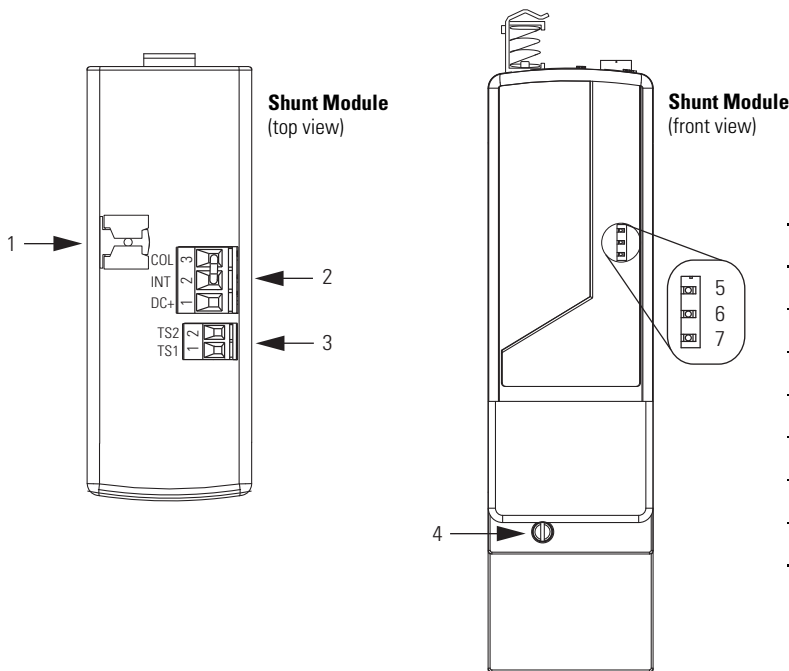
Shunt Module Dimensions



Modules are shown mounted to the power rail and the dimensions reflect that.

Bulletin 2094 Shunt Module Connectors and Indicators

Shunt Module Connectors (catalog number 2094-BSP2)

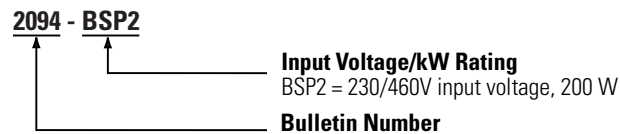


Item	Description
1	Motor cable shield clamp
2	External shunt resistor (RC) connector
3	External thermal switch (TS) connector
4	Mounting screw
5	Shunt fault status indicator
6	Over-temp fault status indicator
7	Bus status indicator

For replacement connector set catalog number, refer to Connector Sets on [page 442](#).

Shunt Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.



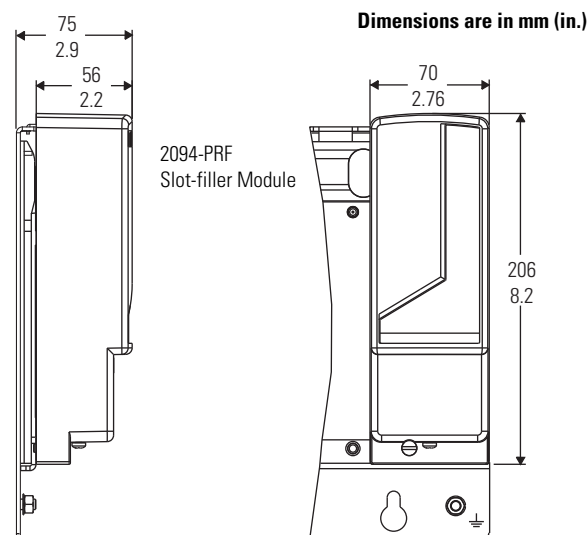
Bulletin 2094 Slot-filler Module

The Bulletin 2094 slot-filler module is compatible with Kinetix 6000, Kinetix 6200, and Kinetix 6500 drive families. This section contains dimensions and catalog numbers for the 2094-PRF slot-filler module.

IMPORTANT

The 2094-PRF slot-filler module is compatible with all 230V and 460V systems. Power rail slots not occupied by an IAM, AM, or shunt module, must have a slot-filler module installed.

Slot-filler Module Dimensions



Slot-filler Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.



Connector Sets

Kinetix 300 Drive Family

Module	Cat. No.	Description	Cat. No.
Kinetix 300 Drive	2097-V3xxxx	Includes AC input (IPD), back-up power (CPD), shunt and DC bus (BC), motor power (MP), and safe-off (STO) replacement connectors for all Kinetix 300 drives.	2097-CONN1

Kinetix 6000, Kinetix 6200, Kinetix 6500 Drive Families

Module	Cat. No.	Description	Cat. No.
IAM Module (converter connectors)	2094-AC05-Mxx-S and 2094-AC09-M02-S	Includes control power (CPD), DC bus/AC input (IPD), and contactor enable (CED) replacement connectors for the IAM (converter).	2094-ANCON-1
	2094-AC16-M03-S and 2094-AC32-M05-S		2094-XNCON-2
	2094-BC01-Mxx-S and 2094-BC02-M02-S 2094-BC01-Mxx-M and 2094-BC02-M02-M		2094-BNCON-1
	2094-BC04-M03-S and 2094-BC07-M05-S		2094-XNCON-2
IAM/AM Module (inverter connectors)	2094-AC05-Mxx-S, 2094-AC09-M02-S, 2094-AMP5-S, 2094-AM01-S, 2094-AM02-S	Includes motor power (MP), motor/resistive brake (BC), and safe-off (SO), replacement connectors for the IAM (inverter) and AM. Also includes bracket kit for SERCOS fiber-optic cable connectors.	2094-XNINV-1
	2094-AC16-M03-S and 2094-AC32-M05-S 2094-AM03-S, 2094-AM05-S 2094-BC04-M03-S, 2094-BM03-S		2094-ANINV-2
	2094-BC01-Mxx-S and 2094-BC02-M02-S 2094-BC01-Mxx-S and 2094-BC02-M02-M 2094-BMP5-M, 2094-BM01-M, 2094-BM02-S 2094-BMP5-M, 2094-BM01-M, 2094-BM02-M		2094-XNINV-1
	2094-BC07-M05-S, 2094-BM05-S		2094-BNINV-2
Shunt Module	2094-BSP2	Includes external shunt resistor (RC) and external thermal switch (TS) replacement connectors for the SM.	2094-XNSHT-1

Kinetix 7000 Drive Family

Module	Cat. No.	Description	Cat. No.
Kinetix 7000 Drive	2099-BMxx-S	Includes safe-off (SO), general purpose I/O (GPIO), general purpose relay (GPR), and control power (CP) replacement connectors for Kinetix 7000 drives.	2099-K7KCK-1

Line Interface Module (LIM) and Resistive Brake Module (RBM)

Module	Cat. No.	Description	Cat. No.
Line Interface Module (LIM)	2094-AL09 and 2094-BL02	Includes VAC line (IPL), VAC load (OPL), control power (CPL), and 24V brake power (PSL) replacement connectors.	2094-XNLIM-1
Line Interface Module (LIM)	2094-ALxxS, 2094-BLxxS, and 2094-XL75S-Cx	Includes I/O (IOL), VAC line (IPL), VAC load (OPL), control power (CPL), 230V auxiliary output (P2L), 24V brake power (P1L), and 230V auxiliary input (APL) replacement connectors.	2094-XNLIM-2
Resistive Brake Module (RBM)	2090-XB33-xx	Includes I/O connector (TB3), drive connector (TB1), and motor connector (TB2).	2090-XNRBM-1
	2090-XB120-xx	Includes I/O connector (TB3), 230V input power connector (TB4), drive connector (TB1), and motor connector (TB2).	2090-XNRBM-2

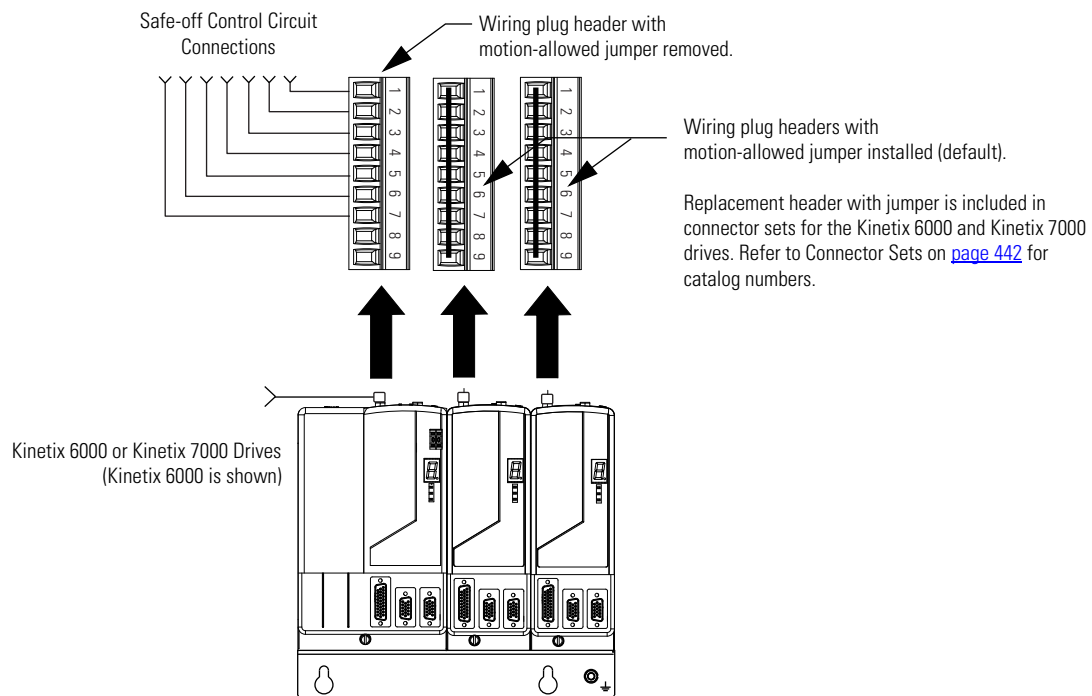
Kinetix Safe-off Headers

The safe-off feature is available with Kinetix 6000 and Kinetix 7000 drives. You can implement the safe-off function in a single drive or extended to as many as eight drives in a multiple safety drive configuration. The safe-off (SO) connector can also be jumpered to effectively remove the safe-off function (this is the default setting). For more information on wiring the safe-off connector, refer to the Kinetix Safe-off Feature Safety Reference Manual, publication [GMC-RM002](#).

Safe-off Header Examples

In this example, a single Kinetix 6000 safe-off drive is shown using the wiring plug header. The second and third drives do not use the safe-off feature, so the motion-allowed jumpers remain installed. This single drive configuration also applies to Kinetix 7000 safe-off applications.

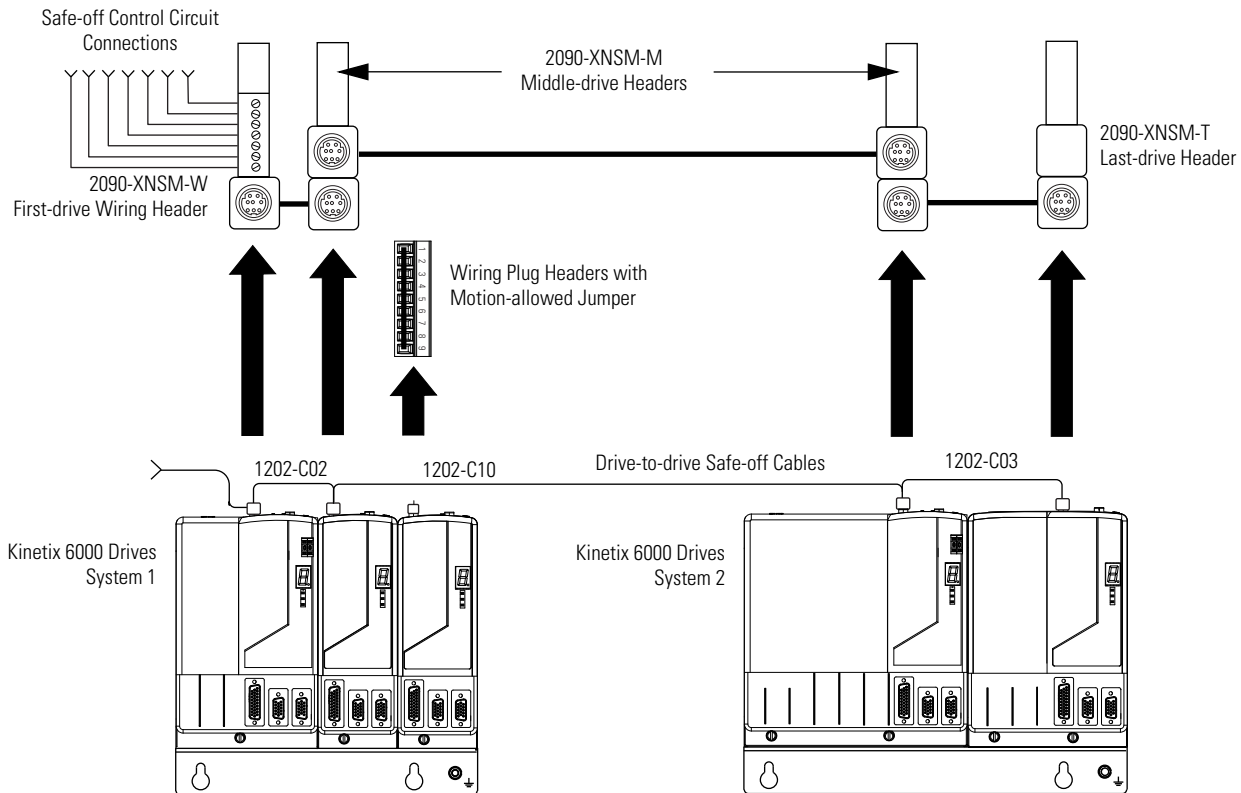
Typical Single Drive Safe-off Configuration



In this example, system 1 contains two (single-wide) Kinetix 6000 drives using the safe-off feature wired with two (double-wide) Kinetix 6000 drives in system 2. The wiring headers with motion allowed jumpers have been replaced as shown. The third axis in system 1 does not use the safe-off feature, so the wiring header and motion allowed jumper remain installed.

This multiple drive configuration also applies to the Kinetix 7000 drives. When wiring the Kinetix 7000 modules from drive-to-drive, use 1202-C10 cables.

Typical Multiple Drive Safe-off Configuration



IMPORTANT Due to the current capacity limitation of the safe-off cable connectors, multiple safe-off drive configurations must not exceed eight Kinetix 6000 or Kinetix 7000 drive modules.

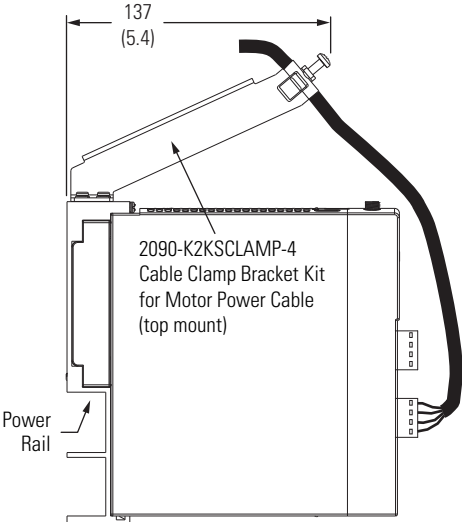
Safe-off Header Components

Description	Cat. No.
Safe-off wiring header for the first drive in multiple safety drive configurations.	2090-XNSM-W
Safe-off middle header for drive-to-drive connections in multiple safety drive configurations with three or more drives.	2090-XNSM-M
Safe-off terminating header for the last drive in multiple safety drive configurations.	2090-XNSM-T

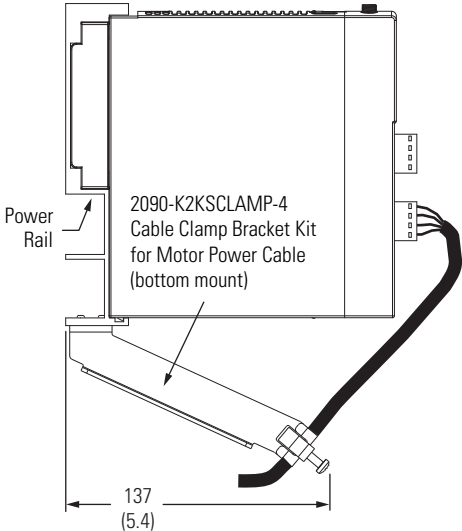
Kinetix 2000 Cable Clamp Bracket Kit

The cable clamp bracket kit (catalog number 2090-K2KSCLAMP-4) is designed for use with the Kinetix 2000 IAM and AM drive modules. The clamp mounts to the power rail and provides stress relief for the motor power cable and an electrical path from the cable shield to machine ground. You can mount the bracket to the top or bottom of the power rail, depending on the layout of cables within your panel.

Cable Clamp Bracket Kit (catalog number 2090-K2KSCLAMP-4)



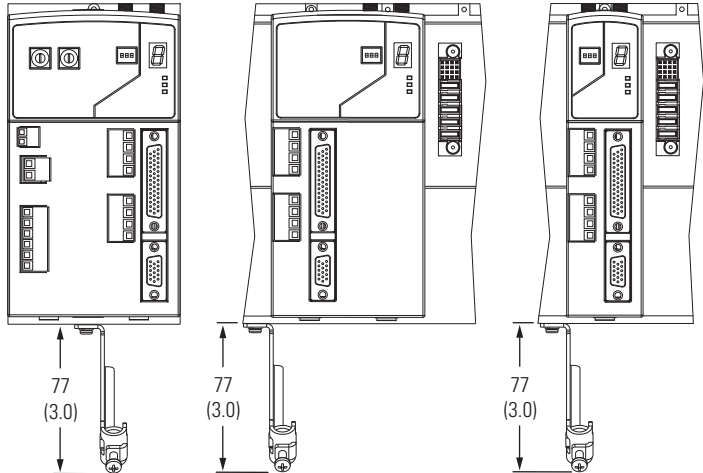
Dimensions are in mm (in.)



Kinetix 2000
Integrated Axis Modules
2093-AC05-MP1
2093-AC05-MP2
2093-AC05-MP5

Kinetix 2000
Axis Modules
2093-AM01
2093-AM02

Kinetix 2000
Axis Modules
2093-AMP1
2093-AMP2
2093-AMP5



IMPORTANT: Additional clearance below the connector is necessary to provide the recommended cable bend radius.

Bulletin 2094 Mounting Brackets

The Bulletin 2094 mounting brackets (catalog number 2094-XNBRKT-1) are designed to save panel space by letting you mount the Bulletin 2094 power rail or line interface module (LIM) over the AC line filter.

Each bracket provides threaded holes for mounting the 2094 power rail or LIM (catalog numbers 2094-ALxxS and 2094-XL75S-Cx). The number of brackets required for use with the power rail and LIM are shown in the table below.

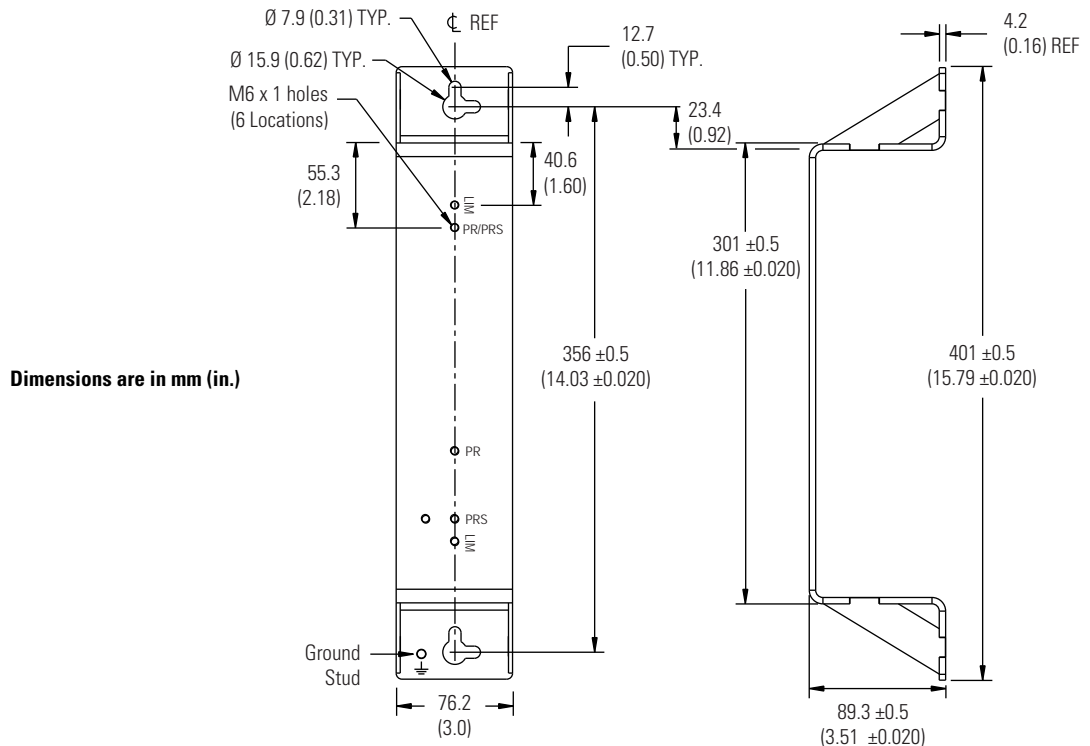
Module to Mount	Brackets Required
LIM (2094-ALxxS and -XL75S-Cx)	2
Power Rail (PRSx) 1-4 axis	2
Power Rail (PRSx) 5-8 axis	3

IMPORTANT The 2094-BLxxS, 2094-AL09, and 2094-BL02 LIM models are not compatible with the 2094 mounting brackets.

Mounting Bracket Dimensions

The mounting bracket dimensions are shown in the figure below. Additional mounting dimensions for applications when brackets are used with the LIM, are shown on [page 447](#).

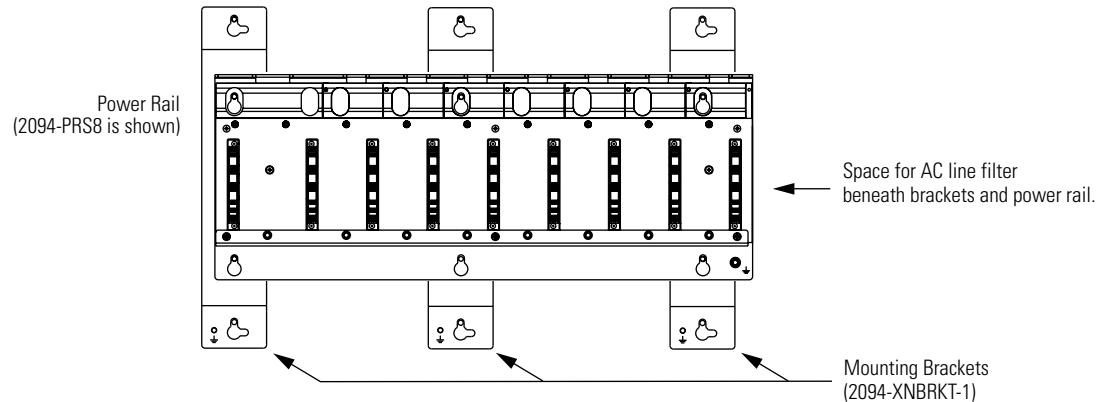
Dimensions (catalog number 2094-XNBRKT-1)



Mounting Bracket Configurations

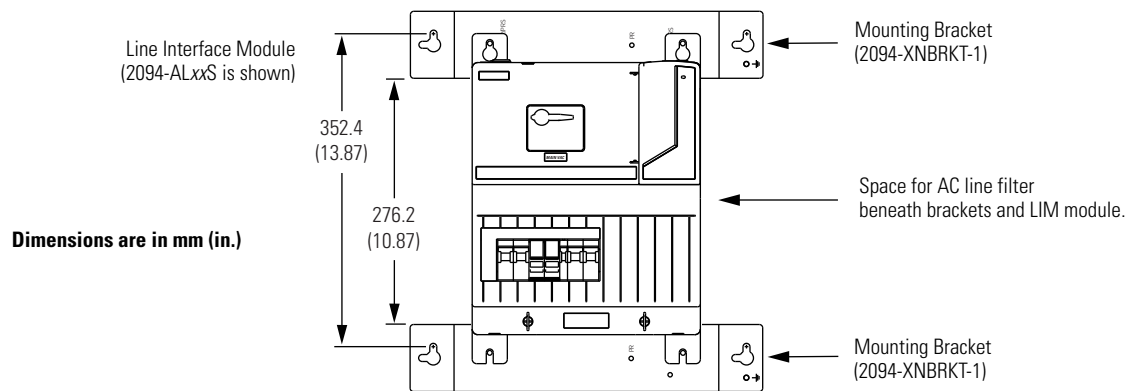
In the figure below, the power rail (catalog number 2094-PRSx) is shown mounted on Bulletin 2094 Mounting Brackets.

Power Rail on 2094 Mounting Brackets



In the figure below, the LIM module (catalog numbers 2094-ALxxS or 2094-XL75S-Cx) is shown mounted on Bulletin 2094 Mounting Brackets.

LIM Module on 2094 Mounting Brackets



IMPORTANT

Only the 2094-ALxxS and 2094-XL75S-Cx Line Interface Modules are compatible with the 2094 Mounting Brackets. The 2094-BLxxS, 2094-AL09, and 2094-BL02 models are not compatible.

Kinetix 7000 DC-DC Converter and Control Board Kits

Cat. No.	Description
2099-K7KCB-1	Control board assembly kit. Replacement control board for 2099-BMxx-S drives.
2099-K7KCP-1	DC-DC converter cassette kit. Replacement DC-DC converter for 2099-BMxx-S drives.

External Auxiliary Encoders

These Allen-Bradley sine/cosine and incremental encoders are suitable for use when auxiliary feedback connections are required for your servo drive application.

Bulletin 842HR Sine/Cosine Encoders

Bulletin 842HR sine/cosine encoders combine the advantages of incremental and absolute encoder technologies in a single, standalone unit targeted for high-performance digital servo drive systems. The Bulletin 842HR is a 15-bit encoder featuring a hybrid digital/analog interface, transmitting sine/cosine signals via analog channels for incremental feedback and delivering absolute position information through the digital RS-485 channel.

Bulletin 842HR, Size 25, Sine/Cosine Encoder Specifications

Cat. No.	Description	Features
842HR-MJDZ115FWYD	<ul style="list-style-type: none"> • Square flange • 3/8 in. solid-shaft 	<ul style="list-style-type: none"> • Absolute feedback for position control • RS-485 interface
842HR-SJDZ115FWYD	<ul style="list-style-type: none"> • 17-pin connector • 5...12V operating voltage 	<ul style="list-style-type: none"> • Hiperface interface compatible • IP66 (IEC 529)

Refer to 842HR Sine Cosine/Serial Encoders catalog, publication [C115-CA600](#), for more information.

Bulletin 844D Incremental Encoders

Bulletin 844D through-shaft incremental encoders are used to electronically monitor the position or speed of a rotating shaft. Shaft position is converted to digital pulses in an A quad B format. A Zero Index Channel is also included with all models.

Bulletin 844D Hollow Shaft (HS35 Style) Encoder Specifications

Cat. No.	Resolution	Description
844D-B5CC1FW	1024 PPR	<ul style="list-style-type: none"> • 5/8 in. through-shaft
844D-B5CC1CS	2048 PPR	<ul style="list-style-type: none"> • 3/8 in. bolt on 2.5...4.0 in. diameter radius • 10-pin connector
844D-B5CC1DR	5000 PPR	<ul style="list-style-type: none"> • 5V DC input /5V DC DLD output (3487)

Refer to 844D Hollow Shaft Incremental Encoders catalog, publication [844D-CA500](#), for more information.

Bulletin 845H Incremental Encoders

The Bulletin 845H optical incremental encoders electronically digitize shaft motion of a rotating element by converting mechanical motion to an electronic digital format. Incremental square waves are accumulated in a counter as position feedback. The encoder provides code disk resolutions up to 5000 pulses per revolution at a signal frequency response of 210 kHz.

The Bulletin 845H encoder is housed in a size 25, NEMA Type 4 and 13, IP66 (IEC 529), enclosure making it suitable for many of today's industrial environments.

Bulletin 845H, Size 25, High Performance, Encoder Specifications

Cat. No.	Resolution	Description
845H-SJDN14FWY2	1024 PPR	<ul style="list-style-type: none"> • Square flange • 3/8 in. w/flat shaft • 5V DC input /5V DC DLD RS-422 output • Radial connector (side)
845H-SJDN14CSY2	2048 PPR	
845H-SJDN14DRY2	5000 PPR	

Refer to 845H Size 25 Incremental Encoders catalog, publication [845H-CA500](#), for more information.

Bulletin 845T Incremental Encoders

Bulletin 845T optical incremental encoders are used to electronically monitor the position of a rotating shaft. Shaft motion is converted to digital pulses that are accumulated and evaluated by various electronic controllers. The Bulletin 845T encoder provides code disk resolutions of up to 3000 pulses per revolution, and a frequency response of up to 100 kHz.

The Bulletin 845T encoder is a heavy duty, NEMA Type 4, and IP66 (IEC 529) rated optical incremental shaft encoder that is housed in a two inch diameter enclosure. Typical applications for the 845T include machine tools, packaging machinery, motion controls, and robotics. The heavy duty bearing assembly, rugged construction and high shaft loading capabilities make the Bulletin 845T encoder suitable for many of today's harsh industrial environments.

Bulletin 845T, Size 20, Heavy Duty Encoder Specifications

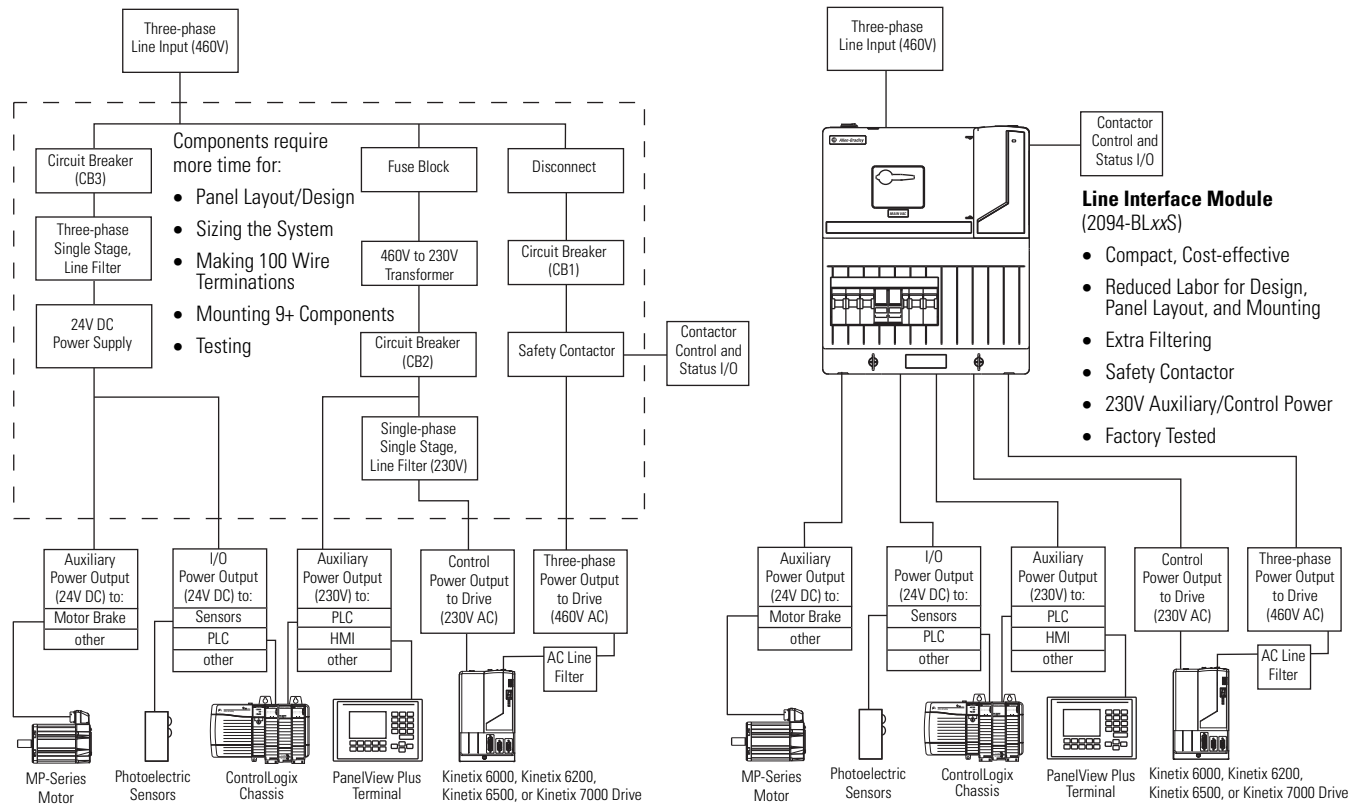
Cat. No.	Resolution	Description
845T-DN13EFW	1024 PPR	<ul style="list-style-type: none"> • Square flange • 3/8 in. w/flat shaft • 5V DC input /5V DC DLD output • Channel A, B, and Z signals • 10-pin connector
845T-DN13ECS	2048 PPR	

Refer to 845T Size 20 Incremental Encoders catalog, publication [845T-CA500](#), for more information.

Line Interface Modules

The Bulletin 2094 Line Interface Module (LIM) is designed to replace many of the common input power devices required for your servo drive system. Using the LIM module saves panel space and reduces the amount of wiring when compared with individual components mounted separately. In this example, the 2094-BLxxS module is compared to a similar configuration of discrete components. Auxiliary and control power (230V) is developed from the LIM module three-phase input power.

Comparing the LIM Module with Discrete Components (catalog number 2094-BLxxS)



An example comparing the 2094-ALxxS module to discrete components would be similar to the example above, but with 230V three-phase input power and without the 460V to 230V step-down transformer.

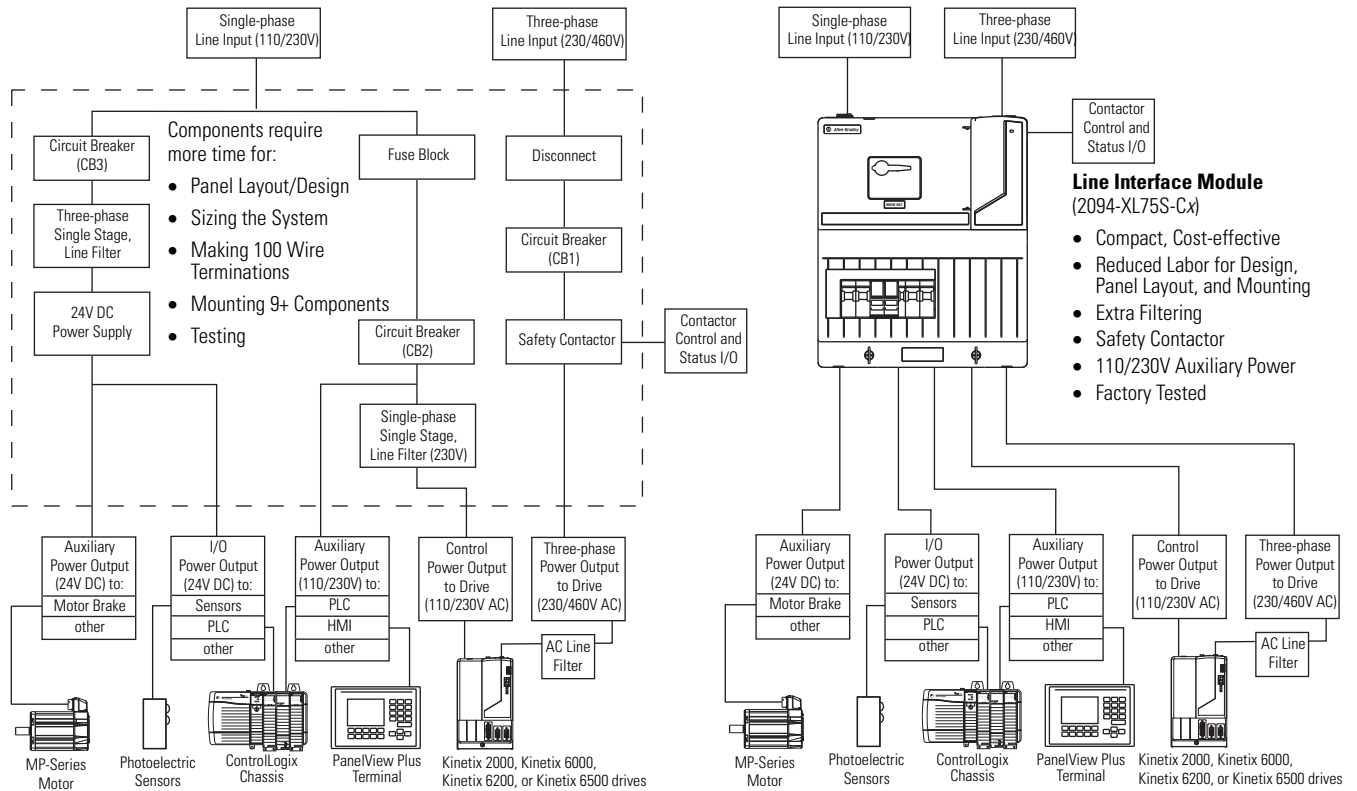
Examples comparing the 2094-AL09 and 2094-BL02 modules to discrete components would also be similar to the examples above and include the features that apply to those models.

Drive/LIM Module Compatibility

Drive Family	Drive Cat. No.	Compatible LIM Module Cat. No.
Kinetix 2000	2093-AC05-Mxx	2094-ALxxS, 2094-XL75S-C2, 2094-AL09
Kinetix 6200/ Kinetix 6500	2094-BCxx-Mxx-M	2094-BLxxS, 2094-BL02, 2094-XL75S-Cx
Kinetix 6000	2094-xCxx-Mxx-S	2094-ALxxS, 2094-AL09, 2094-BLxxS, 2094-BL02, 2094-XL75S-Cx
Kinetix 7000	2099-BM06, 2099-BM07, 2099-BM08	2094-BL75S

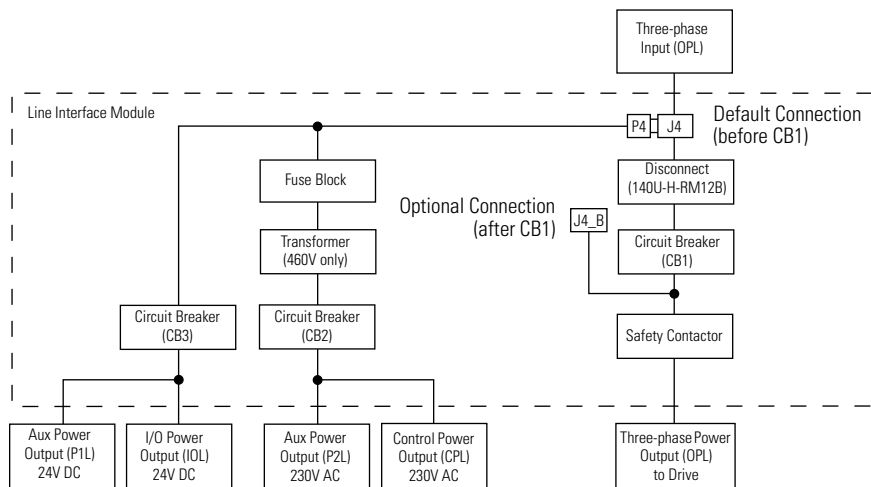
In this example, the 2094-XL75S-C1 and 2094-XL75S-C2 modules are compared to a similar configuration of discrete components. Both of these units provide a connector for an external (customer-supplied) auxiliary and control power input. The 2094-XL75S-C1 module is designed for 110V auxiliary and control power input/output. The 2094-XL75S-C2 module is designed for 230V auxiliary and control power input/output.

Comparing the LIM Module with Discrete Components (catalog number 2094-XL75S-Cx)



Branch circuit protection for the 2094-ALxxS and 2094-BLxxS modules is customer configurable. By moving the CB2/CB3 wiring harness (P4) from one side of CB1 to the other, you can change the module operation. To understand this option, refer to the simplified block diagram below.

Simplified Block Diagram (catalog numbers 2094-ALxxS and 2094-BLxxS)



Features

Features available with the Line Interface Module (LIM) include the following:

- Power production for drive, motor brakes, and auxiliary use.
 - Branch circuit protection and disconnect for three-phase power is provided by an Allen-Bradley Bulletin 140U molded case circuit breaker. The 140U includes both magnetic and thermal protection, eliminating the need for fuses on the three-phase line. Variable Depth Rotary Mechanism (140U-H-RM12B) is required for disconnect feature.
 - Customer configurable branch circuit protection (catalog numbers 2094-ALxxS and 2094-BLxxS) provides the option of using the Bulletin 140U circuit breaker to control all output power (optional) or only three-phase output power (default).
 - Three-phase (230V or 460V) output power to drive controlled by a safety power contactor.
 - 24V DC supply rated at 20 A (catalog numbers 2094-ALxxS, 2094-BLxxS, and 2094-XL75S-Cx) or 8 A (catalog numbers 2094-AL09 and 2094-BL02).
 - Single-phase auxiliary power and control power sourced from internal three-phase input power or external (customer-supplied) input power supply.
- Provides power to single or multiple Kinetix 2000 or Kinetix 6000 power rails. Cumulative IAM input current must not exceed LIM module output current (applies to catalog numbers 2094-ALxxS, 2094-BLxxS, and 2094-XL75S-Cx only).
- Internal line filter (catalog numbers 2094-AL09 and 2094-BL02). External (customer-supplied) line filter (catalog numbers 2094-ALxxS, 2094-BLxxS, and 2094-XL75S-Cx).
- 2094 mounting bracket compatibility for additional panel space saving. Using mounting brackets (catalog number 2094-XNBRKT-1) in your system (2094-ALxxS and 2094-XL75S-Cx modules only) lets you mount the AC line filter behind the LIM module. Refer to Bulletin 2094 Mounting Brackets on [page 446](#) for specifications.
- Plugable connectors let you remove and replace each connector for easy wiring.

Line Interface Module Selection

This table provides a summary of the features available with each Line Interface Module. Use this table and Line Interface Module Selection Flowchart on [page 454](#) to select a LIM module for your drive system.

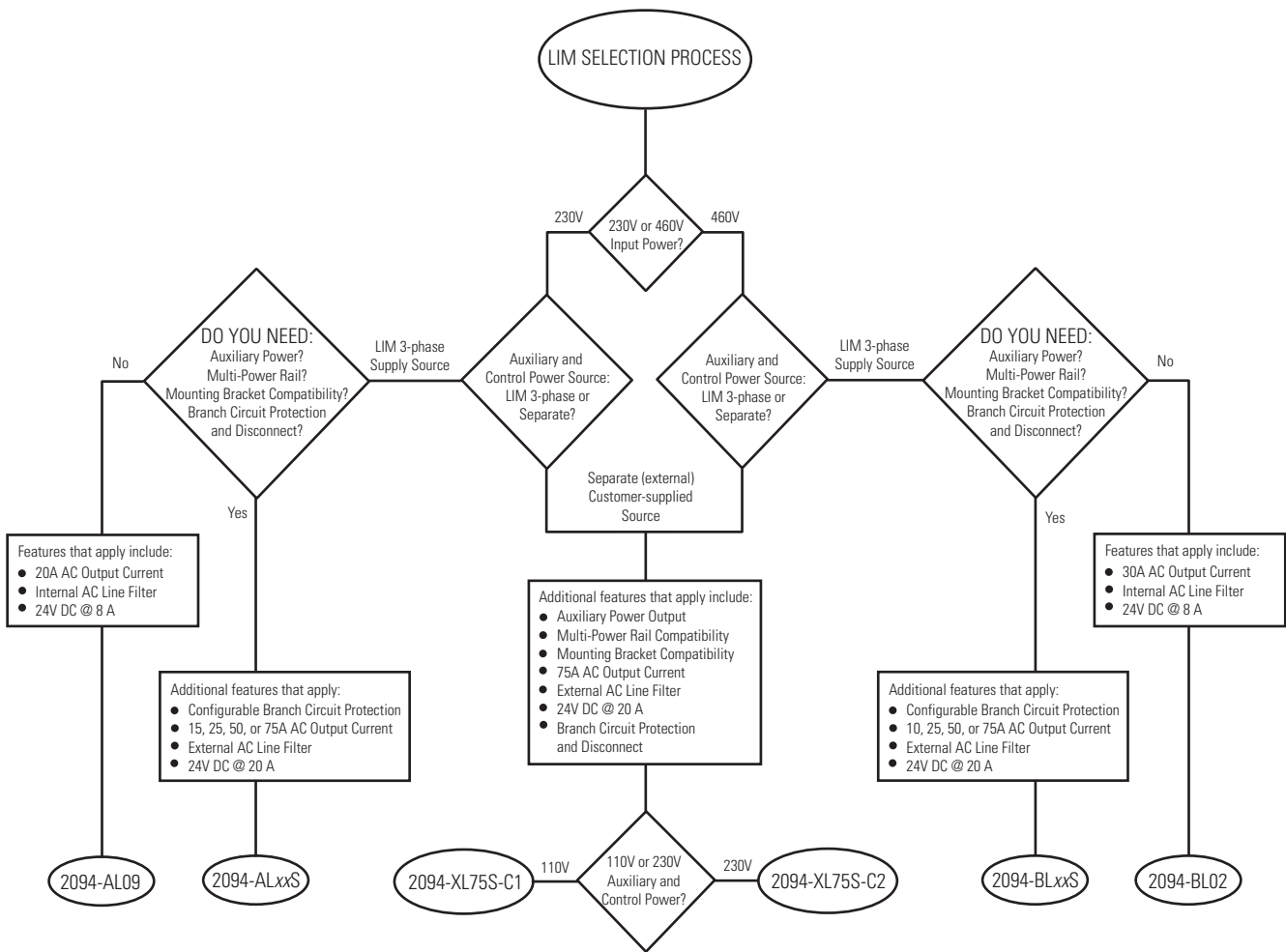
Features	Line Interface Module Cat. No.						
	2094-ALxxS	2094-BLxxS	2094-XL75S-C1	2094-XL75S-C2	2094-AL09	2094-BL02	
Input Power	230V	460V	230V or 460V		230V	460V	
Auxiliary and Control Power Input (customer-supplied)	N/A		110V	230V	N/A		
Auxiliary Power Output	230V ⁽¹⁾	N/A					
Control Power Output	230V	230V					
24V DC Power Output Current Capacity	20 A				8 A		
Configurable Branch Circuit Protection	Yes	Yes	No	No	No	No	
Branch Circuit Protection and Disconnect			Yes	Yes			Yes
Power to Multiple Power Rails ⁽²⁾							
DC Line Filter							
Mounting Bracket Compatibility							
AC Line Filter	External (customer-supplied)				Internal	Internal	
Auxiliary/Control Power Line Filter	Yes						

(1) Auxiliary power output developed internal to LIM module.

(2) For more information on powering multiple power rails from one Line Interface Module, refer to Rockwell Automation technical support.

Use this flowchart to select a LIM module for your drive system based on the input voltage and features you need.

Line Interface Module Selection Flowchart



Line Interface Module Specifications

Power Specifications (catalog numbers 2094-ALxxS and 2094-BLxxS)

Designators	Attribute	Value							
		2094-ALxxS (230V)				2094-BLxxS (460V)			
		AL15S	AL25S	AL50S	AL75S	BL10S	BL25S	BL50S	BL75S
VAC Line (IPL) Connector	AC input voltage	195...265V rms three-phase (230V nom)				380...520V rms three-phase (460V nom)			
	AC input frequency	47...63 Hz				47...63 Hz			
VAC Load (OPL) Connector	Main AC output current (rms)	15 A	25 A	50 A	75 A	10 A	25 A	50 A	75 A
Control Power Output (CPL) Connector and Auxiliary Power Output (P2L) Connector	AC output current (rms)	3 A ⁽¹⁾				3 A ⁽¹⁾			
	AC output voltage	195...265V rms single-phase (230V nom)				190...260V rms single-phase (230V nom)			
Brake Power Output (P1L) Connector and I/O (IOL) Connector	24V DC Power Supply	20 A ⁽²⁾				20 A ⁽²⁾			
Contactor (CR1)	Contactors control voltage ⁽³⁾	21.6...26.4V DC				21.6...26.4V DC			
	Contactors control current ⁽³⁾	12...9 mA				12...9 mA			
	Contactors pickup current ⁽⁴⁾	N/A (Internal)				N/A (Internal)			
	Contactors hold-in current ⁽⁴⁾	N/A (Internal)				N/A (Internal)			
	Contactors voltage	N/A (Internal)				N/A (Internal)			
	Contactors pickup time	18.5 ms (min) 30.0 ms (max)				18.5 ms (min) 30.0 ms (max)			
	Contactors dropout time	10.0 ms (min) 60.0 ms (max)				10.0 ms (min) 60.0 ms (max)			

(1) Sum of CPL and P2L current must not exceed 3 A.

(2) Sum of P1L and IOL current must not exceed 20 A.

(3) Power specifications for DC Interface Module (100 JE) COIL_E1 and COIL_E2 input.

(4) Current provided by auxiliary VAC input.

Power Specifications (catalog number 2094-XL75S-Cx)

Designators	Attribute	Value	
		2094-XL75S-C1 (230/460V)	2094-XL75S-C2 (230/460V)
VAC Line (IPL) Connector	AC input voltage	195...520V rms three-phase (230...460V nom)	
	AC input frequency	47...63 Hz	
VAC Load (OPL) Connector	Main AC output current (rms)	75 A	
Auxiliary Power Input (APL) Connector	Auxiliary AC input voltage	93...121V rms single-phase (110V nom)	196...253V rms single-phase (230V nom)
	Auxiliary AC input current (rms)	20 A	11 A
Control Power Output (CPL) Connector and Auxiliary Power Output (P2L) Connector	AC output current (rms)	12 A	5 A
	AC output voltage	93...121V rms single-phase (110V nom)	196...253V rms single-phase (230V nom)
Brake Power Output (P1L) Connector and I/O (IOL) Connector	24V DC Power Supply	20 A	
Contactor (CR1)	Contactor control voltage ⁽¹⁾	21.6...26.4V DC	
	Contactor control current ⁽¹⁾	12...9 mA	
	Contactor pickup current ⁽²⁾	1.75 A	0.87 A
	Contactor hold-in current ⁽²⁾	0.14 A	0.07 A
	Contactor voltage	93...121V rms single-phase (110V nom)	196...253V rms single-phase (230V nom)
	Contactor pickup time	18.5 ms (min) 30.0 ms (max)	
	Contactor dropout Time	10.0 ms (min) 60.0 ms (max)	

(1) Power specifications for DC Interface Module (100 JE) COIL_E1 and COIL_E2 input.

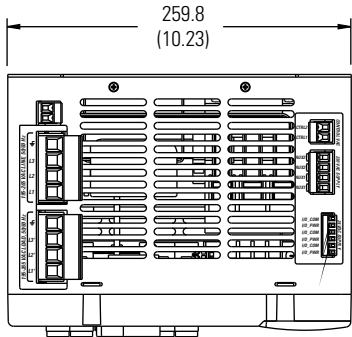
(2) Current provided by auxiliary VAC input.

Power Specifications (catalog numbers 2094-AL09 and 2094-BL02)

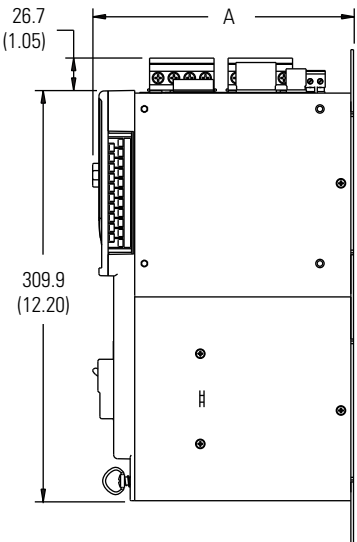
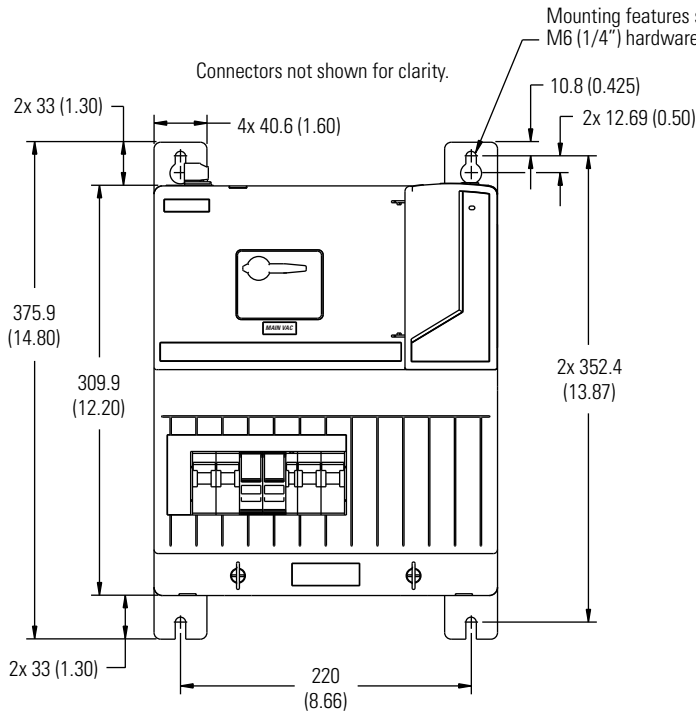
Designator	Attribute	Value	
		2094-AL09 (230V)	2094-BL02 (460V)
VAC Line (IPL) Connector	AC input voltage	195-265V rms three-phase (230V nom)	380-520V rms three-phase (460V nom)
	AC input frequency	47...63 Hz	
VAC Load (OPL) Connector	Main AC output current	20 A rms	30 A rms
Control Power Output (CPL) Connector	AC output current	3 A	
	AC output voltage	195-265V rms three-phase (230V nom)	190-260V rms three-phase (230V nom)
Brake Power Output (PSL) Connector	Brake power 24V DC	2.0 A	
	I/O brake power 24V DC	5.7 A	
LIM Contactor (CR1)	Contactor pickup current	383 mA	
	Contactor hold-in current	383 mA	
	Contactor voltage	24V DC	
	Contactor pickup time	50 ms (min) 80 ms (max)	
	Contactor dropout time	80 ms (min) 125 ms (max)	

Line Interface Module Dimensions

Dimensions (catalog numbers 2094-ALxxS, 2094-BLxxS, and 2094-XL75S-Cx)

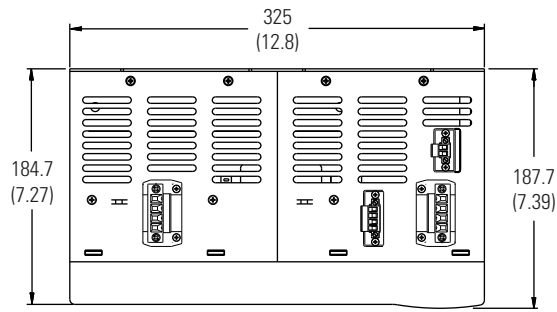


Dimensions are in mm (in.)
2094-XL75S-Cx is shown

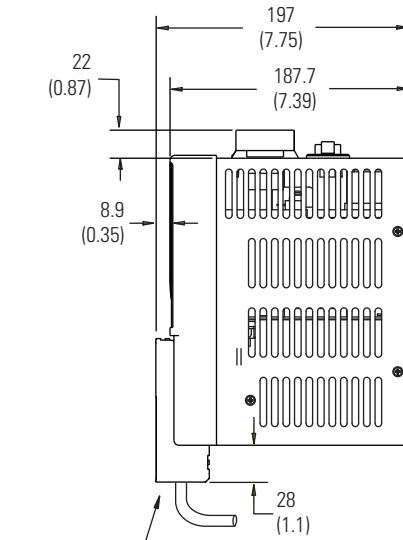
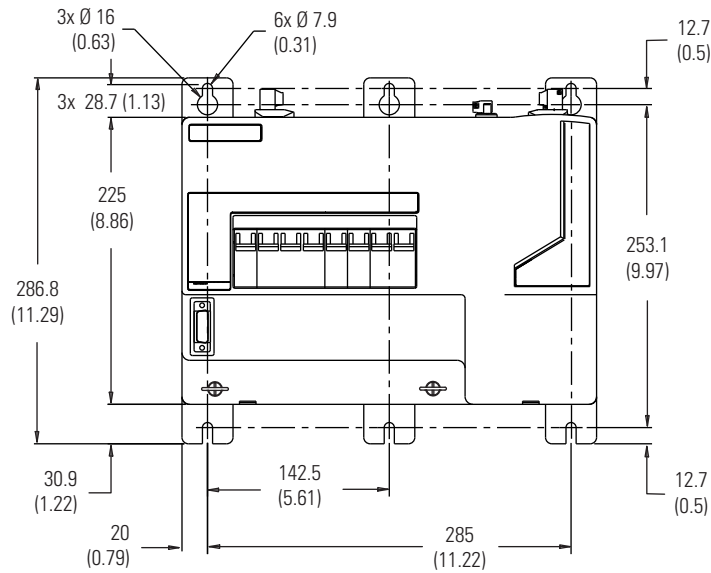


Cat. No.	Dimension A mm (in.)
2094-ALxxS	198.3 (7.81)
2094-XL75S-Cx	
2094-BLxxS	248.0 (9.76)

Line Interface Module Dimensions (catalog number 2094-AL09)



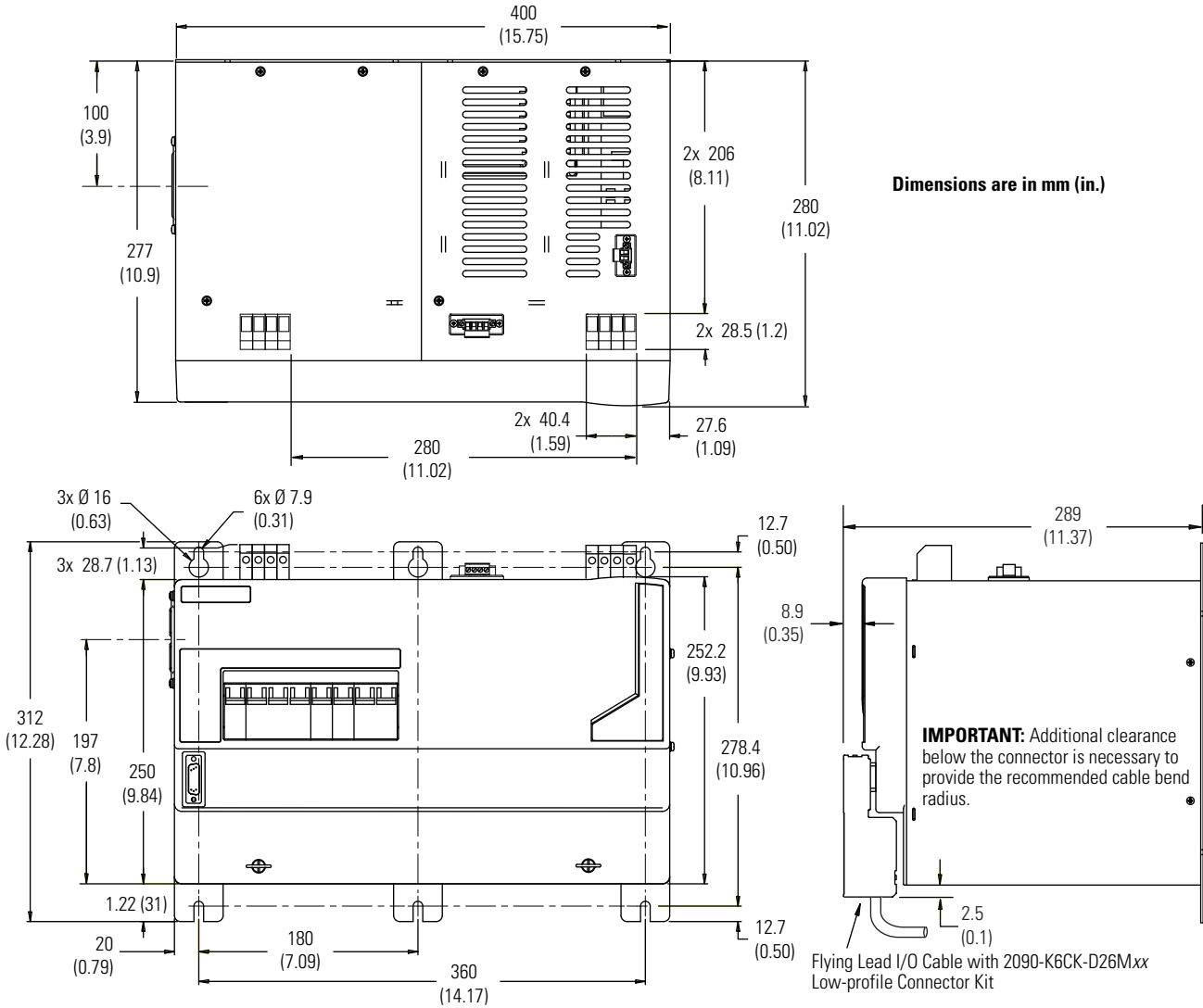
Dimensions are in mm (in.)



Flying Lead I/O Cable with 2090-K6CK-D26Mxx Low-profile Connector Kit

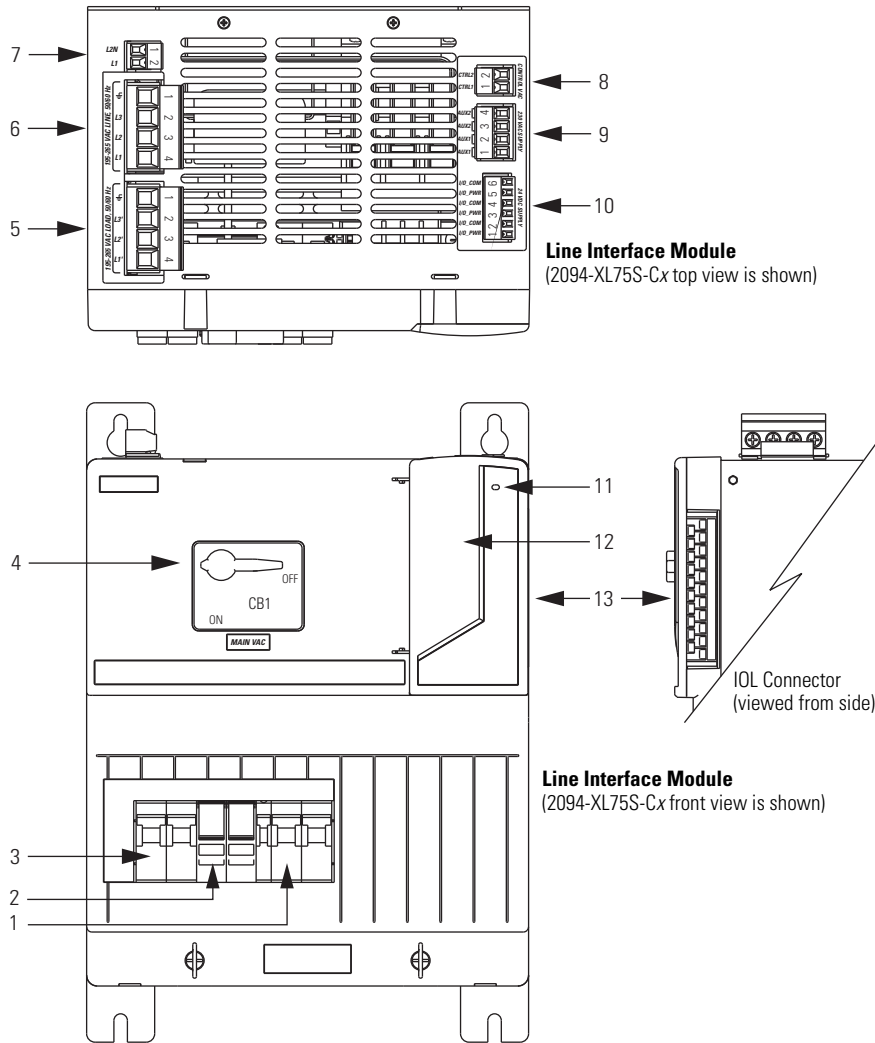
IMPORTANT: Additional clearance below the connector is necessary to provide the recommended cable bend radius.

Line Interface Module Dimensions (catalog number 2094-BL02)



Line Interface Module Connectors and Indicators

Catalog Numbers 2094-ALxxS, 2094-BLxxS, and 2094-XL75S-Cx



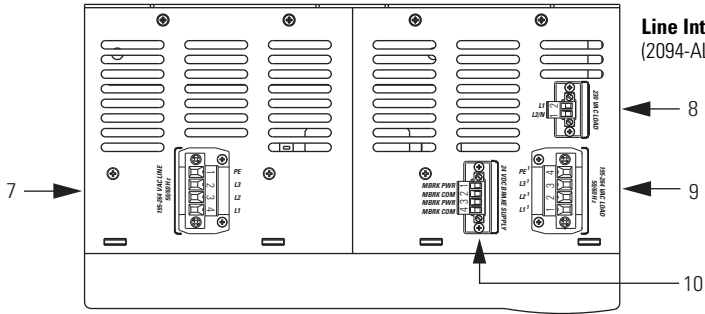
Item	Description
1	CB2 - Control and auxiliary VAC
2	FB1 - Fuse block
3	CB3 - Brake and I/O VAC
4	CB1 - Main VAC disconnect
5	VAC load (OPL) connector
6	VAC line (IPL) connector
7	Auxiliary power input (APL) connector ⁽¹⁾

Item	Description
8	Control power output (CPL) connector
9	Auxiliary power output (P2L) connector
10	24V DC brake power output (P1L) connector
11	24V power status indicator
12	I/O (IOL) connector access door
13	I/O (IOL) connector

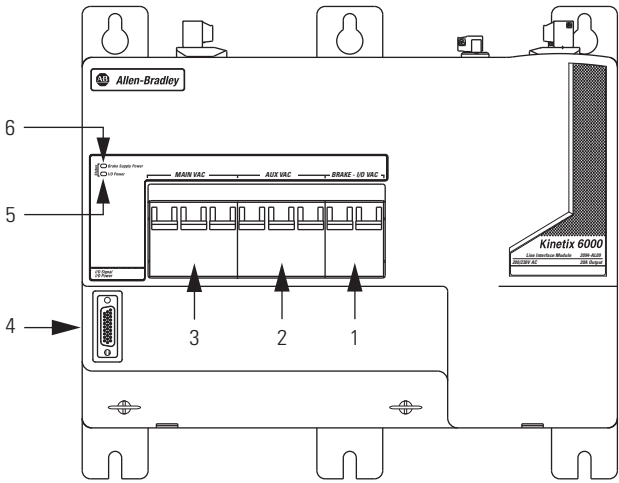
(1) Auxiliary Power Input (APL) connector is present only on the 2094-XL75S-Cx model.

For replacement connector set catalog numbers, refer to Connector Sets on [page 442](#).

Catalog Numbers 2094-AL09 and 2094-BL02



Line Interface Module (2094-AL09 top view is shown)



Line Interface Module (2094-AL09 front view is shown)

Item	Description
1	CB3 - Brake and I/O VAC
2	CB2 - Control and auxiliary VAC
3	CB1 - Main VAC
4	I/O (IOL) connector
5	I/O power status indicator
6	Brake power status indicator
7	VAC line (IPL) connector
8	Control power output (CPL) connector
9	VAC load output (OPL) connector
10	24V DC brake power output (PSL) connector

For I/O connector kit, refer to Low-profile Connector Kit Components on [page 419](#).

Line Interface Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.

2094 - xL xxx - Cx

Features
 AL09 = 20 A, 24V DC @ 8 A, Internal Three-phase Line Filter
 BL02 = 30 A, 24V DC @ 8 A, Internal Three-phase Line Filter
 AL15S = 15 A, 230V AC Auxiliary Power Output, 24V DC @ 20 A, Configurable Branch Circuit Protection
 BL10S = 10 A, 230V AC Auxiliary Power Output, 24V DC @ 20 A, Configurable Branch Circuit Protection
 AL/BL25S = 25 A, 230V AC Auxiliary Power Output, 24V DC @ 20 A, Configurable Branch Circuit Protection
 AL/BL50S = 50 A, 230V AC Auxiliary Power Output, 24V DC @ 20 A, Configurable Branch Circuit Protection
 AL/BL75S = 75 A, 230V AC Auxiliary Power Output, 24V DC @ 20 A, Configurable Branch Circuit Protection
 XL75S-C1 = 75 A, Input for 110V AC (customer-supplied) Auxiliary Power, 24V DC @ 20 A
 XL75S-C2 = 75 A, Input for 230V AC (customer-supplied) Auxiliary Power, 24V DC @ 20 A

Module Input Voltage
 AL = 230V AC, 50/60 Hz
 BL = 460V AC, 50/60 Hz
 XL = 230/460V AC, 50/60 Hz

Bulletin Number

AC Line Filters

This section contains AC line filter selection tables, specification tables, and dimension drawings. Use the tables below to match an AC line filter to your servo drive.

AC Line Filter Selection

Drive Family ⁽¹⁾	Drive Cat. No.	AC Line Filter Cat. No.	Drive Family	Drive Cat. No.	AC Line Filter Cat. No.
Kinetix 2000	2093-AC05-Mxx	2090-XXLF-TC116	Kinetix 6200/ Kinetix 6500	2094-BC01-MP5-M	2090-XXLF-X330B
		2090-XXLF-TC316		2094-BC01-M01-M	
Kinetix 6000	2094-AC05-MP5-S	2090-XXLF-X330B		2094-BC02-M02-M	
	2094-AC05-M01-S		2099-BM06-S		
	2094-AC09-M02-S		2099-BM07-S		
	2094-AC16-M03-S	2090-XXLF-375	Kinetix 7000	2099-BM08-S	2090-XXLF-TC365
	2094-AC32-M05-S	2090-XXLF-3100		2099-BM09-S	2090-XXLF-TC3100
	2094-BC01-MP5-S	2090-XXLF-X330B		2099-BM10-S	2090-XXLF-TC3150
	2094-BC01-M01-S		2099-BM11-S	2090-XXLF-TC3200	
	2094-BC02-M02-S		2099-BM12-S	2090-XXLF-TC3250	
	2094-BC04-M03-S	2090-XXLF-375B	8720MC-RPS	8720MC-RPS065-Bx	8720MC-RFI80
2094-BC07-M05-S	2090-XXLF-3100	8720MC-RPS190-Bx		8720MC-EF190-VB ⁽²⁾	

(1) For Bulletin 2097 line filters used with the Kinetix 300 drive family, refer to AC Line Filters on [page 237](#).

(2) Line filter unit includes magnetic contactor, harmonic filter, and varistor.

AC Line Filter Selection

Drive Family	Drive Cat. No.	AC Line Filter Cat. No.	Motor Cables > 30 m
Ultra3000/5000	2098-xxx-005	2090-UXLF-106	2090-UXLF-110
	2098-xxx-010	2090-UXLF-110	2090-UXLF-110
	2098-xxx-020	2090-UXLF-123	2090-UXLF-123
	2098-xxx-030	2090-UXLF-136	2090-UXLF-132
	2098-xxx-075	2090-UXLF-336	2090-UXLF-HV330
	2098-xxx-150	2090-UXLF-350	2090-UXLF-HV350
	2098-xxx-HV030, 2098-xxx-HV050, 2098-xxx-HV100, 2098-xxx-HV150	2090-UXLF-HV323	2090-UXLF-HV323
	2098-xxx-HV220	2090-UXLF-HV330	2090-UXLF-HV330
Ultra1500	2092-DA1, 2092-DA2	2090-UXLF-106	N/A
	2092-DA3	2090-UXLF-110	N/A
	2092-DA4, 2092-DA5	2090-UXLF-HV323	N/A

AC Line Filter Specifications

AC Line Filter Cat. No.	Specifications ^{(1) (2)}							Dimensions	
	Voltage	Phase	Current A @ 50 °C (122 °F)	Power Loss W	Leakage Current mA	Weight, approx. kg (lb)	Operating Temperature		
2090-UXLF-106	250V AC 50/60 Hz	Single	6	3.5	2.26	0.3 (0.66)	-25...85 °C (-13...185 °F)	page 464	
2090-UXLF-110			10	2.7	45	0.95 (2.0)			
2090-UXLF-123			23	10	90	1.6 (3.5)			
2090-UXLF-132			32	20	90				
2090-UXLF-136			36	—	200	1.75 (3.9)			page 465
2090-XXLF-TC116			16	—	87	0.80 (1.7)			-25...100 °C (-13...212 °F)
2090-UXLF-336	520V AC 50/60 Hz	Three	36	—	138	2.7 (5.9)	page 465		
2090-UXLF-350			50	25	138				
2090-UXLF-HV323	520V AC 50/60 Hz	Three	23	20	80	1.6 (3.5)	page 464		
2090-UXLF-HV330			30	51	24	1.8 (4.0)	page 466		
2090-XXLF-X330B	500V AC 50/60 Hz	Three	30	38	64	2.7 (5.9)	-25...85 °C (-13...185 °F)	page 467	
2090-UXLF-HV350			50	25	35	4.8 (10.6)			
2090-XXLF-375			75	57	50	5.2 (11.4)			
2090-XXLF-375B					108				
2090-XXLF-3100			100	75	73	9.5 (20.9)			
2090-XXLF-TC316	520V AC 50/60 Hz	Three	16	—	38	0.80 (1.7)	-25...100 °C (-13...212 °F)	page 468	
2090-XXLF-TC350			50	—	38	2.4 (5.3)		page 468	
2090-XXLF-TC365			65	—	38	2.4 (5.3)			
2090-XXLF-TC3100			100	—	38	5.2 (11.5)			
2090-XXLF-TC3150			150	—	76	7.5 (16.5)		page 469	
2090-XXLF-TC3200			200	—	76	7.5 (16.5)			
2090-XXLF-TC3250			250	—	76	7.5 (16.5)			
8720MC-RFI80			8720MC-EF190-VB	Three	80	25.9		—	5.3 (11.7)
8720MC-EF190-VB	190	—			—	34.0 (74.8)			

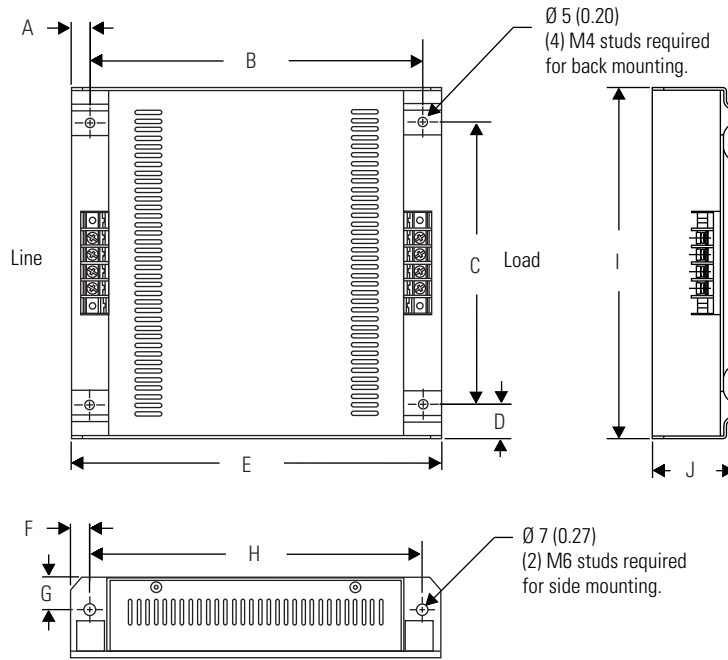
(1) For all filters, 90% relative humidity.

(2) For all filters, 10...200 Hz @ 1.8 g vibration.

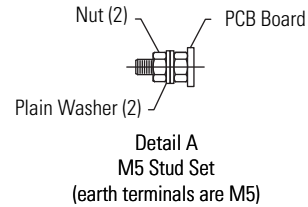
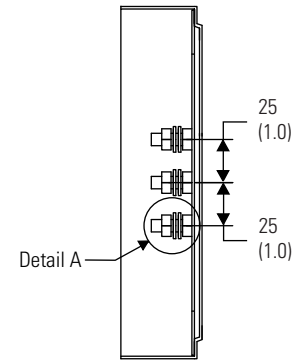
AC Line Filter Dimensions

AC Line Filter Dimensions

Dimensions are in mm (in.)

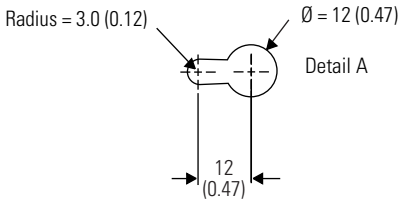
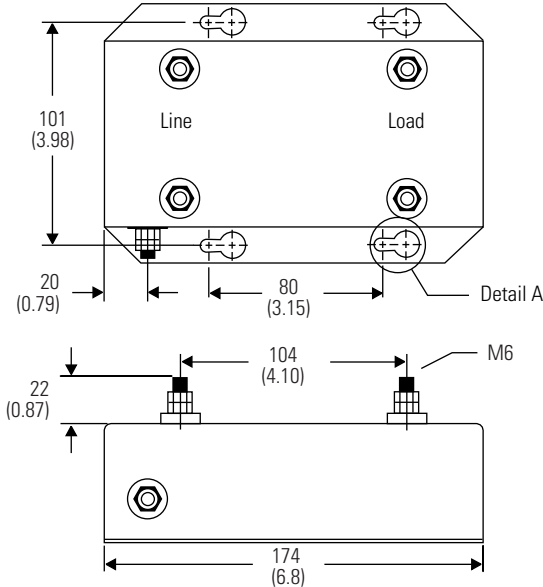


2090-UXLF-132
Terminal Configuration

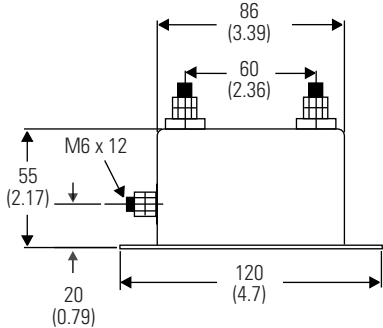


Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	G mm (in.)	H mm (in.)	I mm (in.)	J mm (in.)
2090-UXLF-106	9.0 (0.35)	152.0 (5.99)	55.0 (2.17)	18.0 (0.71)	170.0 (6.69)	9.0 (0.35)	10.0 (0.39)	152.0 (5.99)	92.0 (3.62)	25.0 (0.98)
2090-UXLF-110			104.0 (4.0)				16.0 (0.63)		145.0 (5.71)	40.0 (1.58)
2090-UXLF-123	11.0 (0.43)	192.0 (7.56)	164.0 (6.46)	20.0 (0.79)	214.0 (8.42)	11.0 (0.43)	19.0 (0.75)	192.0 (7.56)	204 (8.04)	47.0 (1.85)
2090-UXLF-132										
2090-UXLF-HV323										

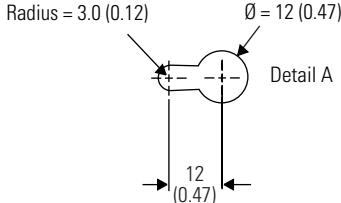
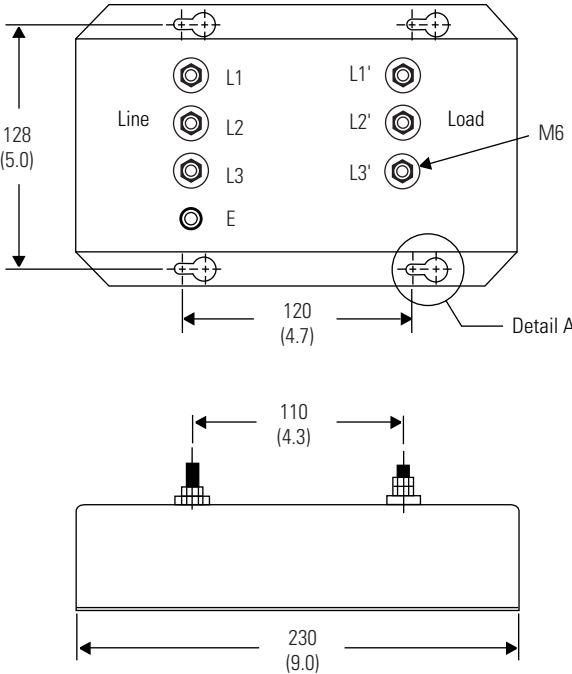
**AC Line Filter Dimensions
(catalog number 2090-UXLF-136)**



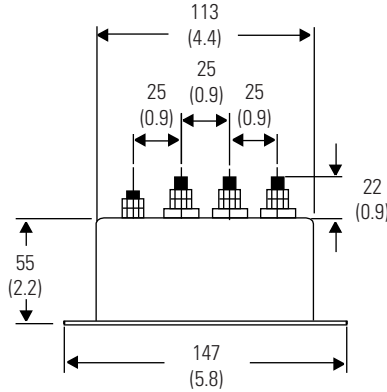
Dimensions are in mm (in.)



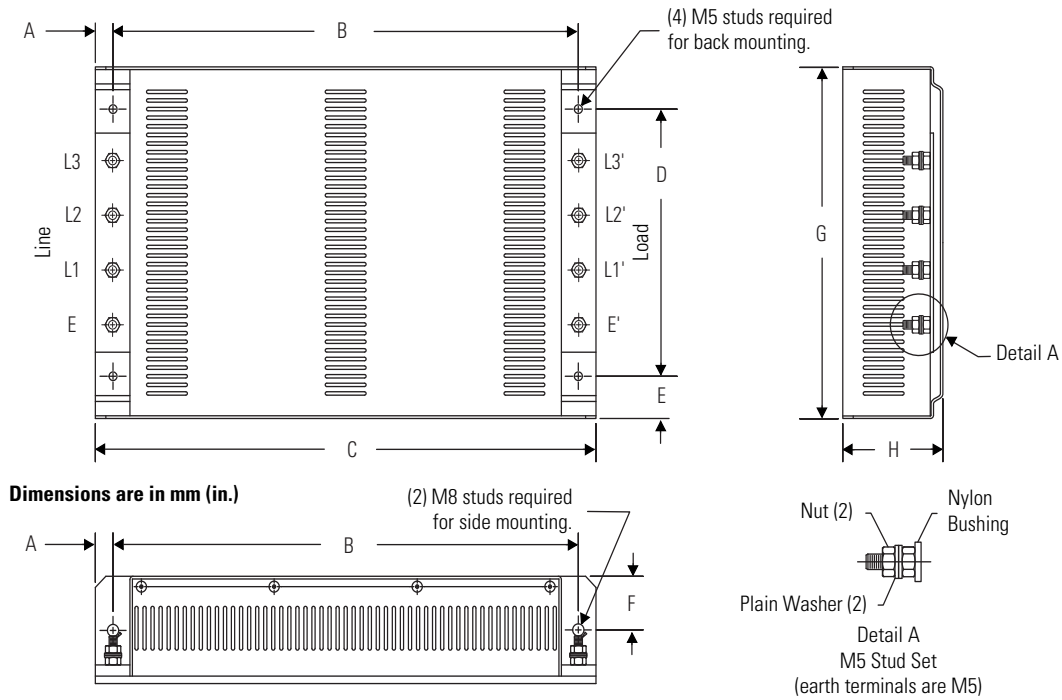
**AC Line Filter Dimensions
(catalog numbers 2090-UXLF-336 and 2090-UXLF-350)**



Dimensions are in mm (in.)



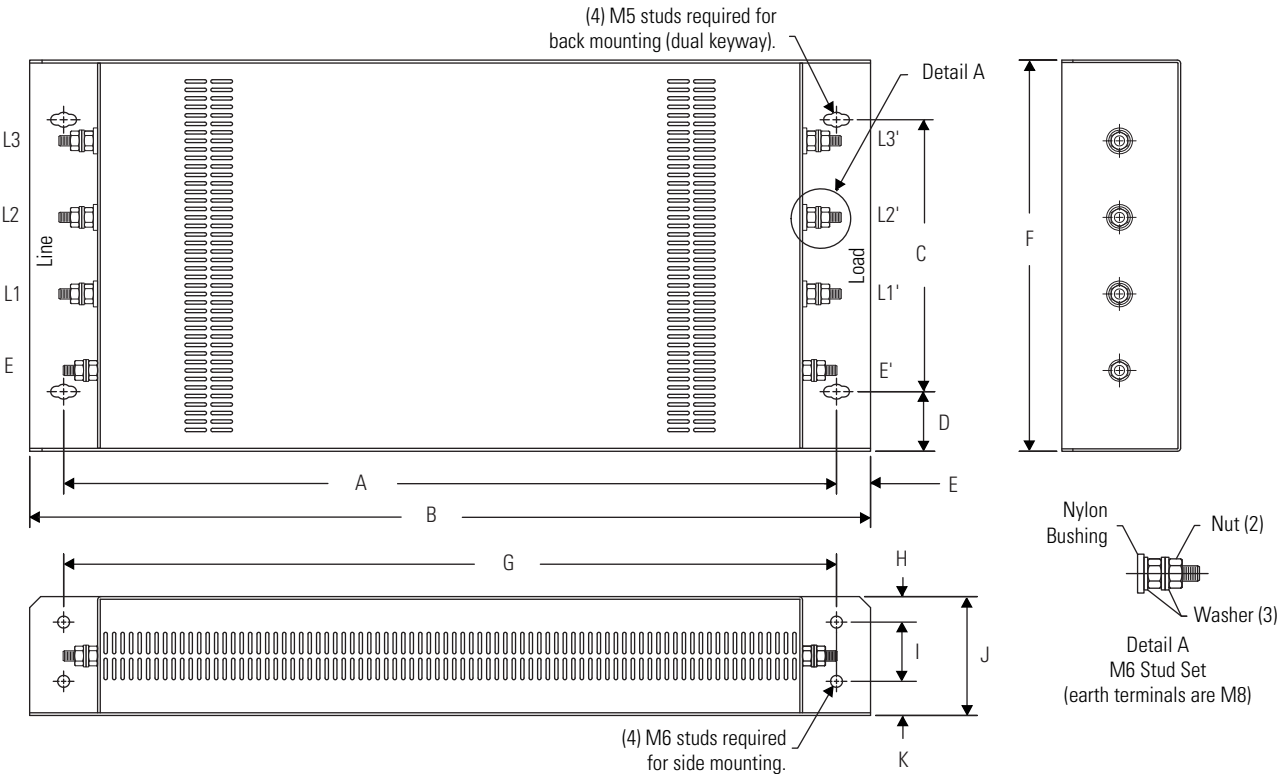
AC Line Filters Dimensions



Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	G mm (in.)	H mm (in.)
2090-UXLF-HV330	11.0 (0.4)	338 (13.3)	360 (14.2)	145 (5.7)	29.5 (1.1)	16.0 (0.63)	204 (8.0)	40.0 (1.6)
2090-XXLF-X330B	15.0 (0.6)	330 (13.0)		155 (6.1)	20.0 (0.8)	32.5 (1.3)	195 (7.7)	65.0 (2.5)

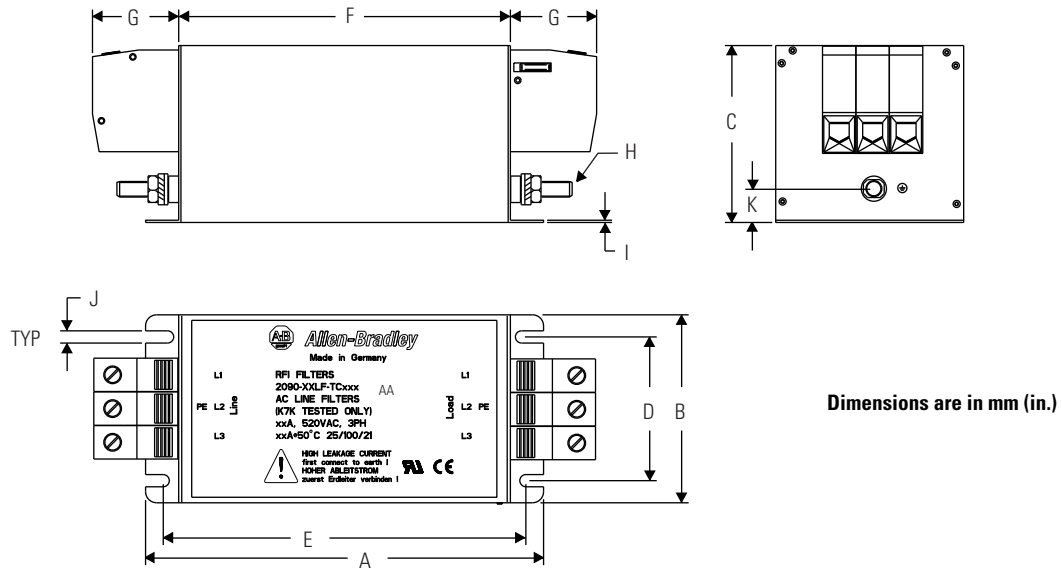
AC Line Filter Dimensions

Dimensions are in mm (in.)



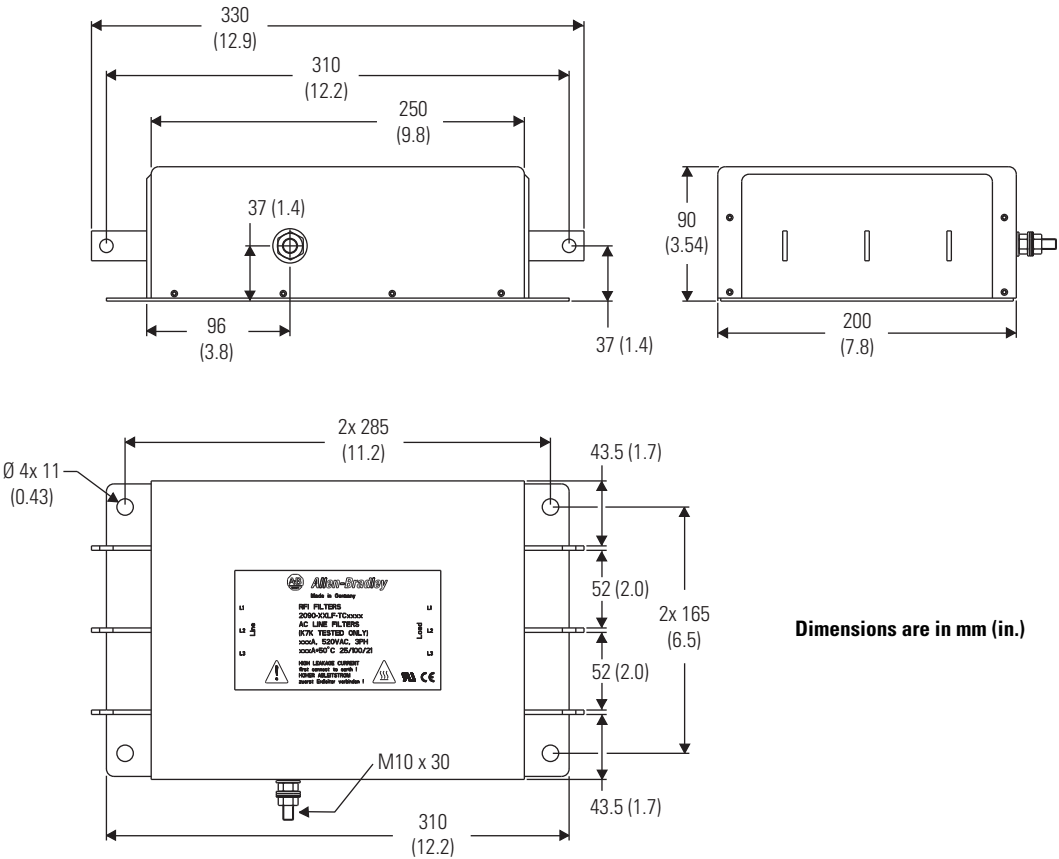
Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	G mm (in.)	H mm (in.)	I mm (in.)	J mm (in.)	K mm (in.)
2090-UXLF-HV350	578 (22.7)	618 (24.3)	160 (6.3)	35 (1.4)	20 (0.8)	230 (9.0)	578 (22.7)	15 (0.6)	35 (1.4)	70 (2.7)	20 (0.8)
2090-XXLF-375 2090-XXLF-375B	646 (25.4)	686 (27.0)	192 (7.5)			262 (10.3)					
2090-XXLF-3100	741 (29.2)	785 (30.9)	215 (8.4)	30 (1.2)	21.5 (0.85)	275 (10.8)	741 (29.2)		47 (1.8)	80 (3.1)	18 (0.7)

AC Line Filter Dimensions



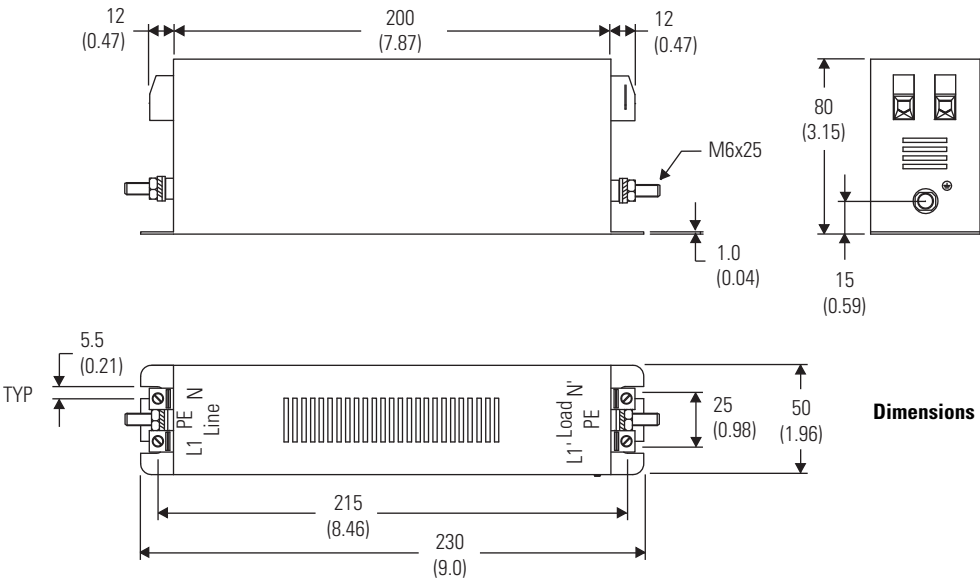
Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	G mm (in.)	H mm (in.)	I mm (in.)	J mm (in.)	K mm (in.)
2090-XXLF-TC316	230 (9.0)	50 (1.96)	80 (3.15)	25 (0.98)	215 (8.46)	200 (7.87)	12 (0.47)	M6x25	1.0 (0.04)	5.5 (0.21)	15 (0.59)
2090-XXLF-TC350	180 (7.08)	85 (3.35)		65 (2.56)	164 (6.45)	150 (5.90)	39 (1.53)				
2090-XXLF-TC365											
2090-XXLF-TC3100	240 (9.45)	95 (3.74)	90 (3.54)	75 (2.95)	223 (8.78)	210 (8.27)	43 (1.69)	M8x40	1.5 (0.06)	5.5 (0.21)	16 (0.63)

AC Line Filter Dimensions
(catalog numbers 2090-XXLF-TC3150, 2090-XXLF-TC3200, and 2090-XXLF-TC3250)



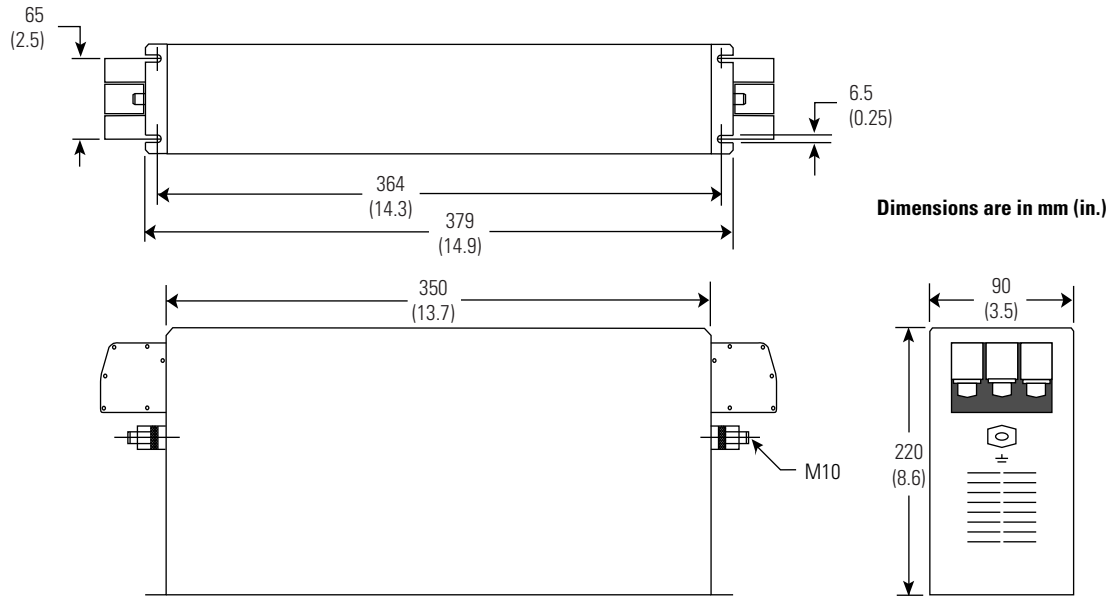
Dimensions are in mm (in.)

AC Line Filter Dimensions
(catalog number 2090-XXLF-TC116)

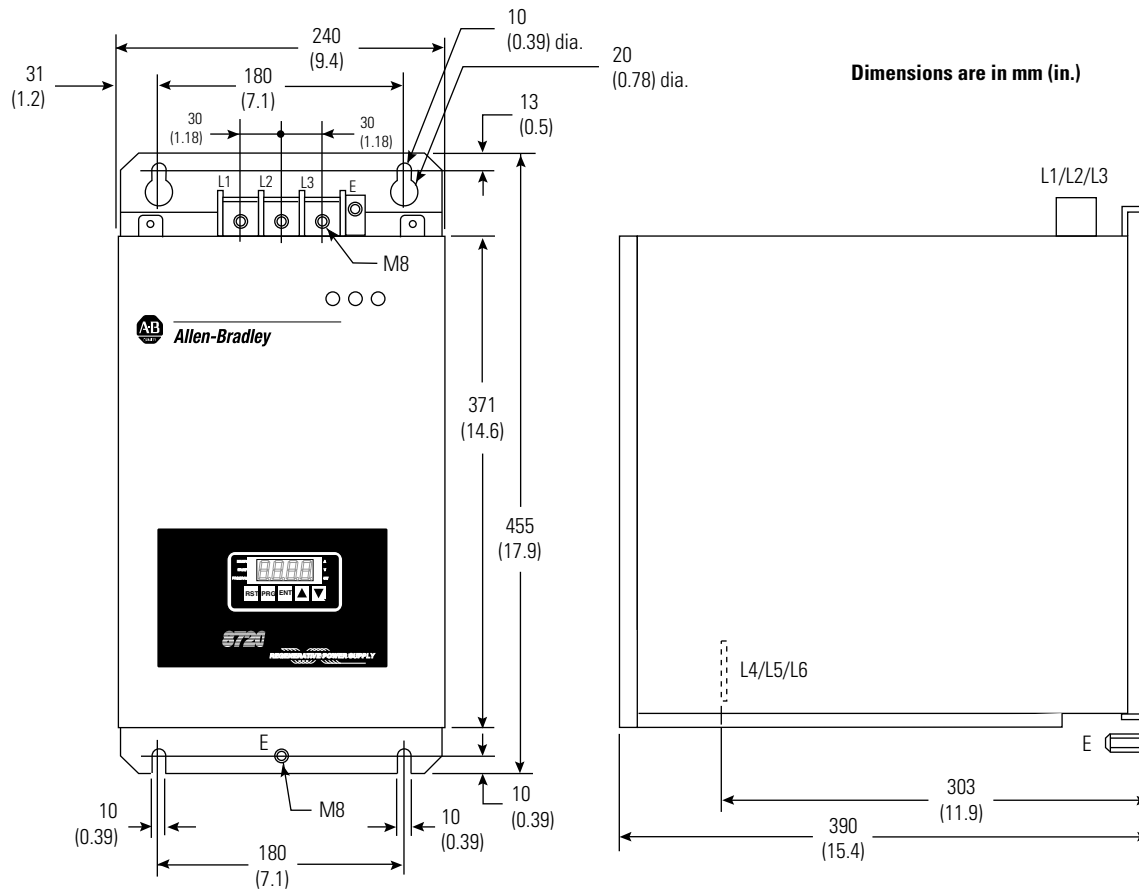


Dimensions are in mm (in.)

AC Line Filter (catalog number 8720MC-RF180)



AC Line Filter (catalog number 8720MC-EF190)



External Shunt Modules

This section contains external shunt module/resistor kit specifications, dimensions, and catalog number information. Use the tables below to match a shunt module to your servo drive.

For Bulletin 2097 shunt modules intended for use with Kinetix 300 servo drives, refer to Shunt Resistor Specifications on [page 238](#).

Bulletin 1394 Passive Shunt Modules

Select one of these Bulletin 1394 passive shunt modules when your Kinetix 6000, Kinetix 6200 or Kinetix 6500 drive application exceeds the capacity of the internal (IAM/AM module) shunt resistor. These external passive shunt modules wire to the Kinetix 6000 (catalog number 2094-BSP2) shunt module.

External Shunt Cat. No.	Specifications						Bussmann Replacement Fuse
	Drive Voltage	Resistance Ω	Peak Power kW	Peak Current A	Cont. Power W	Shipping Weight, approx. kg (lb)	
1394-SR9A	230V AC ¹	4	41.0	101.25	300	3.63 (8)	FNQ-R-20-R1 ⁽¹⁾
	460V AC		160	200			FWP50A14F
1394-SR9AF	230V AC ¹	4	41.0	101.25	900	3.63 (8)	FNQ-R-20-R1 ⁽¹⁾
	460V AC		160	200			FWP50A14F
1394-SR36A	230V AC ¹	4	41.0	101.25	1800	8.6 (19)	FNQ-R-20-R1 ⁽¹⁾
	460V AC		160	200			FWP50A14F
1394-SR36AF	230V AC ¹	4	41.0	101.25	3600	9.0 (20)	FNQ-R-25-R1 ⁽¹⁾
	460V AC		160	200			FWP50A14F

(1) Requires the use of an FNQ fuse with an adapter to allow the smaller body fuse to fit the larger FWP fuse holder.

Bulletin 1336 Active Shunt Modules

Select one of these Bulletin 1336 active shunt modules when your Kinetix 2000, Kinetix 6200, Kinetix 6500, Kinetix 6000, or Kinetix 7000 drive application exceeds the capacity of the internal shunt resistor. These Bulletin 1336 external shunt modules wire directly to the DC bus.

Bulletin 1336 Chopper Shunt Module Specifications

Drive Cat. No.	External Shunt ⁽¹⁾ Module Cat. No.	Specifications					Fuse Replacement (Ferraz Shawmut)
		Drive Voltage V AC	Turn-on Value V	Peak Transistor Current A	Resistor Value, min ⁽²⁾ Ω	Shipping Weight, approx. kg (lb)	
2094-ACxx-Mxx-S	1336-WA115	230	375	400	1.25	11.34 (25)	A70Q
	1336-WA070			200	2.3	4.08 (9)	A70Q
2093-ACxx-Mxx or 2094-ACxx-Mxx-S	1336-WA018			50	9.0	3.18 (7)	A60Q
2094-BCxx-Mxx-S 2094-BCxx-Mxx-M or 2099-BMxx-S	1336-WB110	460	750	400	2.5	11.34 (25)	A70Q
	1336-WB035			100	9.0	4.08 (9)	A70Q
	1336-WB009			25	37.0	3.18 (7)	A60Q

(1) The Bulletin 1336 Chopper modules require an external resistor.

(2) Customer-supplied component.

TIP

You can use Motion Analyzer software to make the selection based on application requirements.

Refer to the Common DC Bus Selection Guide, publication [DRIVES-SG001](#), for dimensions and catalog number information for the chopper modules listed in the table above.

Bulletin 2090 Passive Shunt Modules

Select one of these passive shunt modules when your Ultra3000 or Ultra5000 drive application exceeds the capacity of the internal shunt resistor.

Ultra3000/5000 Drives	Shunt Module Cat. No.	Specifications							Fuse Replacement
		Drive Voltage	Fan Voltage V AC	Resistance Ω	Peak Power kW	Peak Current A	Continuous Power W	Shipping Weight kg (lb)	
2098-xxx-005, 2098-xxx-010, 2098-xxx-020	2090-UCSR-A300	230V AC	N/A	36	4.0	10.5	300	1.51 (3.3)	—
2098-xxx-030	9101-1183			30	5.9	14.0	200	—	CCMR-4-½ ⁽¹⁾
2098-xxx-075, 2098-xxx-150	2090-UCSR-P900			18	10.0	23.3	900	4.08 (9.0)	FWP-10A14F ⁽²⁾
2098-xxx-HV030, 2098-xxx-HV050	2090-SR120-09	460V AC	N/A	120	5.3	6.7		3.63 (8.0)	FWP-2.5A14F ⁽²⁾
	M3575R-H6MFC ⁽³⁾		115	120...148	4.9	6.0	6.3 (14.0)	N/A	
	M3575R-H6MFL,C ⁽³⁾		230		3.63 (8.0)	FWP-5A14F ⁽²⁾			
2098-xxx-HV100	2090-SR040-09	460V AC	N/A	40	16.0	20.0	3.63 (8.0)	FWP-5A14F ⁽²⁾	
	2090-SR040-18		N/A	40		20.0	1800	8.6 (19.0)	FWP-6.3A14F ⁽²⁾
	M3575R-H16BFC ⁽³⁾		115	40...49	14.2	18.0		10.0 (22.0)	N/A
	M3575R-H16BFL,C ⁽³⁾		230		900	11.3 (25.0)	N/A		
2098-xxx-HV150	M3575R-H27B0,C ⁽³⁾	460V AC	N/A	25...31	25.6	31.0	900	11.3 (25.0)	N/A
	M3575R-H27BFC ⁽³⁾		115				1800		
	M3575R-H27BFL,C ⁽³⁾		230						
2098-xxx-HV220	M3575R-H33BFC ⁽³⁾	460V AC	115	20...25	32.0	36.0	3600	12.7 (28.0)	N/A
	M3575R-H33BFL,C ⁽³⁾		230						

(1) Littelfuse part number.

(2) Bussmann part number.

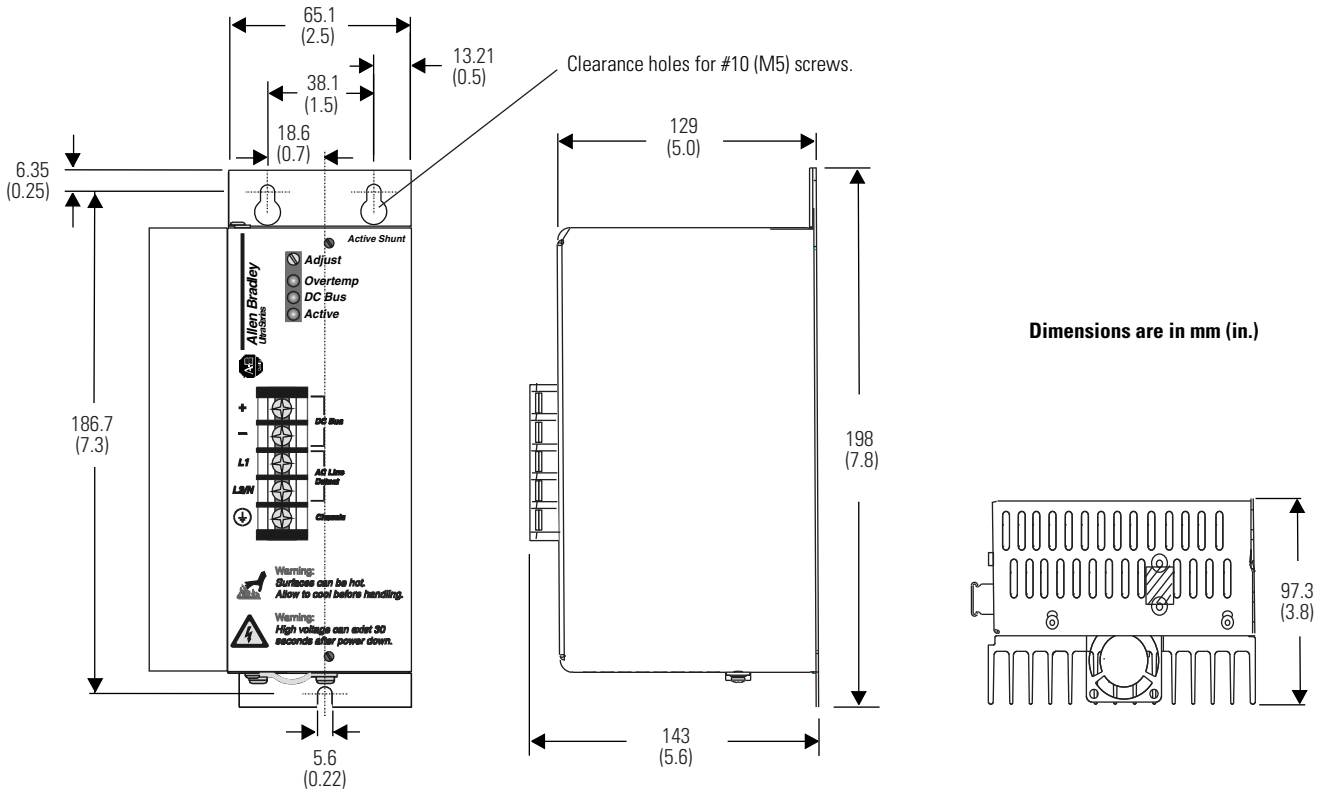
(3) Bonitron part number. For more information contact:

Bonitron, Inc.
521 Fairground Court,
Nashville, TN 37211
Tel: (615) 244-2825
<http://www.BONITRON.com>

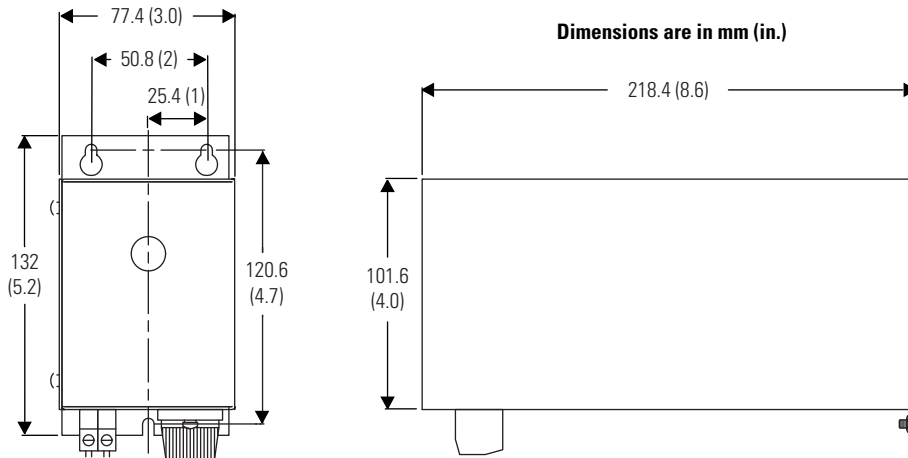
Shunt Resistor Kit Dimensions

Refer to the Common DC Bus Selection Guide, publication [DRIVES-SG001](#), for the Bulletin 1336 shunt module and chopper module dimensions.

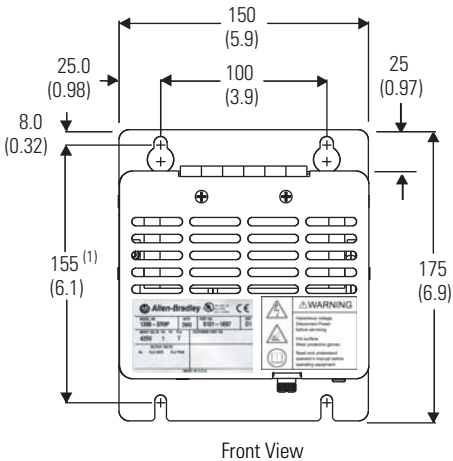
Dimensions (catalog number 2090-UCSR-A300)



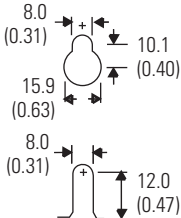
Dimensions (catalog number 9101-1183)



Dimensions (catalog number 2090-UCSR-P900)



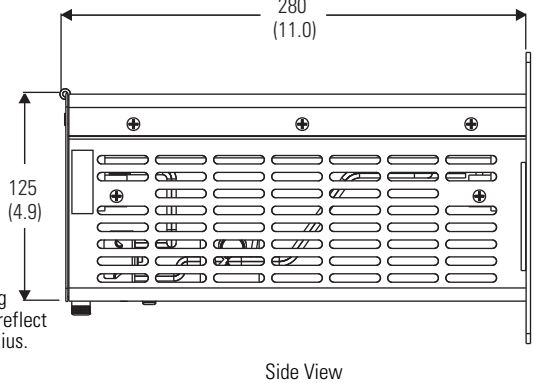
Mounting Hole Detail



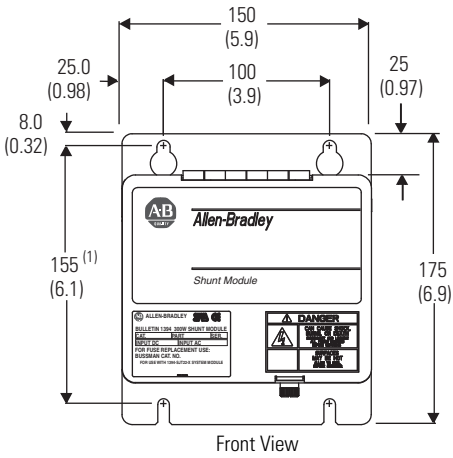
All slots accept M6 or 1/4-20 mounting screws.

(1) Dimension shown is for mounting hardware location and does not reflect the location of the lower slot radius.

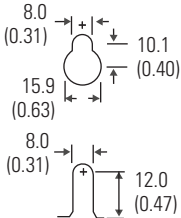
Dimensions are in mm (in.)



Dimensions (catalog numbers 2090-SR120-09, 2090-SR040-09, 1394-SR9A, and 1394-SR9AF)



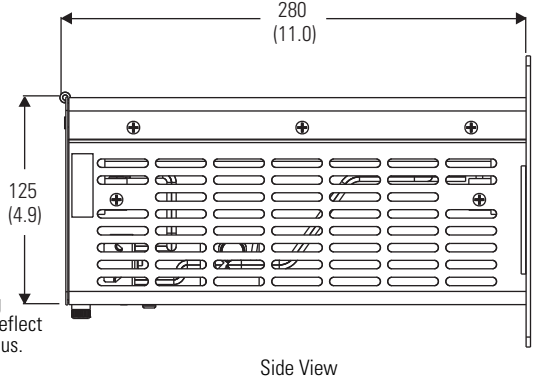
Mounting Hole Detail



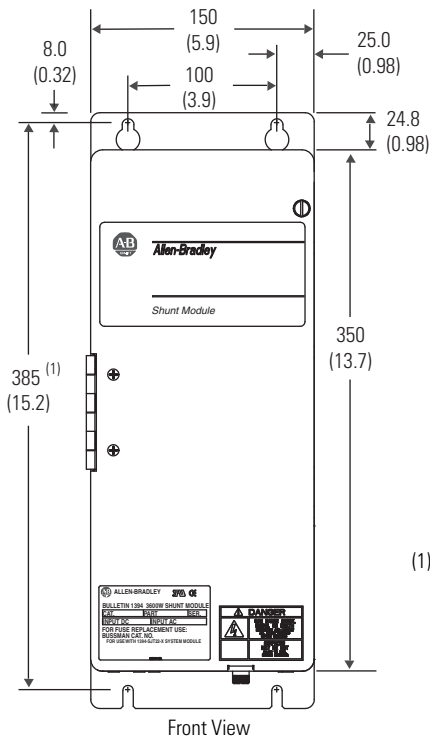
All slots accept M6 or 1/4-20 mounting screws.

(1) Dimension shown is for mounting hardware location and does not reflect the location of the lower slot radius.

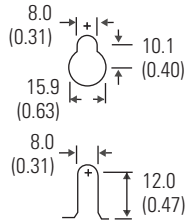
Dimensions are in mm (in.)



Dimensions (catalog numbers 2090-SR040-18, 1394-SR36A, and 1394-SR36AF)

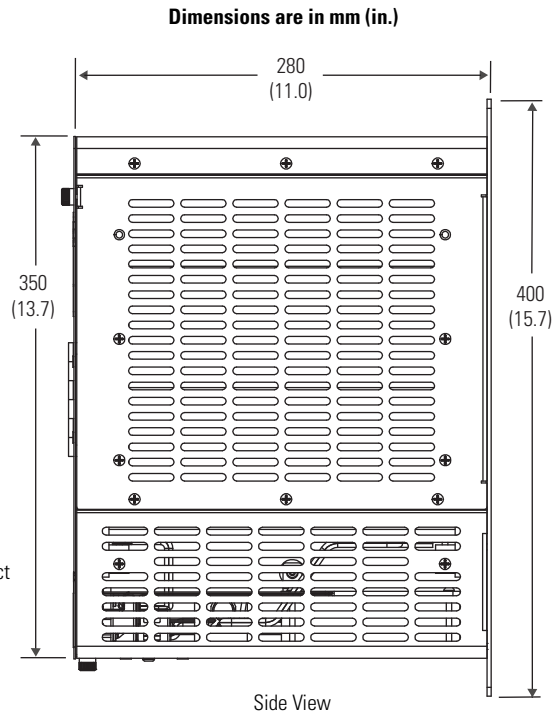


Mounting Hole Detail

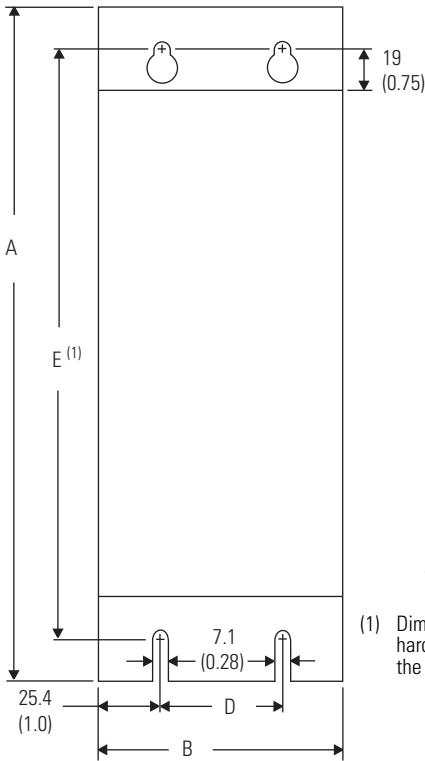


All slots accept M6 or 1/4-20 mounting screws.

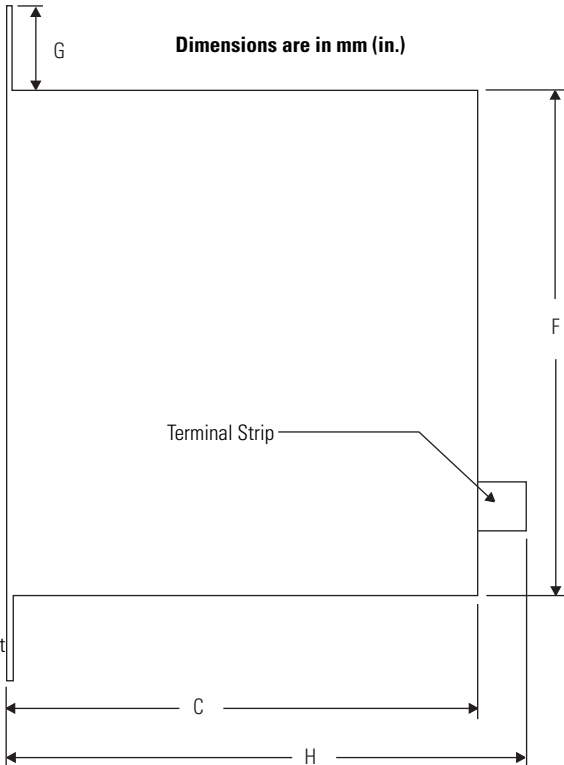
- (1) Dimension shown is for mounting hardware location and does not reflect the location of the lower slot radius.



Dimensions (Bonitron shunt modules)



Front View



Side View

All slots accept M6 or 1/4-20 mounting screws.
 (1) Dimension shown is for mounting hardware location and does not reflect the location of the lower slot radius.

Bonitron Cat. No. (1)	Chassis Size	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	G mm (in.)	H mm (in.)
M3575R-H6MF,C	M7	322 (12.7)	178 (7.0)	196 (7.7)	127 (5.0)	305 (12.0)	267 (10.5)	29 (1.13)	221 (8.7)
M3575R-H16BF,C	B7	451 (17.7)				254 (10.0)	203 (8.0)	425 (16.7)	381 (15.0)
M3575R-H27B0,C	B10		246 (9.7)						
M3575R-H27BF,C			292 (11.5)						
M3575R-H33BF,C	B10D								

(1) Bonitron part numbers. For more information contact:

Bonitron, Inc.
 521 Fairground Court,
 Nashville, TN 37211
 Tel: (615) 244-2825
<http://www.BONITRON.com>

Shunt Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering charts below to understand the configuration of your shunt. For questions regarding product availability, contact your Allen-Bradley distributor.

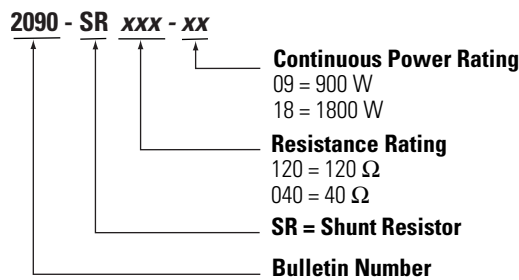
1336 Shunt Modules for Kinetix 6200, Kinetix 6500, Kinetix 6000, or Kinetix 7000 Servo Drives

Refer to the Common DC Bus Selection Guide, publication [DRIVES-SG001](#), for the Bulletin 1336 shunt module and chopper module catalog number description.

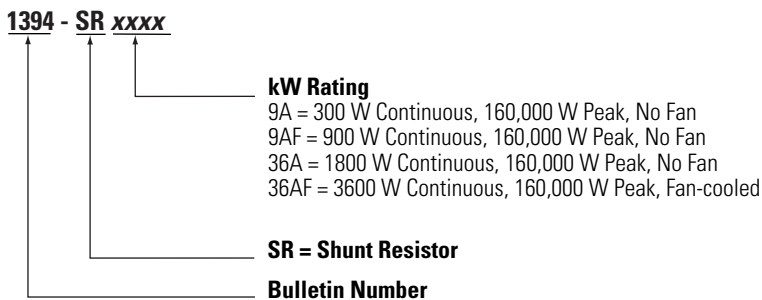
2090 Shunt Resistor Kits for Ultra3000/5000 230V Drives

Cat. No.	Description
2090-UCSR-A300	Active shunt, 300 W for use with 500 W, 1 kW, and 2 kW drives
9101-1183	Passive shunt, 200 W for use with 3 kW drives
2090-UCSR-P900	Passive shunt, 900 W for use with 7.5 and 15 kW drives

2090 Shunt Modules for Ultra3000/5000 460V Drives



1394 Shunt Modules for Kinetix 6200, Kinetix 6500, and Kinetix 6000 Servo Drives



Resistive Brake Modules

This section contains Resistive Brake Module (RBM) descriptions, dimensions, and catalog number information.

Resistive Brake Module Specifications

Cat. No.	Drive Voltage	Resistance ⁽¹⁾ Ω	Peak Energy J	Peak Drive Current		Continuous Power W	Weight, approx. kg (lb)
				A 0-pk	A rms		
2090-XB33-32	230 or 460V AC	32	150	33	23	30	1.91 (4.22)
2090-XB33-16		16					
2090-XB120-06		6	290	106	75	45	2.75 (6.06)
2090-XB120-03		3					
2090-XB120-01		1					

(1) Tolerance = ± 10%.

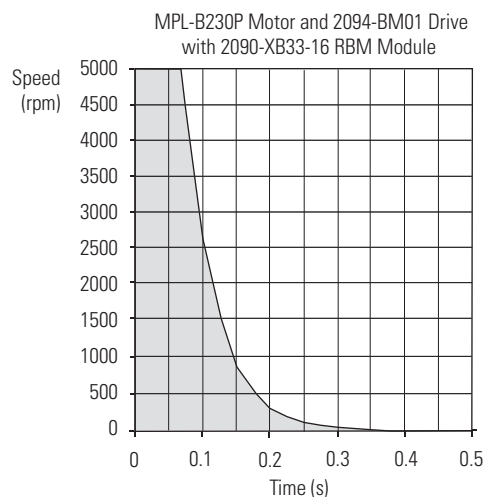
Use Motion Analyzer software to match an RBM module to your servo motor compatible with Kinetix 2000, Kinetix 6000, Kinetix 6200, Kinetix 6500, and Ultra3000-SE drive systems.

IMPORTANT

Drive commands are the preferred and quickest method to bring your drive system to a controlled stop. When using drive commands, the time between braking cycles is limited by the drive/motor/load combination. When the RBM resistors are used to stop the motor, these conditions apply:

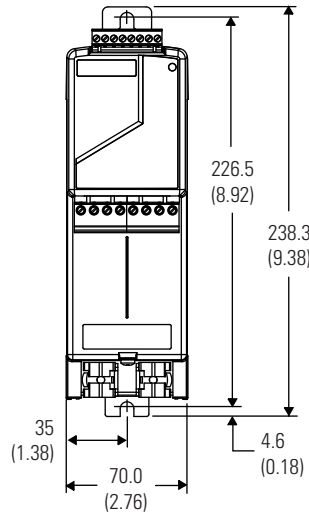
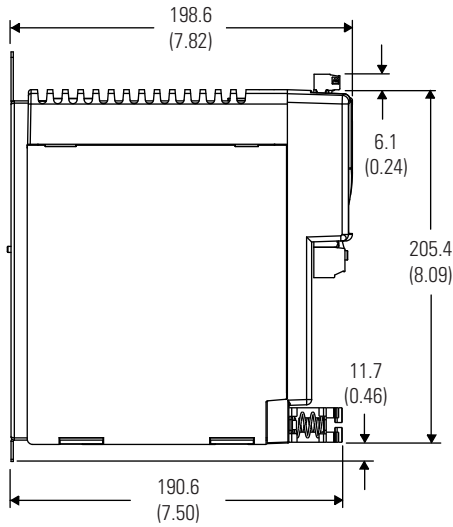
- One minute between braking cycles
- Maximum 15:1 motor inertia
- Maximum motor velocity at the start of braking
- Application must not exceed the current rating of the brake module

Typical RBM Module Curve



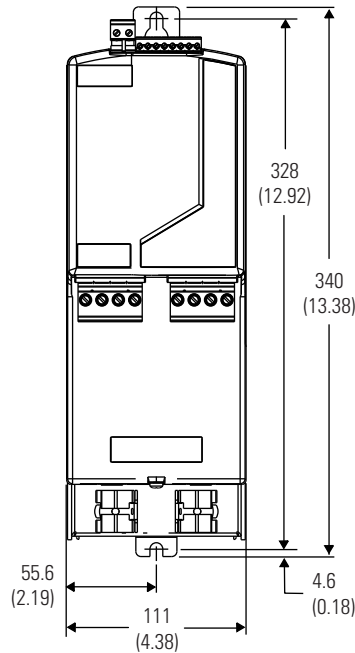
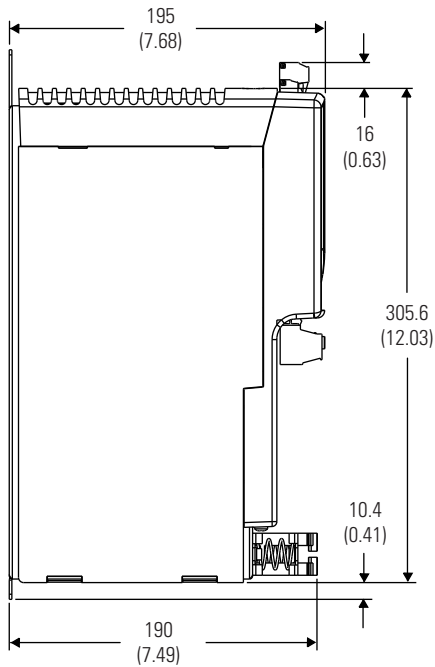
Resistive Brake Module Dimensions

Dimensions (catalog numbers 2090-XB33-16 and 2090-XB33-32)



Dimensions are in mm (in.)

Dimensions (catalog numbers 2090-XB120-01, 2090-XB120-03, and 2090-XB120-06)

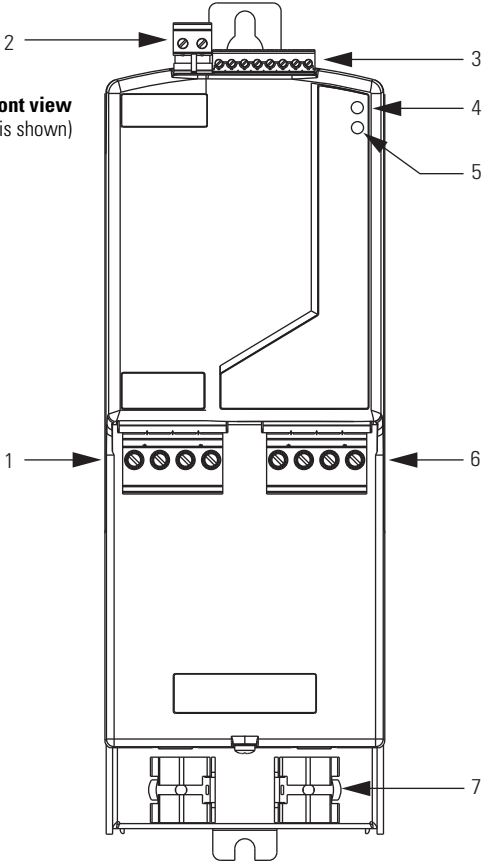


Dimensions are in mm (in.)

RBM Connectors and Indicators

RBM Connectors (catalog numbers 2090-XB33-xx and 2090-XB120-xx)

Resistive Brake Module, front view
(catalog number 2090-XB120-xx is shown)



Item	Description
1	Drive connections (TB1) connector
2	230V AC auxiliary power input (TB4) connector ⁽¹⁾
3	I/O (TB3) connector
4	Contacting status indicator
5	Auxiliary power status indicator ⁽¹⁾
6	Motor connections (TB2) connector
7	Motor cable shield clamps

(1) The 230V AC auxiliary power input (TB4) connector and auxiliary power status indicator are present only on 2090-XB120-xx resistive brake modules.

RBM to Drive Interface Cables

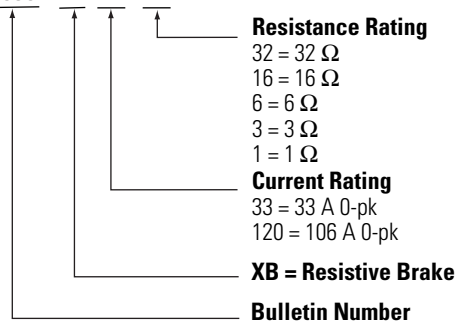
RBM interface cables (motor power, RBM to drive) are available for Kinetix 6000/Kinetix 6200/Kinetix 6500 and Ultra3000-SE drives. Refer to the table below for specific RBM to drive interface cable information.

For This Information	Refer to
Cable catalog numbers for compatible drives	page 392
Available cable lengths	page 395
Cable dimensions	page 405
Cable specifications	page 410

Resistive Brake Module Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering charts below to understand the configuration of your module. For questions regarding product availability, contact your Allen-Bradley distributor.

2090 - XB xx - xx



8720MC Regenerative Power Supplies

This section contains specifications and catalog number information for the 8720MC-RPSxxx Regenerative Power Supplies (RPS). The 8720MC-RPS modules are compatible with Kinetix 6200, Kinetix 6000, and Kinetix 7000 drives when used in DC common bus applications. Refer to the drive chapters for sizing information.

The 8720MC Regenerative Power Supplies support these features:

- Full line regeneration
- Regenerative braking
- Multiple DC common bus drives
- Leader and Follower modes for parallel operation of multiple units
- Adjustable DC output voltage
- CE compliance and UL Listed to U.S. and Canadian safety standards. Refer to <http://www.ab.com> for more information.

8720MC-RPS Power Specifications

The table below lists general power specifications and requirements for the 8720MC-RPS modules (catalog numbers 8720MC-RPS065 and 8720MC-RPS190).

Attribute	Value			
	8720MC-RPS065		8720MC-RPS190	
AC input voltage	324...506V AC rms three-phase			
AC input frequency	47...63 Hz			
AC input current Nom Max (1 minute)	65 A rms 98 A rms	92 A 0-pk 138 A 0-pk	190 A rms 285 A rms	268 A 0-pk 403 A 0-pk
Continuous output current	64 A DC		190 A DC	
Output current (1 minute)	96 A DC		285 A DC	

Refer to 8720MC Regenerative Power Supply User Manual, publication [8720MC-RM001](#), for additional specifications and dimensions for the 8720MC-RPS modules listed in the table above.

8720MC-RPS Precharge Specifications

The table below lists internal (built-in) and external precharge capacitance of the 8720MC-RPS modules.

Attribute	Value	
	8720MC-RPS065	8720MC-RPS190
Capacitance of built-in capacitor	1900 μF	7600 μF
Built-in resistor (value/wattage)	7000 μF (22 Ω /120 W)	25000 μF (10 Ω /400 W)
External resistor (min resistance value) Connect to PR1 and PR2	110000 μF (20 Ω)	165000 μF (10 Ω)
External circuit (min resistance value)	220000 μF (4.7 Ω)	495000 μF (1.5 Ω)

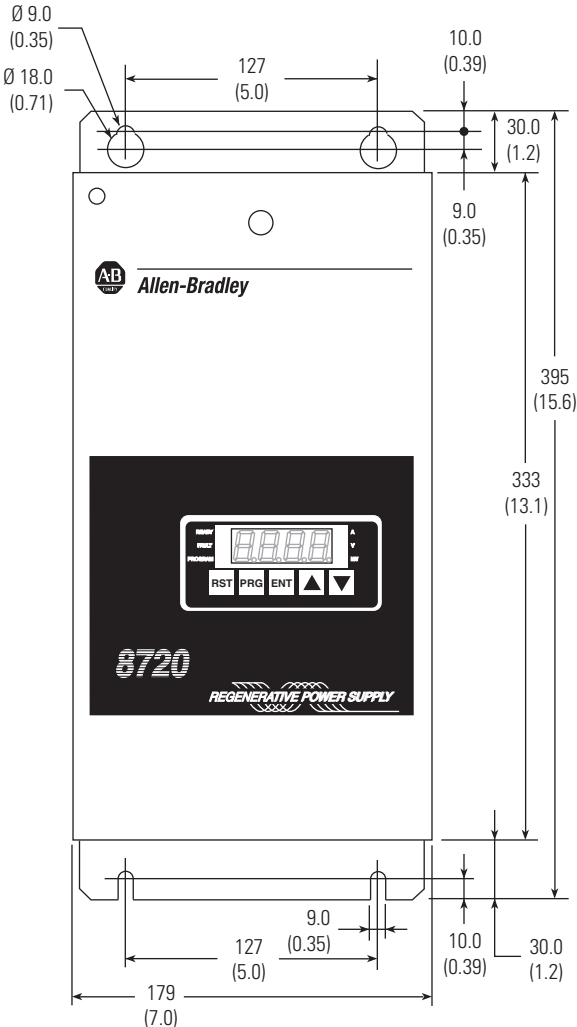
IMPORTANT

Large levels of load capacitance may require modification of the 8720MC-RPS internal precharge/discharge circuit.

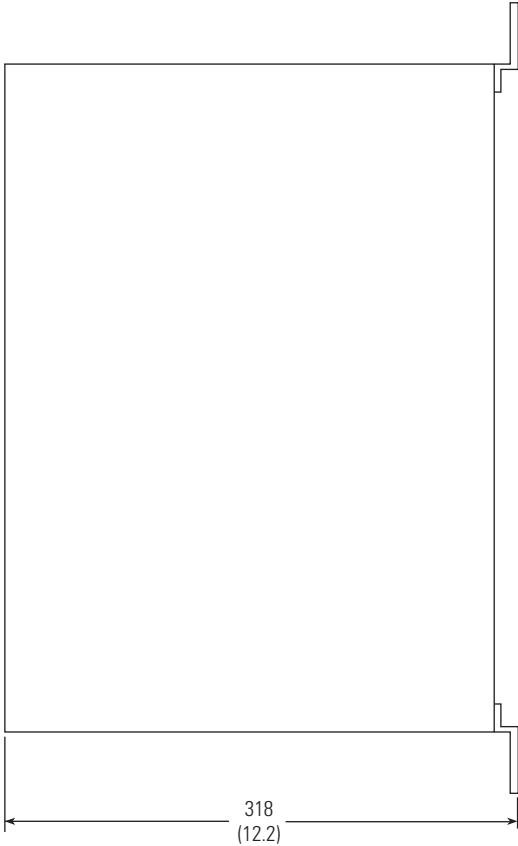
Refer to the wiring instructions in the 8720MC Regenerative Power Supply Installation Manual, publication [8720MC-RM001](#), for information on how to determine the appropriate precharge/discharge resistance power value (ohms/watt) to accommodate the capacitance of your system.

8720MC Regenerative Power Supply Dimensions

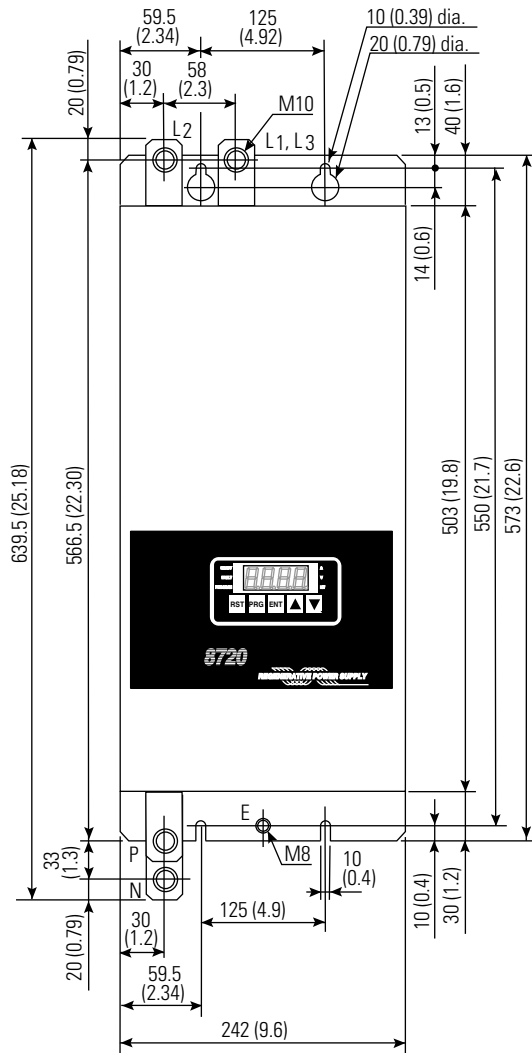
Dimensions (catalog number 8720MC-RPS065)



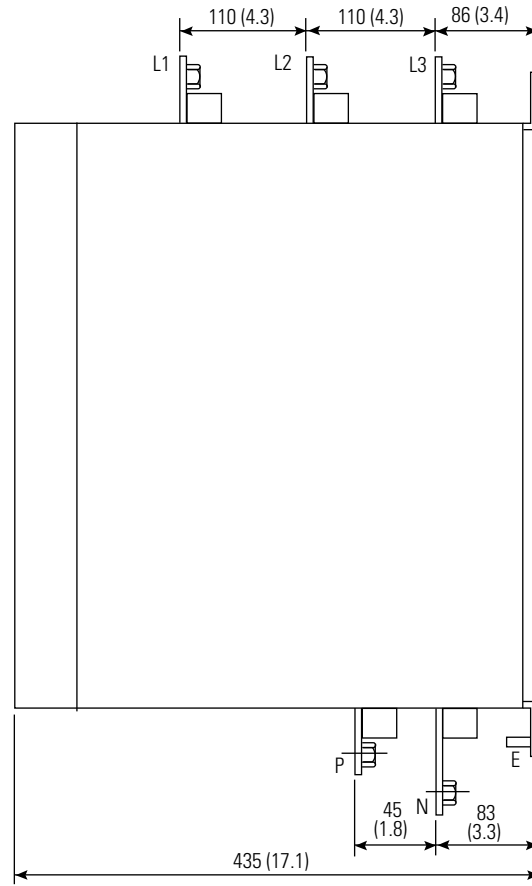
Dimensions are in mm (in.)



Dimensions (catalog number 8720MC-RPS190)

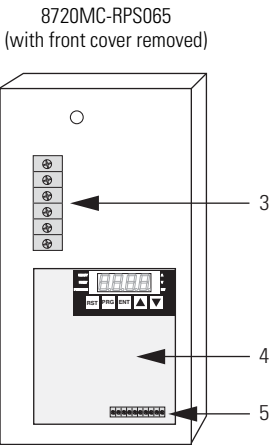
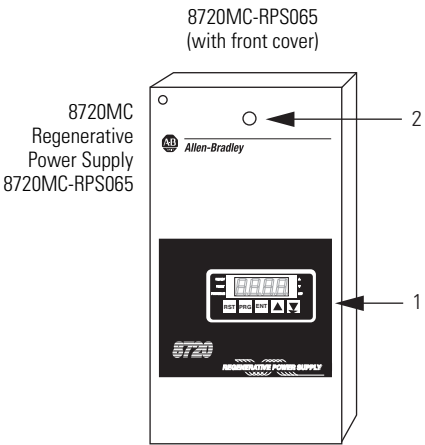


Dimensions are in mm (in.)

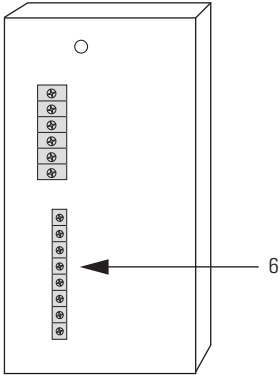


8720MC Regenerative Power Supply Connectors and Indicators

8720MC-RPS Connectors (catalog number 8720MC-RPS065)

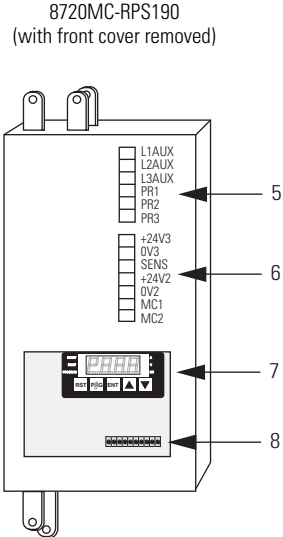
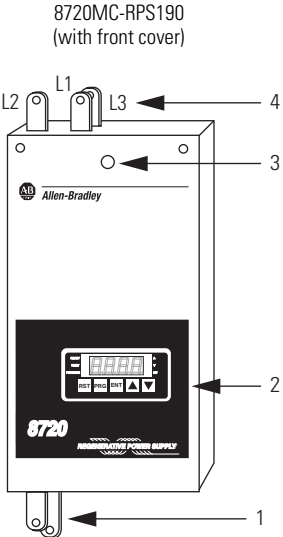


8720MC-RPS065
(front cover and regulator board removed)



Item	Description
1	Operation panel (master unit only)
2	Power status indicator
3	Main power (TB1) terminal block
4	Regulator board (master unit only)
5	Sequence signal (TB3) terminal block
6	Control power (TB2) terminal block

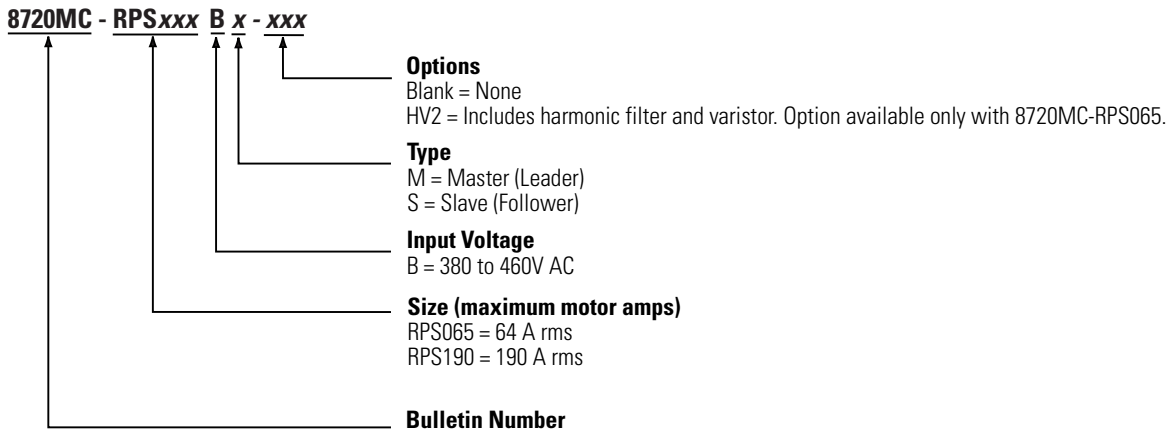
8720MC-RPS Connectors (catalog number 8720MC-RPS190)



Item	Description
1	DC bus terminals
2	Operation panel (master unit only)
3	Power status indicator
4	Main power terminals
5	Control power (TB2) terminal block
6	Control power (TB4) terminal block
7	Regulator board (master unit only)
8	Sequence signal (TB3) terminal block

8720MC-RPS Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your 8720MC Regenerative Power Supply. For questions regarding product availability, contact your Allen-Bradley distributor.



8720MC Line Reactors

This section contains 8720MC line reactor specifications, dimensions, and catalog numbers.

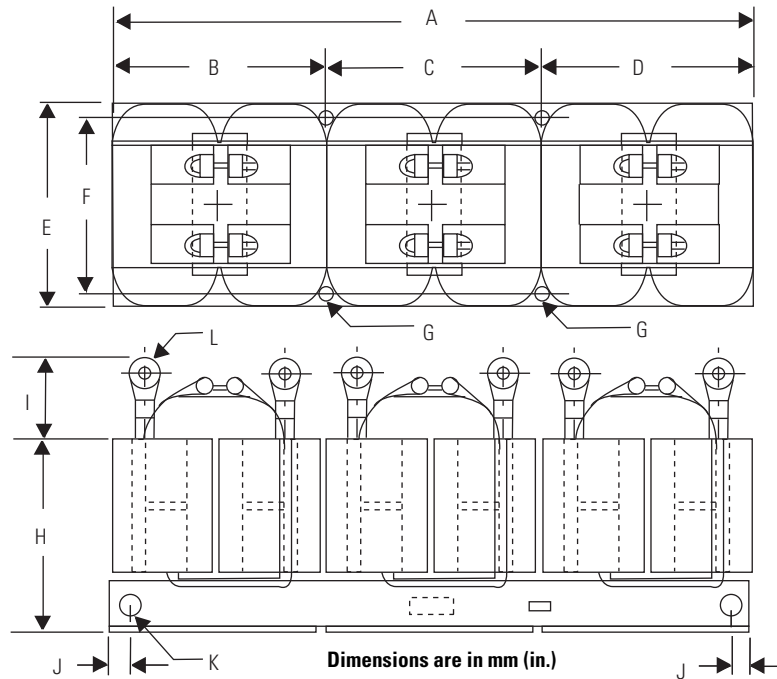
8720MC Line Reactor Specifications

Line Reactor 8720MC-	Specifications			
	Maximum Continuous Current A	Inductance uH	Inductance as % Voltage Drop	Weight, approx. kg (lb)
LR03-032B	32	850	3%	17 (37.47)
LR05-048B	48	800	5%	21 (46.29)
LR10-062B	62	1100	10%	27 (59.52)
LR14-070B	70	1200	14%	38 (83.77)
LR10-100B ⁽¹⁾	100	800	10%	100 (220)

(1) Order two 8720MC-LR10-100B line reactor units and wire in parallel for 200 A rating when used with the 8720MC-RPS190 RPS modules.

8720MC Line Reactor Dimensions

Dimensions (catalog numbers 8720MC-LR03-032B, 8720MC-LR048B, 8720MC-LR062B, and 8720MC-LR070B)



Line Reactor 8720MC-	A (1) mm (in.)	B mm (in.)	C (2) mm (in.)	D mm (in.)	E mm (in.)	F (3) mm (in.)	G mm (in.)	H (4) mm (in.)	I (5) mm (in.)	J mm (in.)	K mm (in.)	K mm (in.)
LR03-032B	345 (13.58)	112.5 (4.42)	120 (4.72)	112.5 (4.42)	140 (5.51)	100 (3.93)	4 to 7 (0.15 to 0.27)	127 (4.99)	80 (3.14)	15 (0.59)	4 to 15 (0.15 to 0.59)	6-(R22-6) (0.23)
LR05-048B	400 (15.74)	132.5 (5.21)	135 (5.31)	132.5 (5.21)	155 (6.10)	105 (4.13)	4 to 7 (0.15 to 0.27)	125 (4.92)	80 (3.14)	15 (0.59)	4 to 15 (0.15 to 0.59)	6-(R22-6) (0.23)
LR10-062B	440 (17.32)	145 (5.70)	150 (5.90)	145 (5.70)	160 (6.29)	110 (4.33)	4 to 9.5 (0.15 to 0.37)	125 (4.92)	80 (3.14)	15 (0.59)	4 to 15 (0.15 to 0.59)	6-(R22-6) (0.23)
LR14-070B	460 (18.11)	155 (6.10)	150 (5.90)	155 (6.10)	180 (7.08)	125 (4.92)	4 to 9.5 (0.15 to 0.37)	140 (5.51)	80 (3.14)	15 (0.59)	4 to 15 (0.15 to 0.59)	6-(R38-6) (0.23)

(1) The tolerance is +/-2 mm (0.07 in.).

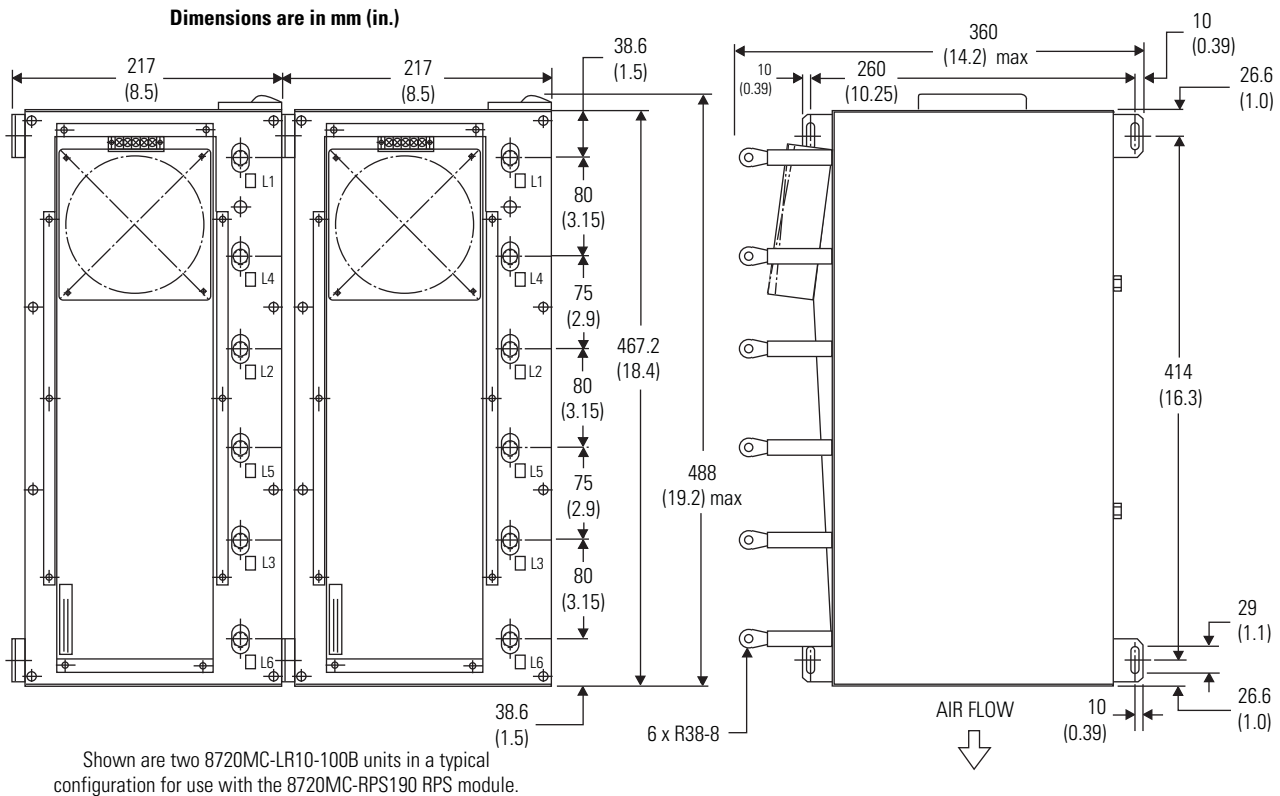
(2) The tolerance is +/-1 mm (0.03 in.).

(3) The tolerance is +1/-5 mm (+0.03/-0.19 in.).

(4) The tolerance is +/-5 mm (0.19 in.).

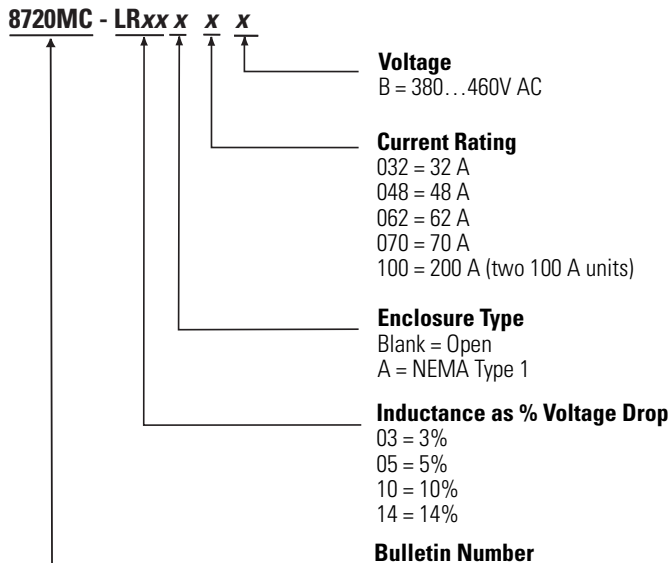
(5) The tolerance is +/-10 mm (0.39 in.).

Dimensions (catalog number 8720MC-LR10-100B)



8720MC Line Reactor Catalog Numbers

Catalog numbers consist of various characters, each of which identifies a specific option for that component. Use the catalog numbering table chart below to understand the configuration of your 8720MC Line Reactors. For questions regarding product availability, contact your Allen-Bradley distributor.



Rotary Motion System Combinations

This chapter provides Kinetix Motion Control servo drive and rotary motor combinations. Each drive family/motor section includes:

- a motor/cable combinations table.
- a drive/motor performance specification table.
- torque/speed curves with each motor matched to the drive with optimum performance.

Performance specification data and curves reflect nominal system performance of a typical system with motor/drive at rated ambient temperature and line voltage. For additional information on ambients, line conditions, and valid combinations not shown in this chapter, refer to Motion Analyzer software.

IMPORTANT

This system combinations chapter does not include all possible motor/drive combinations. Please refer to Motion Analyzer software to verify compatibility. Download is available at <http://www.rockwellautomation.com/en/e-tools>.

Rotary Motion System Combinations

Drive Family	Rotary Motor Series	Class	Page
Kinetix 300 Servo Drives	MP-Series Low Inertia Motors	200V and 400V	492
	MP-Series Medium Inertia Motors		500
	MP-Series Food Grade Motors		503
	MP-Series Stainless Steel Motors		507
	TL-Series (Bulletin TLY) Motors	200V	509
Kinetix 6000 and Kinetix 6200/ Kinetix 6500 Servo Drives	Kinetix 6000 Peak Enhancement Example		515
	MP-Series Low Inertia Motors	200V and 400V	516
	MP-Series Medium Inertia Motors		532
	MP-Series Food Grade Motors		542
	MP-Series Stainless Steel Motors		550
	RDD-Series Direct Drive Motors	400V	553
	TL-Series (Bulletin TLY) Motors	200V	558

Drive Family	Rotary Motor Series	Class	Page
Kinetix 2000 Servo Drives	MP-Series Low Inertia Motors	200V	562
	MP-Series Medium Inertia Motors		567
	MP-Series Food Grade Motors		568
	MP-Series Stainless Steel Motors		570
	TL-Series (Bulletin TLY) Motors		571
Kinetix 7000 Servo Drives	HPK-Series Asynchronous Servo Motors	400V	577
	MP-Series Low Inertia Motors		583
	MP-Series Medium Inertia Motors		588
	RDD-Series Direct Drive Motors		593
Ultra3000 and Ultra5000 Servo Drives	MP-Series Low Inertia Motors	200V and 400V	597
	MP-Series Medium Inertia Motors		611
	MP-Series Food Grade Motors		622
	MP-Series Stainless Steel Motors	627	
	TL-Series (Bulletin TLY) Motors	200V	630
Ultra1500 Servo Drives	TL-Series (Bulletin TL) Motors	200V	634

IMPORTANT

You can configure Kinetix 6000 460V (series B) drives to operate with 250% peak current for limited duty cycles. Drive/actuator performance specifications are given with and without the peak enhancement feature enabled. For more information, refer to Kinetix 6000 Drive Performance Example with Peak Enhancement Feature on [page 515](#).

Kinetix 300 (240V) Drives with MP-Series Low Inertia Motors

This section provides system combination information for the Kinetix 300 (240V) drives when matched with MP-Series low-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

IMPORTANT

The MP-Series low-inertia motors on this page are equipped with DIN connectors (specified by 4 or 7 in the catalog number) and are not compatible with cables designed for motors equipped with bayonet connectors (specified by 2 in the catalog number). The motors with bayonet connectors (for example, MPL-A310P-xx2xAA) are being discontinued and require 2090-XXNxMP- (bayonet) cables. For help with migration or to select bayonet cables, contact your Rockwell Automation sales representative.

Bulletin MPL Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPL-A1510V-xx4xAA, MPL-A1520U-xx4xAA, MPL-A1530U-xx4xAA	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution or Incremental Feedback
MPL-A210V-xx4xAA, MPL-A220T-xx4xAA, MPL-A230P-xx4xAA		
MPL-A310F-xx7xAA, MPL-A310P-xx7xAA, MPL-A320H-xx7xAA, MPL-A320P-xx7xAA, MPL-A330P-xx7xAA	2090-XXNPMF-16Sxx ⁽⁴⁾	2090-XXNFMF-Sxx ⁽⁵⁾ Absolute High-resolution or Incremental Feedback
MPL-A420P-xx7xAA, MPL-A430H-xx7xAA		
MPL-A4530F-xx7xAA, MPL-A4540C-xx7xAA		
MPL-A430P-xx7xAA	2090-XXNPMF-14Sxx ⁽⁴⁾	
MPL-A4530K-xx7xAA, MPL-A4540F-xx7xAA		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

(4) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(5) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

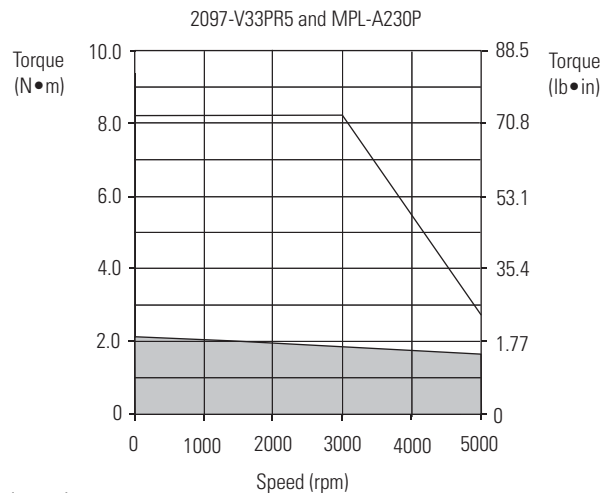
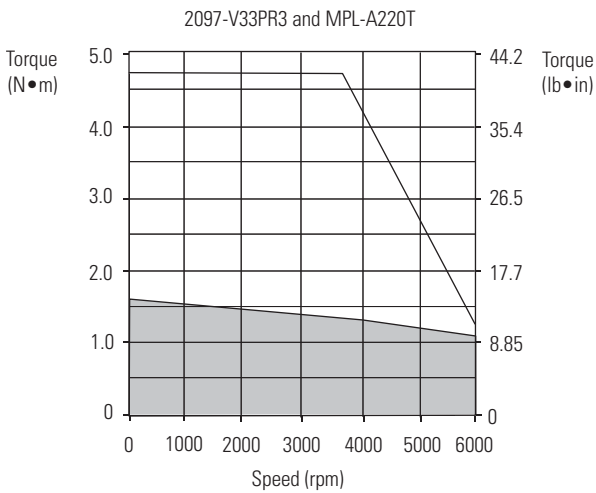
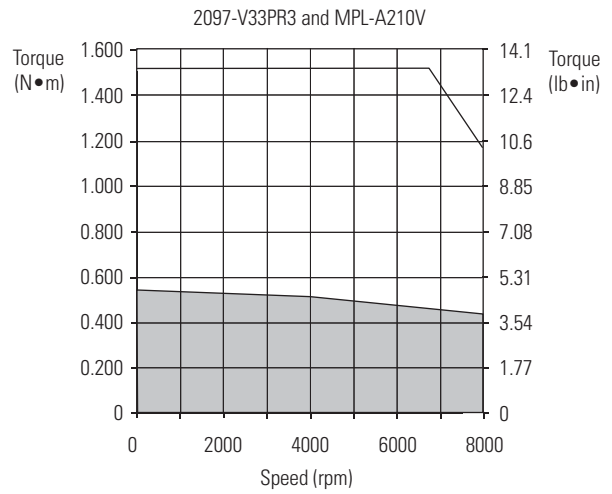
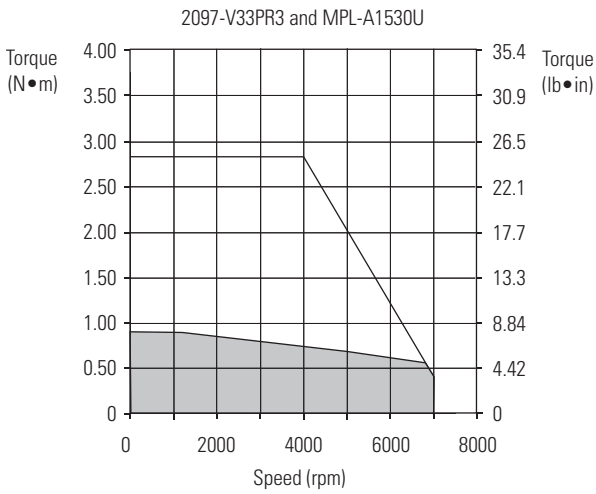
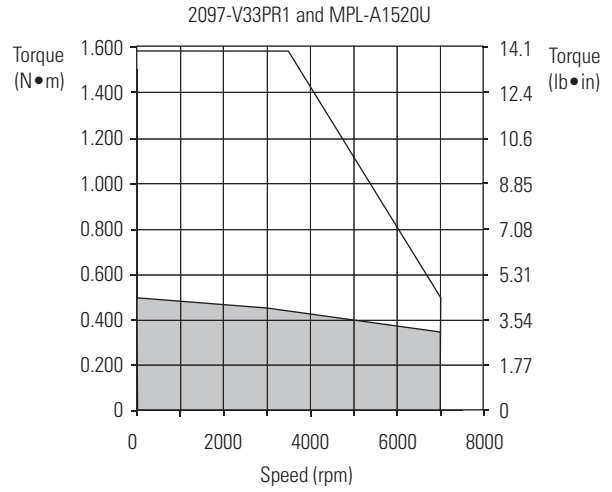
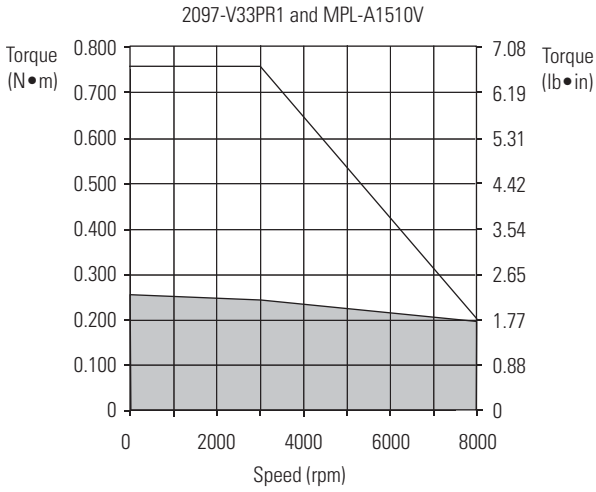
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPL Motor Performance Specifications with Kinetix 300 (240V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 300 240V Drives
MPL-A1510V	8000	1.05	0.26 (2.3)	3.40	0.77 (6.8)	0.16	2097-V33PR1
MPL-A1520U	7000	1.80	0.49 (4.3)	6.10	1.58 (13.9)	0.27	2097-V33PR1
MPL-A1530U	7000	2.82	0.90 (8.0)	10.1	2.82 (24.9)	0.39	2097-V33PR3
MPL-A210V	8000	3.09	0.55 (4.8)	10.2	1.52 (13.5)	0.37	2097-V33PR3
MPL-A220T	6000	4.54	1.61 (14.2)	15.5	4.74 (41.9)	0.62	2097-V33PR3
MPL-A230P	5000	5.40	2.10 (18)	23.0	8.2 (72.5)	0.86	2097-V33PR5
MPL-A310F	3000	3.20	1.58 (14)	9.3	3.61 (32)	0.46	2097-V33PR3
MPL-A310P	5000	4.85	1.58 (14)	14	3.61 (32)	0.73	2097-V33PR3
MPL-A320H	3500	6.1	3.05 (27)	19.3	7.91 (70)	1.0	2097-V33PR5
MPL-A320P	5000	9.0	3.05 (27)	29.5	7.91 (70)	1.3	2097-V33PR5
MPL-A330P	5000	12.0	4.18 (37)	38	11.1 (98)	1.8	2097-V33PR6
MPL-A420P	5000	12.7	4.74 (42)	46	13.5 (120)	2.0	2097-V33PR6
MPL-A430H	3500	12.2	6.21 (55)	45	19.8 (175)	1.8	2097-V33PR6
MPL-A430P	5000	16.8	5.99 (53)	51	15.7 (139)	2.2	2097-V33PR6
MPL-A4530F	2800	13.4	8.36 (74)	42	20.3 (180)	1.9	2097-V33PR6
MPL-A4540C	1500	9.4	10.2 (90)	29	27.1 (240)	1.5	2097-V33PR6

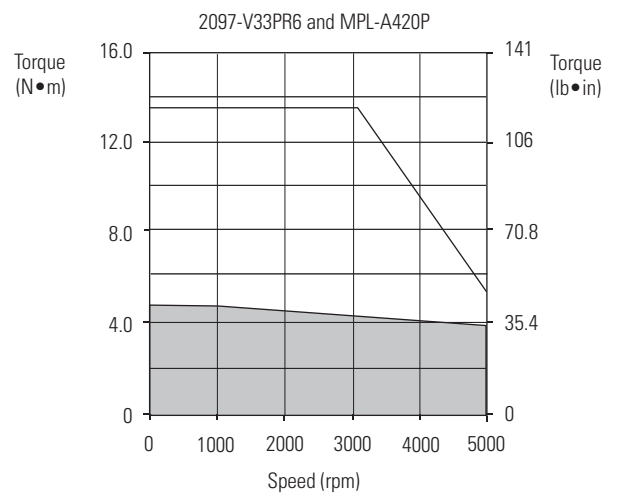
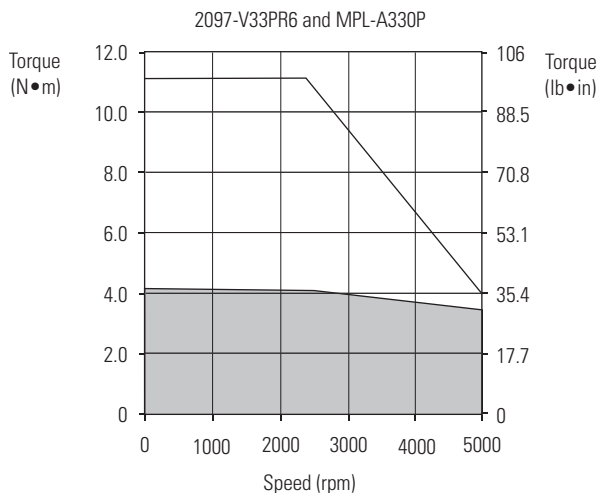
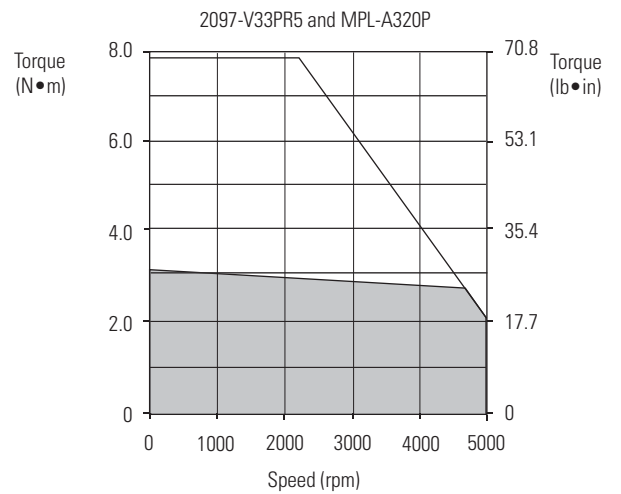
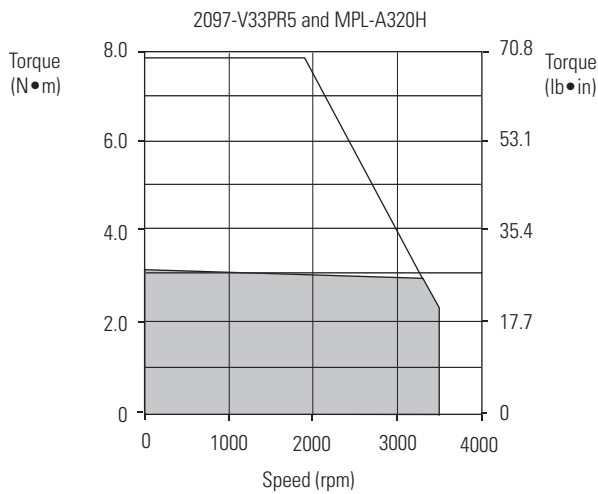
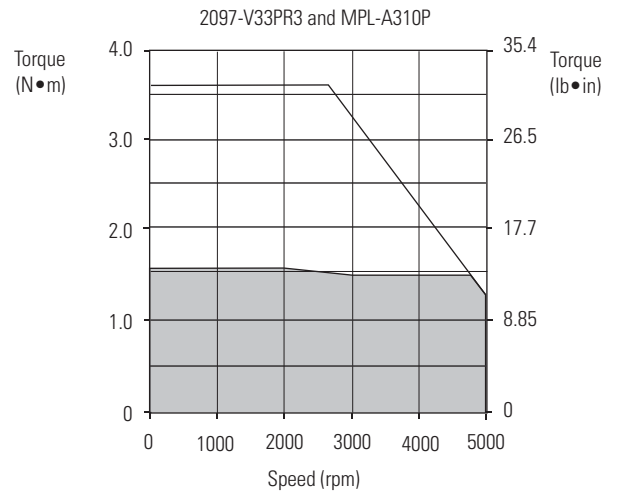
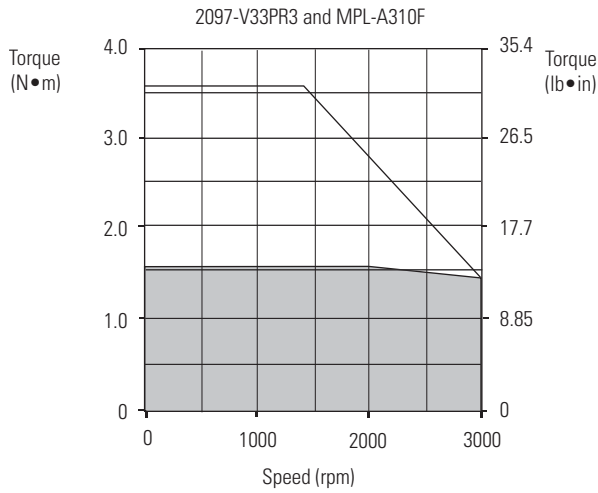
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient, and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 (240V) Drives/MP-Series Low Inertia Motor Curves



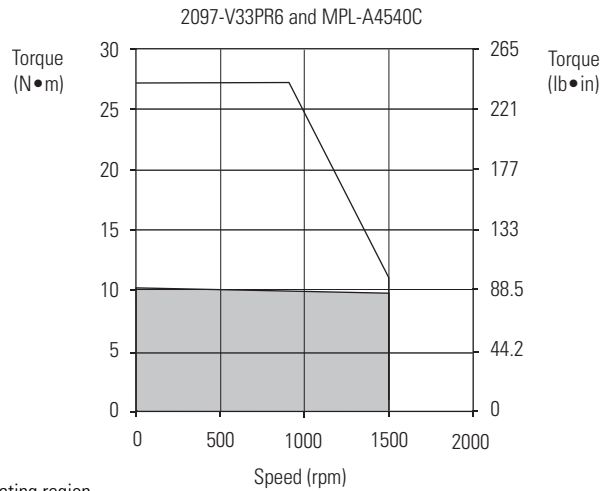
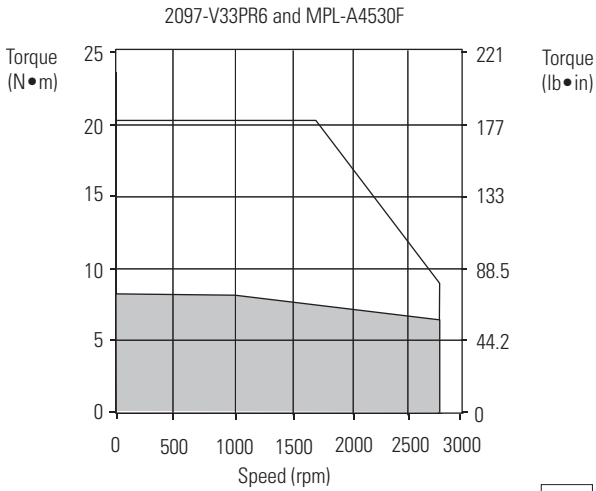
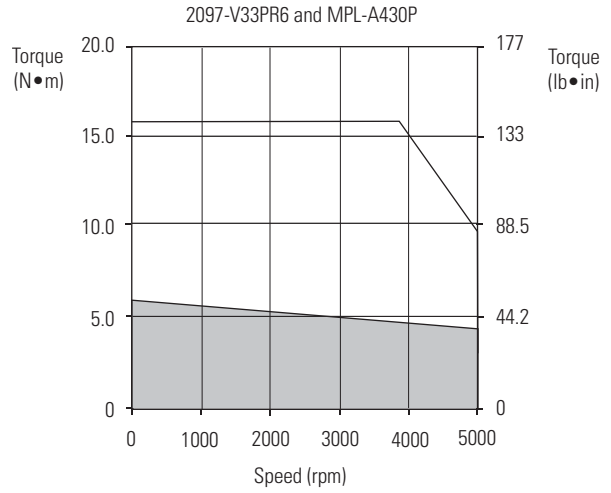
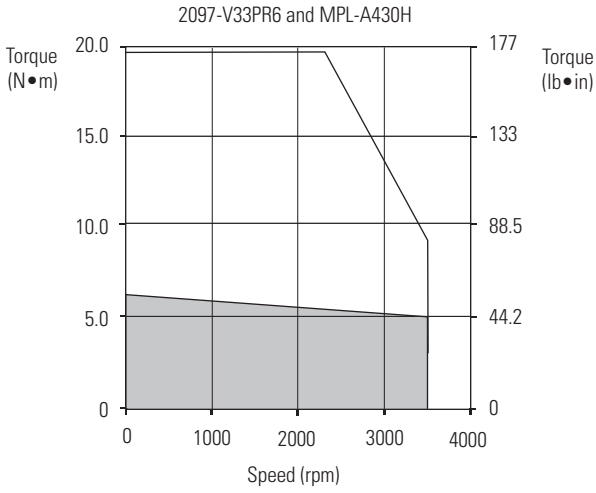
= Intermittent operating region
 = Continuous operating region

Kinetix 300 (240V) Drives/MP-Series Low Inertia Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region

Kinetix 300 (240V) Drives/MP-Series Low Inertia Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region

Kinetix 300 (480V) Drives with MP-Series Low Inertia Motors

This section provides system combination information for the Kinetix 300 (480V) drives when matched with MP-Series low-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

IMPORTANT

The MP-Series low-inertia motors on this page are equipped with DIN connectors (specified by 4 or 7 in the catalog number) and are not compatible with cables designed for motors equipped with bayonet connectors (specified by 2 in the catalog number). The motors with bayonet connectors (for example, MPL-A310P-xx2xAA) are being discontinued and require 2090-XXNxMP- (bayonet) cables. For help with migration or to select bayonet cables, contact your Rockwell Automation sales representative.

Bulletin MPL Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPL-B1510V-xx4xAA, MPL-B1520U-xx4xAA, MPL-B1530U-xx4xAA	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution or Incremental Feedback
MPL-B210V-xx4xAA, MPL-B220T-xx4xAA, MPL-B230P-xx4xAA		
MPL-B310P-xx7xAA, MPL-B320P-xx7xAA, MPL-B330P-xx7xAA	2090-XXNPMF-16Sxx ⁽⁴⁾	2090-XXNFMF-Sxx ⁽⁵⁾ Absolute High-resolution Feedback
MPL-B420P-xx7xAA		
MPL-B4530F-xx7xAA		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

(4) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(5) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

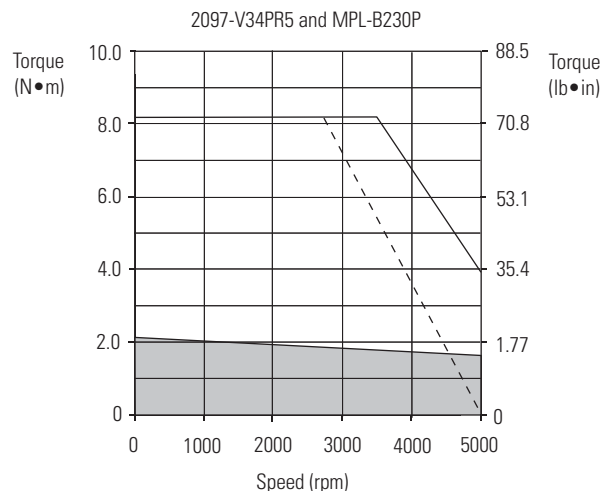
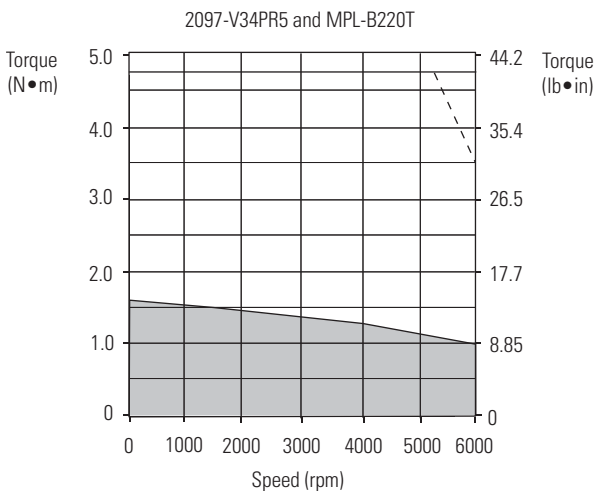
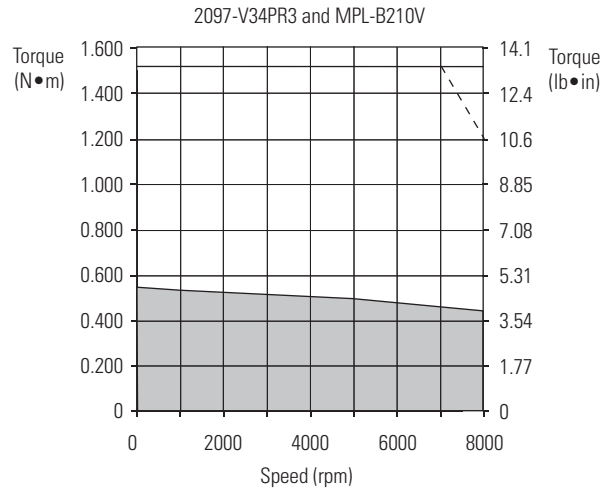
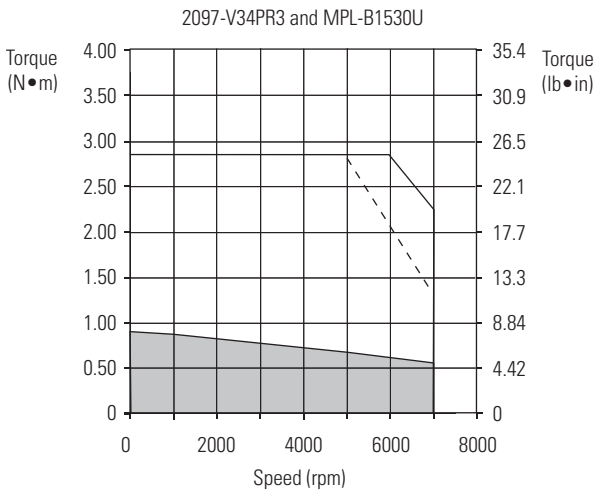
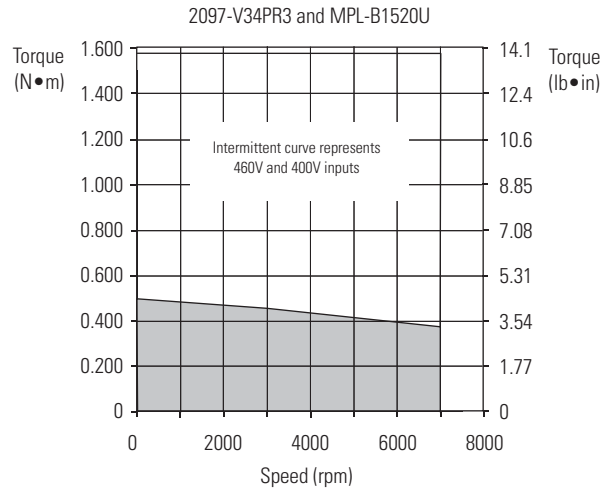
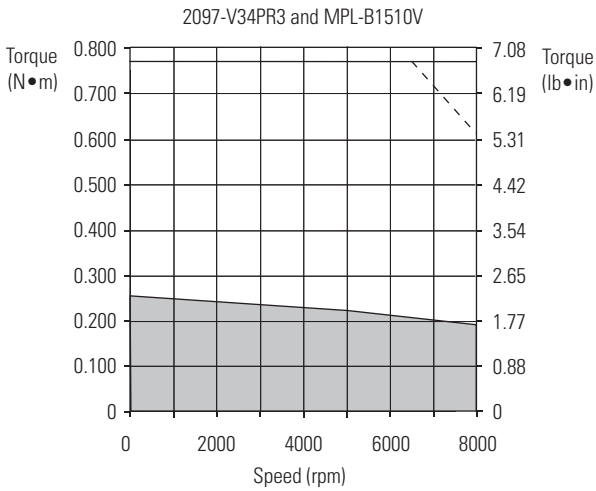
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPL Motor Performance Specifications with Kinetix 300 (480V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A (0-pk)	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A (0-pk)	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 300 480V Drives
MPL-B1510V	8000	0.95	0.26 (2.3)	3.10	0.77 (6.80)	0.16	2097-V34PR3
MPL-B1520U	7000	1.80	0.49 (4.3)	6.10	1.58 (13.9)	0.27	2097-V34PR3
MPL-B1530U	7000	2.0	0.90 (8.0)	7.20	2.82 (24.9)	0.39	2097-V34PR3
MPL-B210V	8000	1.75	0.55 (4.8)	5.80	1.52 (13.5)	0.37	2097-V34PR3
MPL-B220T	6000	3.30	1.61 (14.2)	11.3	4.74 (41.9)	0.62	2097-V34PR5
MPL-B230P	5000	2.60	2.10 (18.6)	11.3	8.20 (73.0)	0.86	2097-V34PR5
MPL-B310P	5000	2.4	1.58 (14)	7.1	3.61 (32)	0.77	2097-V34PR3
MPL-B320P	5000	4.5	2.94 (26)	14.0	7.91 (70)	1.5	2097-V34PR5
MPL-B330P	5000	6.1	4.18 (37)	19.0	11.1 (98)	1.8	2097-V34PR6
MPL-B420P	5000	6.4	4.74 (42)	22.0	13.5 (120)	1.9	2097-V34PR6
MPL-B4530F	3000	6.7	8.36 (74)	21.0	20.3 (180)	2.1	2097-V34PR6

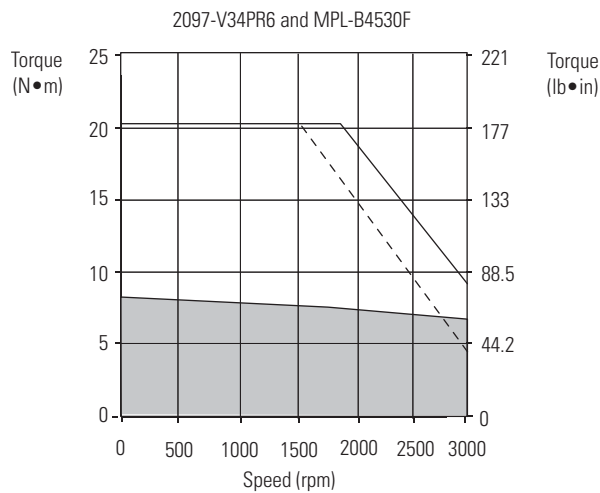
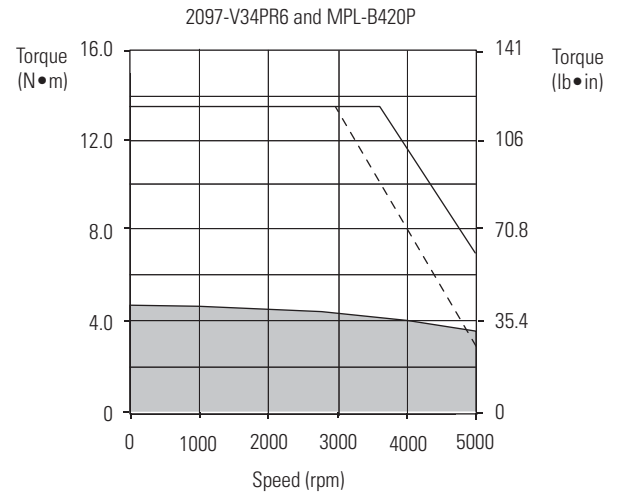
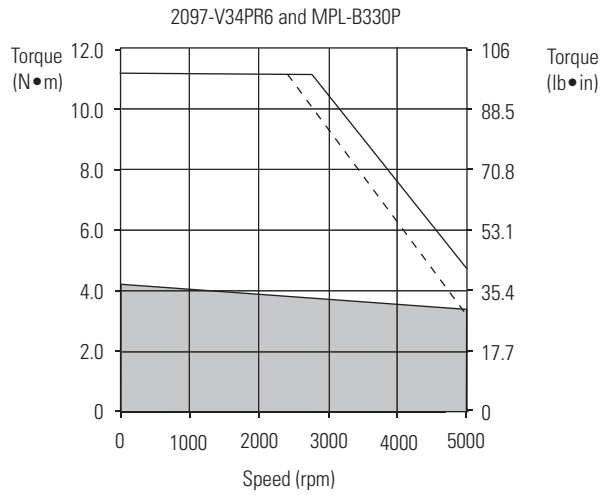
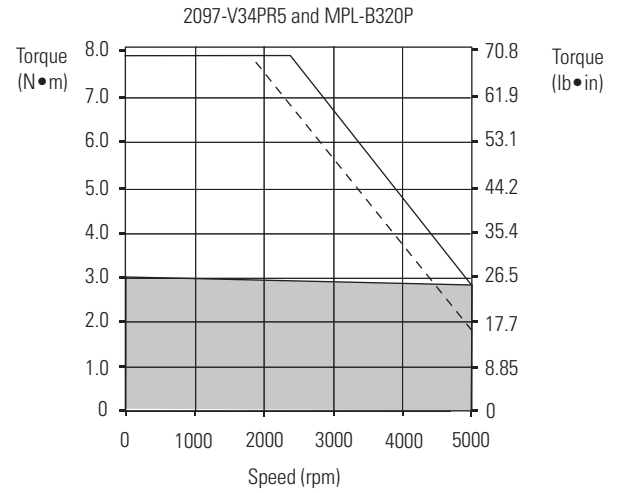
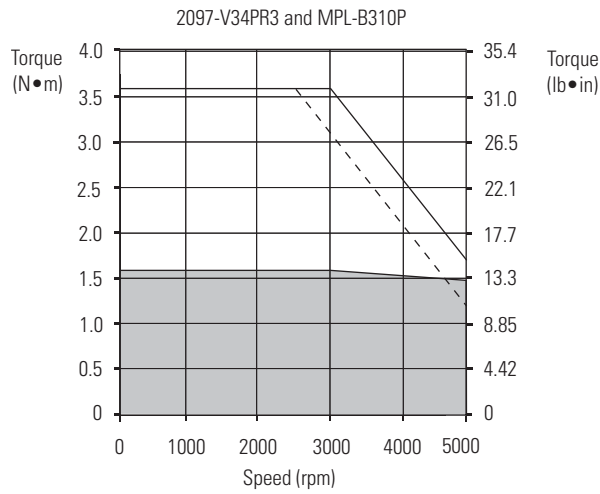
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient, and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 (480V) Drives/MP-Series Low Inertia Motor Curves



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 300 (480V) Drives/MP-Series Low Inertia Motors, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 300 (240V) Drives with MP-Series Medium Inertia Motors

This section provides system combination information for the Kinetix 300 (240V) drives when matched with MP-Series medium-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPM Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPM-A1151M, MPM-A1152F	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

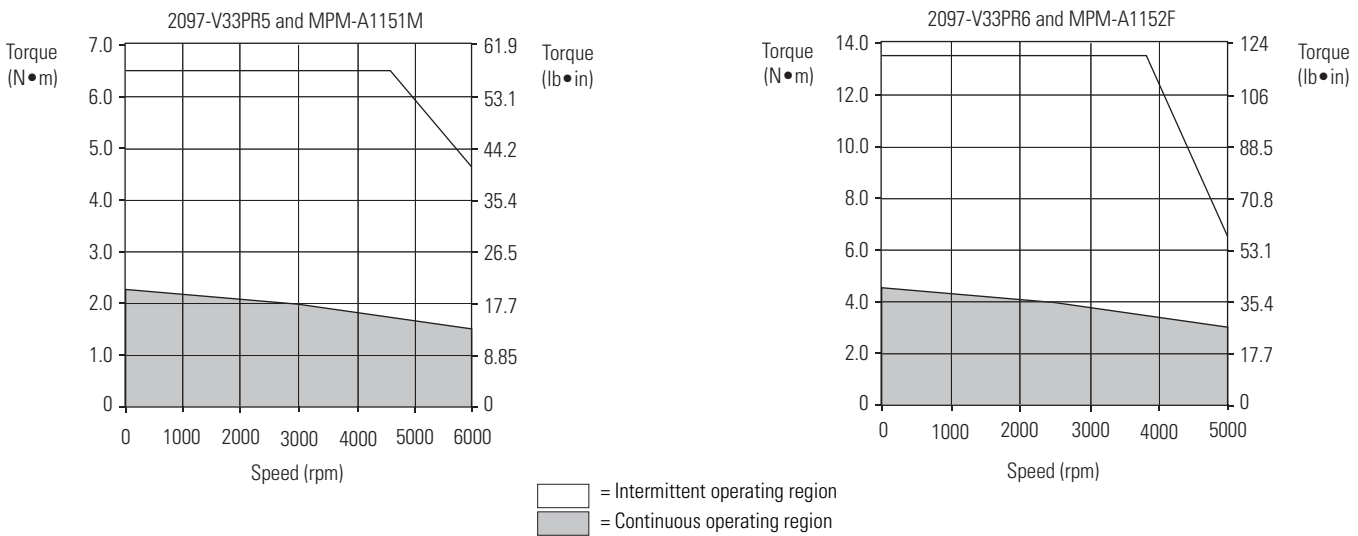
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPM Motor Performance Specifications with Kinetix 300 (240V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 300 240V Drives
MPM-A1151M	6000	10.3	2.3 (20.3)	30.5	6.6 (58.4)	0.90	2097-V33PR5
MPM-A1152F	5000	14.9	4.7 (41.6)	44.8	13.5 (119)	1.40	2097-V33PR6

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient, and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 (240V) Drives/MP-Series Medium Inertia Motor Curves



Kinetix 300 (480V) Drives with MP-Series Medium Inertia Motors

This section provides system combination information for the Kinetix 300 (480V) drives when matched with MP-Series medium-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPM Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPM-B1151F, MPM-B1151T, MPM-B1152C, MPM-B1152F, MPM-B1153E	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPM-B1302F, MPM-B1304C		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

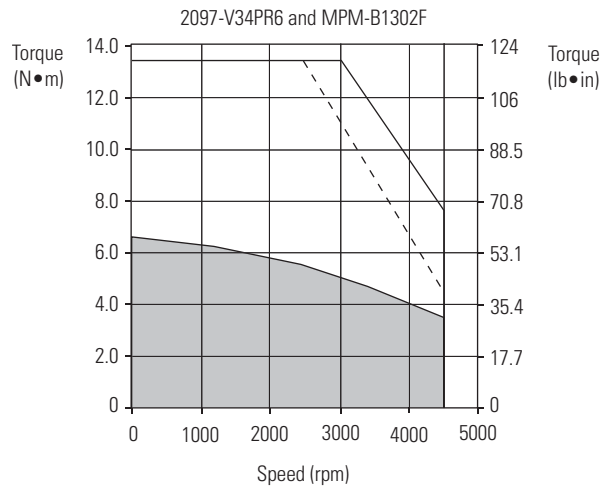
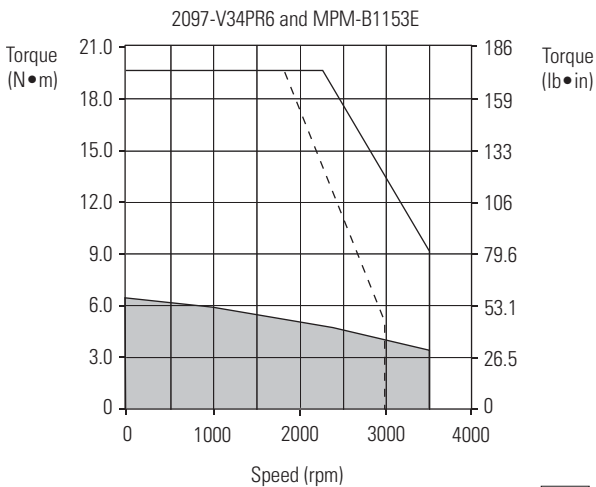
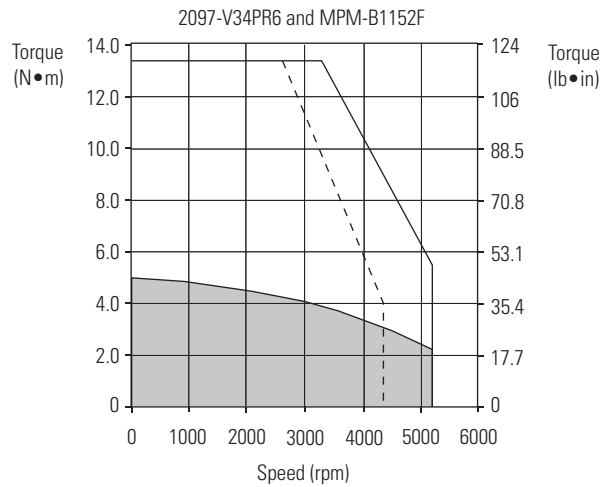
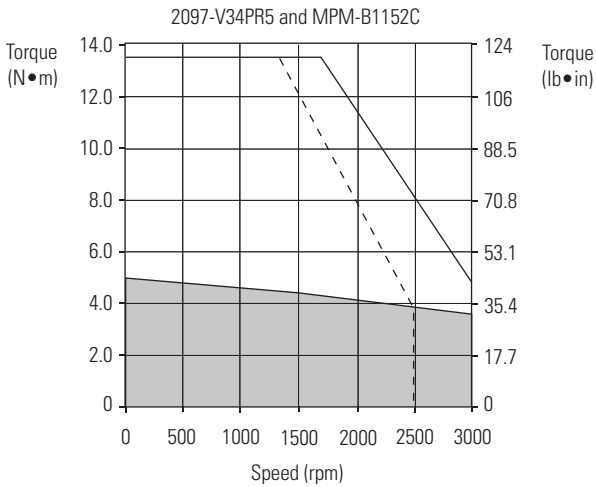
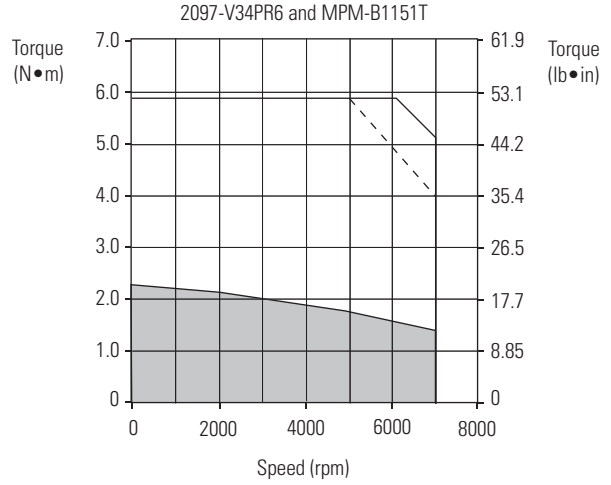
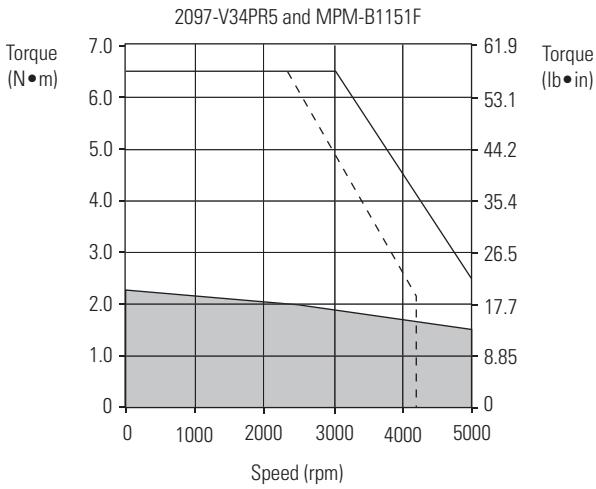
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPM Motor Performance Specifications with Kinetix 300 (480V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 300 480V Drives
MPM-B1151F	5000	3.1	2.3 (20.3)	9.9	6.6 (58.4)	0.75	2097-V34PR5
MPM-B1151T	7000	6.9	2.3 (20.3)	20.5	5.8 (51.3)	0.90	2097-V34PR6
MPM-B1152C	3000	4.1	5.0 (44.2)	12.4	13.5 (119)	1.20	2097-V34PR5
MPM-B1152F	5200	7.0	5.0 (44.2)	21.1	13.3 (118)	1.40	2097-V34PR6
MPM-B1153E	3500	7.1	6.5 (57.5)	21.6	19.7 (174)	1.40	2097-V34PR6
MPM-B1302F	4500	9.8	6.6 (58.4)	22.0	13.2 (117)	1.65	2097-V34PR6
MPM-B1304C	2750	8.0	10.3 (91.1)	22.3	27.1 (240)	2.00	2097-V34PR6

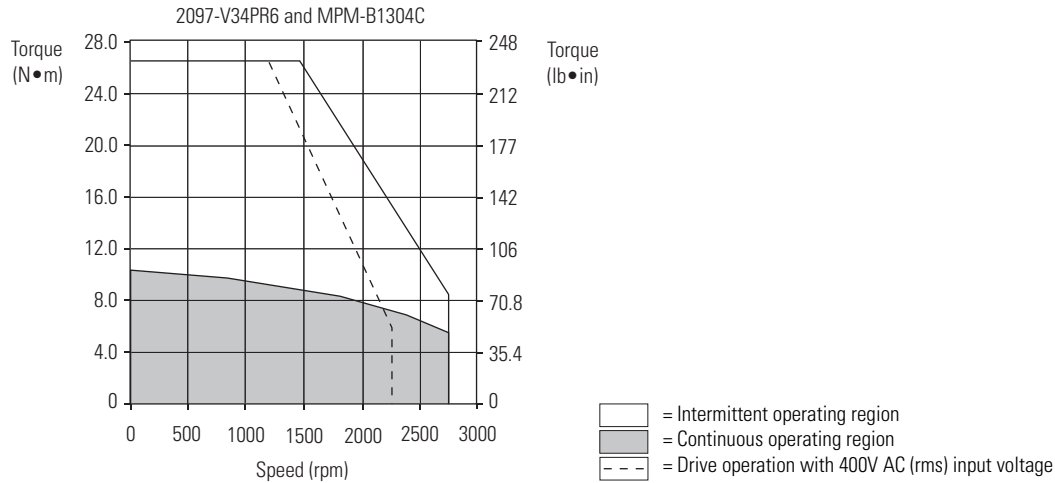
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient, and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 (480V) Drives/MP-Series Medium Inertia Motor Curves



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 300 (480V) Drives/MP-Series Medium Inertia Motor Curves, Continued



Kinetix 300 (240V) Drives with MP-Series Food Grade Motors

This section provides system combination information for the Kinetix 300 (240V) drives when matched with MP-Series food-grade motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPF Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
MPF-A310P, MPF-A320H, MPF-A320P, MPF-A330P	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
MPF-A430H		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-_{xx}S_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-_{xx}AF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

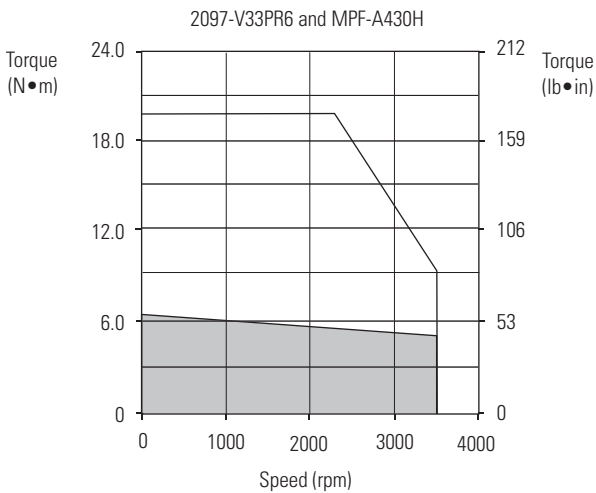
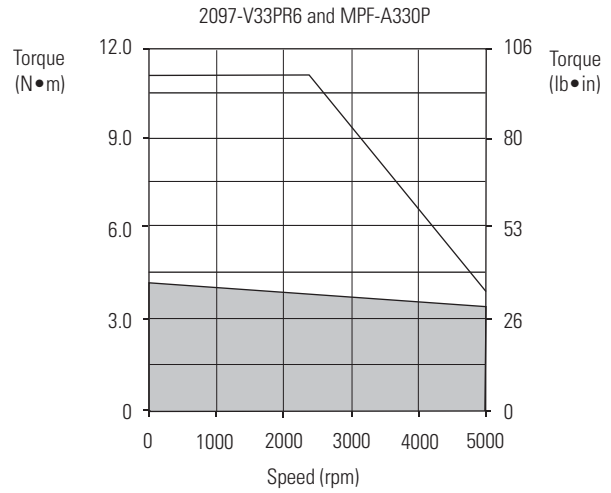
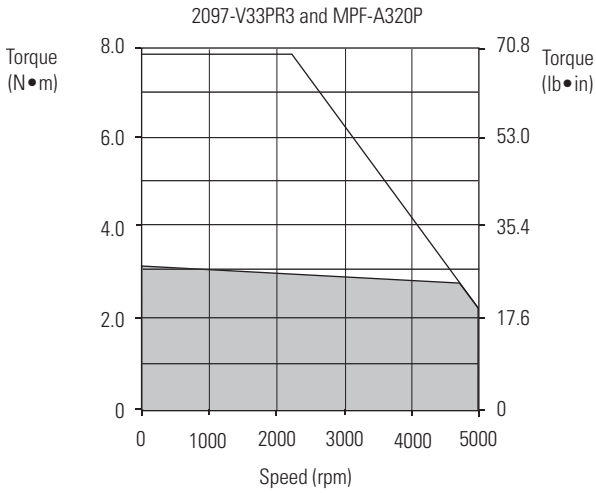
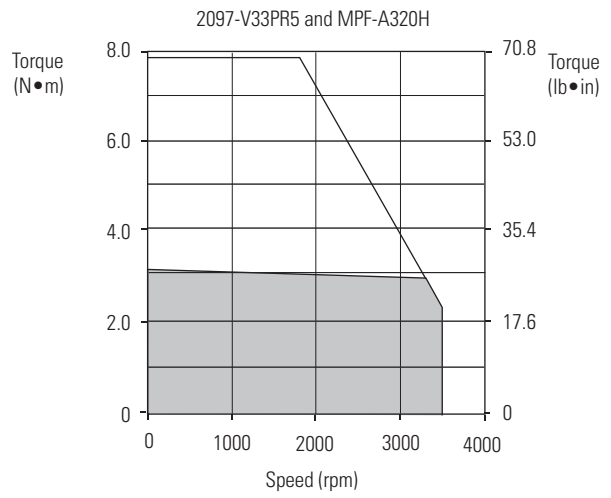
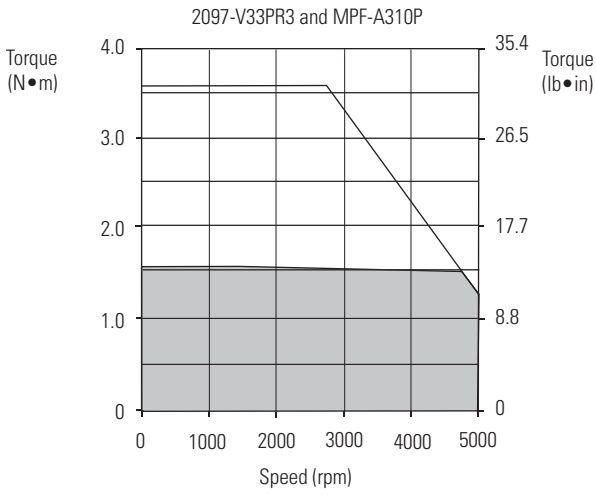
Cable length _{xx} is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPF Motor Performance Specifications with Kinetix 300 (240V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 300 240V Drives
MPF-A310P	5000	4.85	1.58 (14)	14	3.61 (32)	0.73	2097-V33PR3
MPF-A320H	3500	6.1	3.05 (27)	19.3	7.91 (70)	1.0	2097-V33PR5
MPF-A320P	5000	9.0	3.05 (27)	29.5	7.91 (70)	1.3	2097-V33PR3
MPF-A330P	5000	12.0	4.18 (37)	38	11.1 (98)	1.6	2097-V33PR6
MPF-A430H	3500	12.2	6.21 (55)	45	19.8 (175)	1.8	2097-V33PR6

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient, and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 (240V) Drives/MPF-Series Food Grade Motor Curves



= Intermittent operating region
 = Continuous operating region

Kinetix 300 (480V) Drives with MP-Series Food Grade Motors

This section provides system combination information for the Kinetix 300 (480V) drives when matched with MP-Series food-grade motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPF Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
MPF-B310P, MPF-B320P, MPF-B330P	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

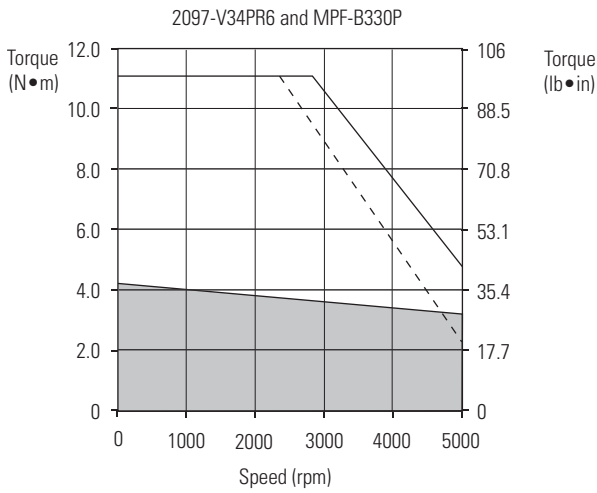
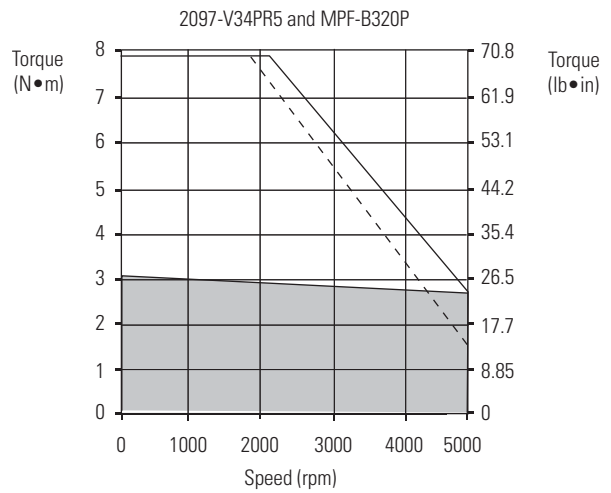
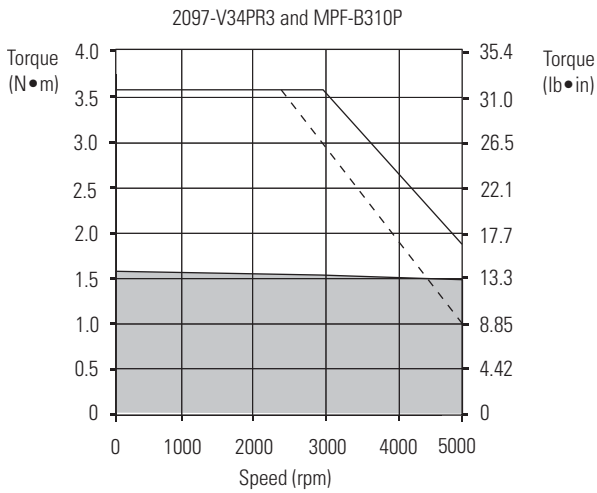
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPF Motor Performance Specifications with Kinetix 300 (480V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A (0-pk)	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A (0-pk)	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 300 480V Drives
MPF-B310P	5000	2.30	1.58 (14)	7.1	3.61 (32)	0.77	2097-V34PR3
MPF-B320P	5000	4.24	3.05 (27)	14.0	7.34 (65)	1.5	2097-V34PR5
MPF-B330P	5000	5.70	4.18 (37)	16.9	10.0 (88)	1.6	2097-V34PR5
				19.0	11.1 (98)		2097-V34PR6

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient, and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 (480V) Drives/MP-Series Food Grade Motor Curves



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 300 (240V) Drives with MP-Series Stainless Steel Motors

This section provides system combination information for the Kinetix 300 (240V) drives when matched with MP-Series stainless-steel motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPS Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
MPS-A330P	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
MPS-A4540F		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxS_{xx}) or continuous-flex (catalog number 2090-CPXM7DF-xxAF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

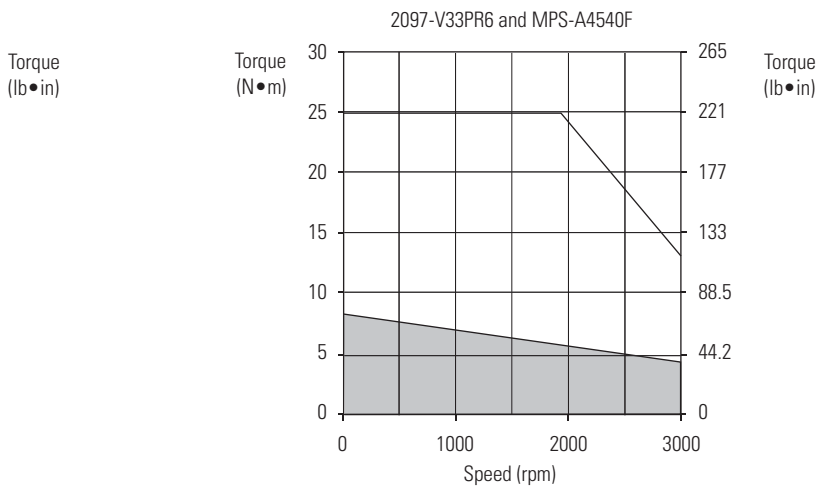
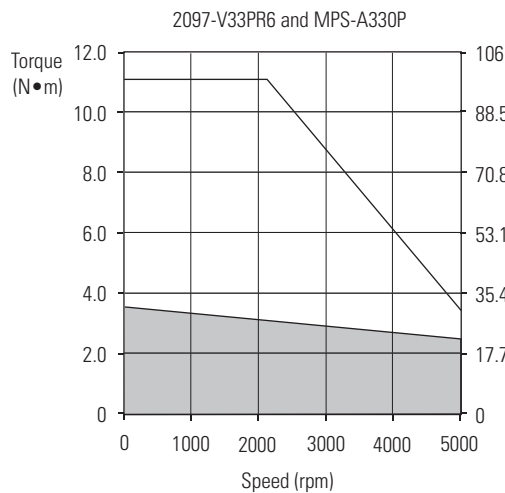
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPS Motor Performance Specifications with Kinetix 300 (240V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 300 240V Drives
MPS-A330P	5000	9.80	3.60 (32)	33.9	10.1 (89.4)	1.3	2097-V33PR5
				38.0	11.1 (98.2)		2097-V33PR6
MPS-A4540F	3000	14.4	8.1 (72)	50.9	24.8 (219)	1.4	2097-V33PR6

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient, and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 (240V) Drives/MP-Series Stainless Steel Motor Curves



□ = Intermittent operating region
 ■ = Continuous operating region

Kinetix 300 (480V) Drives with MP-Series Stainless Steel Motors

This section provides system combination information for the Ultra3000 (460V) drives when matched with MP-Series stainless-steel motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPS Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
MPS-B330P	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾
MPS-B4540F		Absolute High-resolution Feedback

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

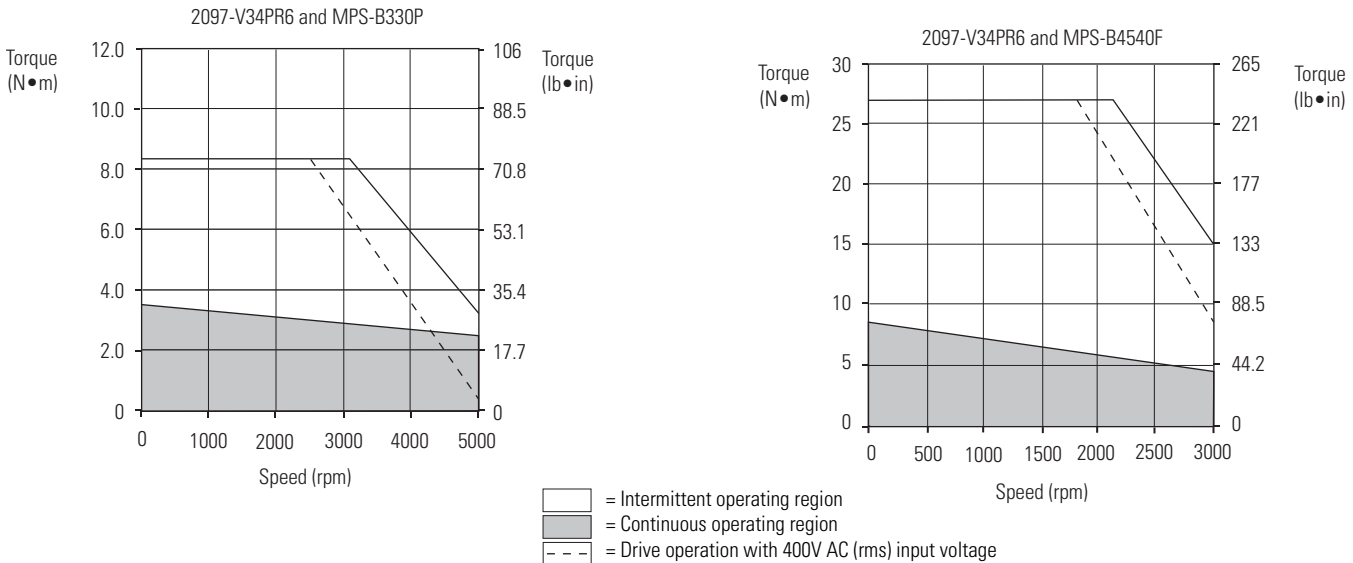
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPS Motor Performance Specifications with Kinetix 300 (480V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 300 480V Drives
MPS-B330P	5000	4.90	3.6 (32)	16.9	10.1 (89.4)	1.3	2097-V34PR5
				19.0	11.1 (98.2)		2097-V34PR6
MPS-B4540F	3000	7.1	8.1 (72)	25.4	26.3 (233)	1.4	2097-V34PR6

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient, and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 (480V) Drives/MP-Series Stainless Steel Motor Curves



Kinetix 300 (240V) Drives with TL-Series Low Inertia Motors

This section provides system combination information for the Kinetix 300 drives when matched with TL-Series (Bulletin TLY) low-inertia motors. Compatible TL-Series motors are equipped with absolute high-resolution or incremental encoder feedback. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin TLY Motor Cable Combinations

Motor Cat. No.	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
TLY-A110x, TLY-A120x, TLY-A130x	2090-CPWM6DF-16AAxx (standard) (without brake)	2090-CFBM6DF-CBAAxx (standard) Absolute High-resolution or Incremental Feedback
TLY-A220x, TLY-A230x		
TLY-A2530P, TLY-A2540P	2090-CPBM6DF-16AAxx (standard) (with brake)	
TLY-A310M		

(1) For TLY-Axxxx-H motors with incremental encoder feedback, use 2090-CFBM6DF-CBAAxx flying-lead cables and 2090-K2CK-D15M connector kit (battery not required) or panel-mounted breakout components on the drive end. Premolded (drive end) feedback cables (catalog number 2090-CFBM6DD-CCAAxx) are also available for Kinetix 300 drives. Refer to Breakout Components and Connector Kits beginning on [page 418](#) for more information.

The TLY-Axxxx-B motors with 17-bit high resolution encoder feedback require the 2090-CFBM6DF-CBAAxx flying-lead feedback cable and 2090-K2CK-D15M connector kit with 2090-DA-BAT2 battery.

TL-Series (Bulletin TLY) motors are characterized as having 1000 mm (39.4 in.) cable extensions with circular plastic connectors and TLY-Axxx catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin TLY (non-brake) Motor Performance Specifications with Kinetix 300 (240V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 300 240V Drives
TLY-110x	6000 ⁽¹⁾	0.55	0.096 (0.85)	1.30	0.20 (1.75)	0.041	2097-V32PRO
TLY-120x		1.03	0.181 (1.60)	2.50	0.36 (3.20)	0.086	2097-V32PRO
TLY-130x		1.85	0.325 (2.88)	4.90	0.76 (6.70)	0.14	2097-V32PRO
TLY-220x		3.50	0.836 (7.40)	7.90	1.48 (13.1)	0.35	2097-V33PR1
TLY-230x		5.50	1.30 (11.5)	15.5	3.05 (27.0)	0.44	2097-V33PR3
TLY-2530P	5000	10.0	2.60 (23.0)	21.0	5.20 (46.0)	0.69	2097-V33PR5
TLY-2540P		10.0	2.94 (26.0)	24.8	7.10 (63.0)	0.86	2097-V33PR5
TLY-310M	4500	10.0	3.61 (31.9)	30.0	9.0 (79.6)	0.95	2097-V33PR5

(1) Applies to TLY-AxxxT-H motors with incremental feedback. The TLY-AxxxP-B motors with absolute high-resolution encoders are rated at 5000 rpm.

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient, and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

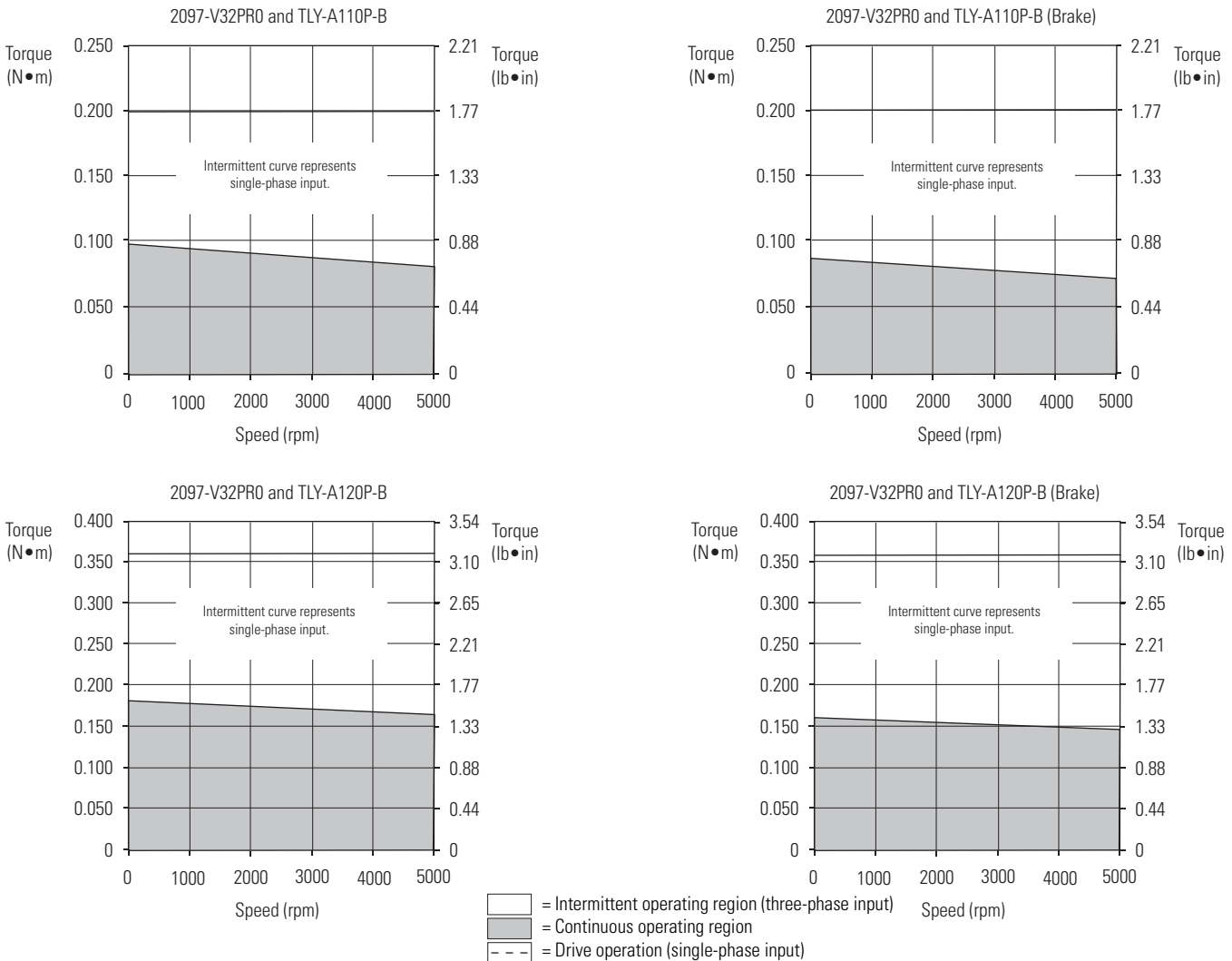
Bulletin TLY (brake) Motor Performance Specifications with Kinetix 300 (240V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 300 240V Drives
TLY-A110x	6000 ⁽¹⁾	0.50	0.086 (0.76)	1.30	0.20 (1.75)	0.037	2097-V32PRO
TLY-A120x		0.93	0.163 (1.44)	2.50	0.36 (3.20)	0.077	2097-V32PRO
TLY-A130x		1.67	0.293 (2.59)	4.90	0.76 (6.70)	0.13	2097-V32PRO
TLY-A220x		3.15	0.757 (6.70)	7.90	1.48 (13.1)	0.24	2097-V33PR1
TLY-A230x		4.95	1.16 (10.3)	15.5	3.05 (27.0)	0.32	2097-V33PR3
TLY-A2530P	5000	10.0	2.60 (23.0)	21.0	5.20 (46.0)	0.55	2097-V33PR5
TLY-A2540P		10.0	2.94 (26.0)	24.8	7.10 (63.0)	0.66	2097-V33PR5
TLY-A310M	4500	10.0	3.61 (31.9)	30.0	9.0 (79.6)	0.90	2097-V33PR5

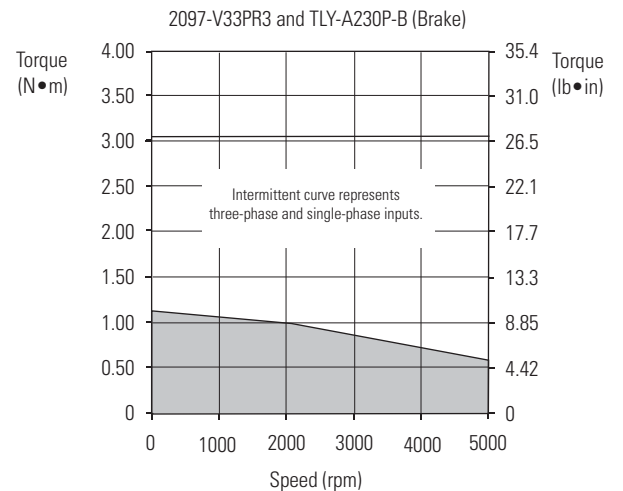
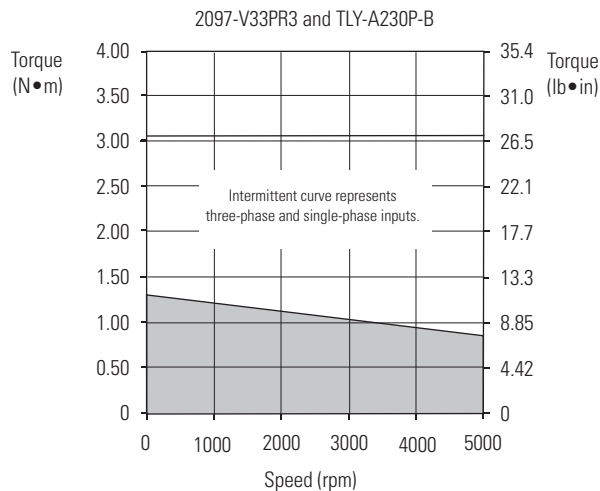
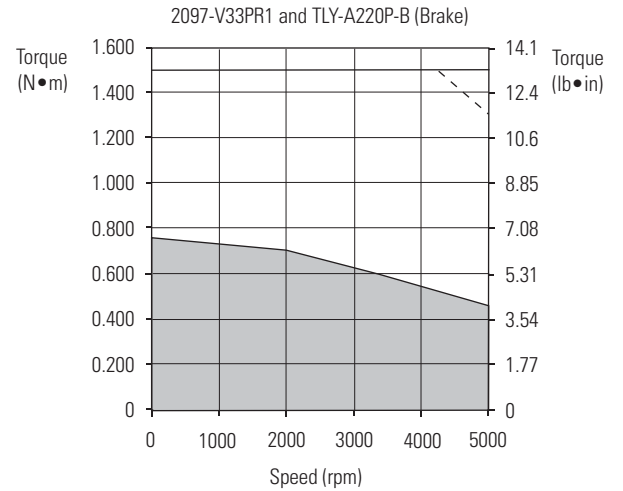
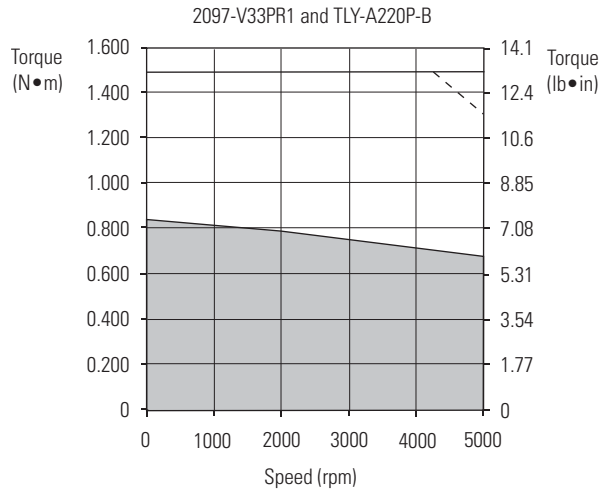
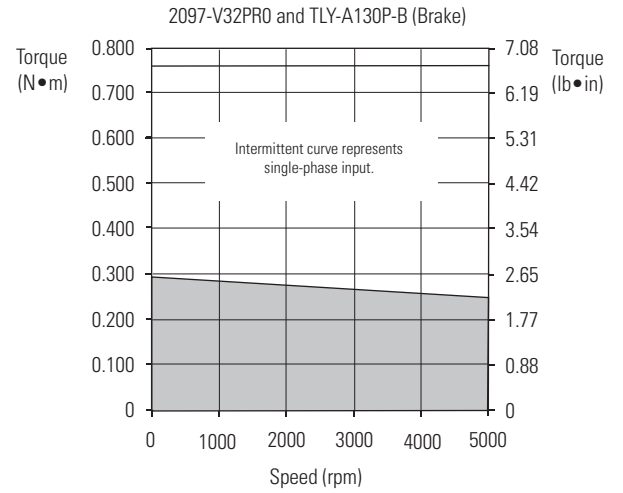
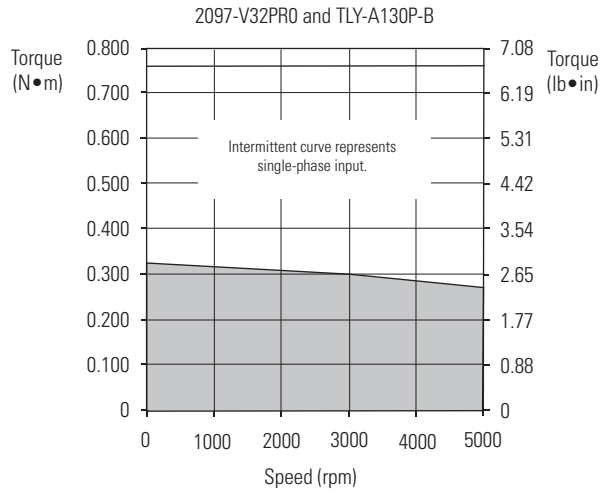
(1) Applies to TLY-AxxxT-H motors with incremental feedback. The TLY-AxxxP-B motors with absolute high-resolution encoders are rated at 5000 rpm.

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient, and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 (240V) Drives/TLY-AxxxP-B (absolute high-resolution) Motor Curves

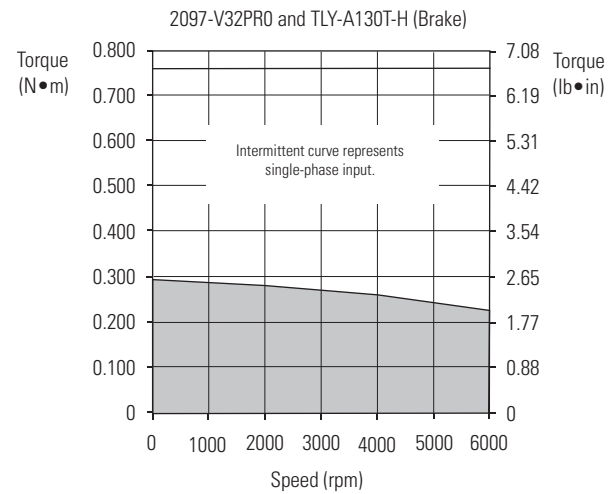
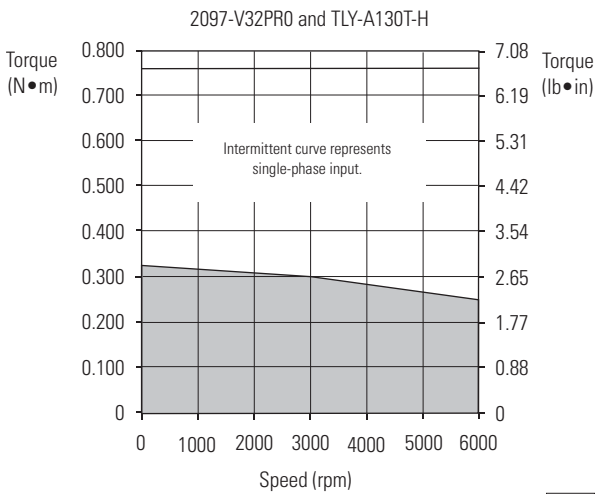
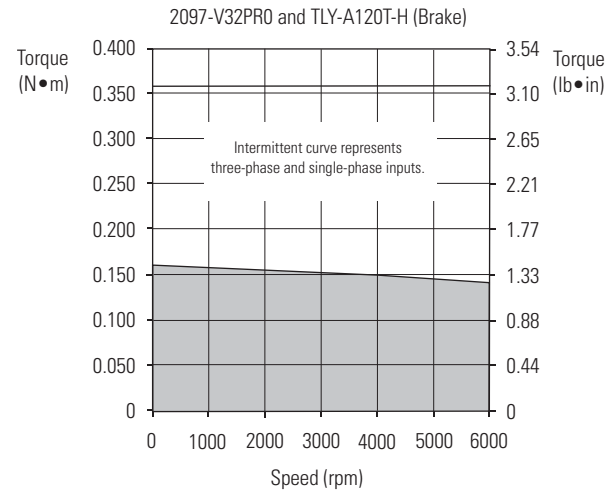
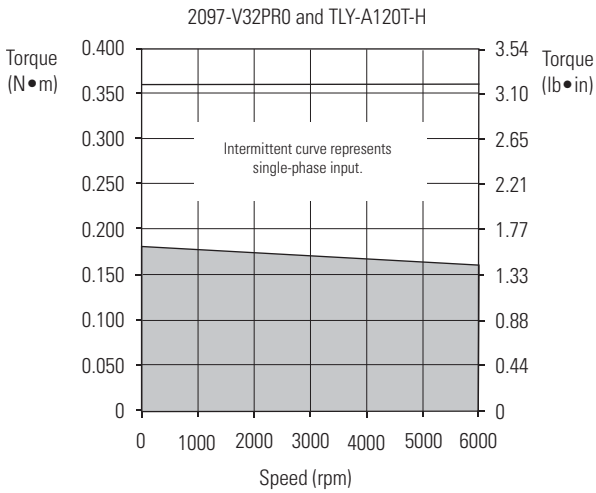
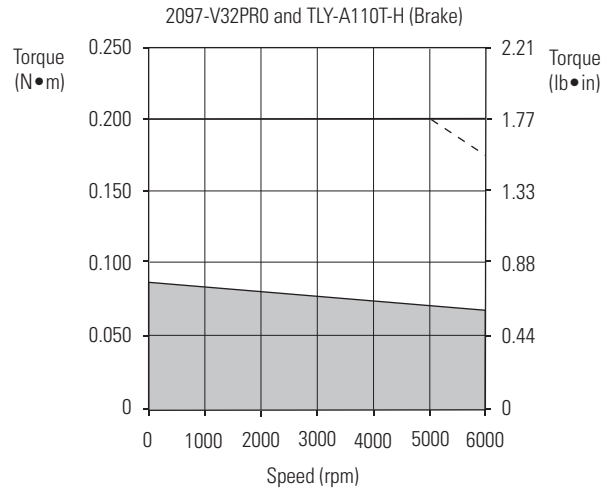
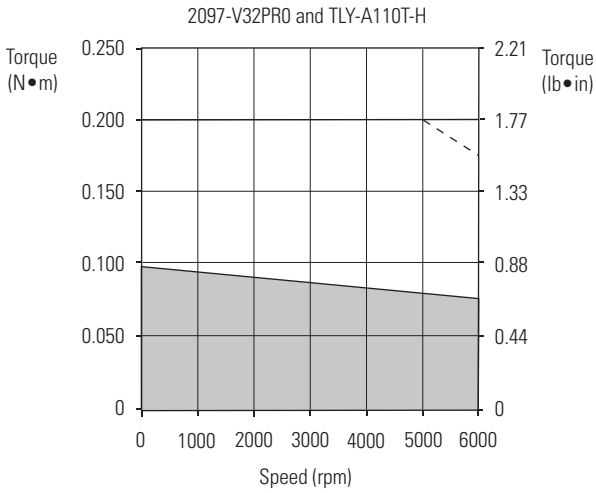


Kinetix 300 (240V) Drives/TLY-AxxxP-B (absolute high-resolution) Motor Curves, Continued



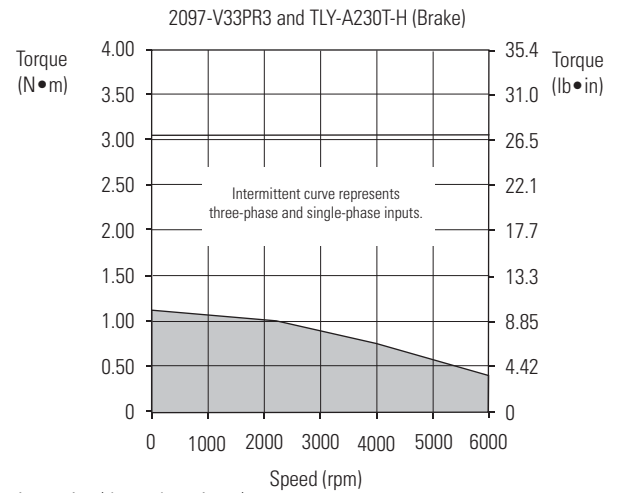
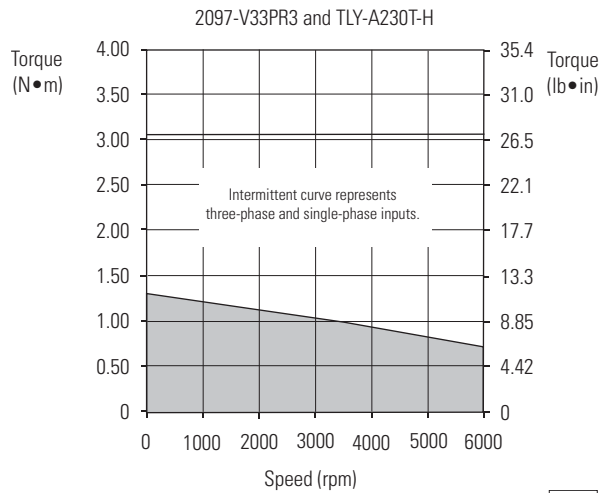
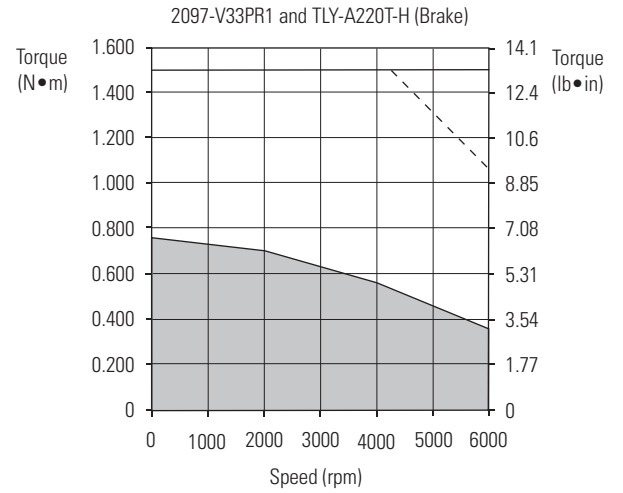
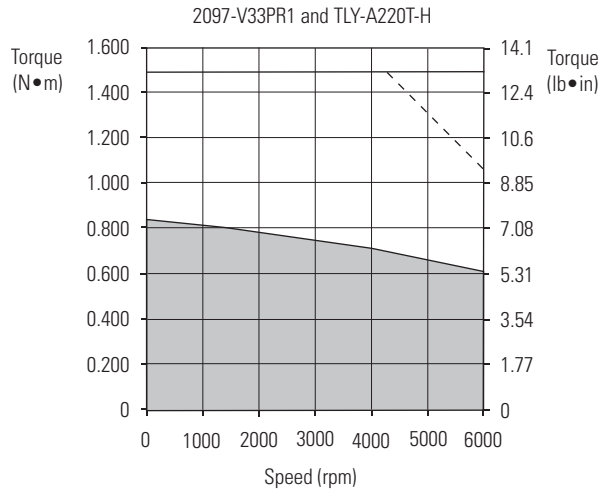
- = Intermittent operating region (three-phase input)
- = Continuous operating region
- = Drive operation (single-phase input)

Kinetix 300 (240V) Drives/TLY-AxxxT-H (incremental) Motor Curves



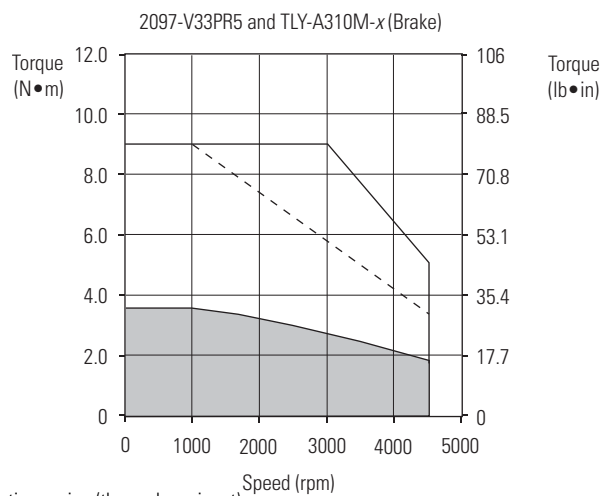
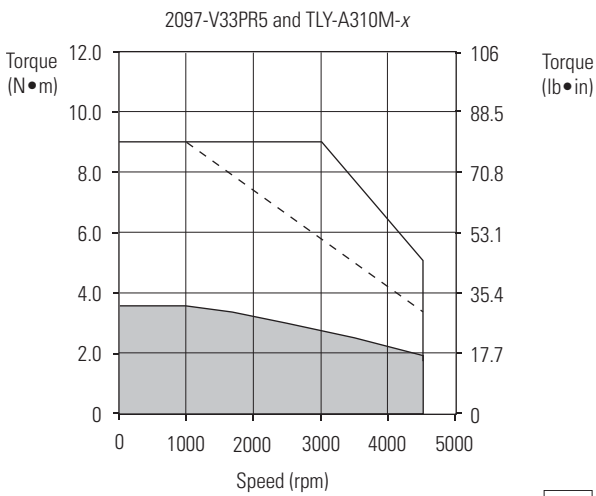
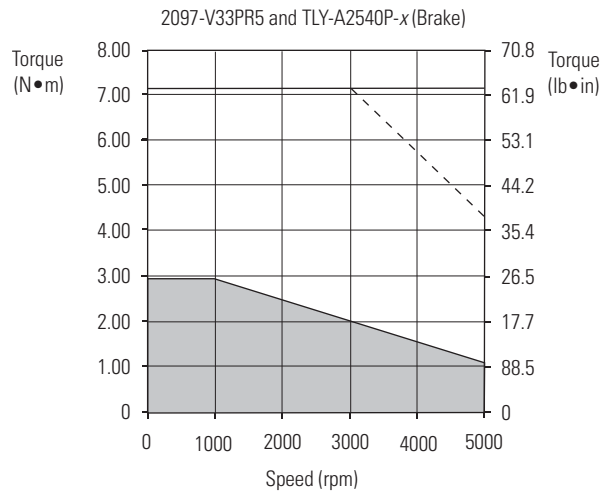
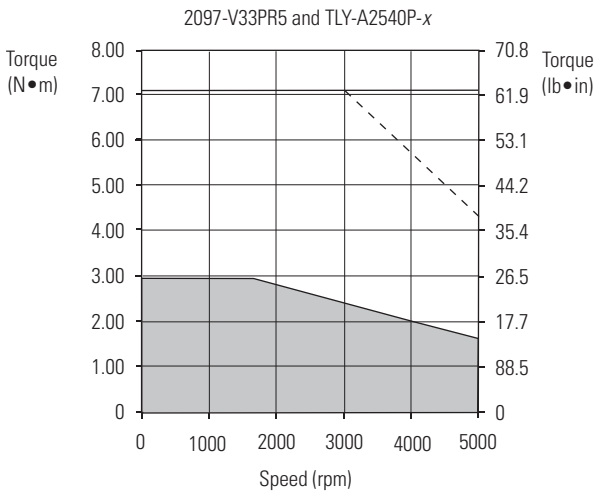
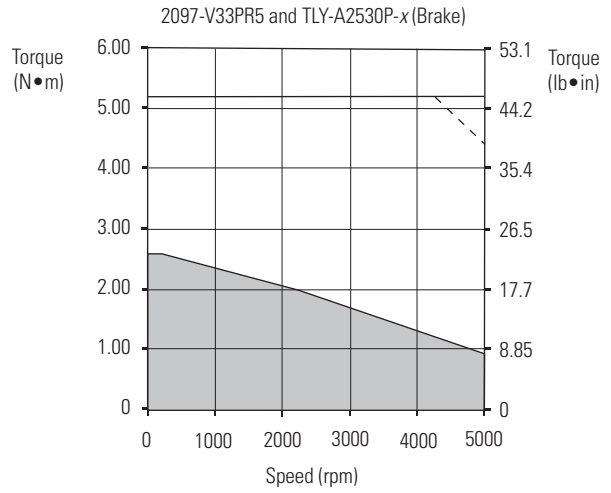
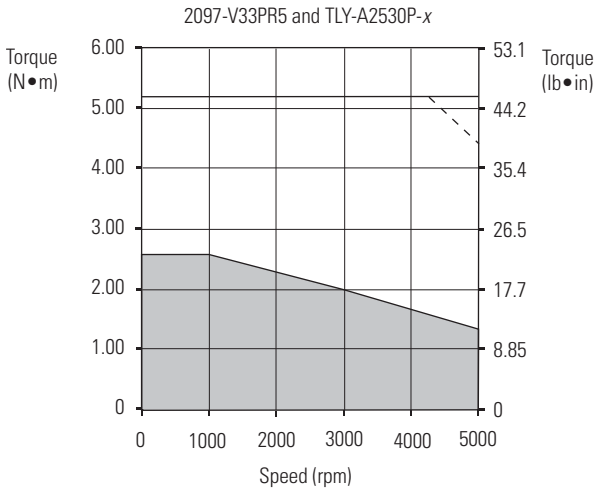
- = Intermittent operating region (three-phase input)
- = Continuous operating region
- = Drive operation (single-phase input)

Kinetix 300 (240V) Drives/TLY-AxxxT-H (incremental) Motor Curves, Continued



- = Intermittent operating region (three-phase input)
- = Continuous operating region
- = Drive operation (single-phase input)

Kinetix 300 (240V) Drives/TLY-Axxxx-x Motor Curves



- = Intermittent operating region (three-phase input)
- = Continuous operating region
- = Drive operation (single-phase input)

Kinetix 6000 Drive Performance Example with Peak Enhancement Feature

The peak current ratings of the Kinetix 6000 AM modules (series A and B) are configured at the factory as 150% of continuous current. You can program 460V (series B) AM modules and the equivalent IAM (inverter) modules, for up to 250% of continuous inverter current. Refer to Peak Enhancement Specifications on [page 272](#) for more information.

IMPORTANT

Before your Kinetix 6000 drive will deliver 250% peak performance, you must enable the peak enhancement feature by configuring your drive by using DriveExplorer or RSLogix 5000 software.

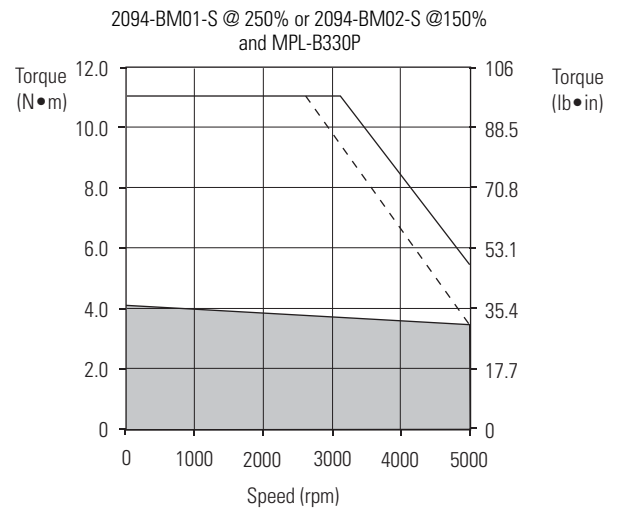
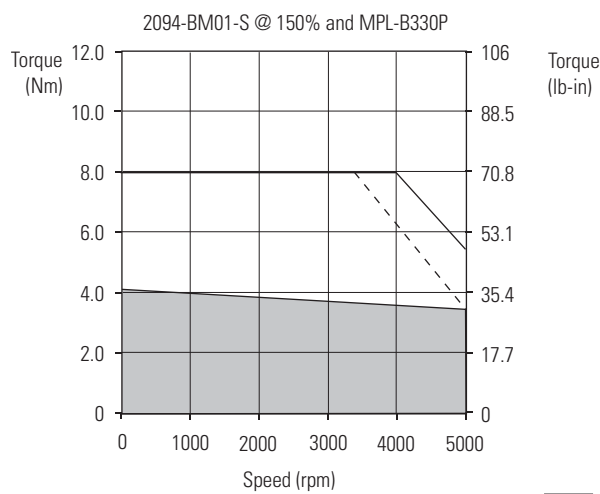
Refer to the interactive Peak Enhancement Configuration Utility to recalculate torque and accel/decel limit values, and paste them into the appropriate Axis Properties dialog box in RSLogix 5000 software. To download the utility, go to <http://www.ab.com/motion/software/peak.html>.

For sizing your drive/motor combination by using series-B drives and the peak enhancement feature, use Motion Analyzer software, version 4.6 or later.

In this example, the MPL-B330P motor, usually paired with the 2094-BM02 (series A) AM module, is shown paired with the 2094-BM01-S (series B) AM module. The two curves illustrate how the 2094-BM01-S (series B) drive, when configured for 250% peak, can achieve full motor performance.

Rotary Motor Performance Specifications Example with Kinetix 6000 Drives

Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 460V Drives
MPL-B330P	5000	6.10	4.18 (37)	13.0	8.0 (71)	1.8	2094-BM01-S @ 150%
				19.0	11.1 (98)		2094-BM01-S @ 250%
							2094-BM02-S @ 150%



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 (230V) Drives with MP-Series Low Inertia Motors

This section provides system combination information for the Kinetix 6000 (230V) drives when matched with MP-Series low-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

IMPORTANT

The MP-Series low-inertia motors on this page are equipped with DIN connectors (specified by 4 or 7 in the catalog number) and are not compatible with cables designed for motors equipped with bayonet connectors (specified by 2 in the catalog number). The motors with bayonet connectors (for example, MPL-A310P-xx2xAA) are being discontinued and require 2090-XXNxxMP- (bayonet) cables. For help with migration or to select bayonet cables, contact your Rockwell Automation sales representative.

Bulletin MPL Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPL-A1510V-xx4xAA, MPL-A1520U-xx4xAA, MPL-A1530U-xx4xAA	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution or Incremental Feedback
MPL-A210V-xx4xAA, MPL-A220T-xx4xAA, MPL-A230P-xx4xAA		
MPL-A310F-xx7xAA, MPL-A310P-xx7xAA, MPL-A320H-xx7xAA, MPL-A320P-xx7xAA, MPL-A330P-xx7xAA	2090-XXNPMF-16Sxx ⁽⁴⁾	2090-XXNFMF-Sxx ⁽⁵⁾ Absolute High-resolution or Incremental Feedback
MPL-A420P-xx7xAA, MPL-A430H-xx7xAA		
MPL-A4530F-xx7xAA, MPL-A4540C-xx7xAA		
MPL-A430P-xx7xAA	2090-XXNPMF-14Sxx ⁽⁴⁾	
MPL-A4530K-xx7xAA, MPL-A4540F-xx7xAA		
MPL-A520K-xx7xAA	2090-XXNPMF-10Sxx ⁽⁴⁾	
MPL-A540K-xx7xAA, MPL-A560F-xx7xAA	2090-CPBM7DF-08AAxx (standard)	

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

(4) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(5) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

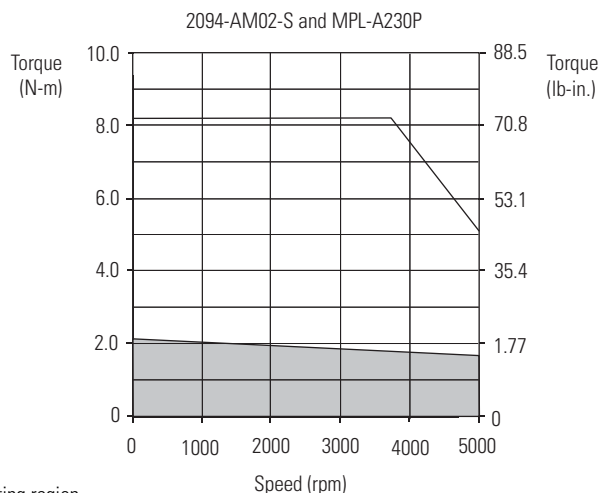
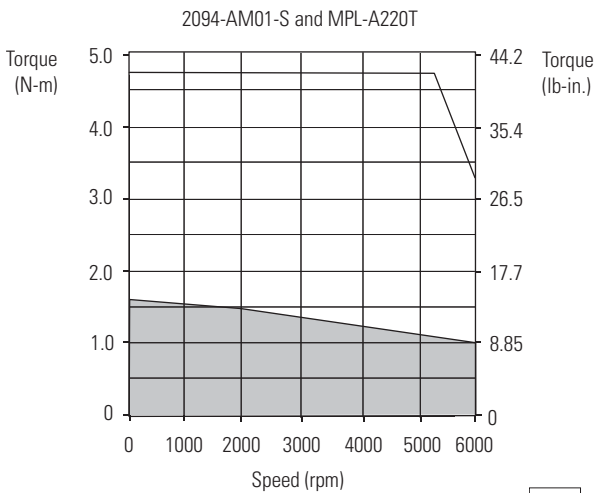
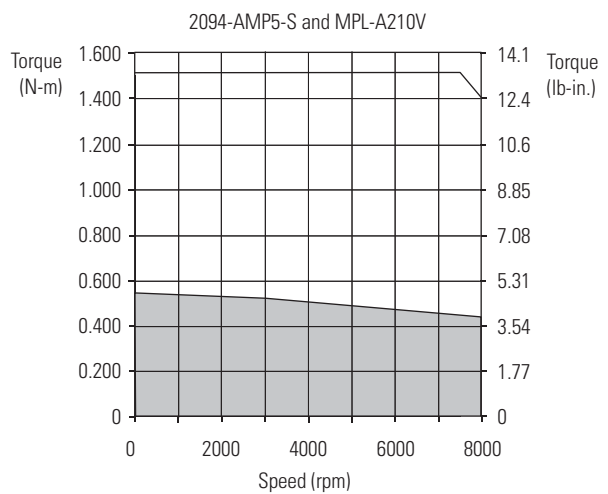
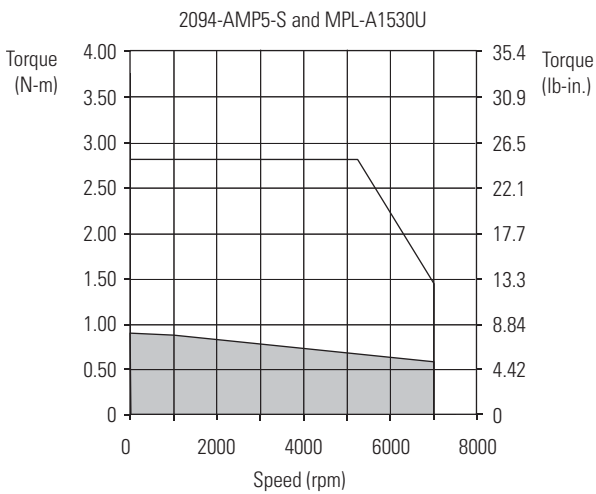
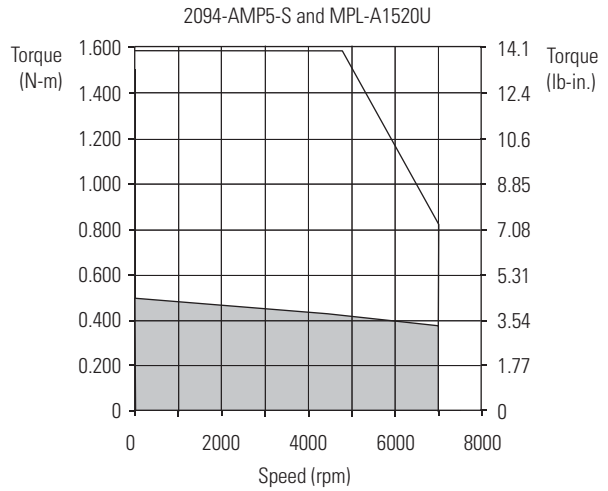
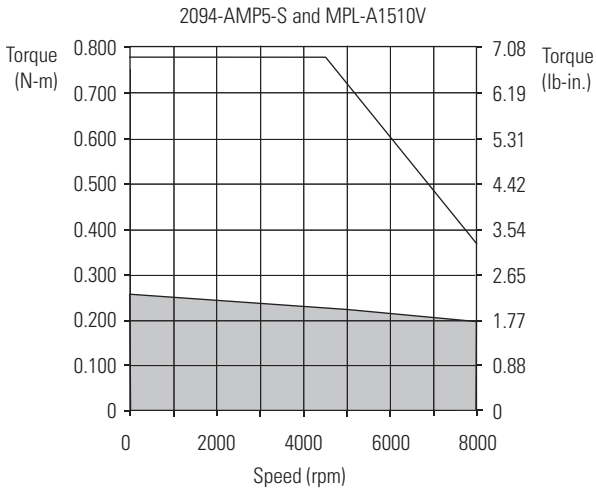
Bulletin MPL Motor Performance Specifications with Kinetix 6000 (230V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 230V Drives
MPL-1510V	8000	1.05	0.26 (2.3)	3.40	0.77 (6.8)	0.16	2094-AMP5-S
MPL-1520U	7000	1.80	0.49 (4.3)	6.10	1.58 (13.9)	0.27	2094-AMP5-S
MPL-1530U	7000	2.82	0.90 (8.0)	10.1	2.82 (24.9)	0.39	2094-AMP5-S
MPL-210V	8000	3.09	0.55 (4.8)	10.2	1.52 (13.4)	0.37	2094-AMP5-S
MPL-220T	6000	4.54	1.61 (14.2)	10.5	3.45 (30.0)	0.62	2094-AMP5-S
				15.5	4.74 (41.9)		2094-AM01-S

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 230V Drives
MPL-230P	5000	5.40	2.10 (18.6)	17.0	8.0 (70.8)	0.86	2094-AM01-S
				23.0	8.2 (73.0)		2094-AM02-S
MPL-310F	3000	3.24	1.58 (14.0)	9.30	3.61 (31.9)	0.46	2094-AMP5-S
MPL-310P	5000	4.91	1.58 (14.0)	10.5	2.90 (25.6)	0.73	2094-AMP5-S
				14.0	3.61 (31.9)		2094-AM01-S
MPL-A320H	3500	6.10	3.05 (27.0)	17.0	7.13 (63.0)	1.0	2094-AM01-S
				19.3	7.91 (70.0)		2094-AM02-S
MPL-A320P	5000	8.50	2.88 (25.5)	17.0	5.07 (44.8)	1.3	2094-AM01-S
		9.00	3.05 (27.0)	29.5	7.91 (70.0)		2094-AM02-S
MPL-A330P	5000	12.0	4.18 (37.0)	30.0	9.10 (80.5)	1.8	2094-AM02-S
				38.0	11.1 (98.2)		2094-AM03-S
MPL-A420P	5000	12.9	4.79 (42.3)	30.0	9.67 (85.5)	2.0	2094-AM02-S
				46.0	13.6 (119)		2094-AM03-S
MPL-A430H	3500	12.2	6.21 (55.0)	30.0	13.9 (123)	1.8	2094-AM02-S
				45.0	19.8 (175)		2094-AM03-S
MPL-A430P	5000	15.0	5.35 (47.3)	30.0	9.99 (88.3)	2.2	2094-AM02-S
		16.80	5.99 (52.9)	49.0	15.4 (136)		2094-AM03-S
				67.0	19.8 (175)		2094-AM05-S
MPL-A4530F	2800	13.40	8.36 (74.0)	30.0	15.8 (139)	1.9	2094-AM02-S
				42.0	20.3 (179)		2094-AM03-S
MPL-A4530K	4000	15.0	6.21 (54.9)	30.0	11.3 (99.9)	2.5	2094-AM02-S
		19.50	8.13 (71.9)	49.0	17.0 (150)		2094-AM03-S
				62.0	20.3 (179)		2094-AM05-S
MPL-A4540C	1500	8.50	9.15 (80.9)	17.0	16.9 (150)	1.5	2094-AM01-S
		9.55	10.30 (91.1)	29.0	27.1 (239)		2094-AM02-S
MPL-A4540F	3000	15.0	8.32 (73.6)	30.0	15.3 (135)	2.6	2094-AM02-S
		18.40	10.19 (90.1)	49.0	23.6 (208)		2094-AM03-S
				58.0	27.1 (239)		2094-AM05-S
MPL-A520K	4000	15.0	6.98 (61.7)	30.0	12.6 (111)	3.5	2094-AM02-S
		23.31	10.77 (95.2)	49.0	19.3 (171)		2094-AM03-S
				65.0	24.2 (214)		2094-AM05-S
MPL-A540K	4000	24.5	11.26 (99.5)	49.0	21.5 (190)	5.5	2094-AM03-S
		42.0	19.42 (171)	73.4	31.3 (277)		2094-AM05-S
MPL-A560F	3000	24.5	15.65 (138)	49.0	28.1 (249)	5.3	2094-AM03-S
		42.7	27.39 (242)	73.4	39.6 (350)		2094-AM05-S

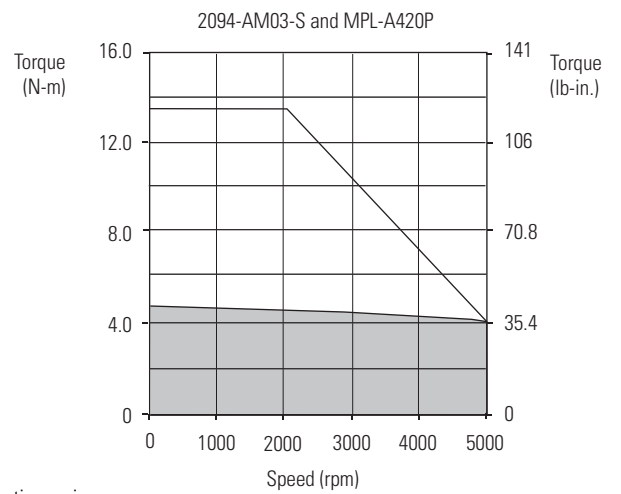
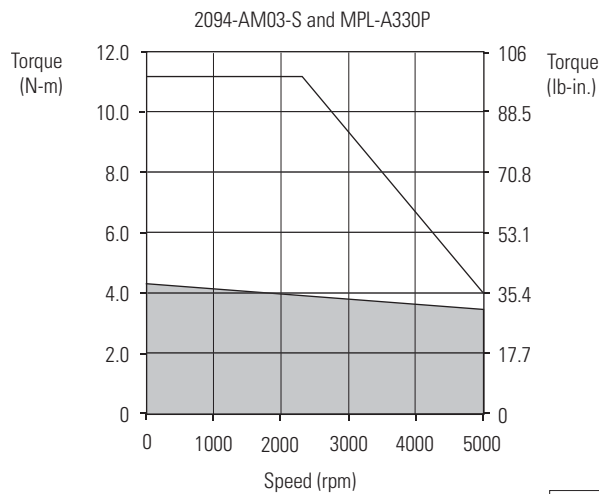
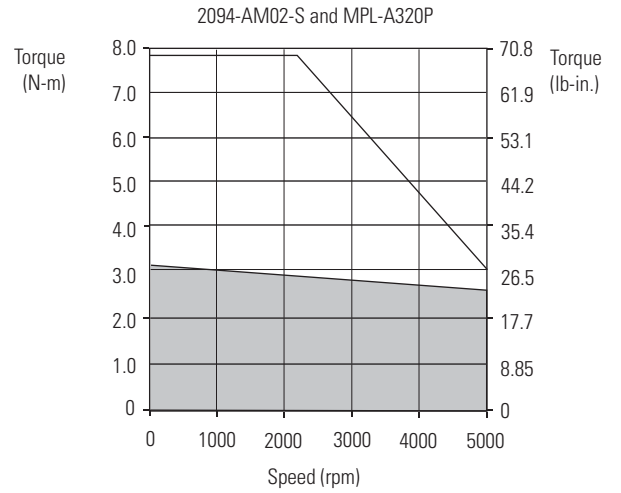
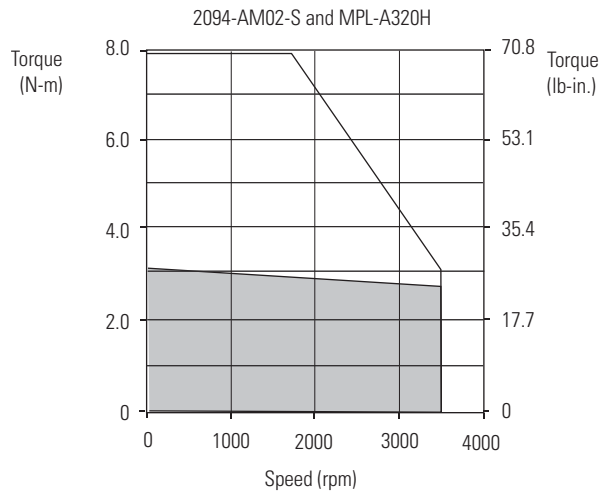
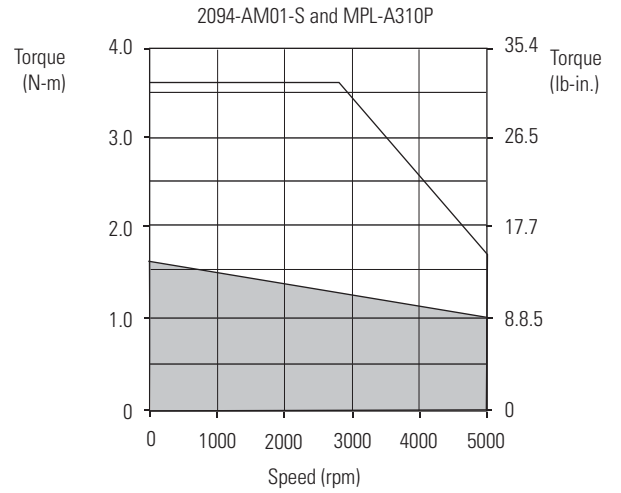
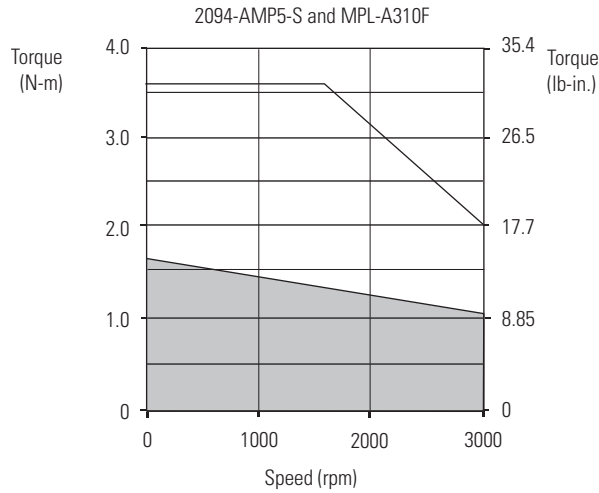
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 (230V) Drives/MP-Series Low Inertia Motor Curves



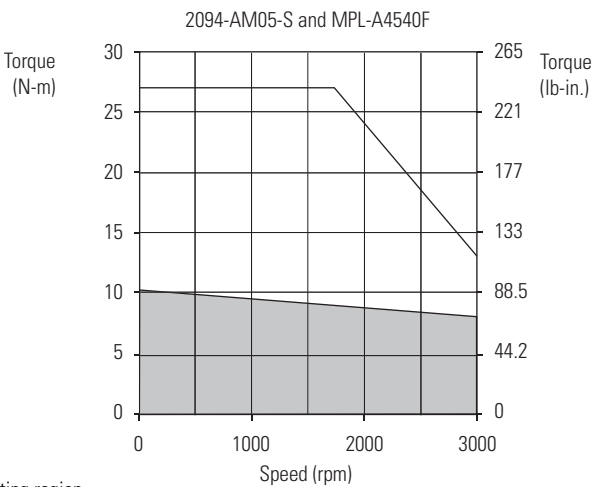
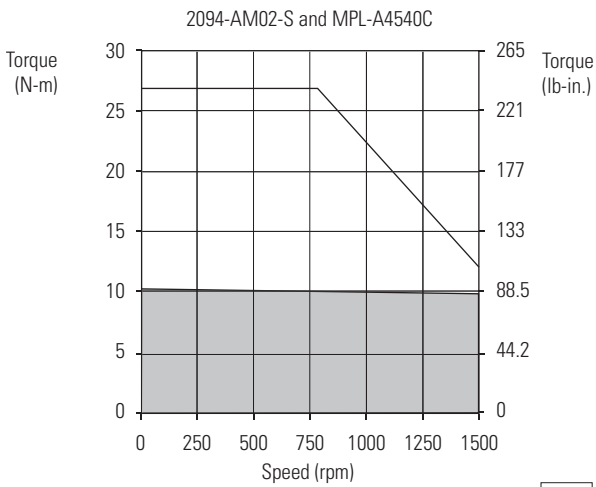
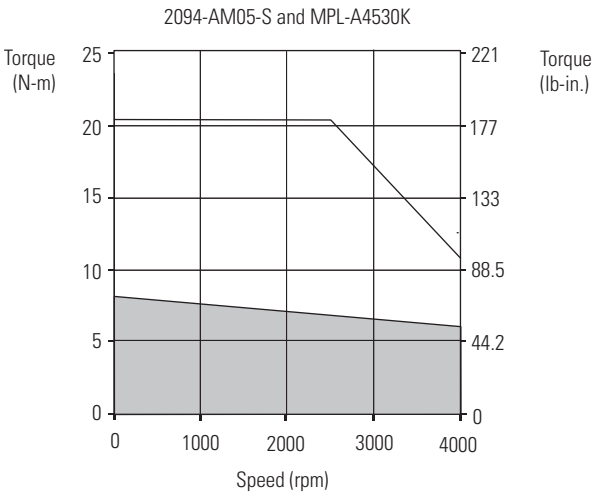
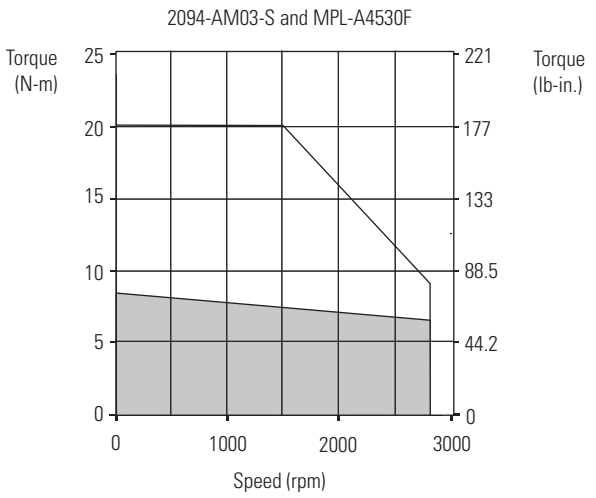
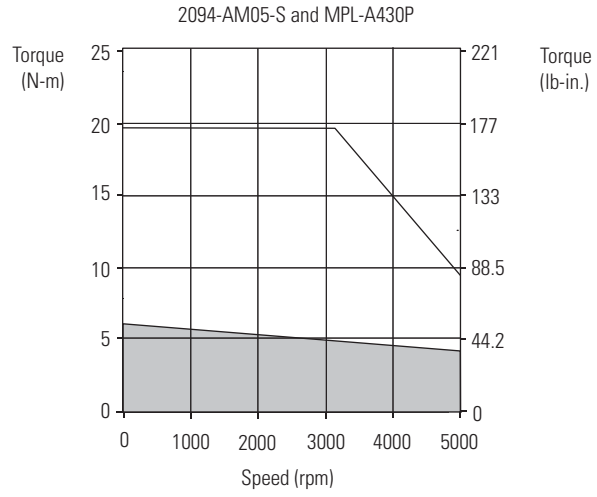
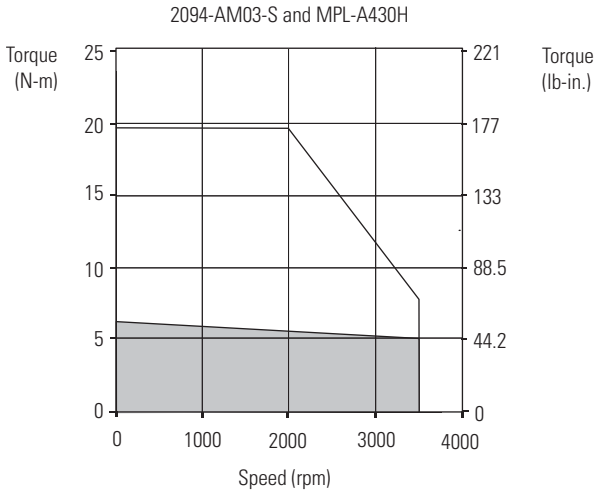
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Kinetix 6000 (230V) Drives/MP-Series Low Inertia Motor Curves, Continued



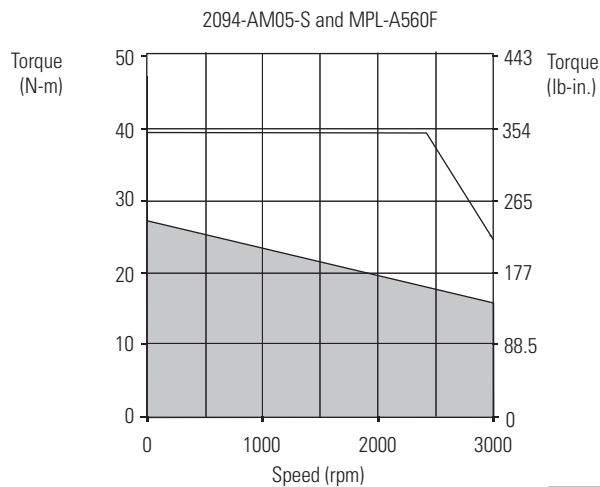
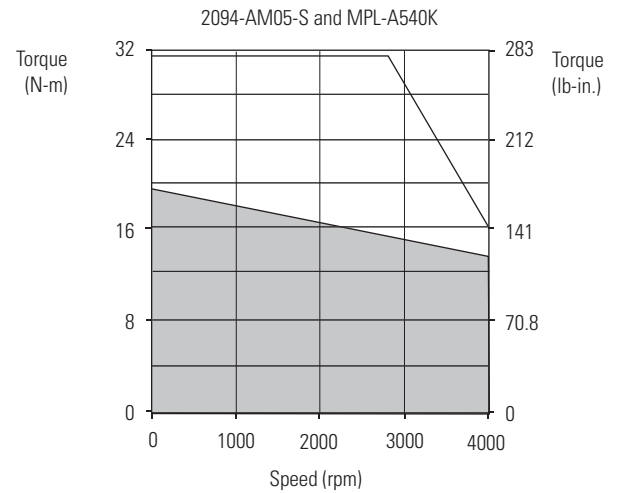
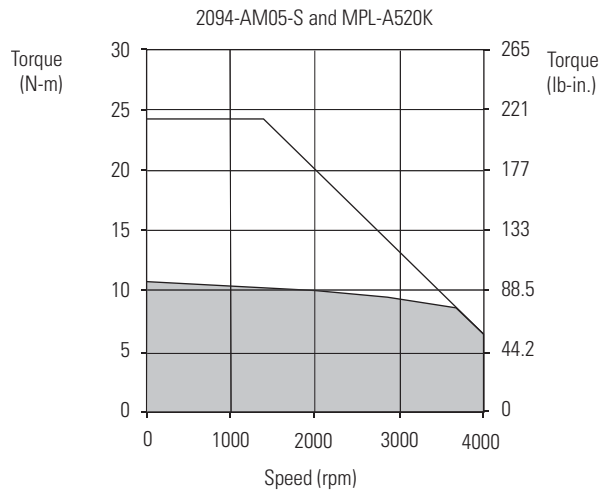
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Kinetix 6000 (230V) Drives/MP-Series Low Inertia Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region

Kinetix 6000 (230V) Drives/MP-Series Low Inertia Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives with MP-Series Low Inertia Motors

This section provides system combination information for the Kinetix 6000 and the Kinetix 6200/6500 (460V) drives when matched with MP-Series low-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

IMPORTANT

When using the Kinetix 6000 (series B) drives, configured for 250% peak performance, you can usually achieve full motor performance with a smaller drive. The drive/motor performance specifications table reflects the standard 150% peak current rating and the peak-enhanced rating for the series-B drive. The torque/speed curves include the smallest drive that provides full motor performance.

Refer to [Kinetix 6000 IAM/AM Module Series Change](#) on [page 268](#) for more information about using the peak enhancement feature.

Kinetix 6200 and Kinetix 6500 drives are configured for 250% peak performance by default. Expect the same peak performance from Kinetix 6200/6500 drives and Kinetix 6000 (series B) drives configured for 250% peak performance.

IMPORTANT

The MP-Series low-inertia motors on this page are equipped with DIN connectors (specified by 4 or 7 in the catalog number) and are not compatible with cables designed for motors equipped with bayonet connectors (specified by 2 in the catalog number). The motors with bayonet connectors (for example, MPL-A310P-xx2xAA) are being discontinued and require 2090-XXNxMP- (bayonet) cables. For help with migration or to select bayonet cables, contact your Rockwell Automation sales representative.

Bulletin MPL Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPL-B1510V-xx4xAA, MPL-B1520U-xx4xAA, MPL-B1530U-xx4xAA	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution or Incremental Feedback
MPL-B210V-xx4xAA, MPL-B220T-xx4xAA, MPL-B230P-xx4xAA		
MPL-B310P-xx7xAA, MPL-B320P-xx7xAA, MPL-B330P-xx7xAA	2090-XXNPMF-16Sxx ⁽⁴⁾	2090-XXNFMF-Sxx ⁽⁵⁾ Absolute High-resolution Feedback
MPL-B420P-xx7xAA, MPL-B430P-xx7xAA		
MPL-B4530F-xx7xAA, MPL-B4530K-xx7xAA, MPL-B4540F-xx7xAA, MPL-B4560F-xx7xAA		
MPL-B520K-xx7xAA	2090-XXNPMF-14Sxx ⁽⁴⁾	2090-CFBM4DF-CEAAxx ⁽⁶⁾ (standard) Resolver Feedback
MPL-B540D-xx7xAA, MPL-B540K-xx7xAA, MPL-B560F-xx7xAA	2090-XXNPMF-10Sxx ⁽⁴⁾	
MPL-B580F-xx7xAA, MPL-B580J-xx7xAA, MPL-B640F-xx7xAA	2090-CPBM7DF-08AAxx (standard)	
MPL-B660F-xx7xAA, MPL-B680D-xx7xAA, MPL-B960B-xx7xAA, MPL-B980B-xx7xAA	2090-CPBM7DF-06AAxx (standard)	
MPL-B680F-xx7xAA, MPL-B860D-xx7xAA, MPL-B880C-xx7xAA, MPL-B960C-xx7xAA	2090-CPBM7DF-04AAxx (standard)	
MPL-B880D-xx7xAA, MPL-B960D-xx7xAA, MPL-B980C-xx7xAA, MPL-B980D-xx7xAA		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

(4) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(5) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

(6) Applies to Kinetix 6000 drives and MPL-B3xxx-R...MPL-B45xxx-R motors with resolver feedback.

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPL Motor Performance Specifications with Kinetix 6200/6500 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6200/ Kinetix 6500 460V Drives
MPL-B1510V	8000	0.95	0.26 (2.3)	3.10	0.77 (6.8)	0.16	2094-BMP5-M
MPL-B1520U	7000	1.80	0.49 (4.3)	6.10	1.58 (13.9)	0.27	2094-BMP5-M
MPL-B1530U	7000	2.0	0.90 (8.0)	7.20	2.82 (24.9)	0.39	2094-BMP5-M
MPL-B210V	8000	1.75	0.55 (4.9)	5.80	1.52 (13.4)	0.37	2094-BMP5-M
MPL-B220T	6000	3.30	1.61 (14.2)	9.90	4.12 (36.4)	0.62	2094-BMP5-M
				11.3	4.74 (41.9)		2094-BM01-M
MPL-B230P	5000	2.60	2.10 (18.6)	9.90	7.24 (64.0)	0.86	2094-BMP5-M
				11.3	8.20 (73.0)		2094-BM01-M
MPL-B310P	5000	2.4	1.6 (14.1)	7.10	3.6 (32)	0.77	2094-BMP5-M
MPL-B320P	5000	4.0	2.7 (23.9)	9.90	5.9 (52.2)	1.5	2094-BMP5-M
		4.5	3.10 (27)	14.0	8.2 (72.5)		2094-BM01-M
MPL-B330P	5000	4.0	2.7 (23.9)	9.90	6.8 (60.2)	1.8	2094-BMP5-M
		6.1	4.18 (37)	19.0	11.1 (98)		2094-BM01-M
MPL-B420P	5000	4.0	3.0 (26.5)	9.90	6.8 (60.2)	1.9	2094-BMP5-M
		6.3	4.74 (42)	21.6	13.1 (116)		2094-BM01-M
				22.0	13.5 (119)		2094-BM02-M
MPL-B430P	5000	8.6	6.2 (54.9)	21.6	13.9 (123)	2.2	2094-BM01-M
		9.2	6.55 (58)	32.0	19.8 (175)		2094-BM02-M
MPL-B4530F	3000	4.0	4.9 (43.3)	9.90	11.0 (97.3)	2.1	2094-BMP5-M
		6.7	8.36 (74)	21.0	20.3 (180)		2094-BM01-M
MPL-B4530K	4000	8.6	7.1 (62.8)	21.6	15.1 (133)	2.6	2094-BM01-M
		9.9	8.25 (73)	31.0	20.3 (179)		2094-BM02-M
MPL-B4540F	3000	8.6	9.5 (84.1)	21.6	20.9 (185)	2.6	2094-BM01-M
		9.1	10.20 (90)	29.0	27.1 (240)		2094-BM02-M
MPL-B4560F	3000	8.6	10.5 (92.9)	21.6	22.7 (201)	3.2	2094-BM01-M
		11.8	14.0 (124)	36.0	34.4 (304)		2094-BM02-M
MPL-B520K	4000	8.6	7.9 (69.9)	21.6	16.6 (147)	3.5	2094-BM01-M
		11.5	10.7 (95)	33.0	23.2 (205)		2094-BM02-M
MPL-B540D	2000	8.6	15.8 (139)	21.6	37.9 (335)	3.4	2094-BM01-M
		10.5	19.4 (172)	23.0	41.0 (362)		2094-BM02-M

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

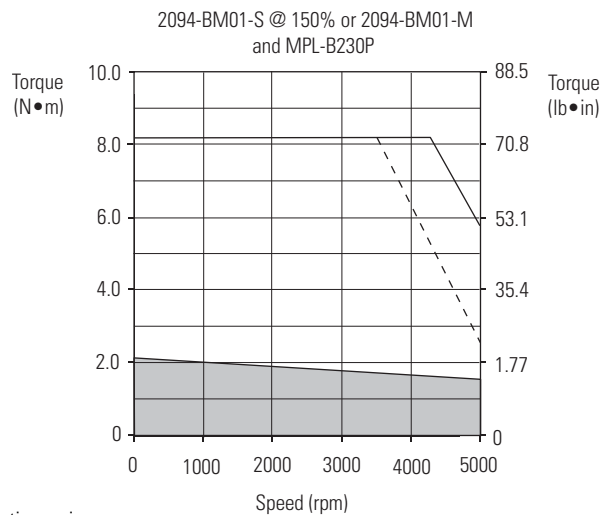
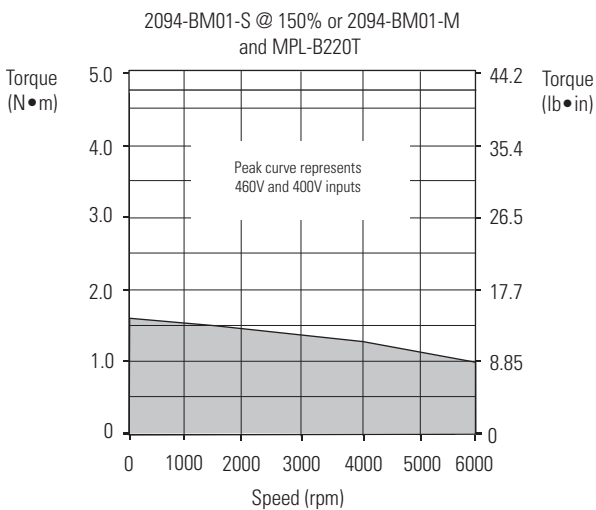
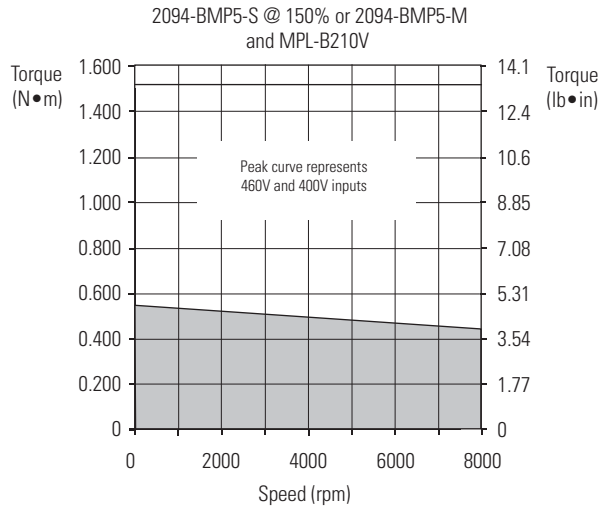
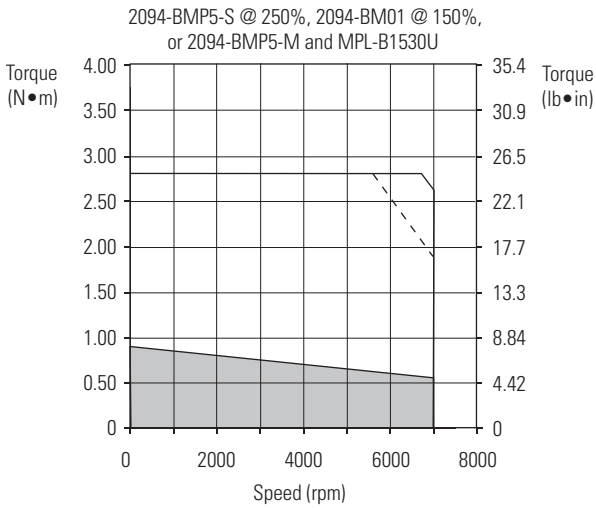
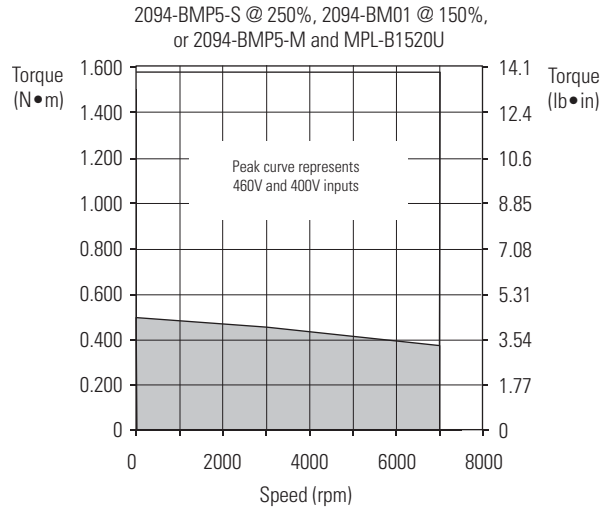
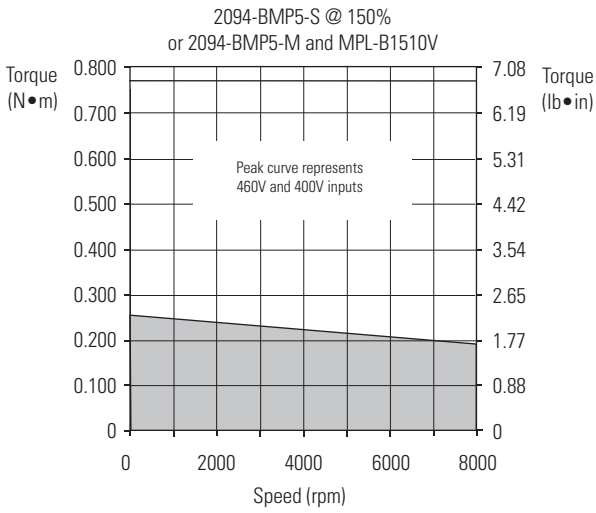
Bulletin MPL Motor Performance Specifications with Kinetix 6000 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 460V Drives
MPL-B1510V	8000	0.95	0.26 (2.3)	3.10	0.77 (6.8)	0.16	BMP5-S @ 150%
MPL-B1520U	7000	1.80	0.49 (4.3)	5.90	1.53 (13.3)	0.27	BMP5-S @ 150%
				6.10	1.58 (13.9)		BMP5-S @ 250%
MPL-B1530U	7000	2.0	0.90 (8.0)	5.90	2.34 (20.7)	0.39	BMP5-S @ 150%
				7.20	2.82 (24.9)		BMP5-S @ 250%
							BM01-S @ 150%
MPL-B210V	8000	1.75	0.55 (4.9)	5.80	1.52 (13.4)	0.37	BMP5-S @ 150%
MPL-B220T	6000	3.30	1.61 (14.2)	5.90	2.50 (21.3)	0.62	BMP5-S @ 150%
				9.90	4.12 (36.4)		BMP5-S @ 250%
				11.3	4.74 (41.9)		BM01-S @ 150%
MPL-B230P	5000	2.60	2.10 (18.6)	5.90	4.30 (38.0)	0.86	BMP5-S @ 150%
				9.90	7.24 (64.0)		BMP5-S @ 250%
				11.3	8.20 (73.0)		BM01-S @ 150%
MPL-B310P	5000	2.4	1.6 (14)	5.90	3.2 (28)	0.77	BMP5-S @ 150%
				7.10	3.6 (32)		BMP5-S @ 250%
MPL-B320P	5000	4.0	2.70 (24)	5.90	3.9 (34)	1.5	BMP5-S @ 150%
		4.5	3.10 (27)	13.0	7.5 (66)		BM01-S @ 150%
				14.0	8.2 (72.5)		BM01-S @ 250%
MPL-B330P	5000	6.1	4.18 (37)	13.0	8.0 (71)	1.8	BM01-S @ 150%
				19.0	11.1 (98)		BM01-S @ 250%
							BM02-S @ 150%
MPL-B420P	5000	6.3	4.74 (42)	13.0	8.7 (77)	1.9	BM01-S @ 150%
				21.8	13.4 (118)		BM02-S @ 150%
				22.0	13.5 (119)		BM02-S @ 250%
MPL-B430P	5000	9.2	6.55 (58)	21.8	14.4 (127)	2.2	BM02-S @ 150%
				32.0	19.8 (175)		BM02-S @ 250%
							BM03-S @ 150%
MPL-B4530F	3000	6.7	8.36 (74)	13.0	13.9 (123)	2.1	BM01-S @ 150%
				21.0	20.3 (180)		BM01-S @ 250%
							BM02-S @ 150%
MPL-B4530K	4000	9.9	8.25 (73)	21.8	15.5 (137)	2.6	BM02-S @ 150%
				31.0	20.3 (179)		BM02-S @ 250%
							BM03-S @ 150%

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 460V Drives
MPL-B4540F	3000	9.1	10.20 (90)	21.8	21.4 (189)	2.6	BM02-S @ 150%
				29.0	27.1 (240)		BM02-S @ 250%
MPL-B4560F	3000	11.8	14.0 (124)	21.8	23.3 (206)	3.2	BM02-S @ 150%
				36.0	34.4 (304)		BM02-S @ 250%
MPL-B520K	4000	11.5	10.7 (95)	21.8	17.0 (150)	3.5	BM02-S @ 150%
				33.0	23.2 (205)		BM02-S @ 250%
MPL-B540D	2000	10.5	19.4 (172)	21.8	38.8 (343)	3.4	BM02-S @ 150%
				23.0	41.0 (362)		BM02-S @ 250%
MPL-B540K	4000	20.4	19.4 (171)	45.0	38.1 (337)	5.4	BM03-S @ 150%
				60.0	48.6 (430)		BM05-S @ 150%
MPL-B560F	3000	20.9	26.7 (236)	45.0	49.3 (436)	5.5	BM03-S @ 150%
				68.0	67.7 (599)		BM05-S @ 150%
MPL-B580F	3000	26.1	34.0 (300)	45.0	51.0 (451)	7.1	BM03-S @ 150%
				73.4	74.3 (657)		BM05-S @ 150%
MPL-B580J	3800	30.0	31.8 (281)	45.0	43.7 (386)	7.9	BM03-S @ 150%
		32.0	33.9 (299)	73.4	66.6 (589)		BM05-S @ 150%
MPL-B640F	3000	30.0	34.2 (302)	45.0	50.8 (449)	6.1	BM03-S @ 150%
		32.0	36.7 (324)	65.0	72.7 (643)		BM05-S @ 150%
MPL-B660F	3000	38.5	47.9 (423)	73.4	81.0 (716)	6.1	BM05-S @ 150%
MPL-B680D	2000	34.0	62.8 (555)	73.4	124 (1098)	9.3	BM05-S @ 150%
MPL-B680F	3000	47.9	59.7 (528)	73.4	85.4 (755)	7.5	BM05-S @ 150%
MPL-B860D	2000	47.3	83.2 (736)	73.4	120 (1065)	12.5	BM05-S @ 150%
MPL-B880C	1500	47.5	109 (965)	73.4	157 (1387)	12.6	BM05-S @ 150%
MPL-B880D	2000	48.9	79.9 (706)	73.4	114 (1011)	12.6	BM05-S @ 150%
MPL-B960B	1200	42.5	130 (1150)	73.4	190 (1684)	12.7	BM05-S @ 150%
MPL-B960C	1500	48.9	110 (975)	73.4	146 (1296)	14.8	BM05-S @ 150%
MPL-B960D	2000	48.9	86 (760)	73.4	131 (1158)	15.0	BM05-S @ 150%
MPL-B980B	1000	40.0	162 (1440)	73.4	235 (2077)	15.2	BM05-S @ 150%
MPL-B980C	1500	48.9	112 (996)	73.4	157 (1387)	16.8	BM05-S @ 150%
MPL-B980D	2000	48.9	97 (858)	73.4	147 (1300)	18.6	BM05-S @ 150%

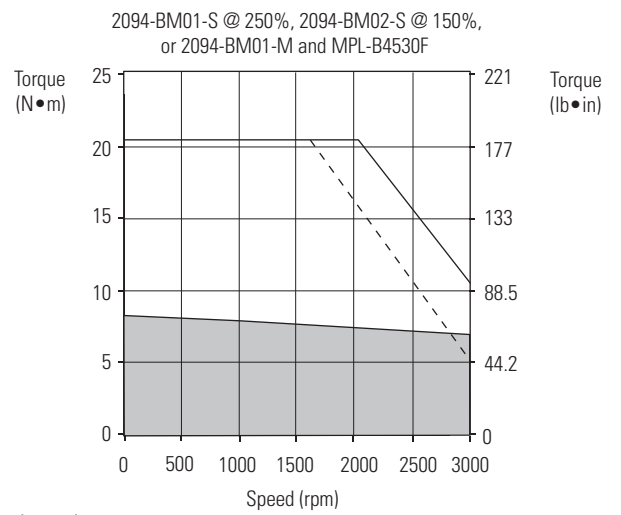
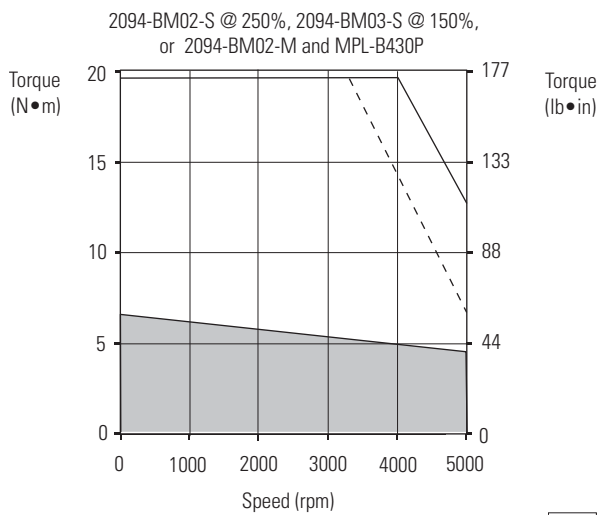
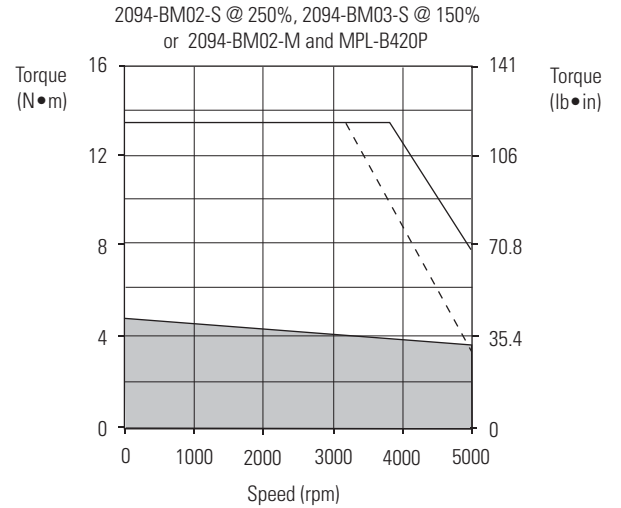
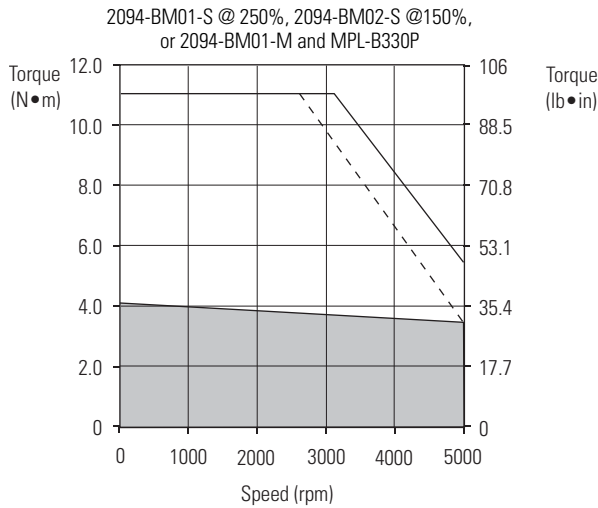
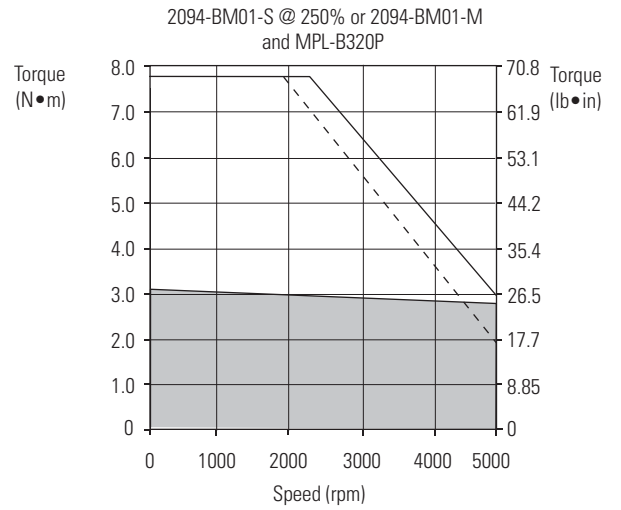
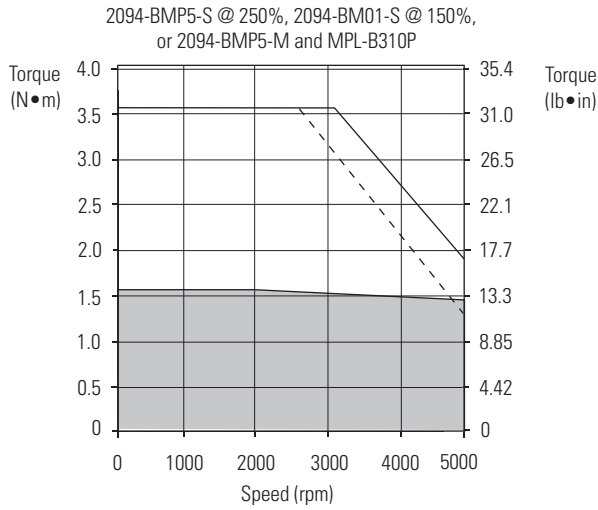
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/MP-Series Low Inertia Motor Curves



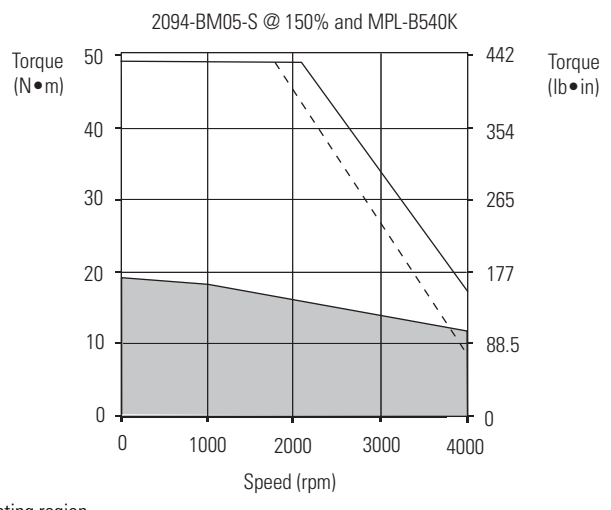
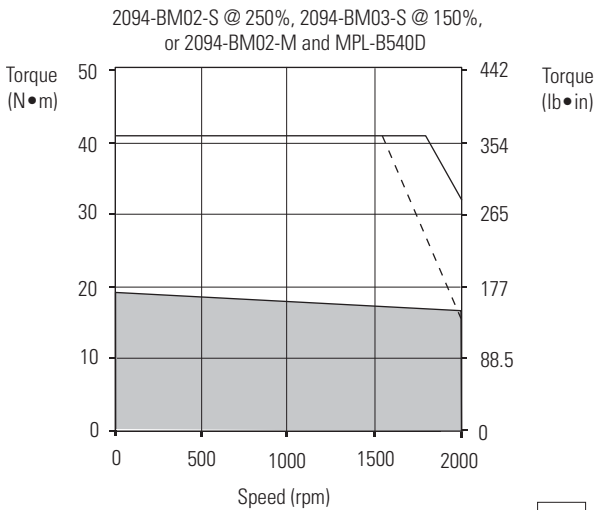
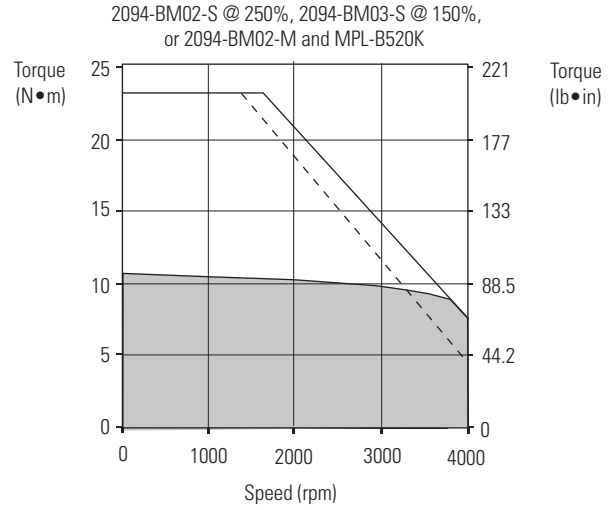
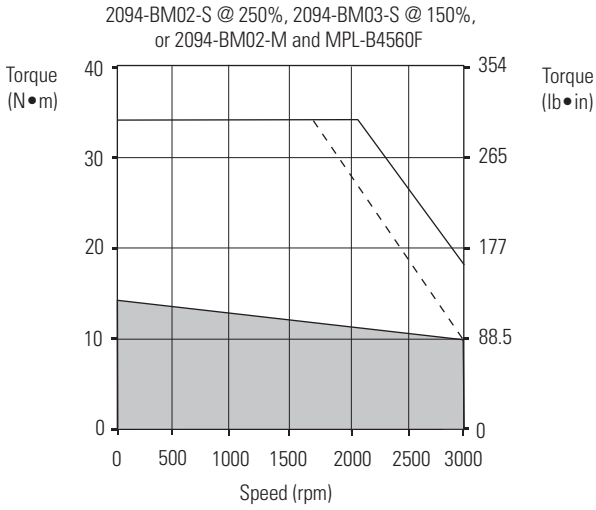
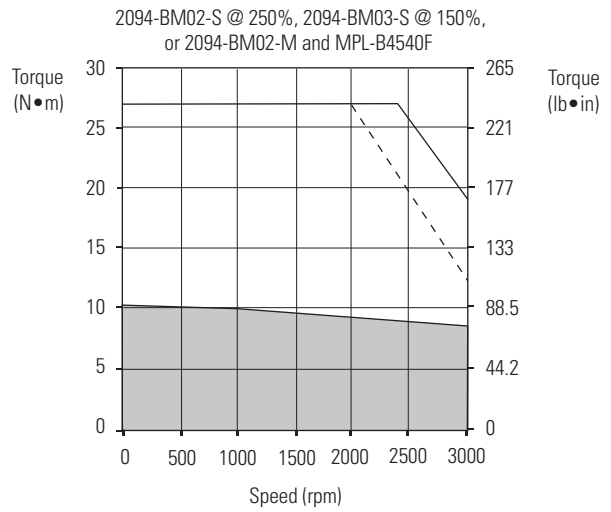
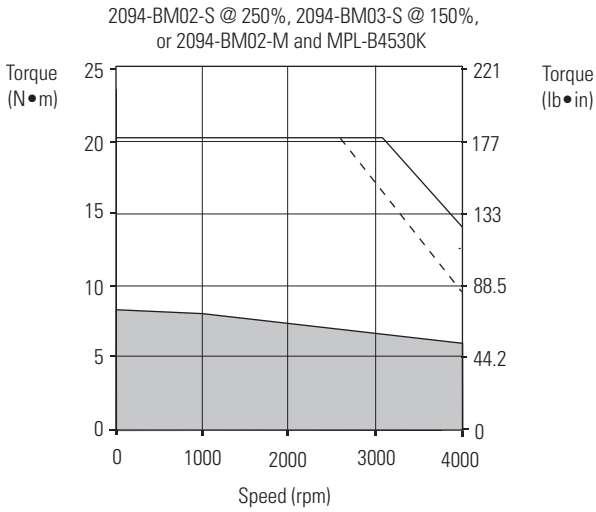
- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/MP-Series Low Inertia Motor Curves, Continued



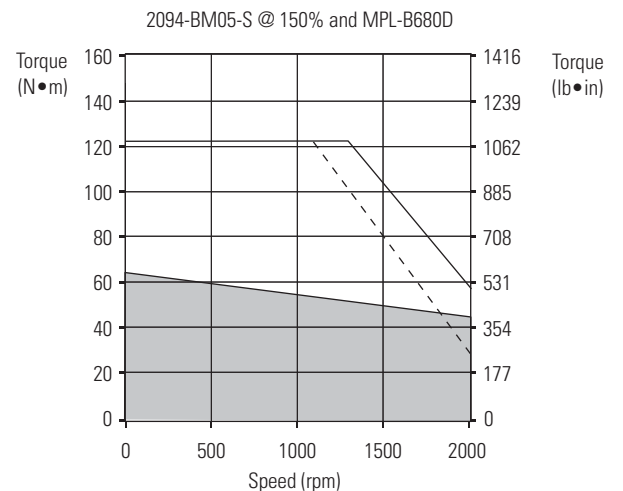
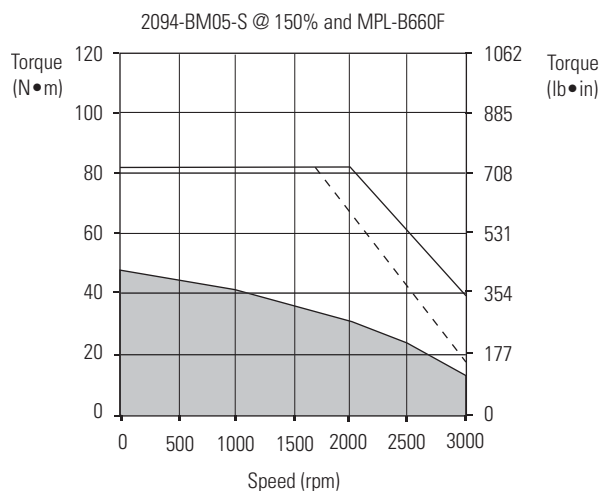
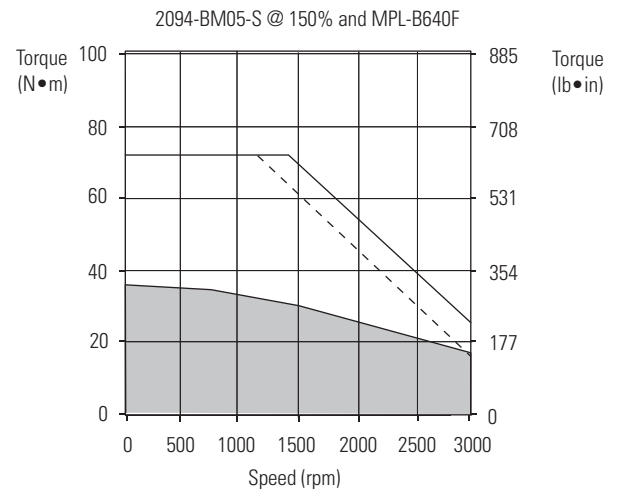
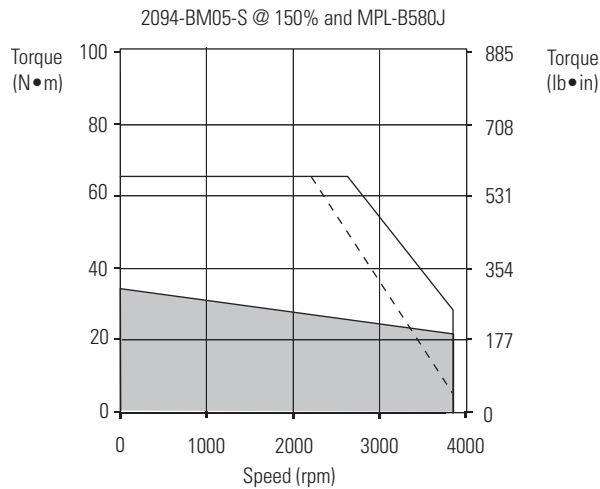
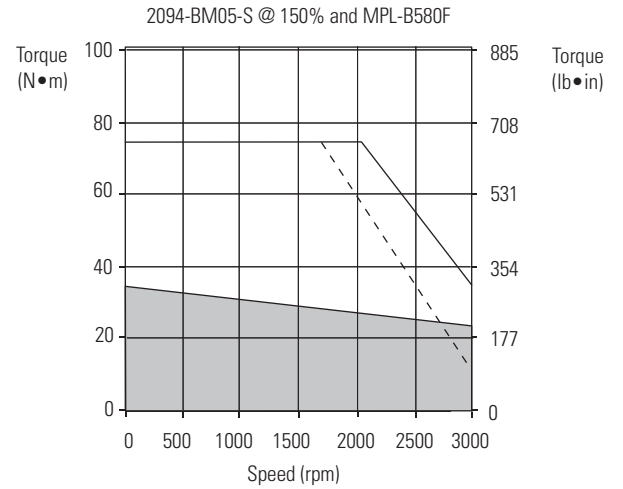
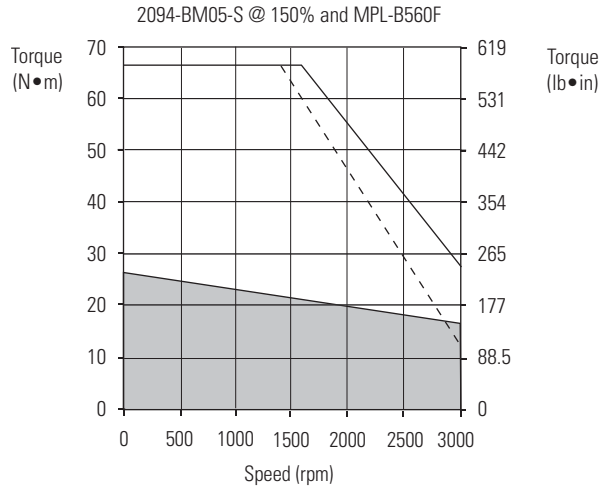
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Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/MP-Series Low Inertia Motor Curves, Continued



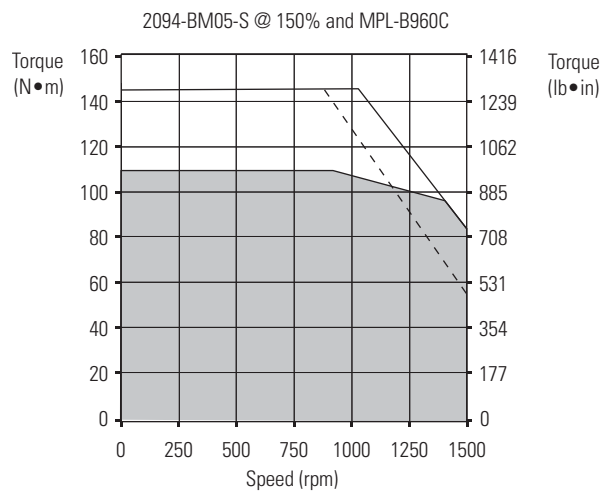
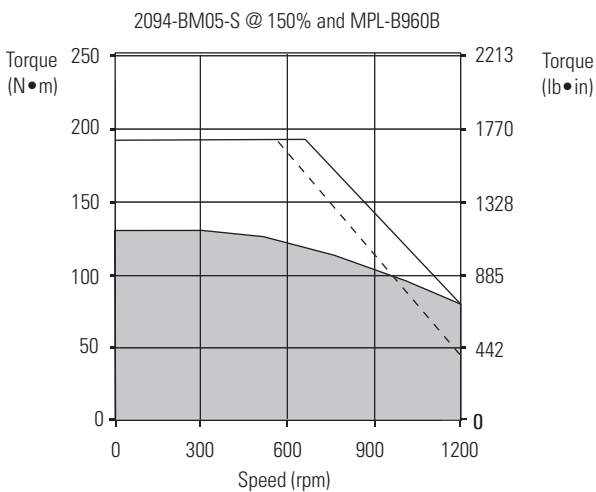
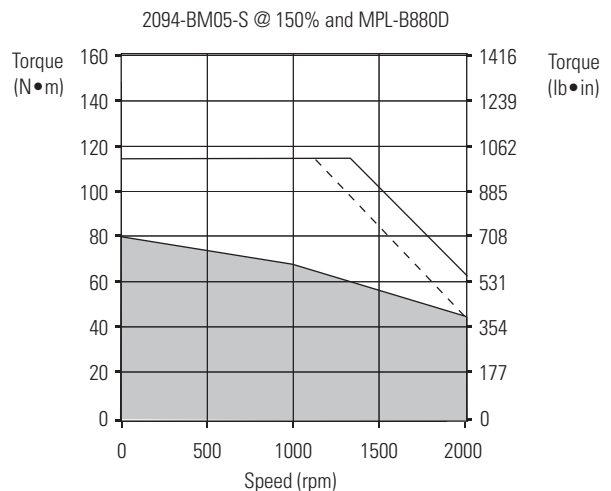
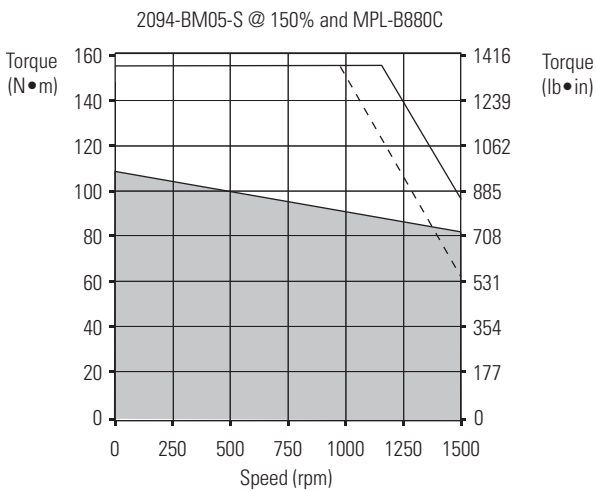
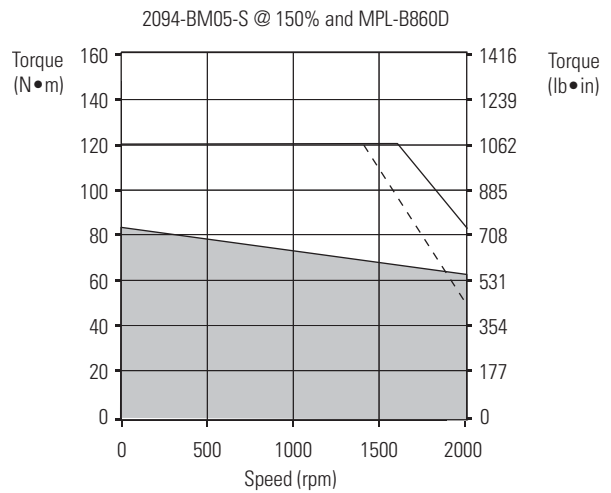
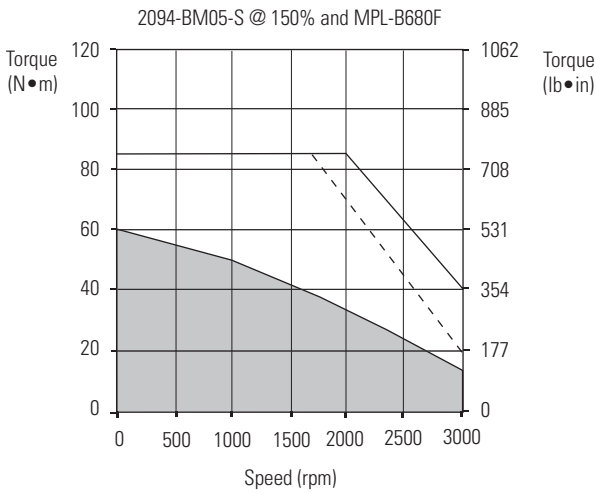
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- = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/MP-Series Low Inertia Motor Curves, Continued



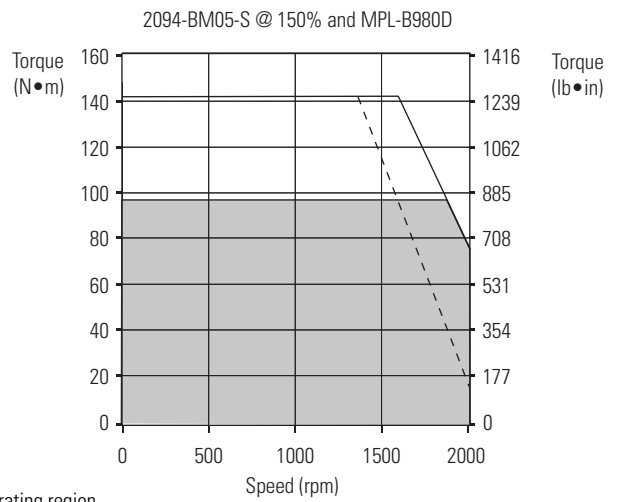
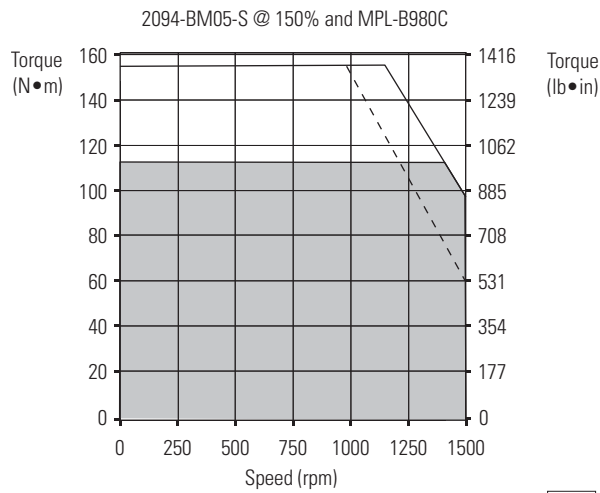
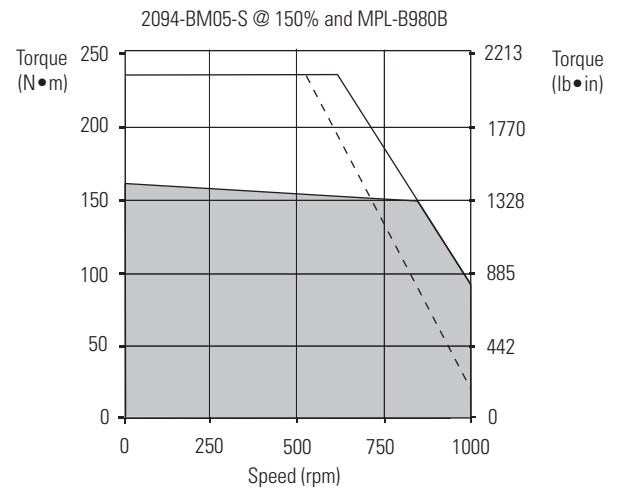
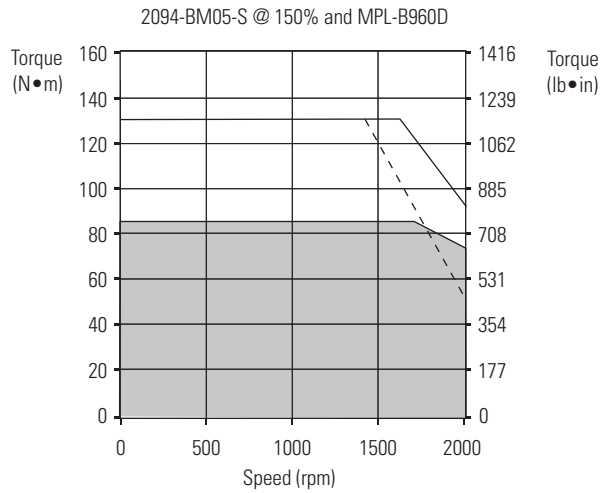
= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/MP-Series Low Inertia Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/MP-Series Low Inertia Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 (230V) Drives with MP-Series Medium Inertia Motors

This section provides system combination information for the Kinetix 6000 (230V) drives when matched with MP-Series medium-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPM Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPM-A1151M, MPM-A1152F, MPM-A1153F	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
MPM-A1302F	2090-XXNPMF-14S _{xx} ⁽²⁾	
MPM-A1304F	2090-CPxM7DF-12AA _{xx} (standard)	2090-CFBM4DF-CEAA _{xx} ⁽⁴⁾ (standard) Resolver Feedback
MPM-A1651F	2090-XXNPMF-10S _{xx} ⁽²⁾	
MPM-A1652F, MPM-A1653F	2090-CPBM7DF-08AA _{xx} (standard)	

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxS_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-xxAF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

(4) These cables apply to Kinetix 6000 drives and MPM-Axxxx-2 motors (resolver feedback).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

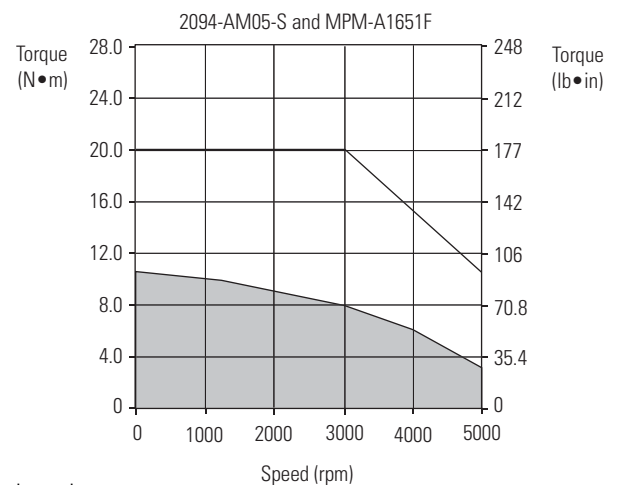
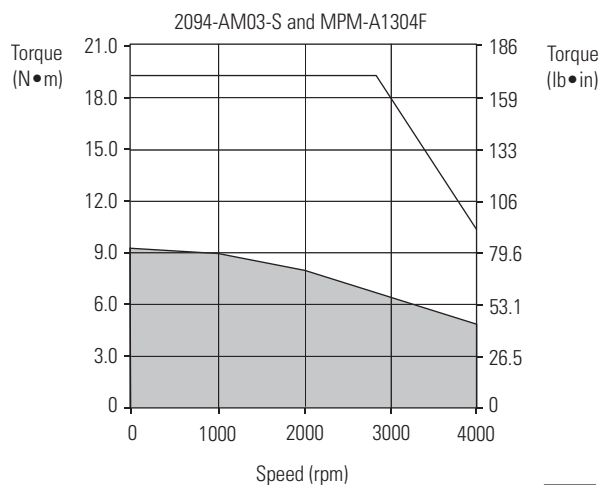
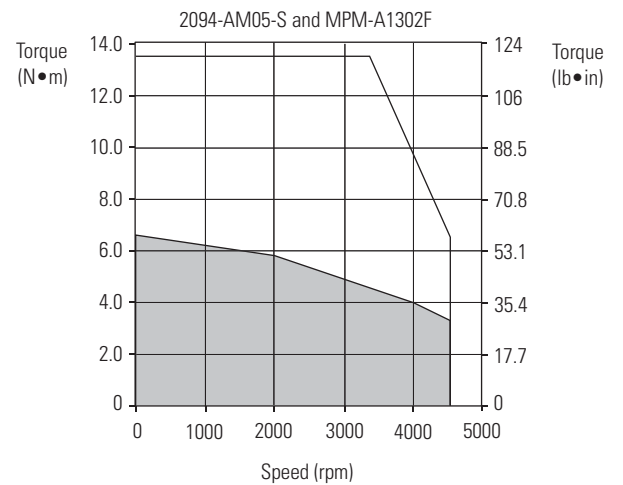
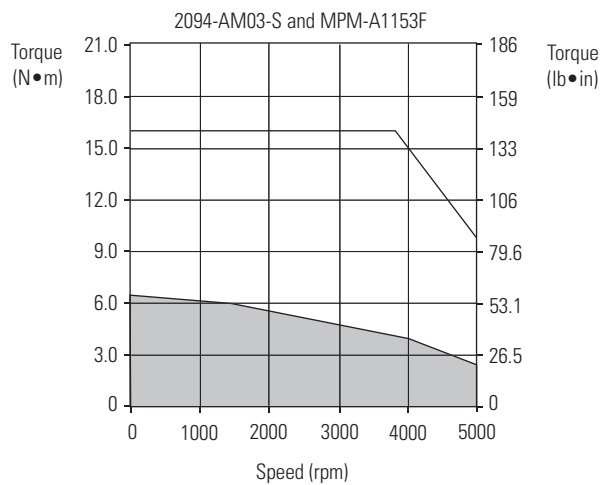
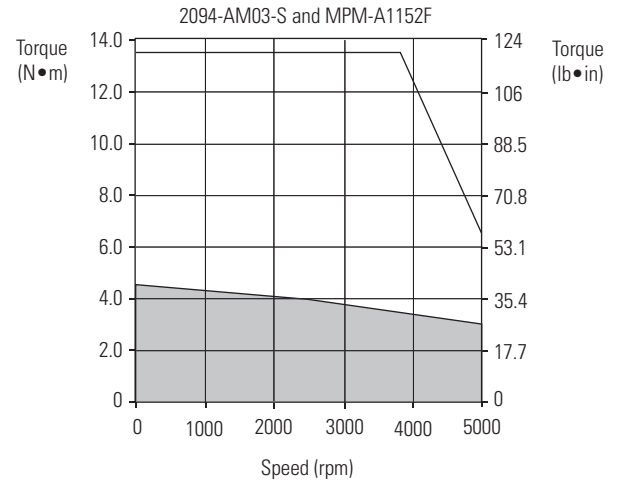
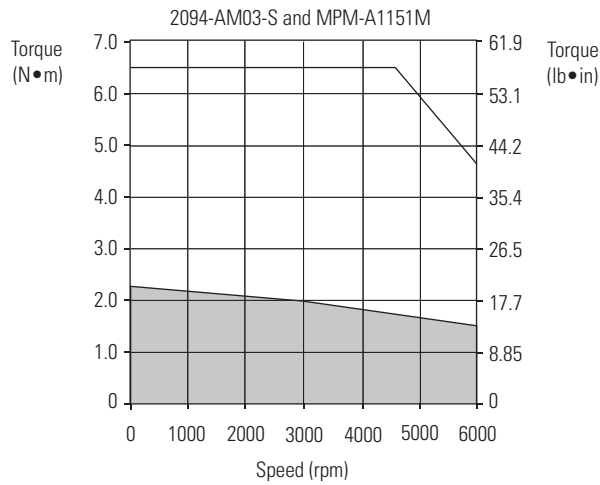
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPM Motor Performance Specifications with Kinetix 6000 (230V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 230V Drives
MPM-A1151M	6000	10.3	2.3 (20.3)	30.0	6.5 (57.5)	0.90	2094-AM02-S
				30.5	6.6 (58.4)		2094-AM03-S
MPM-A1152F	5000	14.9	4.7 (41.6)	30.0	9.9 (87.6)	1.40	2094-AM02-S
				44.8	13.5 (119)		2094-AM03-S
MPM-A1153F	5000	15.0	6.0 (53.1)	30.0	10.7 (94.7)	1.45	2094-AM02-S
		18.6	6.5 (57.5)	49.0	16.1 (142)		2094-AM03-S
MPM-A1302F	4500	19.8	6.6 (58.4)	49.0	13.2 (117)	1.65	2094-AM03-S
				50.2	13.5 (119)		2094-AM05-S
MPM-A1304F	4000	15.0	7.6 (67.2)	30.0	13.2 (117)	2.20	2094-AM02-S
		22.5	9.2 (81.4)	48.3	19.3 (171)		2094-AM03-S
MPM-A1651F	5000	24.5	9.3 (82.3)	49.0	15.2 (134)	2.50	2094-AM03-S
		35.6	10.7 (94.7)	73.4	20.3 (179)		2094-AM05-S
MPM-A1652F	4000	24.5	11.0 (97.3)	49.0	19.7 (174)	4.03	2094-AM03-S
		38.5	13.4 (119)	73.4	27.7 (245)		2094-AM05-S
MPM-A1653F	4000	24.5	11.7 (103)	49.0	21.1 (187)	5.10	2094-AM03-S
		48.7	18.6 (165)	73.4	29.6 (262)		2094-AM05-S

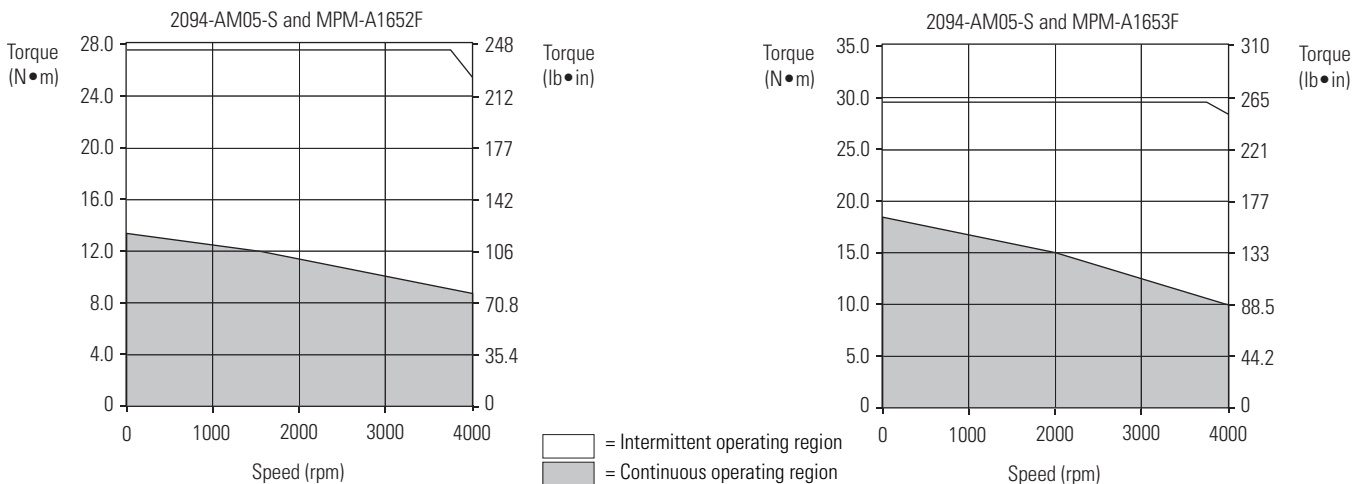
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 (230V) Drives/MP-Series Medium Inertia Motor Curves



= Intermittent operating region
 = Continuous operating region

Kinetix 6000 (230V) Drives/MP-Series Medium Inertia Motor Curves, Continued



Kinetix 6000 / Kinetix 6200/6500 (460V) Drives with MP-Series Medium Inertia Motors

This section provides system combination information for the Kinetix 6000 and Kinetix 6200/6500 (460V) drives when matched with MP-Series medium-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPM Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPM-B1151x, MPM-B1152x, MPM-B1153E, MPM-B1153F	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPM-B1302F, MPM-B1302M, MPM-B1304C, MPM-B1304E		
MPM-B1651C, MPM-B1652C		
MPM-B1153T	2090-XXNPMF-14Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPM-B1302T, MPM-B1304M		
MPM-B1651F, MPM-B1653C		
MPM-B1652E	2090-CPxM7DF-12AAxx (standard)	2090-CFBM4DF-CEAAxx ⁽⁴⁾ (standard) Resolver Feedback
MPM-B1651M, MPM-B1652F, MPM-B1653E	2090-XXNPMF-10Sxx ⁽²⁾	
MPM-B2152C, MPM-B2153B	2090-CPBM7DF-08AAxx (standard)	2090-CFBM4DF-CEAAxx ⁽⁴⁾ (standard) Resolver Feedback
MPM-B1653F		
MPM-B2152F, MPM-B2152M, MPM-B2153E, MPM-B2153F, MPM-B2154B, MPM-B2154E, MPM-B2154F	2090-CPBM7DF-08AAxx (standard)	2090-CFBM4DF-CEAAxx ⁽⁴⁾ (standard) Resolver Feedback

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

(4) These cables apply to Kinetix 6000 drives and MPM-Bxxxx-2 motors (resolver feedback).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPM Motor Performance Specifications with Kinetix 6200/6500 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6200/ Kinetix 6500 460V Drives
MPM-B1151F	5000	3.1	2.3 (20.3)	9.9	6.6 (58.4)	0.75	2094-BMP5-M
MPM-B1151T	7000	6.9	2.3 (20.3)	20.5	5.8 (51.3)	0.90	2094-BM01-M
MPM-B1152C	3000	4.1	5.0 (44.2)	12.4	13.5 (119)	1.20	2094-BM02-M
MPM-B1152F	5200	7.0	5.0 (44.2)	21.1	13.3 (118)	1.40	2094-BM01-M
MPM-B1152T	7000	12.6	5.0 (44.2)	36.5	13.1 (116)	1.40	2094-BM02-M
MPM-B1153E	3500	7.1	6.5 (57.5)	21.6	19.7 (174)	1.40	2094-BM01-M
MPM-B1153F	5500	10.5	6.4 (56.6)	32.0	19.7 (174)	1.40	2094-BM02-M
MPM-B1302F	4500	8.6	6.6 (58.4)	21.5	13.0 (115)	1.65	2094-BM01-M
MPM-B1302M	6000	14.4	6.6 (58.4)	32.4	13.3 (118)	1.65	2094-BM02-M
MPM-B1304C	2750	8.0	10.3 (91.1)	21.5	26.4 (233)	2.00	2094-BM01-M
MPM-B1304E	4000	12.3	10.2 (90.3)	34.2	27.1 (240)	2.20	2094-BM02-M
MPM-B1651C	3500	11.7	11.4 (101)	29.2	23.2 (205)	2.50	2094-BM02-M
MPM-B1652C	2500	13.2	16.4 (145)	33.6	40.2 (356)	3.80	2094-BM02-M

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

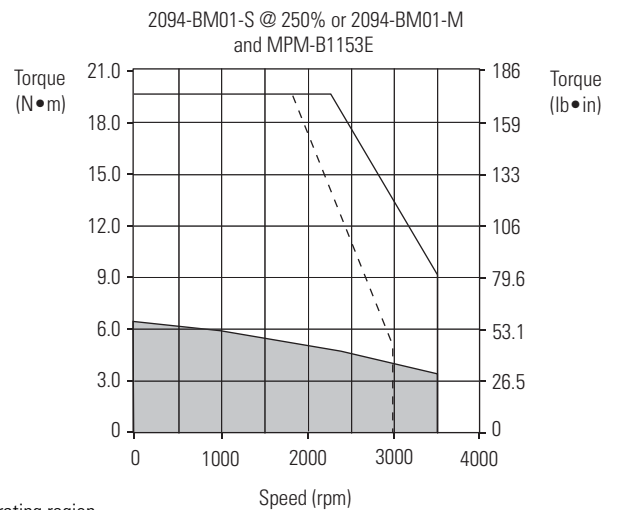
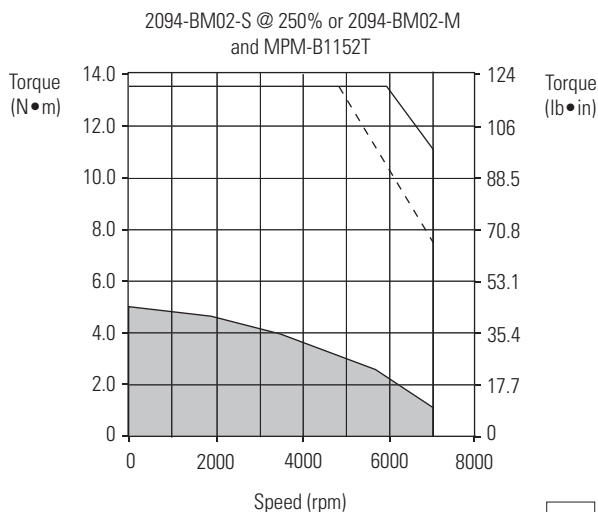
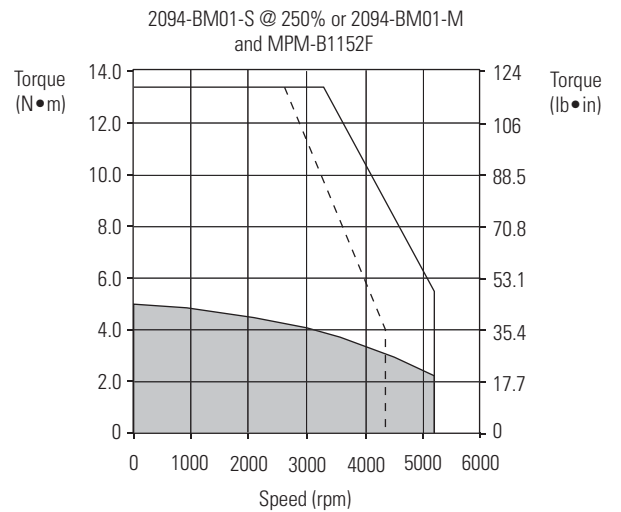
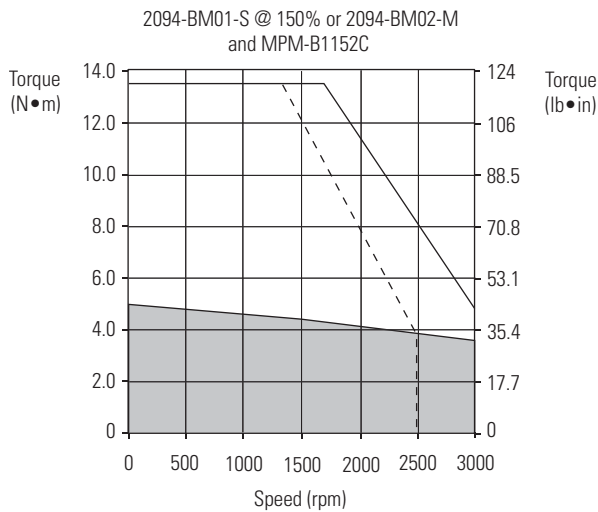
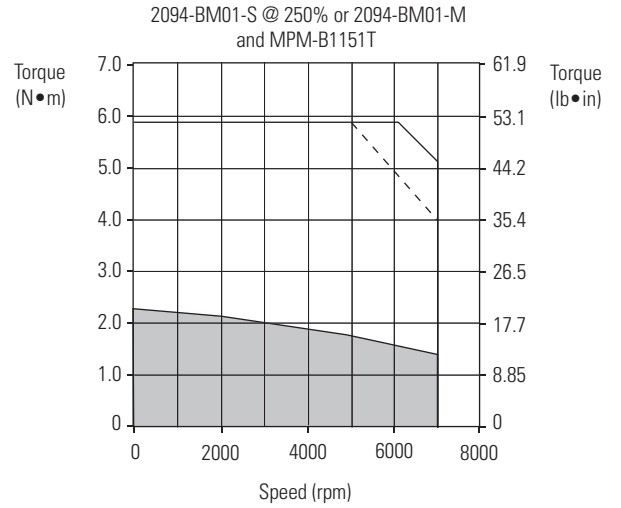
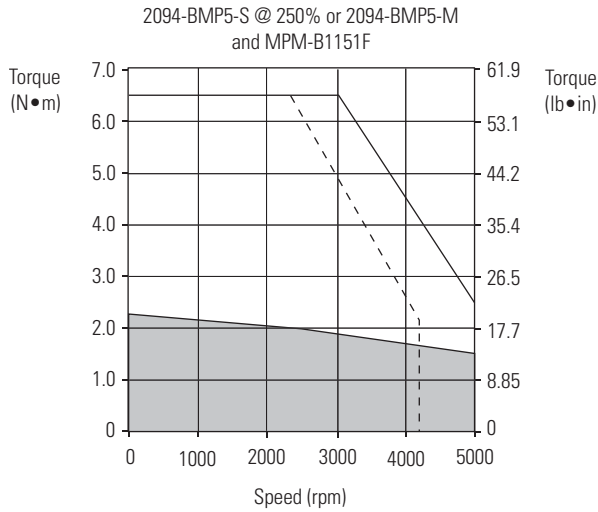
Bulletin MPM Motor Performance Specifications with Kinetix 6000 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 460V Drives
MPM-B1151F	5000	3.1	2.3 (20.3)	5.9	4.3 (38.0)	0.75	2094-BMP5-S @ 150%
				9.9	6.6 (58.4)		2094-BMP5-S @ 250%
MPM-B1151T	7000	6.9	2.3 (20.3)	13.0	4.1 (36.3)	0.90	2094-BM01-S @ 150%
				20.5	5.8 (51.3)		2094-BM01-S @ 250%
MPM-B1152C	3000	4.1	5.0 (44.2)	5.9	7.2 (63.7)	1.20	2094-BMP5-S @ 150%
				10.0	11.3 (100)		2094-BMP5-S @ 250%
				12.4	13.5 (119)		2094-BM01-S @ 150%
MPM-B1152F	5200	7.0	5.0 (44.2)	13.0	9.0 (79.6)	1.40	2094-BM01-S @ 150%
				21.1	13.3 (118)		2094-BM01-S @ 250%
MPM-B1152T	7000	12.6	5.0 (44.2)	21.8	8.5 (75.2)	1.40	2094-BM02-S @ 150%
				36.5	13.1 (116)		2094-BM02-S @ 250%
MPM-B1153E	3500	7.1	6.5 (57.5)	21.5	13.0 (115)	1.40	2094-BM01-S @ 150%
				21.6	19.7 (174)		2094-BM01-S @ 250%
MPM-B1153F	5500	10.5	6.4 (56.6)	21.8	14.4 (127)	1.40	2094-BM02-S @ 150%
				32.0	19.7 (174)		2094-BM02-S @ 250%
MPM-B1153T	7000	18.3	6.4 (56.6)	45.0	14.5 (128)	1.45	2094-BM03-S @ 150%
MPM-B1302F	4500	8.6	6.6 (58.4)	13.0	8.9 (78.8)	1.65	2094-BM01-S @ 150%
				21.5	13.0 (115)		2094-BM01-S @ 250%

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 460V Drives
MPM-B1302M	6000	14.4	6.6 (58.4)	21.8	9.9 (87.6)	1.65	2094-BM02-S @ 150%
				32.4	13.3 (118)		2094-BM02-S @ 250%
MPM-B1302T	7000	14.6	6.0 (53.1)	36.5	11.8 (104)	1.65	2094-BM02-S @ 250%
				43.4	13.3 (118)		2094-BM03-S @ 150%
MPM-B1304C	2750	8.0	10.3 (91.1)	13.0	17.6 (156)	2.00	2094-BM01-S @ 150%
				21.5	26.4 (233)		2094-BM01-S @ 250%
MPM-B1304E	4000	12.3	10.2 (90.3)	21.8	19.0 (168)	2.20	2094-BM02-S @ 150%
				34.2	27.1 (240)		2094-BM02-S @ 250%
MPM-B1304M	6000	21.8	10.4 (92.0)	45.0	21.5 (190)	2.20	2094-BM03-S @ 150%
				60.6	27.1 (240)		2094-BM05-S @ 150%
MPM-B1651C	3500	11.7	11.4 (101)	21.8	19.4 (172)	2.50	2094-BM02-S @ 150%
				29.2	23.2 (205)		2094-BM02-S @ 250%
MPM-B1651F	5000	20.4	11.4 (101)	45.0	21.6 (191)	2.50	2094-BM03-S @ 150%
				50.9	23.2 (205)		2094-BM05-S @ 150%
MPM-B1651M	5000	25.8	11.3 (100)	45.0	18.8 (166)	2.50	2094-BM03-S @ 150%
				56.8	21.4 (189)		2094-BM05-S @ 150%
MPM-B1652C	2500	13.2	16.4 (145)	21.8	28.7 (254)	3.80	2094-BM02-S @ 150%
				33.6	40.2 (356)		2094-BM02-S @ 250%
MPM-B1652E	3500	24.0	21.1 (187)	45.0	38.4 (340)	3500	2094-BM03-S @ 150%
				60.5	48.0 (425)		2094-BM05-S @ 150%
MPM-B1652F	4500	33.0	21.1 (187)	73.4	41.1 (364)	4.30	2094-BM05-S @ 150%
MPM-B1653C	2500	23.0	26.7 (236)	45.0	55.0 (487)	4.60	2094-BM03-S @ 150%
				59.2	67.7 (599)		2094-BM05-S @ 150%
MPM-B1653E	3500	30.0	26.8 (237)	45.0	42.5 (376)	5.10	2094-BM03-S @ 150%
		31.0		72.9	62.0 (549)		2094-BM05-S @ 150%
MPM-B1653F	4000	40.1	31.0 (274)	73.4	47.8 (423)	5.10	2094-BM05-S @ 150%
MPM-B2152C	2500	30.0	36.7 (325)	45.0	60.3 (534)	5.60	2094-BM03-S @ 150%
		31.5		55.4	72.2 (639)		2094-BM05-S @ 150%
MPM-B2152F	4500	48.9	34.1 (302)	73.4	56.2 (497)	5.90	2094-BM05-S @ 150%
MPM-B2152M	5000	48.9	34.1 (302)	73.4	51.0 (451)	5.90	2094-BM05-S @ 150%
MPM-B2153B	2000	27.6	48.0 (425)	45.0	80.0 (708)	6.80	2094-BM03-S @ 150%
				60.0	101.2 (895)		2094-BM05-S @ 150%
MPM-B2153E	3000	45.5	47.9 (424)	73.4	79.4 (703)	7.20	2094-BM05-S @ 150%
MPM-B2153F	3800	48.9	45.6 (403)	73.4	75.0 (664)		
MPM-B2154B	2000	40.7	62.7 (555)	73.4	121 (1071)	6.90	
MPM-B2154E	3000	48.9	55.9 (495)	73.4	87.7 (776)	7.50	2094-BM05-S @ 150%
MPM-B2154F	3300	48.9	56.2 (497)	73.4	78.8 (697)		

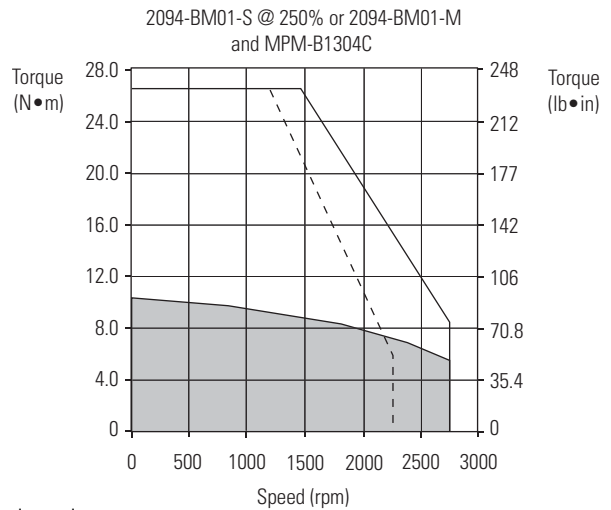
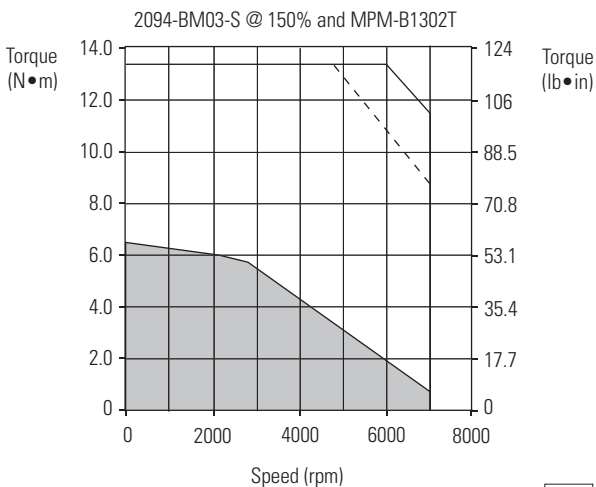
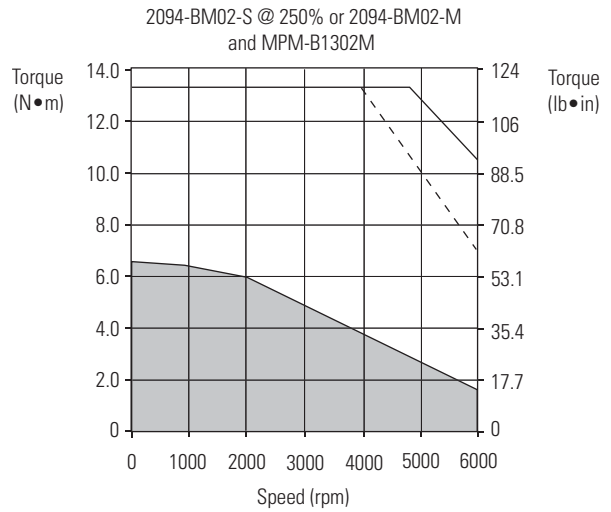
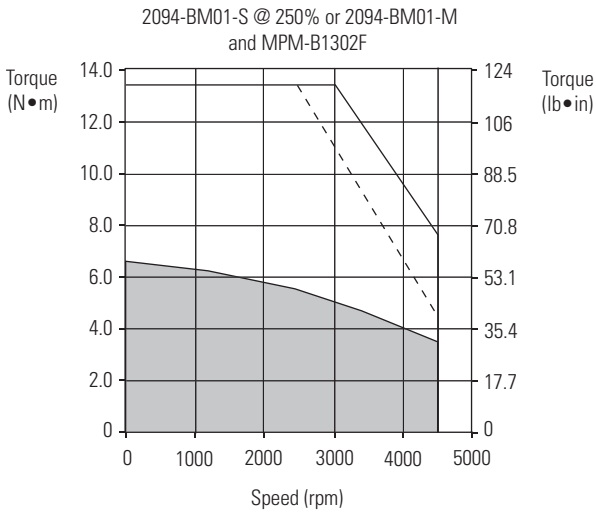
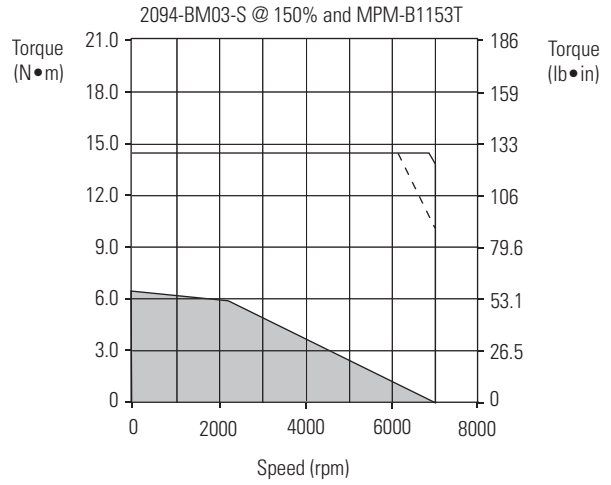
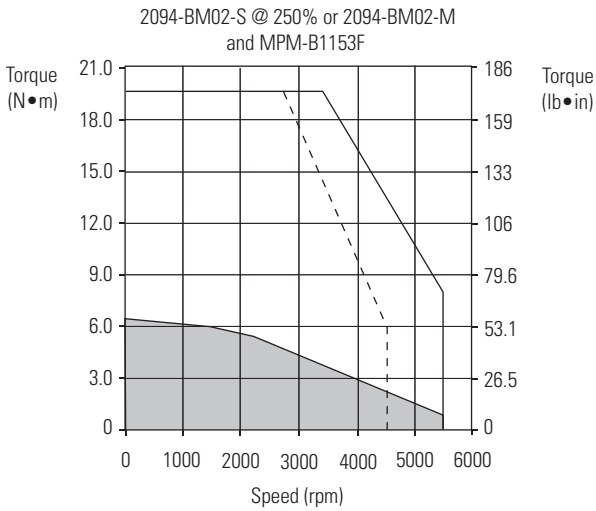
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 / Kinetix 6200/6500 (460V) Drives/MP-Series Medium Inertia Motor Curves



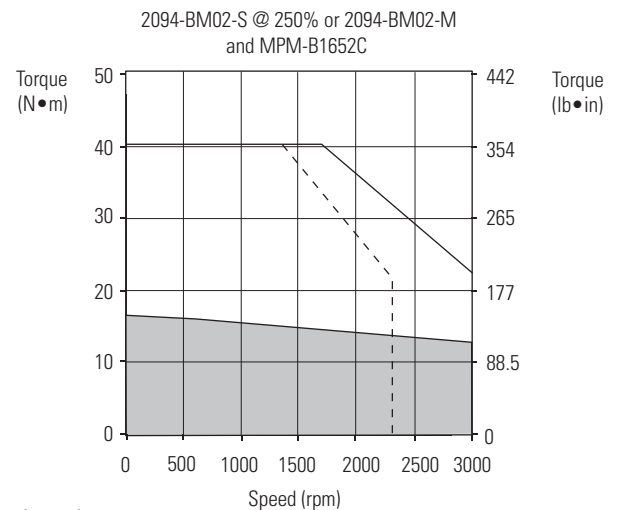
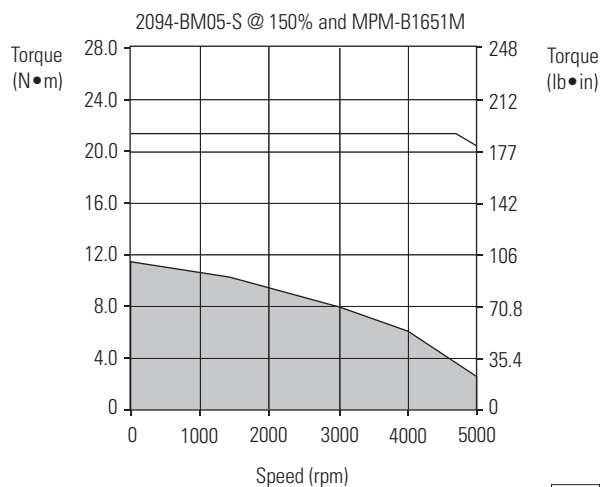
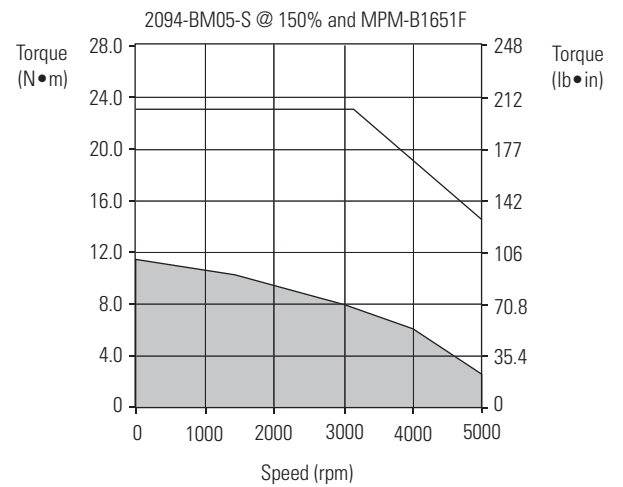
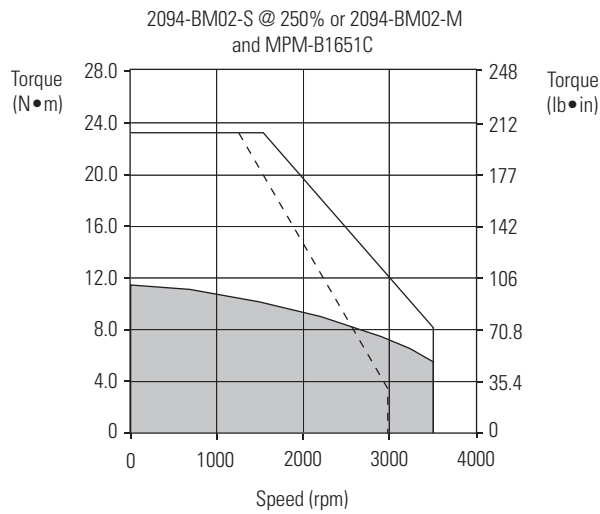
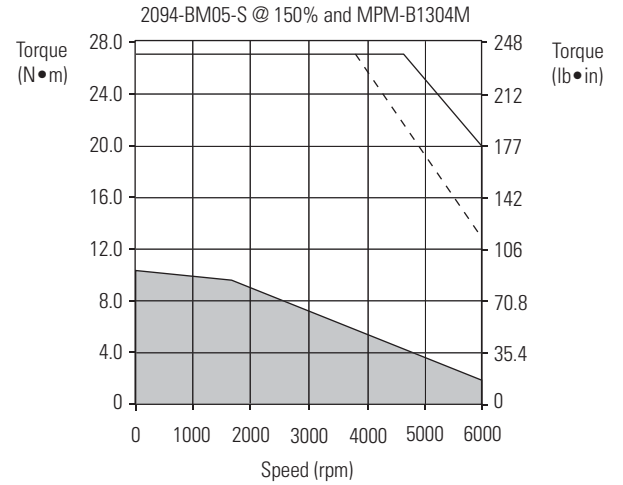
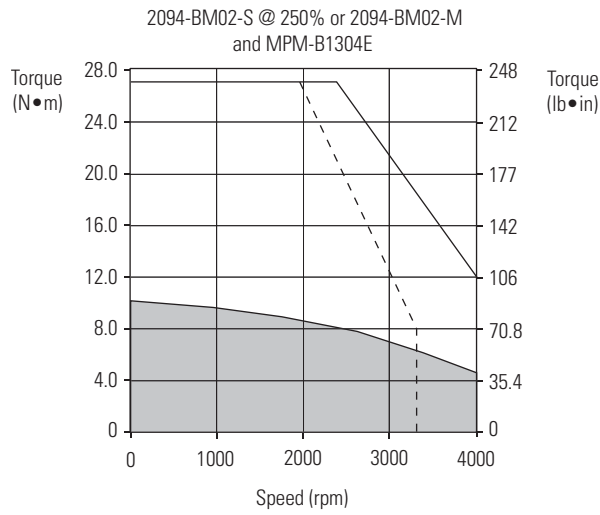
= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 / Kinetix 6200/6500 (460V) Drives/MP-Series Medium Inertia Motor Curves, Continued



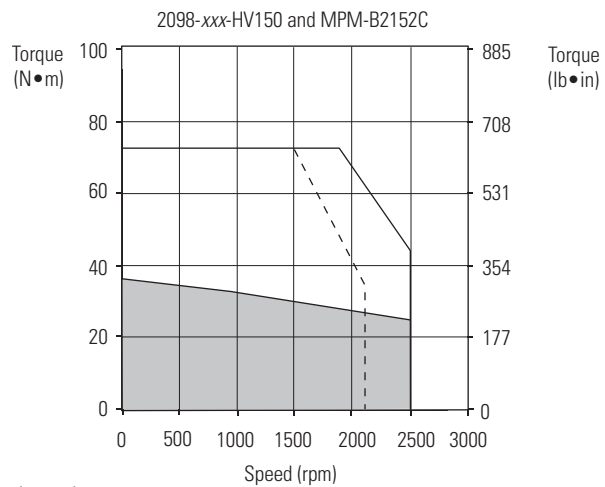
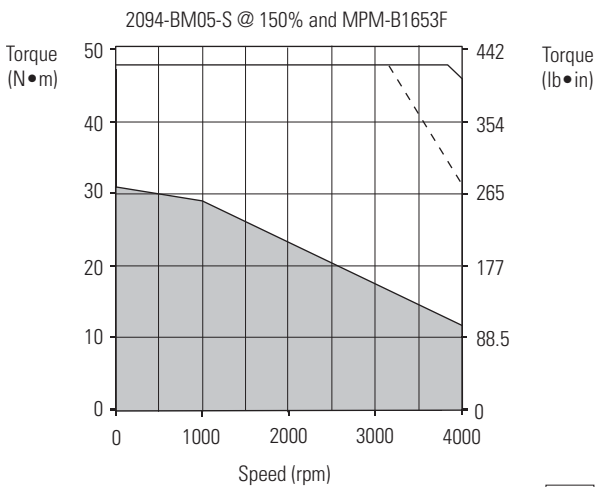
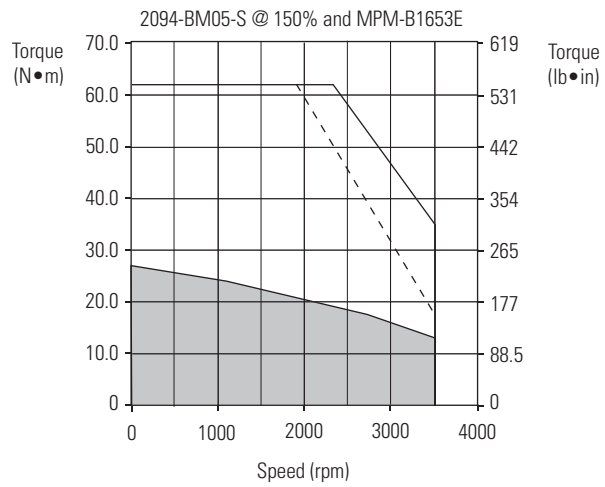
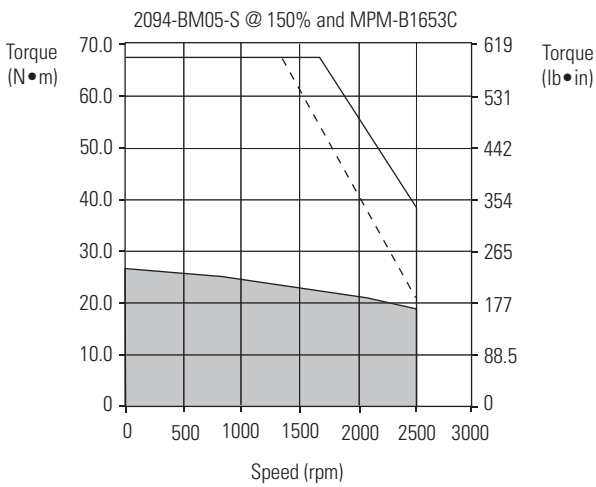
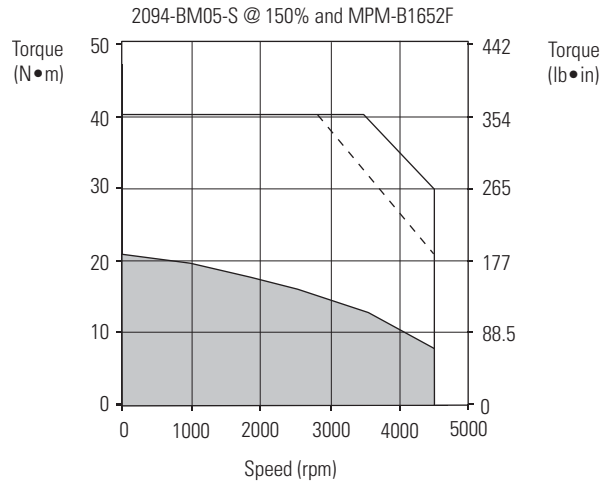
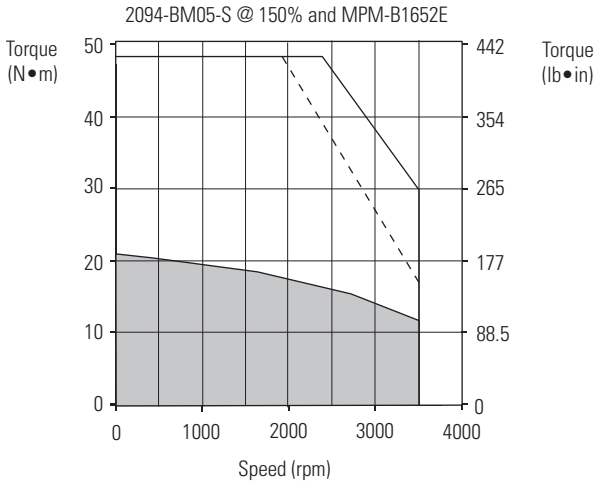
= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 / Kinetix 6200/6500 (460V) Drives/MP-Series Medium Inertia Motor Curves, Continued



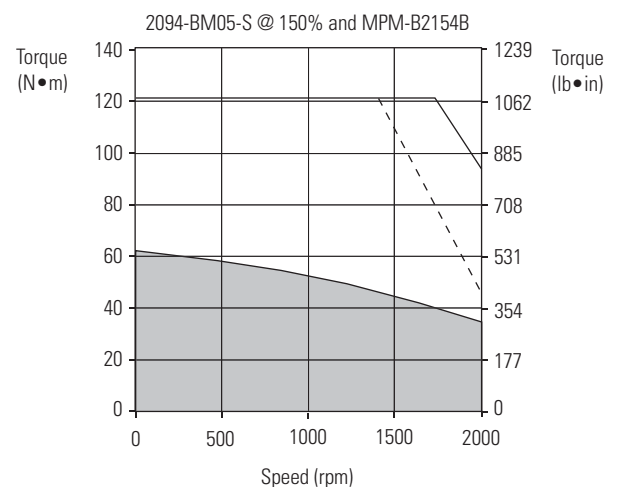
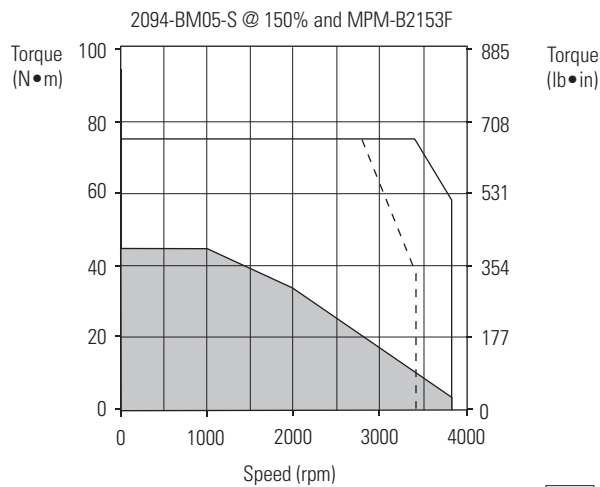
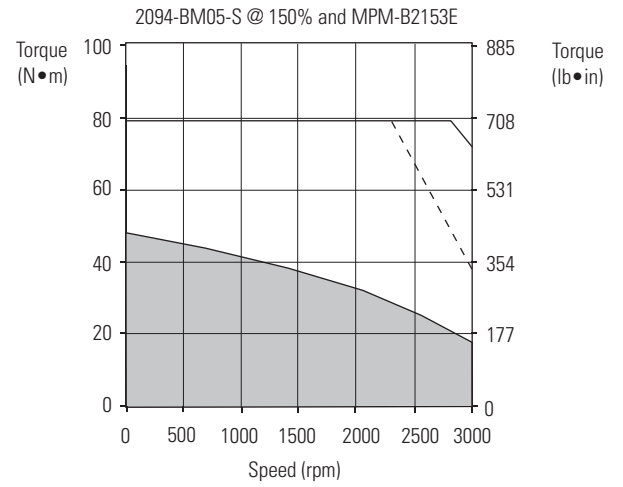
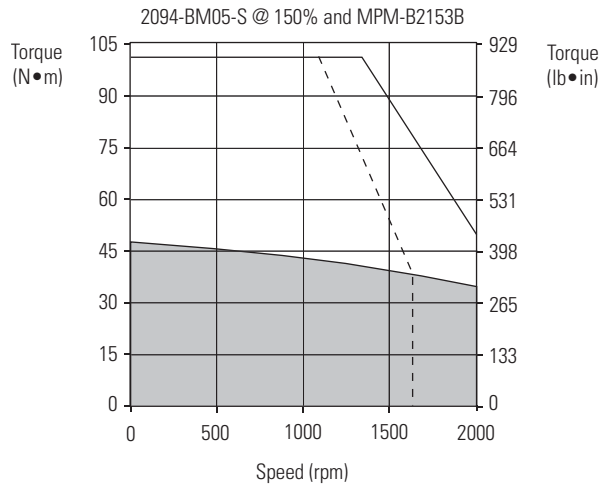
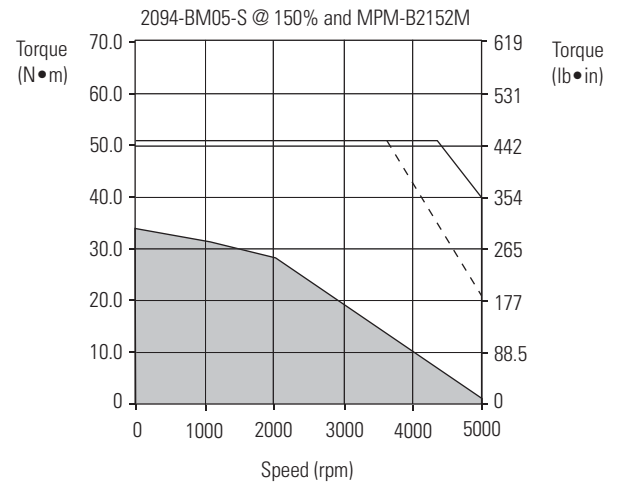
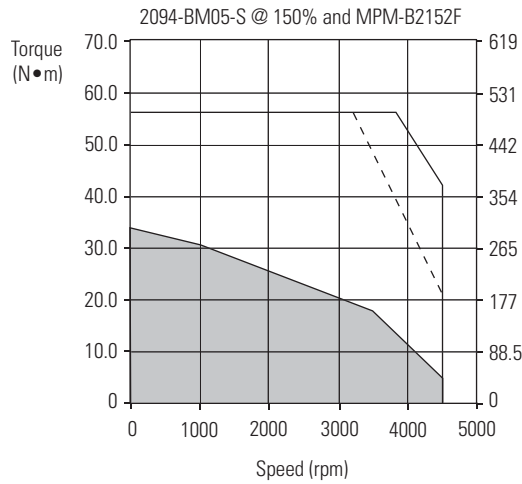
= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 / Kinetix 6200/6500 (460V) Drives/MP-Series Medium Inertia Motor Curves, Continued



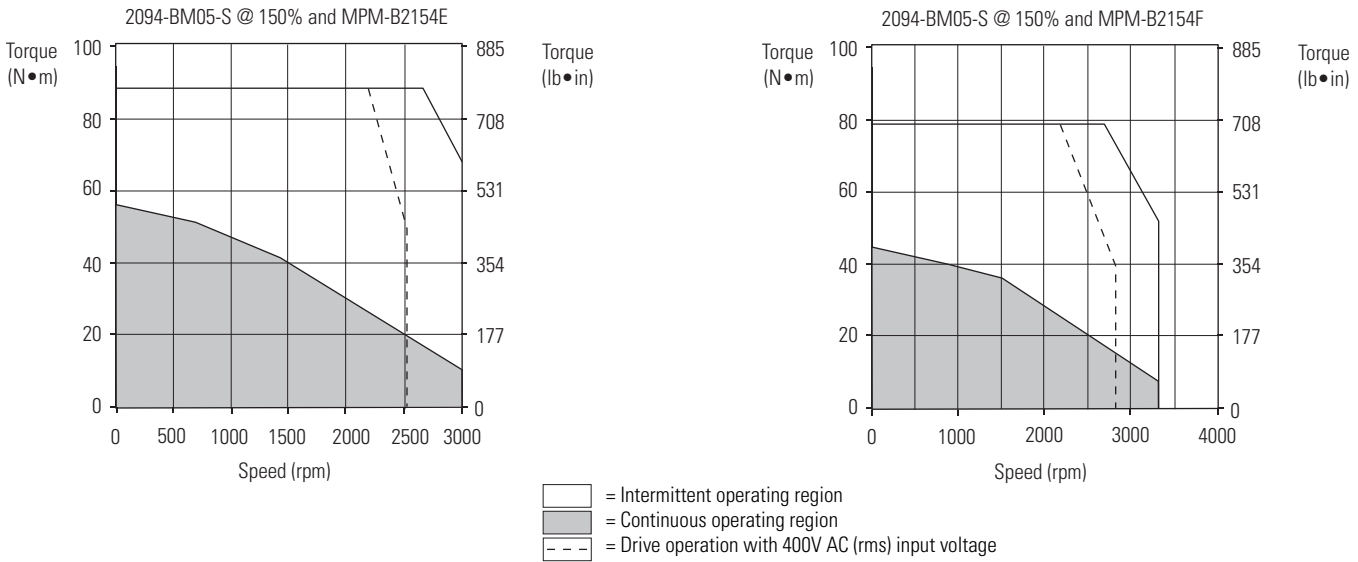
= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 / Kinetix 6200/6500 (460V) Drives/MP-Series Medium Inertia Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 / Kinetix 6200/6500 (460V) Drives/MP-Series Medium Inertia Motor Curves, Continued



Kinetix 6000 (230V) Drives with MP-Series Food Grade Motors

This section provides system combination information for the Kinetix 6000 (230V) drives when matched with MP-Series food-grade motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPF Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPF-A310P, MPF-A320H, MPF-A320P, MPF-A330P	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
MPF-A430H		
MPF-A430P MPF-A4540F, MPF-A4530K	2090-XXNPMF-14S _{xx} ⁽²⁾	
MPF-A540K	2090-CPBM7DF-08AA _{xx} (standard)	

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxS_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-xxAF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

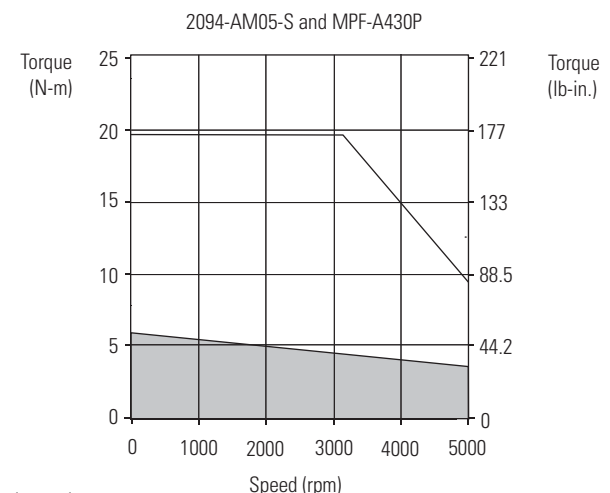
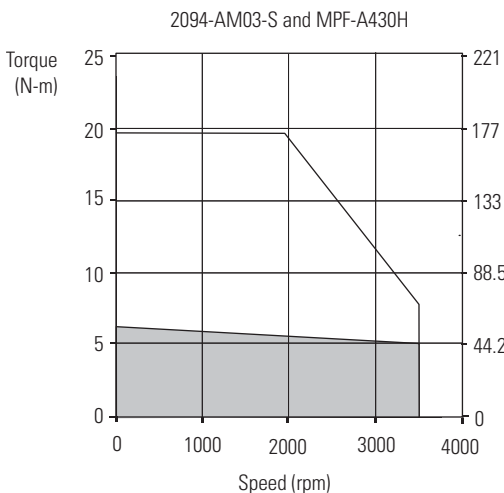
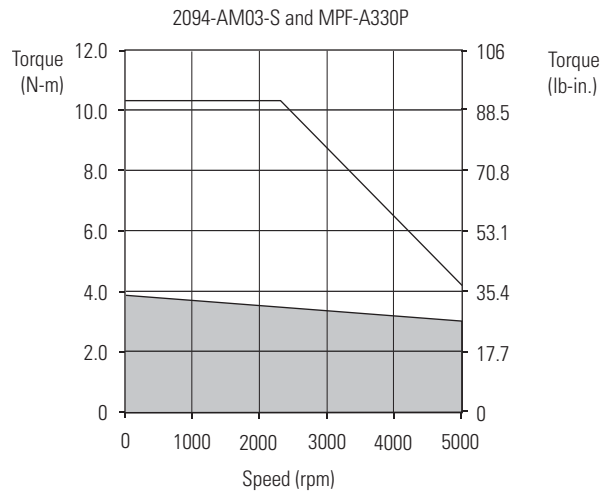
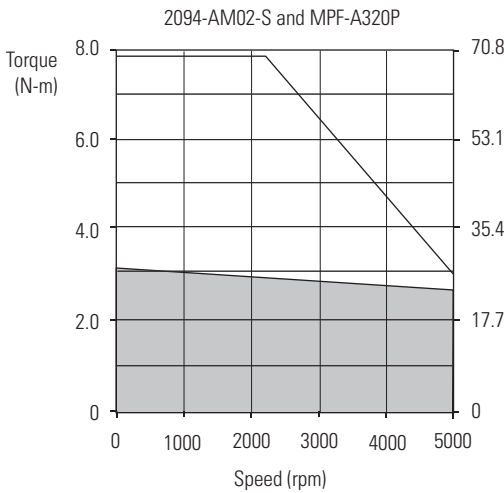
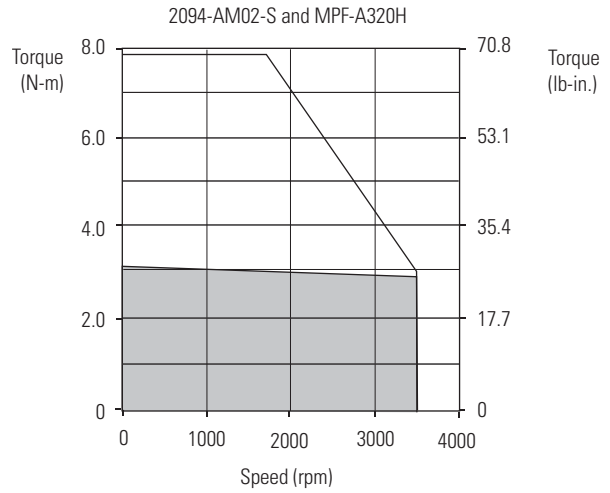
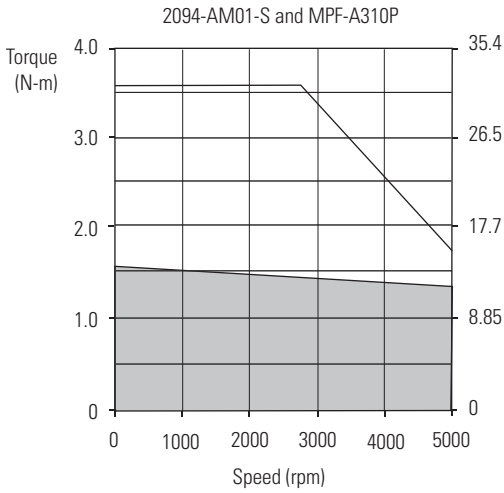
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPF Motor Performance Specifications with Kinetix 6000 (230V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 230V Drives
MPF-A310P	5000	4.91	1.58 (14.0)	10.5	2.91 (25.7)	0.73	2094-AMP5-S
				14.0	3.61 (31.9)		2094-AM01-S
MPF-A320H	3500	6.10	3.05 (27.0)	17.0	6.97 (61.6)	1.0	2094-AM01-S
				19.3	7.91 (70.0)		2094-AM02-S
MPF-A320P	5000	8.50	2.88 (25.5)	17.0	5.07 (44.8)	1.3	2094-AM01-S
		9.00	3.05 (27.0)	29.5	7.91 (70.0)		2094-AM02-S
MPF-A330P	5000	12.0	3.85 (34.0)	30.0	8.47 (74.9)	1.6	2094-AM02-S
				38.0	10.32 (91.2)		2094-AM03-S
MPF-A430H	3500	12.2	6.21 (55.0)	30.0	13.20 (117)	1.8	2094-AM02-S
				45.0	19.82 (175)		2094-AM03-S
MPF-A430P	5000	15.0	5.28 (46.6)	30.0	9.99 (88.3)	1.9	2094-AM02-S
		16.80	5.94 (52.5)	49.0	15.36 (136)		2094-AM03-S
				67.0	19.80 (175)		2094-AM05-S
MPF-A4530K	4000	15.0	6.17 (54.5)	30.0	11.30 (44.8)	2.3	2094-AM02-S
		19.50	8.08 (71.4)	49.0	17.01 (150)		2094-AM03-S
				62.0	20.30 (179)		2094-AM05-S
MPF-A4540F	3000	15.0	8.25 (72.9)	30.0	15.30 (135)	2.5	2094-AM02-S
		18.40	10.15 (89.7)	49.0	23.56 (208)		2094-AM03-S
				58.0	27.10 (239)		2094-AM05-S
MPF-A540K	4000	24.5	11.40 (100)	49.0	21.68 (192)	4.1	2094-AM03-S
		41.5	19.42 (171)	73.4	31.55 (279)		2094-AM05-S

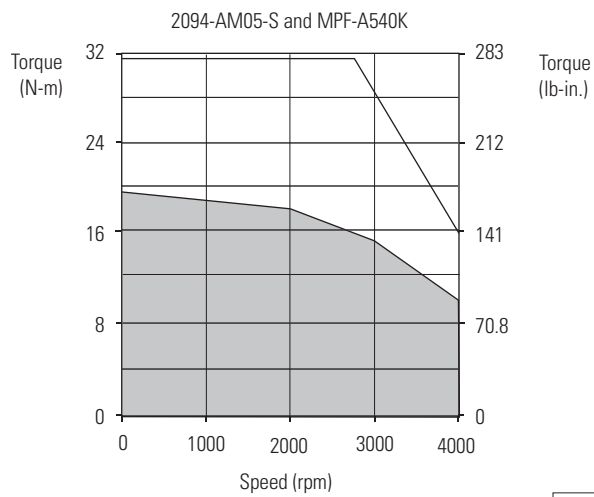
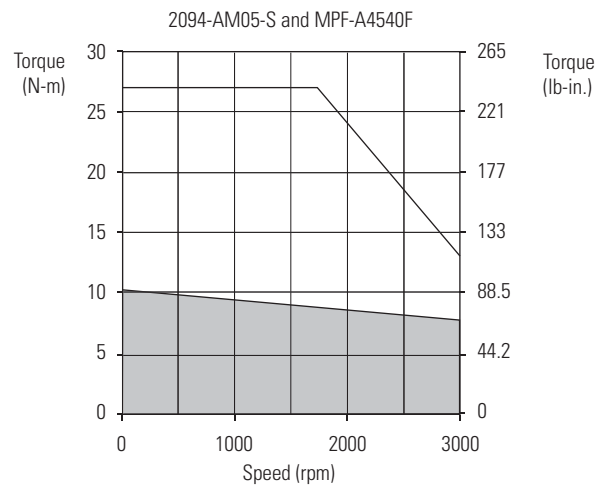
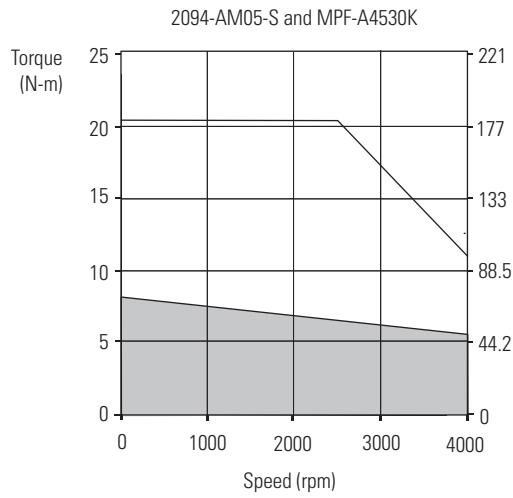
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 (230V) Drives/MP-Series Food Grade Motor Curves



□ = Intermittent operating region
 ■ = Continuous operating region

Kinetix 6000 (230V) Drives/MP-Series Food Grade Motor Curves



= Intermittent operating region
 = Continuous operating region

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives with MP-Series Food Grade Motors

This section provides system combination information for the Kinetix 6000 and the Kinetix 6200/6500 (460V) drives when matched with MP-Series food-grade motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

IMPORTANT

When using the Kinetix 6000 (series B) drives, configured for 250% peak performance, you can usually achieve full motor performance with a smaller drive. The drive/motor performance specifications table reflects the standard 150% peak current rating and the peak-enhanced rating for the series-B drive. The torque/speed curves include the smallest drive that provides full motor performance.

Refer to [Kinetix 6000 IAM/AM Module Series Change](#) on [page 268](#) for more information about using the peak enhancement feature.

Kinetix 6200 and Kinetix 6500 drives are configured for 250% peak performance by default. Expect the same peak performance from Kinetix 6200/6500 drives and Kinetix 6000 (series B) drives configured for 250% peak performance.

Bulletin MPF Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPF-B310P, MPF-B320P, MPF-B330P	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
MPF-B430P		
MPF-B4530K, MPF-B4540F	2090-XXNPMF-10S _{xx} ⁽²⁾	
MPF-B540K		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxS_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-xxAF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPF Motor Performance Specifications with Kinetix 6200/6500 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6200/ Kinetix 6500 460V Drives
MPF-B310P	5000	2.30	1.60 (14)	7.10	3.6 (32)	0.77	2094-BMP5-M
MPF-B320P	5000	4.0	2.90 (25.6)	9.90	6.0 (53.1)	1.5	2094-BMP5-M
		4.24	3.10 (27)	14.0	7.8 (69)		2094-BM01-M
MPF-B330P	5000	4.0	2.90 (25.6)	9.90	6.5 (57.5)	1.6	2094-BMP5-M
		5.70	4.18 (37)	19.0	11.1 (98)		2094-BM01-M
MPF-B430P	5000	8.60	6.20 (54.9)	21.5	13.9 (123)	2.0	2094-BM01-M
		9.20	6.55 (58)	32.0	19.8 (175)		2094-BM02-M
MPF-B4530K	4000	8.60	7.10 (62.8)	21.5	15.1 (133)	2.4	2094-BM01-M
		9.90	8.25 (73)	31.0	20.3 (179)		2094-BM02-M
MPF-B4540F	3000	8.60	9.50 (84.1)	21.5	20.9 (185)	2.5	2094-BM01-M
		9.10	10.20 (90)	29.0	27.1 (240)		2094-BM02-M

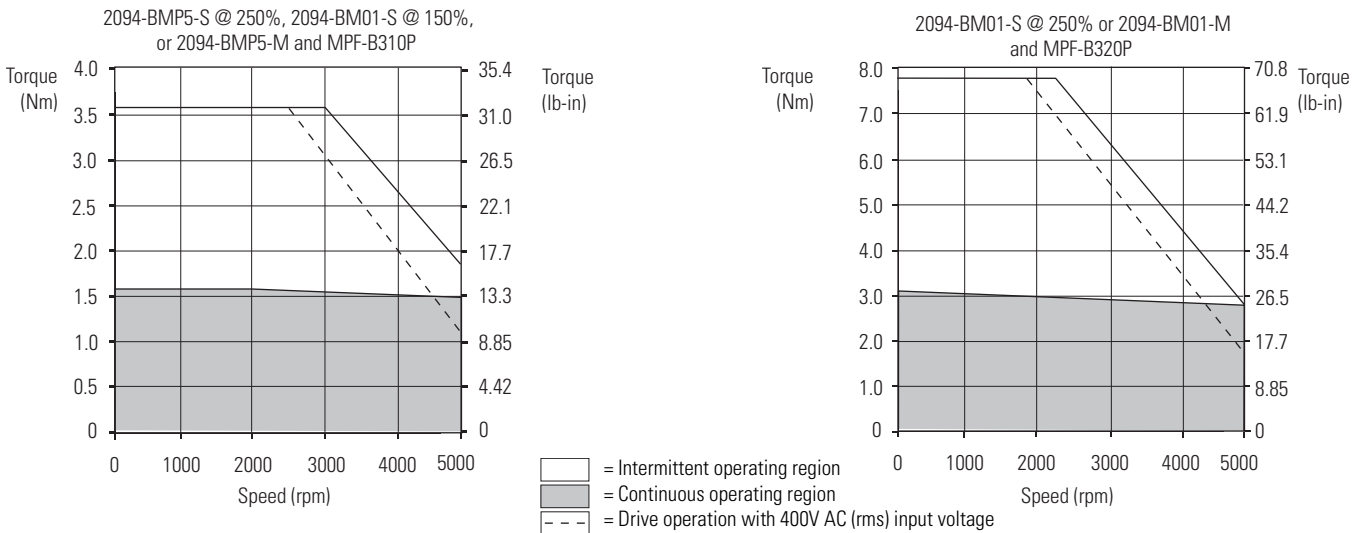
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Bulletin MPF Motor Performance Specifications with Kinetix 6000 (460V) Drives

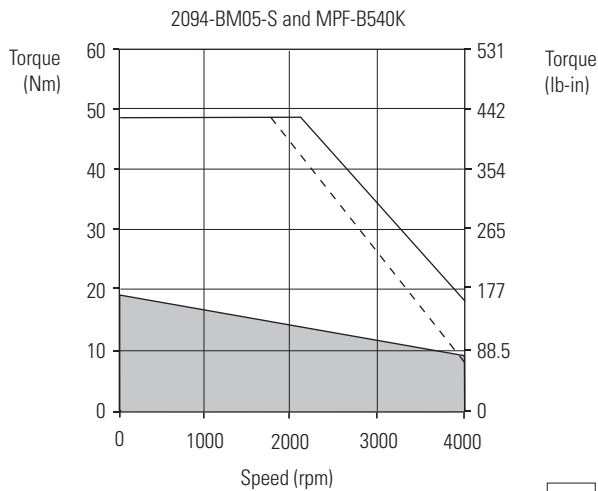
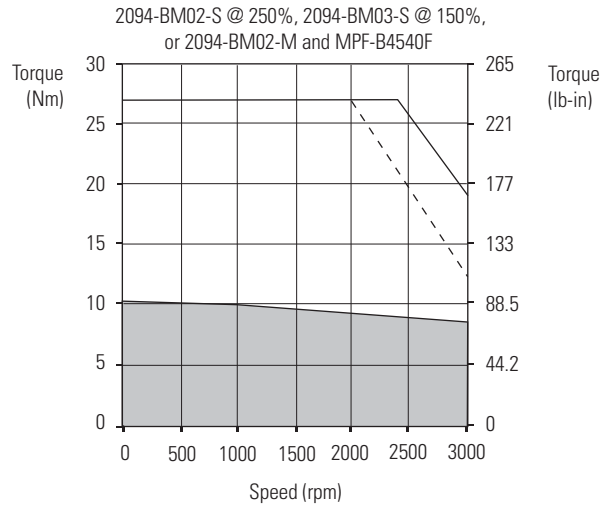
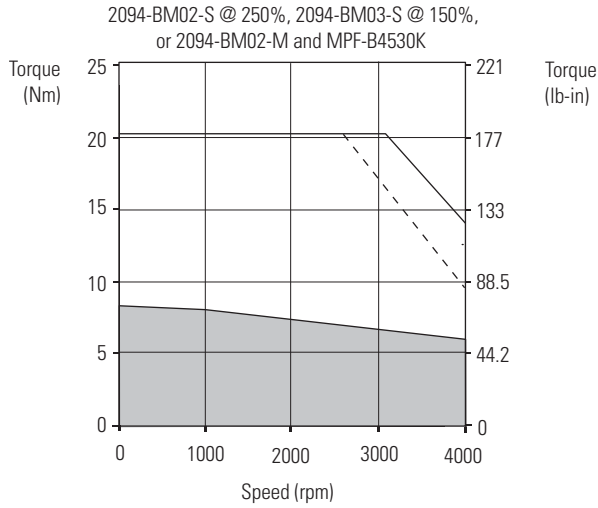
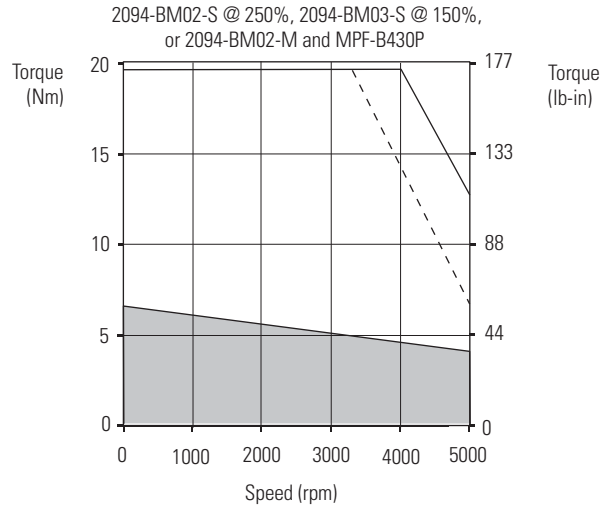
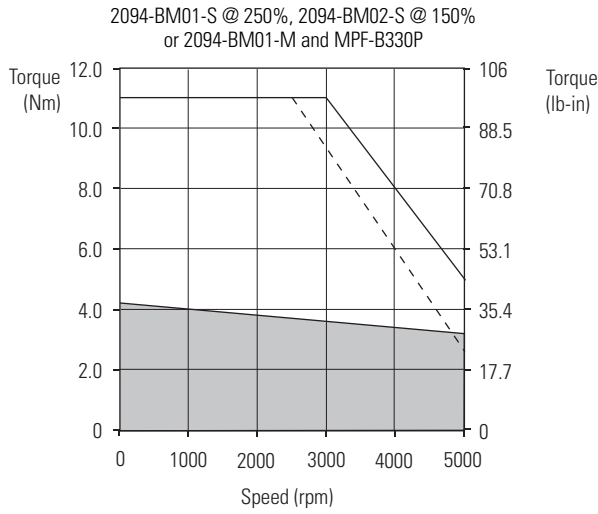
Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 460V Drives
MPF-B310P	5000	2.30	1.6 (14)	5.90	3.2 (28)	0.77	2094-BMP5-S @ 150%
				7.10	3.6 (32)		2094-BMP5-S @ 250%
							2094-BM01-S @ 150%
MPF-B320P	5000	4.00	2.90 (26)	5.90	3.9 (34)	1.5	2094-BMP5-S @ 150%
		4.24	3.10 (27)	13.0	7.5 (66)		2094-BM01-S @ 150%
				14.0	7.8 (69)		2094-BM01-S @ 250%
MPF-B330P	5000	5.70	4.18 (37)	13.0	8.2 (72)	1.6	2094-BM01-S @ 150%
				19.0	11.1 (98)		2094-BM01-S @ 250%
							2094-BM02-S @ 150%
MPF-B430P	5000	9.20	6.55 (58)	21.8	14.2 (125)	2.0	2094-BM02-S @ 150%
				32.0	19.8 (175)		2094-BM02-S @ 250%
							2094-BM03-S @ 150%
MPF-B4530K	4000	9.90	8.25 (73)	21.8	15.4 (136)	2.4	2094-BM02-S @ 150%
				31.0	20.3 (179)		2094-BM02-S @ 250%
							2094-BM03-S @ 150%
MPF-B4540F	3000	9.10	10.20 (90)	21.8	21.4 (189)	2.5	2094-BM02-S @ 150%
				29.0	27.1 (240)		2094-BM02-S @ 250%
							2094-BM03-S @ 150%
MPF-B540K	4000	14.6	13.7 (121)	21.8	19.6 (173)	4.1	2094-BM02-S @ 150%
		20.5	19.4 (171)	45.0	37.9 (335)		2094-BM03-S @ 150%
				60.0	48.6 (430)		2094-BM05-S @ 150%

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/MP-Series Food Grade Motor Curves



Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/MP-Series Food Grade Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 (230V) Drives with MP-Series Stainless Steel Motors

This section provides system combination information for the Kinetix 6000 (230V) drives when matched with MP-Series stainless-steel motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPS Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPS-A330P	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPS-A4540F		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPXM7DF-xxAFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

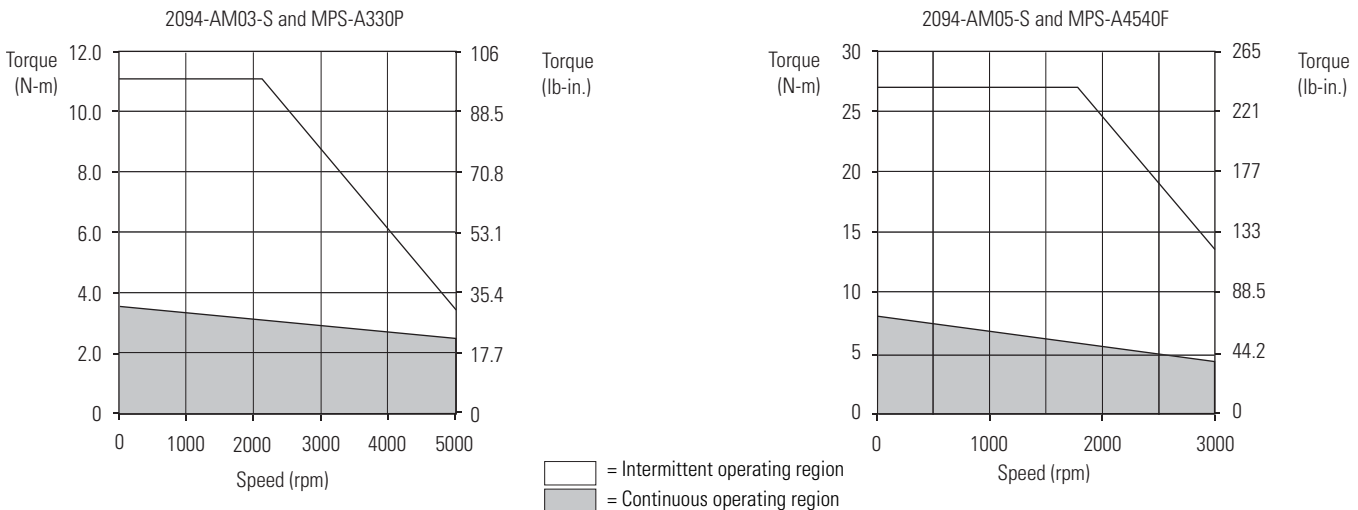
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPS Motor Performance Specifications with Kinetix 6000 (230V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 230V Drives
MPS-A330P	5000	8.50	3.10 (27)	17.0	5.80 (51)	1.3	2094-AM01-S
				30.0	9.30 (82)		2094-AM02-S
				38.0	11.10 (98)		2094-AM03-S
MPS-A4540F	3000	14.4	8.1 (72)	30.0	15.9 (140)	1.4	2094-AM02-S
				49.0	24.2 (214)		2094-AM03-S
				56.0	27.1 (240)		2094-AM05-S

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 (230V) Drives/MP-Series Stainless Steel Motor Curves



Kinetix 6000 / Kinetix 6200/6500 (460V) Drives with MP-Series Stainless Steel Motors

This section provides system combination information for the Kinetix 6000 and the Kinetix 6200/ Kinetix 6500 (460V) drives when matched with MP-Series stainless-steel motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

IMPORTANT

When using the Kinetix 6000 (series B) drives, configured for 250% peak performance, you can usually achieve full motor performance with a smaller drive. The drive/motor performance specifications table reflects the standard 150% peak current rating and the peak-enhanced rating for the series-B drive. The torque/speed curves include the smallest drive that provides full motor performance.

Refer to [Kinetix 6000 IAM/AM Module Series Change](#) on [page 268](#) for more information about using the peak enhancement feature.

Kinetix 6200 and Kinetix 6500 drives are configured for 250% peak performance by default. Expect the same peak performance from Kinetix 6200/6500 drives and Kinetix 6000 (series B) drives configured for 250% peak performance.

Bulletin MPS Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
MPS-B330P	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
MPS-B4540F		
MPS-B560F	2090-XXNPMF-14S _{xx} ⁽²⁾	

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxS_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-xxAF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length *xx* is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPS Motor Performance Specifications with Kinetix 6200/6500 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6200/ Kinetix 6500 460V Drives
MPS-B330P	5000	4.0	3.0 (26.5)	9.90	6.6 (58.4)	1.3	2094-BM01-M
		4.9	3.6 (32)	19.0	11.0 (97.2)		2094-BM01-M
MPS-B4540F	3000	8.6	8.4 (74.3)	21.5	22.7 (201)	1.4	2094-BM01-M
		7.1	8.1 (72)	26.0	27.1 (240)		2094-BM02-M

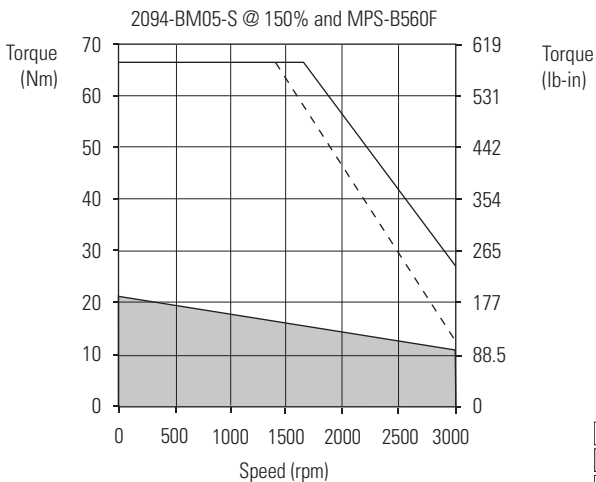
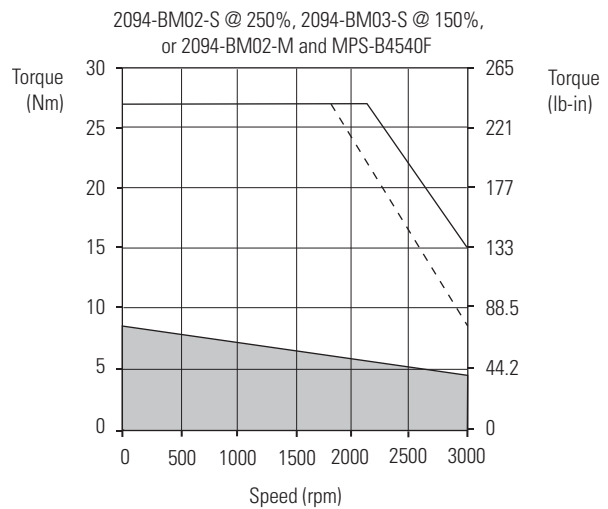
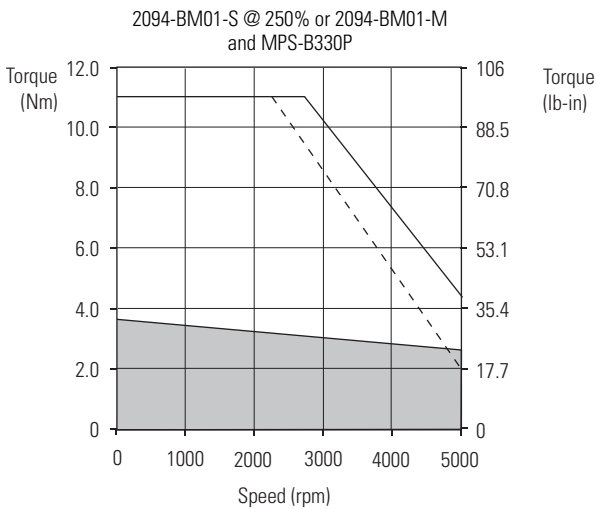
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Bulletin MPS Motor Performance Specifications with Kinetix 6000 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 460V Drives
MPS-B330P	5000	4.9	3.60 (32)	13.0	8.2 (72.5)	1.3	2094-BM01-S @ 150%
				19.0	11.0 (97.2)		2094-BM01-S @ 250%
MPS-B4540F	3000	7.1	8.1 (72)	13.0	14.5 (128)	1.4	2094-BM01-S @ 150%
				21.8	23.2 (205)		2094-BM02-S @ 150%
				26.0	27.1 (240)		2094-BM02-S @ 250%
MPS-B560F	3000	17.0	21.5 (190)	45.0	49.2 (435)	3.5	2094-BM03-S @ 150%
				68.0	67.7 (599)		2094-BM05-S @ 150%

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/MP-Series Stainless Steel Motor Curves



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives with RDD-Series Direct Drive Motors

This section provides system combination information for the Kinetix 6000 and Kinetix 6200/6500 (460V) drives when matched with RDD-Series direct drive motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin RDB Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
RDB-B21519, RDB-B21529	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback Kinetix 6200/6500 support for Heidenhain EnDat high-resolution feedback has not been implemented.
RDB-B29014, RDB-B29016, RDB-B29024		
RDB-B2151C, RDB-B21539	2090-XXNPMF-14S _{xx} ⁽²⁾	
RDB-B29019, RDB-B29034		
RDB-B2152C	2090-CPxM7DF-12AA _{xx} (standard)	
RDB-B29026		
RDB-B2153C	2090-XXNPMF-10S _{xx} ⁽²⁾	
RDB-B29036, RDB-B41014		
RDB-B29029, RDB-B41016, RDB-B41024	2090-CPBM7DF-08AA _{xx} (standard)	

(1) For Kinetix 6200/6500 drives, use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on the drive end.

For Kinetix 6000 drives, use low-profile feedback module (catalog number 2090-K6CK-KENDAT). Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxS_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-xxAF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length *xx* is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin RDB Motor Performance Specifications with Kinetix 6200/6500 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6200/ Kinetix 6500 460V Drives
RDB-B21519	1235	10.3	31.2 (276)	27.3	83.1 (735)	3.64	2094-BM02-M
RDB-B21529	1035	12.2	43.4 (384)	32.8	111 (982)	4.33	2094-BM02-M
RDB-B29014	450	5.9	48.9 (433)	17.6	110 (973)	1.97	2094-BM01-M
RDB-B29016	785	10.0	48.9 (433)	31.0	110 (973)	3.18	2094-BM02-M
RDB-B29024	435	11.0	97.8 (865)	33.0	214 (1894)	3.33	2094-BM02-M

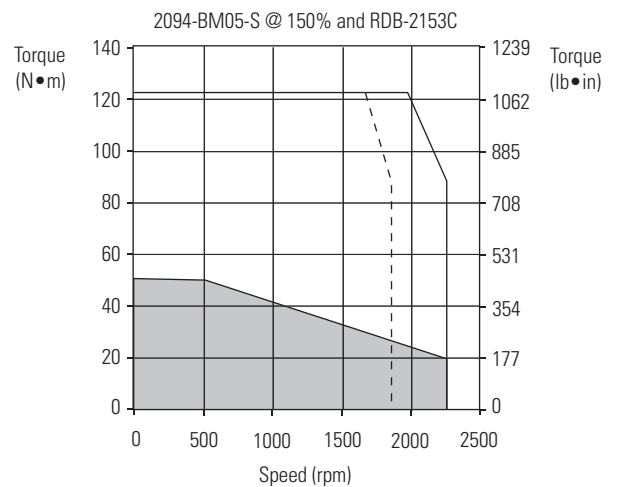
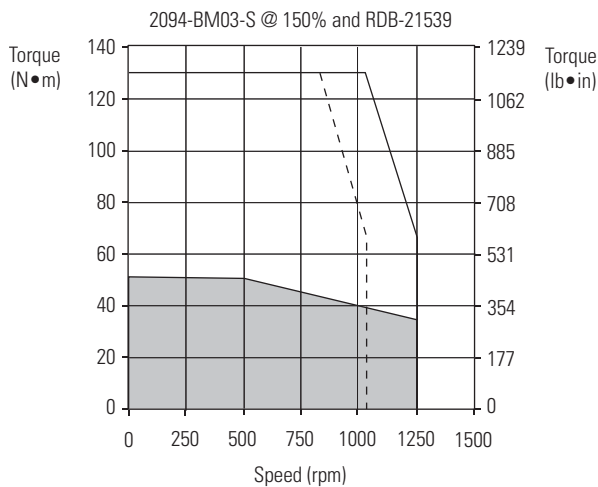
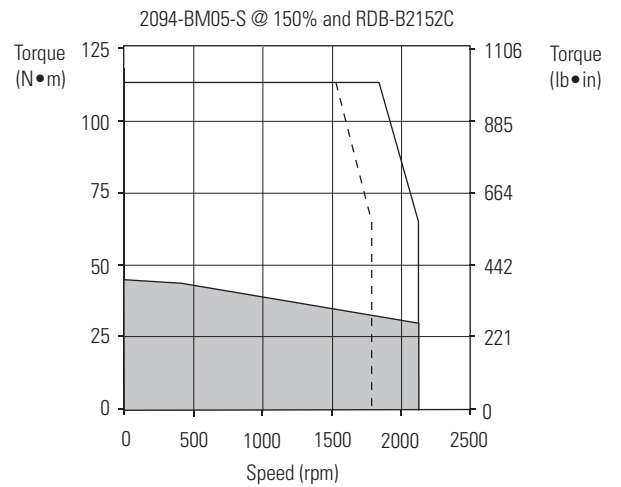
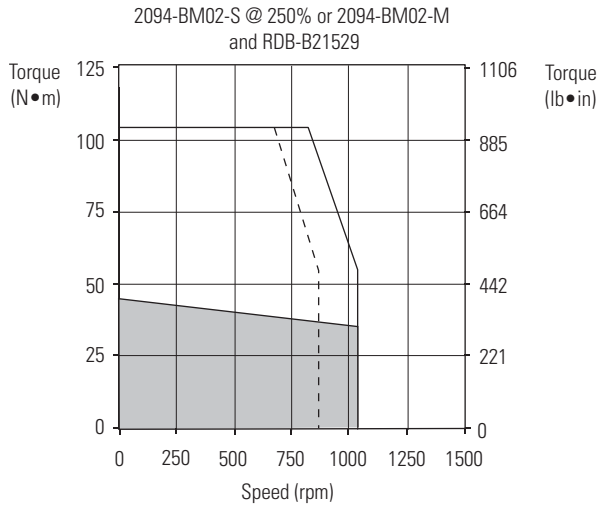
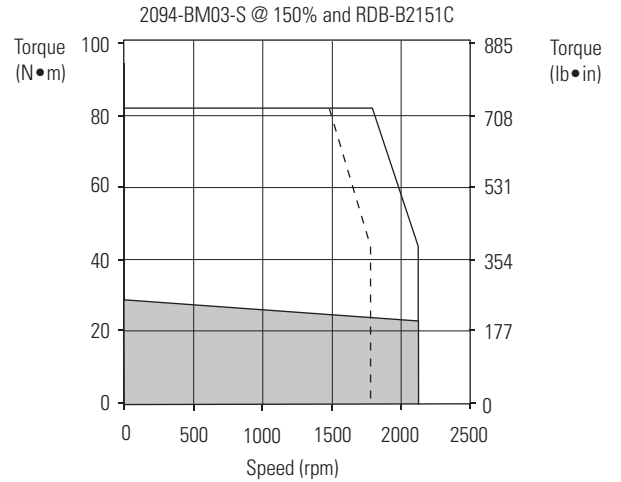
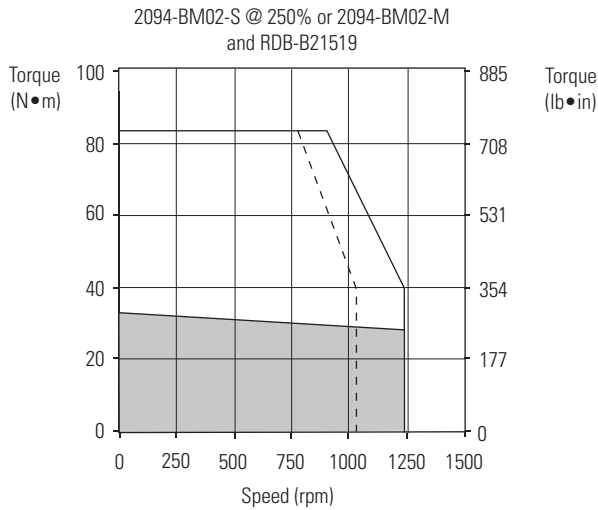
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Bulletin RDB Motor Performance Specifications with Kinetix 6000 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 460V Drives
RDB-B21519	1235	10.3	31.2 (276)	21.8	66.8 (591)	3.64	2094-BM02-S @ 150%
				27.3	83.1 (735)		2094-BM02-S @ 250%
RDB-B2151C	2125	17.3	31.3 (277)	45.0	80.2 (710)	5.23	2094-BM03-S @ 150%
RDB-B21529	1035	12.2	43.4 (384)	21.8	76.8 (680)	4.33	2094-BM02-S @ 150%
				32.8	111 (982)		2094-BM02-S @ 250%
RDB-B2152C	2125	23.5	43.4 (384)	45.0	80.4 (711)	6.41	2094-BM03-S @ 150%
				63.2	111 (982)		2094-BM05-S @ 150%
RDB-B21539	1250	15.8	51.5 (456)	45.0	130 (1150)	5.34	2094-BM03-S @ 150%
RDB-B2153C	2250	29.4	51.5 (456)	45.0	77.7 (688)	5.87	2094-BM03-S @ 150%
				73.4	122 (1080)		2094-BM05-S @ 150%
RDB-B29014	450	5.9	48.9 (167)	13.0	89.2 (789)	1.97	2094-BM01-S @ 150%
				17.6	110 (973)		2094-BM01-S @ 250%
RDB-B29016	785	10.0	48.9 (167)	21.8	86.6 (766)	3.18	2094-BM02-S @ 150%
				31.0	110 (973)		2094-BM02-S @ 250%
RDB-B29019	1500	20.0	48.9 (167)	45.0	90.8 (803)	3.63	2094-BM03-S @ 150%
				58.7	110 (973)		2094-BM05-S @ 150%
RDB-B29024	435	11.0	97.8 (865)	21.8	159 (1407)	3.33	2094-BM02-S @ 150%
				33.0	214 (1894)		2094-BM02-S @ 250%
RDB-B29026	885	22.3	97.8 (865)	45.0	161 (1425)	4.05	2094-BM03-S @ 150%
				67.2	214 (1894)		2094-BM05-S @ 150%
RDB-B29029	1200	40.0	97.5 (863)	73.4	156 (1381)	4.05	2094-BM05-S @ 150%
RDB-B29034	500	18.2	140 (1239)	45.0	274 (2425)	5.16	2094-BM03-S @ 150%
RDB-B29036	750	27.0	140 (1239)	45.0	200 (1770)	5.49	2094-BM03-S @ 150%
				73.4	289 (2558)		2094-BM05-S @ 150%
RDB-B41014	385	18.3	183 (1619)	45.0	317 (2805)	5.20	2094-BM03-S @ 150%
RDB-B41016	700	33.8	183 (1619)	73.4	292 (2584)	4.83	2094-BM05-S @ 150%
RDB-B41024	365	31.5	330 (2929)	73.4	593 (5248)	7.29	2094-BM05-S @ 150%

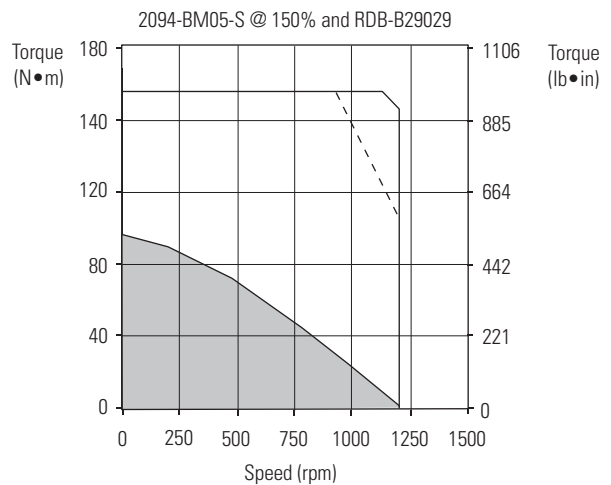
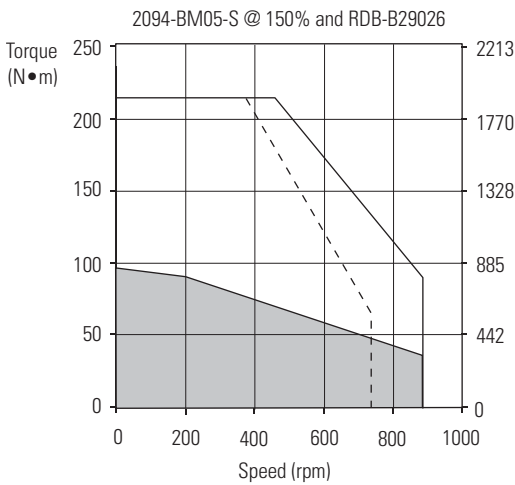
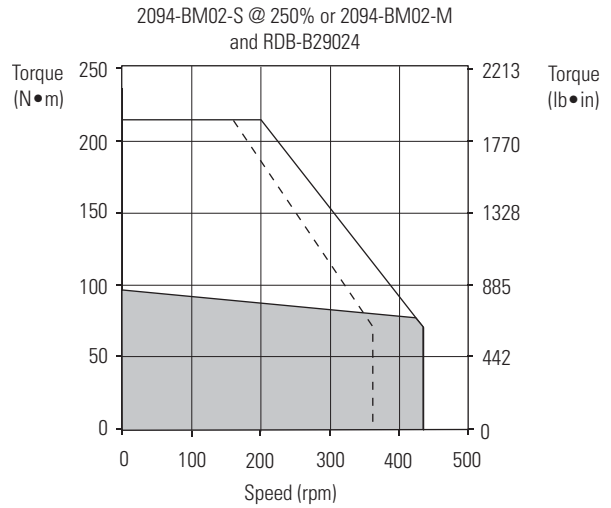
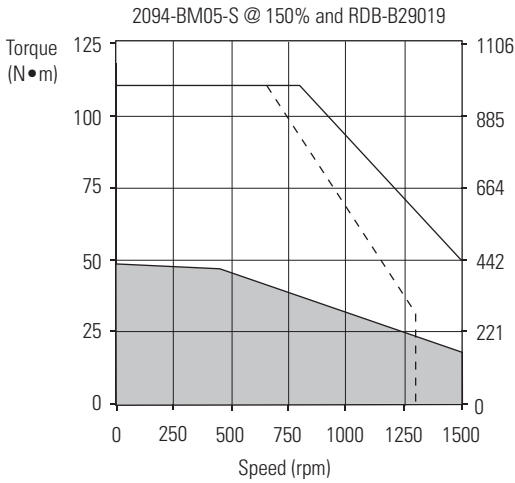
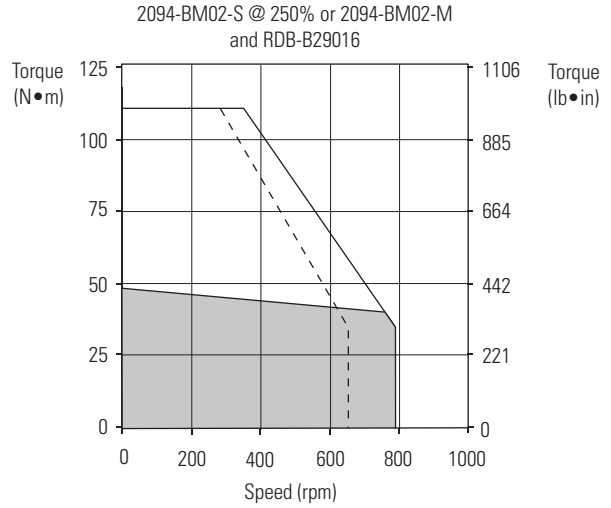
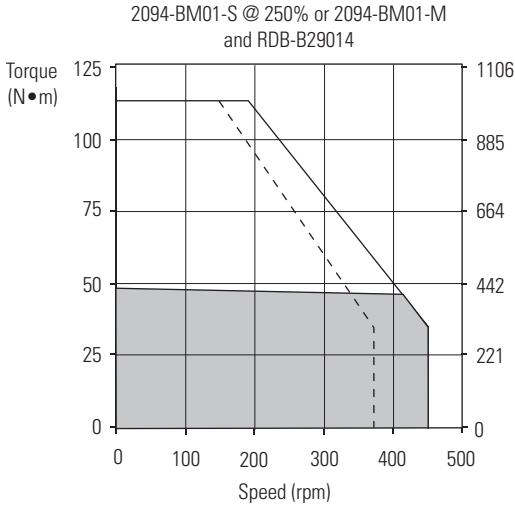
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 (460V) Drives with RDD-Series Direct Drive Motor Curves



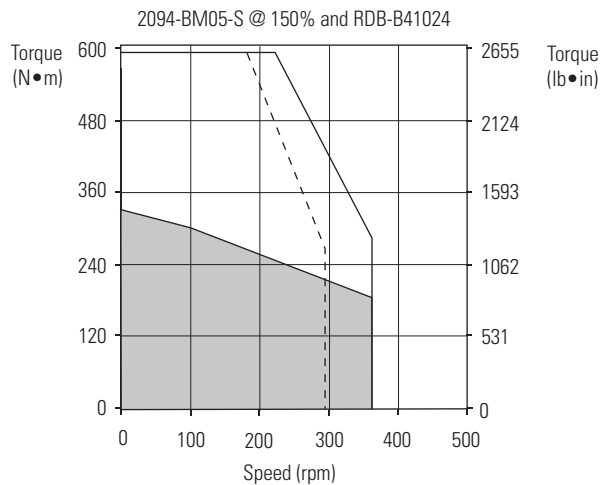
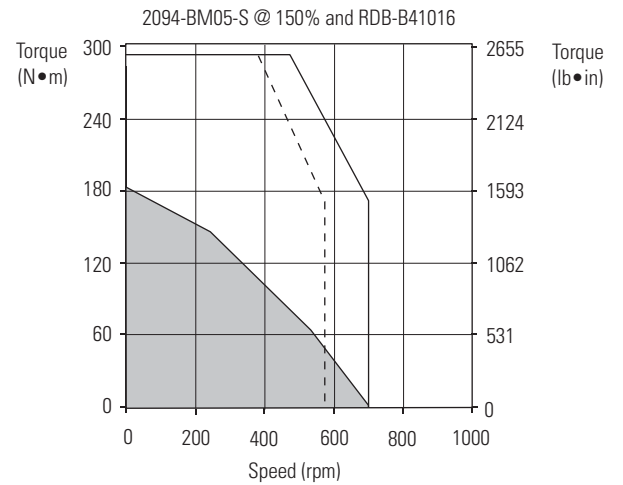
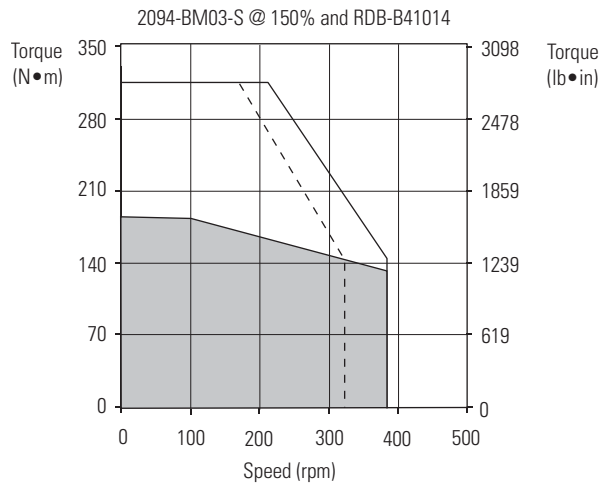
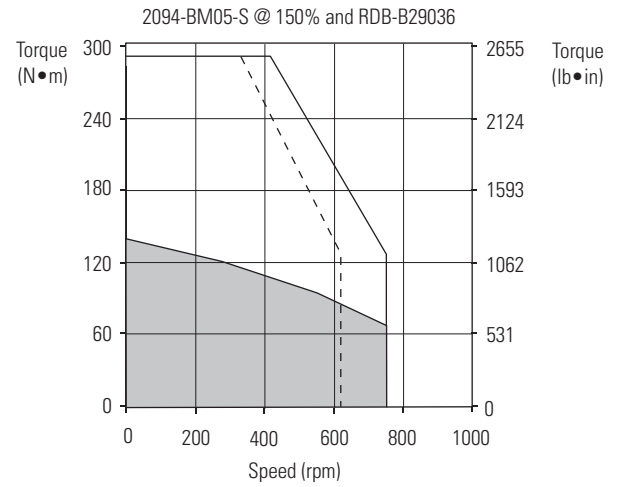
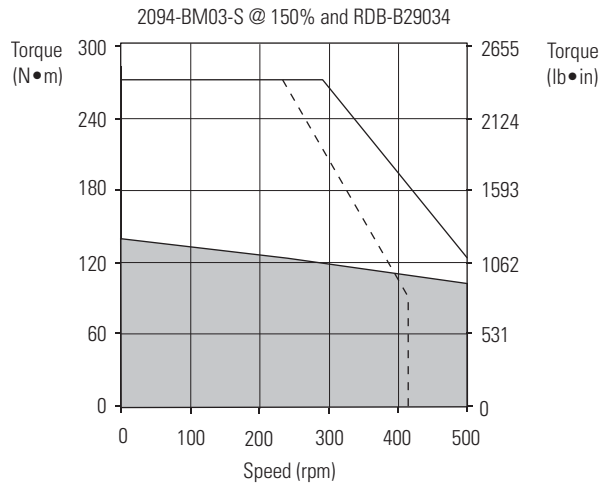
= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 (460V) Drives with RDD-Series Direct Drive Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 (460V) Drives with RDD-Series Direct Drive Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 6000 (230V) Drives with TL-Series Low Inertia Motors

This section provides system combination information for the Kinetix 6000 (230V) drives when matched with TL-Series (Bulletin TLY) low-inertia motors. Compatible TL-Series motors are equipped with incremental encoder feedback. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin TLY Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
TLY-A110T, TLY-A120T, TLY-A130T	2090-CPWM6DF-16AAxx (standard) without brake	2090-CFBM6DF-CBAAxx ⁽²⁾ (standard) Incremental Feedback
TLY-A220T, TLY-A230T		
TLY-A2530P, TLY-A2540P	2090-CPBM6DF-16AAxx (standard) with brake	
TLY-A310M		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#) for more information.

(2) Premolded (drive end) feedback cables (catalog number 2090-CFBM6DD-CCAAxx) are also available for Kinetix 6000 drives.

TL-Series (Bulletin TLY-Axxx) motors are characterized as having 1000 mm (39.4 in.) cable extensions with circular plastic connectors.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin TLY (non-brake) Motor Performance Specifications with Kinetix 6000 (230V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 230V Drives	
TLY-A110T	6000	0.55	0.096 (0.85)	1.50	0.20 (1.75)	0.041	2094-AMP5-S	
TLY-A120T		1.03	0.181 (1.60)	2.50	0.36 (3.20)	0.086	2094-AMP5-S	
TLY-A130T		1.85	0.325 (2.88)	4.90	0.76 (6.70)	0.14	2094-AMP5-S	
TLY-A220T		3.50	0.836 (7.40)	7.90	1.48 (13.1)	0.35	2094-AMP5-S	
TLY-A230T		5.20	1.23 (10.9)	10.5	2.07 (18.3)	0.44	2094-AMP5-S	
		5.50	1.30 (11.5)	15.5	3.05 (27.0)		2094-AM01-S	
TLY-A2530P	5000	8.50	2.20 (19.5)	17.0	4.18 (37.0)	0.69	2094-AM01-S	
		10.0	2.60 (23.0)	21.0	5.20 (46.0)		2094-AM02-S	
TLY-A2540P		8.50	2.48 (22.0)	17.0	4.97 (44.0)	0.86	2094-AM01-S	
		10.0	2.94 (26.0)	24.8	7.10 (63.0)		2094-AM02-S	
TLY-A310M		4500	10.0	3.61 (31.9)	30.0	9.0 (79.6)	0.95	2094-AM02-S

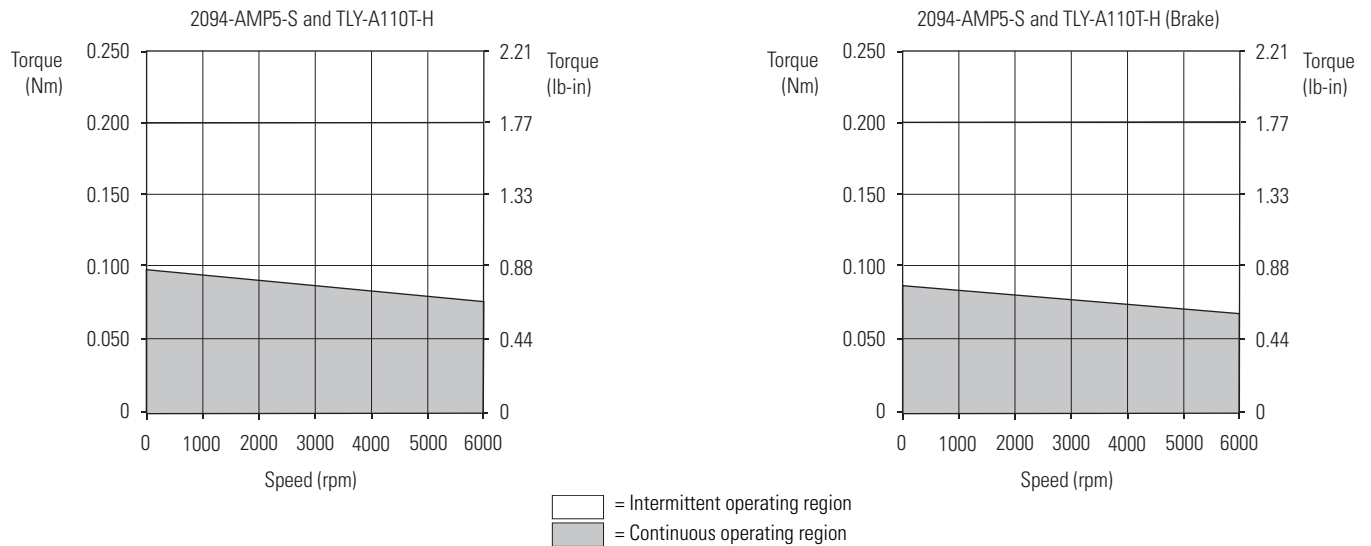
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Bulletin TLY (brake) Motor Performance Specifications with Kinetix 6000 (230V) Drives

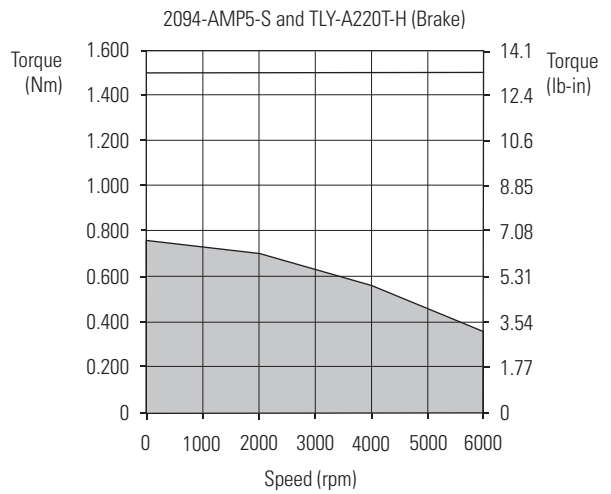
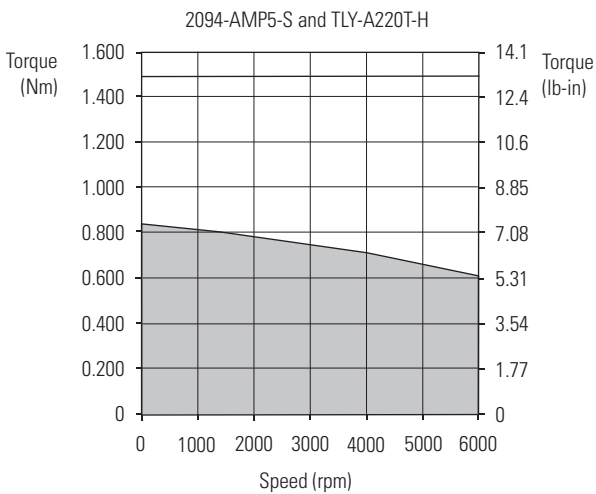
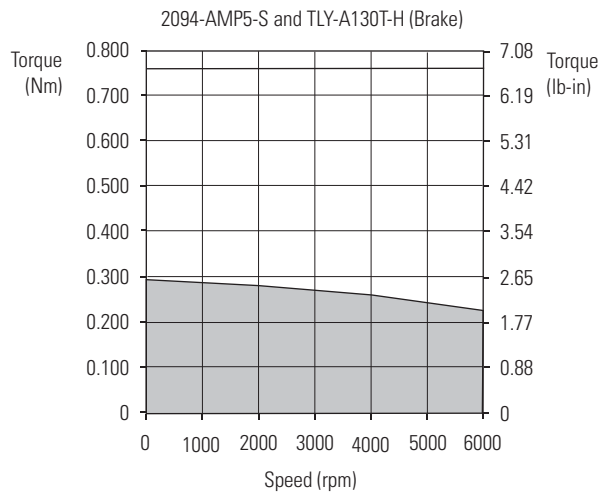
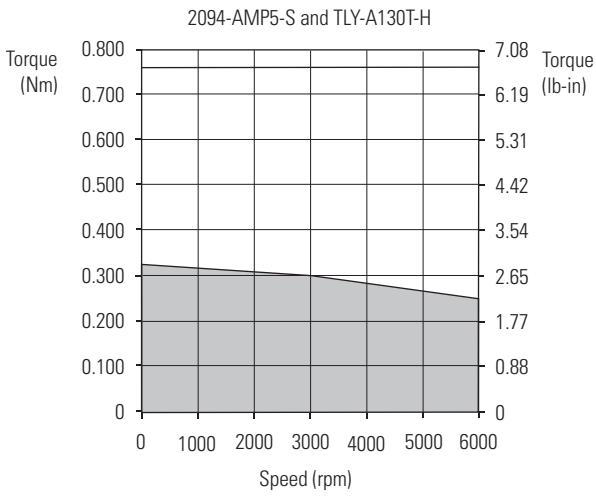
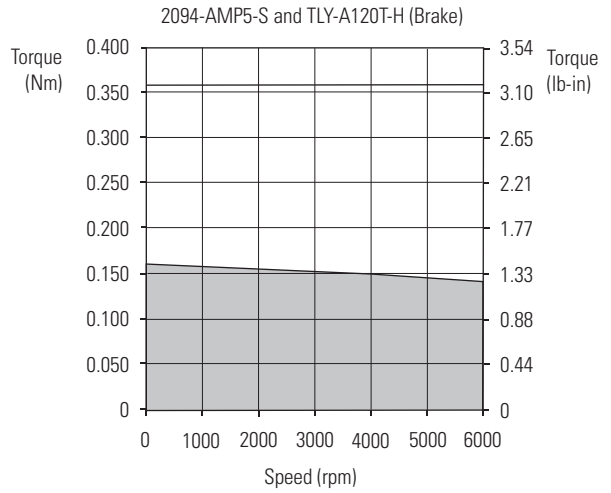
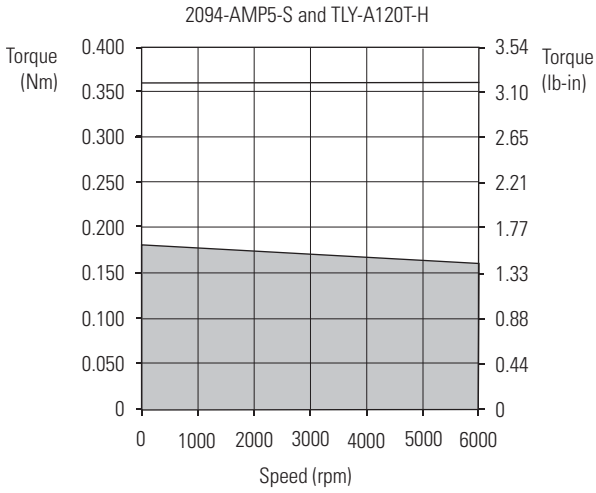
Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 6000 230V Drives
TLY-A110T	6000	0.50	0.086 (0.76)	1.50	0.20 (1.75)	0.041	2094-AMP5-S
TLY-A120T		0.93	0.163 (1.44)	2.50	0.36 (3.20)	0.086	2094-AMP5-S
TLY-A130T		1.67	0.293 (2.59)	4.90	0.76 (6.70)	0.14	2094-AMP5-S
TLY-A220T		3.15	0.757 (6.70)	7.90	1.48 (13.1)	0.35	2094-AMP5-S
TLY-A230T		4.95	1.16 (10.3)	10.5	2.07 (18.3)	0.44	2094-AMP5-S
	4.95	1.16 (10.3)	15.5	3.05 (27.0)	2094-AM01-S		
TLY-A2530P	5000	5.20	1.41 (12.5)	10.5	2.71 (24.0)	0.69	2094-AMP5-S
		8.50	2.20 (19.5)	17.0	4.18 (37.0)		2094-AM01-S
		10.0	2.60 (23.0)	21.0	5.20 (46.0)		2094-AM02-S
TLY-A2540P		5.20	1.56 (13.8)	10.5	3.05 (27.0)	0.86	2094-AMP5-S
		8.50	2.48 (22.0)	17.0	4.97 (44.0)		2094-AM01-S
	10.0	2.94 (26.0)	24.8	7.10 (63.0)	2094-AM02-S		
TLY-A310M	4500	10.0	3.61 (31.9)	30.0	9.0 (79.6)	0.90	2094-AM02-S

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 (230V) Drives/TLY-Axxxx-H (incremental) Motor Curves

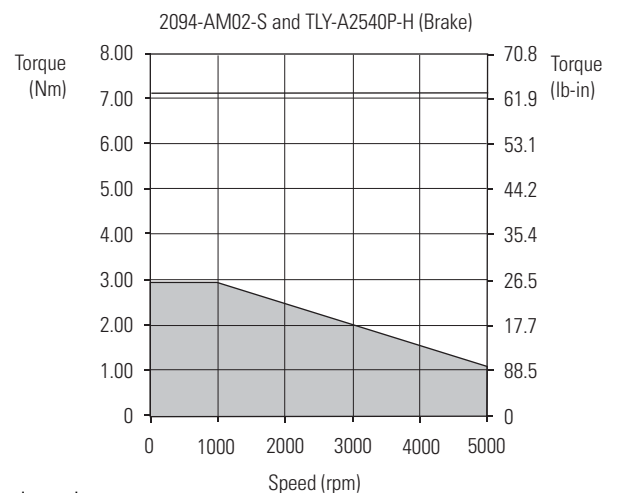
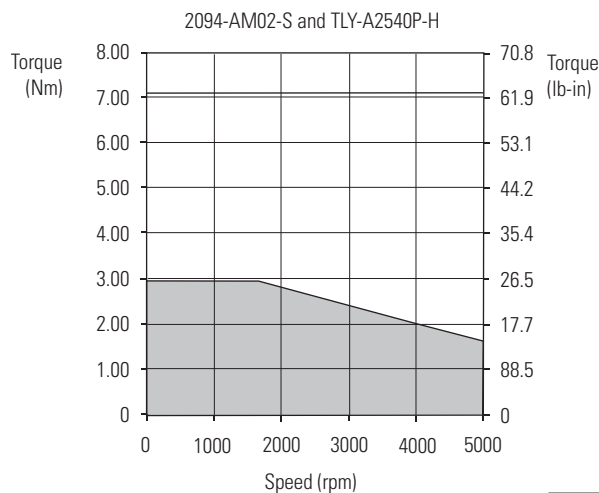
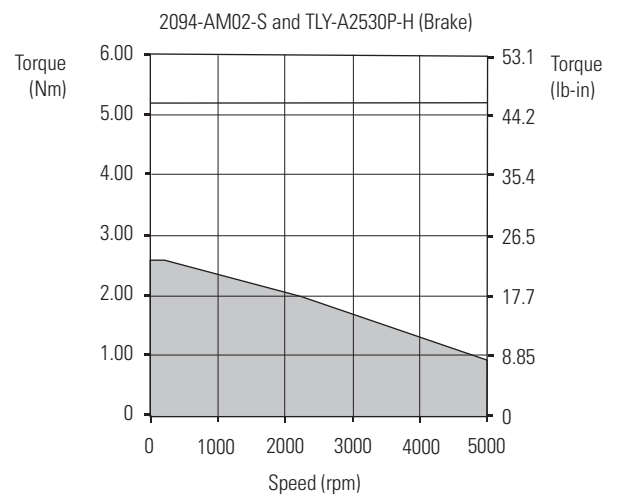
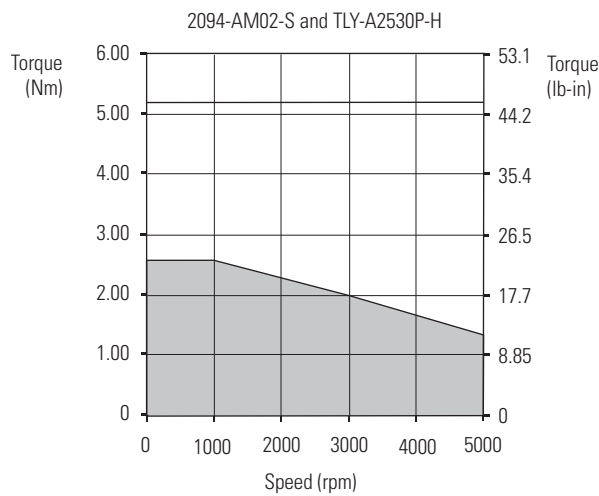
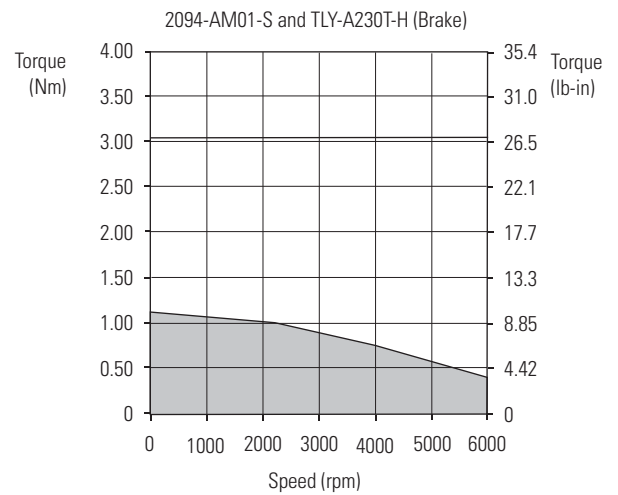
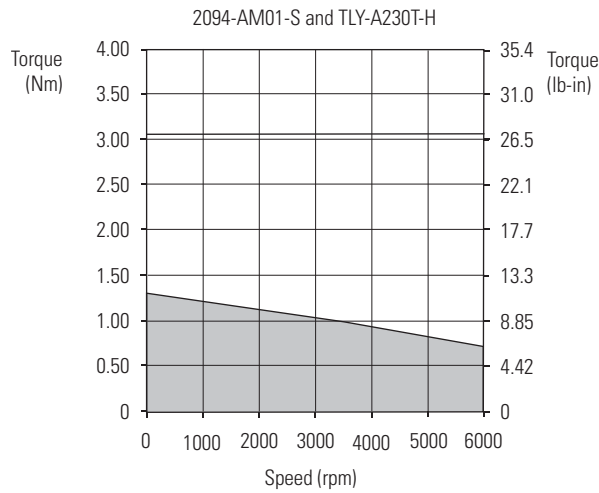




Kinetix 6000 (230V) Drives/TLY-Axxxx-H (incremental) Motor Curves, Continued



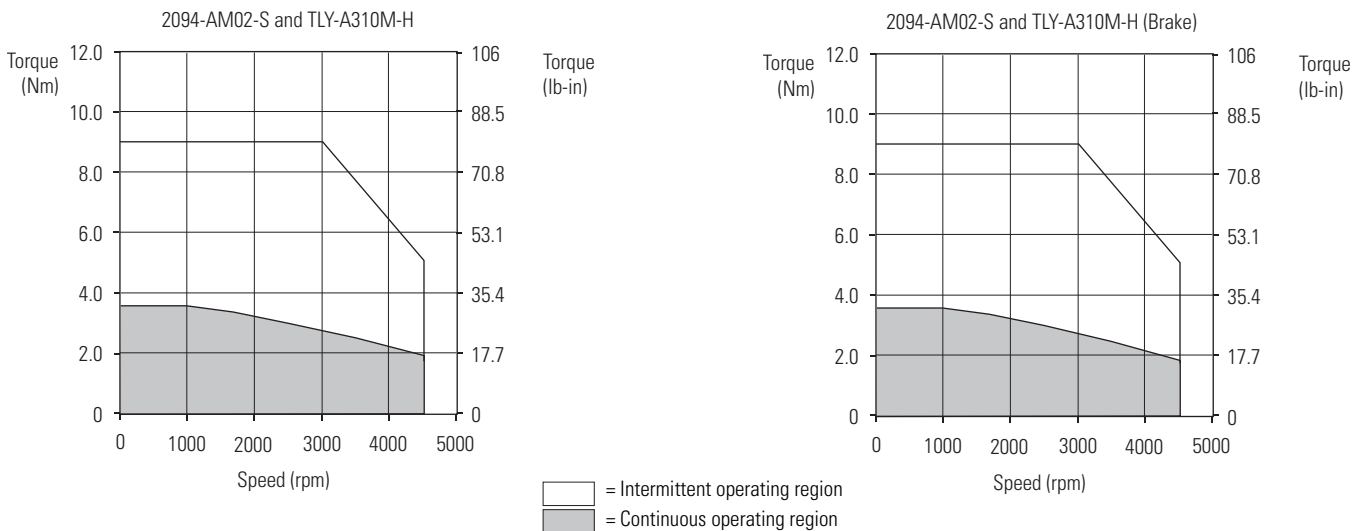
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 = Continuous operating region

Kinetix 6000 (230V) Drives/TLY-Axxxx-H (incremental) Motor Curves, Continued



 = Intermittent operating region
 = Continuous operating region

Kinetix 6000 (230V) Drives/TLY-Axxxx-H (incremental) Motor Curves, Continued



Kinetix 2000 Drives with MP-Series Low Inertia Motors

This section provides system combination information for the Kinetix 2000 drives when matched with MP-Series low-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

IMPORTANT

The MP-Series low-inertia motors on this page are equipped with DIN connectors (specified by 4 or 7 in the catalog number) and are not compatible with cables designed for motors equipped with bayonet connectors (specified by 2 in the catalog number). The motors with bayonet connectors (for example, MPL-A310P-xx2xAA) are being discontinued and require 2090-XXNxxMP- (bayonet) cables. For help with migration or to select bayonet cables, contact your Rockwell Automation sales representative.

Bulletin MPL Motor Cable Combinations

Motor Cat. No.	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPL-A1510V-xx4xAA, MPL-A1520U-xx4xAA, MPL-A1530U-xx4xAA	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution or Incremental Feedback
MPL-A210V-xx4xAA, MPL-A220T-xx4xAA, MPL-A230P-xx4xAA		
MPL-A310F-xx7xAA, MPL-A310P-xx7xAA, MPL-A320H-xx7xAA, MPL-A320P-xx7xAA, MPL-A330P-xx7xAA	2090-XXNPMF-16Sxx ⁽⁴⁾	2090-XXNFMF-Sxx ⁽⁵⁾ Absolute High-resolution or Incremental Feedback
MPL-A420P-xx7xAA, MPL-A430H-xx7xAA		
MPL-A4530F-xx7xAA, MPL-A4540C-xx7xAA		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

(4) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM7DF-16AFxx).

(5) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

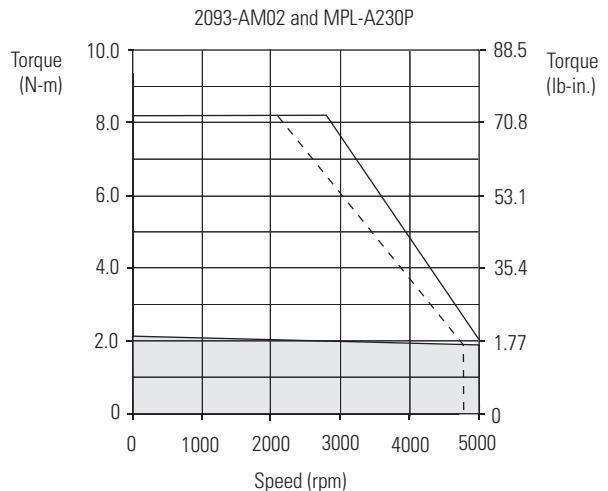
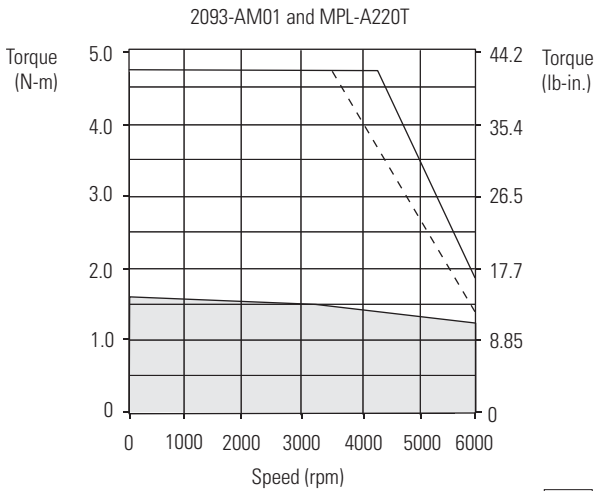
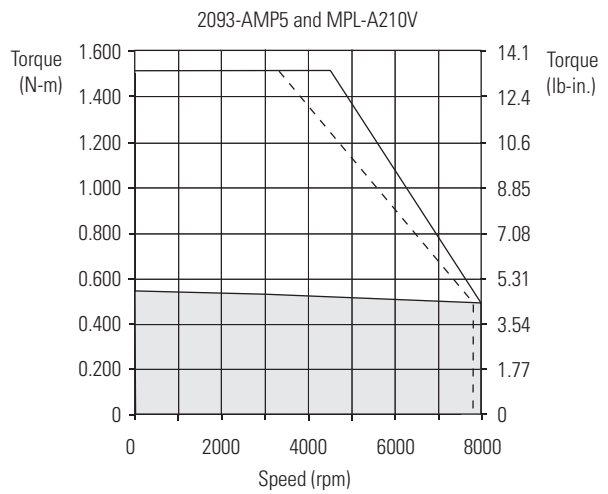
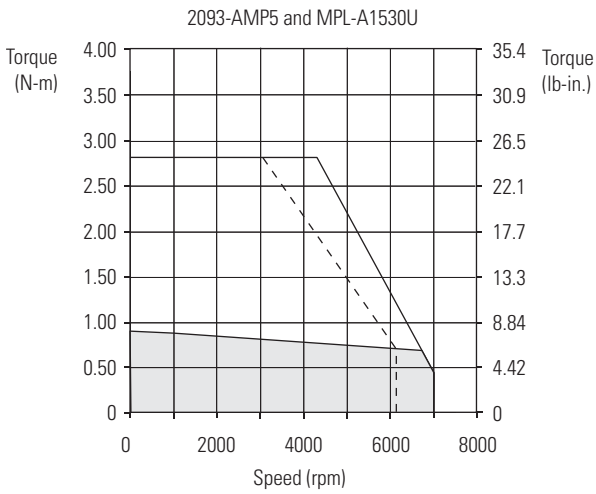
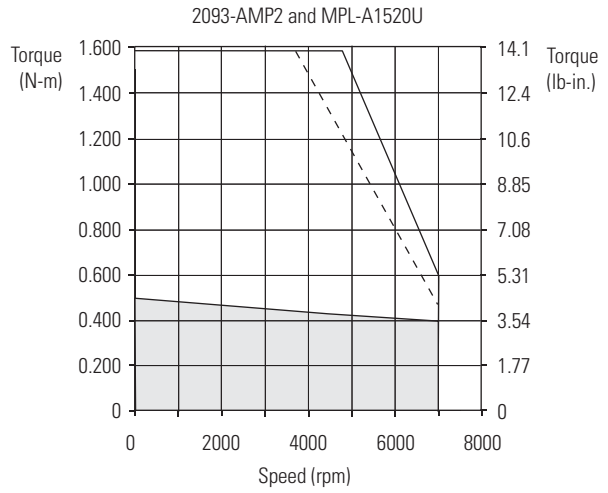
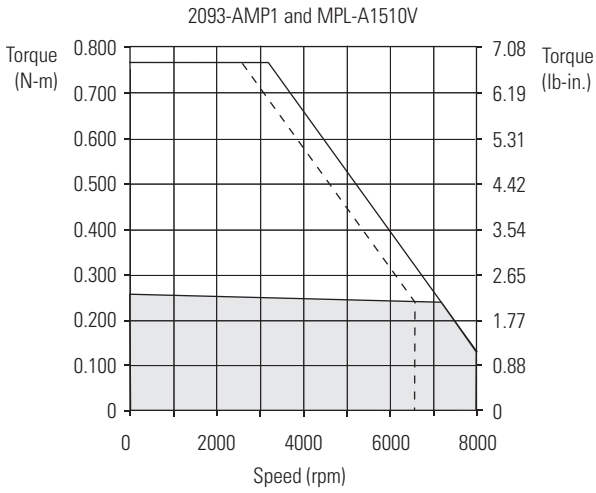
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPL Motor Performance Specifications with Kinetix 2000 Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 2000 IAM/AM Module
MPL-A1510V	8000	1.05	0.26 (2.3)	3.40	0.77 (6.8)	0.16	2093-AMP1
MPL-1520U	7000	1.80	0.49 (4.3)	6.10	1.58 (13.9)	0.27	2093-AMP2
MPL-1530U	7000	2.82	0.90 (8.0)	10.1	2.82 (24.9)	0.39	2093-AMP5
MPL-210V	8000	3.09	0.55 (4.8)	10.2	1.52 (13.4)	0.37	2093-AMP5
MPL-220T	6000	4.54	1.61 (14.2)	15.5	4.74 (41.9)	0.62	2093-AM01
MPL-230P	5000	5.40	2.10 (18.6)	23.0	8.2 (73.0)	0.86	2093-AM01
MPL-310F	3000	3.24	1.58 (14.0)	9.30	3.61 (31.9)	0.46	2093-AMP5
MPL-310P	5000	4.91	1.58 (14.0)	14.0	3.61 (31.9)	0.73	2093-AM01
MPL-320H	3500	6.10	3.05 (27.0)	19.3	7.91 (70.0)	1.0	2093-AM01
MPL-320P	5000	9.00	3.05 (27.0)	29.5	7.91 (70.0)	1.3	2093-AM02
MPL-330P	5000	12.0	4.18 (37.0)	38.0	11.1 (98.2)	1.8	2093-AM02
MPL-420P	5000	12.9	4.79 (42.3)	46.0	12.3 (109)	2.0	2093-AM02
MPL-430H	3500	12.2	6.21 (55.0)	45.0	18.7 (165)	1.8	2093-AM02
MPL-4530F	2800	13.40	8.36 (74.0)	42.0	19.7 (174)	1.9	2093-AM02
MPL-4540C	1500	9.55	10.30 (91.1)	29.0	27.1 (239)	1.5	2093-AM02

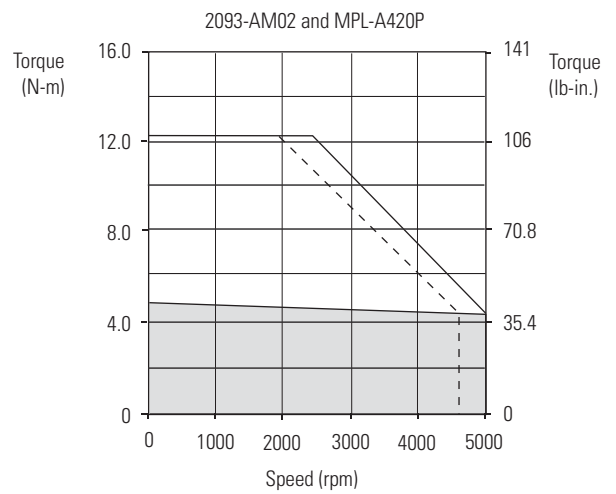
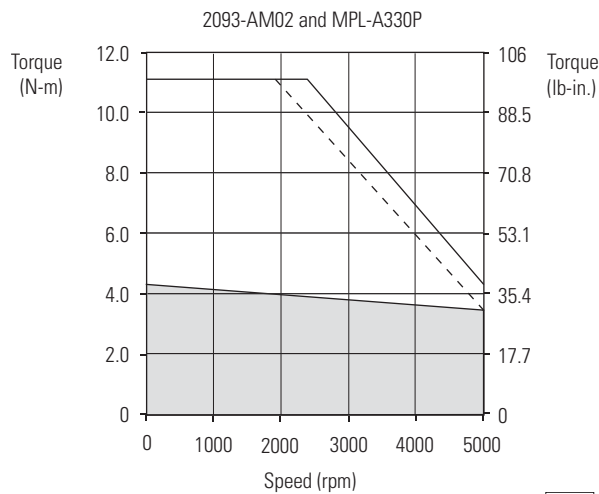
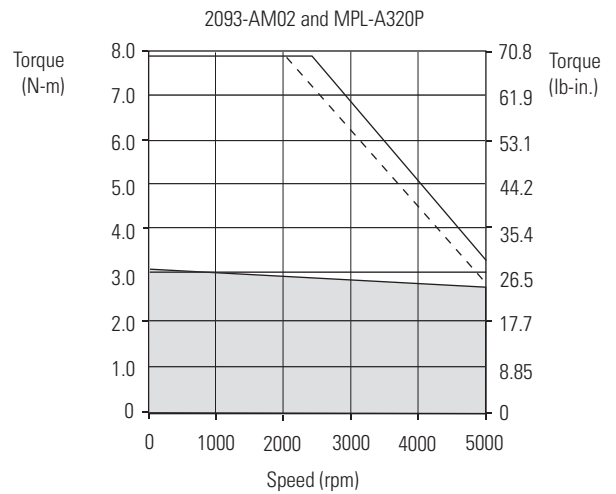
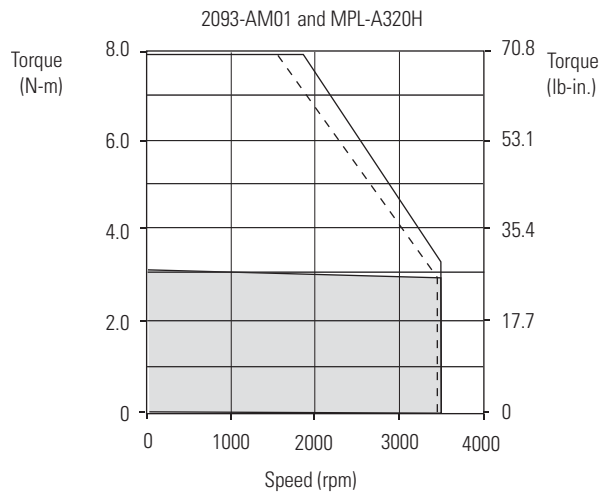
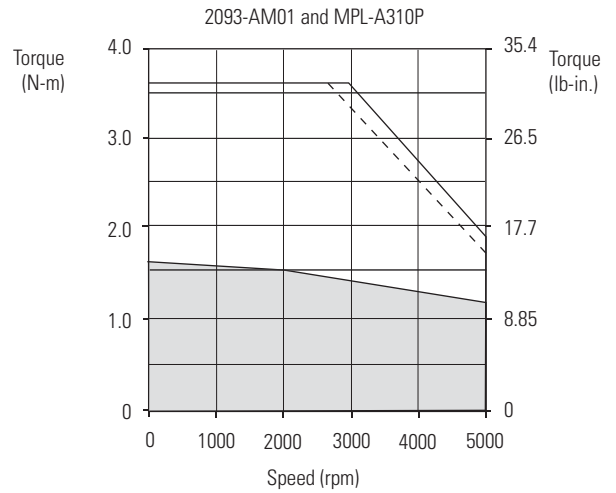
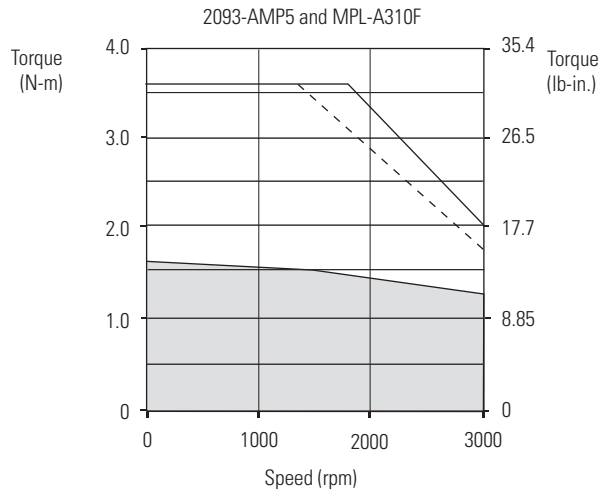
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 2000 Drives with MP-Series Low Inertia Motor Curves



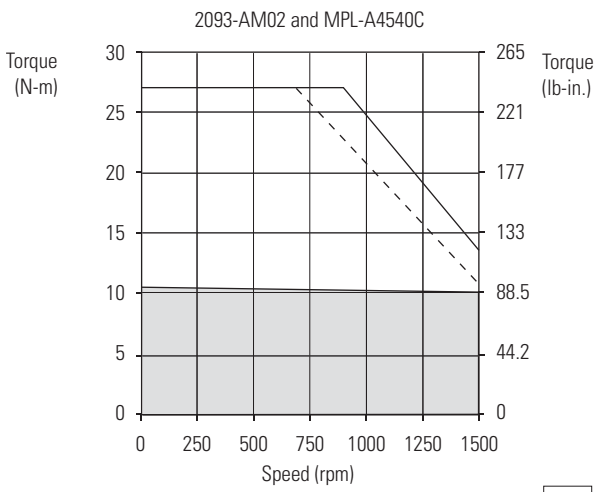
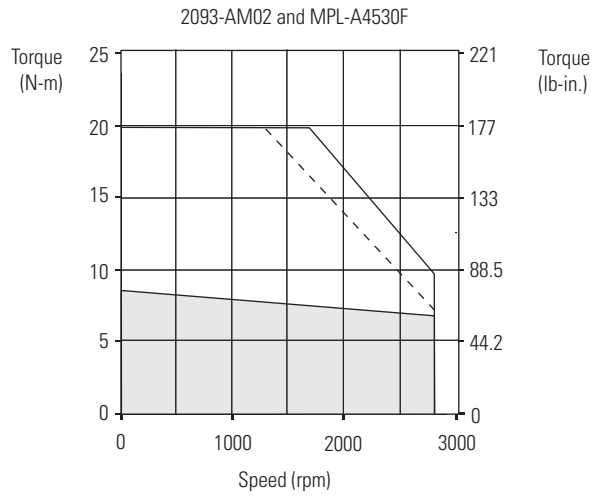
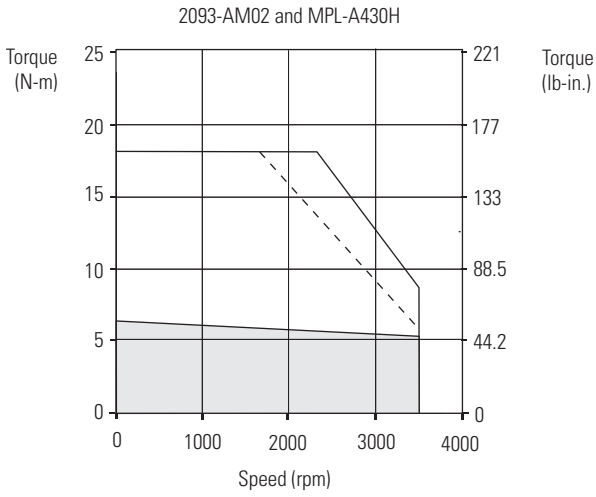
= Intermittent operating region (three-phase input)
 = Continuous operating region
 = Drive operation (single-phase input)

Kinetix 2000 Drives with MP-Series Low Inertia Motor Curves, Continued



- = Intermittent operating region (three-phase input)
- = Continuous operating region
- = Drive operation (single-phase input)

Kinetix 2000 Drives with MP-Series Low Inertia Motor Curves, Continued



= Intermittent operating region (three-phase input)
 = Continuous operating region
 = Drive operation (single-phase input)

Kinetix 2000 Drives with MP-Series Medium Inertia Motors

This section provides system combination information for the Kinetix 2000 (230V) drives when matched with MP-Series medium-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPM Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPM-A1151M, MPM-A1152F	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

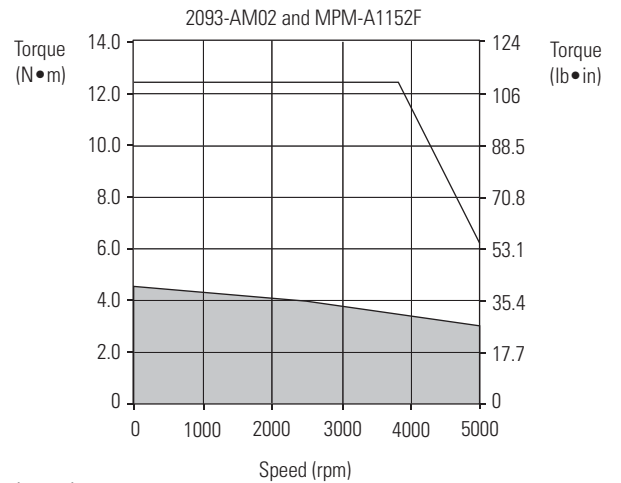
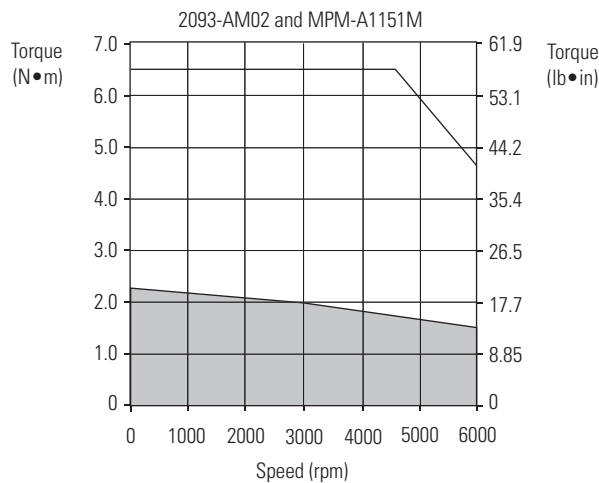
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPM Motor Performance Specifications with Kinetix 2000 Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 2000 AM Module
MPM-A1151M	6000	8.40	2.3 (20.3)	25.5	5.7 (50.4)	0.90	2093-AM01
		10.3		30.5	6.6 (58.4)		2093-AM02
MPM-A1152F	5000	13.4	4.7 (41.6)	40.3	12.4 (110)	1.40	2093-AM02

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 2000 Drives with MP-Series Medium Inertia Motor Curves



□ = Intermittent operating region
 ■ = Continuous operating region

Kinetix 2000 Drives with MP-Series Food Grade Motors

This section provides system combination information for the Kinetix 2000 drives when matched with MP-Series food-grade motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPF Motor Cable Combinations

Motor Cat. No.	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPF-A310P, MPF-320H, MPF-A320P, MPF-A330P	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPF-A430H		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM7DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

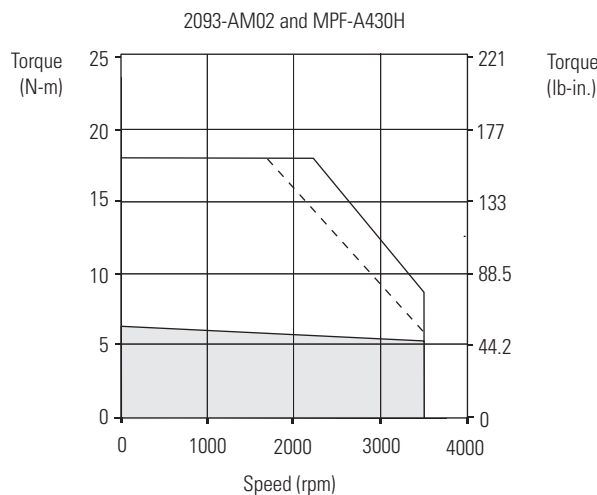
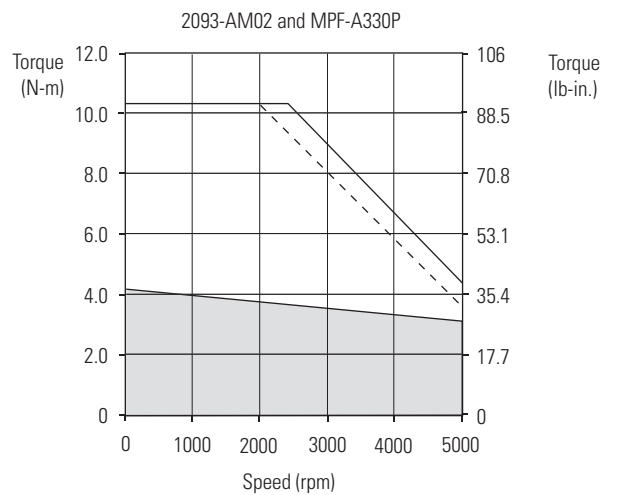
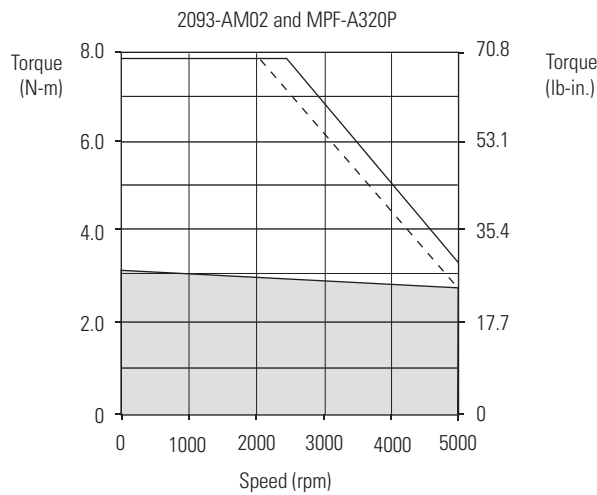
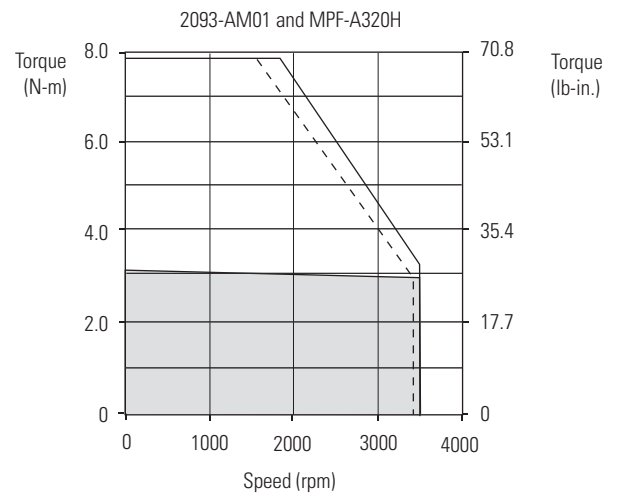
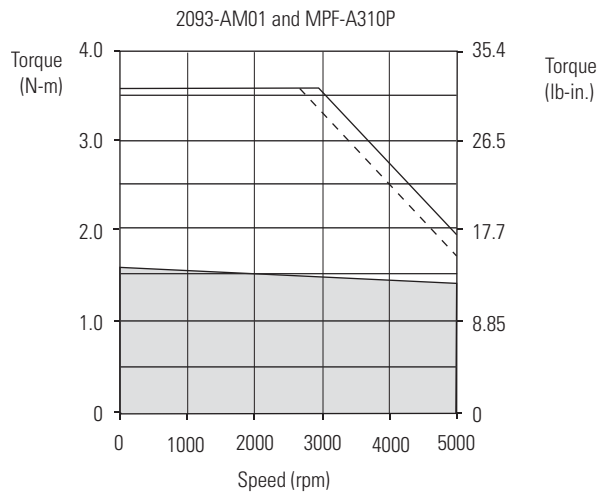
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPF Motor Performance Specifications with Kinetix 2000 Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 2000 AM Module
MPF-A310P	5000	4.91	1.58 (14.0)	14.0	3.61 (31.9)	0.73	2093-AM01
MPF-A320H	3500	6.10	3.05 (27.0)	19.3	7.91 (70.0)	1.0	2093-AM01
MPF-A320P	5000	9.00	3.05 (27.0)	29.5	7.91 (70.0)	1.3	2093-AM02
MPF-A330P	5000	12.0	4.18 (37.0)	38.0	10.32 (91.2)	1.6	2093-AM02
MPF-A430H	3500	12.2	6.21 (55.0)	45.0	18.0 (159)	1.8	2093-AM02

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 2000 Drives/MP-Series Food Grade Motor Curves



- = Intermittent operating region (three-phase input)
- = Continuous operating region
- = Drive operation (single-phase input)

Kinetix 2000 Drives with MP-Series Stainless Steel Motors

This section provides system combination information for the Kinetix 2000 drives when matched with MP-Series stainless-steel motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPS Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPS-A330P	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM7DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

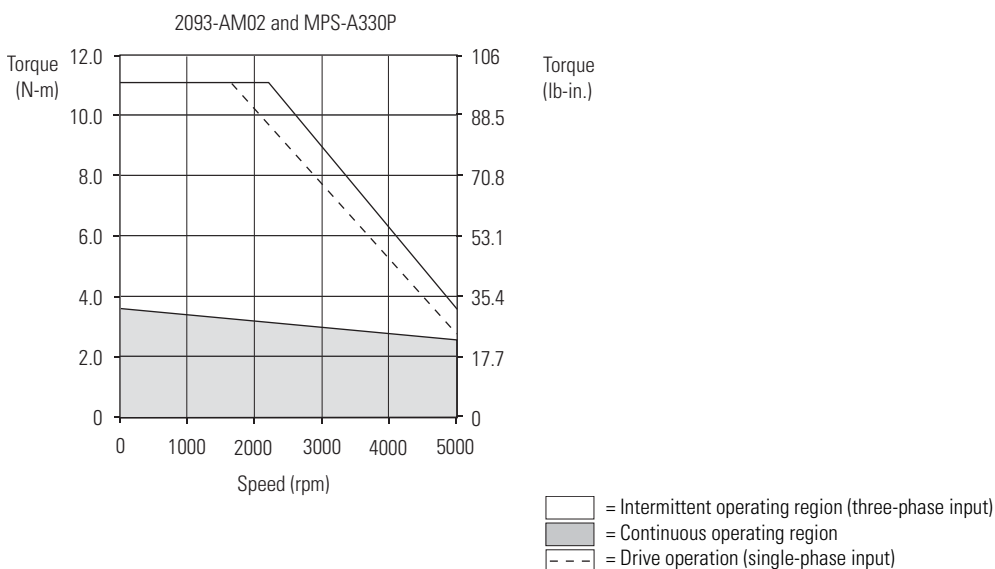
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPS Motor Performance Specifications with Kinetix 2000 Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 2000 AM Module
MPS-A330P	5000	9.80	3.60 (32.0)	38.0	11.10 (98)	1.3	2093-AM02

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 2000 Drives with MP-Series Stainless Steel Motor Curves



Kinetix 2000 Drives with TL-Series Low Inertia Motors

This section provides system combination information for the Kinetix 2000 drives when matched with TL-Series (Bulletin TLY) low-inertia motors. Compatible TL-Series motors are equipped with absolute high-resolution or incremental encoder feedback. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin TLY Motor Cable Combinations

Motor Cat. No.	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
TLY-A110x, TLY-A120x, TLY-A130x	2090-CPWM6DF-16AAxx (standard) (without brake)	2090-CFBM6DF-CBAAxx (standard) Absolute High-resolution or Incremental Feedback
TLY-A220x, TLY-A230x		
TLY-A2530P, TLY-A2540P	2090-CPBM6DF-16AAxx (standard) (with brake)	
TLY-A310M		

(1) For TLY-Axxxx-H motors with incremental encoder feedback, use 2090-CFBM6DF-CBAAxx flying-lead cables and 2090-K2CK-D15M connector kit (battery not required) or panel-mounted breakout components on the drive end. Premolded (drive end) feedback cables (catalog number 2090-CFBM6DD-CCAAxx) are also available for Kinetix 2000 drives. Refer to Breakout Components and Connector Kits beginning on [page 418](#) for more information.

The TLY-Axxxx-B motors with 17-bit high resolution encoder feedback require the 2090-CFBM6DF-CBAAxx flying-lead feedback cable and 2090-K2CK-D15M connector kit with 2090-DA-BAT2 battery.

TL-Series (Bulletin TLY) motors are characterized as having 1000 mm (39.4 in.) cable extensions with circular plastic connectors and TLY-Axxx catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin TLY (non-brake) Motor Performance Specifications with Kinetix 2000 Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 2000 IAM/AM Module
TLY-110x	6000 ⁽¹⁾	0.55	0.096 (0.85)	1.30	0.20 (1.75)	0.041	2093-AMP1
TLY-120x		1.03	0.181 (1.60)	2.50	0.36 (3.20)	0.086	2093-AMP1
TLY-130x		1.85	0.325 (2.88)	4.90	0.76 (6.70)	0.14	2093-AMP2
TLY-220x		3.50	0.836 (7.40)	7.90	1.48 (13.1)	0.35	2093-AMP5
TLY-230x		5.50	1.30 (11.5)	15.5	3.05 (27.0)	0.44	2093-AM01
TLY-2530P	5000	10.0	2.60 (23.0)	21.0	5.20 (46.0)	0.69	2093-AM02
TLY-2540P		10.0	2.94 (26.0)	24.8	7.10 (63.0)	0.86	2093-AM02
TLY-310M	4500	10.0	3.61 (31.9)	30.0	9.0 (79.6)	0.95	2093-AM02

(1) Applies to TLY-AxxxT-H motors with incremental feedback. The TLY-AxxxP-B motors with absolute high-resolution encoders are rated at 5000 rpm.

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

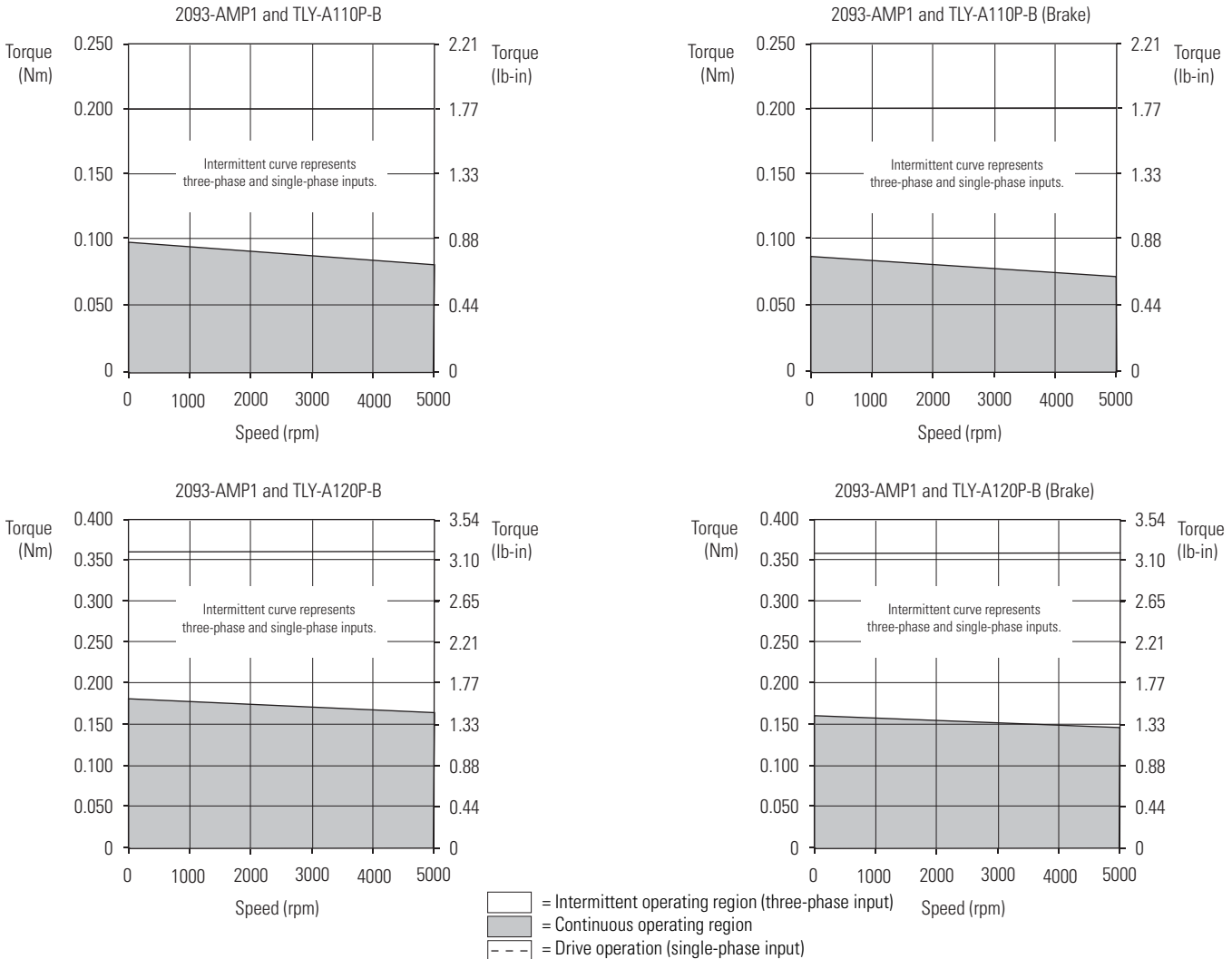
Bulletin TLY (brake) Motor Performance Specifications with Kinetix 2000 Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 2000 IAM/AM Module
TLY-A110x	6000 ⁽¹⁾	0.50	0.086 (0.76)	1.30	0.20 (1.75)	0.037	2093-AMP1
TLY-A120x		0.93	0.163 (1.44)	2.50	0.36 (3.20)	0.077	2093-AMP1
TLY-A130x		1.67	0.293 (2.59)	4.90	0.76 (6.70)	0.13	2093-AMP2
TLY-A220x		3.15	0.757 (6.70)	7.90	1.48 (13.1)	0.24	2093-AMP5
TLY-A230x		4.95	1.16 (10.3)	15.5	3.05 (27.0)	0.32	2093-AM01
TLY-A2530P	5000	10.0	2.60 (23.0)	21.0	5.20 (46.0)	0.55	2093-AM02
TLY-A2540P		10.0	2.94 (26.0)	24.8	7.10 (63.0)	0.66	2093-AM02
TLY-A310M	4500	10.0	3.61 (31.9)	30.0	9.0 (79.6)	0.90	2093-AM02

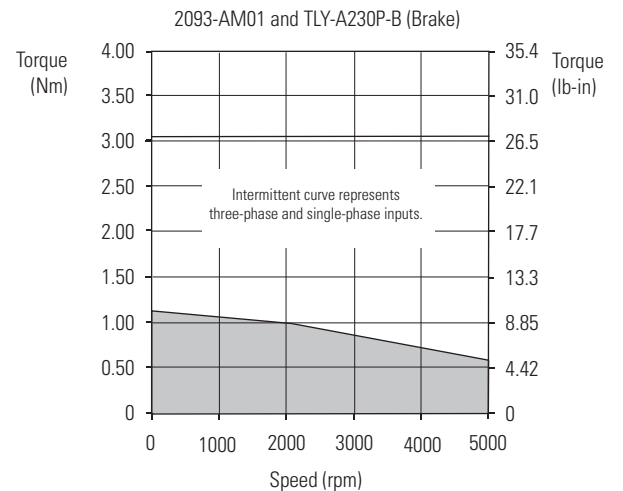
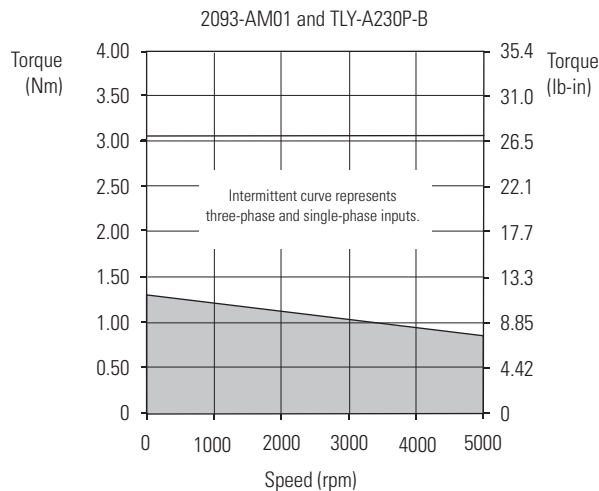
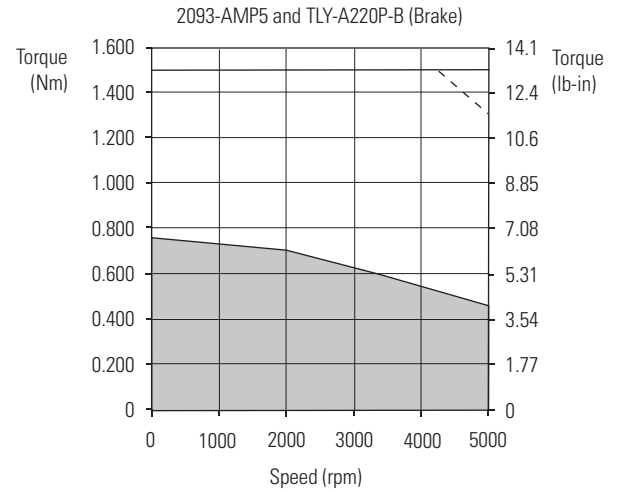
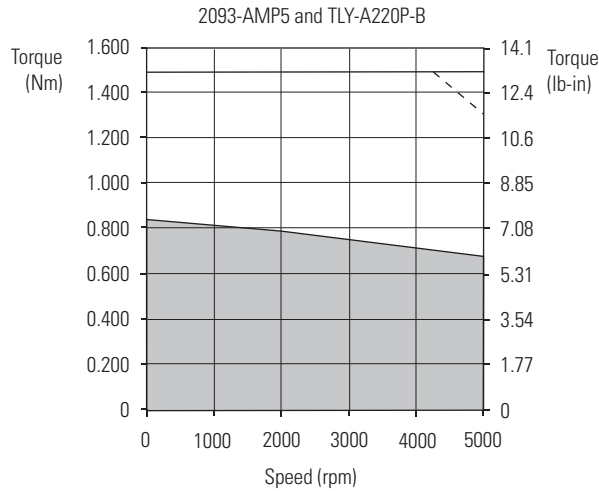
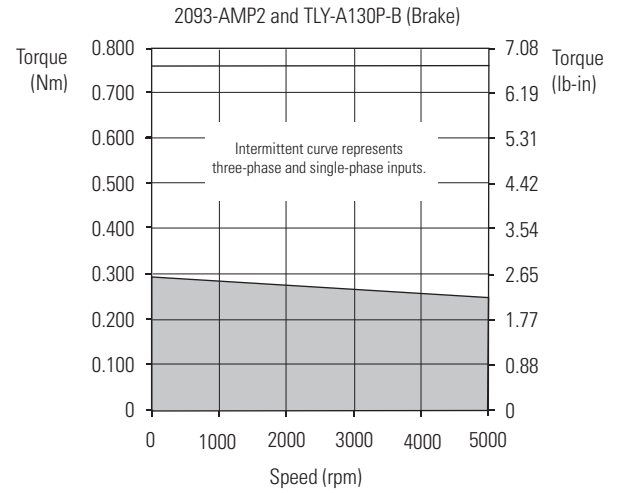
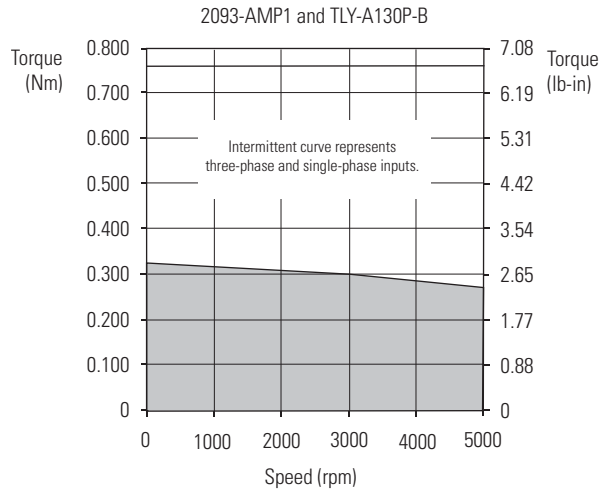
(1) Applies to TLY-AxxxT-H motors with incremental feedback. The TLY-AxxxP-B motors with absolute high-resolution encoders are rated at 5000 rpm.

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 2000 Drives/TLY-AxxxP-B (absolute high-resolution) Motor Curves

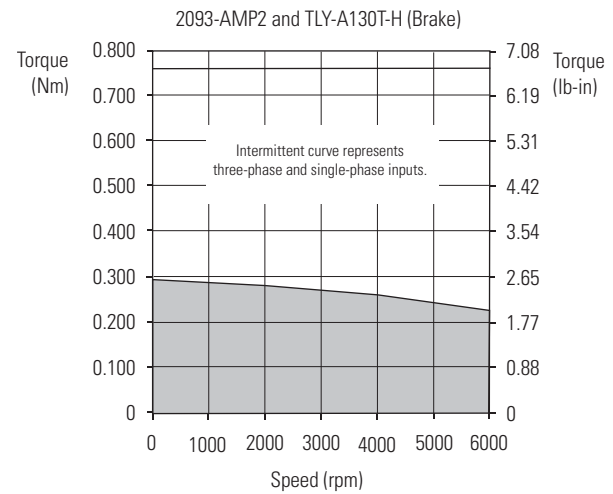
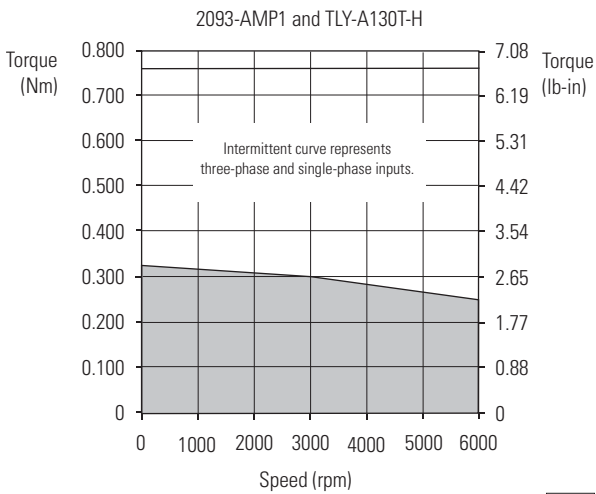
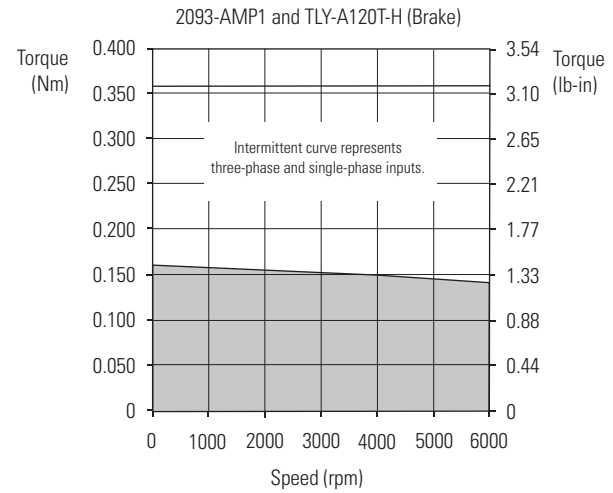
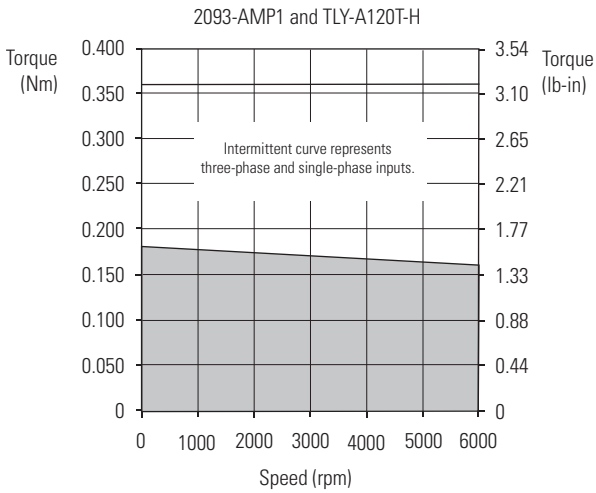
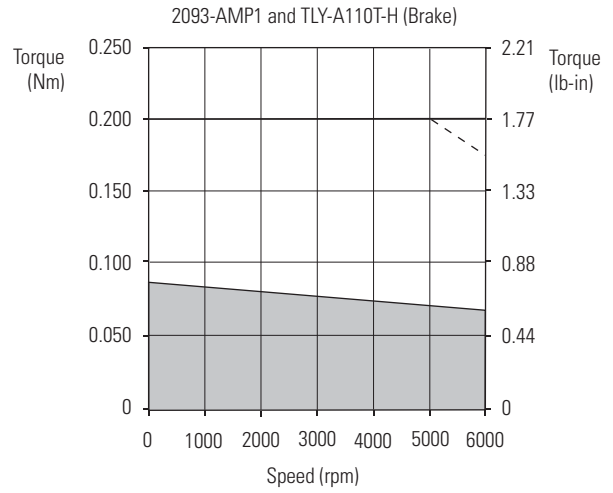
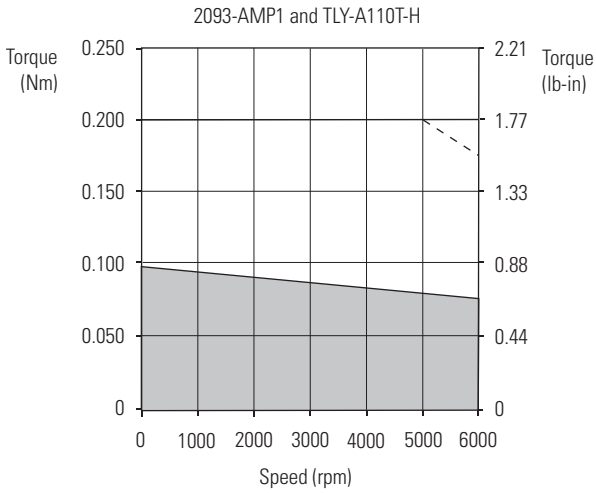


Kinetix 2000 Drives/TLY-AxxxP-B (absolute high-resolution) Motor Curves, Continued



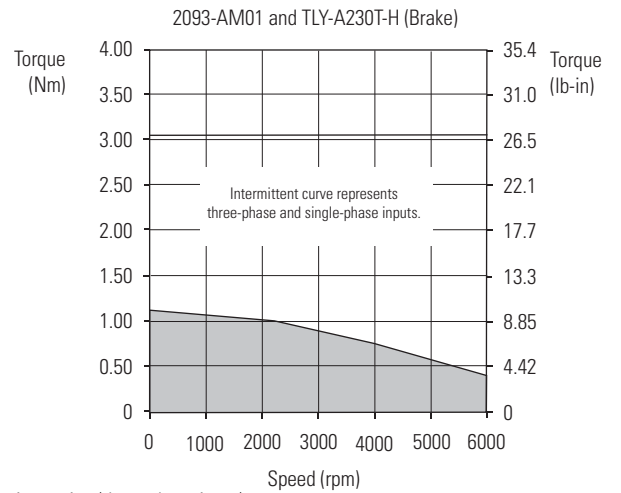
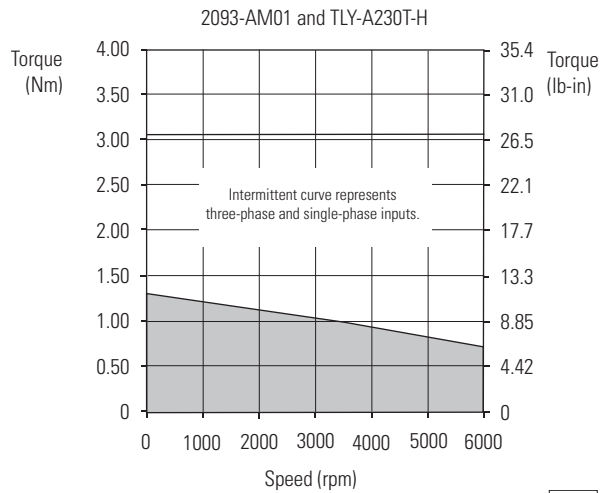
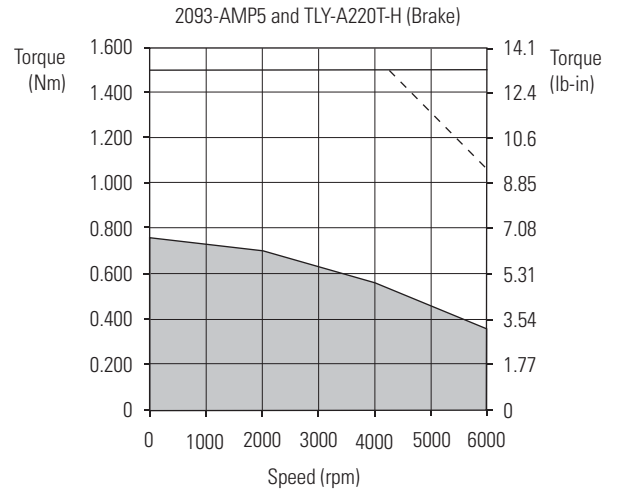
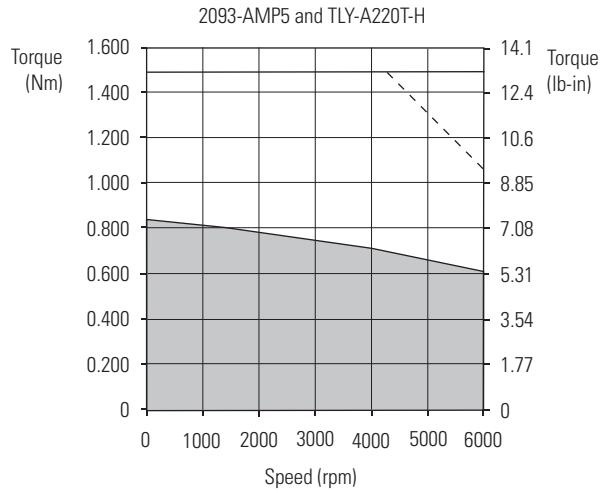
- = Intermittent operating region (three-phase input)
- = Continuous operating region
- = Drive operation (single-phase input)

Kinetix 2000 Drives/TLY-AxxxT-H (incremental) Motor Curves



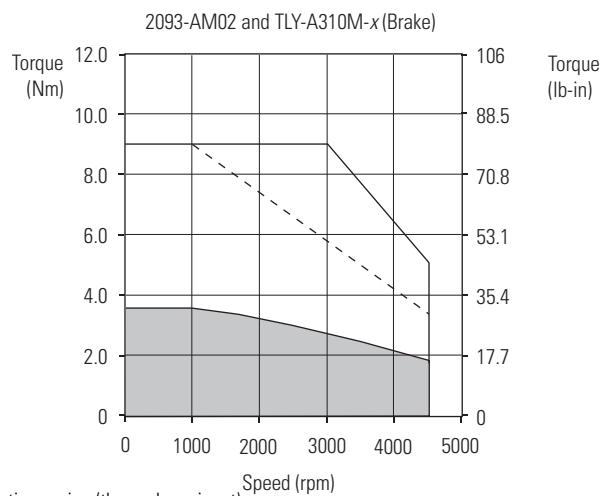
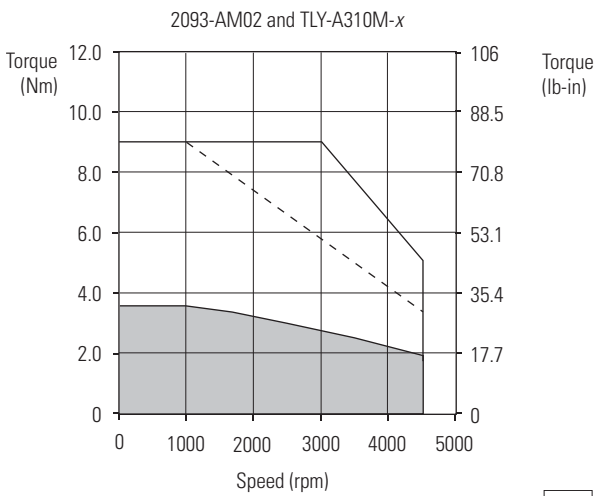
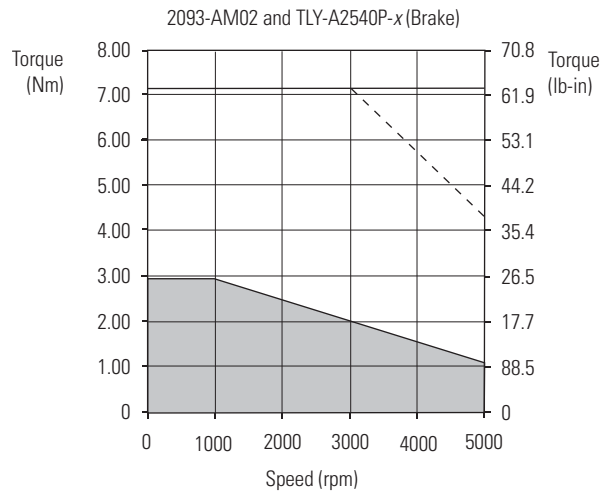
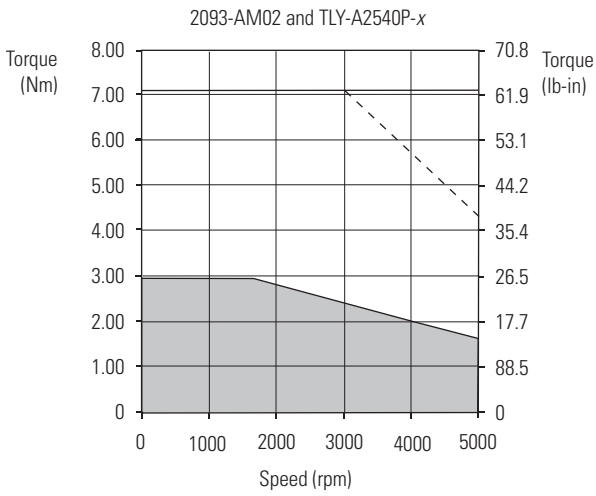
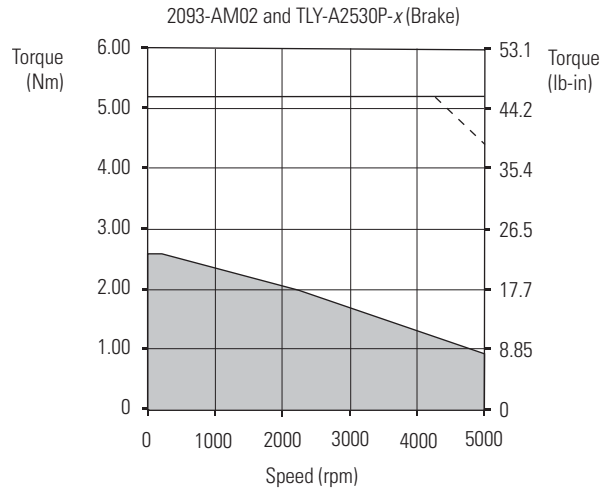
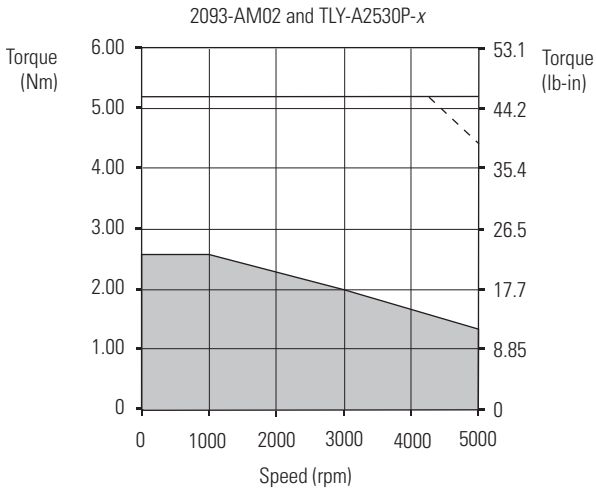
- = Intermittent operating region (three-phase input)
- = Continuous operating region
- = Drive operation (single-phase input)

Kinetix 2000 Drives/TLY-AxxxT-H (incremental) Motor Curves, Continued



- = Intermittent operating region (three-phase input)
- = Continuous operating region
- = Drive operation (single-phase input)

Kinetix 2000 Drives/TLY-Axxxx-x Motor Curves



- = Intermittent operating region (three-phase input)
- = Continuous operating region
- = Drive operation (single-phase input)

Kinetix 7000 Drives with HPK-Series Asynchronous Servo Motors

This section provides system combination information for the Kinetix 7000 drives when matched with HPK-Series motors. These motors are available with 460V and 400V windings. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPL Motor Cable Combinations (460V Motors)

Motor Cat. No.	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
HPK-B1307C and HPK-B1308C	Customer Supplied	2090-XXNFMF-S _{xx} ⁽²⁾ Absolute High-resolution Feedback
HPK-B1307E and HPK-B1310C		
HPK-B1308E, HPK-B1609E, and HPK-B1613C		
HPK-B1611E and HPK-B1613E		
HPK-B1815C		
HPK-B2010C, HPK-B2010E		
HPK-B2212C, HPK-B2510C		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

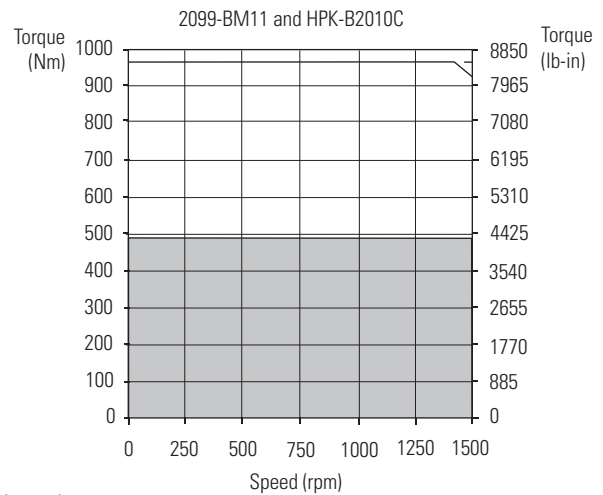
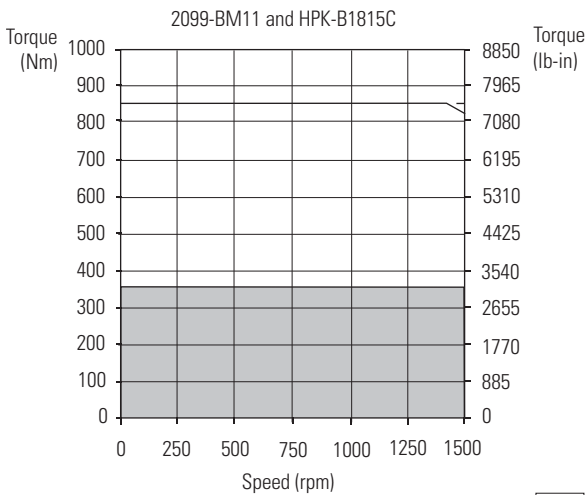
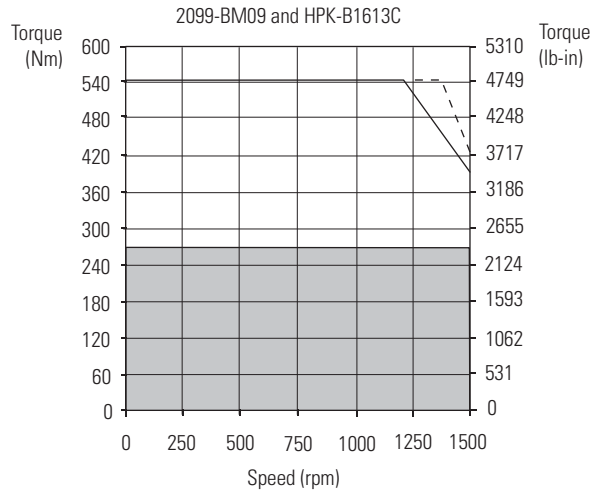
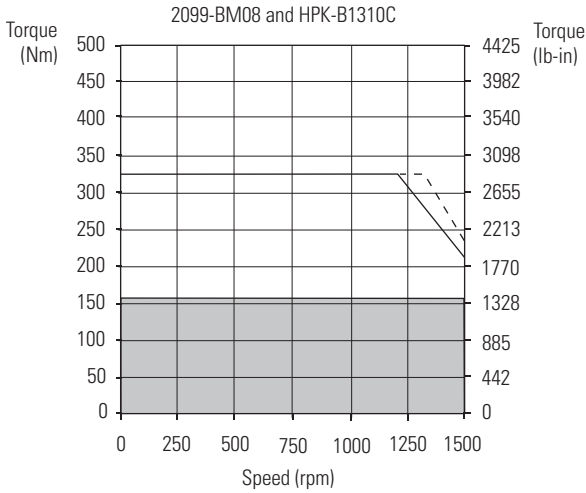
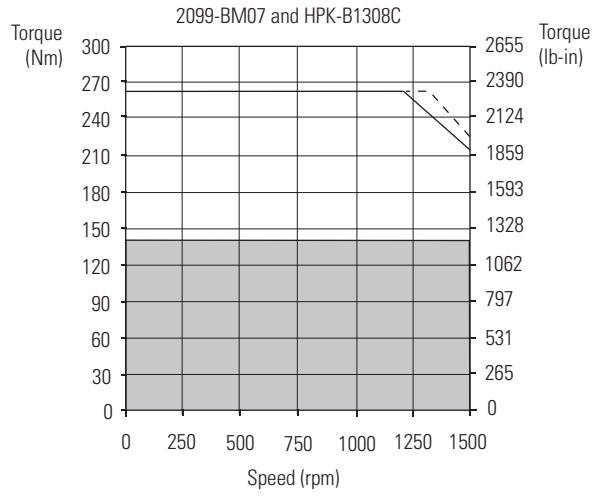
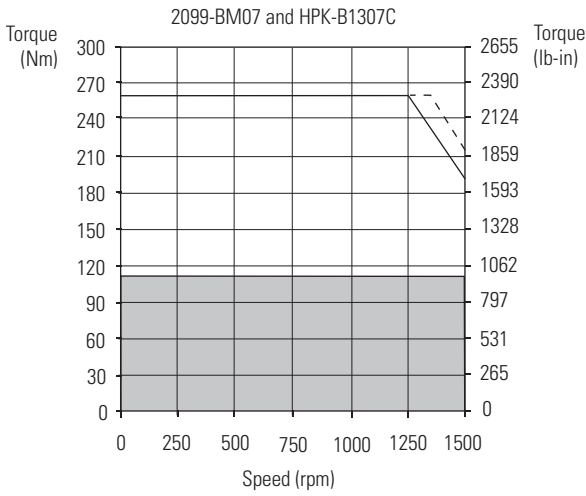
Cable length *xx* is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

HPK-Series (460V) Performance Specifications with Kinetix 7000 (460V) Drives

Rotary Motor	Base Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW (Hp)	Kinetix 7000 Drives
HPK-B1307C	1500	102.0	112 (991)	113.0	257 (2274)	17.1 (22.9)	2099-BM07
HPK-B1308C		59.6	141 (1248)	119.3	262 (2319)	21.6 (28.9)	2099-BM07
HPK-B1310C		64.9	155 (1372)	144.0	325 (2876)	23.8 (31.9)	2099-BM08
HPK-B1613C		109.8	271 (2398)	217.0	542 (4797)	41.7 (55.9)	2099-BM09
HPK-B1815C		153.7	360 (3186)	402.0	850 (7523)	55.9 (74.9)	2099-BM11
HPK-B2010C		196.4	482 (4266)	440.0	970 (8585)	75.0 (100.5)	2099-BM11
HPK-B2212C		278.0	714 (6319)	524.0	1356 (12,000)	112 (151)	2099-BM12
HPK-B2510C		351.0	865 (7656)	526.0	1216 (10,762)	136 (180)	2099-BM12
HPK-B1307E	3000	81.0	96.0 (849)	146.6	165 (1460)	29.8 (39.9)	2099-BM08
HPK-B1308E		91.4	115 (1018)	190.3	230 (2035)	35.7 (47.8)	2099-BM09
HPK-B1609E		124.4	156 (1381)	217.0	270 (2390)	48.4 (64.8)	2099-BM09
HPK-B1611E		149.0	183 (1619)	338.4	400 (3540)	57.0 (76.4)	2099-BM11
HPK-B1613E		191.0	237 (2097)	440.0	459 (4062)	73.7 (98.8)	2099-BM11
HPK-B2010E		254.0	295 (2610)	440.0	500 (4425)	92.0 (125.0)	2099-BM11

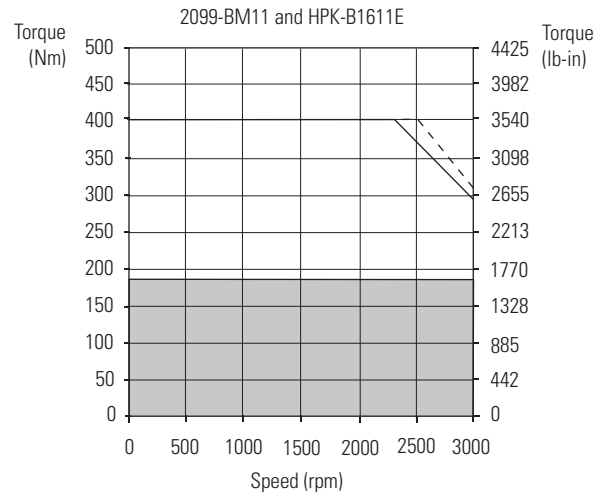
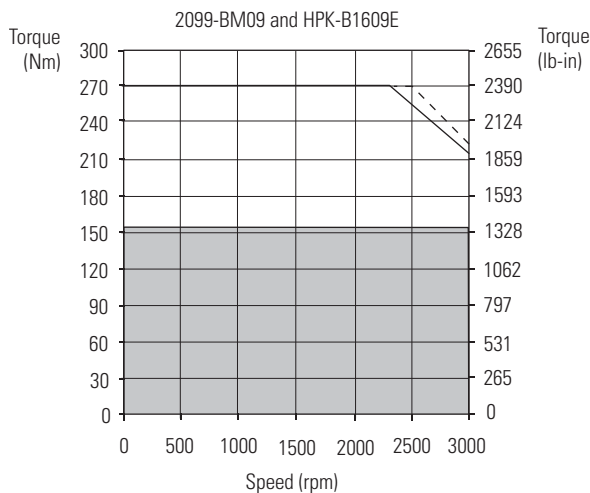
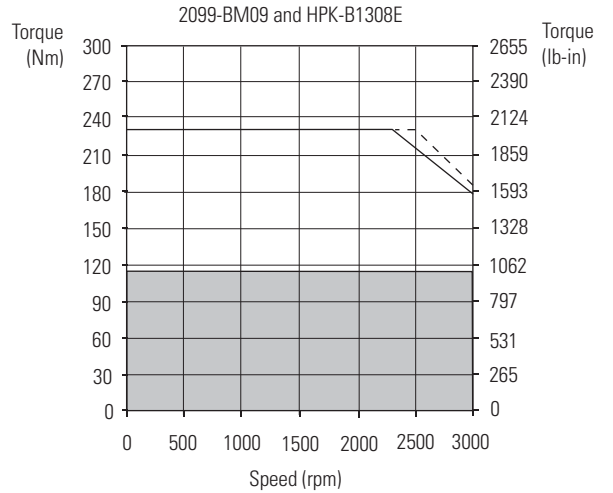
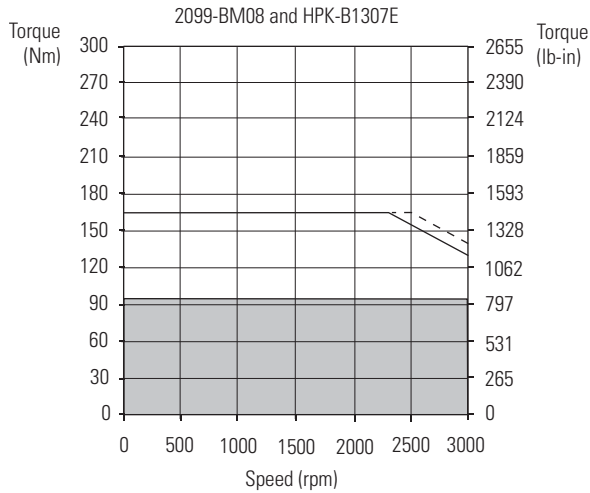
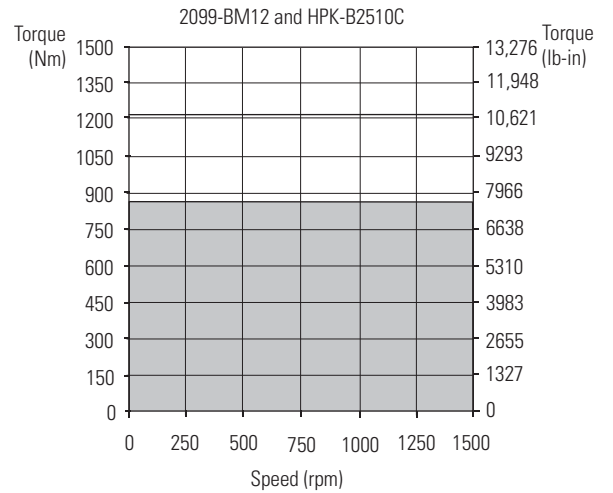
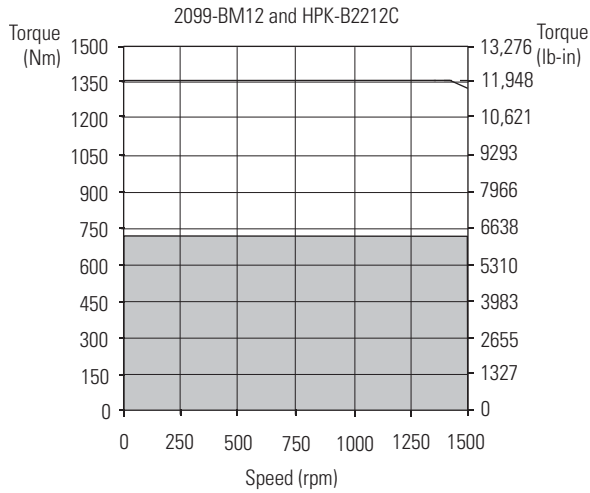
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 7000 (460V) Drives/HPK-Series (460V) Motor Curves



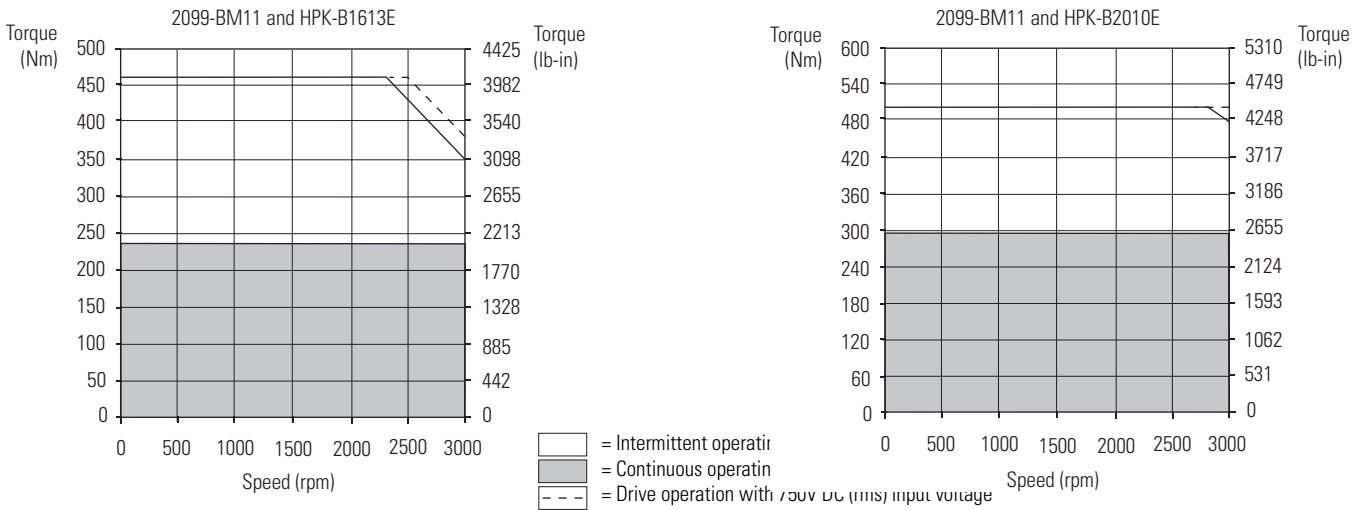
- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 750V DC (rms) input voltage

Kinetix 7000 (460V) Drives/HPK-Series (460V) Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 750V DC (rms) input voltage

Kinetix 7000 (460V) Drives/HPK-Series (460V) Motor Curves, Continued



HPK-Series Motor Cable Combinations (400V Motors)

Motor Cat. No. (400V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
HPK-E1307C	Customer Supplied	2090-XXNFMF-Sxx ⁽²⁾ Absolute High-resolution Feedback
HPK-E1307E, HPK-E1308E, and HPK-E1310C		
HPK-E1609E, HPK-E1611E, HPK-E1613C, and HPK-E1613E		
HPK-E1815C and HPK-E2010C		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

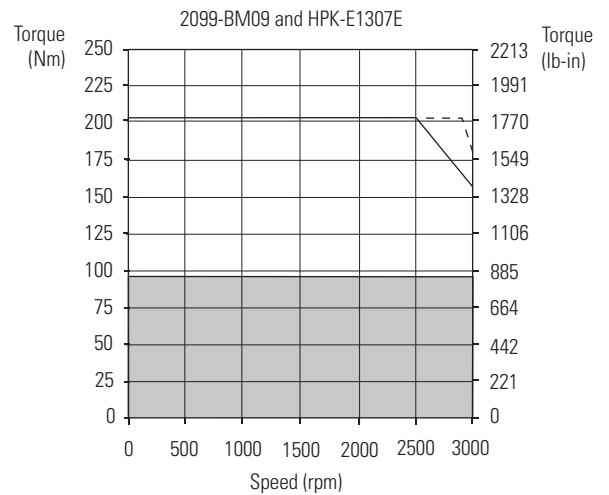
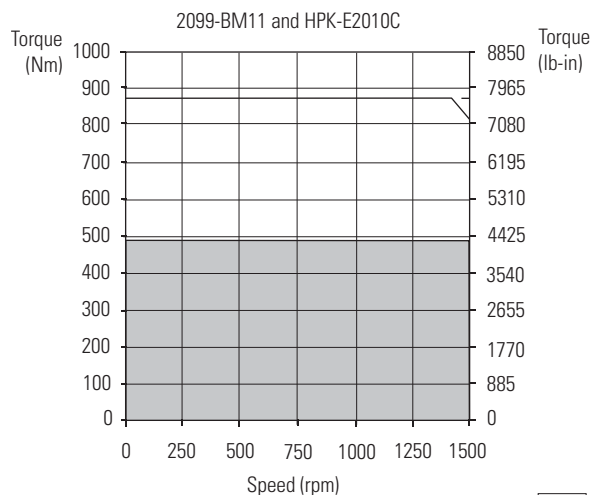
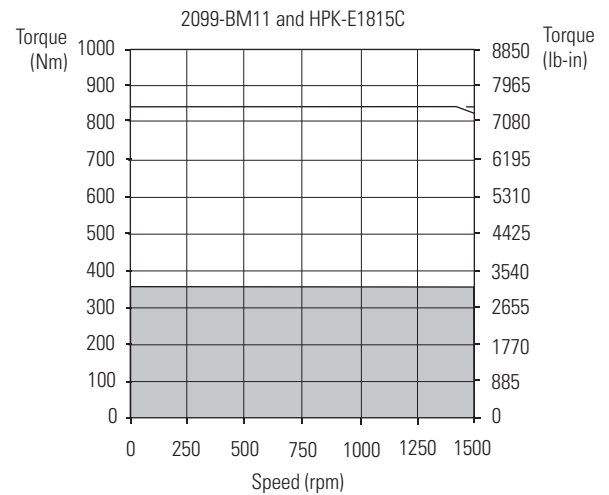
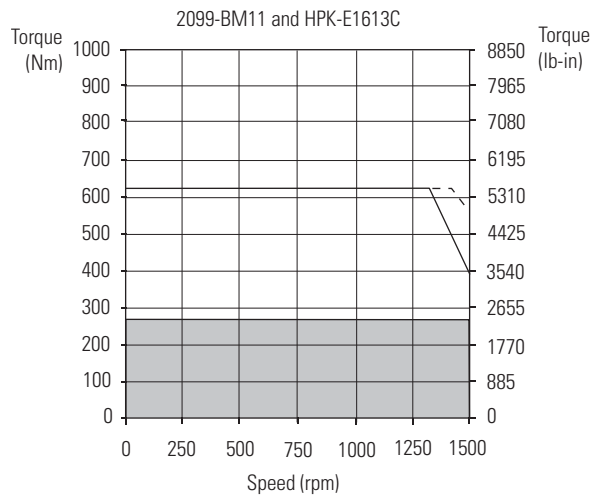
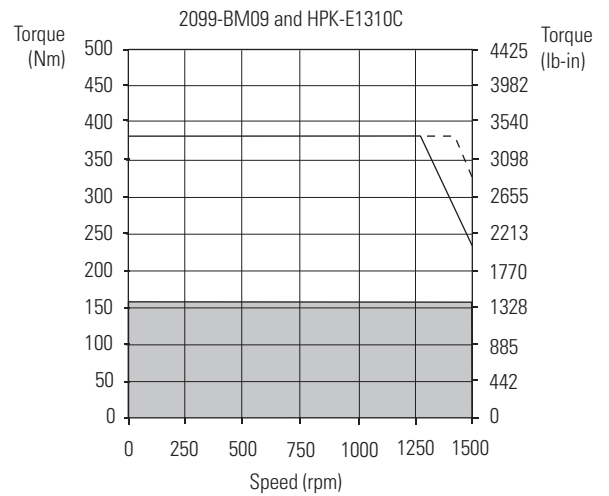
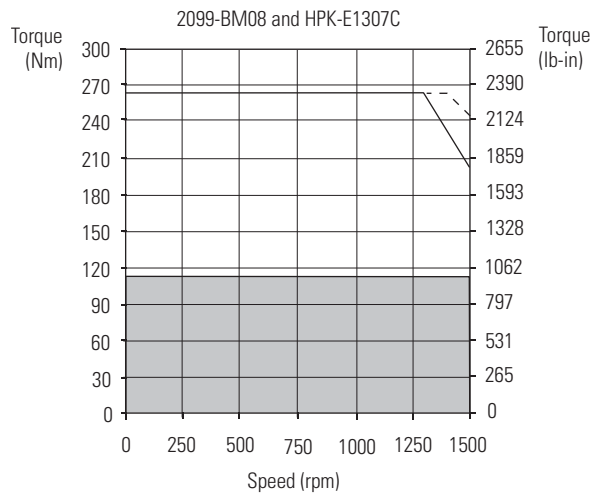
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

HPK-Series (400V) Performance Specifications with Kinetix 7000 (460V) Drives

Rotary Motor	Base Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW (Hp)	Kinetix 7000 Drives
HPK-E1307C	1500	58.5	112 (991)	146.6	263 (2327)	17.1 (22.9)	2099-BM08
HPK-E1310C		80.0	155 (1372)	200.0	380 (3363)	23.8 (32.4)	2099-BM09
HPK-E1613C		133.0	271 (2398)	310.0	625 (5531)	41.7 (55.9)	2099-BM11
HPK-E1815C		187.0	360 (3186)	440.0	840 (7434)	55.9 (74.9)	2099-BM11
HPK-E2010C		243.0	482 (4266)	440.0	870 (7700)	75.0 (100.5)	2099-BM11
HPK-E1307E	3000	102.0	96.0 (849)	217.0	202 (1788)	29.8 (39.9)	2099-BM09
HPK-E1308E		112.8	107 (947)	217.7	200 (1770)	33.2 (45.0)	2099-BM09
HPK-E1609E		153.7	156 (1381)	356.7	359 (3176)	48.4 (64.9)	2099-BM11
HPK-E1611E		185.0	183 (1619)	440.0	430 (3805)	57.0 (76.4)	2099-BM11
HPK-E1613E		242.5	237 (2097)	440.0	430 (3805)	73.7 (98.8)	2099-BM11

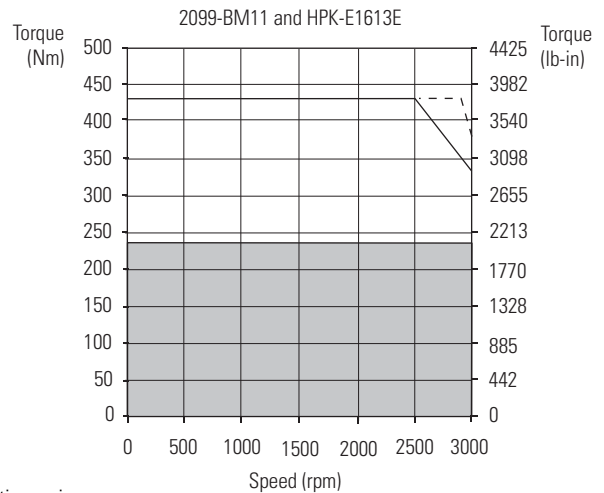
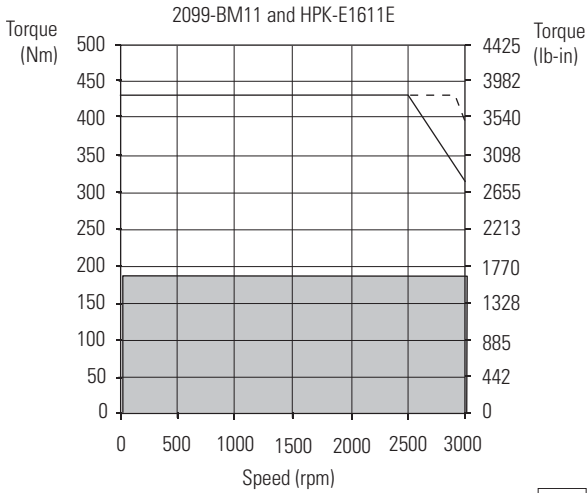
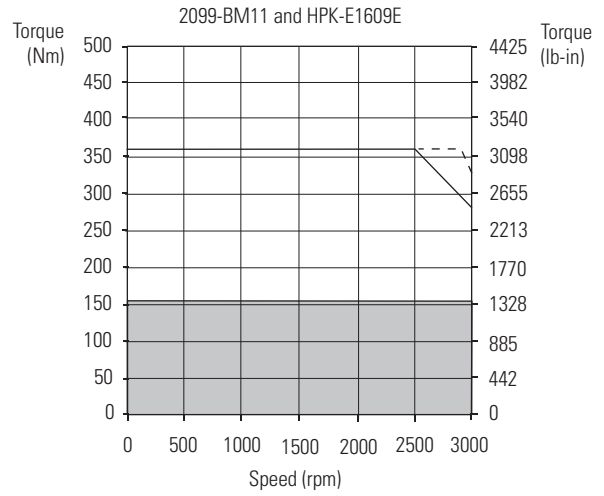
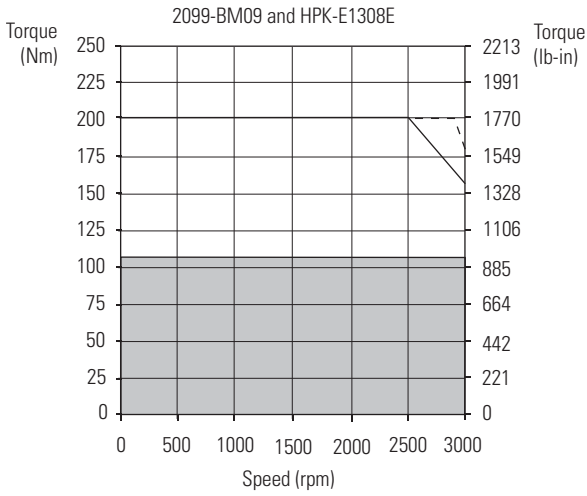
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 7000 (460V) Drives/HPK-Series (400V) Motor Curves



= Intermittent operating region
 = Continuous operating region
 = Drive operation with 750V DC (rms) input voltage

Kinetix 7000 (460V) Drives/HPK-Series (400V) Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region
 = Drive operation with 750V DC (rms) input voltage

Kinetix 7000 Drives with MP-Series Low Inertia Motors

This section provides system combination information for the Kinetix 7000 drives when matched with MP-Series low-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

IMPORTANT

The MP-Series low-inertia motors on this page are equipped with DIN connectors (specified by 4 or 7 in the catalog number) and are not compatible with cables designed for motors equipped with bayonet connectors (specified by 2 in the catalog number). The motors with bayonet connectors (for example, MPL-A310P-xx2xAA) are being discontinued and require 2090-XXN \times MP- (bayonet) cables. For help with migration or to select bayonet cables, contact your Rockwell Automation sales representative.

Bulletin MPL Motor Cable Combinations

Motor Cat. No.	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPL-B540K-xx7xAA, MPL-B560F-xx7xAA	2090-XXNPMF-14Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPL-B580F-xx7xAA, MPL-B580J-xx7xAA MPL-B640F-xx7xAA	2090-XXNPMF-10Sxx ⁽²⁾	
MPL-B660F-xx7xAA, MPL-B680D-xx7xAA, MPL-B960B-xx7xAA, MPL-B980B-xx7xAA	2090-CPBM7DF-08AAxx (standard)	
MPL-B680F-xx7xAA, MPL-B860D-xx7xAA	2090-CPBM7DF-06AAxx (standard)	
MPL-B960C-xx7xAA		
MPL-B880C-xx7xAA		
MPL-B880D-xx7xAA	2090-CPBM7DF-04AAxx (standard)	
MPL-B960D-xx7xAA, MPL-B980C-xx7xAA, MPL-B980D-xx7xAA		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CP \times M7DF-xxAFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

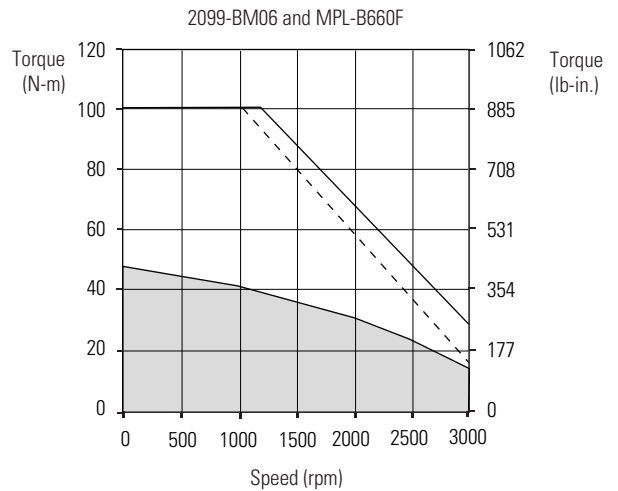
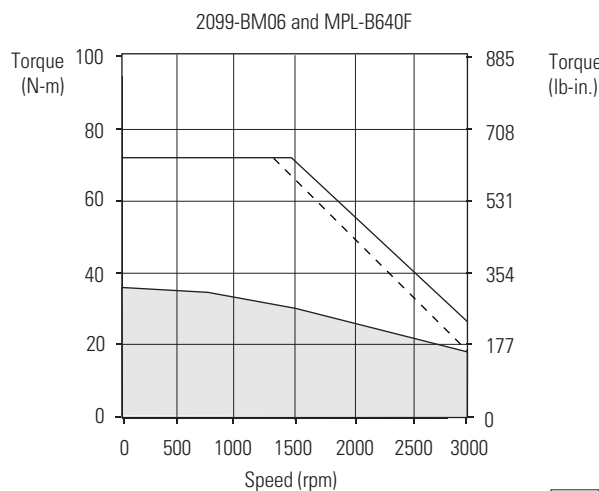
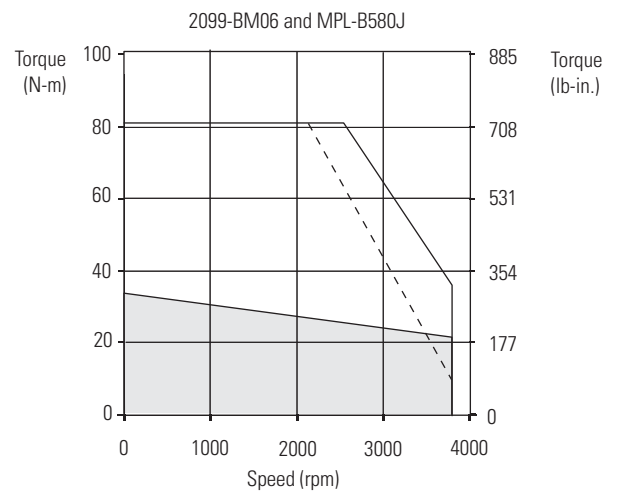
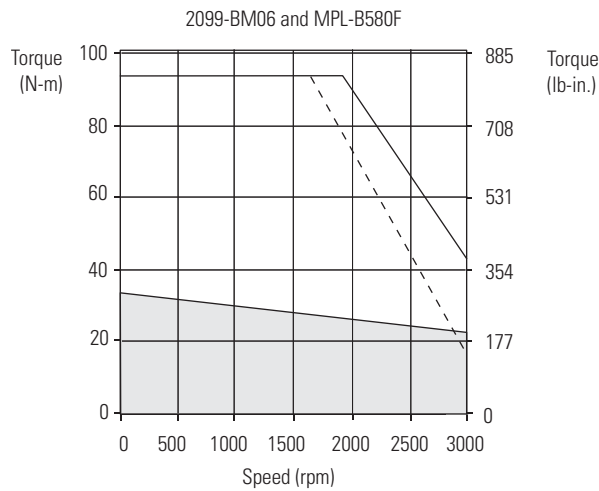
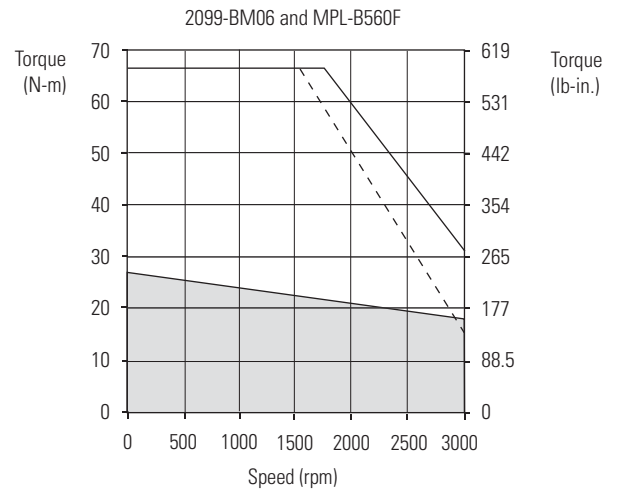
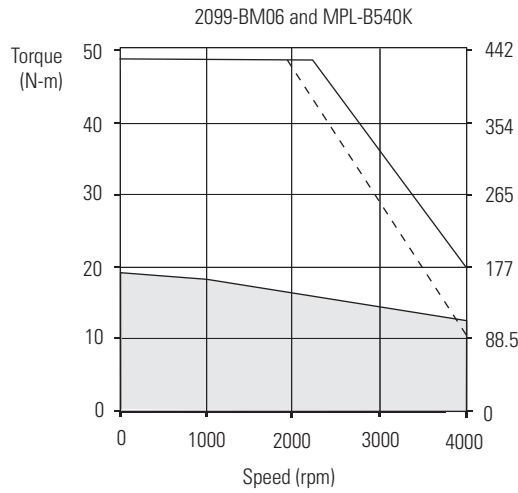
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPL Motor Performance Specifications with Kinetix 7000 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 7000 Drives
MPL-B540K	3000	20.4	19.5 (172)	60.0	48.6 (430)	5.4	2099-BM06
MPL-B560F	3000	20.9	27.0 (239)	68.0	67.7 (599)	5.5	2099-BM06
MPL-B580F	3000	26.0	34.0 (301)	94.0	87.0 (770)	7.1	2099-BM06
MPL-B580J	3800	32.0	34.0 (301)	94.0	81.0 (717)	7.9	2099-BM06
MPL-B640F	3000	27.8	36.7 (325)	65.0	72.3 (640)	6.1	2099-BM06
MPL-B660F	3000	33.0	48.0 (425)	96.0	101 (894)	6.1	2099-BM06
MPL-B680D	2000	29.4	62.8 (556)	94.0	154 (1363)	9.3	2099-BM06
MPL-B680F	3000	41.5	59.4 (526)	96.0	108 (956)	7.5	2099-BM06
MPL-B860D	2000	40.9	83.1 (735)	95.5	152 (1345)	12.5	2099-BM06
MPL-B880C	1500	41.1	108 (956)	96.0	200 (1796)	12.6	2099-BM06
			109 (965)	97.5	203 (1770)		2099-BM07
MPL-B880D	2000	57.0	92.5 (818)	96.0	147 (1301)	12.6	2099-BM06
		58.0	110 (973)				2099-BM07
MPL-B960B	1200	36.8	130 (1150)	94.0	231 (2044)	12.7	2099-BM06
MPL-B960C	1500	47.6	124 (1097)	96.0	184 (1628)	14.8	2099-BM06
				113	209 (1850)		2099-BM07
				125	226 (2000)		2099-BM08
MPL-B960D	2000	57.0	100 (885)	96.0	171 (1513)	15.0	2099-BM06
		60.6	124 (1097)	113	201 (1779)		2099-BM07
				125	223 (1973)		2099-BM08
MPL-B980B	1000	34.6	162 (1434)	94.0	278 (2460)	15.2	2099-BM06
MPL-B980C	1500	57.0	131 (1159)	96.0	198 (1752)	16.8	2099-BM06
		59.0	158 (1398)	113	227 (2009)		2099-BM07
				140	270 (2389)		2099-BM08
MPL-B980D	2000	57.0	113 (1000)	96.0	183 (1619)	18.6	2099-BM06
		68.4	148 (1310)	113	213 (1885)		2099-BM07
			158 (1398)	140	259 (2292)		2099-BM08

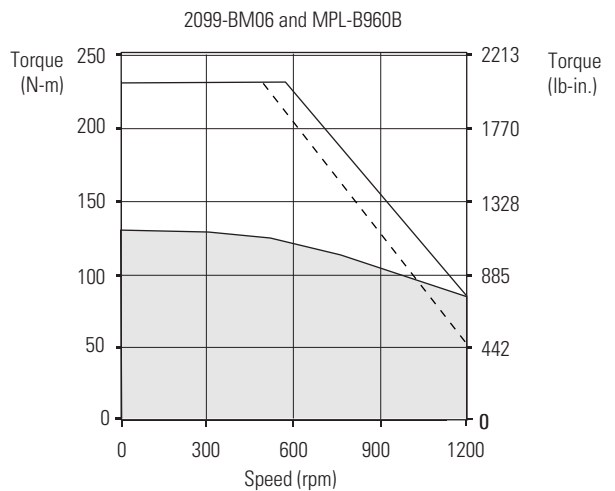
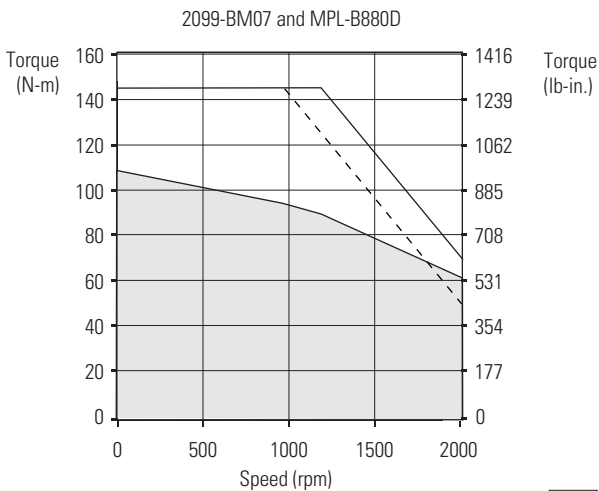
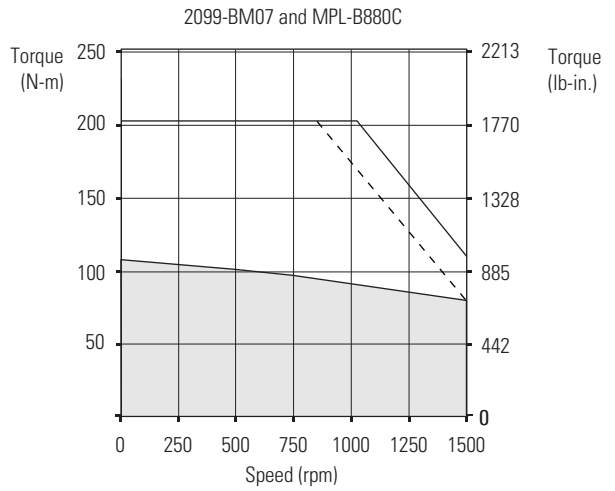
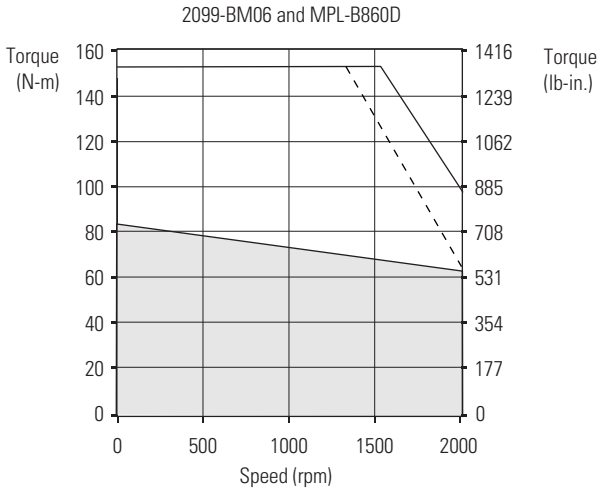
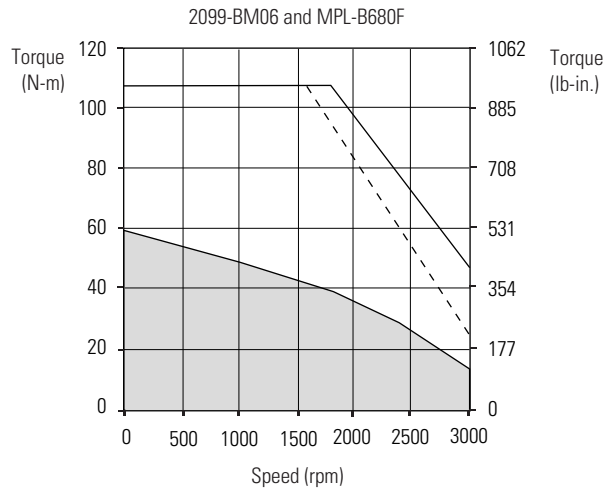
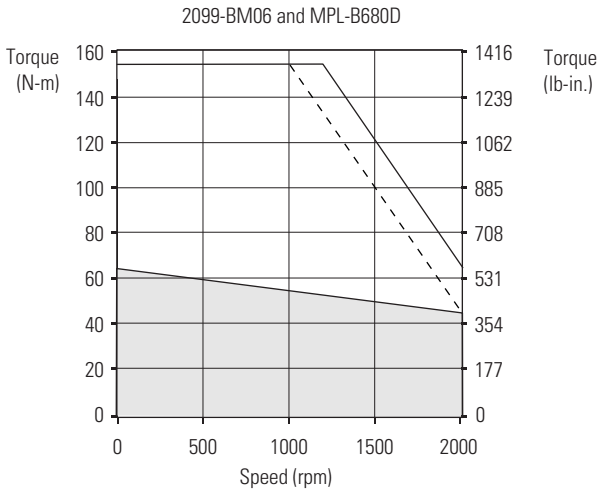
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 7000 (460V) Drives/MP-Series Low Inertia Motor Curves



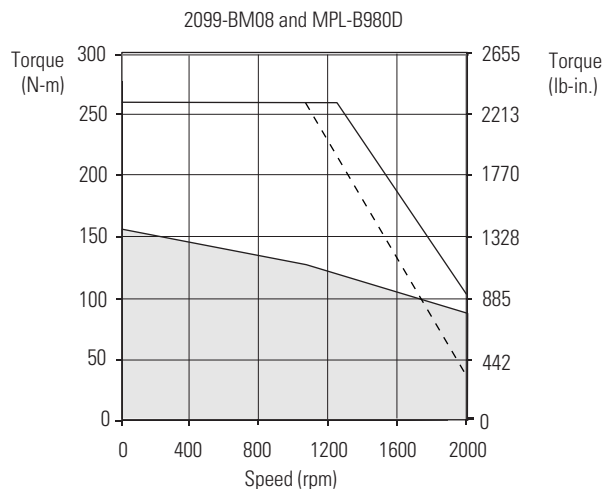
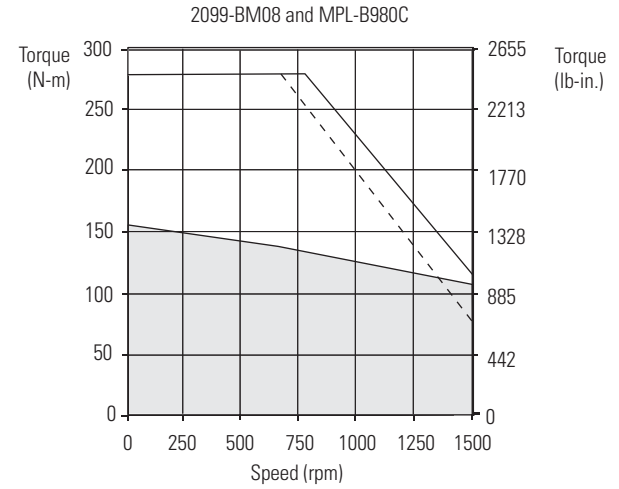
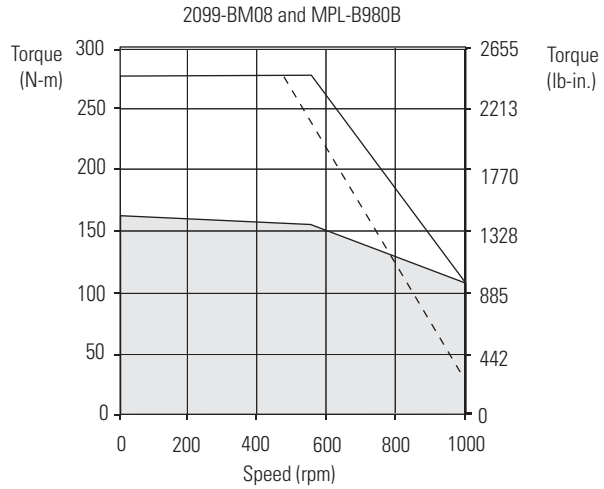
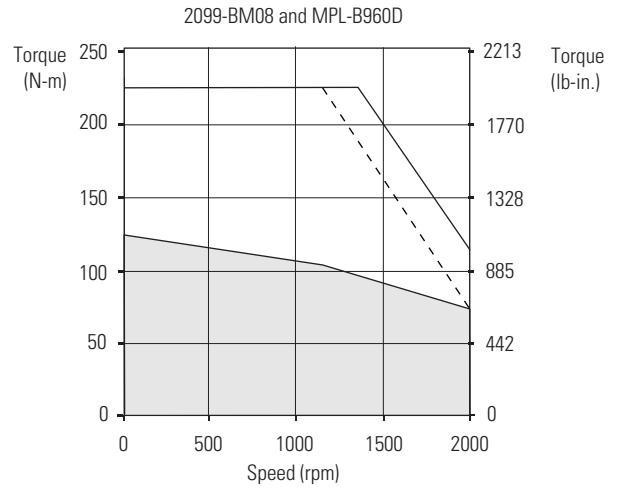
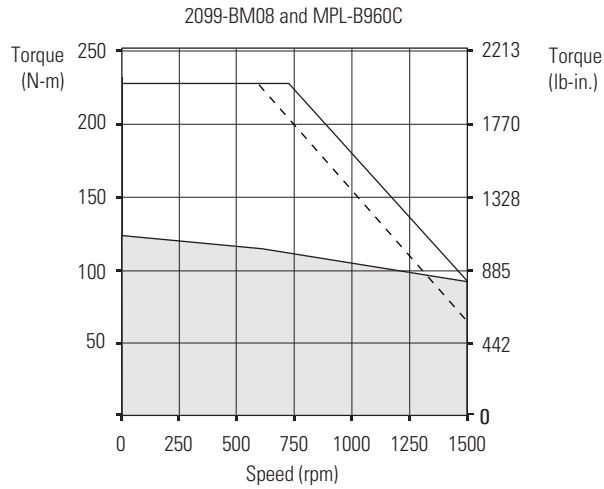
= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Kinetix 7000 (460V) Drives/MP-Series Low Inertia Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Kinetix 7000 (460V) Drives/MP-Series Low Inertia Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 7000 (460V) Drives with MP-Series Medium Inertia Motors

This section provides system combination information for the Kinetix 7000 (460V) drives when matched with MP-Series medium-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPM Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPM-B1151x, MPM-B1152x, MPM-B1153E, MPM-B1153F	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPM-B1302F, MPM-B1302M, MPM-B1304C, MPM-B1304E		
MPM-B1651C, MPM-B1652C		
MPM-B1153T	2090-XXNPMF-14Sxx ⁽²⁾	
MPM-B1302T, MPM-B1304M		
MPM-B1651F, MPM-B1653C		
MPM-B1652E	2090-CPxM7DF-12AAxx (standard)	
MPM-B1651M, MPM-B1652F, MPM-B1653E	2090-XXNPMF-10Sxx ⁽²⁾	
MPM-B2152C, MPM-B2153B		
MPM-B1653F	2090-CPBM7DF-08AAxx (standard)	
MPM-B2152F, MPM-B2152M, MPM-B2153E, MPM-B2153F, MPM-B2154B, MPM-B2154E, MPM-B2154F		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

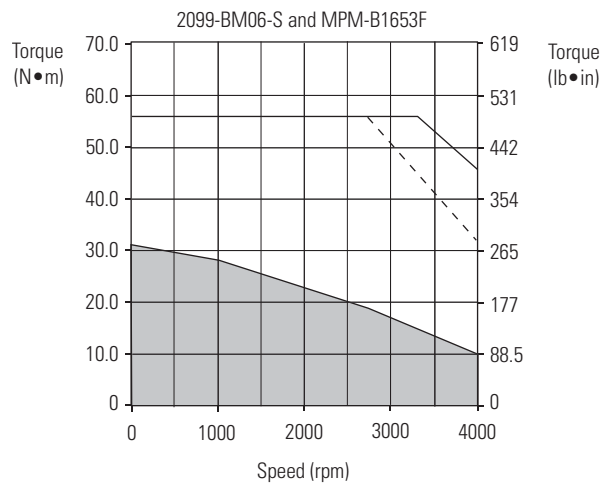
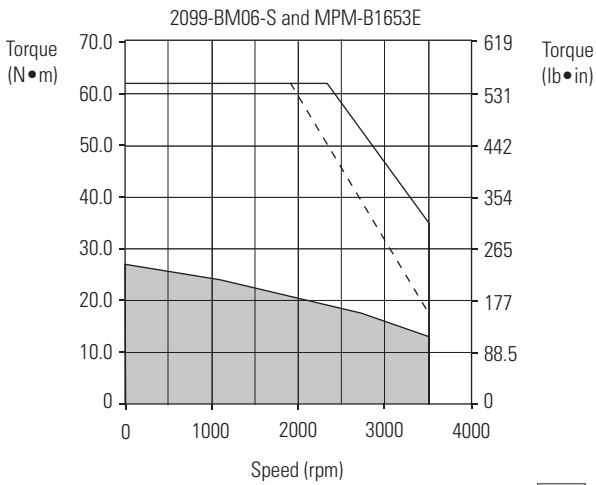
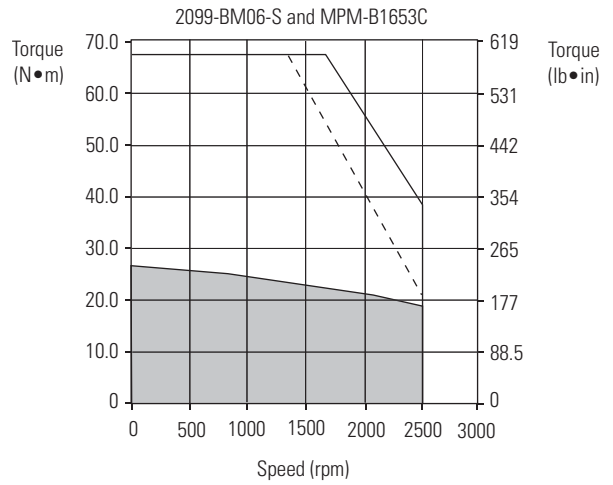
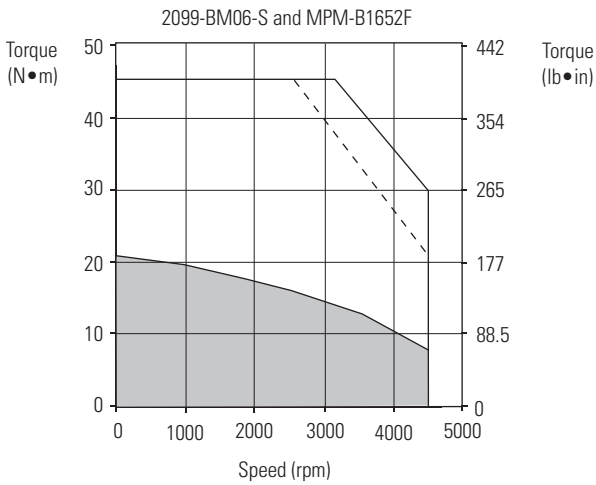
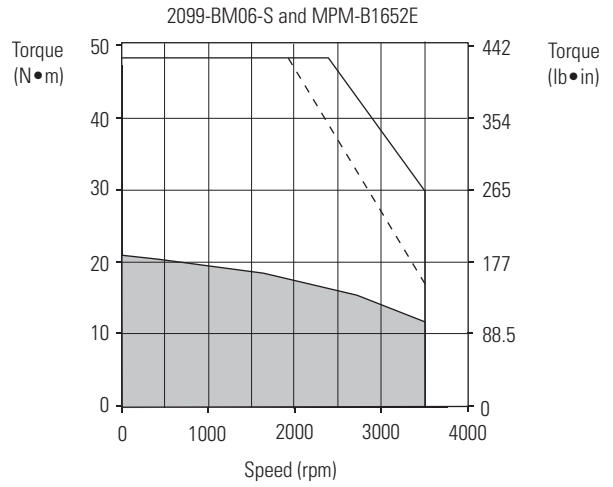
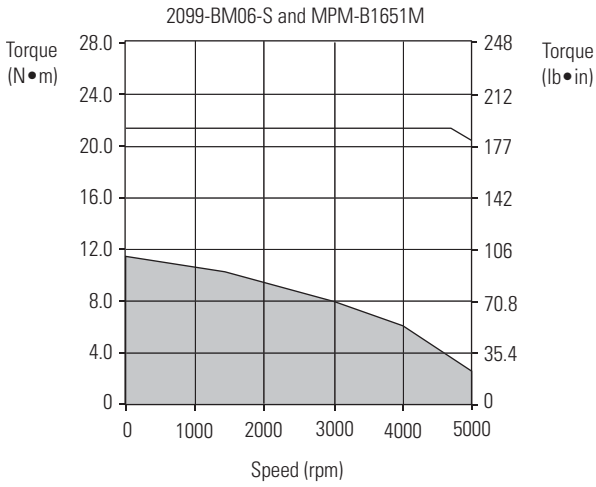
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPM Motor Performance Specifications with Kinetix 7000 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 7000 Drives
MPM-B1651M	5000	25.8	11.3 (100)	56.8	21.4 (189)	2.50	2099-BM06-S
MPM-B1652E	3500	24.0	21.1 (187)	60.5	48.0 (425)	4.30	2099-BM06-S
MPM-B1652F	4500	33.0	21.1 (187)	84.1	45.0 (398)	4.30	2099-BM06-S
MPM-B1653C	2500	23.0	26.7 (236)	59.2	67.7 (599)	4.60	2099-BM06-S
MPM-B1653E	3500	31.0	26.8 (237)	72.9	62.0 (549)	5.10	2099-BM06-S
MPM-B1653F	4000	40.1	31.0 (274)	94.3	56.1 (496)	5.10	2099-BM06-S
MPM-B2152C	2500	31.5	36.7 (325)	55.4	72.2 (639)	5.60	2099-BM06-S
MPM-B2152F	4500	50.0	34.1 (302)	96.0	70.8 (626)	5.90	2099-BM06-S
				98.0	72.2 (639)		2099-BM07-S
MPM-B2152M	5000	51.2	34.1 (302)	76.3	52.9 (468)	5.90	2099-BM06-S
MPM-B2153B	2000	27.6	48.0 (425)	60.0	101 (895)	6.80	2099-BM06-S
MPM-B2153E	3000	45.5	47.9 (424)	96.0	98.8 (468)	7.20	2099-BM06-S
				98.6	101 (895)		2099-BM07-S
MPM-B2153F	3800	50.4	45.6 (403)	96.0	96.6 (855)	7.20	2099-BM06-S
				98.4	98.9 (875)		2099-BM07-S
MPM-B2154B	2000	40.7	62.7 (555)	96.0	151 (1336)	6.90	2099-BM06-S
				98.0	154 (1363)		2099-BM07-S
MPM-B2154E	3000	50.2	55.9 (495)	96.0	110 (973)	7.50	2099-BM06-S
				98.3	112 (991)		2099-BM07-S
MPM-B2154F	3300	51.0	56.2 (497)	83.6	87.9 (778)	7.50	2099-BM06-S

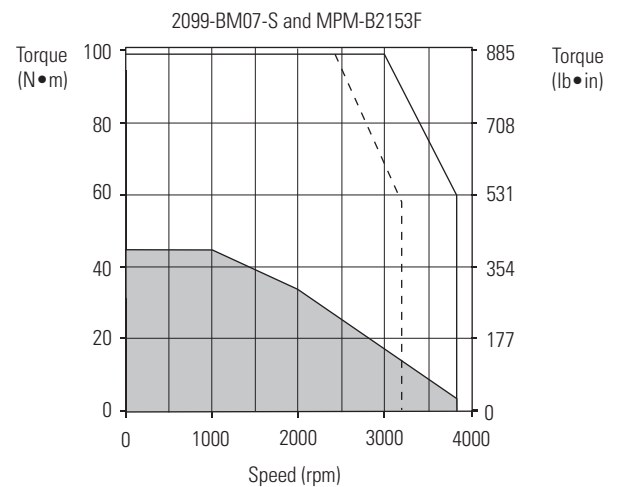
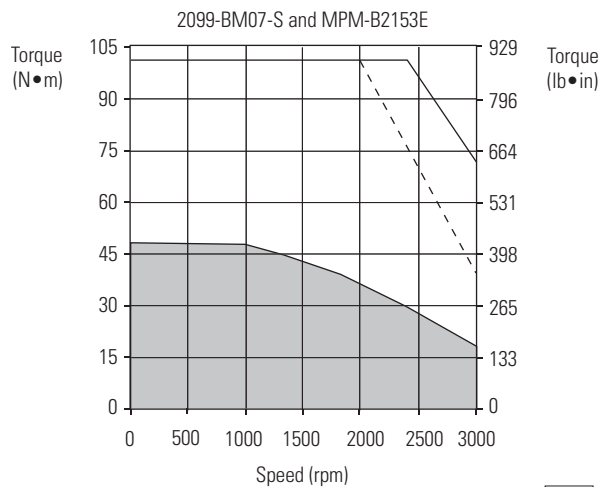
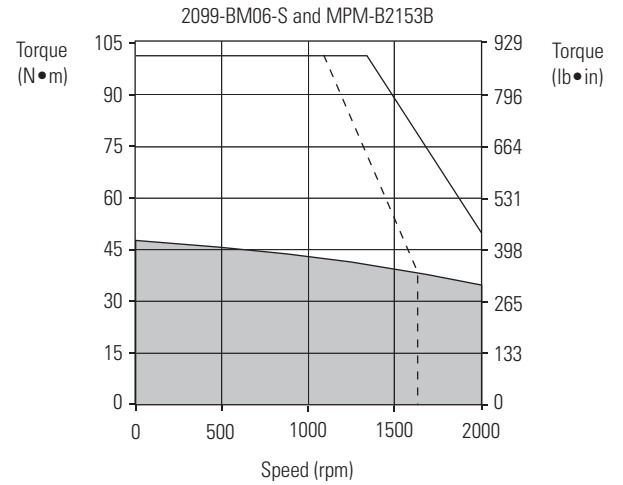
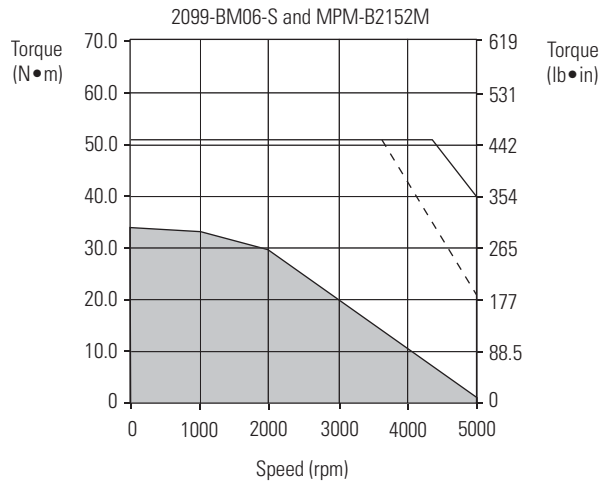
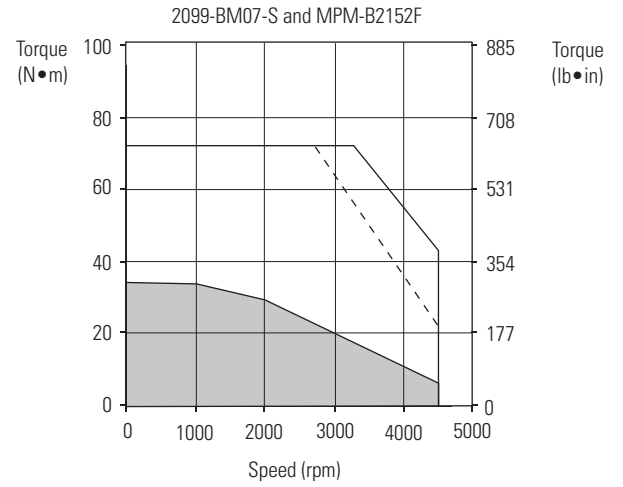
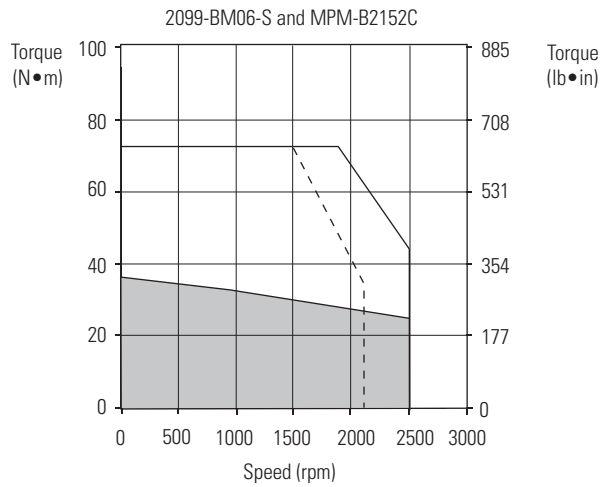
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 7000 (460V) Drives/MP-Series Medium Inertia Motor Curves



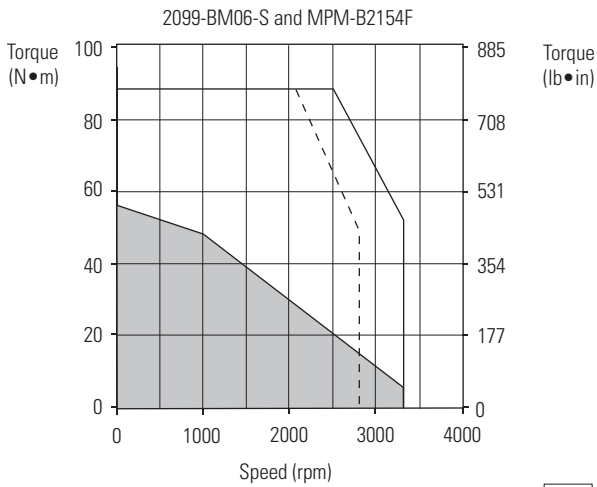
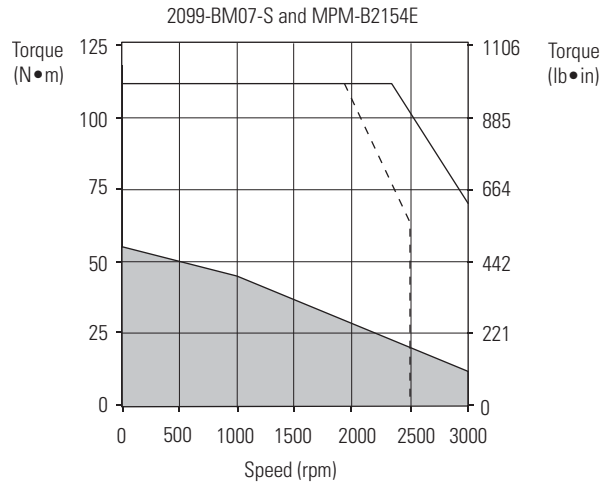
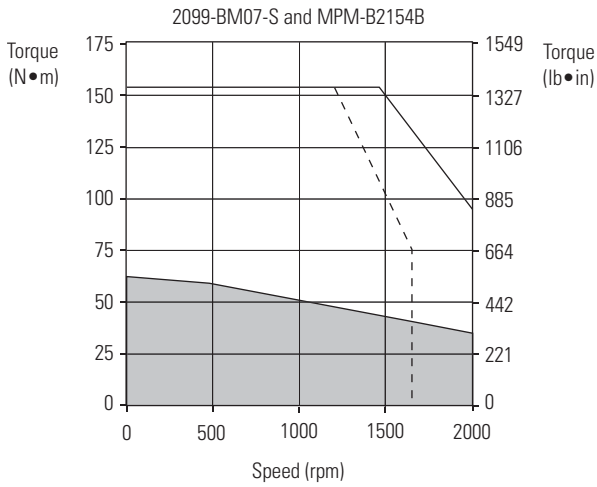
= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Kinetix 7000 (460V) Drives/MP-Series Medium Inertia Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 7000 (460V) Drives/MP-Series Medium Inertia Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 7000 Drives with RDD-Series Direct Drive Motors

This section provides system combination information for the Kinetix 7000 (460V) drives when matched with RDD-Series direct-drive motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin RDB Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
RDB-B21519, RDB-B21529	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
RDB-B29014, RDB-B29016, RDB-B29024		
RDB-B2151C, RDB-B21539	2090-XXNPMF-14S _{xx} ⁽²⁾	
RDB-B29019, RDB-B29034		
RDB-B2152C	2090-CPxM7DF-12AA _{xx} (standard)	
RDB-B29026		
RDB-B2151F, RDB-B2153C	2090-XXNPMF-10S _{xx} ⁽²⁾	
RDB-B29036, RDB-B41014		
RDB-B2152F, RDB-B2153E	2090-CPBM7DF-08AA _{xx} (standard)	
RDB-B29029, RDB-B41016, RDB-B41024		
RDB-B29039, RDB-B41018, RDB-B41026, RDB-B41035	2090-CPBM7DF-06AA _{xx} (standard)	

(1) Use low-profile feedback module (catalog number 2090-K7CK-KENDAT). Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxS_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-xxAF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

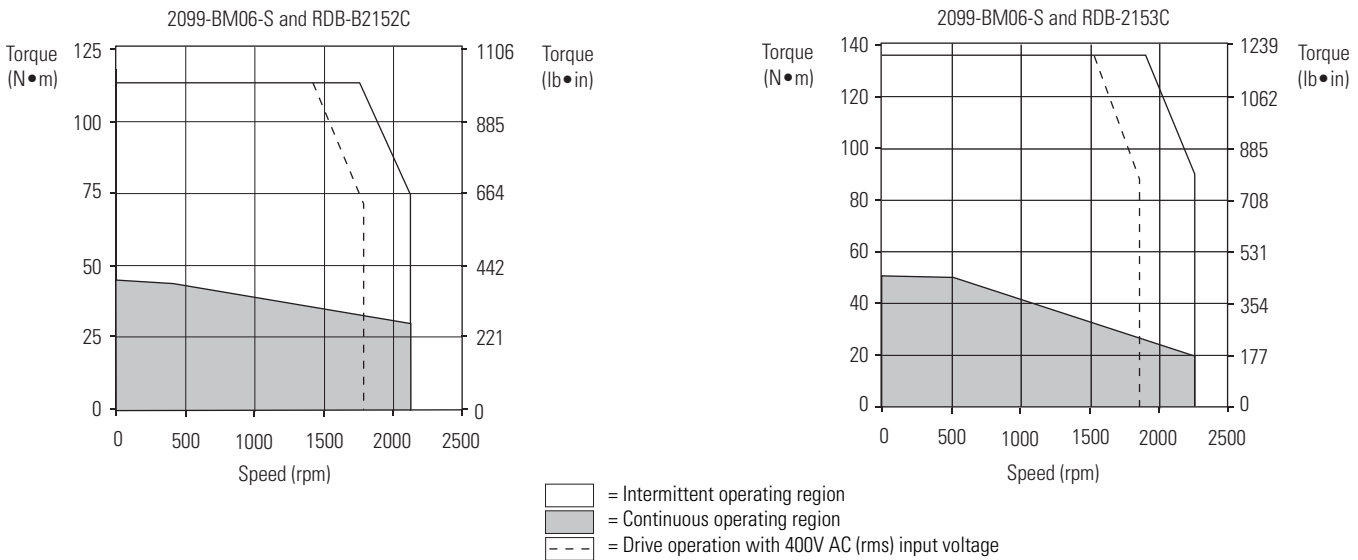
Cable length *xx* is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin RDB Motor Performance Specifications with Kinetix 7000 (460V) Drives

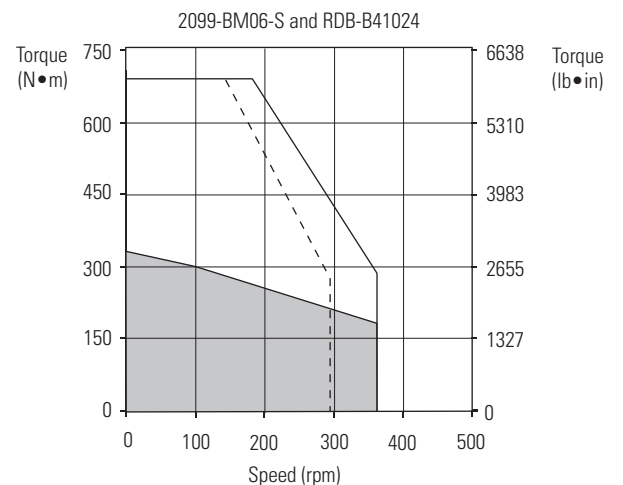
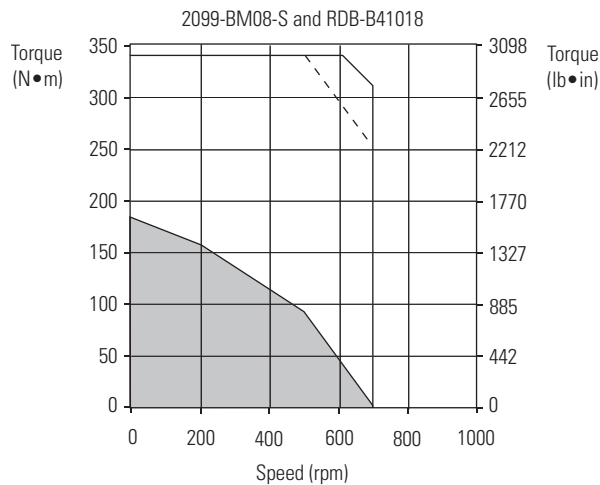
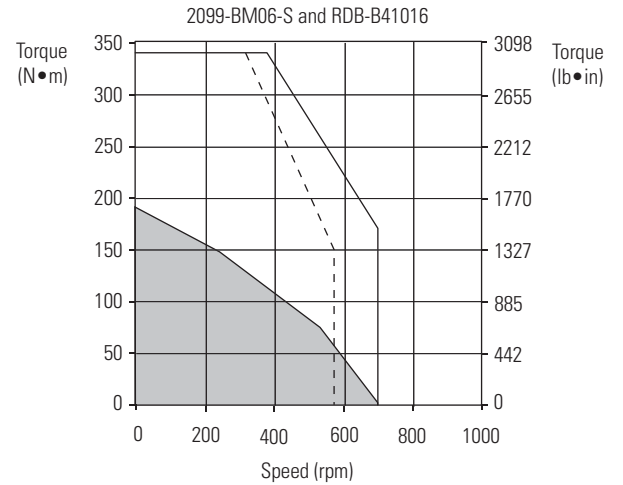
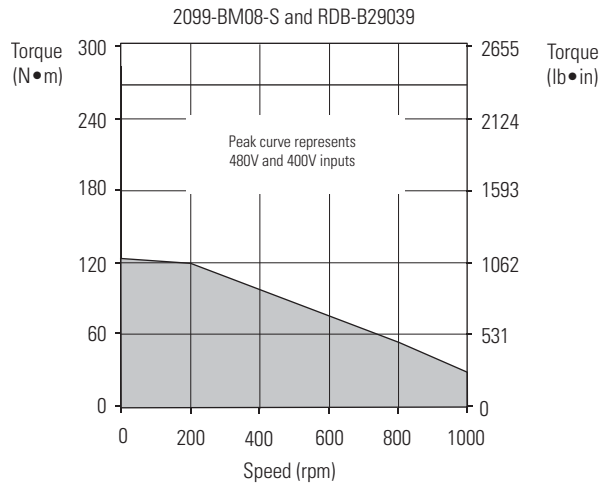
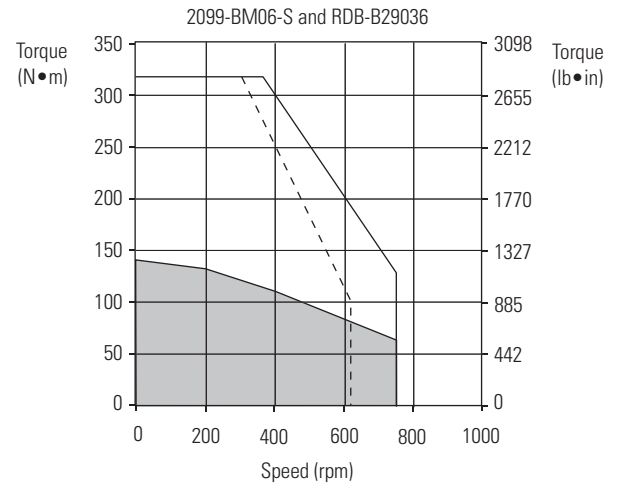
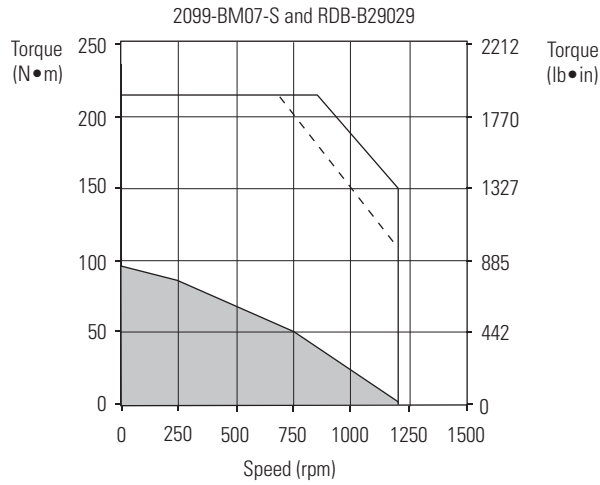
Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Kinetix 7000 460V Drives
RDB-B2152C	2125	23.5	43.4 (384)	63.2	111 (982)	6.41	2099-BM06-S
RDB-B2153C	2250	29.4	51.5 (456)	82.6	137 (1212)	5.87	2099-BM06-S
RDB-B29029	1200	40.0	97.5 (863)	96.0	193 (1708)	4.05	2099-BM06-S
				111	214 (1894)		2099-BM07-S
RDB-B29036	750	27.0	140 (1239)	84.9	318 (2814)	5.49	2099-BM06-S
RDB-B29039	1000	52.7	122 (1080)	147	268 (2372)	4.41	2099-BM08-S
RDB-B41016	700	33.8	183 (1619)	95.5	339 (3000)	4.83	2099-BM06-S
RDB-B41018	700	51.3	183 (1619)	113	299 (2646)	4.83	2099-BM07-S
				140	339 (3000)		2099-BM08-S
RDB-B41024	365	31.5	330 (2929)	95.5	690 (6107)	7.29	2099-BM06-S
RDB-B41026	600	52.0	308 (2726)	147	626 (5540)	7.29	2099-BM08-S
				218	688 (6089)		2099-BM09-S
RDB-B41035	490	52.6	425 (3761)	147	897 (7939)	8.69	2099-BM08-S
				218	1050 (9293)		2099-BM09-S

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 7000 (460V) Drives with RDD-Series Direct Drive Motor Curves

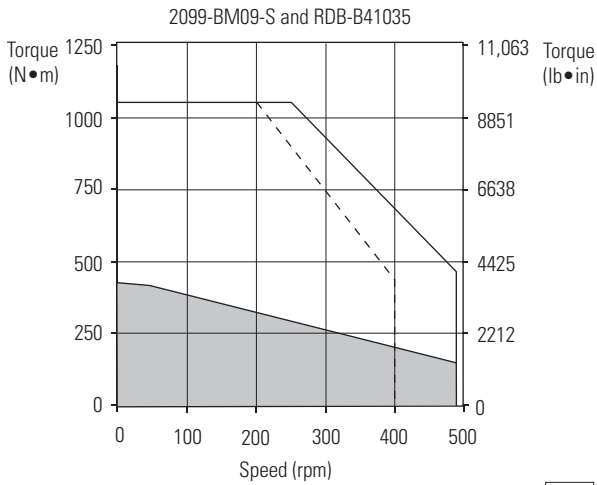
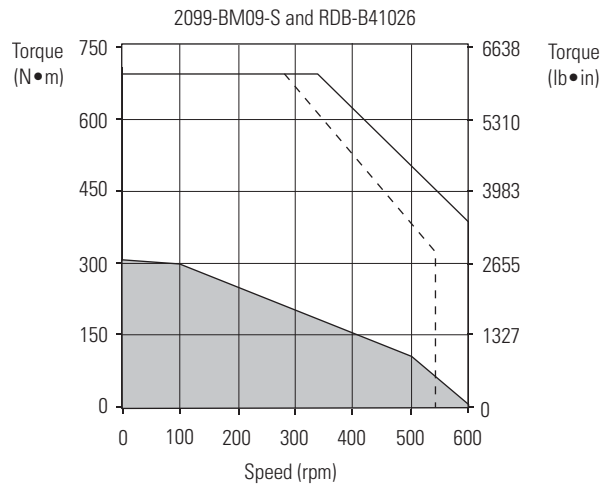
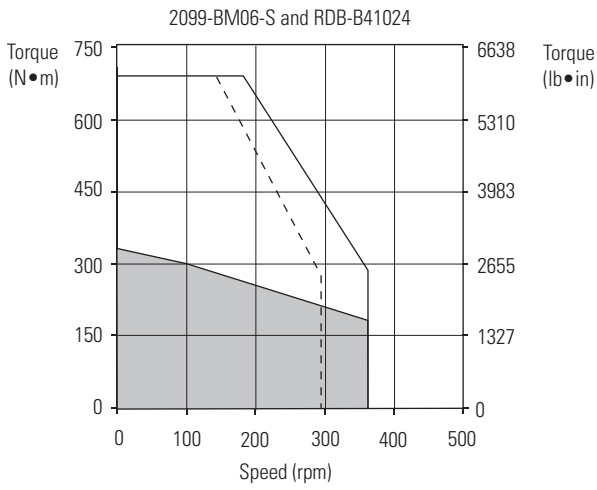


Kinetix 7000 (460V) Drives with RDD-Series Direct Drive Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Kinetix 7000 (460V) Drives with RDD-Series Direct Drive Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Ultra3000/5000 (230V) Drives with MP-Series Low Inertia Motors

This section provides system combination information for the Ultra3000/5000 (230V) drives when matched with MP-Series low-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

IMPORTANT

The MP-Series low-inertia motors on this page are equipped with DIN connectors (specified by 4 or 7 in the catalog number) and are not compatible with cables designed for motors equipped with bayonet connectors (specified by 2 in the catalog number). The motors with bayonet connectors (for example, MPL-A310P-xx2xAA) are being discontinued and require 2090-XXNxMP- (bayonet) cables. For help with migration or to select bayonet cables, contact your Rockwell Automation sales representative.

Bulletin MPL Motor Cable Combinations

Motor Cat. No. (200V class) ⁽¹⁾	Motor Power/Brake Cable	Motor Feedback Cable ⁽²⁾
MPL-A1510V-xx4xAA, MPL-A1520U-xx4xAA, MPL-A1530U-xx4xAA	2090-XXNPMF-16Sxx ⁽³⁾	2090-XXNFMF-Sxx ⁽⁴⁾ Absolute High-resolution or Incremental Feedback
MPL-A210V-xx4xAA, MPL-A220T-xx4xAA, MPL-A230P-xx4xAA		
MPL-A310F-xx7xAA, MPL-A310P-xx7xAA, MPL-A320H-xx7xAA, MPL-A320P-xx7xAA, MPL-A330P-xx7xAA	2090-XXNPMF-16Sxx ⁽⁵⁾	2090-XXNFMF-Sxx ⁽⁶⁾ Absolute High-resolution or Incremental Feedback
MPL-A420P-xx7xAA, MPL-A430H-xx7xAA		
MPL-A4530F-xx7xAA, MPL-A4540C-xx7xAA		
MPL-A430P-xx7xAA	2090-XXNPMF-14Sxx ⁽⁵⁾	
MPL-A4530K-xx7xAA, MPL-A4540F-xx7xAA		
MPL-A520K-xx7xAA	2090-XXNPMF-10Sxx ⁽⁵⁾	
MPL-A540K-xx7xAA, MPL-A560F-xx7xAA	2090-CPBM7DF-08AAxx (standard)	

(1) MPL-A15xx and MPL-A2xx motors are not compatible with Ultra5000 drives.

(2) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(3) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(4) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

(5) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(6) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

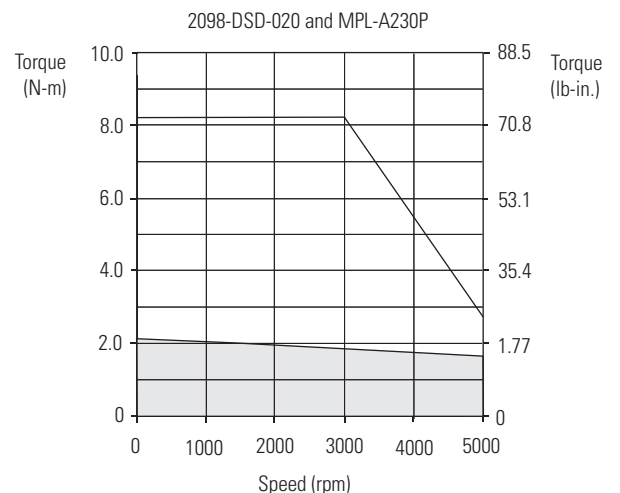
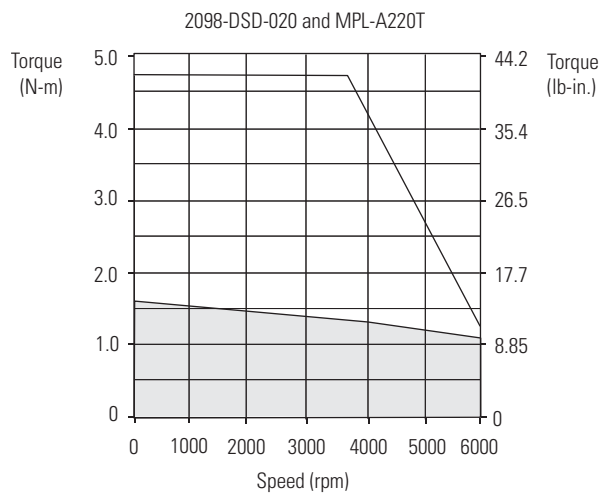
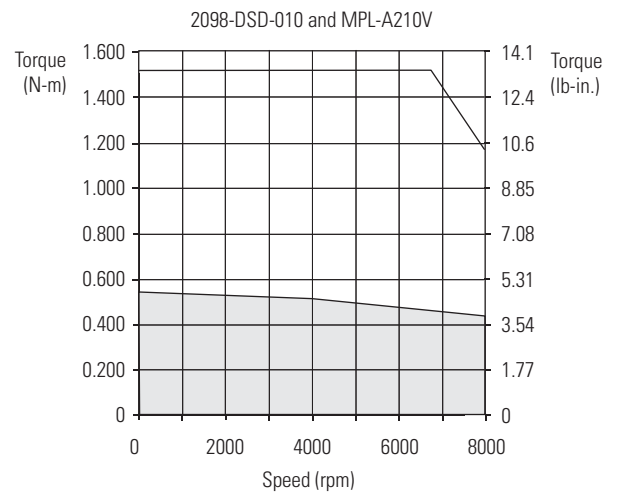
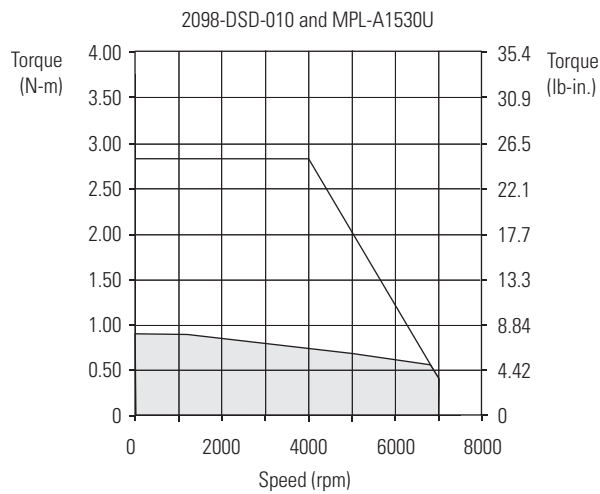
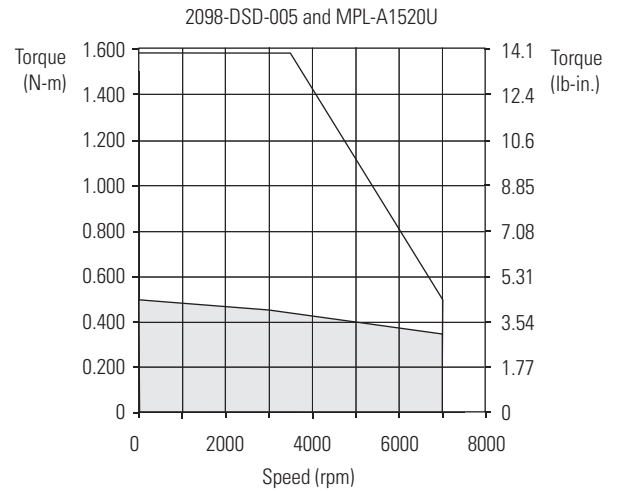
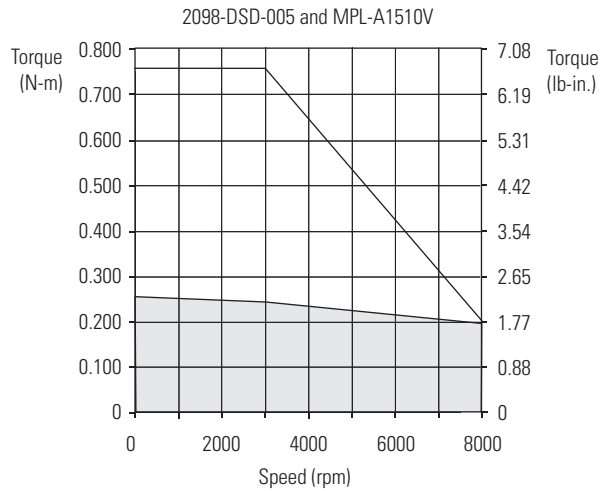
Bulletin MPL Motor Performance Specifications with Ultra3000/5000 (230V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 230V Drives
MPL-A1510V	8000	1.05	0.26 (2.3)	3.40	0.77 (6.8)	0.16	2098-DSD-005
MPL-A1520U	7000	1.80	0.49 (4.3)	6.10	1.58 (13.9)	0.27	2098-DSD-005
MPL-A1530U	7000	2.82	0.90 (8.0)	10.1	2.82 (24.9)	0.39	2098-DSD-010
MPL-A210V	8000	3.09	0.55 (4.8)	10.2	1.52 (13.5)	0.37	2098-DSD-010
MPL-A220T	6000	4.54	1.61 (14.2)	15.5	4.74 (41.9)	0.62	2098-DSD-020
MPL-A230P	5000	5.40	2.10 (18)	23.0	8.2 (72.5)	0.86	2098-DSD-020

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 230V Drives
MPL-A310F	3000	2.50	1.24 (11)	7.5	2.94 (26)	0.46	2098-xxx-005
		3.20	1.58 (14)	9.3	3.61 (32)		2098-xxx-010
MPL-A310P	5000	2.50	0.79 (6.9)	7.5	1.92 (17)	0.73	2098-xxx-005
		4.85	1.58 (14)	14	3.61 (32)		2098-xxx-010
MPL-A320H	3500	2.50	1.24 (11)	7.5	3.16 (28)	1.0	2098-xxx-005
		5.0	2.48 (22)	15	6.44 (57)		2098-xxx-010
		6.1	3.05 (27)	19.3	7.91 (70)		2098-xxx-020
MPL-A320P	5000	2.50	0.85 (7.5)	7.5	2.03 (18)	1.3	2098-xxx-005
		5.0	1.69 (15)	15	3.95 (35)		2098-xxx-010
		9.0	3.05 (27)	29.5	7.91 (70)		2098-xxx-020
MPL-A330P	5000	10.0	3.50 (31)	30	9.60 (85)	1.8	2098-xxx-020
		12.0	4.18 (37)		11.1 (98)		2098-xxx-030
				38			2098-xxx-075
MPL-A420P	5000	10.0	3.73 (33)	30	10.2 (90)	2.0	2098-xxx-020
		12.7	4.74 (42)		13.5 (120)		2098-xxx-030
				46			2098-xxx-075
MPL-A430H	3500	10.0	5.08 (45)	30	14.7 (130)	1.8	2098-xxx-020
		12.2	6.21 (55)		45		19.8 (175)
			6.21 (55)	19.8 (175)			2098-xxx-075
MPL-A430P	5000	10.0	3.50 (31)	30	10.2 (90)	2.2	2098-xxx-020
		15.0	5.42 (48)		19.8 (175)		2098-xxx-030
		16.8	5.99 (53)	67	19.8 (175)		2098-xxx-075
MPL-A4530F	2800	10.0	6.21 (55)	30	17.5 (155)	1.9	2098-xxx-020
		13.4	8.36 (74)		42		20.3 (180)
MPL-A4530K	4000	10.0	4.18 (35)	30	11.3 (100)	2.5	2098-xxx-020
		15.0	6.21 (55)		20.3 (180)		2098-xxx-030
		19.5	8.13 (72)	62	20.3 (180)		2098-xxx-075
MPL-A4540C	1500	9.4	10.2 (90)	29	27.1 (240)	1.5	2098-xxx-020
MPL-A4540F	3000	10.0	5.54 (49)	30	15.8 (140)	2.6	2098-xxx-020
		15.0	8.25 (73)		27.1 (240)		2098-xxx-030
		18.4	10.2 (90)	58	27.1 (240)		2098-xxx-075
MPL-A520K	4000	23	10.7 (95.0)	65	24.0 (212)	3.5	2098-xxx-075
					24.3 (215)		2098-xxx-150
MPL-A540K	4000	41.5	19.4 (172)	120	48.6 (430)	5.5	2098-xxx-150
MPL-A560F	3000	42.0	26.8 (237)		61.0 (540)	5.3	2098-xxx-150

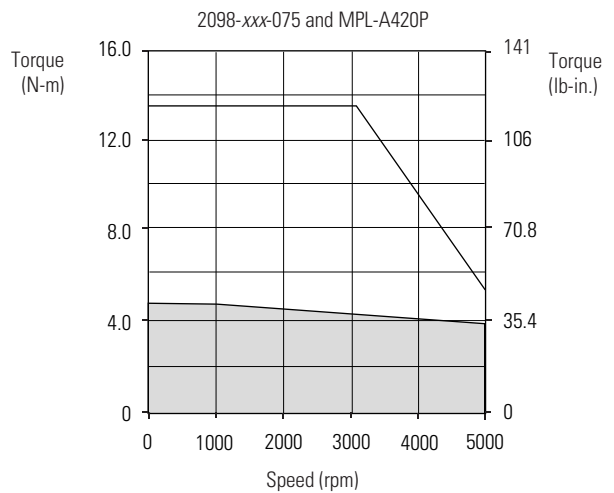
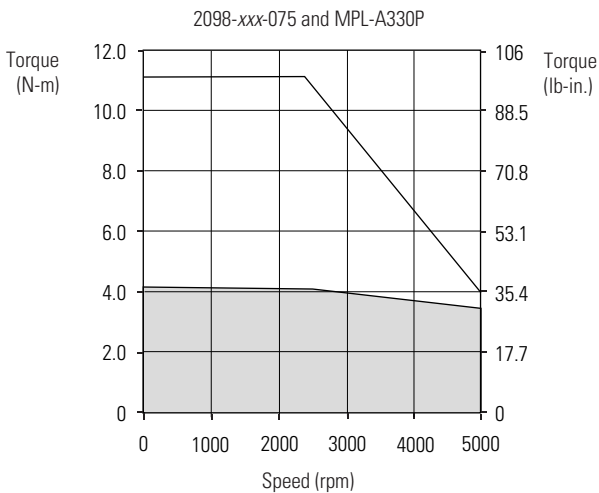
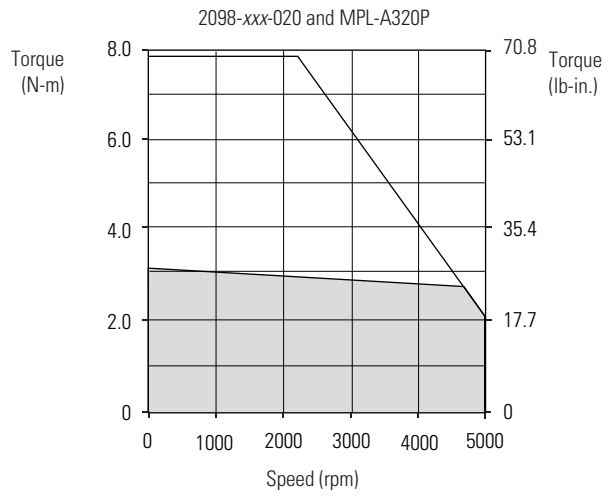
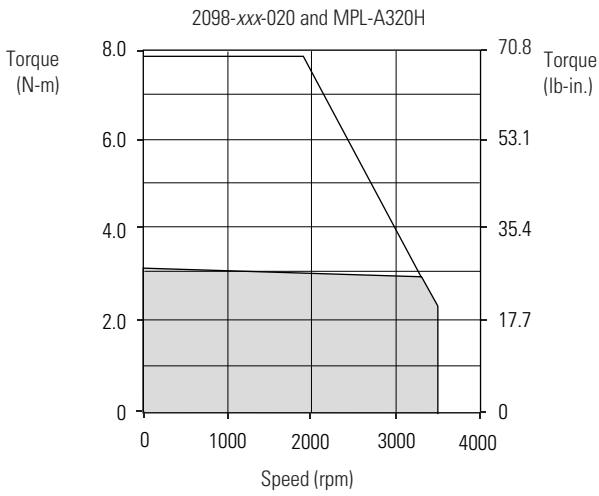
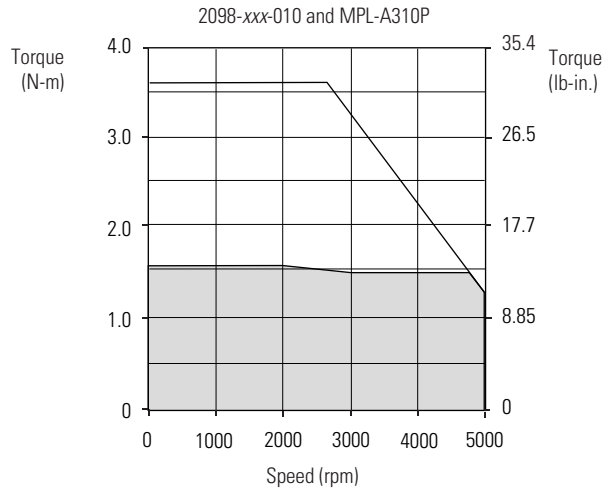
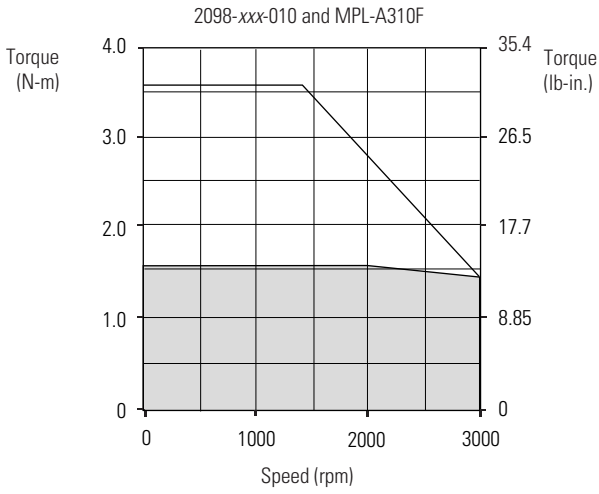
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.



Ultra3000 (230V) Drives/MP-Series Low Inertia Motor Curves



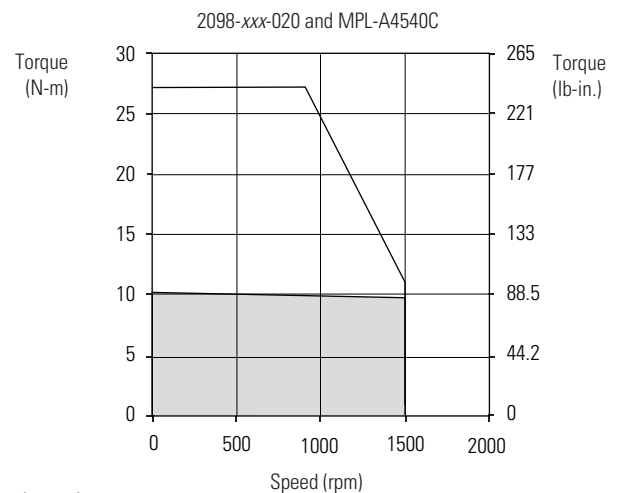
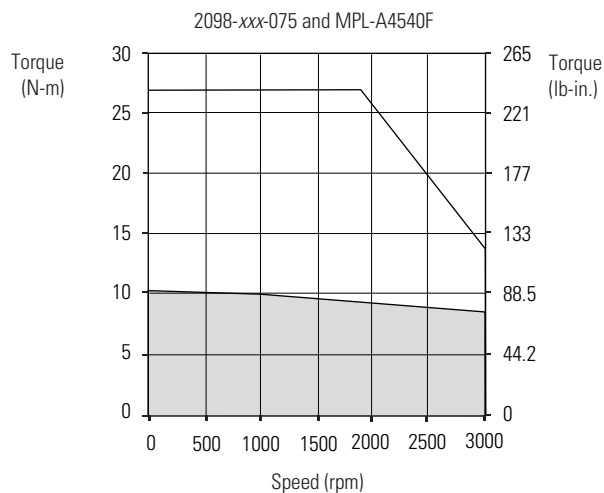
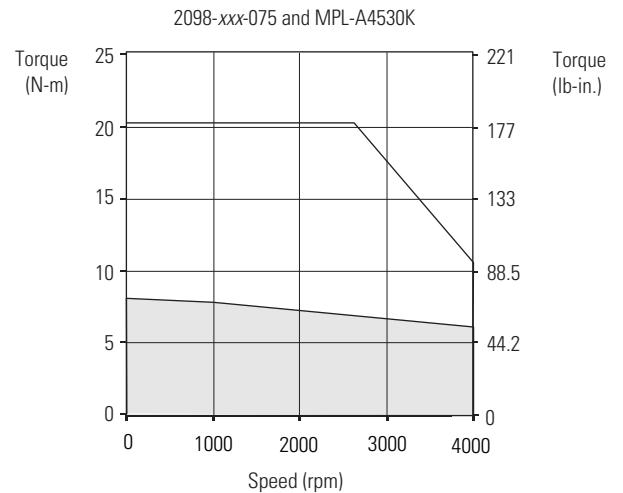
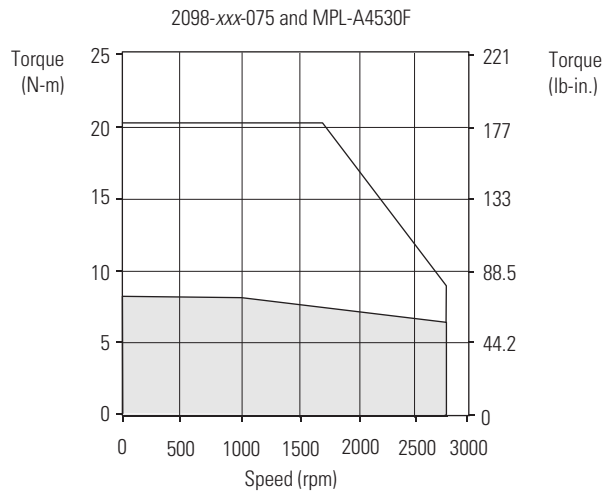
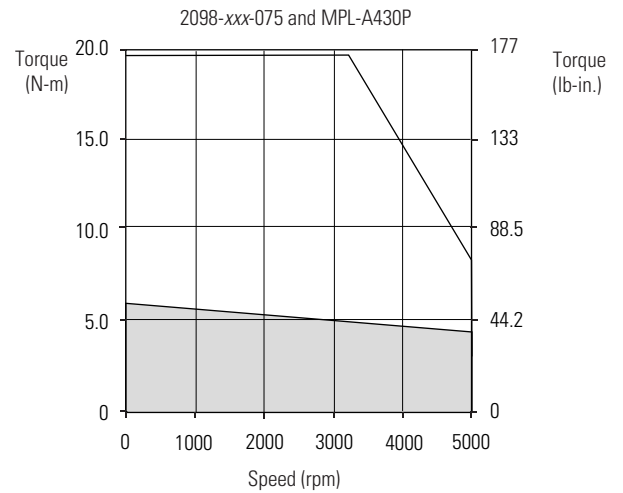
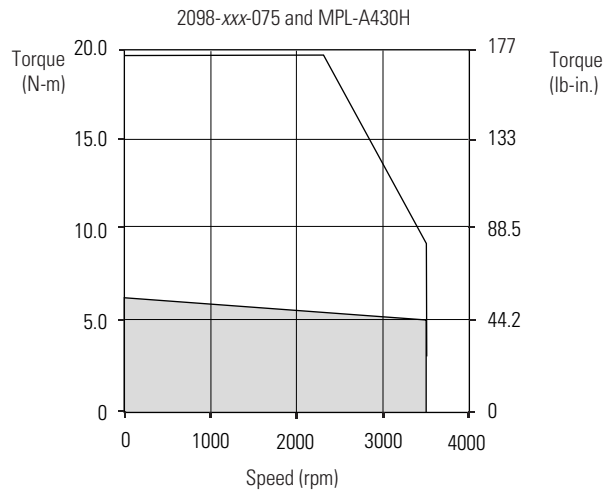
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Ultra3000/5000 (230V) Drives/MP-Series Low Inertia Motor Curves, Continued



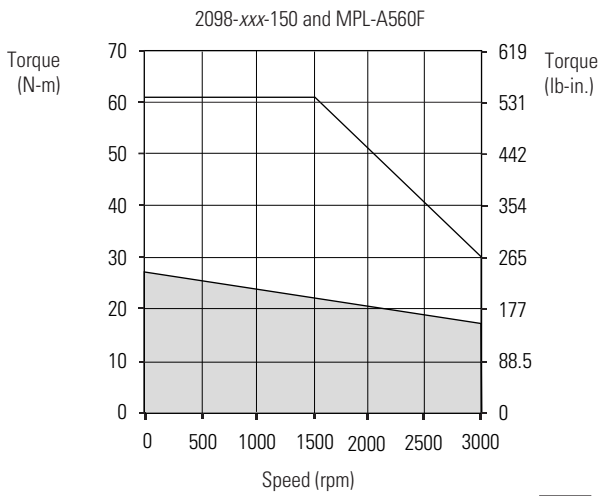
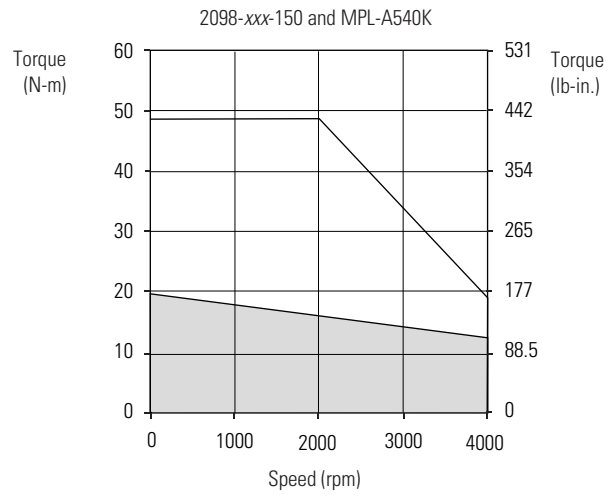
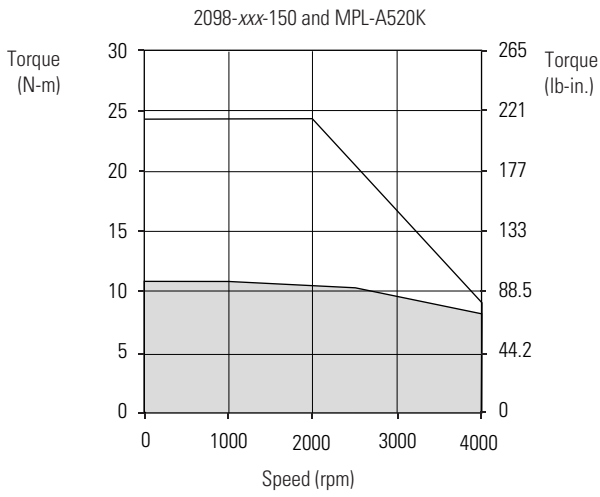
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Ultra3000/5000 (230V) Drives/MP-Series Low Inertia Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region

Ultra3000/5000 (230V) Drives/MP-Series Low Inertia Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region

Ultra3000/5000 (460V) Drives with MP-Series Low Inertia Motors

This section provides system combination information for the Ultra3000/5000 (460V) drives when matched with MP-Series low-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

IMPORTANT

The MP-Series low-inertia motors on this page are equipped with DIN connectors (specified by 4 or 7 in the catalog number) and are not compatible with cables designed for motors equipped with bayonet connectors (specified by 2 in the catalog number). The motors with bayonet connectors (for example, MPL-A310P-xx2xAA) are being discontinued and require 2090-XXNxMP- (bayonet) cables. For help with migration or to select bayonet cables, contact your Rockwell Automation sales representative.

Bulletin MPL Motor Cable Combinations

Motor Cat. No. (400V class) ⁽¹⁾	Motor Power/Brake Cable	Motor Feedback Cable ⁽²⁾
MPL-B1510V-xx4xAA, MPL-B1520U-xx4xAA, MPL-B1530U-xx4xAA	2090-XXNPMF-16Sxx ⁽³⁾	2090-XXNFMF-Sxx ⁽⁴⁾ Absolute High-resolution or Incremental Feedback
MPL-B210V-xx4xAA, MPL-B220T-xx4xAA, MPL-B230P-xx4xAA		
MPL-B310P-xx7xAA, MPL-B320P-xx7xAA, MPL-B330P-xx7xAA	2090-XXNPMF-16Sxx ⁽⁵⁾	2090-XXNFMF-Sxx ⁽⁶⁾ Absolute High-resolution Feedback
MPL-B420P-xx7xAA, MPL-B430P-xx7xAA		
MPL-B4530F-xx7xAA, MPL-B4530K-xx7xAA, MPL-B4540F-xx7xAA, MPL-B4560F-xx7xAA		
MPL-B520K-xx7xAA		
MPL-B540D-xx7xAA, MPL-B540K-xx7xAA, MPL-B560F-xx7xAA	2090-XXNPMF-14Sxx ⁽⁵⁾	
MPL-B580F-xx7xAA, MPL-B580J-xx7xAA, MPL-B640F-xx7xAA	2090-XXNPMF-10Sxx ⁽⁵⁾	
MPL-B660F-xx7xAA, MPL-B680D-xx7xAA, MPL-B960B-xx7xAA, MPL-B980B-xx7xAA	2090-CPBM7DF-08AAxx (standard)	
MPL-B680F-xx7xAA, MPL-B860D-xx7xAA, MPL-B880C-xx7xAA, MPL-B960C-xx7xAA	2090-CPBM7DF-06AAxx (standard)	
MPL-B880D-xx7xAA, MPL-B960D-xx7xAA, MPL-B980C-xx7xAA, MPL-B980D-xx7xAA	2090-CPBM7DF-04AAxx (standard)	

(1) MPL-A15xx and MPL-A2xx motors are not compatible with Ultra5000 drives.

(2) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(3) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(4) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

(5) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(6) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

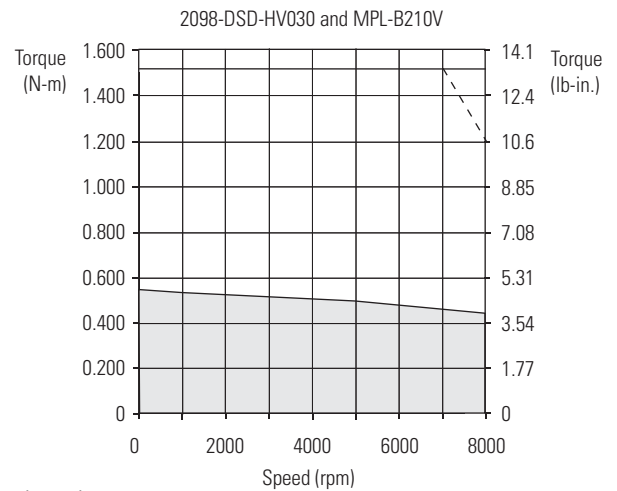
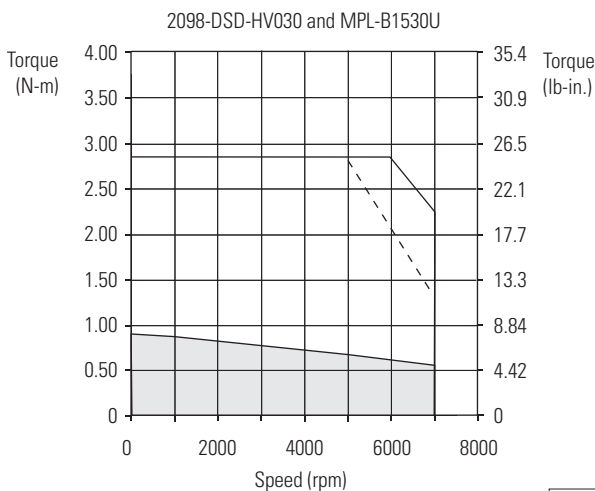
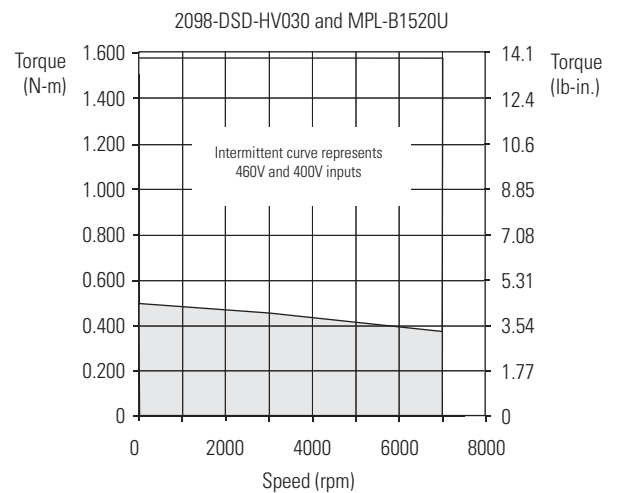
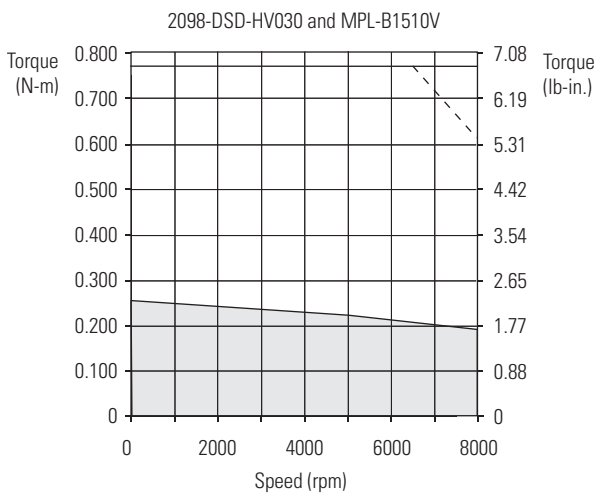
Bulletin MPL Motor Performance Specifications with Ultra3000/5000 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A (0-pk)	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A (0-pk)	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 460V Drives
MPL-B1510V	8000	0.95	0.26 (2.3)	3.10	0.77 (6.80)	0.16	2098-DSD-HV030
MPL-B1520U	7000	1.80	0.49 (4.3)	6.10	1.58 (13.9)	0.27	2098-DSD-HV030
MPL-B1530U	7000	2.0	0.90 (8.0)	7.20	2.82 (24.9)	0.39	2098-DSD-HV030
MPL-B210V	8000	1.75	0.55 (4.8)	5.80	1.52 (13.5)	0.37	2098-DSD-HV030
MPL-B220T	6000	3.30	1.61 (14.2)	11.3	4.74 (41.9)	0.62	2098-DSD-HV030
MPL-B230P	5000	2.60	2.10 (18.6)	11.3	8.20 (73.0)	0.86	2098-DSD-HV030
MPL-B310P	5000	2.4	1.58 (14)	7.1	3.61 (32)	0.77	2098-xxx-HV030
MPL-B320P	5000	4.5	2.94 (26)	13.0	7.91 (70)	1.5	2098-xxx-HV030
MPL-B330P	5000	6.1	4.18 (37)	14.0	8.59 (76)	1.8	2098-xxx-HV030
				17.0	11.1 (98)		2098-xxx-HV050
MPL-B420P	5000	6.4	4.74 (42)	14.0	8.59 (76)	1.9	2098-xxx-HV030
				22.0	12.9 (114)		2098-xxx-HV050
				23.0	13.5 (120)		2098-xxx-HV100
MPL-B430P	5000	9.2	6.55 (58)	22.0	12.9 (114)	2.2	2098-xxx-HV050
				31.0	19.8 (175)		2098-xxx-HV100
MPL-B4530F	3000	7.0	8.25 (73)	14.0	13.5 (120)	2.1	2098-xxx-HV030
		7.1	8.36 (74)	21.0	20.3 (180)		2098-xxx-HV050
MPL-B4530K	4000	11.0	8.36 (74)	22.0	14.5 (128)	2.6	2098-xxx-HV050
				31.0	20.3 (180)		2098-xxx-HV100
MPL-B4540F	3000	9.1	10.2 (90)	22.0	22.0 (195)	2.6	2098-xxx-HV050
				26.0	27.1 (240)		2098-xxx-HV100
MPL-B4560F	3000	11.0	13.1 (116)	22.0	21.0 (186)	3.2	2098-xxx-HV050
		11.8	14.1 (125)	36.0	34.4 (305)		2098-xxx-HV100
MPL-B520K	4000	11.0	10.3 (91)	22.0	15.8 (140)	3.5	2098-xxx-HV050
		11.5	10.7 (95)	33.0	23.2 (205)		2098-xxx-HV100
MPL-B540D	2000	10.5	19.4 (172)	22.0	39.2 (346)	3.4	2098-xxx-HV050
				23.0	41.0 (362)		2098-xxx-HV100
MPL-B540K	4000	20.5	19.4 (172)	46.0	33.9 (300)	5.4	2098-xxx-HV100
				60.0	45.2 (400)		2098-xxx-HV150
MPL-B560F	3000	20.6	26.8 (237)	46.0	50.4 (446)	5.5	2098-xxx-HV100
				68.0	67.8 (600)		2098-xxx-HV150
MPL-B580F	3000	26.0	34.0 (301)	68.0	70.5 (623)	7.1	2098-xxx-HV150
				94.0	87.0 (769)		2098-xxx-HV220
MPL-B580J	3800	32.0	34.0 (301)	68.0	62.4 (552)	7.9	2098-xxx-HV150
				94.0	81.0 (717)		2098-xxx-HV220
MPL-B640F	3000	32.1	36.7 (325)	65.0	72.3 (640)	6.1	2098-xxx-HV220
MPL-B660F	3000	34.0	40.7 (360)	68.0	73.4 (650)	6.1	2098-xxx-HV150
		38.5	48.0 (425)	94.0	96.0 (850)		2098-xxx-HV220

Rotary Motor	Max Speed rpm	System Continuous Stall Current A (0-pk)	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A (0-pk)	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 460V Drives
MPL-B680D	2000	34.0	62.8 (556)	94.0	154.2 (1365)	9.3	2098-xxx-HV220
MPL-B680F	3000	48.0	58.2 (515)	94.0	101.7 (900)	7.5	2098-xxx-HV220
MPL-B860D	2000	47.5	83.1 (735)	94.0	151 (1335)	12.5	2098-xxx-HV220
MPL-B880C	1500	47.5	109.9 (973)	94.0	197 (1742)	12.6	2098-xxx-HV220
MPL-B880D	2000	47.0	77.4 (685)	94.0	144 (1275)	12.6	2098-xxx-HV220
MPL-B960B	1200	42.5	130 (1150)	94.0	231 (2050)	12.7	2098-xxx-HV220
MPL-B960C	1500	41.5	112 (990)	94.0	181 (1600)	14.8	2098-xxx-HV220
MPL-B980B	1000	40.0	163 (1440)	94.0	278 (2460)	15.2	2098-xxx-HV220
MPL-B980C	1500	47.5	118.6 (1050)	94.0	213 (1890)	16.8	2098-xxx-HV220

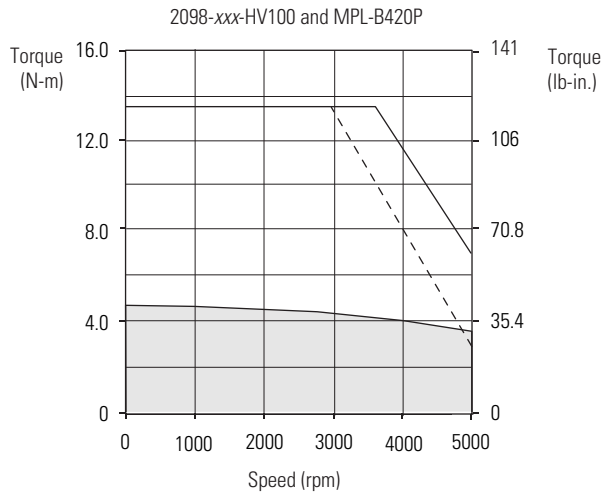
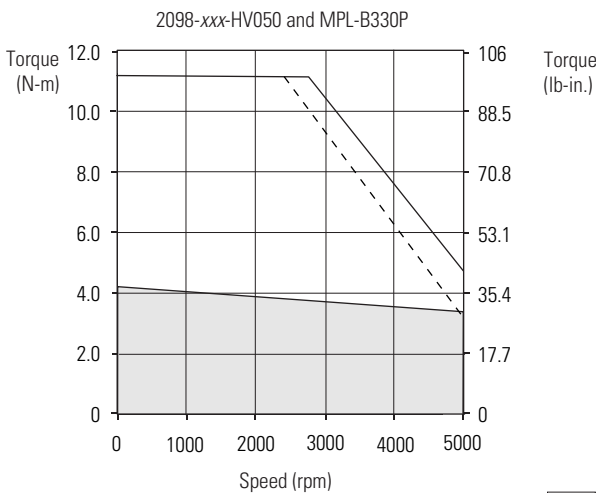
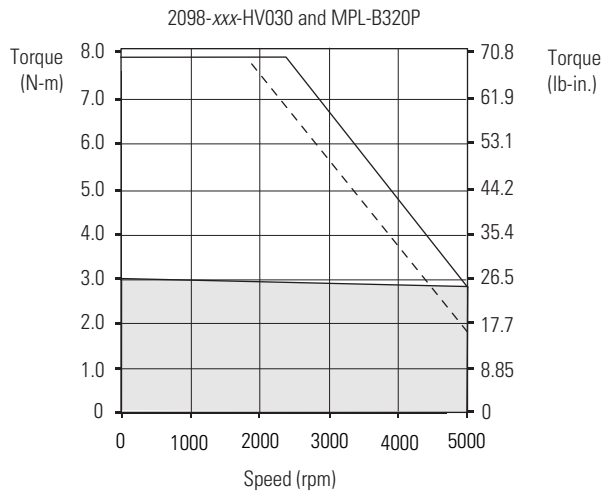
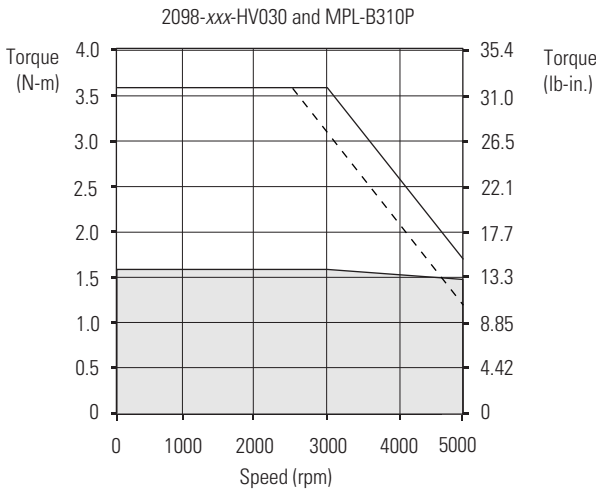
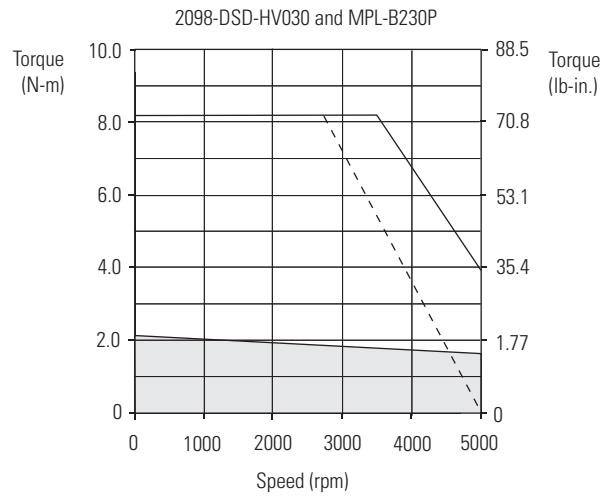
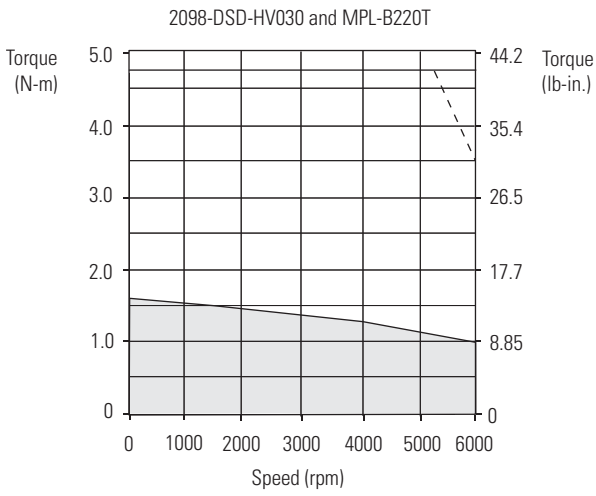
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000 (460V) Drives/MP-Series Low Inertia Motor Curves



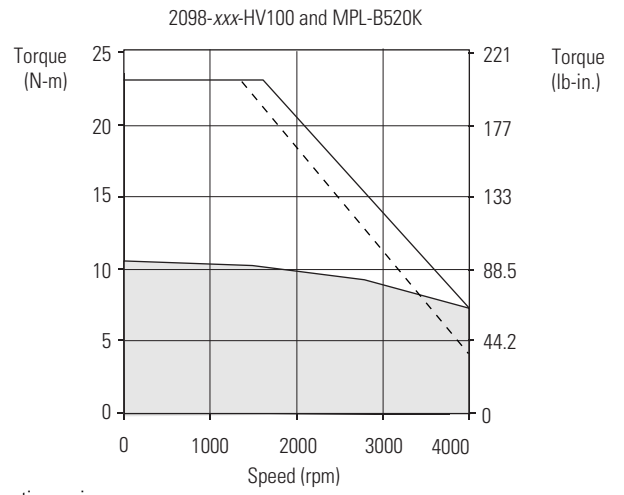
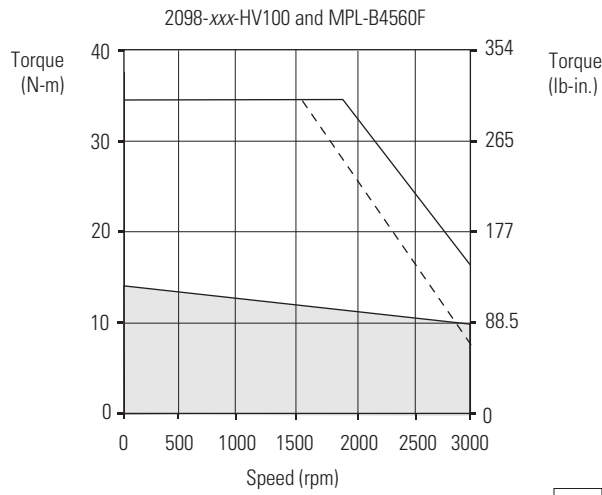
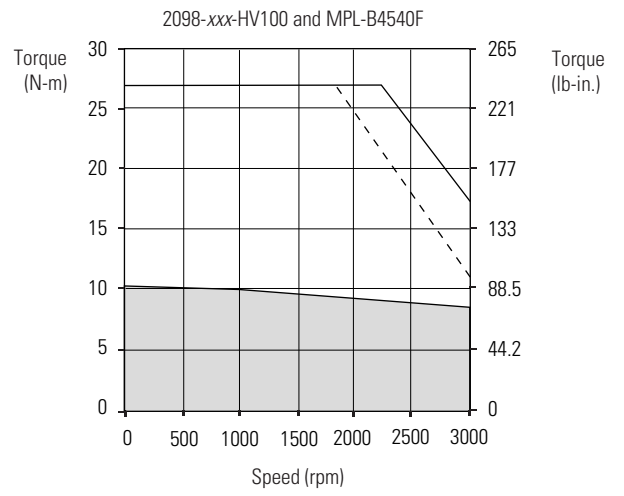
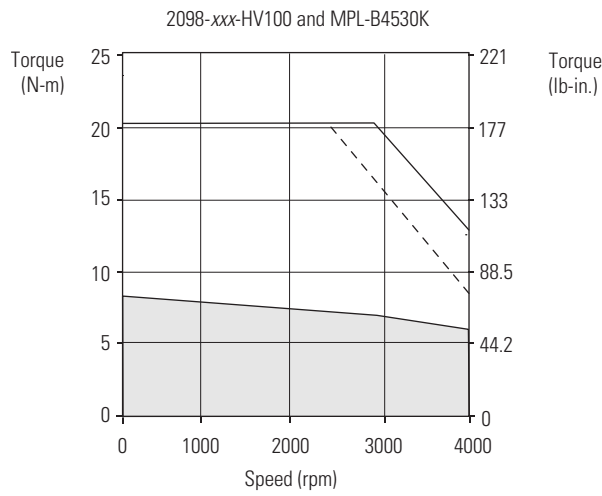
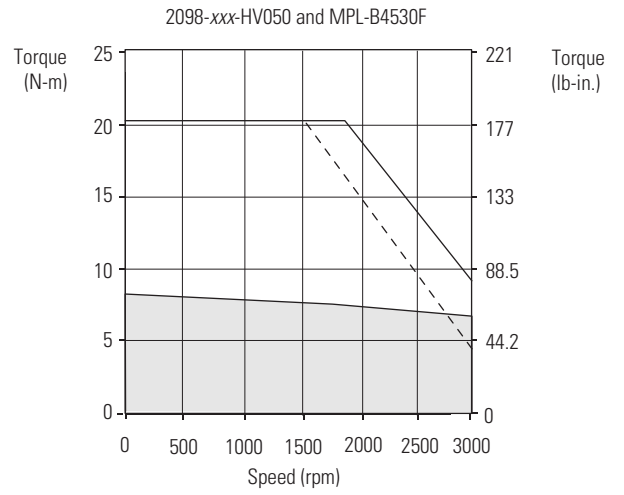
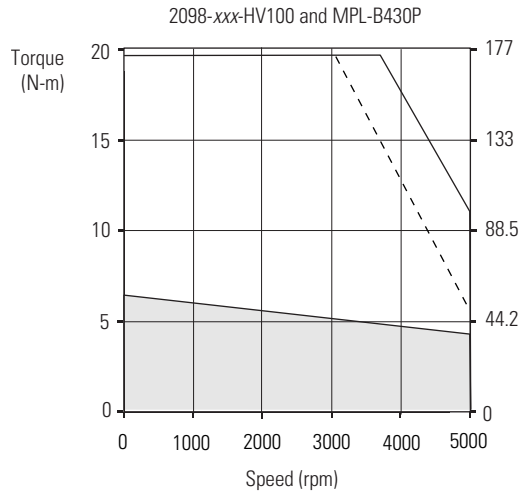
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- = Continuous operating region
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Ultra3000/5000 (460V) Drives/MP-Series Low Inertia Motors, Continued



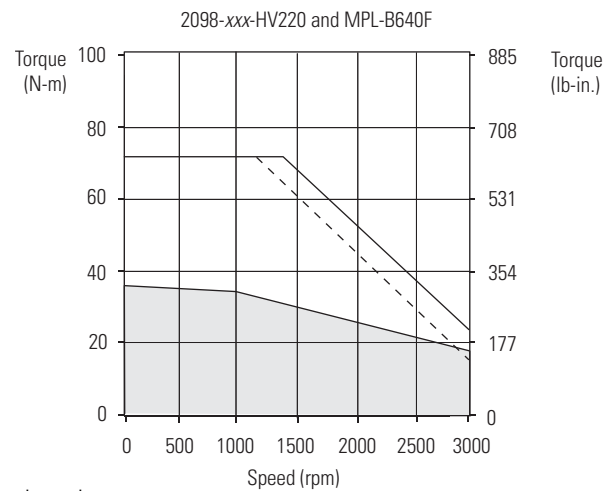
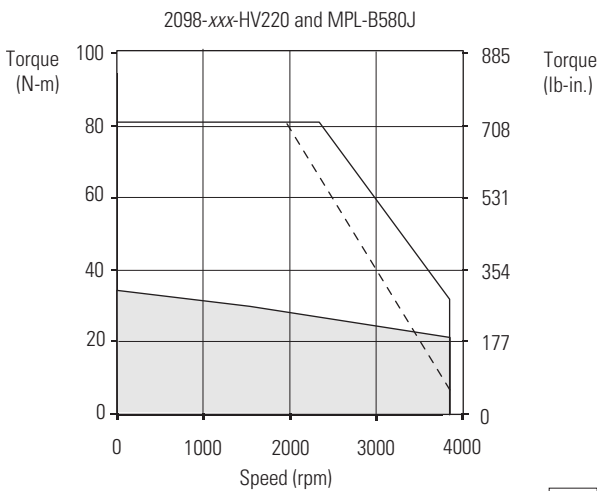
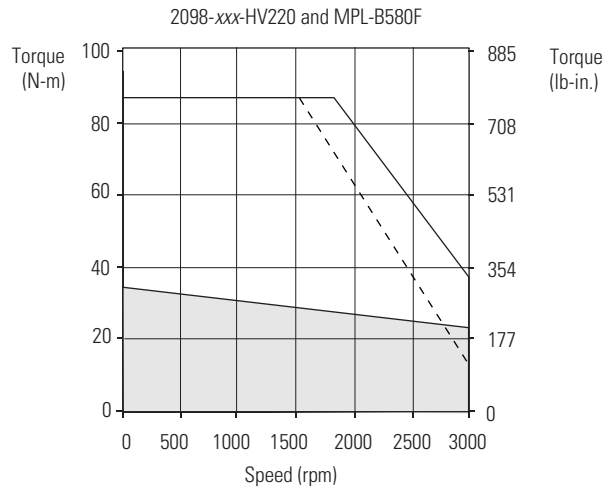
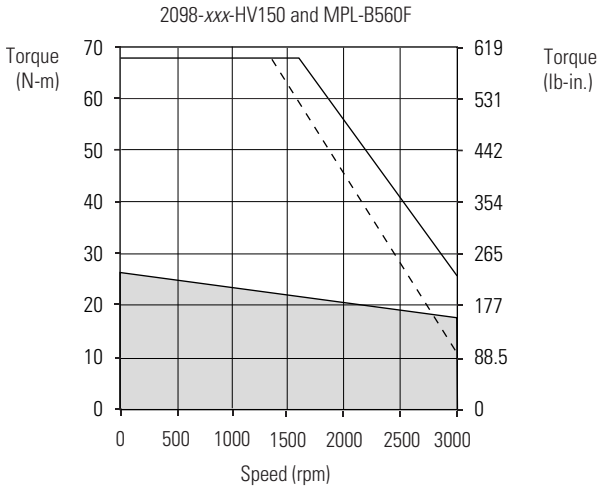
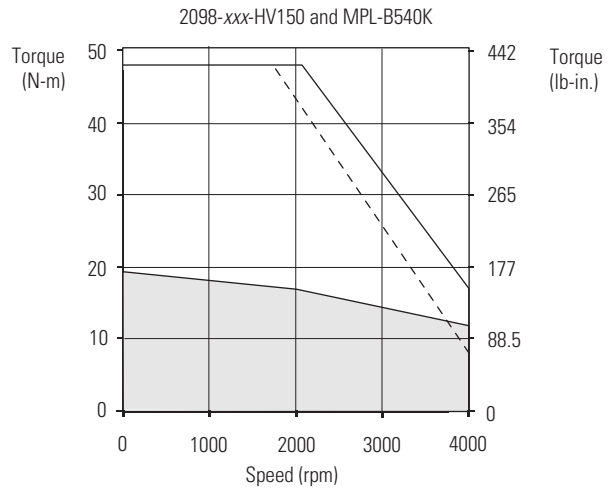
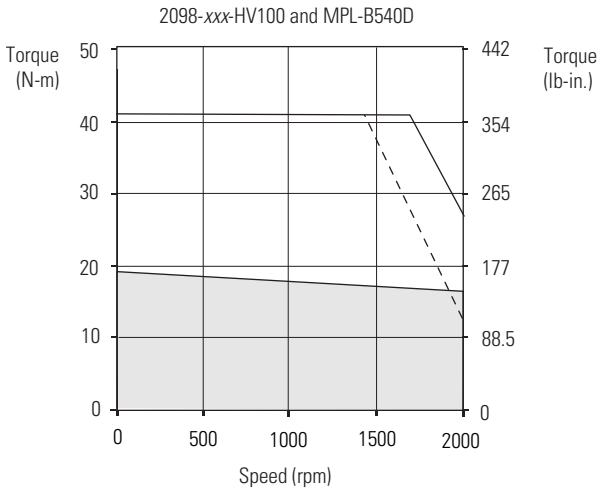
- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Ultra3000/5000 (460V) Drives/MP-Series Low Inertia Motors, Continued



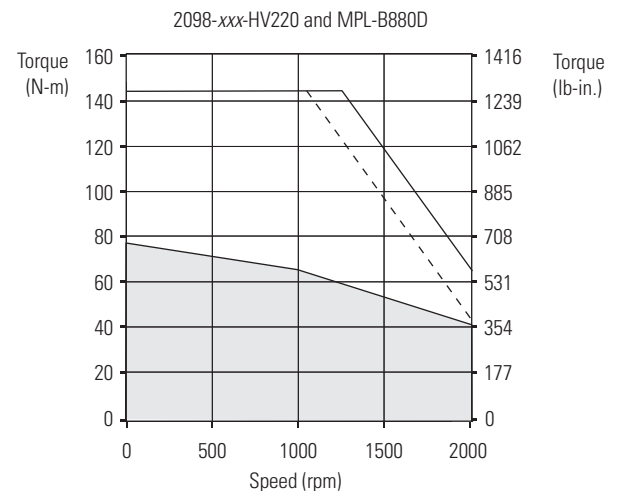
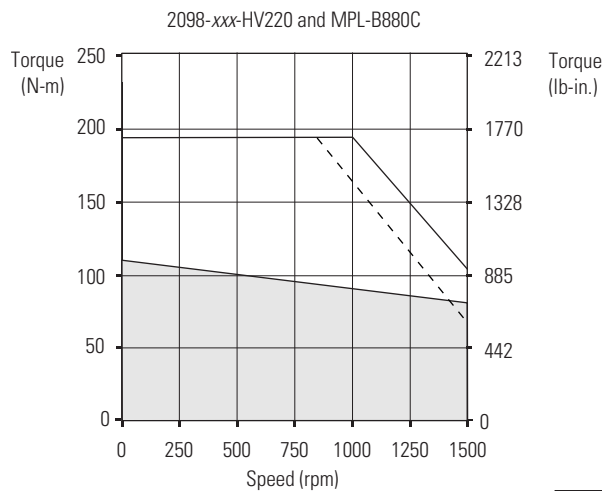
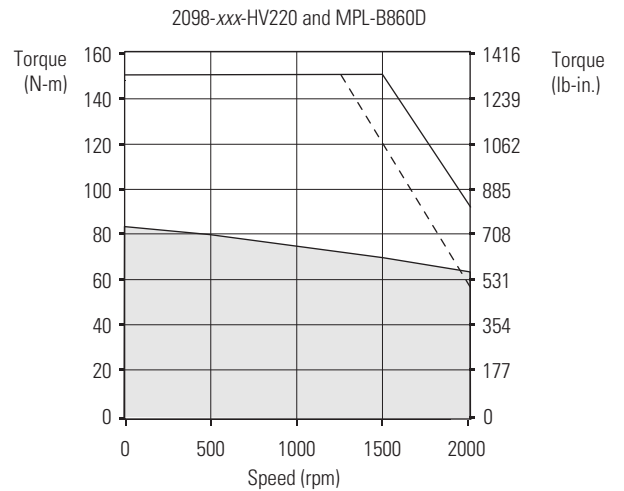
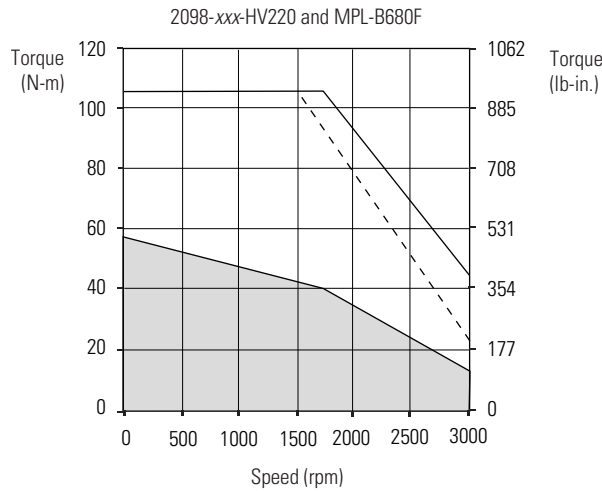
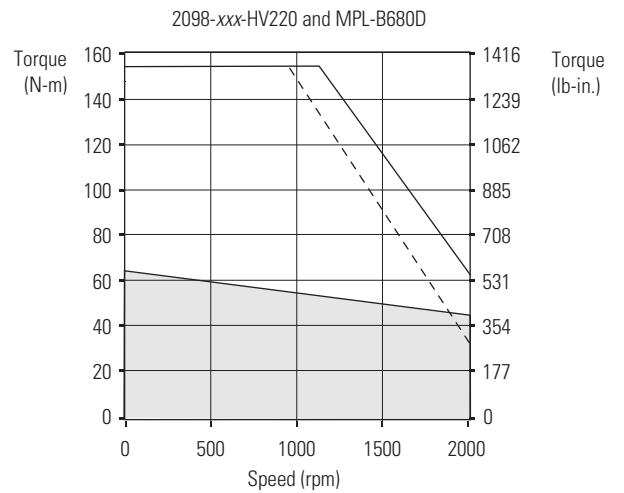
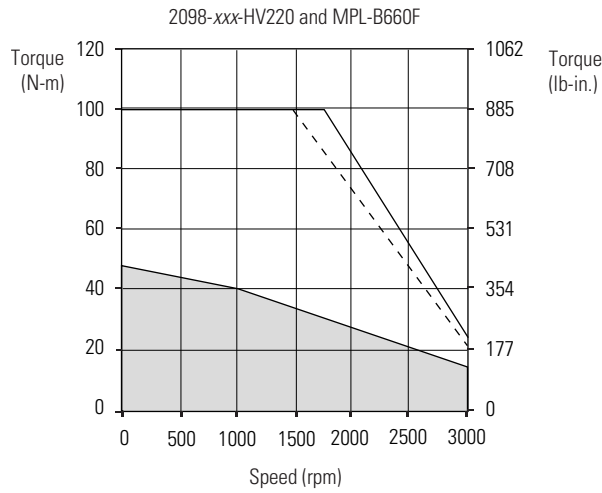
= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Ultra3000/5000 (460V) Drives/MP-Series Low Inertia Motors, Continued



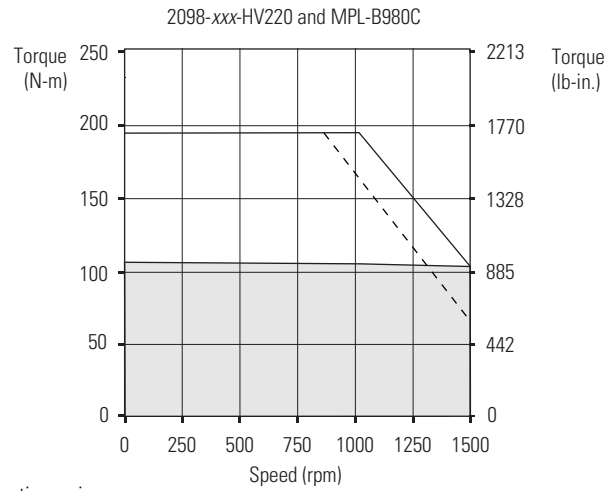
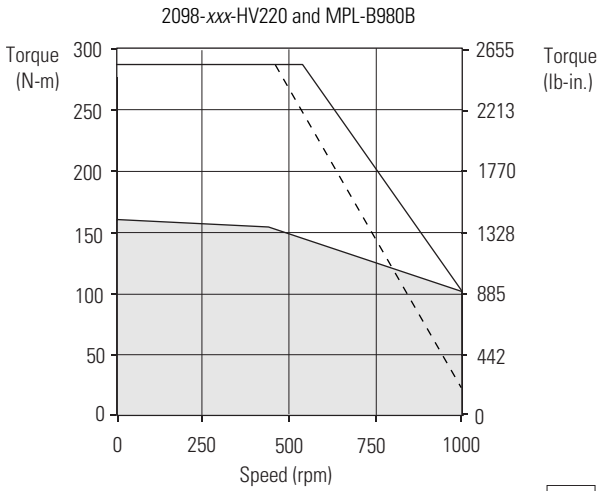
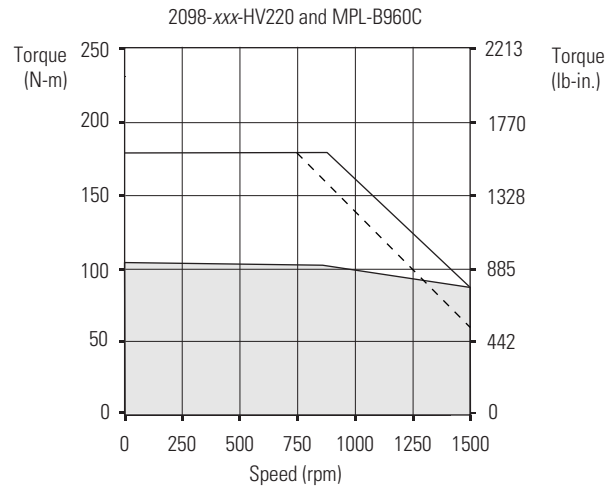
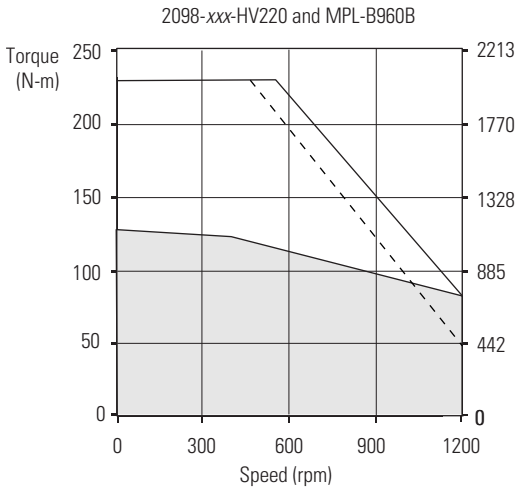
= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Ultra3000/5000 (460V) Drives/MP-Series Low Inertia Motors, Continued



= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Ultra3000/5000 (460V) Drives/MP-Series Low Inertia Motors, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Ultra3000/5000 (230V) Drives with MP-Series Medium Inertia Motors

This section provides system combination information for the Ultra3000/5000 (230V) drives when matched with MP-Series medium-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPM Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPM-A1151M, MPM-A1152F, MPM-A1153F	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
MPM-A1302F	2090-XXNPMF-14S _{xx} ⁽²⁾	
MPM-A1304F	2090-CPxM7DF-12AA _{xx} (standard)	
MPM-A1651F	2090-XXNPMF-10S _{xx} ⁽²⁾	
MPM-A1652F, MPM-A1653F	2090-CPBM7DF-08AA _{xx} (standard)	
MPM-A2152F, MPM-A2153F, MPM-A2154C, MPM-A2154E	2090-CPBM7DF-06AA _{xx} (standard)	

(1) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxS_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-xxAF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

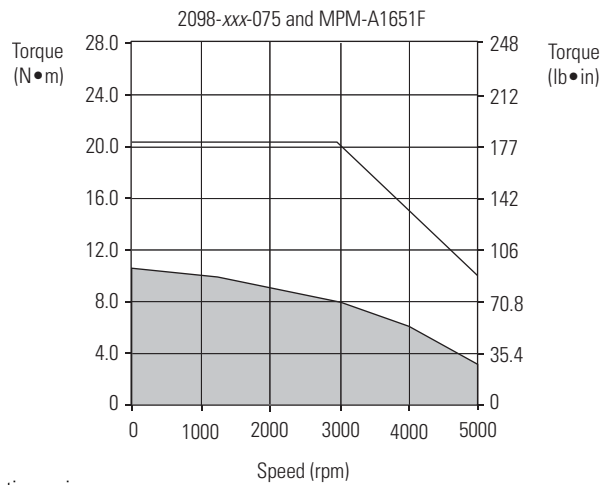
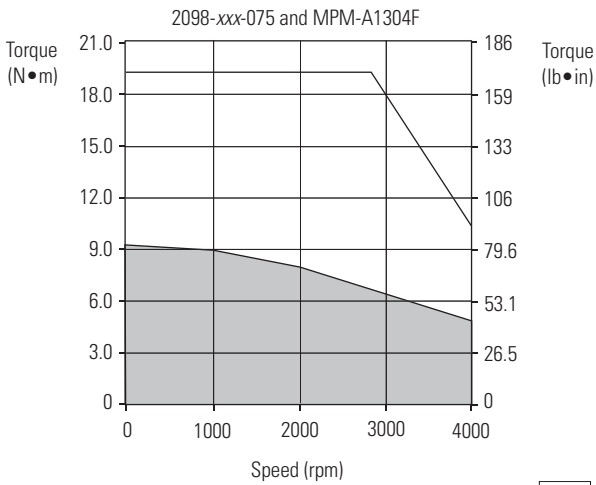
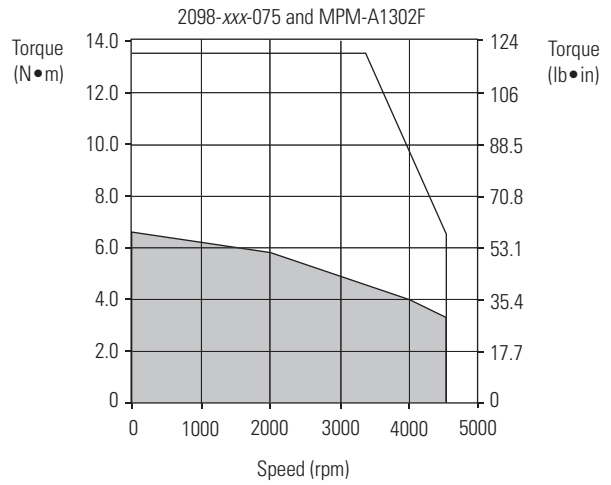
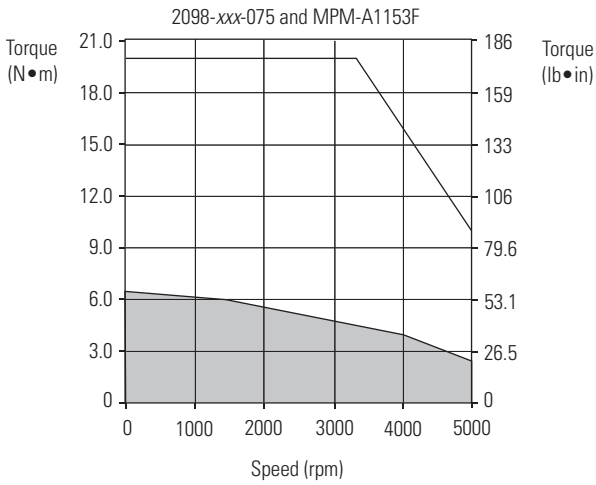
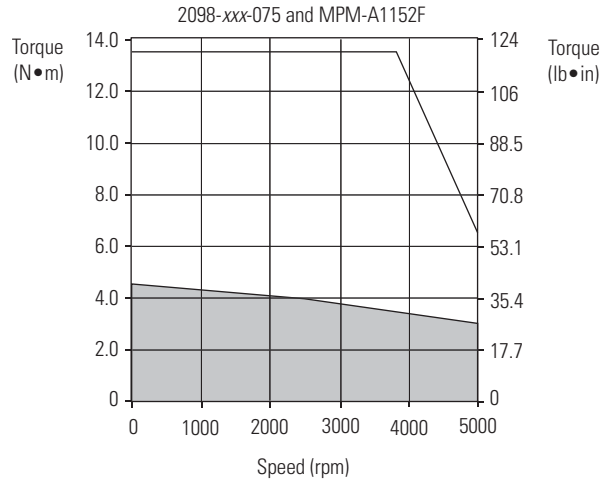
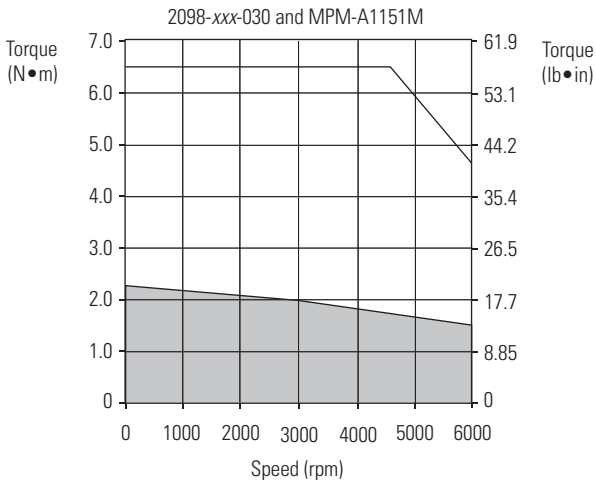
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPM Motor Performance Specifications with Ultra3000/5000 (230V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 230V Drives
MPM-A1151M	6000	10.3	2.3 (20.3)	30.5	6.6 (58.4)	0.90	2098-xxx-030
MPM-A1152F	5000	14.9	4.7 (41.6)	44.8	13.5 (119)	1.40	2098-xxx-075
MPM-A1153F	5000	18.6	6.5 (57.5)	64.5	19.8 (175)	1.45	2098-xxx-075
MPM-A1302F	4500	19.8	6.6 (58.4)	50.2	13.5 (119)	1.65	2098-xxx-075
MPM-A1304F	4000	22.5	9.2 (81.4)	48.3	19.3 (171)	2.20	2098-xxx-075
MPM-A1651F	5000	35.6	10.7 (94.7)	75.0	20.4 (180)	2.50	2098-xxx-075
MPM-A1652F	4000	38.5	13.4 (119)	103.2	36.0 (318)	4.03	2098-xxx-150
MPM-A1653F	4000	48.7	18.6 (165)	119.1	41.9 (371)	5.10	2098-xxx-150
MPM-A2152F	4000	65.0	26.9 (238)	125.8	56.0 (495)	5.20	2098-xxx-150
MPM-A2153F	3600	65.0	35.2 (311)	120.4	58.0 (513)	5.80	2098-xxx-150
MPM-A2154C	2000	65.0	55.5 (491)	127.3	106 (938)	6.50	2098-xxx-150
MPM-A2154E	3000	65.0	44.0 (389)	128.2	83.9 (742)	7.00	2098-xxx-150

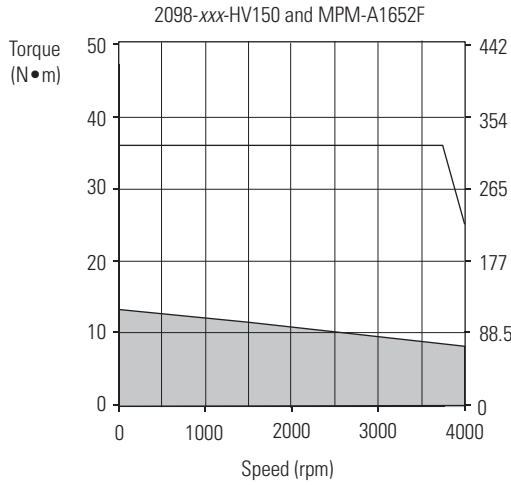
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000/5000 (230V) Drives/MP-Series Medium Inertia Motor Curves

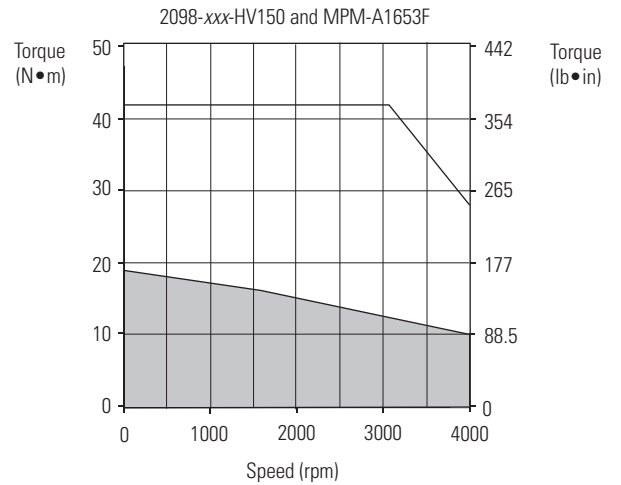


= Intermittent operating region
 = Continuous operating region

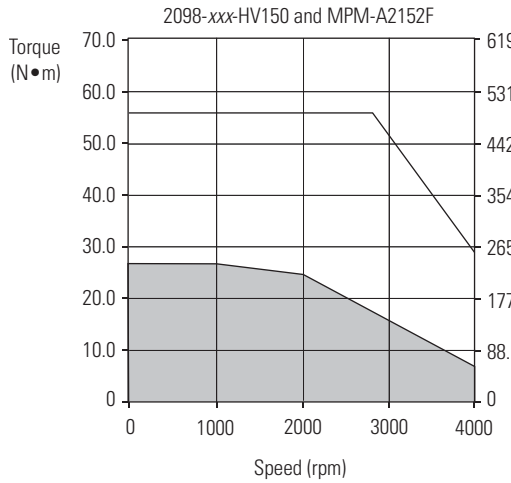
Ultra3000/5000 (230V) Drives/MP-Series Medium Inertia Motor Curves, Continued



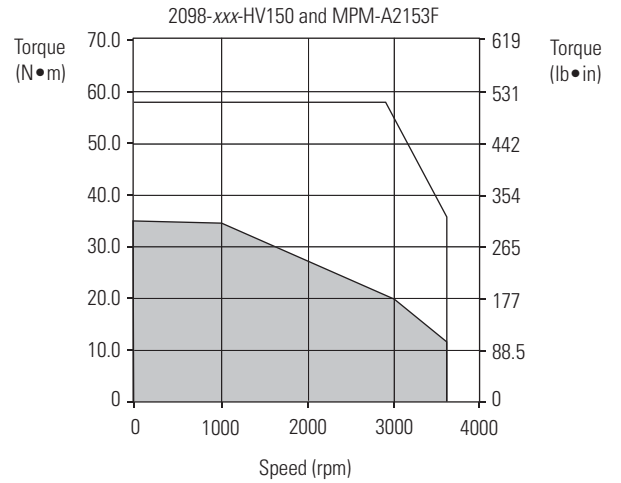
Torque (lb·in)



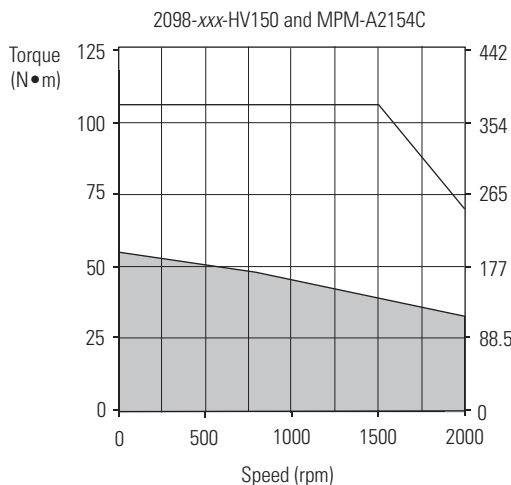
Torque (lb·in)



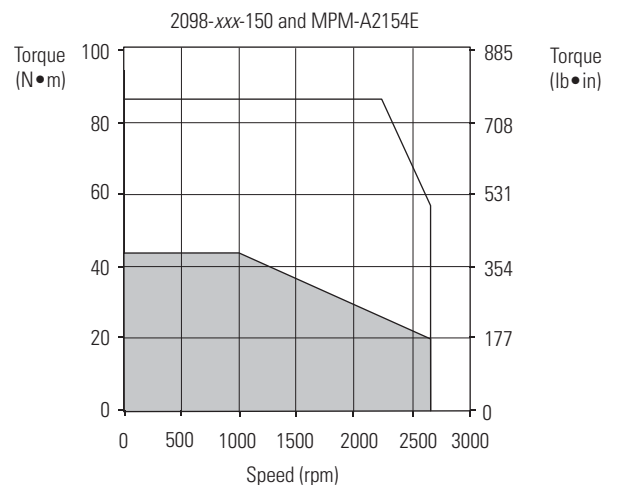
Torque (lb·in)



Torque (lb·in)



Torque (lb·in)



Torque (lb·in)

□ = Intermittent operating region
 ■ = Continuous operating region

Ultra3000/5000 (460V) Drives with MP-Series Medium Inertia Motors

This section provides system combination information for the Ultra3000/5000 (460V) drives when matched with MP-Series medium-inertia motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPM Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPM-B1151x, MPM-B1152x, MPM-B1153E, MPM-B1153F	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPM-B1302F, MPM-B1302M, MPM-B1304C, MPM-B1304E		
MPM-B1651C, MPM-B1652C		
MPM-B1153T	2090-XXNPMF-14Sxx ⁽²⁾	
MPM-B1302T, MPM-B1304M		
MPM-B1651F, MPM-B1653C		
MPM-B1652E	2090-CPxM7DF-12AAxx (standard)	
MPM-B1651M, MPM-B1652F, MPM-B1653E	2090-XXNPMF-10Sxx ⁽²⁾	
MPM-B2152C, MPM-B2153B		
MPM-B1653F	2090-CPBM7DF-08AAxx (standard)	
MPM-B2152F, MPM-B2152M, MPM-B2153E, MPM-B2153F, MPM-B2154B, MPM-B2154E, MPM-B2154F		

(1) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

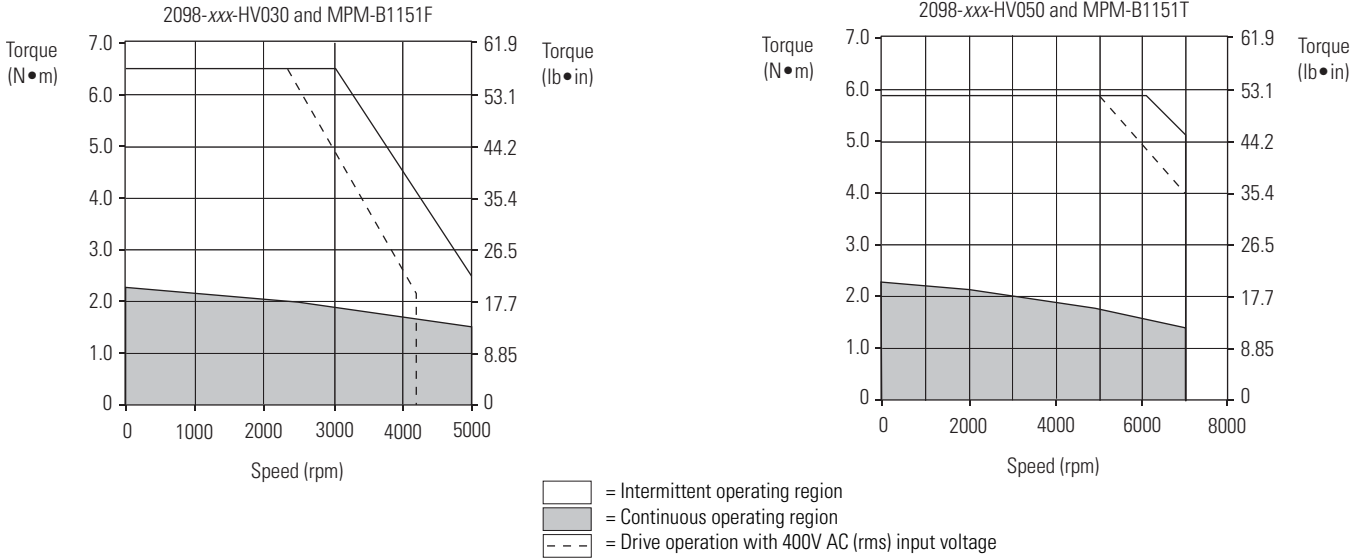
Bulletin MPM Motor Performance Specifications with Ultra3000/5000 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 460V Drives
MPM-B1151F	5000	3.1	2.3 (20.3)	9.9	6.6 (58.4)	0.75	2098-xxx-HV030
MPM-B1151T	7000	6.9	2.3 (20.3)	14.0	4.4 (38.9)	0.90	2098-xxx-HV030
				20.5	5.8 (51.3)		2098-xxx-HV050
MPM-B1152C	3000	4.1	5.0 (44.2)	12.4	13.5 (119)	1.20	2098-xxx-HV030
MPM-B1152F	5200	7.0	5.0 (44.2)	14.0	9.6 (84.9)	1.40	2098-xxx-HV030
				21.1	13.3 (118)		2098-xxx-HV050
MPM-B1152T	7000	12.6	5.0 (44.2)	22.0	8.6 (76.1)	1.40	2098-xxx-HV050
				37.8	13.5 (119)		2098-xxx-HV100
MPM-B1153E	3500	7.1	6.5 (57.5)	14.0	13.8 (122)	1.40	2098-xxx-HV030
				21.6	19.7 (174)		2098-xxx-HV050
MPM-B1153F	5500	10.5	6.4 (56.6)	22.0	14.6 (129)	1.40	2098-xxx-HV050
				32.0	19.7 (174)		2098-xxx-HV100
MPM-B1153T	7000	18.3	6.4 (56.6)	46.0	14.8 (131)	1.45	2098-xxx-HV100
				55.4	16.5 (146)		2098-xxx-HV150
MPM-B1302F	4500	9.8	6.6 (58.4)	22.0	13.2 (117)	1.65	2098-xxx-HV050
MPM-B1302M	6000	14.4	6.6 (58.4)	32.4	13.3 (118)	1.65	2098-xxx-HV100
MPM-B1302T	7000	19.3	6.7 (59.3)	43.4	13.3 (118)	1.65	2098-xxx-HV100
MPM-B1304C	2750	8.0	10.3 (91.1)	14.0	18.7 (165)	2.00	2098-xxx-HV030
				22.0	26.8 (237)		2098-xxx-HV050
MPM-B1304E	4000	12.3	10.2 (90.3)	22.0	19.1 (169)	2.20	2098-xxx-HV050
				34.2	27.1 (240)		2098-xxx-HV100
MPM-B1304M	6000	21.8	10.4 (92.0)	46.0	21.9 (194)	2.20	2098-xxx-HV100
				60.6	27.1 (240)		2098-xxx-HV150
MPM-B1651C	3500	11.7	11.4 (101)	22.0	19.5 (172)	2.50	2098-xxx-HV050
				29.2	23.2 (205)		2098-xxx-HV100
MPM-B1651F	5000	20.4	11.4 (101)	46.0	21.8 (193)	2.50	2098-xxx-HV100
				50.9	23.2 (205)		2098-xxx-HV150
MPM-B1651M	5000	25.8	11.3 (100)	46.0	18.5 (164)	2.50	2098-xxx-HV100
				56.8	21.4 (189)		2098-xxx-HV150
MPM-B1652C	2500	13.2	16.4 (145)	22.0	30.0 (265)	3.80	2098-xxx-HV050
				33.6	40.2 (356)		2098-xxx-HV100
MPM-B1652E	3500	24.0	21.1 (187)	46.0	39.1 (346)	4.30	2098-xxx-HV100
				60.5	48.0 (425)		2098-xxx-HV150
MPM-B1652F	4500	33.0	21.1 (187)	68.0	39.1 (346)	4.30	2098-xxx-HV150
				84.1	45.0 (398)		2098-xxx-HV220
MPM-B1653C	2500	23.0	26.7 (236)	46.0	56.1 (496)	4.60	2098-xxx-HV100
				59.2	67.7 (599)		2098-xxx-HV150

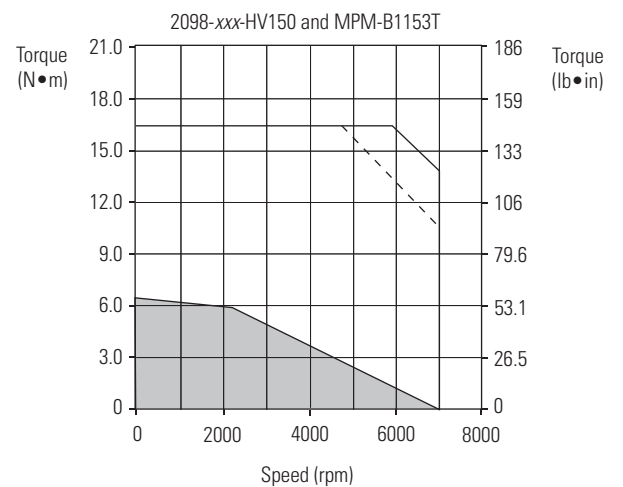
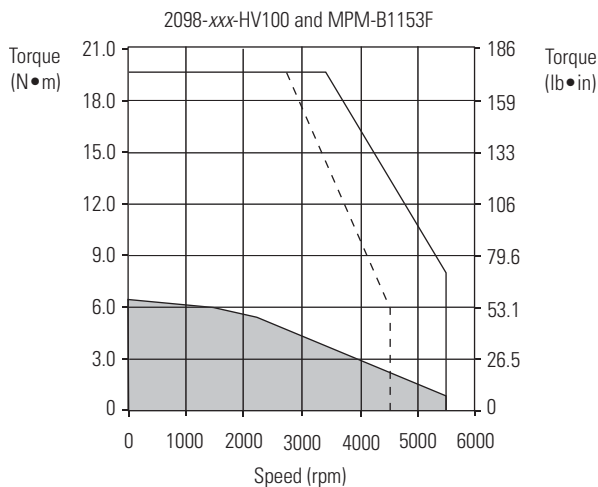
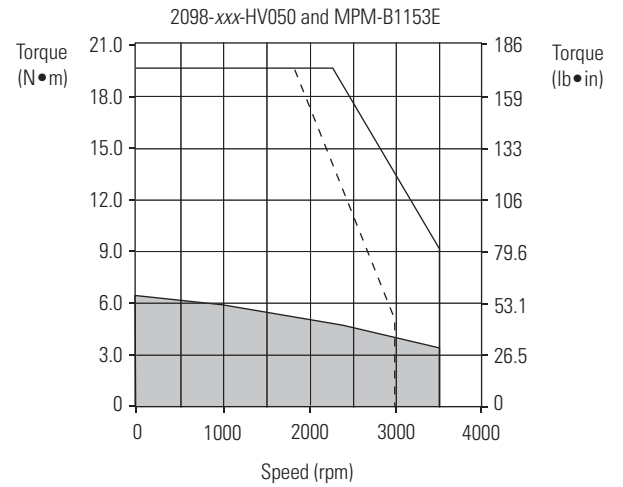
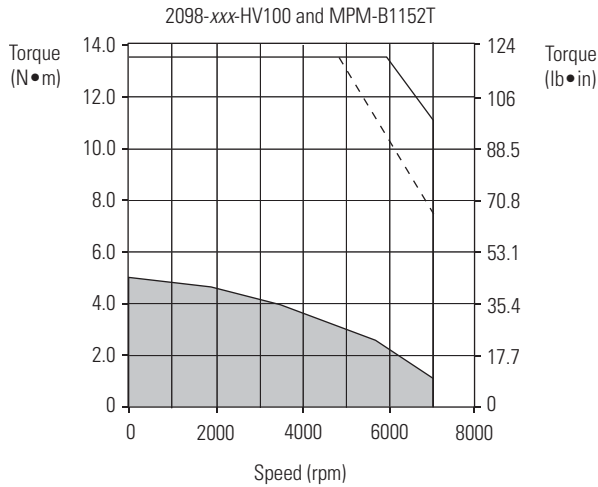
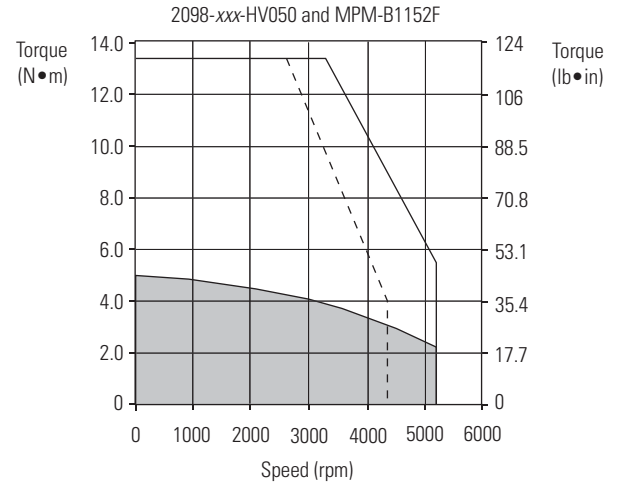
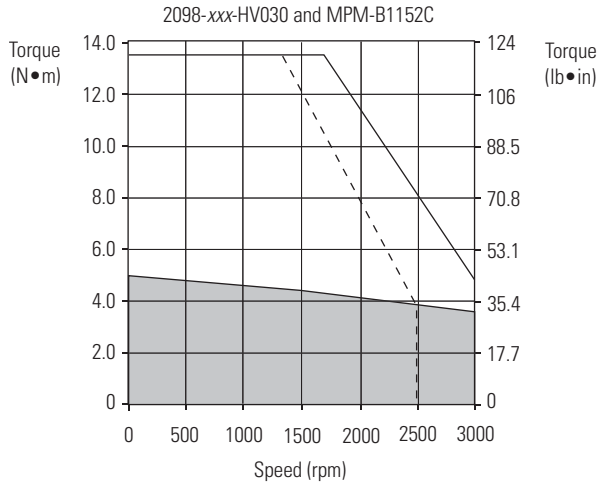
Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 460V Drives
MPM-B1653E	3500	31.0	26.8 (237)	68.0	58.8 (520)	5.10	2098-xxx-HV150
				72.9	62.0 (549)		2098-xxx-HV220
MPM-B1653F	4000	40.1	31.0 (274)	94.0	56.1 (496)	5.10	2098-xxx-HV220
MPM-B2152C	2500	31.5	36.7 (325)	55.4	72.2 (639)	5.60	2098-xxx-HV150
MPM-B2152F	4500	47.0	33.9 (300)	94.0	69.8 (618)	5.90	2098-xxx-HV220
MPM-B2152M	5000	47.0	34.1 (302)	94.0	52.9 (468)	5.90	2098-xxx-HV220
MPM-B2153B	2000	23.0	47.1 (417)	46.0	81.5 (721)	6.80	2098-xxx-HV100
				60.0	101.2 (895)		2098-xxx-HV150
MPM-B2153E	3000	45.5	47.9 (424)	94.0	97.1 (859)	7.20	2098-xxx-HV220
MPM-B2153F	3800	47.0	45.6 (403)	94.0	94.8 (839)	7.20	2098-xxx-HV220
MPM-B2154B	2000	40.7	62.7 (555)	94.0	149 (1319)	6.90	2098-xxx-HV220
MPM-B2154E	3000	47.0	55.9 (495)	94.0	108 (956)	7.50	2098-xxx-HV220
MPM-B2154F	3300	47.0	56.2 (497)	83.6	87.9 (778)	7.50	2098-xxx-HV220

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000/5000 (460V) Drives/MP-Series Medium Inertia Motor Curves

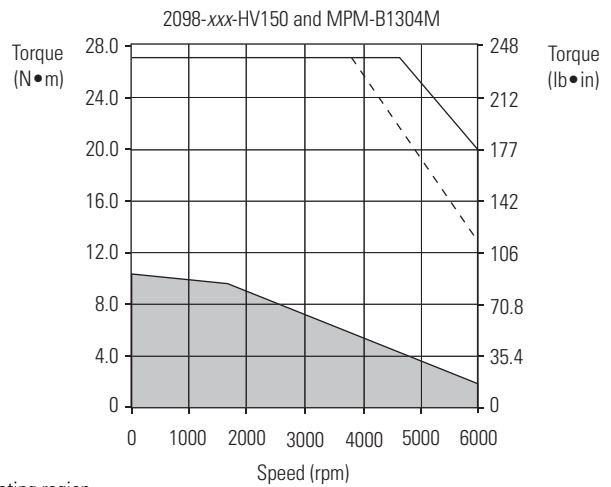
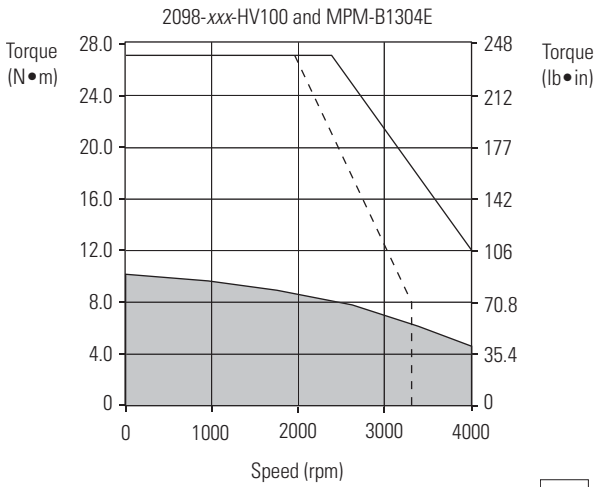
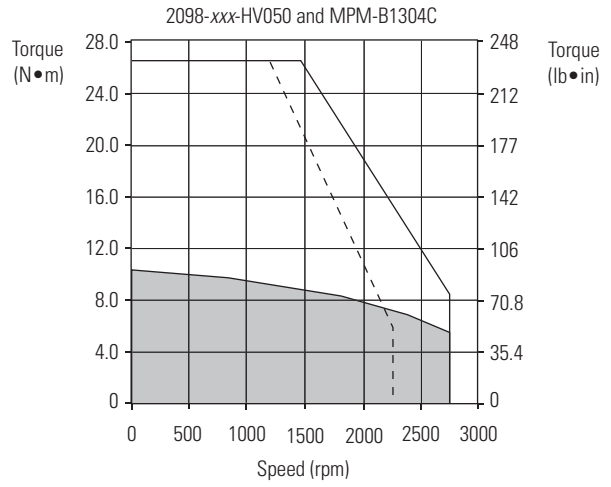
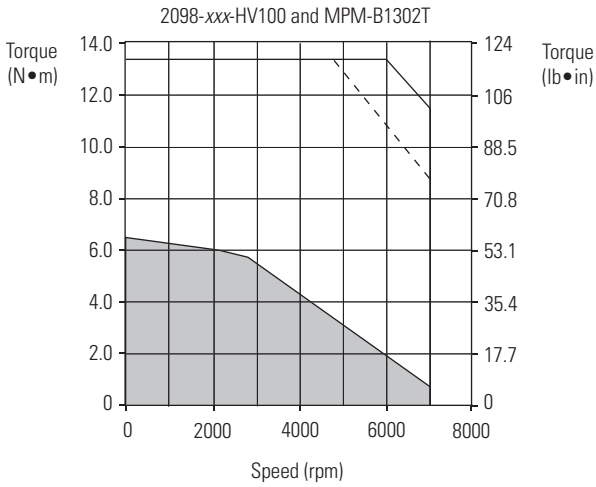
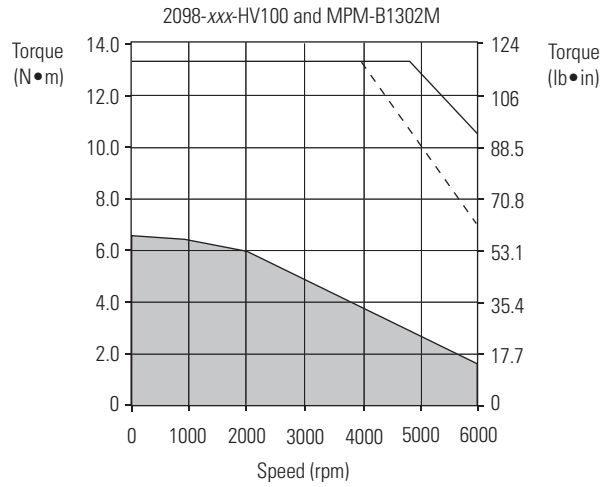
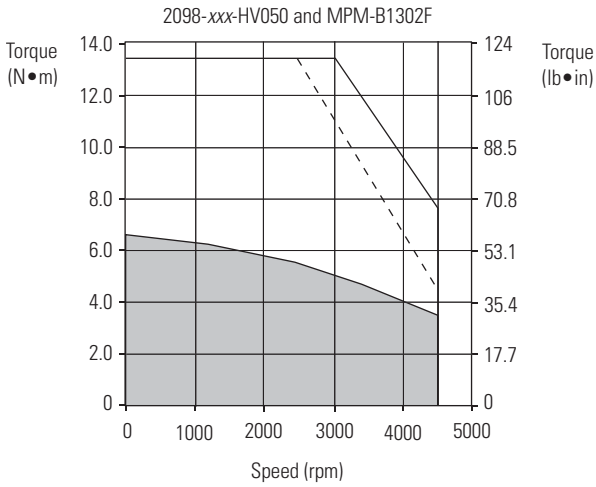


Ultra3000/5000 (460V) Drives/MP-Series Medium Inertia Motor Curves, Continued



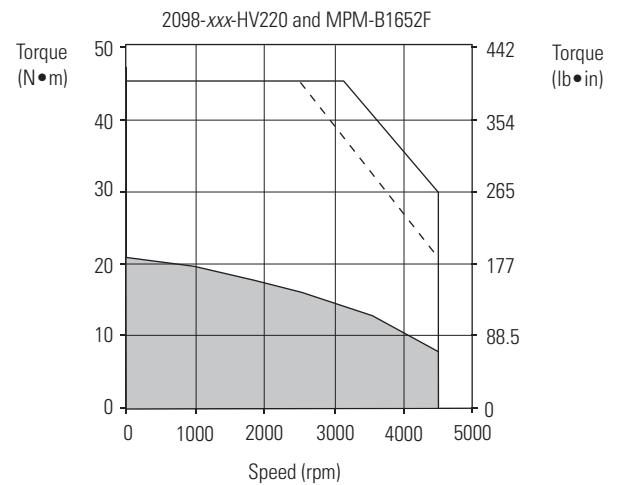
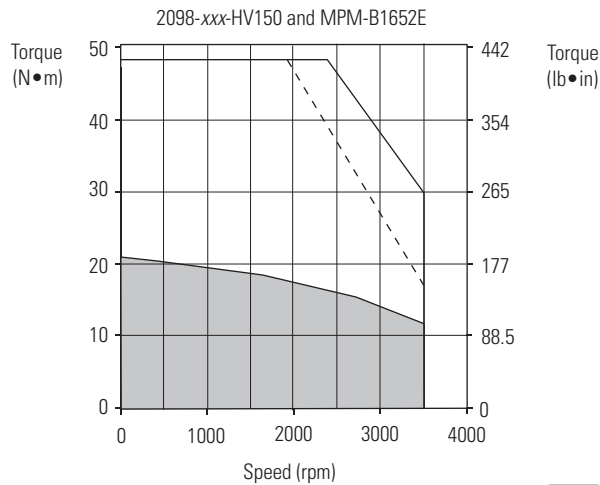
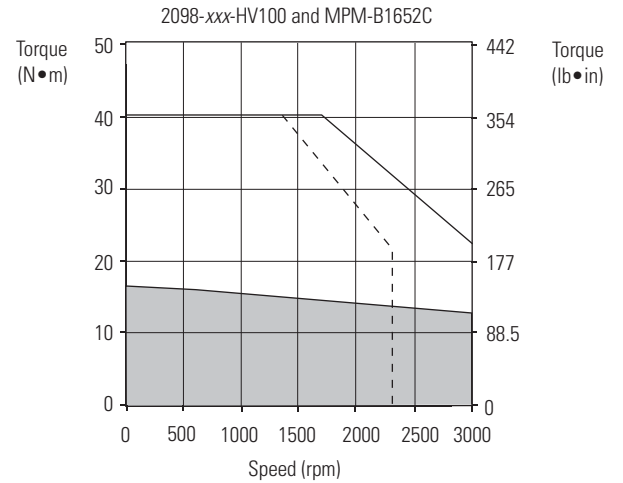
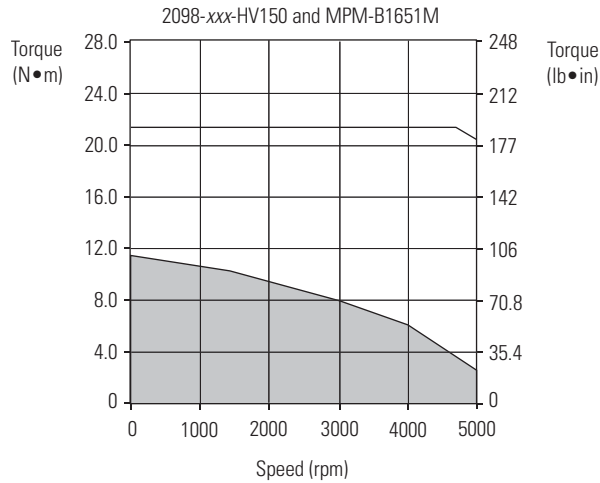
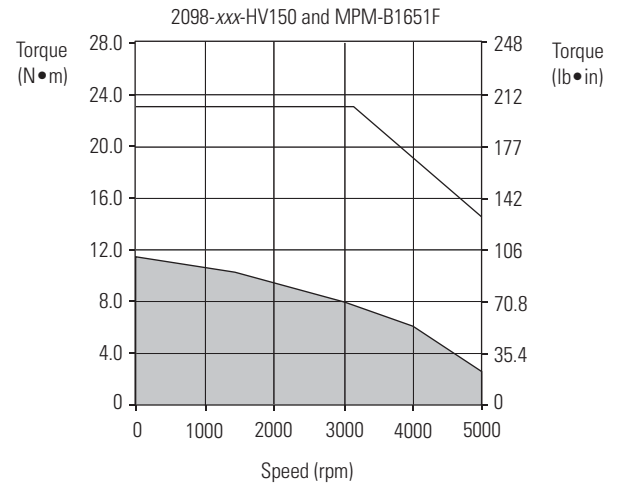
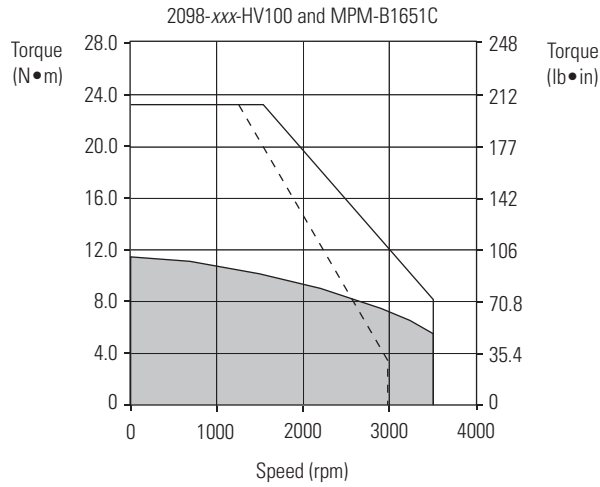
= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Ultra3000/5000 (460V) Drives/MP-Series Medium Inertia Motor Curves, Continued



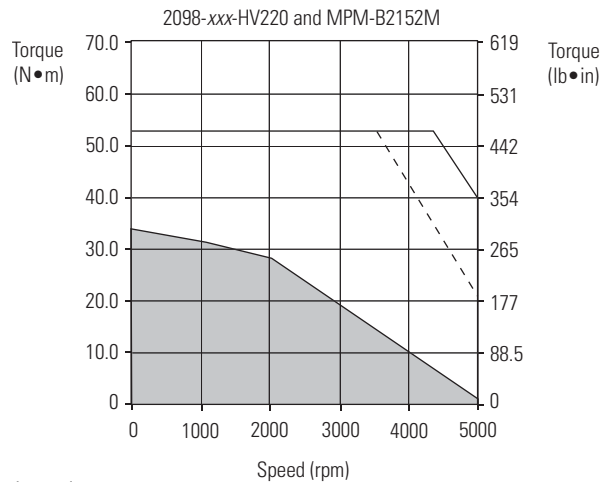
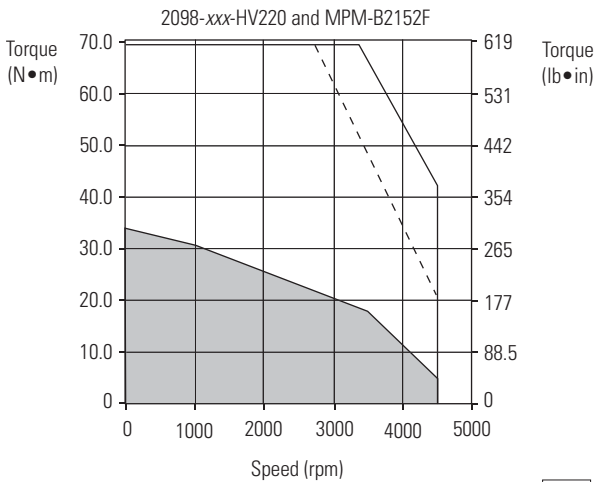
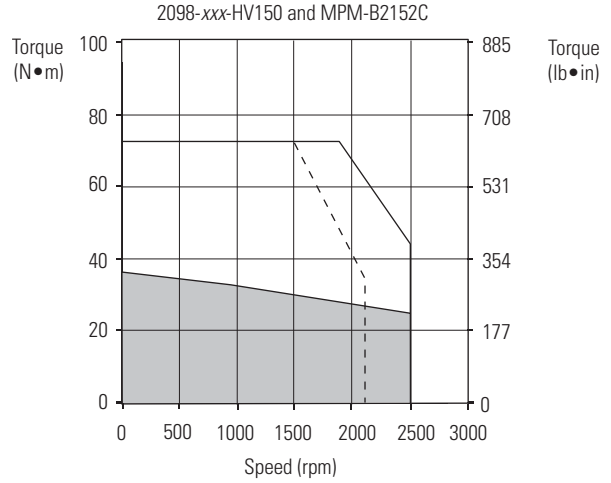
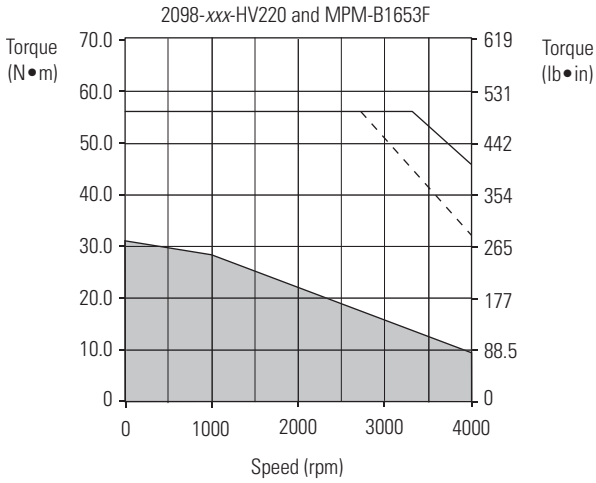
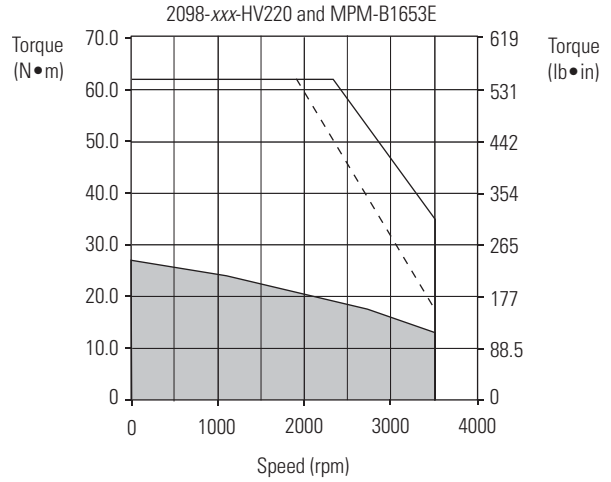
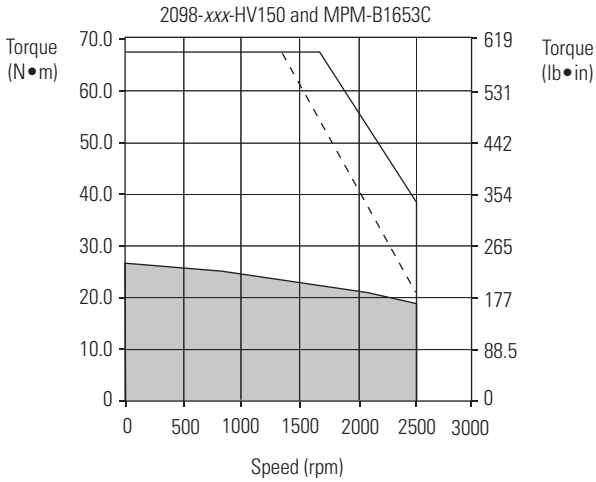
= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Ultra3000/5000 (460V) Drives/MP-Series Medium Inertia Motor Curves, Continued



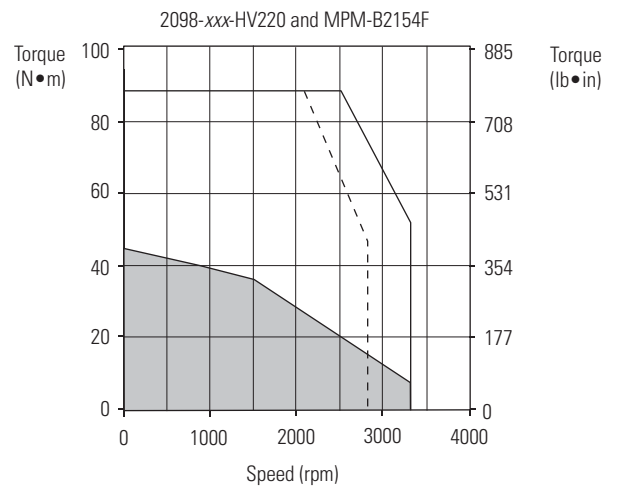
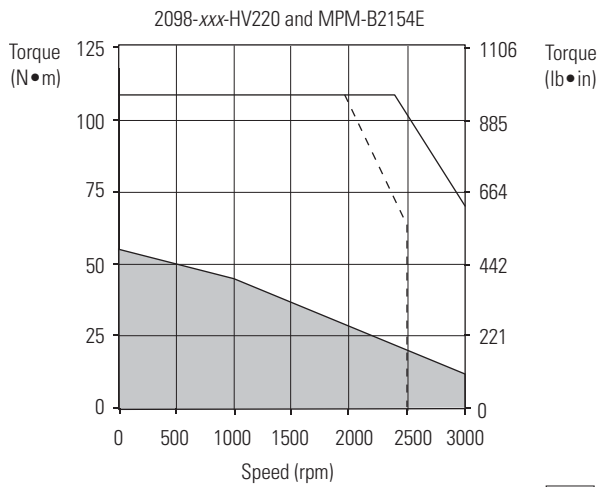
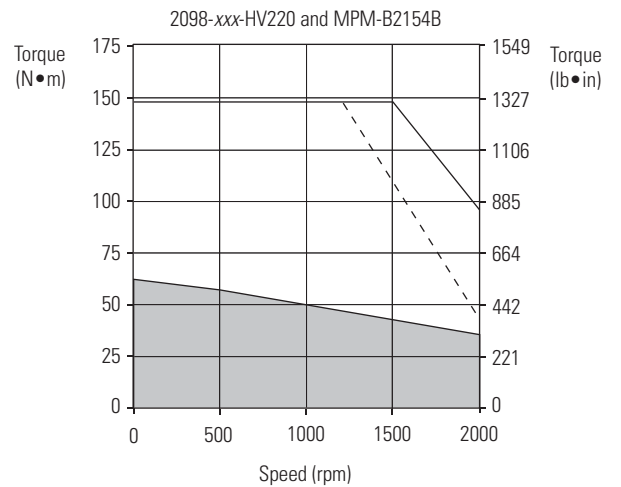
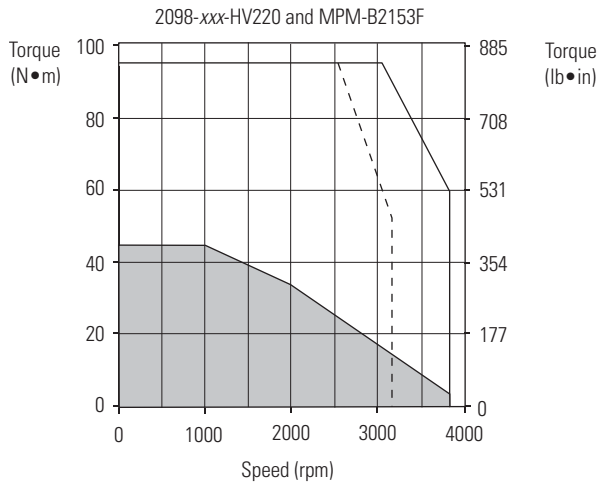
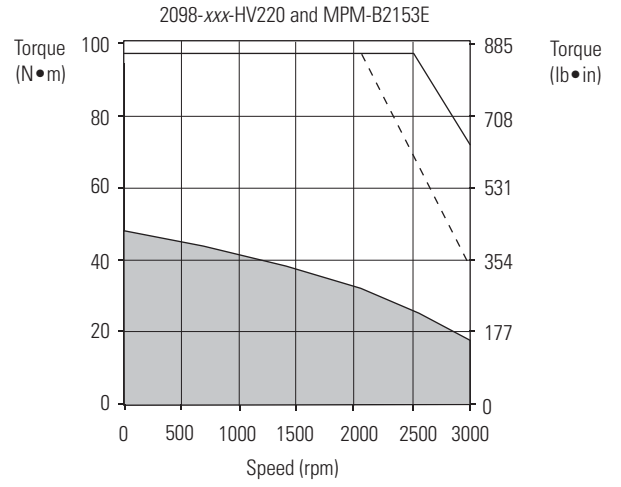
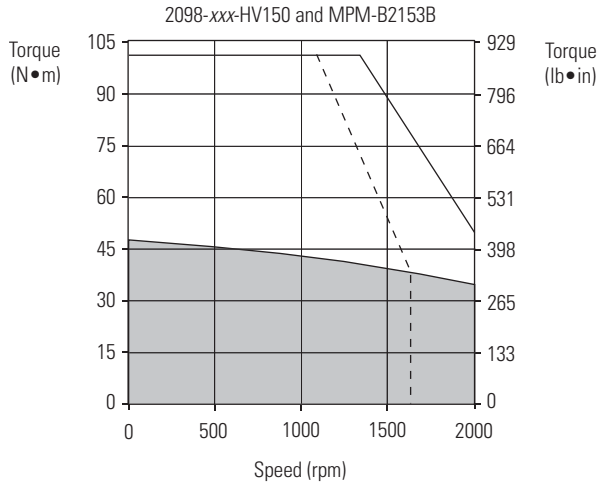
- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Ultra3000/5000 (460V) Drives/MP-Series Medium Inertia Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Ultra3000/5000 (460V) Drives/MP-Series Medium Inertia Motor Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = Drive operation with 400V AC (rms) input voltage

Ultra3000/5000 (230V) Drives with MP-Series Food Grade Motors

This section provides system combination information for the Ultra3000/5000 (230V) drives when matched with MP-Series food-grade motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPF Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
MPF-A310P, MPF-A320H, MPF-A320P, MPF-A330P	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
MPF-A430H		
MPF-A430P	2090-XXNPMF-14S _{xx} ⁽²⁾	
MPF-A4530K, MPF-A4540F		
MPF-A540K	2090-CPBM7DF-08AA _{xx} (standard)	

(1) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxS_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-xxAF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

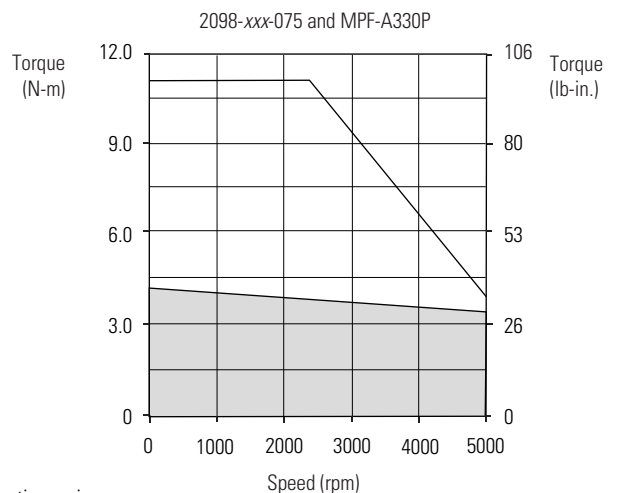
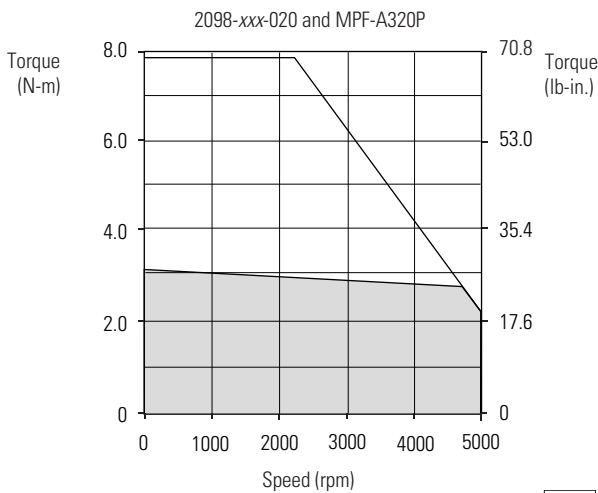
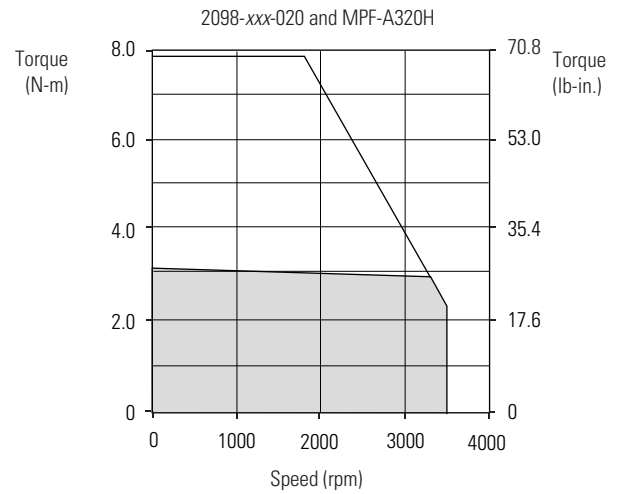
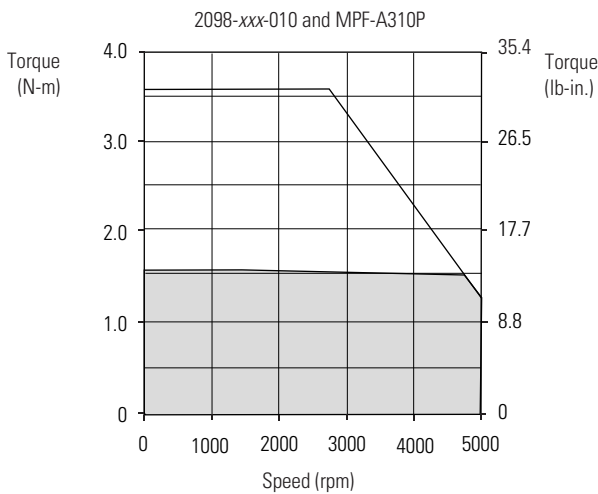
Bulletin MPF Motor Performance Specifications with Ultra3000/5000 (230V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 230V Drives
MPF-A310P	5000	2.50	0.79 (7)	7.5	1.92 (17)	0.73	2098-xxx-005
		4.85	1.58 (14)	14	3.61 (32)		2098-xxx-010
MPF-A320H	3500	2.50	1.24 (11)	7.5	3.16 (28)	1.0	2098-xxx-005
		5.0	2.48 (22)	15	6.44 (57)		2098-xxx-010
		6.1	3.05 (27)	19.3	7.91 (70)		2098-xxx-020
MPF-A320P	5000	2.50	0.85 (7.5)	7.5	2.03 (18)	1.3	2098-xxx-005
		5.0	1.69 (15)	15	3.95 (35)		2098-xxx-010
		9.0	3.05 (27)	29.5	7.91 (70)		2098-xxx-020
MPF-A330P	5000	10.0	3.50 (31)	30	9.60 (85)	1.6	2098-xxx-020
		12.0	4.18 (37)				2098-xxx-030
				38	11.1 (98)		2098-xxx-075
MPF-A430H	3500	10.0	5.08 (45)	30	14.7 (130)	1.8	2098-xxx-020
		12.2	6.21 (55)				2098-xxx-030
				6.21 (55)	45		19.8 (175)
MPF-A430P	5000	10.0	3.50 (31)	30	10.2 (90)	1.9	2098-xxx-020
		15.0	5.42 (48)				2098-xxx-030
		16.8	5.99 (53)	67	19.8 (175)		2098-xxx-075

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 230V Drives
MPF-A4530K	4000	10.0	4.18 (35)	30	11.3 (100)	2.3	2098-xxx-020
		15.0	6.21 (55)				2098-xxx-030
		19.5	8.13 (72)	62	20.3 (180)		2098-xxx-075
MPF-A4540F	3000	10.0	5.54 (49)	30	15.8 (140)	2.5	2098-xxx-020
		15.0	8.25 (73)				2098-xxx-030
		18.4	10.2 (90)	58	27.1 (240)		2098-xxx-075
MPF-A540K	4000	41.5	19.4 (172)	120	48.6 (430)	4.1	2098-xxx-150

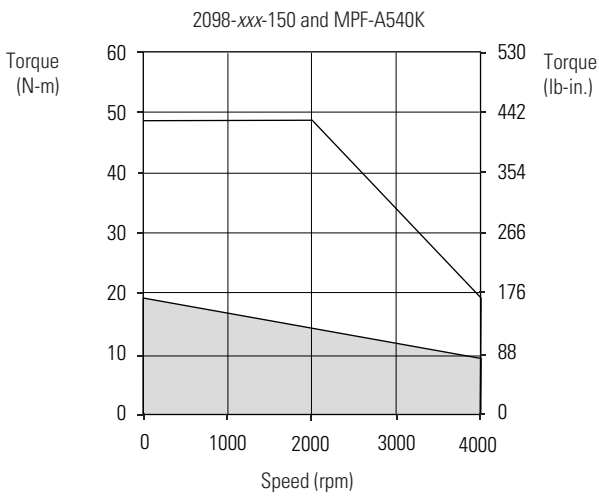
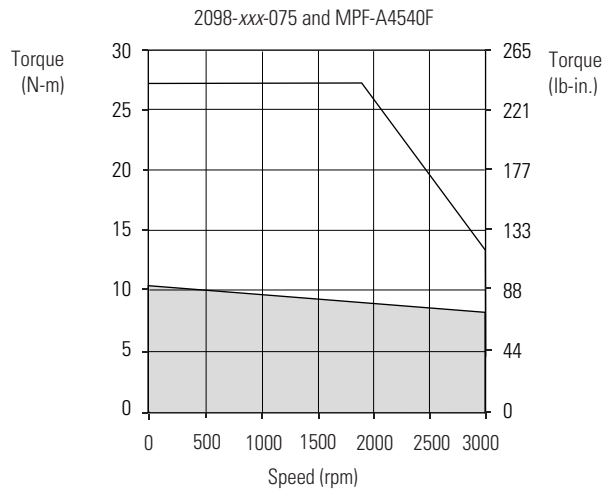
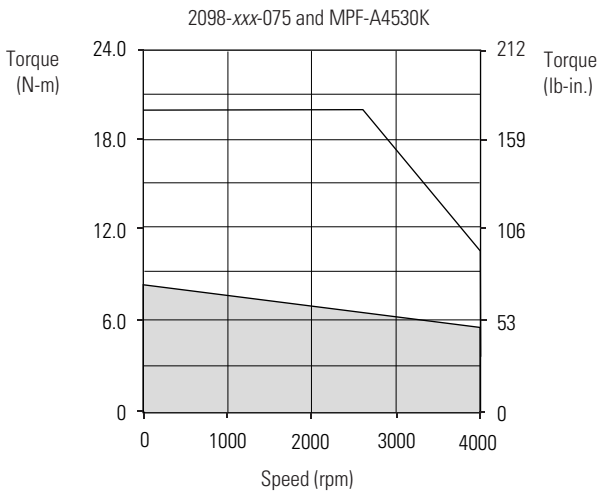
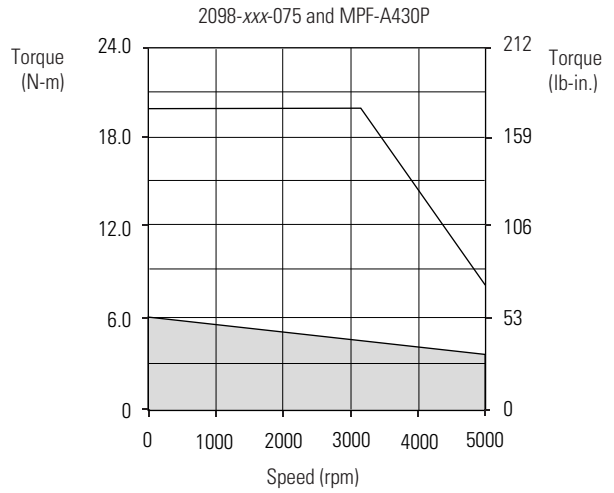
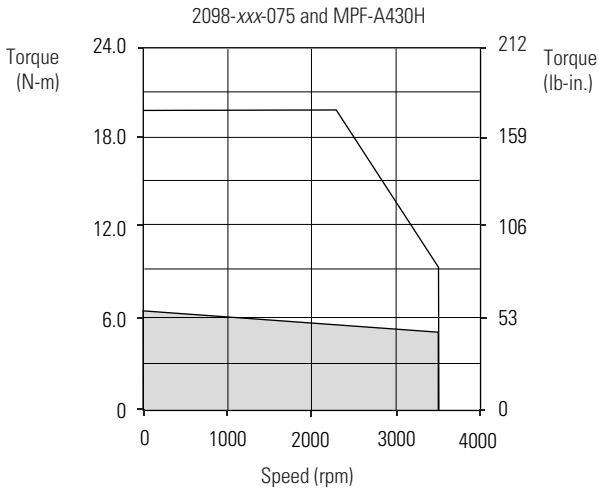
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000/5000 (230V) Drives/MP-Series Food Grade Motor Curves



□ = Intermittent operating region
 ■ = Continuous operating region

Ultra3000/5000 (230V) Drives/MP-Series Food Grade Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region

Ultra3000/5000 (460V) Drives with MP-Series Food Grade Motors

This section provides system combination information for the Ultra3000/5000 (460V) drives when matched with MP-Series food-grade motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPF Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
MPF-B310P, MPF-B320P, MPF-B330P	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
MPF-B430P		
MPF-B4530K, MPF-B4540F		
MPF-B540K	2090-XXNPMF-10S _{xx} ⁽²⁾	

(1) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxS_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-xxAF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

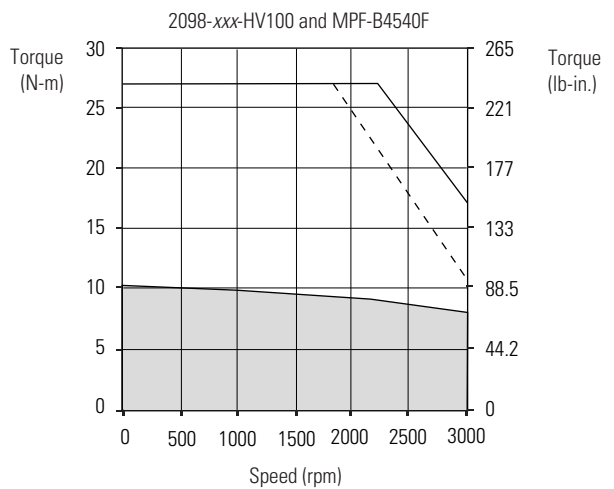
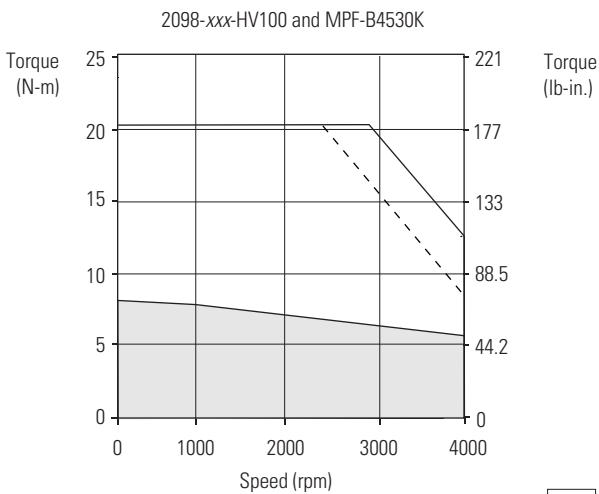
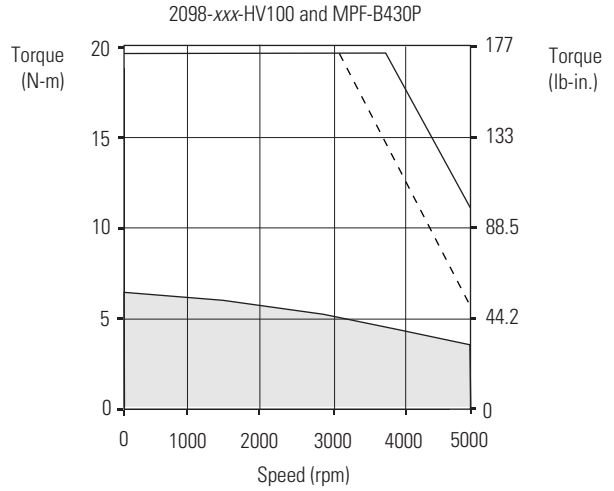
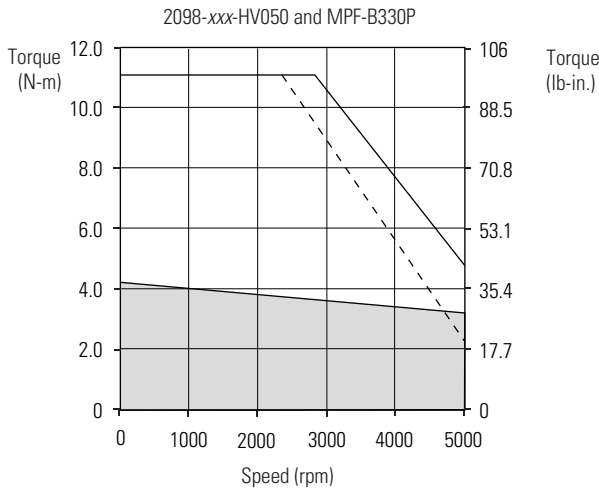
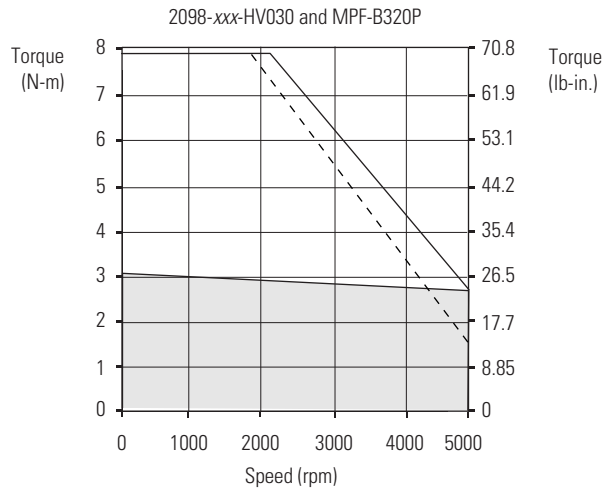
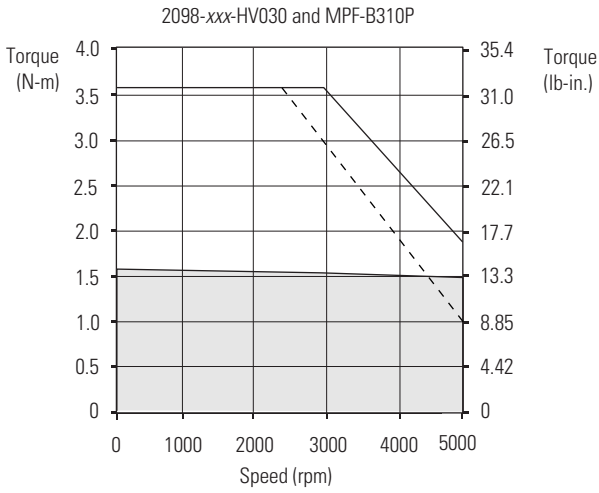
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPF Motor Performance Specifications with Ultra3000/5000 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A (0-pk)	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A (0-pk)	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 460V Drives
MPF-B310P	5000	2.30	1.58 (14)	7.1	3.61 (32)	0.77	2098-xxx-HV030
MPF-B320P	5000	4.24	3.05 (27)	14.0	7.34 (65)	1.5	2098-xxx-HV030
MPF-B330P	5000	5.70	4.18 (37)	14.0	8.59 (76)	1.6	2098-xxx-HV030
				19.0	11.1 (98)		2098-xxx-HV050
MPF-B430P	5000	9.20	6.55 (58)	22.0	12.9 (114)	2.0	2098-xxx-HV050
				32.0	19.8 (175)		2098-xxx-HV100
MPF-B4530K	4000	9.90	8.25 (73)	22.0	14.5 (128)	2.4	2098-xxx-HV050
				31.0	20.3 (180)		2098-xxx-HV100
MPF-B4540F	3000	9.10	10.2 (90)	22.0	22.0 (195)	2.5	2098-xxx-HV050
				29.0	27.1 (240)		2098-xxx-HV100
MPF-B540K	4000	20.5	19.4 (172)	46.0	33.9 (300)	4.1	2098-xxx-HV100
				60.0	45.2 (400)		2098-xxx-HV150

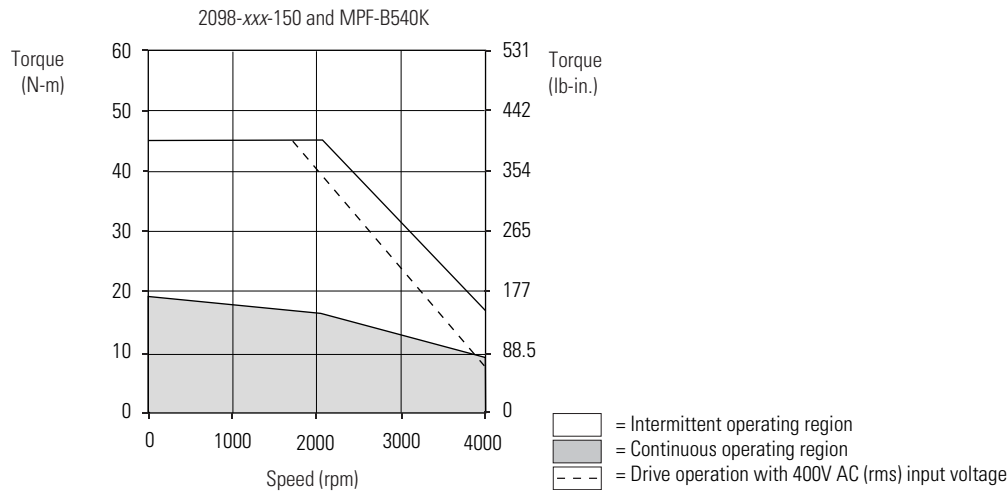
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000/5000 (460V) Drives/MP-Series Food Grade Motor Curves



= Intermittent operating region
 = Continuous operating region
 = Drive operation with 400V AC (rms) input voltage

Ultra3000/5000 (460V) Drives/MP-Series Food Grade Motor Curves, Continued



Ultra3000/5000 (230V) Drives with MP-Series Stainless Steel Motors

This section provides system combination information for the Ultra3000/5000 (230V) drives when matched with MP-Series stainless-steel motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPS Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
MPS-A330P	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPS-A4540F		

(1) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

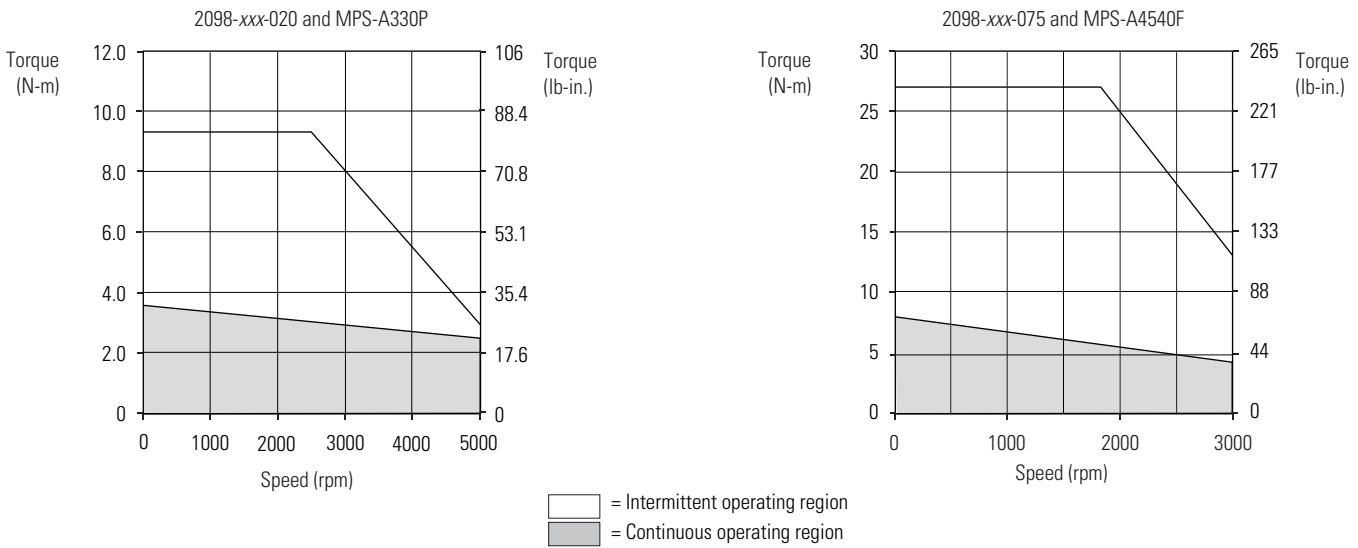
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPS Motor Performance Specifications with Ultra3000/5000 (230V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 230V Drives
MPS-A330P	5000	5.0	1.80 (16)	15.0	5.20 (46)	1.3	2098-xxx-010
		9.80	3.60 (32)	30.0	9.30 (82)		2098-xxx-020
MPS-A4540F	3000	10.0	5.5 (49)	30.0	15.9 (141)	1.4	2098-xxx-020
		14.4	8.1 (72)	30.0			2098-xxx-030
							56.0

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000/5000 (230V) Drives/MP-Series Stainless Steel Motor Curves



Ultra3000/5000 (460V) Drives with MP-Series Stainless Steel Motors

This section provides system combination information for the Ultra3000/5000 (460V) drives when matched with MP-Series stainless-steel motors. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPS Motor Cable Combinations

Motor Cat. No. (400V class)	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
MPS-B330P	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPS-B4540F		
MPS-B560F	2090-XXNPMF-14Sxx ⁽²⁾	

(1) Use drive-mounted breakout board (catalog number 2090-LXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-xxSxx) or continuous-flex (catalog number 2090-CPxM7DF-xxAFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

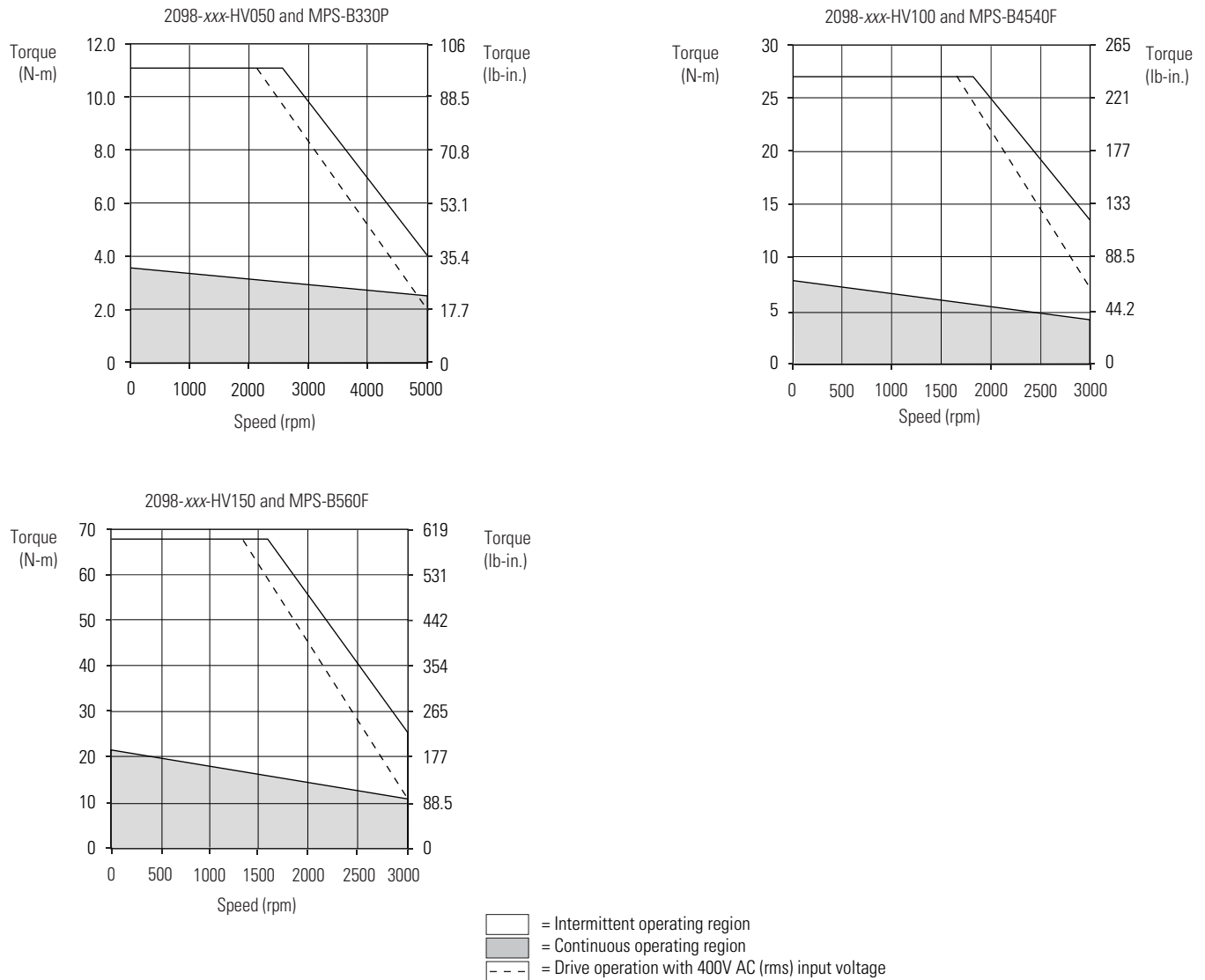
Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Bulletin MPS Motor Performance Specifications with Ultra3000/5000 (460V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Stall Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 460V Drives
MPS-B330P	5000	4.90	3.6 (32)	14.0	8.80 (78)	1.3	2098-xxx-HV030
				19.0	11.10 (98)		2098-xxx-HV050
MPS-B4540F	3000	7.0	8.0 (71)	14.0	15.6 (138)	1.4	2098-xxx-HV030
				22.0	23.5 (208)		2098-xxx-HV050
				26.0	27.1 (240)		2098-xxx-HV100
MPS-B560F	3000	17.0	21.5 (190)	46.0	50.1 (443)	3.5	2098-xxx-HV100
				68.0	67.7 (599)		2098-xxx-HV150

Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000/5000 (460V) Drives/MP-Series Stainless Steel Motor Curves



Ultra3000/5000 Drives with TL-Series Low Inertia Motors

This section provides system combination information for the Ultra3000/5000 (230V) drives when matched with TL-Series (Bulletin TLY) low-inertia motors. Compatible TL-Series motors are equipped with incremental encoder feedback. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin TLY Motor Cable Combinations

Motor Cat. No. (200V class)	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
TLY-A110T, TLY-A120T, TLY-A130T	2090-CPWM6DF-16AA _{xx} (standard) without brake	2090-CFBM6DF-CBAA _{xx} ⁽²⁾ (standard) Incremental Feedback
TLY-A220T, TLY-A230T		
TLY-A2530P, TLY-A2540P	2090-CPBM6DF-16AA _{xx} (standard) with brake	
TLY-A310M		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#) for more information.

(2) Premolded (drive end) feedback cables (catalog number 2090-CFBM6DD-CCAA_{xx}) are also available for Kinetix 6000 drives.

TL-Series (Bulletin TLY-A_{xxx}) motors are characterized as having 1000 mm (39.4 in.) cable extensions with circular plastic connectors.

Cable length _{xx} is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

TL-Series (non-brake) Performance Specifications with Ultra3000/5000 (230V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 230V Drives	
TLY-A110T	6000	0.55	0.096 (0.85)	1.50	0.20 (1.75)	0.041	2098- <i>xxx</i> -005	
TLY-A120T		1.03	0.181 (1.60)	2.50	0.36 (3.20)	0.086	2098- <i>xxx</i> -005	
TLY-A130T		1.85	0.325 (2.88)	4.90	0.76 (6.70)	0.14	2098- <i>xxx</i> -005	
TLY-A220T		2.50	0.576 (5.10)	7.50	1.40 (12.4)	0.35	2098- <i>xxx</i> -005	
		3.50	0.836 (7.40)	7.90	1.48 (13.1)		2098- <i>xxx</i> -010	
TLY-A230T		2.50	0.576 (5.10)	7.50	1.40 (12.4)	0.44	2098- <i>xxx</i> -005	
		5.00	1.17 (10.4)	15.0	2.94 (26.0)		2098- <i>xxx</i> -010	
		5.50	1.30 (11.5)	15.5	3.05 (27.0)		2098- <i>xxx</i> -020	
TLY-A2530P		5000	5.00	1.32 (11.7)	15.0	3.73 (33.0)	0.69	2098- <i>xxx</i> -010
			10.0	2.60 (23.0)	21.0	5.20 (46.0)		2098- <i>xxx</i> -020
TLY-A2540P	5.00		1.49 (13.2)	15.0	4.40 (39.0)	0.86	2098- <i>xxx</i> -010	
	10.0		2.94 (26.0)	24.8	7.10 (63.0)		2098- <i>xxx</i> -020	
TLY-A310M	4500		10.0	3.61 (31.9)	30.0	9.0 (79.6)	0.95	2098- <i>xxx</i> -020

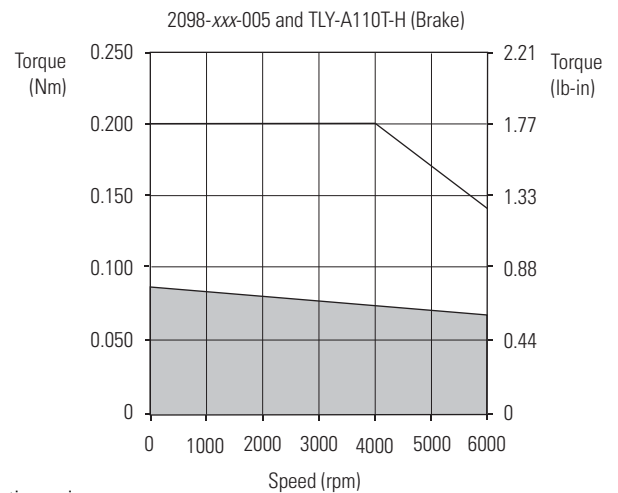
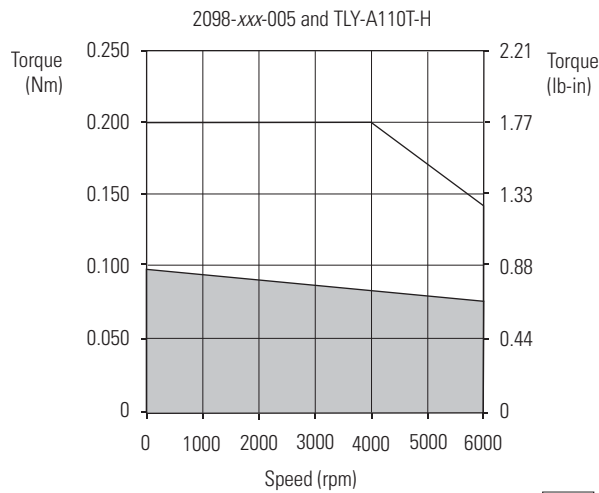
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

TL-Series (brake) Performance Specifications with Ultra3000/5000 (230V) Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Torque N•m (lb•in)	Motor Rated Output kW	Ultra3000/ Ultra5000 230V Drives	
TLY-A110T	6000	0.50	0.086 (0.76)	1.50	0.20 (1.75)	0.037	2098-xxx-005	
TLY-A120T		0.93	0.163 (1.44)	2.50	0.36 (3.20)	0.077	2098-xxx-005	
TLY-A130T		1.67	0.293 (2.59)	4.90	0.76 (6.70)	0.13	2098-xxx-005	
TLY-A220T		2.50	0.576 (5.10)	7.50	1.40 (12.4)	0.24	2098-xxx-005	
		3.15	0.757 (6.70)	7.90	1.48 (13.1)		2098-xxx-010	
TLY-A230T		2.50	0.576 (5.10)	7.50	1.40 (12.4)	0.32	2098-xxx-005	
		4.95	1.16 (10.3)	15.0	2.94 (26.0)		2098-xxx-010	
		4.95	1.16 (10.3)	15.5	3.05 (27.0)		2098-xxx-020	
TLY-A2530P		5000	5.00	1.32 (11.7)	15.0	3.73 (33.0)	0.55	2098-xxx-010
			10.0	2.60 (23.0)	21.0	5.20 (46.0)		2098-xxx-020
TLY-A2540P	5.0		1.49 (13.2)	15.0	4.40 (39.0)	0.66	2098-xxx-010	
	10.0		2.94 (26.0)	24.8	7.10 (63.0)		2098-xxx-020	
TLY-A310M	4500		10.0	3.61 (31.9)	30.0	9.0 (79.6)	0.90	2098-xxx-020

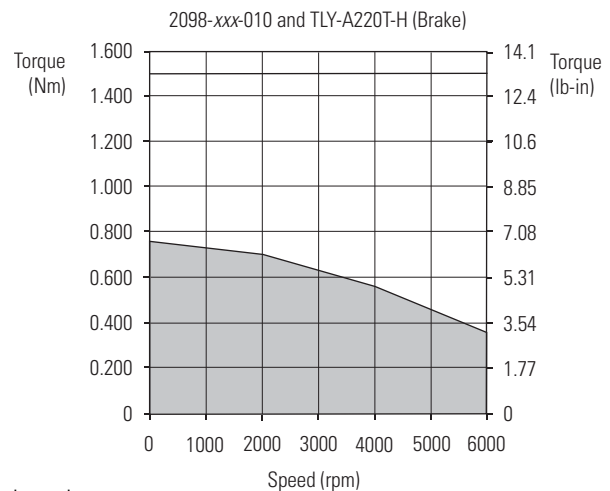
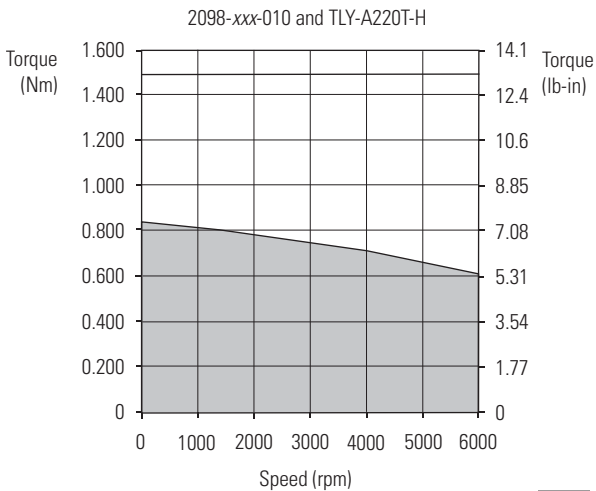
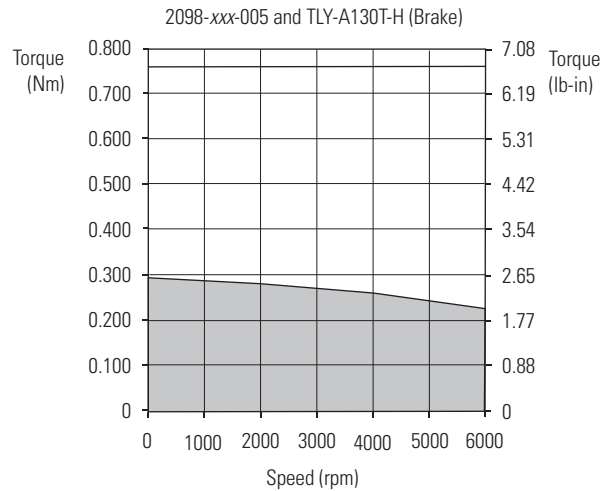
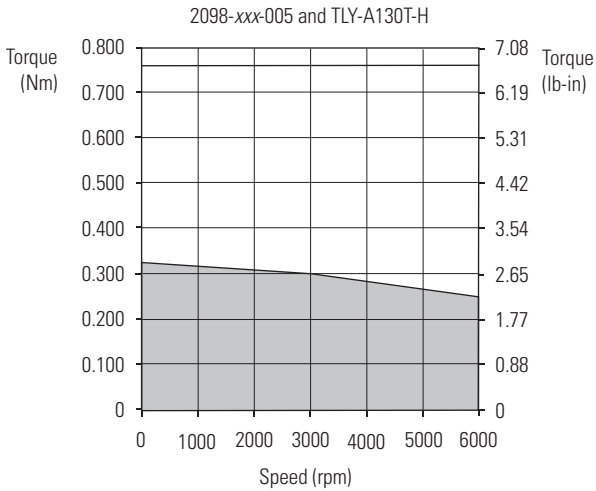
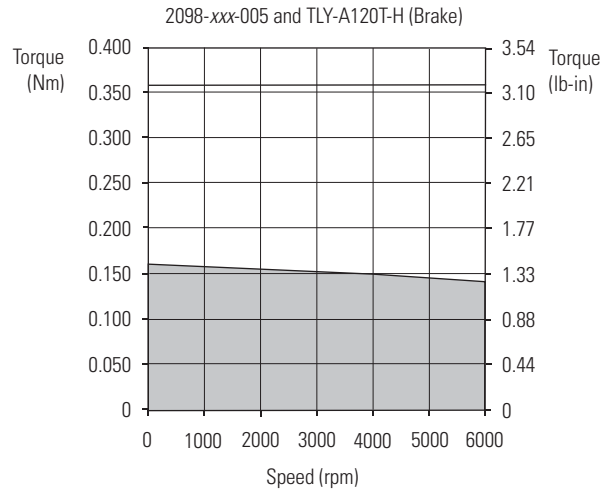
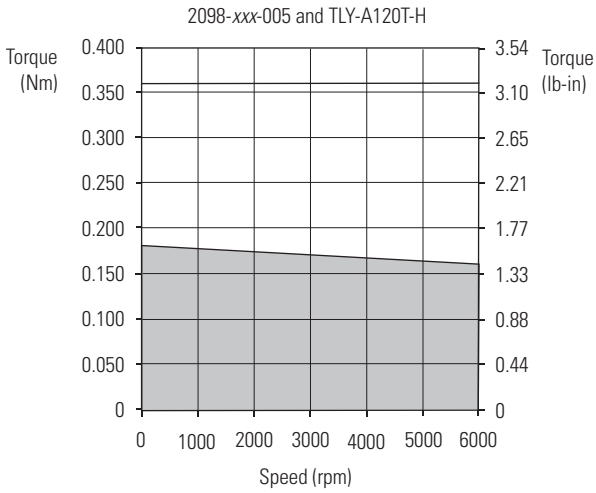
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000/5000 (230V) Drives/TLY-Axxxx-H (incremental) Motor Curves



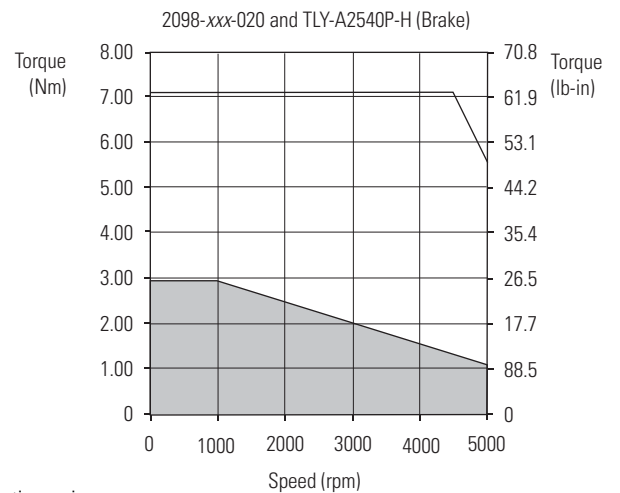
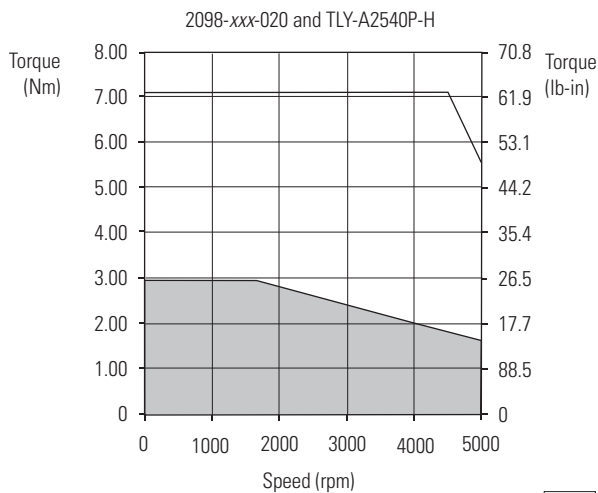
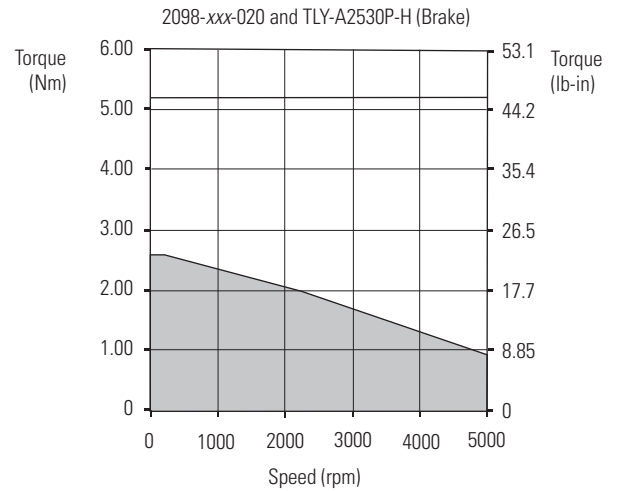
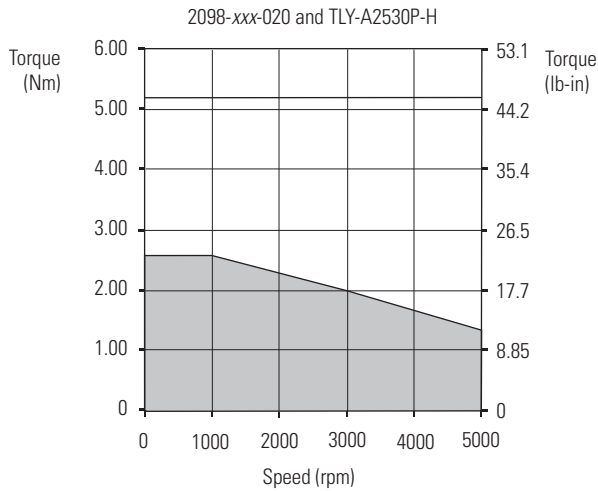
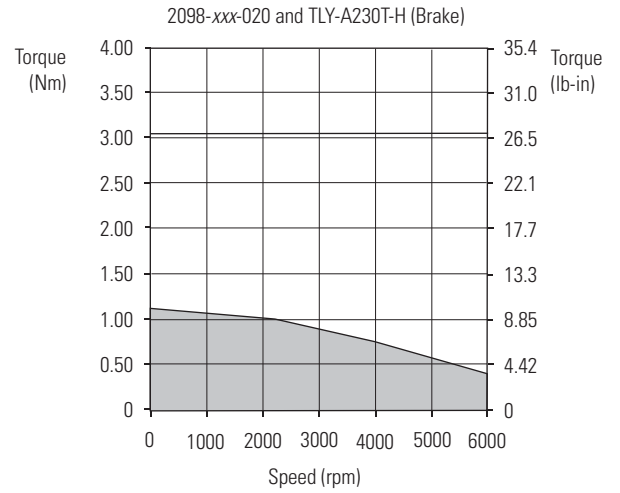
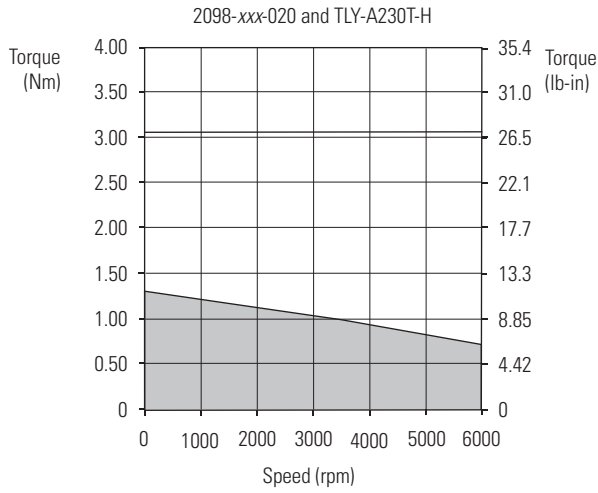
= Intermittent operating region
 = Continuous operating region

Ultra3000/5000 (230V) Drives/TLY-Axxxx-H (incremental) Motor Curves, Continued



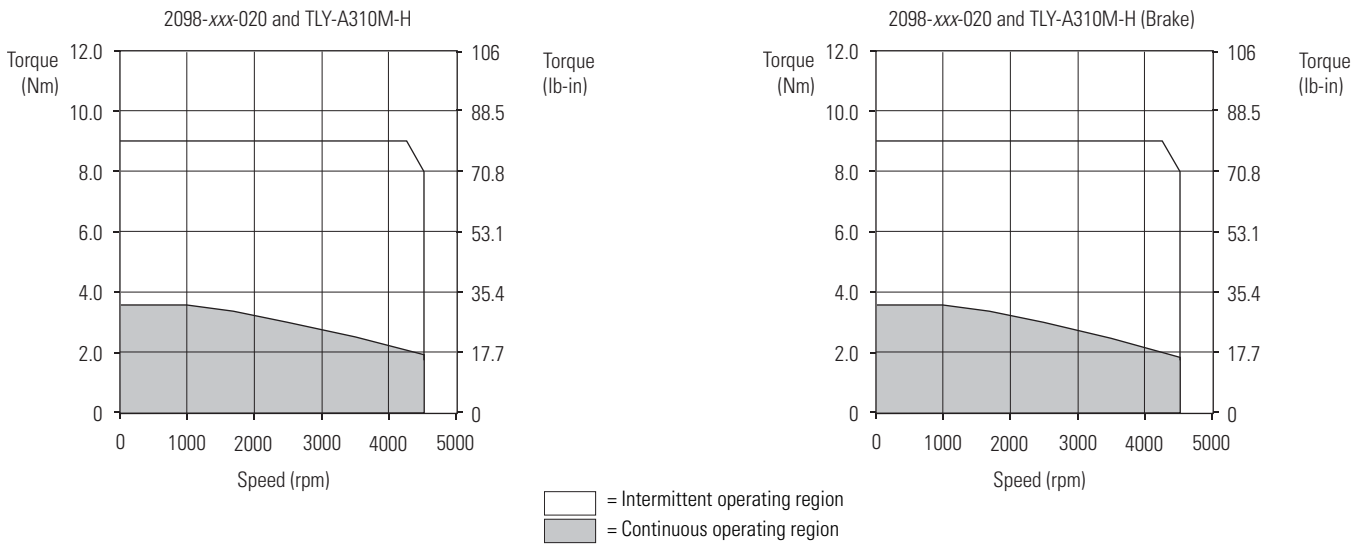
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 = Continuous operating region

Ultra3000/5000 (230V) Drives/TLY-Axxxx-H (incremental) Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region

Ultra3000/5000 (230V) Drives/TLY-Axxxx-H (incremental) Motor Curves, Continued



Ultra1500 Drives with TL-Series Low Inertia Motors

This section provides system combination information for the Ultra1500 servo drives when matched with TL-Series (Bulletin TL) low-inertia motors. Bulletin TL-Axxx motors are equipped with absolute high-resolution encoder feedback and are characterized as having 300 mm (11.8 in.) cable extensions with rectangular connectors. Included in this section are motor power, feedback, and brake cable catalog numbers, system performance specifications, and the optimum torque/speed curves.

Bulletin MPL Motor Cable Combinations

Motor Cat. No.	Motor Power Cable	Motor Feedback Cable	Motor Brake Cable
TL-A110P, TL-A120P, TL-A130P	2090-DANPT-16Sxx	2090-DANFCT-Sxx Absolute High-resolution	2090-DANBT-18Sxx
TL-A220P, TL-A230P			
TL-A2530P, TL-A2540P			
TL-A410M			

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

TL-Series (non-brake) Performance Specifications with Ultra1500 Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Torque N•m (lb•in)	Motor Rated Output kW	Ultra1500 Drives	
TL-A110P	5000	0.55	0.096 (0.85)	1.50	0.20 (1.75)	0.041	2092-DA1	
TL-A120P		1.03	0.181 (1.60)	2.50	0.36 (3.20)	0.086		
TL-A130P		1.40	0.246 (2.18)	3.40	0.53 (4.70)	0.14	2092-DA1	
		1.85	0.325 (2.88)	4.90	0.76 (6.70)		2092-DA2	
TL-A220P		2.40	0.549 (4.86)	7.20	1.34 (11.9)	0.35	2092-DA2	
		3.50	0.836 (7.40)	7.90	1.48 (13.1)		2092-DA3	
TL-A230P		4.70	1.10 (9.80)	11.3	2.22 (19.7)	0.44	2092-DA3	
		5.50	1.30 (11.5)	15.5	3.05 (27.0)		2092-DA4	
TL-A2530P		4.70	1.24 (11.0)	11.3	2.82 (25.0)	0.69	2092-DA3	
		10.0	2.60 (23.0)	21.0	5.20 (46.0)		2092-DA4	
TL-A2540P		4.70	1.41 (12.5)	11.3	3.27 (29.0)	0.86	2092-DA3	
		10.0	2.94 (26.0)	24.8	7.10 (63.0)		2092-DA4	
TL-A410M		4500	10.7	3.73 (33.0)	24.8	7.46 (66.0)	2.0	2092-DA4
			15.5	5.42 (48.0)	43.4	13.0 (115.0)		2092-DA5

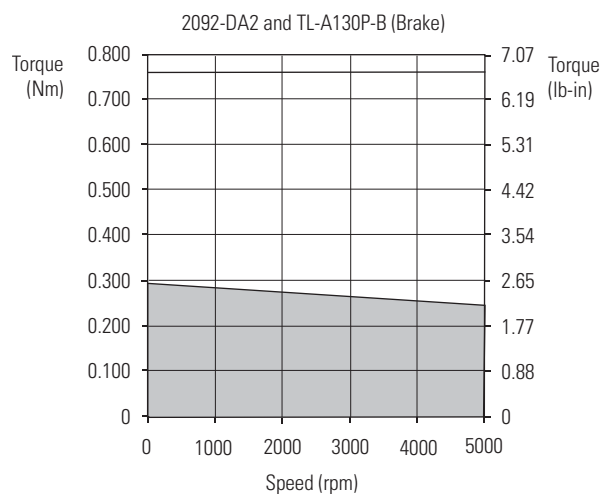
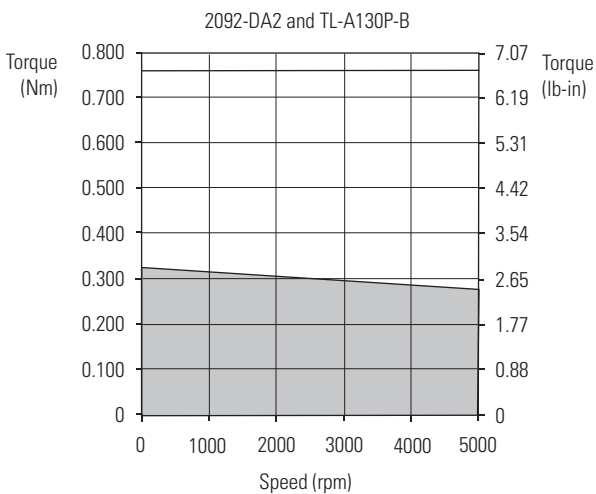
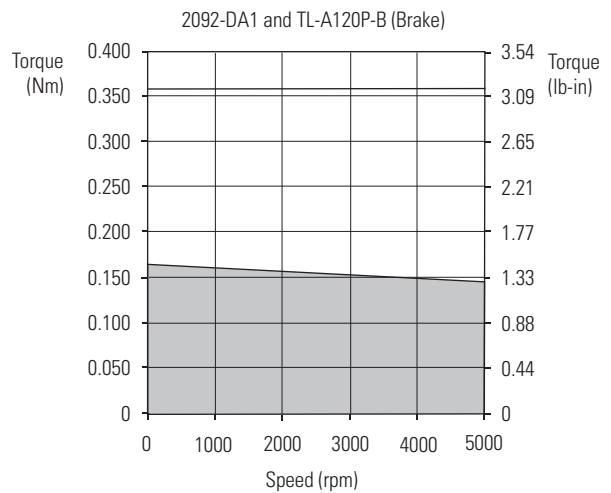
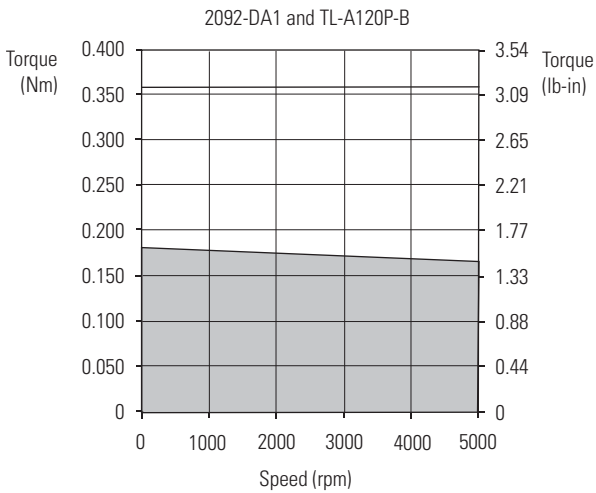
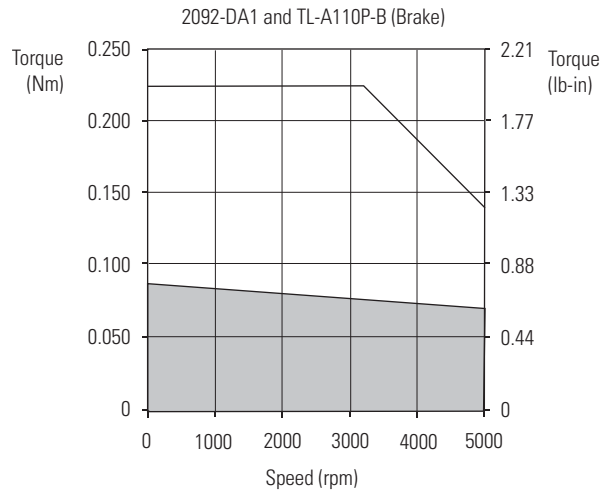
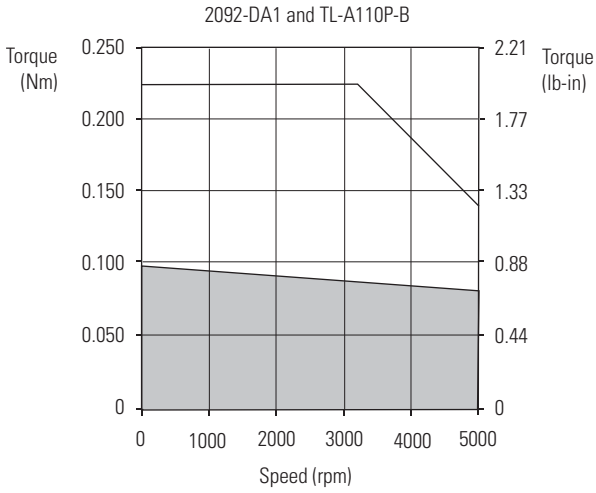
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

TL-Series (brake) Performance Specifications with Ultra1500 Drives

Rotary Motor	Max Speed rpm	System Continuous Stall Current A 0-pk	System Continuous Stall Torque N•m (lb•in)	System Peak Stall Current A 0-pk	System Peak Torque N•m (lb•in)	Motor Rated Output kW	Ultra1500 Drives	
TL-A110P	5000	0.50	0.086 (0.76)	1.50	0.20 (1.75)	0.037	2092-DA1	
TL-A120P		0.93	0.163 (1.44)	2.50	0.36 (3.20)	0.077		
TL-A130P		1.40	0.246 (2.18)	3.40	0.53 (4.70)	0.13	2092-DA1	
		1.67	0.293 (2.59)	4.90	0.76 (6.70)		2092-DA2	
TL-A220P		2.40	0.549 (4.86)	7.20	1.34 (11.90)	0.24	2092-DA2	
		3.15	0.757 (6.70)	7.90	1.48 (13.10)		2092-DA3	
TL-A230P		4.70	1.100 (9.80)	11.3	2.22 (19.70)	0.32	2092-DA3	
		4.95	1.160 (10.30)	15.5	3.05 (27.0)		2092-DA4	
TL-A2530P		4.70	1.24 (11.0)	11.3	2.82 (25.0)	0.55	2092-DA3	
		10.0	2.600 (23.0)	21.0	5.20 (46.0)		2092-DA4	
TL-A2540P		4.70	1.41 (12.5)	11.3	3.27 (29.0)	0.66	2092-DA3	
		10.0	2.940 (26.00)	24.8	7.10 (63.0)		2092-DA4	
TL-A410M		4500	10.70	3.73 (33.0)	24.8	7.46 (66.0)	1.8	2092-DA4
			14.0	4.860 (43.0)	43.4	13.0 (115.0)		2092-DA5

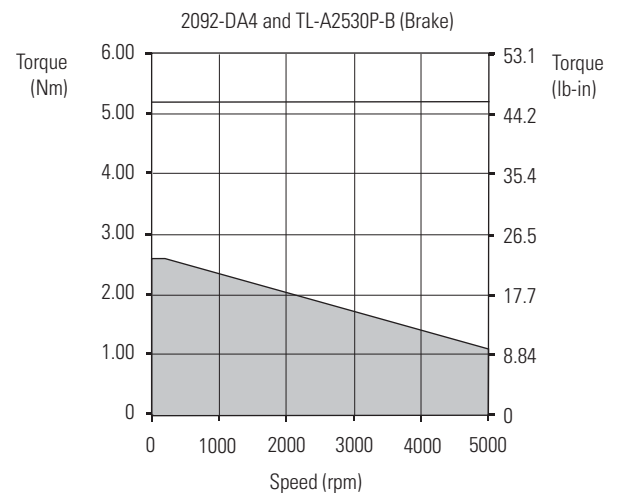
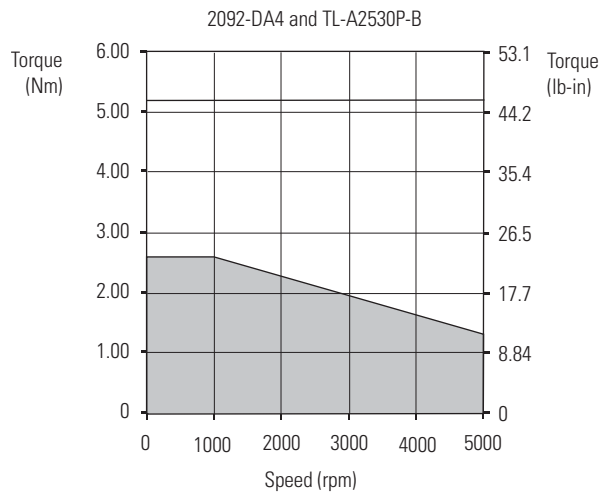
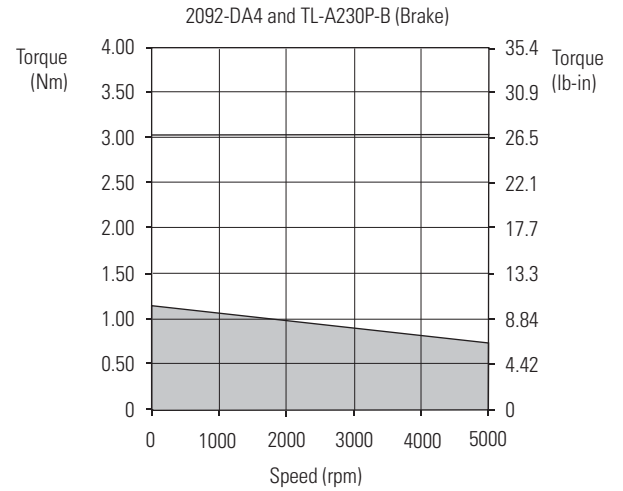
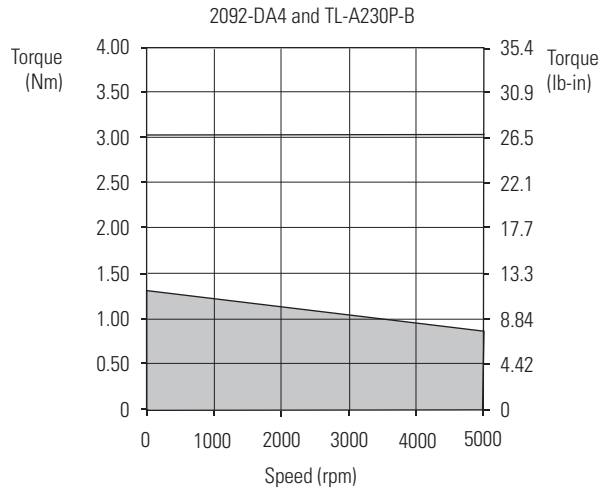
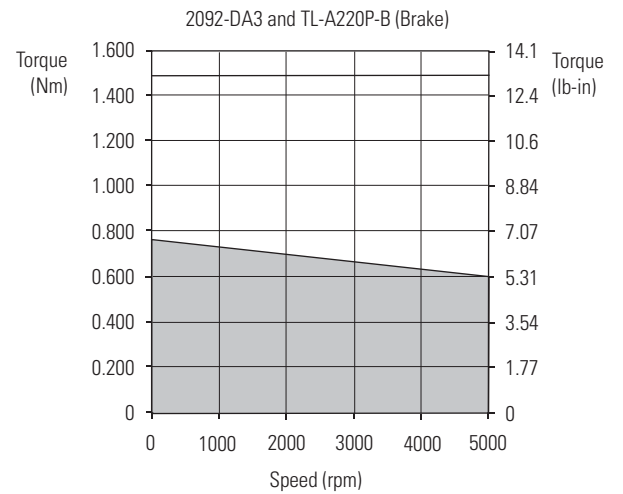
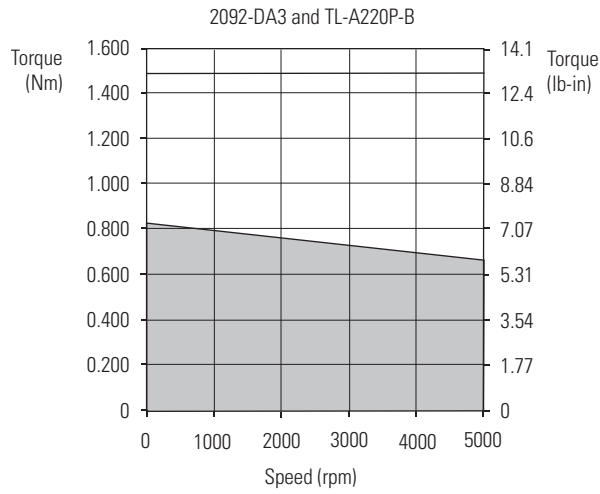
Performance specification data and curves reflect nominal system performance of a typical system with motor at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra1500 Drives/TL-Axxxx-B (absolute high-resolution) Motor Curves



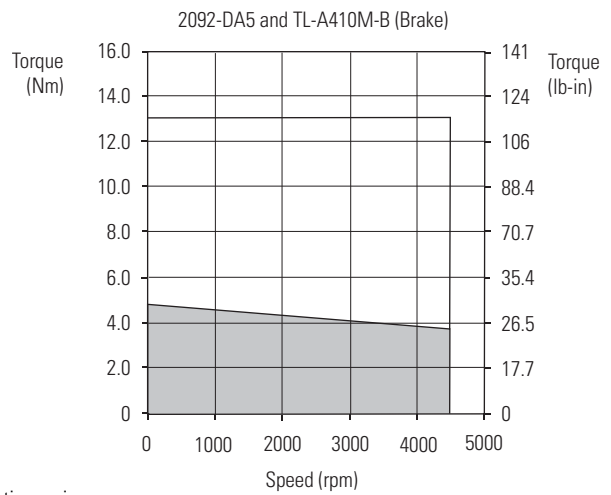
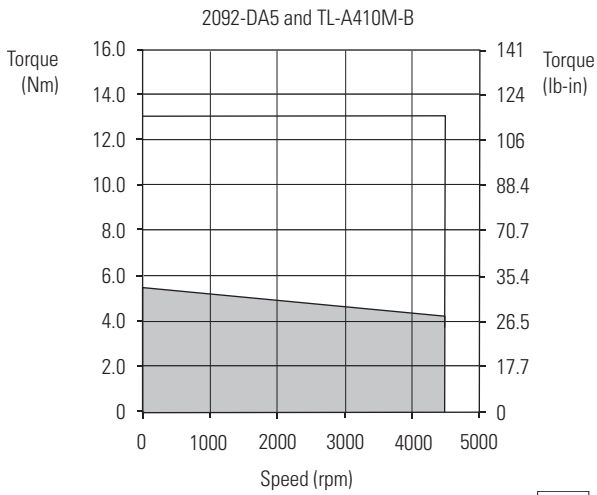
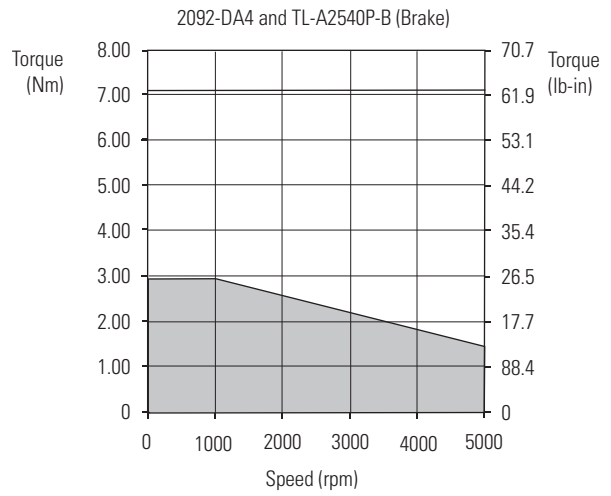
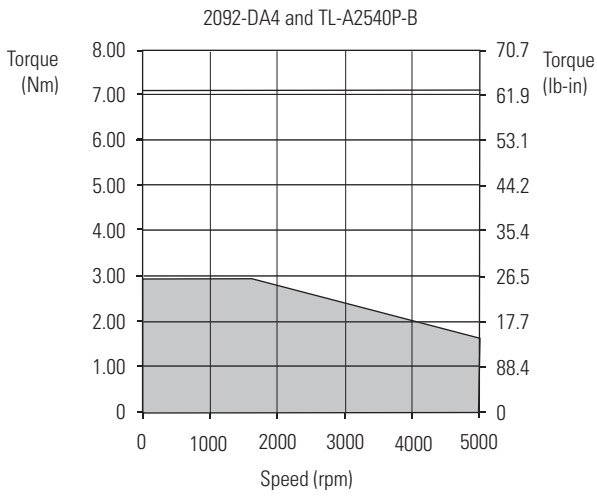
= Intermittent operating region
 = Continuous operating region

Ultra1500 Drives/TL-Axxxx-B (absolute high-resolution) Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region

Ultra1500 Drives/TL-Axxxx-B (absolute high-resolution) Motor Curves, Continued



= Intermittent operating region
 = Continuous operating region

Linear Motion System Combinations

This chapter provides the Kinetix Motion Control servo drive and actuator combinations. Each drive family/actuator section includes:

- an actuator/cable combinations table.
- a drive/actuator performance specifications table.
- force/velocity curves with each actuator matched to the drive with optimum performance.

Performance specification data and curves reflect nominal system performance of a typical system with actuator/drive at rated ambient temperature and line voltage. For additional information on ambients, line conditions, and valid combinations not shown in this chapter, refer to Motion Analyzer software.

IMPORTANT

This system combinations chapter does not include all possible actuator/drive combinations. Please refer to Motion Analyzer software to verify compatibility. Download is available at <http://www.rockwellautomation.com/en/e-tools>.

Linear Motion System Combinations

Drive Family	Linear Motor/Actuator Series	Class	Page
Kinetix 300 Servo Drives	MP-Series Integrated Linear Stages	200V	640
	MP-Series Integrated Linear Stages	400V	642
	MP-Series Electric Cylinders	200V and 400V	644
	MP-Series Heavy Duty Electric Cylinders		646
	TL-Series Electric Cylinders	200V	650
Kinetix 6000 and Kinetix 6200/ Kinetix 6500 Servo Drives	Kinetix 6000 Peak Enhancement Example		653
	MP-Series Integrated Linear Stages	200V	654
	MP-Series Integrated Linear Stages	400V	657
	MP-Series Electric Cylinders	200V and 400V	661
	MP-Series Heavy Duty Electric Cylinders		664
	LDC-Series Linear Motors	200V	668
	LDC-Series Linear Motors	400V	672
	LDL-Series Linear Motors	200V	679

Drive Family	Linear Motor/Actuator Series	Class	Page
Kinetix 2000 Servo Drives	MP-Series Integrated Linear Stages	200V	683
	MP-Series Electric Cylinders		687
	MP-Series Heavy Duty Electric Cylinders		689
	TL-Series Electric Cylinders		692
	LDC-Series Linear Motors		695
	LDL-Series Linear Motors		699
	Ultra3000 Servo Drives		MP-Series Integrated Linear Stages
MP-Series Integrated Linear Stages		400V	707
MP-Series Electric Cylinders		200V and 400V	710
MP-Series Heavy Duty Electric Cylinders			713
LDC-Series Linear Motors		200V	717
LDC-Series Linear Motors		400V	721
LDL-Series Linear Motors		200V	727

IMPORTANT

You can configure Kinetix 6000 460V (series B) drives to operate with 250% peak current for limited duty cycles. Drive/actuator performance specifications are given with and without the peak enhancement feature enabled. For more information, refer to Kinetix 6000 Drive Performance Example with Peak Enhancement Feature on [page 653](#).

Kinetix 300 (240V) Drives with MP-Series Integrated Linear Stages

This section provides system combination information for the Kinetix 300 (240V) drives when matched with MP-Series (230V) integrated ballscrew linear stages. Included are motor power/brake and feedback cable catalog numbers, system performance specifications, and force/velocity curves.

Linear Stage Cable Combinations

Linear Stage	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAS-Axxx1-V05SxA	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPAS-Axxx2-V20SxA		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Linear Stage Performance Specifications with Kinetix 300 (240V) Drives

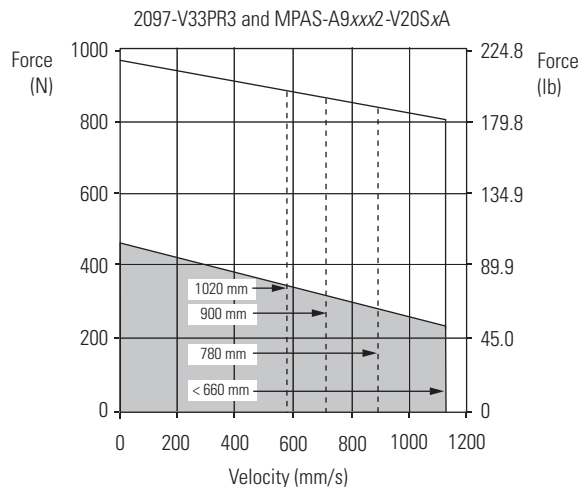
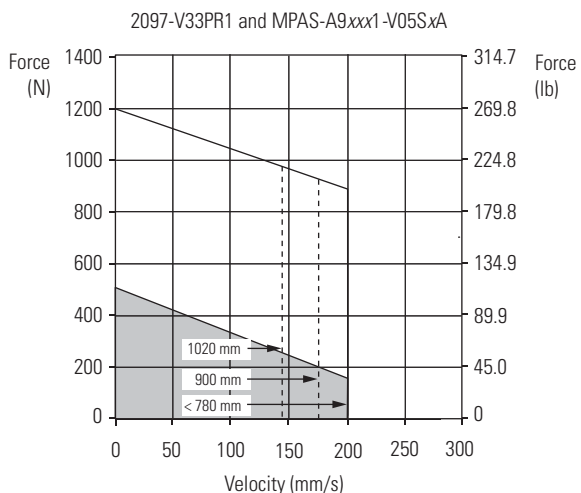
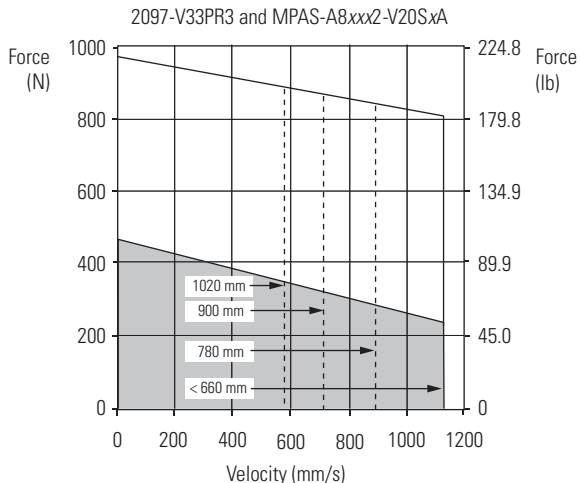
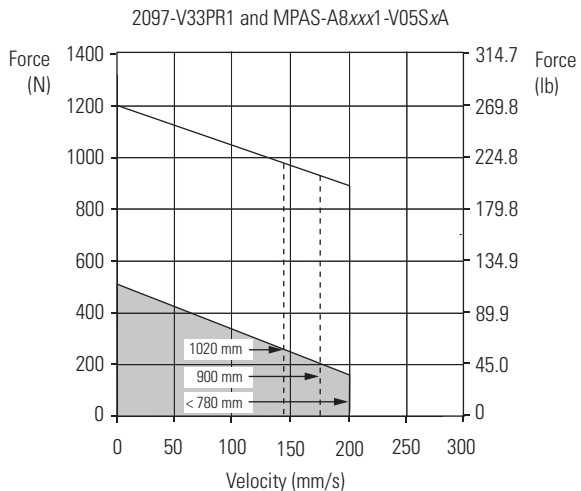
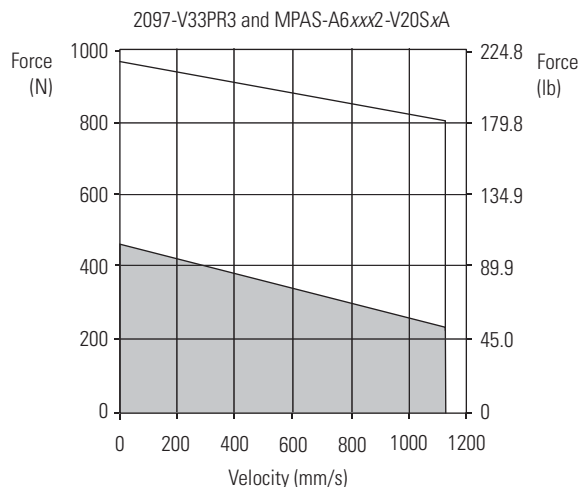
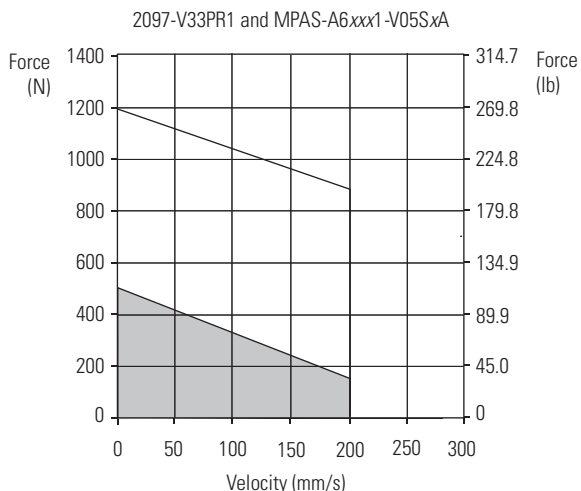
Linear Stage	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Stage Rated Output kW	Kinetix 300 240V Drives
MPAS-Axxx1-V05SxA	200 (7.9) ¹	3.09	521 (117)	6.10	1212 (272)	0.37	2097-V33PR1
MPAS-Axxx2-V20SxA	1124 (44.3) ²	4.54	462 (104)	9.10	968 (218)	0.62	2097-V33PR3

¹ For 900 mm stroke length, maximum speed is 176 mm/s (6.9 in./s). For 1020 mm stroke length, maximum speed is 143 mm/s (5.6 in./s).

² For 780 mm stroke length, maximum speed is 889 mm/s (35.0 in./s). For 900 mm stroke length, maximum speed is 715 mm/s (28.2 in./s). For 1020 mm stroke length, maximum speed is 582 mm/s (22.9 in./s).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 (240V) Drives/MP-Series Integrated Linear Stage Curves



= Intermittent operating region
 = Continuous operating region
 = System operation for specified stroke length

Kinetix 300 (480V) Drives with MP-Series Linear Stages

This section provides system combination information for the Kinetix 300 (480V) drives when matched with MP-Series (460V) integrated ballscrew linear stages. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Linear Stage Cable Combinations

Linear Stage	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAS-Bxxxx1-V05SxA	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPAS-Bxxxx2-V20SxA		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Linear Stage Performance Specifications with Kinetix 300 (480V) Drives

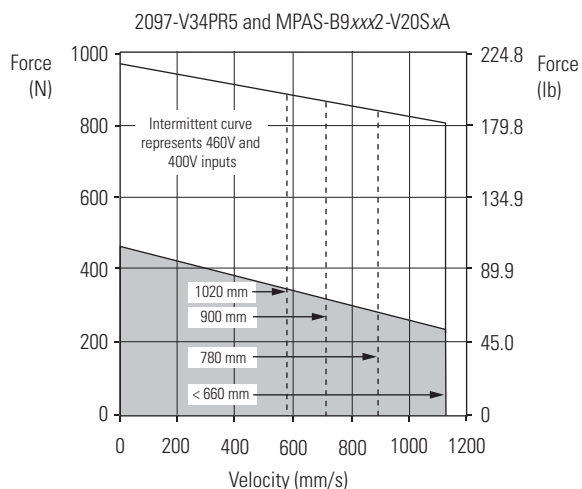
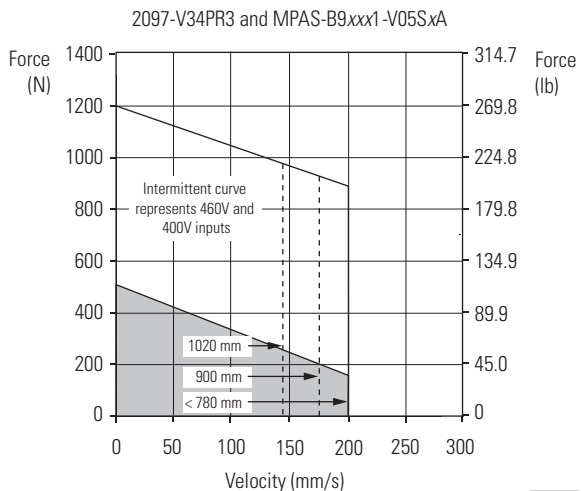
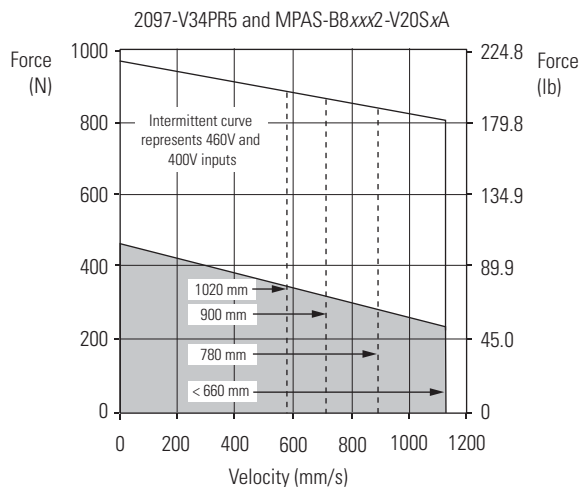
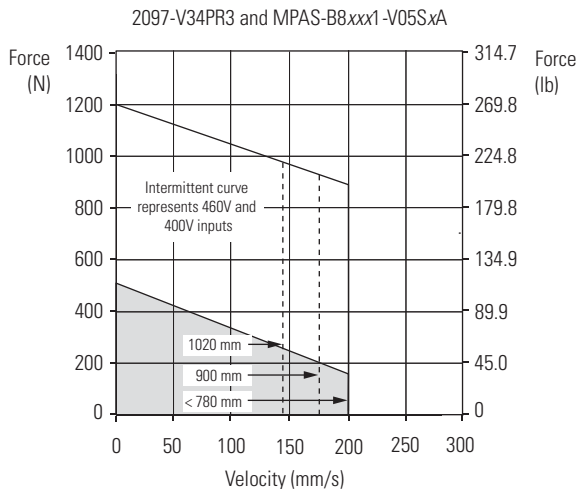
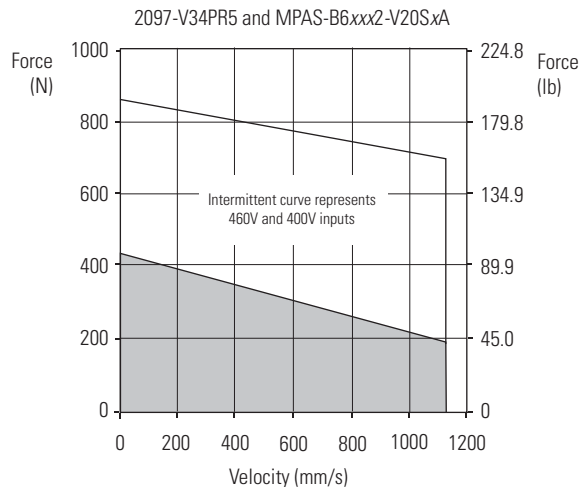
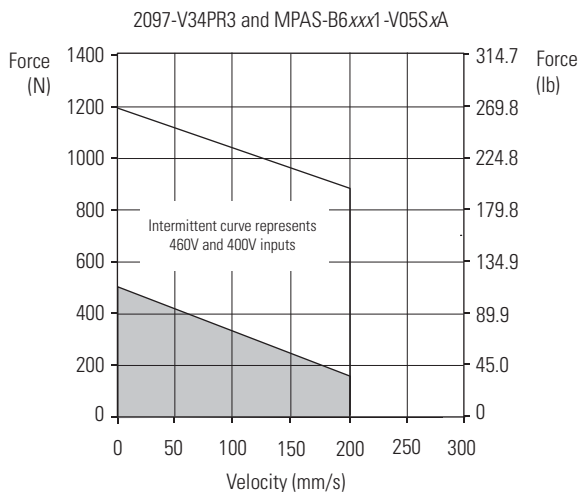
Linear Stage	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Stage Rated Output kW	Kinetix 300 480V Drives
MPAS-Bxxxx1-V05SxA	200 (7.9) ⁽¹⁾	1.75	521 (117)	3.50	1212 (272)	0.138	2097-V34PR3
MPAS-Bxxxx2-V20SxA	1124 (44.3) ⁽²⁾	3.30	462 (104)	6.60	968 (218)	0.52	2097-V34PR5

(1) For 900 mm stroke length, maximum speed is 176 mm/s (6.9 in./s). For 1020 mm stroke length, maximum speed is 143 mm/s (5.6 in./s).

(2) For 780 mm stroke length, maximum speed is 889 mm/s (35.0 in./s). For 900 mm stroke length, maximum speed is 715 mm/s (28.2 in./s). For 1020 mm stroke length, maximum speed is 582 mm/s (22.9 in./s).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 (480V) Drives/MP-Series Integrated Linear Stage Curves



- = Intermittent operating region
- = Continuous operating region
- = System operation for specified stroke length

Kinetix 300 Drives with MP-Series Electric Cylinders

This section provides system combination information for the Kinetix 300 drives when matched with MP-Series electric cylinders. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Electric Cylinder Cable Combinations

Electric Cylinder	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAR-A/B1 _{xxx} B MPAR-A/B1 _{xxx} E MPAR-A/B2 _{xxx} C MPAR-A/B2 _{xxx} F	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
MPAR-A/B3 _{xxx} E MPAR-A/B3 _{xxx} H	2090-XXNPMF-16S _{xx} ⁽⁴⁾	2090-XXNFMF-S _{xx} ⁽⁵⁾ Absolute High-resolution Feedback

(1) Use low-profile connector kit (2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16S_{xx}) or continuous-flex (catalog number 2090-CPxM4DF-16AF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM4DF-CDAF_{xx}).

(4) These cables are available as standard (catalog number 2090-XXNPMF-16S_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-16AF_{xx}).

(5) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length *xx* is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Electric Cylinder Performance Specifications with Kinetix 300 Drives

Performance Specifications with Kinetix 300 (240V) Drives

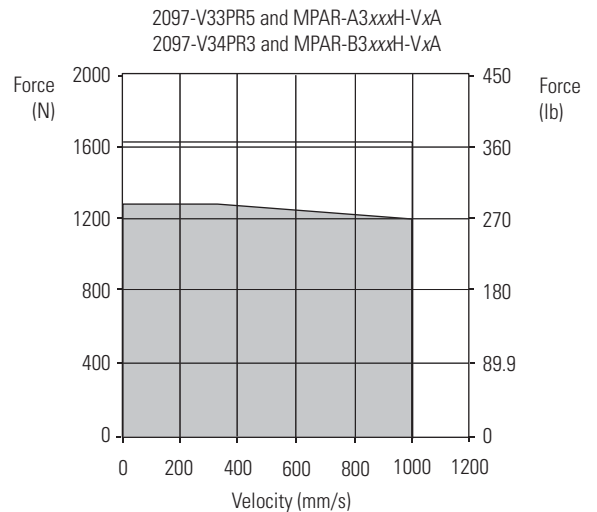
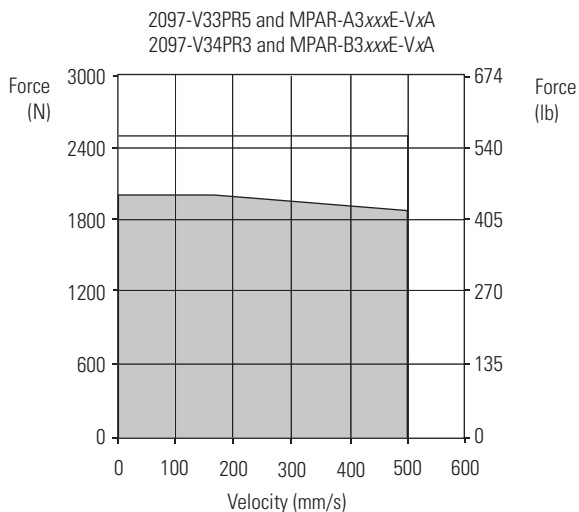
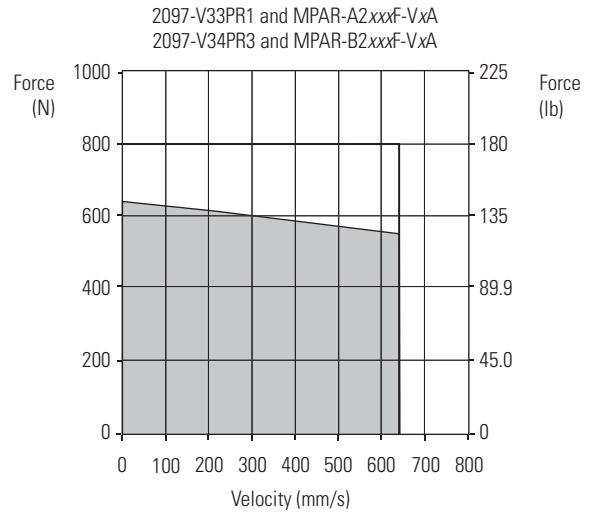
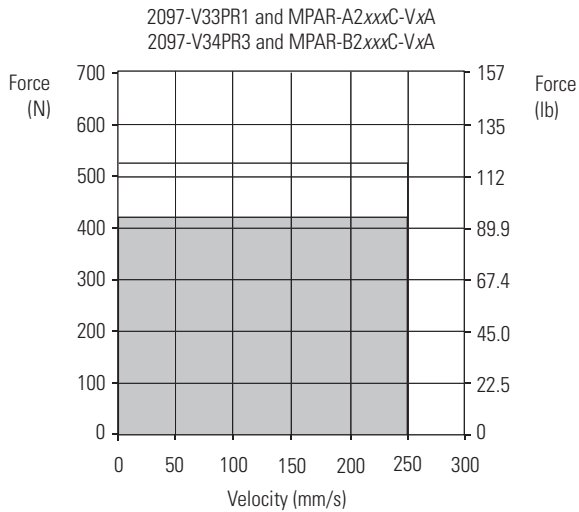
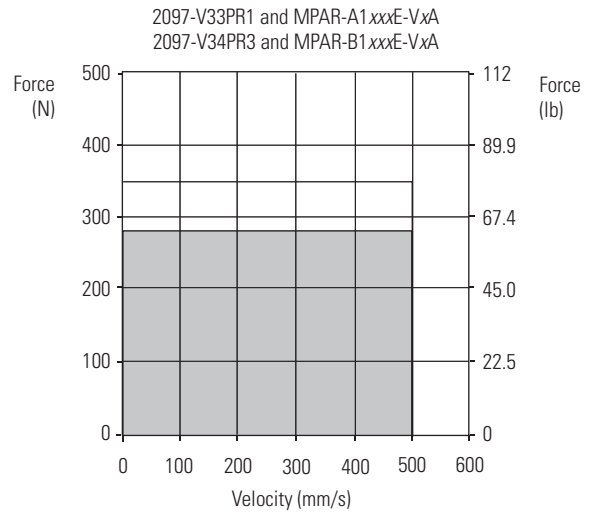
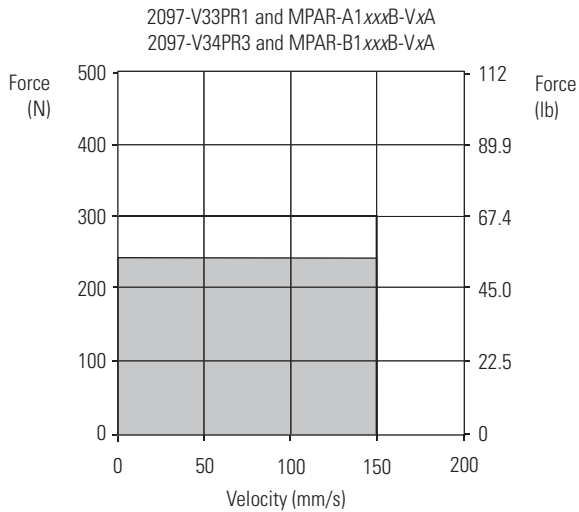
Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 300 Drives
MPAR-A1 _{xxx} B	150	1.15	240 (53.9)	1.35	300 (67.4)	0.036	2097-V33PR1
MPAR-A1 _{xxx} E	500	2.16	280 (62.9)	2.48	350 (78.7)	0.140	
MPAR-A2 _{xxx} C	250	2.42	420 (94.4)	2.72	525 (118)	0.105	
MPAR-A2 _{xxx} F	640	4.54	640 (144)	5.41	800 (180)	0.410	
MPAR-A3 _{xxx} E	500	10.33	2000 (450)	12.34	2500 (562)	1.00	2097-V33PR5
MPAR-A3 _{xxx} H	1000	12.20	1300 (292)	16.40	1625 (365)	1.30	

Performance Specifications with Kinetix 300 (480V) Drives

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 300 Drives
MPAR-B1 _{xxx} B	150	1.15	240 (53.9)	1.35	300 (67.4)	0.036	2097-V34PR3
MPAR-B1 _{xxx} E	500	1.49	280 (62.9)	1.71	350 (78.7)	0.140	
MPAR-B2 _{xxx} C	250	1.67	420 (94.4)	1.90	525 (118)	0.105	
MPAR-B2 _{xxx} F	640	3.29	640 (144)	3.93	800 (180)	0.410	
MPAR-B3 _{xxx} E	500	5.16	2000 (450)	6.17	2500 (562)	1.00	
MPAR-B3 _{xxx} H	1000	6.13	1300 (292)	6.79	1625 (365)	1.30	

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 Drives/MP-Series Electric Cylinder Curves



= Intermittent operating region
 = Continuous operating region

Kinetix 300 Drives/MP-Series Heavy Duty Electric Cylinders

This section provides system combination information for the Kinetix 300 drives when matched with MP-Series heavy-duty electric cylinders. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Electric Cylinder Cable Combinations

Electric Cylinder	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAI-A/B3xxxC MPAI-A/B3xxxE MPAI-A/B3xxxR MPAI-A/B3xxxS	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPAI-A/B4xxxC MPAI-A/B4xxxE MPAI-A/B4xxxR MPAI-A/B4xxxS		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM7DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Electric Cylinder Performance Specifications with Kinetix 300 (240V) Drives

Performance Specifications with Ball Screw Electric Cylinders

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 300 240V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-A3xxxC	279 (11)	5.61	4003 (900)	3176 (714)	8.40	4448 (1000)	0.39	2097-V33PR3
MPAI-A3xxxE	559 (22)		2002 (450)	1588 (357)	14.14	4003 (900)		
MPAI-A4xxxC	279 (11)	10.89	7784 (1750)	6179 (1389)	17.07	8896 (2000)	0.43	2097-V33PR5
MPAI-A4xxxE	559 (22)		3892 (875)	3092 (695)	27.44	7784 (1750)		

Performance Specifications with Roller Screw Electric Cylinders

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 300 240V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-A3xxxR	279 (11)	5.61	3781 (850)	3003 (675)	14.14	7562 (1700)	0.39	2097-V33PR3
MPAI-A3xxxS	559 (22)		1891 (425)	1499 (337)		3781 (850)		
MPAI-A4xxxR	279 (11)	10.89	7340 (1650)	5827 (1310)	27.44	14,679 (3300)	0.43	2097-V33PR5
MPAI-A4xxxS	559 (22)		3670 (825)	2914 (655)		7340 (1650)		

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.8 or later.

Electric Cylinder Performance Specifications with Kinetix 300 (480V) Drives

Performance Specifications with Ball Screw Electric Cylinders

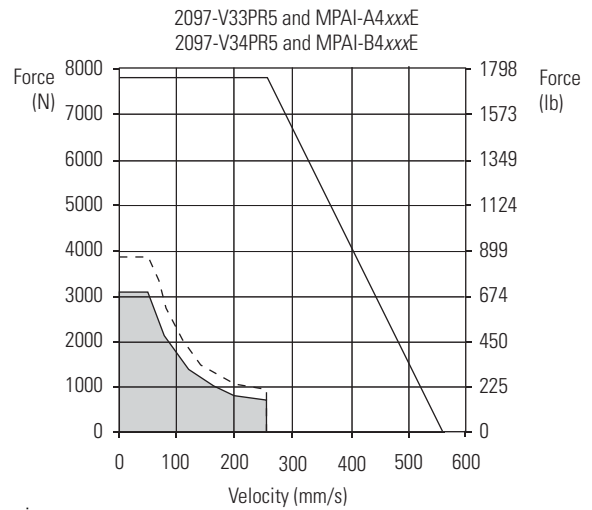
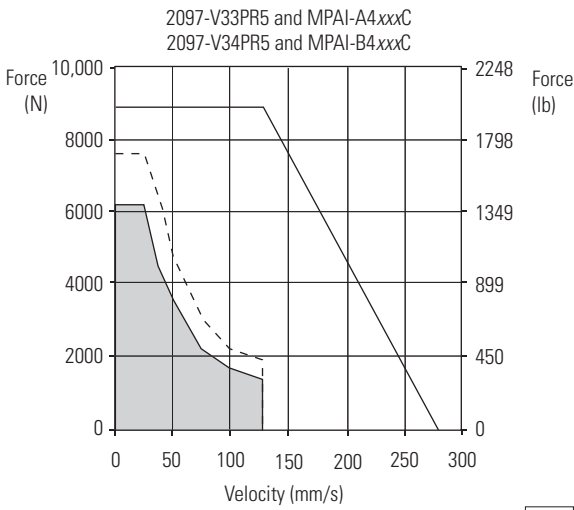
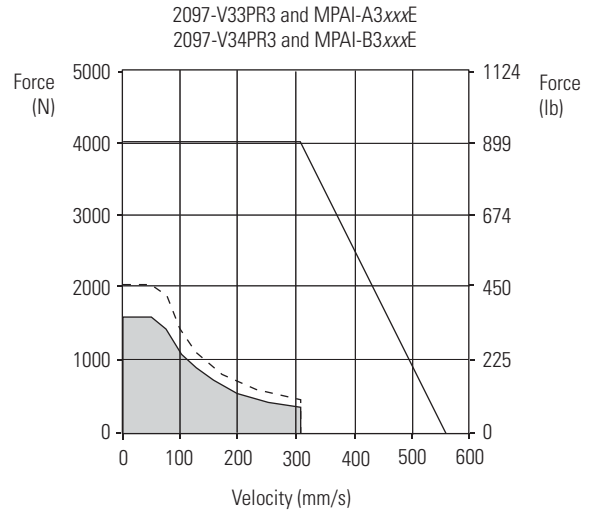
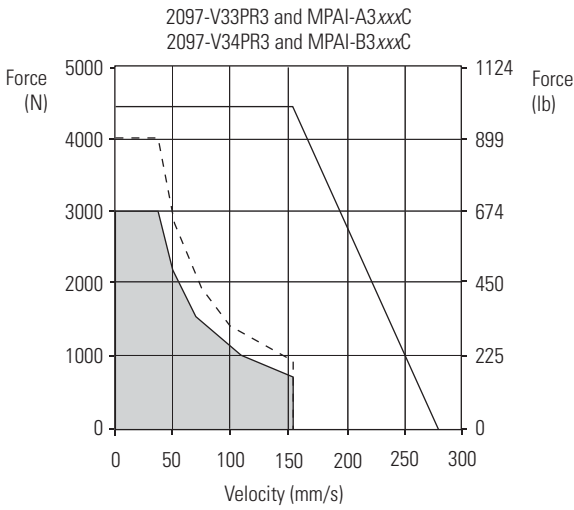
Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 300 480V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-B3xxxC	279 (11)	2.81	4003 (900)	3176 (714)	4.30	4448 (1000)	0.39	2097-V34PR3
MPAI-B3xxxE	559 (22)		2002 (450)	1588 (357)	7.07	4003 (900)		
MPAI-B4xxxC	279 (11)	5.61	7784 (1750)	6179 (1389)	8.68	8896 (2000)	0.43	2097-V34PR5
MPAI-B4xxxE	559 (22)		3892 (875)	3092 (695)	14.14	7784 (1750)		

Performance Specifications with Roller Screw Electric Cylinders

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 300 480V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-B3xxxR	279 (11)	2.81	3781 (850)	3003 (675)	7.07	7562 (1700)	0.39	2097-V34PR3
MPAI-B3xxxS	559 (22)		1891 (425)	1499 (337)		3781 (850)		
MPAI-B4xxxR	279 (11)	5.61	7340 (1650)	5827 (1310)	14.14	14,679 (3300)	0.43	2097-V34PR5
MPAI-B4xxxS	559 (22)		3670 (825)	2914 (655)		7340 (1650)		

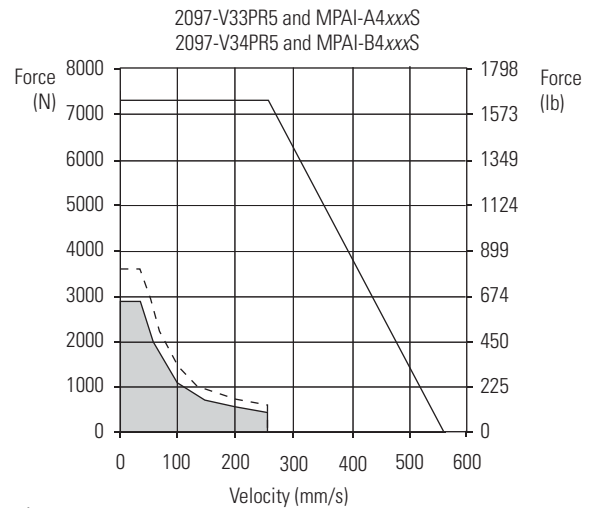
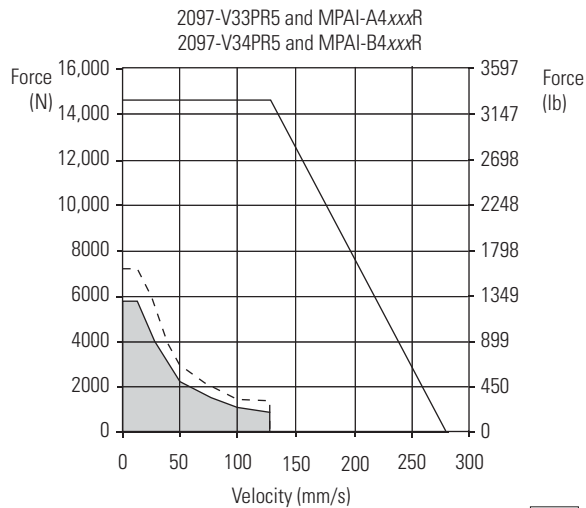
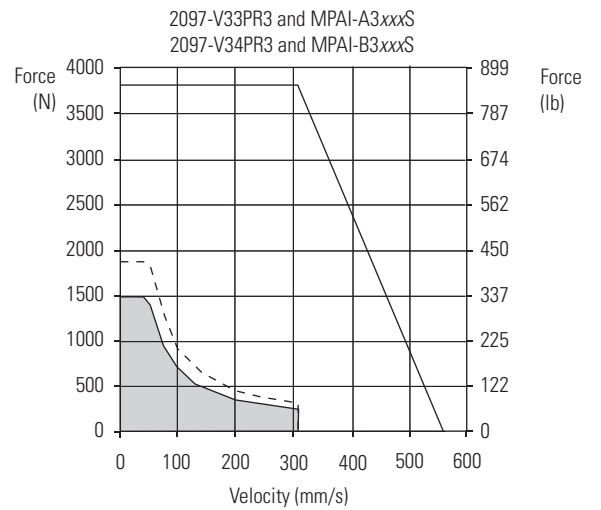
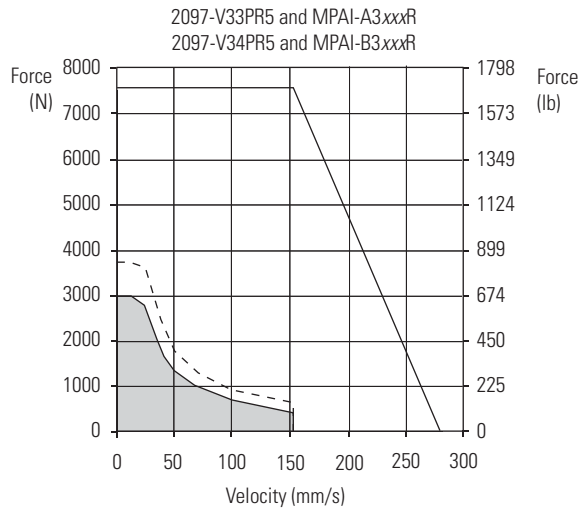
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.8 or later.

Kinetix 300 Drives/MP-Series Heavy Duty (ball screw) Electric Cylinder Curves



= Intermittent operating region
 = Continuous operating region @ 25 °C (77 °F)
 = Continuous operating region @ 40 °C (104 °F)

Kinetix 300 Drives/MP-Series Heavy Duty (roller screw) Electric Cylinder Curves



= Intermittent operating region
 = Continuous operating region @ 25 °C (77 °F)
 = Continuous operating region @ 40 °C (104 °F)

Kinetix 300 (240V) Drives with TL-Series Electric Cylinders

This section provides system combination information for the Kinetix 300 drives when matched with TL-Series electric cylinders. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Electric Cylinder Cable Combinations

Electric Cylinder	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
TLAR-A1xxxB TLAR-A1xxxE	2090-CPWM6DF-16AAxx (standard) (without brake)	2090-CFBM6DF-CBAAxx (standard) Absolute High-resolution Feedback
TLAR-A2xxxC TLAR-A2xxxF	2090-CPBM6DF-16AAxx (standard) (with brake)	
TLAR-A3xxxE TLAR-A3xxxH		

(1) The TLY-Axxxx-B motors with 17-bit high-resolution encoder feedback (mounted to the electric cylinder) require the 2090-CFBM6DF-CBAAxx flying-lead feedback cable and 2090-K2CK-D15M connector kit with 2090-DA-BAT2 battery. Refer to Breakout Components and Connector Kits beginning on [page 418](#) for more information.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Electric Cylinder (non-brake) Performance Specifications with Kinetix 300 Drives

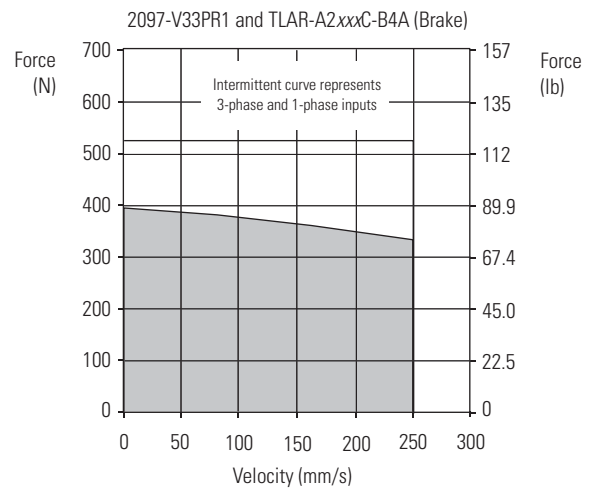
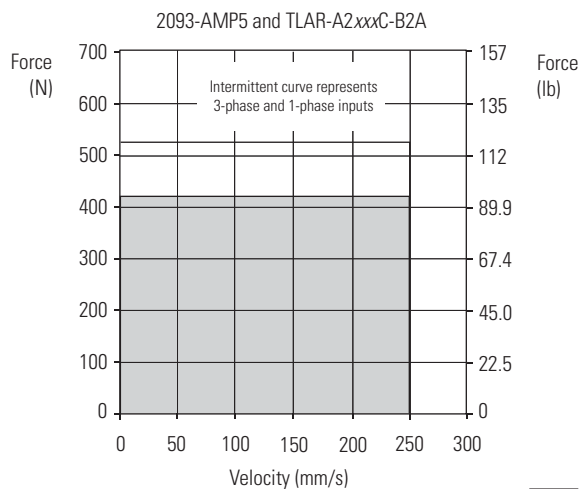
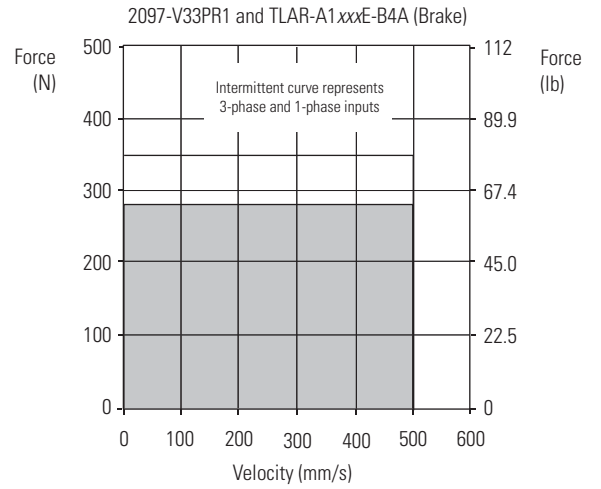
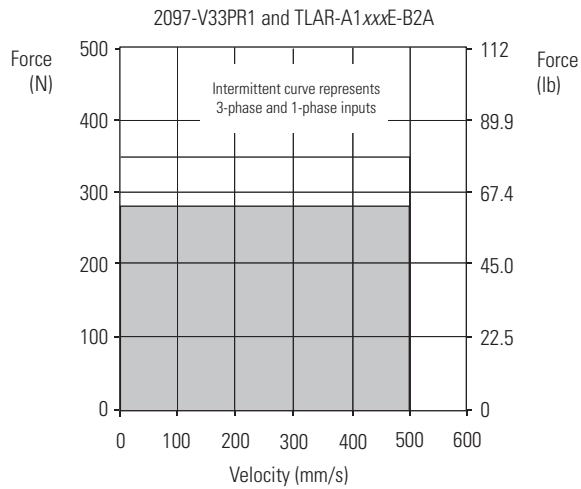
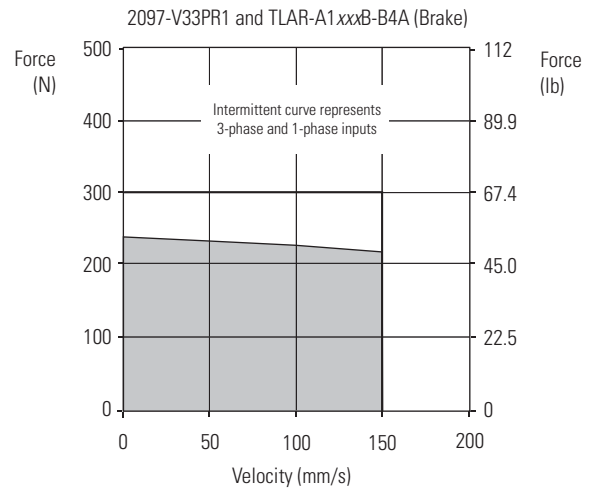
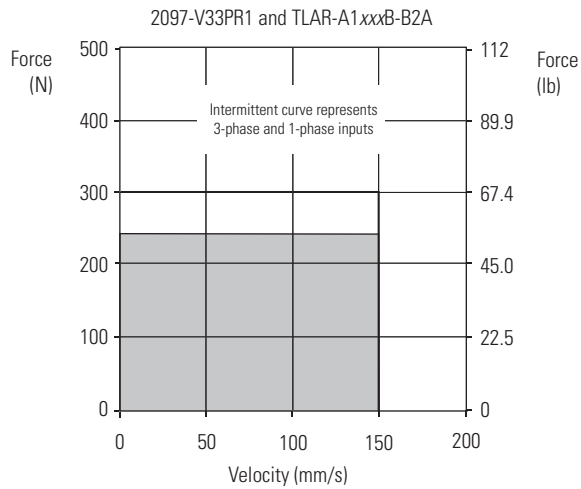
Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 300 230V Drives
TLAR-A1xxxB	150	1.36	240 (53.9)	1.79	300 (67.4)	0.036	2097-V33PR1
TLAR-A1xxxE	500	2.59	280 (62.9)	3.03	350 (78.7)	0.140	
TLAR-A2xxxC	250	3.03	420 (94.4)	3.41	525 (118)	0.105	
TLAR-A2xxxF	640	5.50	640 (144)	7.25	800 (180)	0.350	
TLAR-A3xxxE	500	10.0	2000 (450)	12.9	2500 (562)	0.930	2097-V33PR5
TLAR-A3xxxH	1000		1300 (292)	17.2	1625 (365)		

Electric Cylinder (brake) Performance Specifications with Kinetix 300 Drives

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 300 230V Drives
TLAR-A1xxxB	150	1.18	240 (53.9)	1.79	300 (67.4)	0.036	2097-V33PR1
TLAR-A1xxxE	500	2.24	280 (62.9)	3.03	350 (78.7)	0.140	
TLAR-A2xxxC	250	2.68	420 (94.4)	3.41	525 (118)	0.105	
TLAR-A2xxxF	640	4.95	640 (144)	7.25	800 (180)	0.350	
TLAR-A3xxxE	500	10.0	2000 (450)	12.9	2500 (562)	0.930	2097-V33PR5
TLAR-A3xxxH	1000		1300 (292)	17.2	1625 (365)		

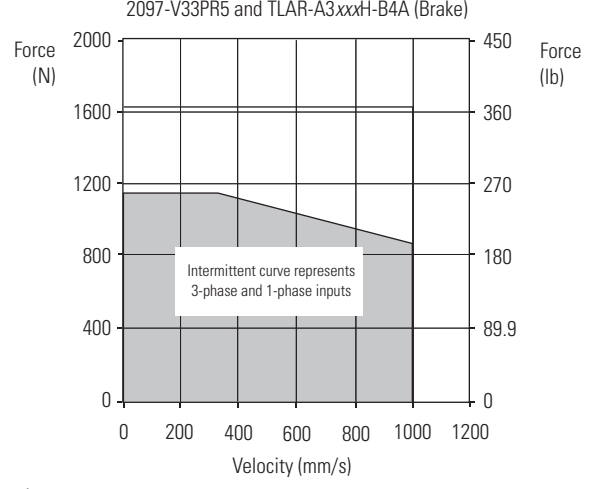
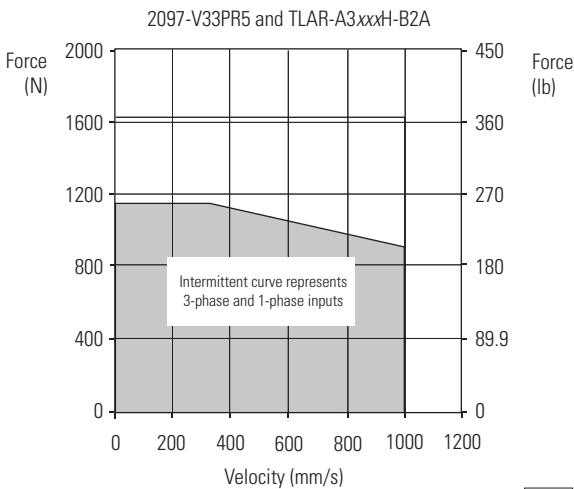
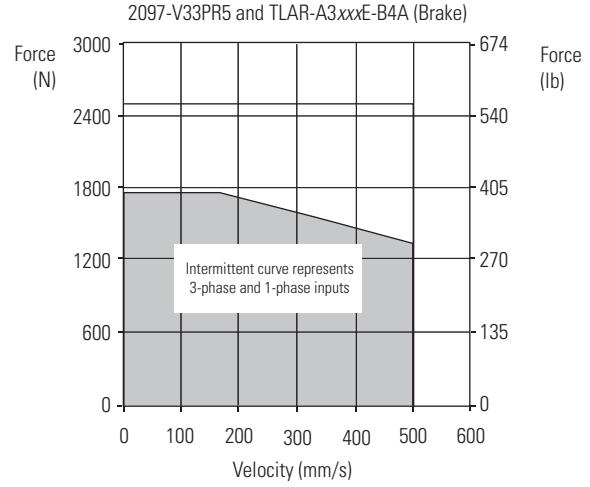
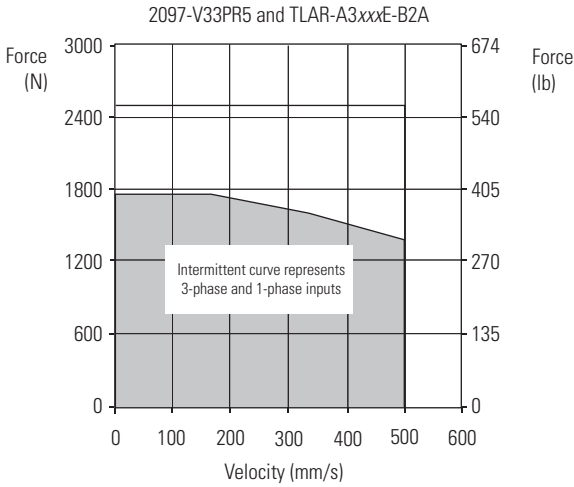
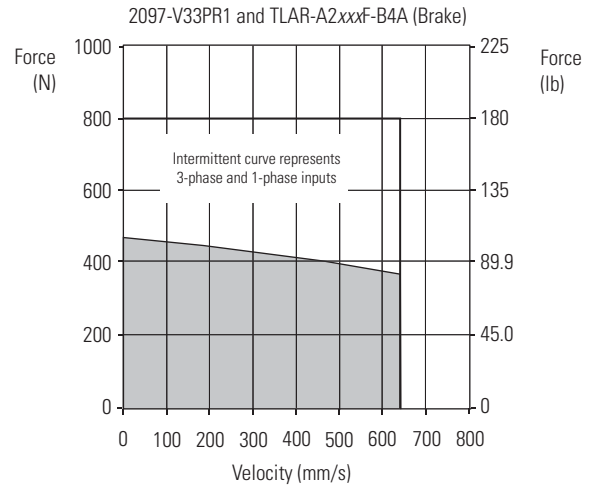
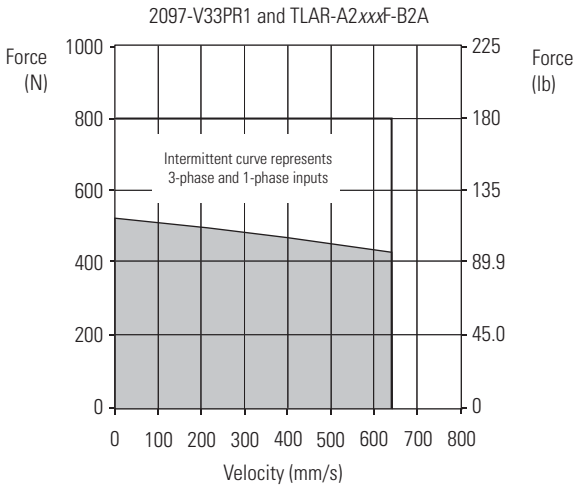
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 40 °C (104 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 300 (240V) Drives/TL-Series Electric Cylinder Curves



= Intermittent operating region
 = Continuous operating region

Kinetix 300 (240V) Drives/TL-Series Electric Cylinder Curves, Continued



= Intermittent operating region
 = Continuous operating region

Kinetix 6000 Drive Performance Example with Peak Enhancement Feature

The peak current ratings of the Kinetix 6000 AM modules (series A and B) are configured at the factory as 150% of continuous current. You can program 460V (series B) AM modules and the equivalent IAM (inverter) modules, for up to 250% of continuous inverter current. Refer to Peak Enhancement Specifications on [page 272](#) for more information.

IMPORTANT

Before your Kinetix 6000 drive will deliver 250% peak performance, you must enable the peak enhancement feature by configuring your drive by using DriveExplorer or RSLogix 5000 software.

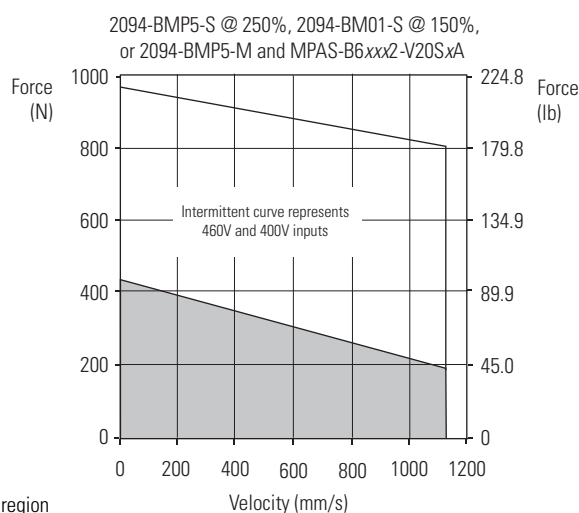
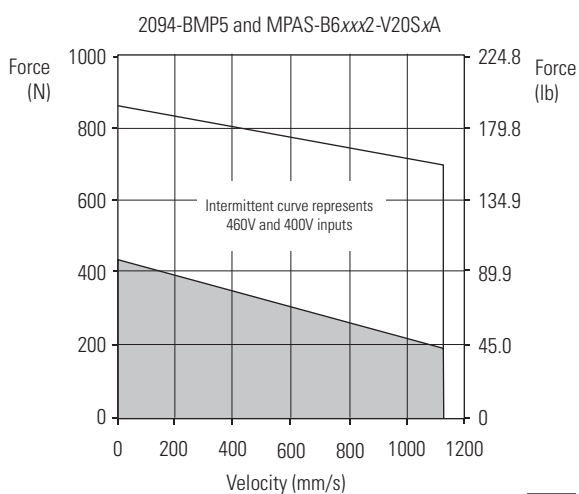
Refer to the interactive Peak Enhancement Configuration Utility to recalculate torque and accel/decel limit values, and paste them into the appropriate Axis Properties dialog box in RSLogix 5000 software. To download the utility, go to <http://www.ab.com/motion/software/peak.html>.

For sizing your drive/motor combination by using series-B drives and the peak enhancement feature, use Motion Analyzer software, version 4.6 or later.

In this example, the MPAS-Bxxxx2-V20SxA linear stage, usually paired with the 2094-BM01 (series A) AM module, is shown paired with the 2094-BMP5-S (series B) AM module. The two curves illustrate how the 2094-BMP5-S (series B) drive, when configured for 250% peak, can achieve full performance.

Linear Stage Performance Specifications Example with Kinetix 6000 Drives

Linear Stage	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Stage Rated Output kW	Kinetix 6000 460V Drives
MPAS-Bxxxx2-V20SxA	1124 (44.3)	3.30	462 (104)	5.90	865 (194)	0.52	2094-BMP5-S @ 150%
				6.60	968 (218)		2094-BMP5-S @ 250%
							2094-BM01-S @ 150%



- = Intermittent operating region
- = Continuous operating region
- = System operation for specified stroke length

Kinetix 6000 (230V) Drives with MP-Series Integrated Linear Stages

This section provides system combination information for the Kinetix 6000 (230V) drives when matched with MP-Series (230V) integrated direct-drive or ballscrew linear stages. Included are motor power and feedback cable catalog numbers, system performance specifications, and force/velocity curves.

Linear Stage Cable Combinations

Linear Stage	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAS-Axxxx1-V05SxA, MPAS-Axxxx2-V20SxA	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPAS-A6xxxB-ALMx2C, MPAS-A8xxxE-ALMx2C, MPAS-A9xxxK-ALMx2C		2090-XXNFMF-Sxx ⁽¹⁾ Incremental Feedback

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Linear Stage Performance Specifications with Kinetix 6000 (230V) Drives

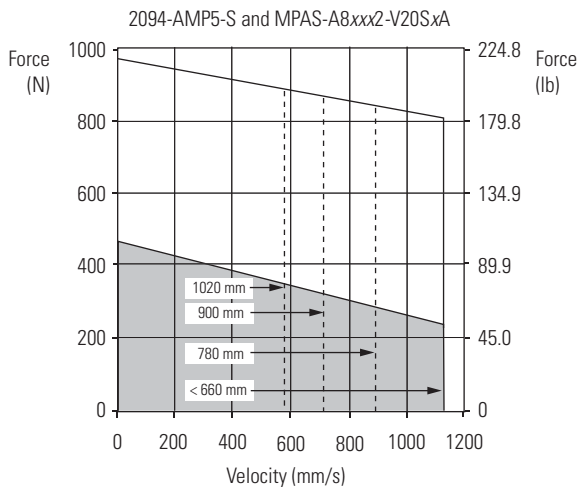
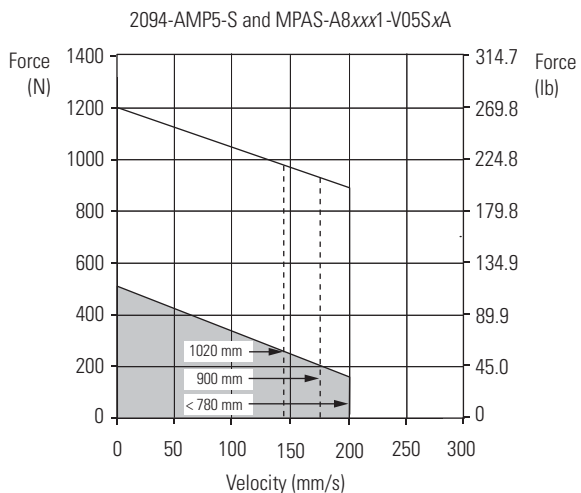
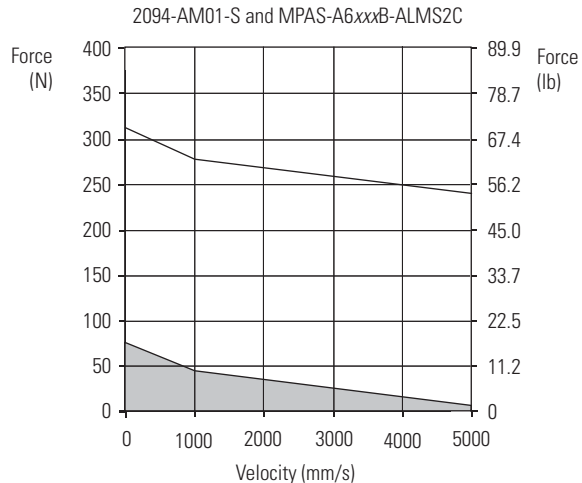
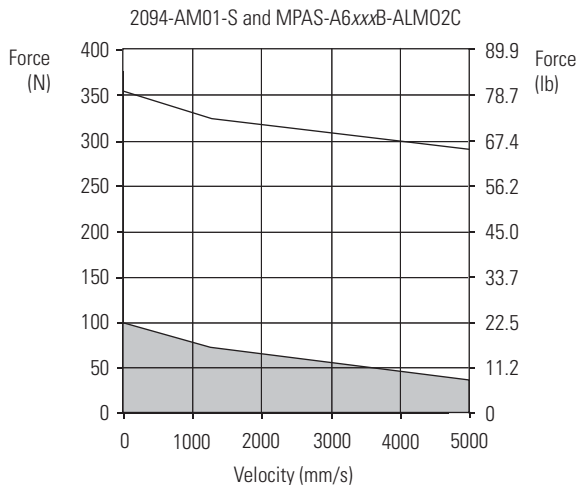
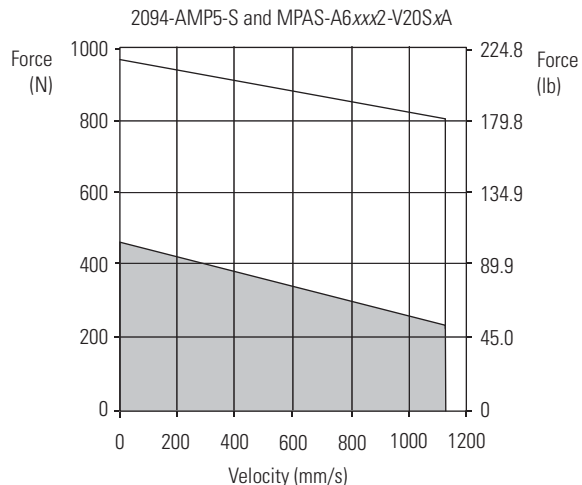
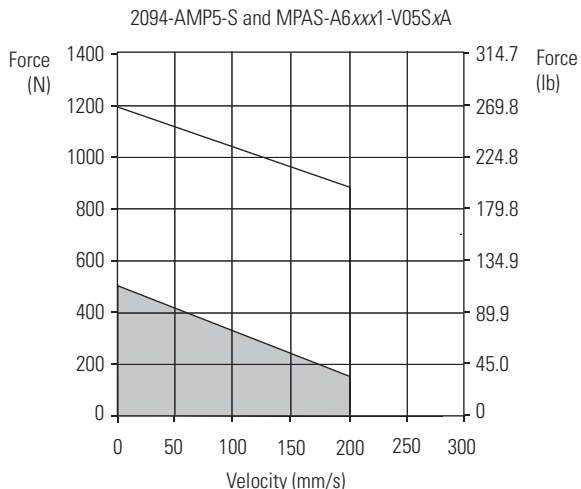
Linear Stage	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Stage Rated Output kW	Kinetix 6000 230V Drives
MPAS-Axxxx1-V05SxA	200 (7.9) ¹	3.09	521 (117)	6.10	1212 (272)	0.37	2094-AMP5-S
MPAS-Axxxx2-V20SxA	1124 (44.3) ²	4.54	462 (104)	9.10	968 (218)	0.62	2094-AMP5-S
MPAS-A6xxxB-ALM02C	5000 (200)	5.2	103 (23.2)	10.5	231 (51.9)	0.32	2094-AMP5-S
		5.3	105 (23.6)	15.8	359 (80.7)		2094-AM01-S
MPAS-A6xxxB-ALMS2C	5000 (200)	4.7	83.0 (18.7)	10.5	222 (49.9)	0.29	2094-AMP5-S
				14.2	312 (70.1)		2094-AM01-S
MPAS-A8xxxE-ALM02C	5000 (200)	5.2	136 (30.6)	10.5	249 (56.0)	0.53	2094-AMP5-S
				17.0	417 (93.7)		2094-AM01-S
				18.5	456 (103)		2094-AM02-S
MPAS-A8xxxE-ALMS2C	5000 (200)	5.2	127 (28.5)	10.5	240 (53.9)	0.48	2094-AMP5-S
				6.3	159 (35.7)		16.7
MPAS-A9xxxK-ALM02C	5000 (200)	5.2	218 (49.0)	10.5	381 (85.6)	0.77	2094-AMP5-S
				17.0	630 (142)		2094-AM01-S
				18.3	680 (153)		2094-AM02-S
MPAS-A9xxxK-ALMS2C	5000 (200)	5.2	206 (46.3)	10.5	372 (83.6)	0.69	2094-AMP5-S
				6.1	245 (55.1)		16.5

¹ For 900 mm stroke length, maximum speed is 176 mm/s (6.9 in./s). For 1020 mm stroke length, maximum speed is 143 mm/s (5.6 in./s).

² For 780 mm stroke length, maximum speed is 889 mm/s (35.0 in./s). For 900 mm stroke length, maximum speed is 715 mm/s (28.2 in./s). For 1020 mm stroke length, maximum speed is 582 mm/s (22.9 in./s).

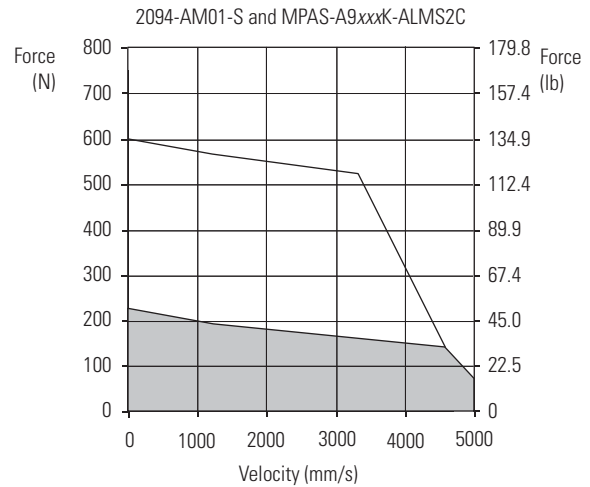
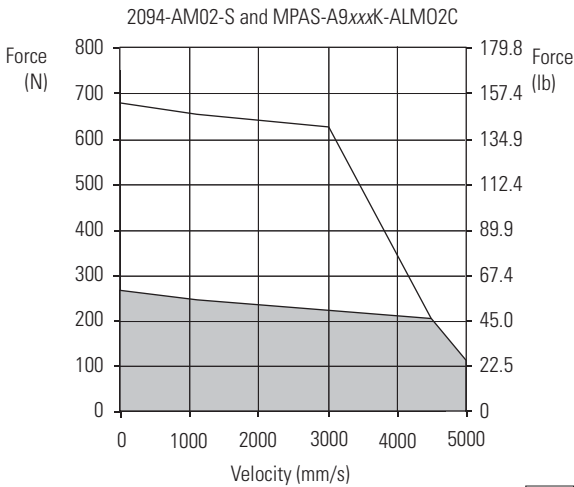
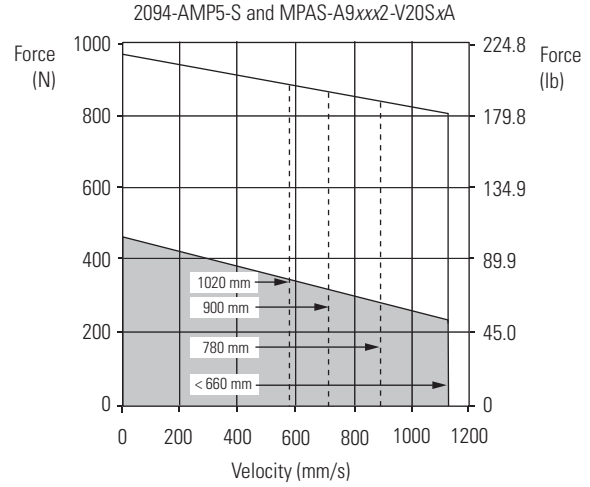
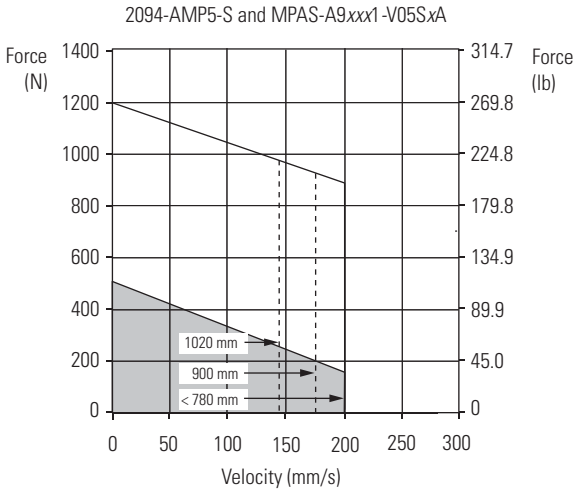
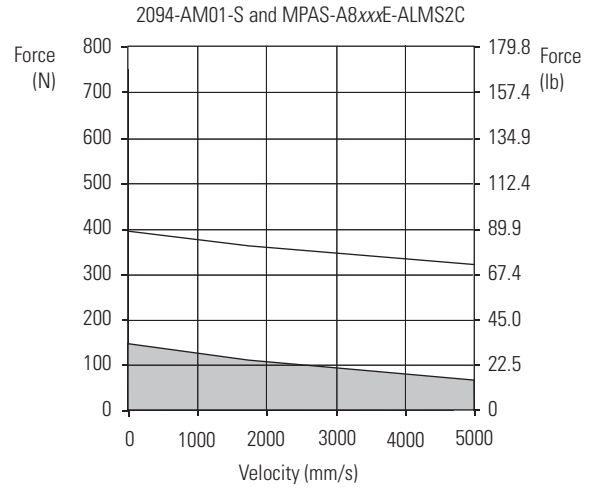
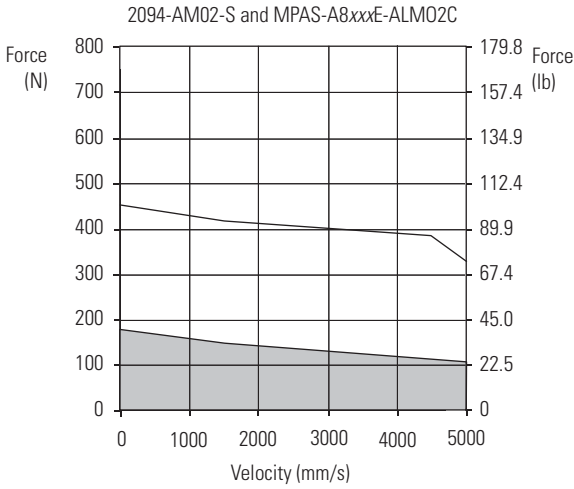
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 (230V) Drives/MP-Series Integrated Linear Stage Curves



- = Intermittent operating region
- = Continuous operating region
- = System operation for specified stroke length

Kinetix 6000 (230V) Drives/MP-Series Integrated Linear Stage Curves, Continued



= Intermittent operating region
 = Continuous operating region
 = System operation for specified stroke length

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives with MP-Series Linear Stages

This section provides system combination information for the Kinetix 6000 and Kinetix 6200/6500 (460V) drives when matched with MP-Series (460V) integrated direct-drive or ballscrew linear stages. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

IMPORTANT

When using Kinetix 6000 (series B) drives, configured for 250% peak performance, you can usually achieve full actuator performance with a smaller drive. The drive/actuator performance specifications table reflects the standard 150% peak current rating and the peak-enhanced rating for the series B drive. The force/velocity curves include the smallest drive that provides full actuator performance.

Refer to Kinetix 6000 Drive Performance Example with Peak Enhancement Feature on [page 653](#) for more information about using the peak enhancement feature.

Linear Stage Cable Combinations

Linear Stage	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAS-Bxxxx1-V05SxA	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPAS-Bxxxx2-V20SxA		
MPAS-B8xxx-ALMx2C MPAS-B9xxx-ALMx2C		2090-XXNFMF-Sxx ⁽³⁾ Incremental Feedback

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Linear Stage Performance Specifications with Kinetix 6200/Kinetix 6500 (460V) Drives

Linear Stage	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Stage Rated Output kW	Kinetix 6200/ Kinetix 6500 460V Drives
MPAS-Bxxxx1-V05SxA	200 (7.9) ⁽¹⁾	1.75	521 (117)	3.50	1212 (272)	0.138	2094-BMP5-M
MPAS-Bxxxx2-V20SxA	1124 (44.3) ⁽²⁾	3.30	462 (104)	6.60	968 (218)	0.52	2094-BMP5-M
MPAS-B8xxxF-ALM02C	5000 (200)	3.50	189 (42.5)	9.30	456 (103)	0.527	2094-BMP5-M
MPAS-B8xxxF-ALMS2C	5000 (200)	3.15	159 (35.7)	8.37	399 (89.7)	0.475	2094-BMP5-M
MPAS-B9xxxL-ALM02C	5000 (200)	3.40	285 (64.1)	9.10	680 (153)	0.768	2094-BMP5-M
MPAS-B9xxxL-ALMS2C	5000 (200)	3.03	245 (55.1)	8.19	601 (135)	0.69	2094-BMP5-M

(1) For 900 mm stroke length, maximum speed is 176 mm/s (6.9 in./s). For 1020 mm stroke length, maximum speed is 143 mm/s (5.6 in./s).

(2) For 780 mm stroke length, maximum speed is 889 mm/s (35.0 in./s). For 900 mm stroke length, maximum speed is 715 mm/s (28.2 in./s). For 1020 mm stroke length, maximum speed is 582 mm/s (22.9 in./s).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Linear Stage Performance Specifications with Kinetix 6000 (460V) Drives

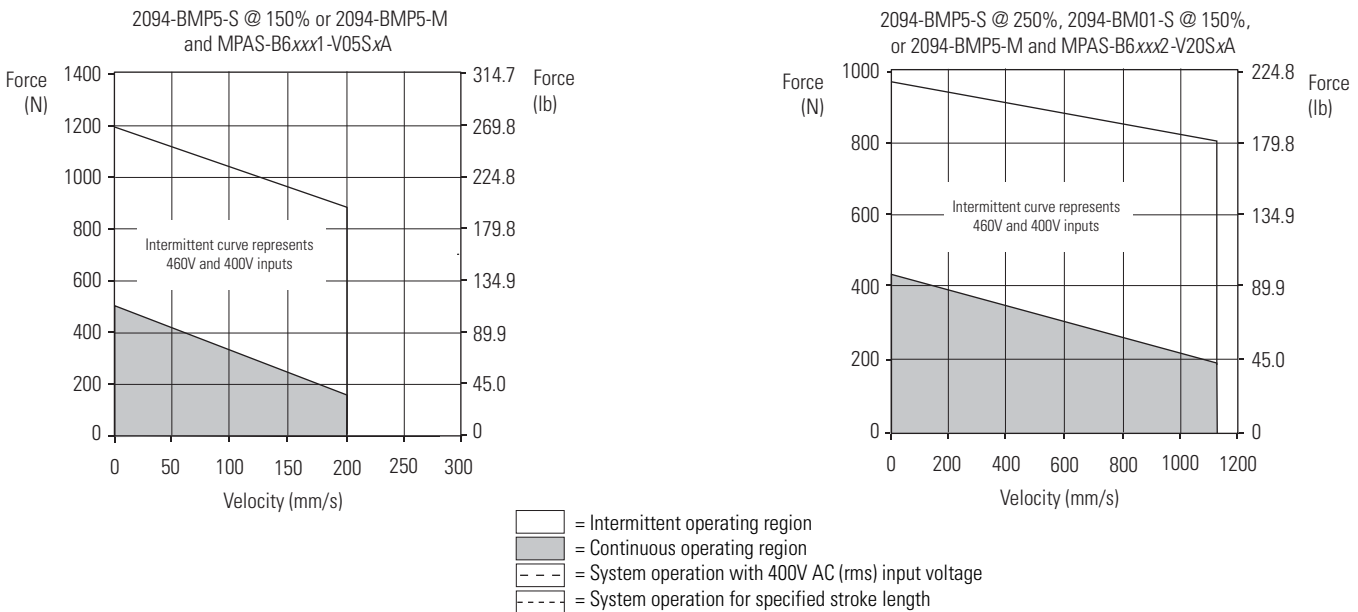
Linear Stage	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Stage Rated Output kW	Kinetix 6000 460V Drives
MPAS-B6xxx1-V05SxA	200 (7.9) ⁽¹⁾	1.75	521 (117)	3.50	1212 (272)	0.138	2094-BMP5-S @ 150%
MPAS-B6xxx2-V20SxA	1124 (44.3) ⁽²⁾	3.30	462 (104)	5.90	865 (194)	0.52	2094-BMP5-S @ 150%
				6.60	968 (218)		2094-BMP5-S @ 250%
							2094-BM01-S @ 150%
MPAS-B8xxxF-ALMO2C	5000 (200)	3.50	189 (42.5)	5.90	281 (63.2)	0.527	2094-BMP5-S @ 150%
				9.30	456 (103)		2094-BMP5-S @ 250%
							2094-BM01-S @ 150%
MPAS-B8xxxF-ALMS2C	5000 (200)	3.15	159 (35.7)	5.90	272 (61.1)	0.475	2094-BMP5-S @ 150%
				8.37	399 (89.7)		2094-BMP5-S @ 250%
							2094-BM01-S @ 150%
MPAS-B9xxxL-ALMO2C	5000 (200)	3.40	285 (64.1)	5.90	433 (97.3)	0.768	2094-BMP5-S @ 150%
				9.10	680 (153)		2094-BMP5-S @ 250%
							2094-BM01-S @ 150%
MPAS-B9xxxL-ALMS2C	5000 (200)	3.03	245 (55.1)	5.90	424 (95.3)	0.69	2094-BMP5-S @ 150%
				8.19	601 (135)		2094-BMP5-S @ 250%
							2094-BM01-S @ 150%

(1) For 900 mm stroke length, maximum speed is 176 mm/s (6.9 in./s). For 1020 mm stroke length, maximum speed is 143 mm/s (5.6 in./s).

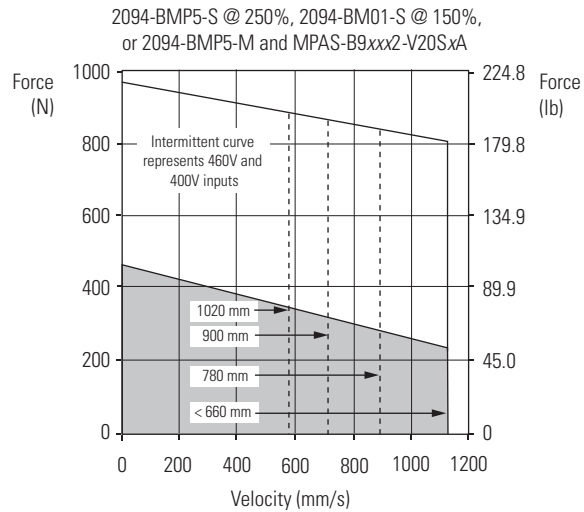
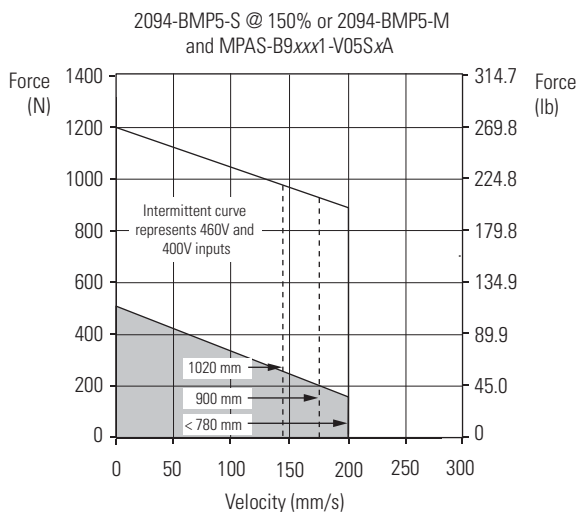
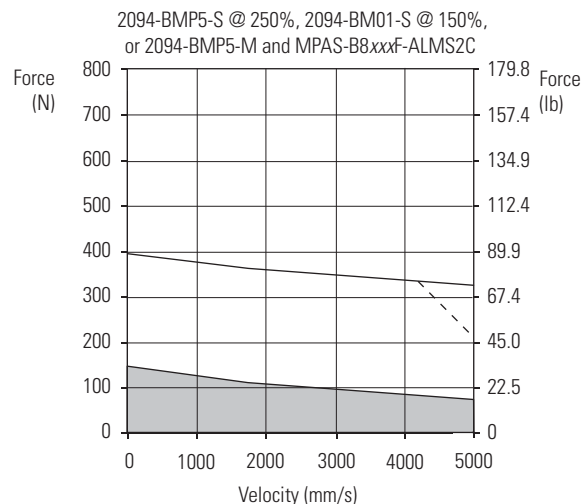
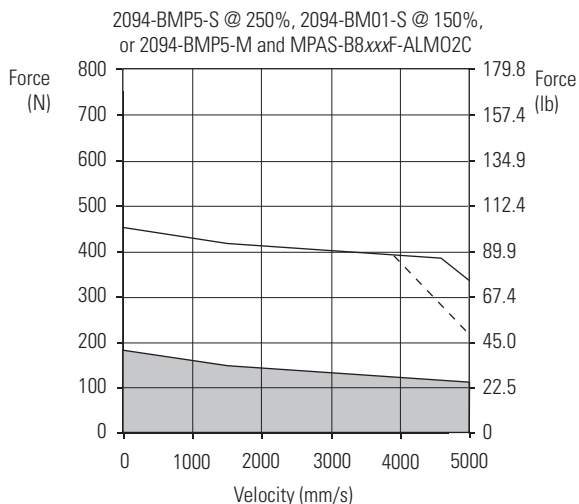
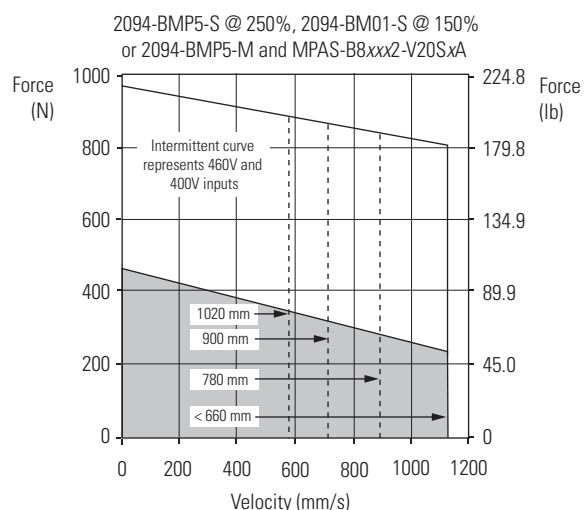
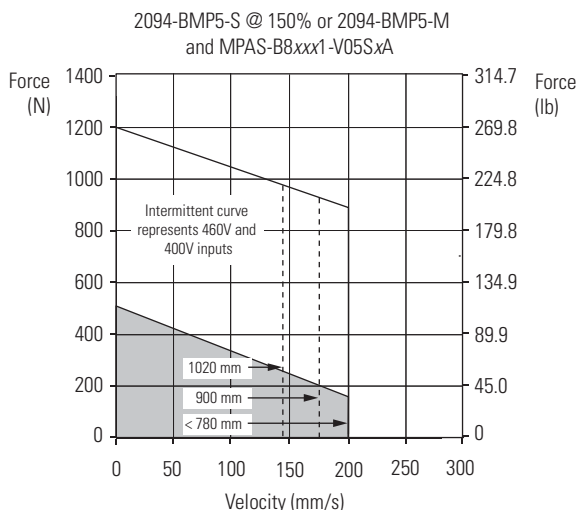
(2) For 780 mm stroke length, maximum speed is 889 mm/s (35.0 in./s). For 900 mm stroke length, maximum speed is 715 mm/s (28.2 in./s). For 1020 mm stroke length, maximum speed is 582 mm/s (22.9 in./s).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/MP-Series Linear Stage Curves

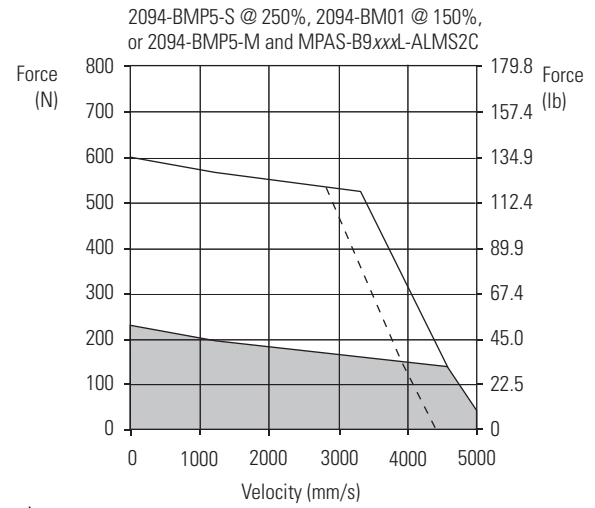
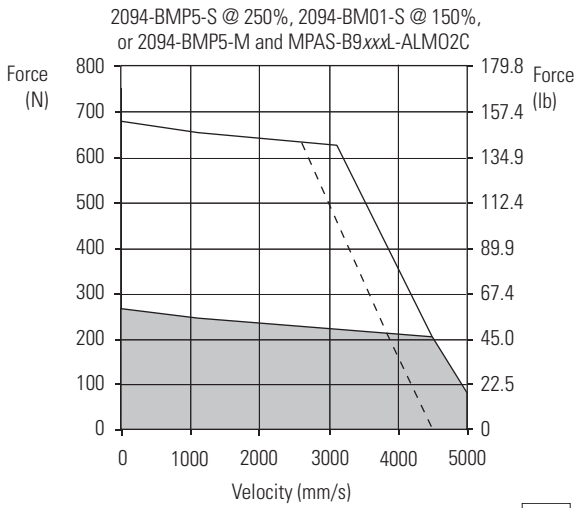


Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/MP-Series Linear Stage Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = System operation with 400V AC (rms) input voltage
- = System operation for specified stroke length

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/MP-Series Linear Stage Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = System operation with 400V AC (rms) input voltage
- = System operation for specified stroke length

Kinetix 6000 and Kinetix 6200/6500 Drives with MP-Series Electric Cylinders

This section provides system combination information for the Kinetix 6000 and Kinetix 6200/6500 drives when matched with MP-Series electric cylinders. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Electric Cylinder Cable Combinations

Electric Cylinder	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAR-A/B1 _{xxx} B MPAR-A/B1 _{xxx} E MPAR-A/B2 _{xxx} C MPAR-A/B2 _{xxx} F	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
MPAR-A/B3 _{xxx} E MPAR-A/B3 _{xxx} H	2090-XXNPMF-16S _{xx} ⁽⁴⁾	2090-XXNFMF-S _{xx} ⁽⁵⁾ Absolute High-resolution Feedback

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16S_{xx}) or continuous-flex (catalog number 2090-CPxM4DF-16AF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM4DF-CDAF_{xx}).

(4) These cables are available as standard (catalog number 2090-XXNPMF-16S_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-16AF_{xx}).

(5) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length *xx* is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Electric Cylinder Performance Specifications with Kinetix 6000 and Kinetix 6200/6500 Drives

Performance Specifications with Kinetix 6200/6500 (460V) Drives

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 6200/ Kinetix 6500 460V Drives
MPAR-B1 _{xxx} B	150	1.15	240 (53.9)	1.35	300 (67.4)	0.036	2094-BMP5-M
MPAR-B1 _{xxx} E	500	1.49	280 (62.9)	1.71	350 (78.7)	0.140	2094-BMP5-M
MPAR-B2 _{xxx} C	250	1.67	420 (94.4)	1.90	525 (118)	0.105	2094-BMP5-M
MPAR-B2 _{xxx} F	640	3.29	640 (144)	3.93	800 (180)	0.410	2094-BMP5-M
MPAR-B3 _{xxx} E	500	5.16	2000 (450)	6.17	2500 (562)	1.00	2094-BMP5-M
MPAR-B3 _{xxx} H	1000	6.13	1300 (292)	6.79	1625 (365)	1.30	2094-BMP5-M

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Performance Specifications with Kinetix 6000 (230V) Drives

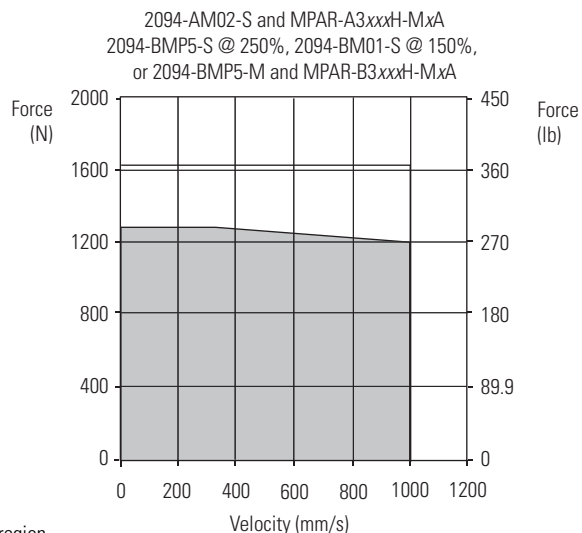
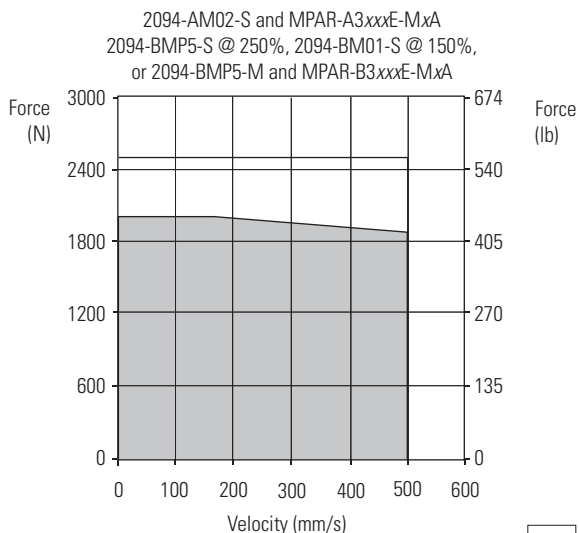
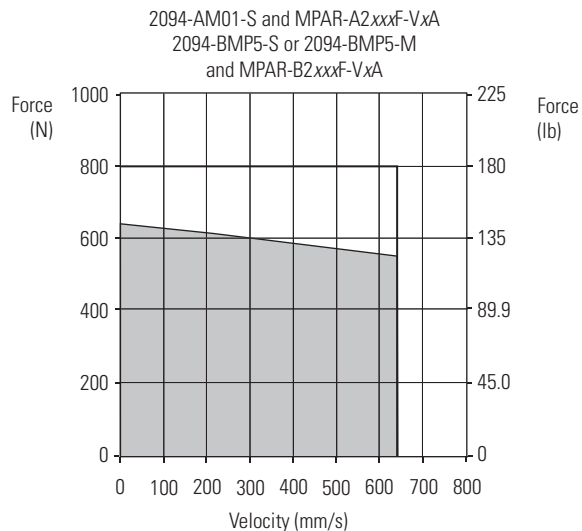
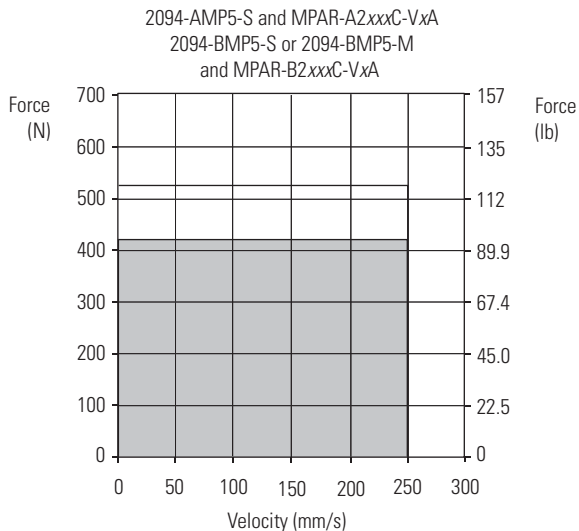
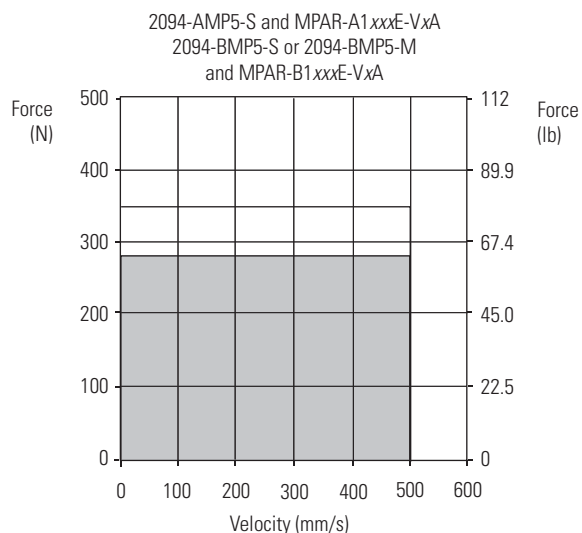
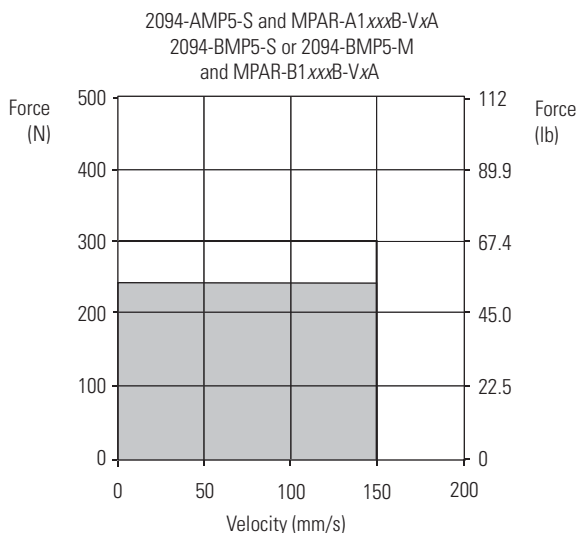
Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 6000 230V Drives
MPAR-A1xxxB	150	1.15	240 (53.9)	1.35	300 (67.4)	0.036	2094-AMP5-S
MPAR-A1xxxE	500	2.16	280 (62.9)	2.48	350 (78.7)	0.140	2094-AMP5-S
MPAR-A2xxxC	250	2.42	420 (94.4)	2.72	525 (118)	0.105	2094-AMP5-S
MPAR-A2xxxF	640	4.54	640 (144)	5.41	800 (180)	0.410	2094-AM01-S
MPAR-A3xxxE	500	10.33	2000 (450)	12.34	2500 (562)	1.00	2094-AM02-S
MPAR-A3xxxH	1000	12.20	1300 (292)	16.40	1625 (365)	1.30	2094-AM02-S

Performance Specifications with Kinetix 6000 (460V) Drives

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 6000 460V Drives
MPAR-B1xxxB	150	1.15	240 (53.9)	1.35	300 (67.4)	0.036	2094-BMP5-S @ 150%
MPAR-B1xxxE	500	1.49	280 (62.9)	1.71	350 (78.7)	0.140	2094-BMP5-S @ 150%
MPAR-B2xxxC	250	1.67	420 (94.4)	1.90	525 (118)	0.105	2094-BMP5-S @ 150%
MPAR-B2xxxF	640	3.29	640 (144)	3.93	800 (180)	0.410	2094-BMP5-S @ 150%
MPAR-B3xxxE	500	5.16	2000 (450)	6.17	2500 (562)	1.00	2094-BMP5-S @ 250%
							2094-BM01-S @ 150%
MPAR-B3xxxH	1000	6.13	1300 (292)	6.79	1625 (365)	1.30	2094-BMP5-S @ 250%
							2094-BM01-S @ 150%

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 and Kinetix 6200/6500 Drives/MP-Series Electric Cylinder Curves



□ = Intermittent operating region
■ = Continuous operating region

Kinetix 6000 and Kinetix 6200/6500 Drives/MP-Series Heavy Duty Electric Cylinders

This section provides system combination information for the Kinetix 6000 and the Kinetix 6200/6500 drives when matched with MP-Series heavy-duty electric cylinders. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Electric Cylinder Cable Combinations

Electric Cylinder	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAI-A/B3xxxC MPAI-A/B3xxxE MPAI-A/B3xxxR MPAI-A/B3xxxS	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPAI-A/B4xxxC MPAI-A/B4xxxE MPAI-A/B4xxxR MPAI-A/B4xxxS		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM7DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Electric Cylinder Performance Specifications with Kinetix 6200/6500 (460V) Drives

Performance Specifications with Ball Screw Electric Cylinders

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 6200/ Kinetix 6500 460V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-B3xxxC	279 (11)	2.81	4003 (900)	3176 (714)	4.30	4448 (1000)	0.39	2094-BMP5-M
MPAI-B3xxxE	559 (22)		2002 (450)	1588 (357)	7.07	4003 (900)		
MPAI-B4xxxC	279 (11)	5.61	7784 (1750)	6179 (1389)	8.68	8896 (2000)	0.43	2094-BM01-M
MPAI-B4xxxE	559 (22)		3892 (875)	3092 (695)	14.14	7784 (1750)		

Performance Specifications with Roller Screw Electric Cylinders

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 6200/ Kinetix 6500 460V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-B3xxxR	279 (11)	2.81	3781 (850)	3003 (675)	7.07	7562 (1700)	0.39	2094-BMP5-M
MPAI-B3xxxS	559 (22)		1891 (425)	1499 (337)		3781 (850)		
MPAI-B4xxxR	279 (11)	5.61	7340 (1650)	5827 (1310)	14.14	14,679 (3300)	0.43	2094-BM01-M
MPAI-B4xxxS	559 (22)		3670 (825)	2914 (655)		7340 (1650)		

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.8 or later.

Electric Cylinder Performance Specifications with Kinetix 6000 (230V) Drives

Performance Specifications with Ball Screw Electric Cylinders

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 6000 230V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-A3xxxC	279 (11)	5.61	4003 (900)	3176 (714)	8.40	4448 (1000)	0.39	2094-AM01-S
MPAI-A3xxxE	559 (22)		2002 (450)	1588 (357)	14.14	4003 (900)		
MPAI-A4xxxC	279 (11)	10.89	7784 (1750)	6179 (1389)	17.07	8896 (2000)	0.43	2094-AM02-S
MPAI-A4xxxE	559 (22)		3892 (875)	3092 (695)	27.44	7784 (1750)		

Performance Specifications with Roller Screw Electric Cylinders

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 6000 230V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-A3xxxR	279 (11)	5.61	3781 (850)	3003 (675)	14.14	7562 (1700)	0.39	2094-AM01-S
MPAI-A3xxxS	559 (22)		1891 (425)	1499 (337)		3781 (850)		
MPAI-A4xxxR	279 (11)	10.89	7340 (1650)	5827 (1310)	27.44	14,679 (3300)	0.43	2094-AM02-S
MPAI-A4xxxS	559 (22)		3670 (825)	2914 (655)		7340 (1650)		

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.8 or later.

Electric Cylinder Performance Specifications with Kinetix 6000 (460V) Drives

Performance Specifications with Ball Screw Electric Cylinders

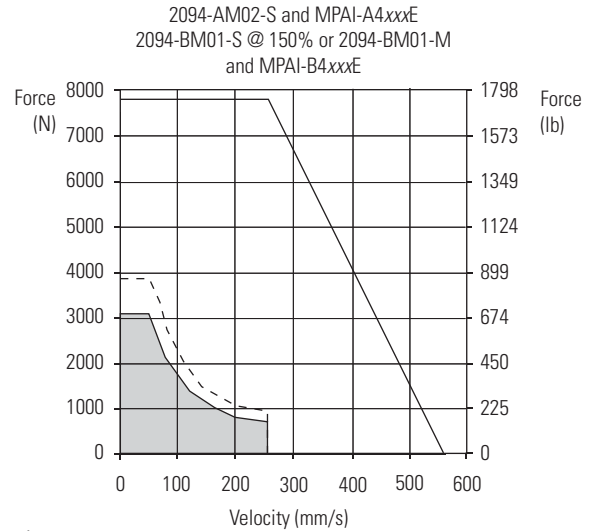
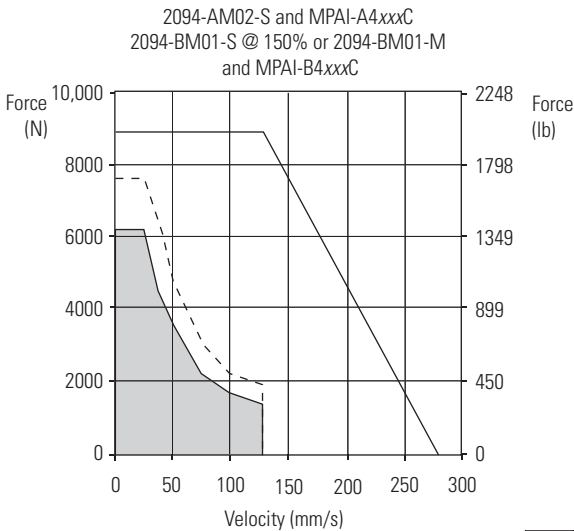
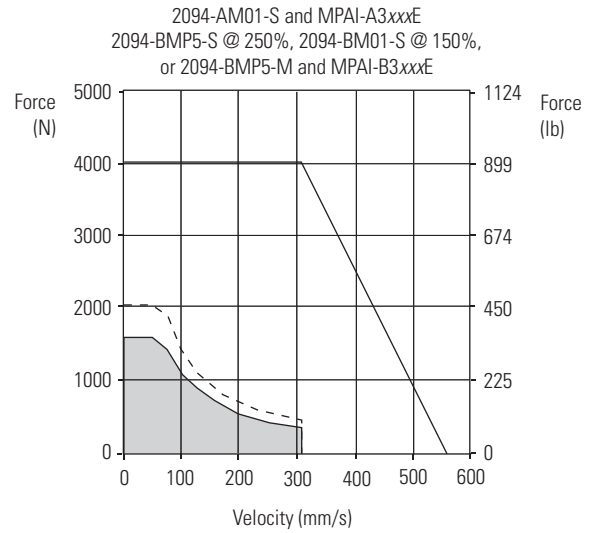
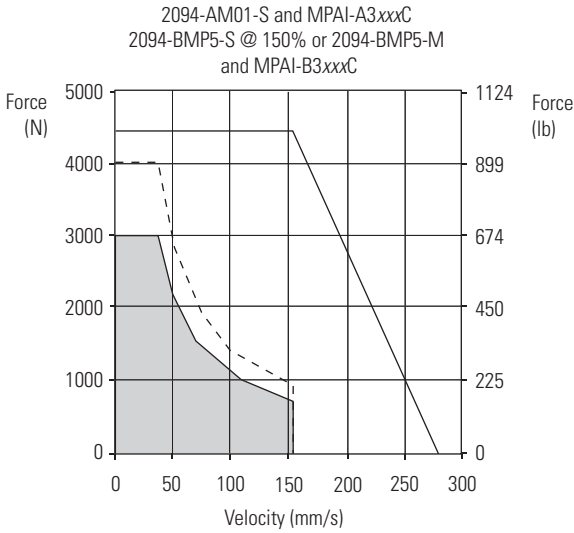
Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 6000 460V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-B3xxxC	279 (11)	2.81	4003 (900)	3176 (714)	4.30	4448 (1000)	0.39	2094-BMP5-S @ 150%
MPAI-B3xxxE	559 (22)		2002 (450)	1588 (357)	7.07	4003 (900)		2094-BMP5-S @ 250% 2094-BM01-S @ 150%
MPAI-B4xxxC	279 (11)	5.61	7784 (1750)	6179 (1389)	8.68	8896 (2000)	0.43	2094-BM01-S @ 150%
MPAI-B4xxxE	559 (22)		3892 (875)	3092 (695)	14.14	7784 (1750)		2094-BM01-S @ 250% 2094-BM02-S @ 150%

Performance Specifications with Roller Screw Electric Cylinders

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 6000 460V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-B3xxxR	279 (11)	2.81	3781 (850)	3003 (675)	7.07	7562 (1700)	0.39	2094-BMP5-S @ 250% 2094-BM01-S @ 150%
MPAI-B3xxxS	559 (22)		1891 (425)	1499 (337)		3781 (850)		
MPAI-B4xxxR	279 (11)	5.61	7340 (1650)	5827 (1310)	14.14	14,679 (3300)	0.43	2094-BM01-S @ 250% 2094-BM02-S @ 150%
MPAI-B4xxxS	559 (22)		3670 (825)	2914 (655)		7340 (1650)		

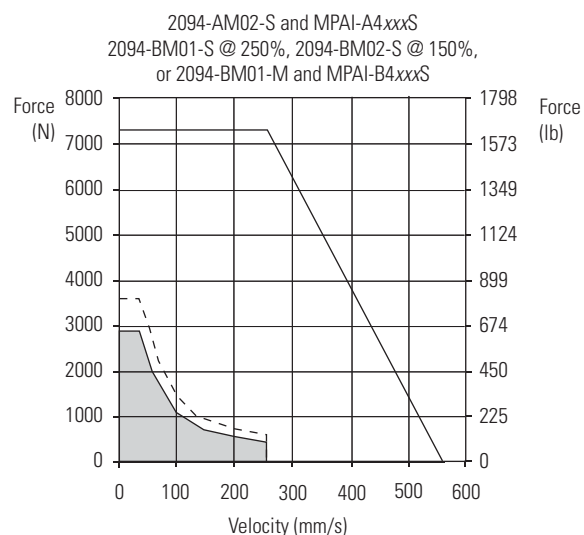
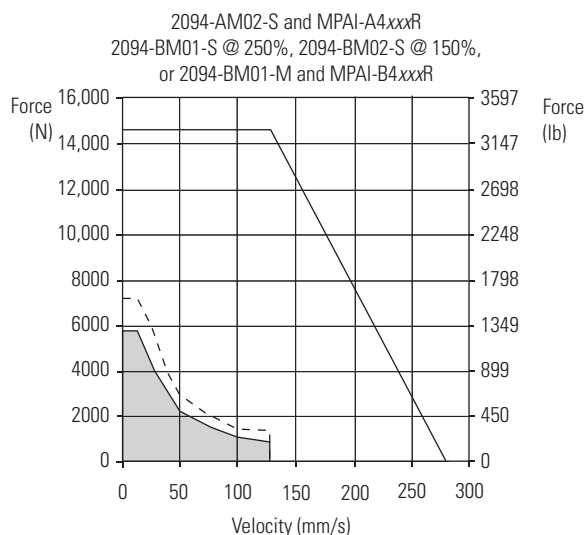
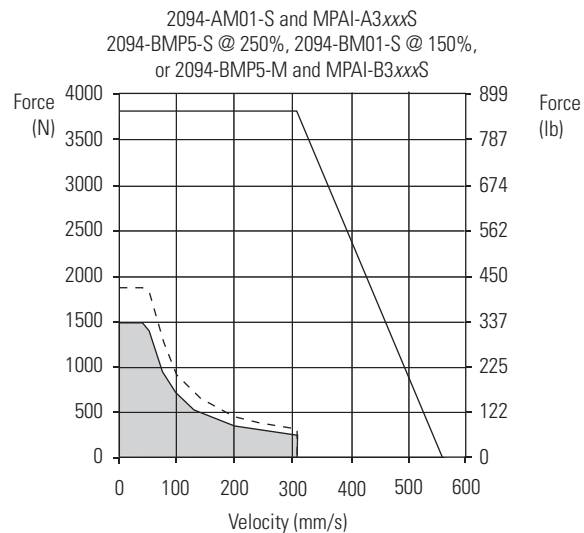
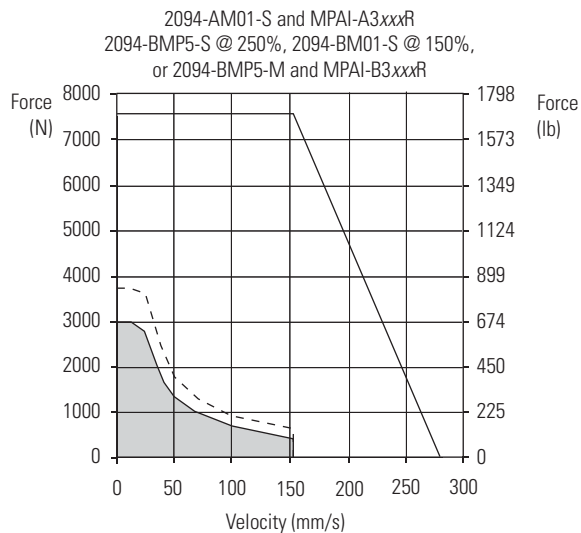
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.8 or later.

Kinetix 6000 and Kinetix 6200/6500 Drives/MP-Series (ball screw) Electric Cylinder Curves



- = Intermittent operating region
- = Continuous operating region @ 25 °C (77 °F)
- = Continuous operating region @ 40 °C (104 °F)

Kinetix 6000 and Kinetix 6200/6500 Drives/MP-Series (roller screw) Electric Cylinder Curves



= Intermittent operating region
 = Continuous operating region @ 25 °C (77 °F)
 = Continuous operating region @ 40 °C (104 °F)

Kinetix 6000 (230V) Drives with LDC-Series Linear Motors

This section provides system combination information for the Kinetix 6000 (230V) drives when matched with LDC-Series iron-core linear motors. Included are power and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Linear Motor Cable Combinations

Linear Motor	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
LDC-C030100-DHT, LDC-C030200-DHT, LDC-C030200-EHT	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Sin/Cos or TTL Encoder Feedback
LDC-C050100-DHT, LDC-C050200-DHT, LDC-C050200-EHT, LDC-C050300-DHT, LDC-C050300-EHT		
LDC-C075200-DHT, LDC-C075200-EHT, LDC-C075300-DHT, LDC-C075300-EHT, LDC-C075400-DHT, LDC-C075400-EHT		
LDC-C100300-DHT, LDC-C100300-EHT, LDC-C100400-DHT, LDC-C100400-EHT, LDC-C100600-DHT		
LDC-C150400-DHT, LDC-C150600-DHT		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPWM7DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

LDC-Series Performance Specifications with Kinetix 6000 (230V) Drives

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current ⁽¹⁾ Amps 0-pk	System Continuous Stall Force ⁽¹⁾ N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Kinetix 6000 230V Drives
LDC-C030100-DHT	10.0 (32.8)	4.1...6.1	74...111 (17...25)	12.1	188 (42)	0.37...0.55	2094-AM01-S
LDC-C030200-DHT		8.1...12.2	148...222 (33...50)	24.3	375 (84)	0.74...1.11	2094-AM02-S
LDC-C030200-EHT		4.1...6.1		12.1			2094-AM01-S
LDC-C050100-DHT	10.0 (32.8)	3.9...5.9	119...179 (27...40)	11.7	302 (68)	0.59...0.89	2094-AM01-S
LDC-C050200-DHT		7.9...11.8	240...359 (54...81)	23.3	600 (135)	1.20...1.79	2094-AM02-S
LDC-C050200-EHT		3.9...5.9		11.6			2094-AMP5-S
LDC-C050300-DHT		11.8...17.7	363...544 (82...122)	35.9	941 (212)	1.81...2.72	2094-AM03-S
LDC-C050300-EHT		3.9...5.9		12.0			2094-AMP5-S

(1) Values represent the range between no cooling (low value) and water cooling (high value).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

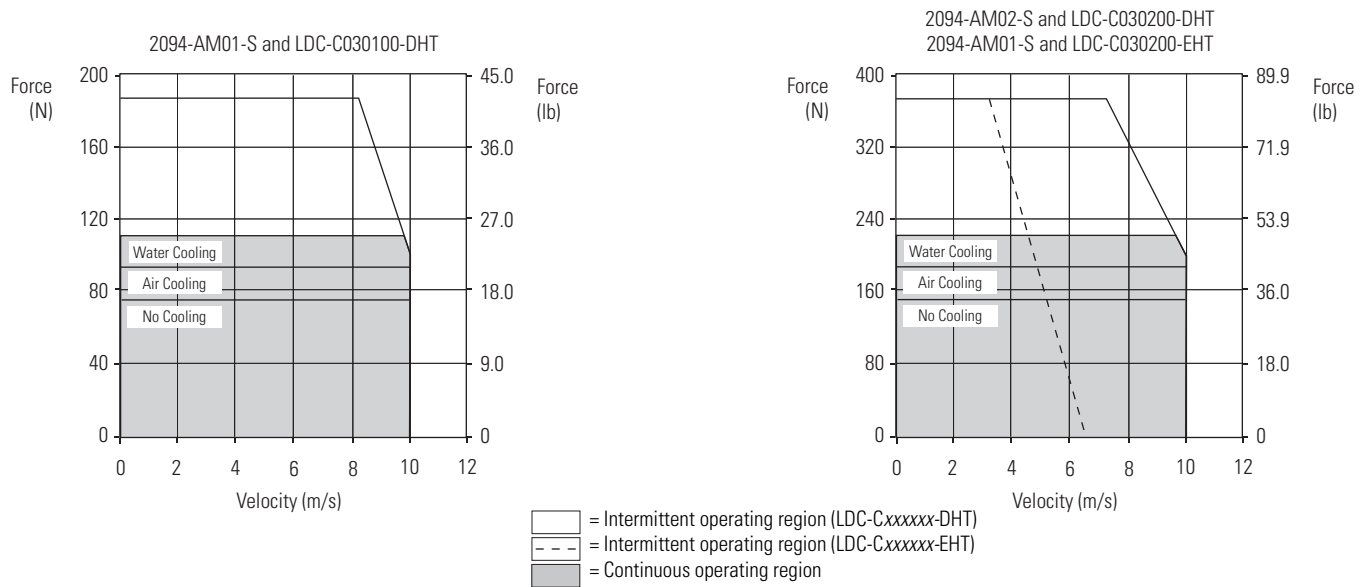
LDC-Series Performance Specifications with Kinetix 6000 (230V) Drives, Continued

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current ⁽¹⁾ Amps 0-pk	System Continuous Stall Force ⁽¹⁾ N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Kinetix 6000 230V Drives
LDC-C075200-DHT	10.0 (32.8)	7.7...11.5	348...523 (78...117)	22.9	882 (198)	1.74...2.61	2094-AM02-S
LDC-C075200-EHT		3.8...5.7		11.5			2094-AMP5-S
LDC-C075300-DHT		11.5...17.2	523...784 (117...176)	35.6	1368 (308)	2.61...3.92	2094-AM03-S
LDC-C075300-EHT		3.8...5.7		11.9			2094-AM01-S
LDC-C075400-DHT		15.3...23.0	697...1045 (157...235)	47.4	1824 (410)	3.48...5.22	2094-AM03-S
LDC-C075400-EHT		7.7...11.5		23.7			2094-AM02-S
LDC-C100300-DHT	10.0 (32.8)	11.1...16.7	674...1012 (152...227)	34.3	1767 (397)	3.37...5.06	2094-AM03-S
LDC-C100300-EHT		3.7...5.6		11.4			2094-AM01-S
LDC-C100400-DHT		14.8...22.2	899...1349 (202...303)	45.7	2356 (530)	4.49...6.74	2094-AM03-S
LDC-C100400-EHT		7.4...11.1		22.8			2094-AM02-S
LDC-C100600-DHT	22.2...33.3	1349...2023 (303...455)	68.5	3534 (794)	6.74...10.11	2094-AM05-S	
LDC-C150400-DHT	10.0 (32.8)	14.1...21.1	1281...1922 (288...432)	45.2	3498 (786)	6.40...9.61	2094-AM03-S
LDC-C150600-DHT		21.1...31.7	1922...2882 (432...648)	67.8	5246 (1179)	9.61...14.41	2094-AM05-S

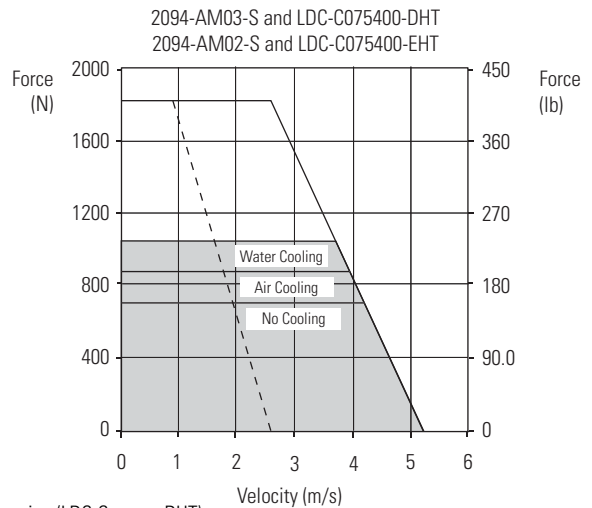
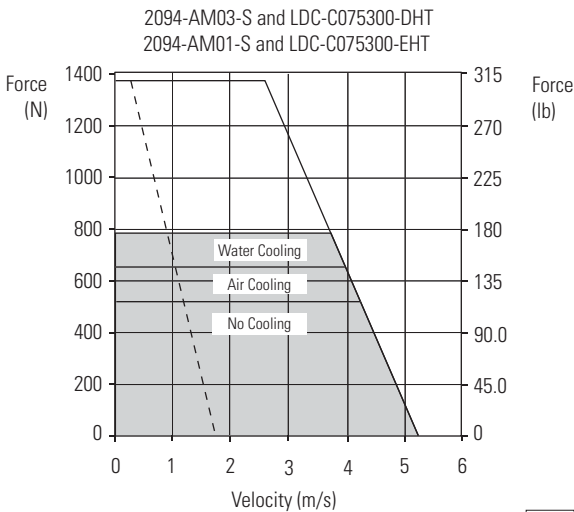
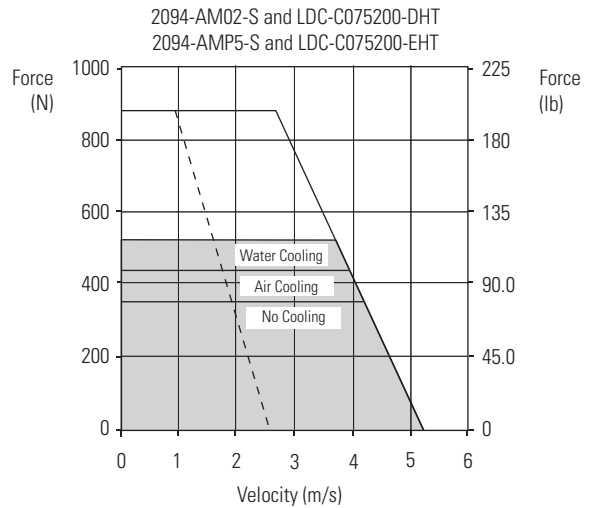
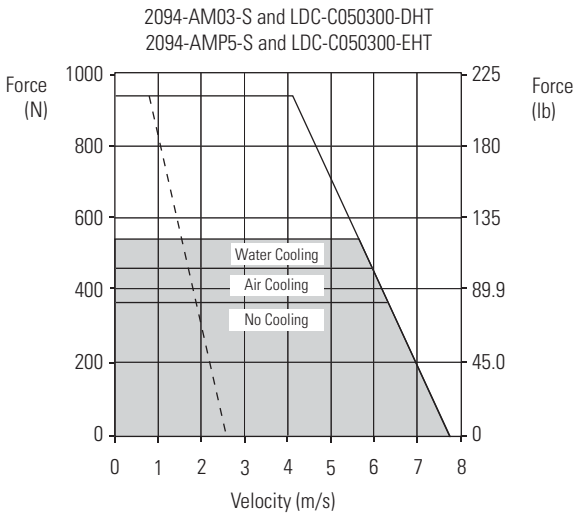
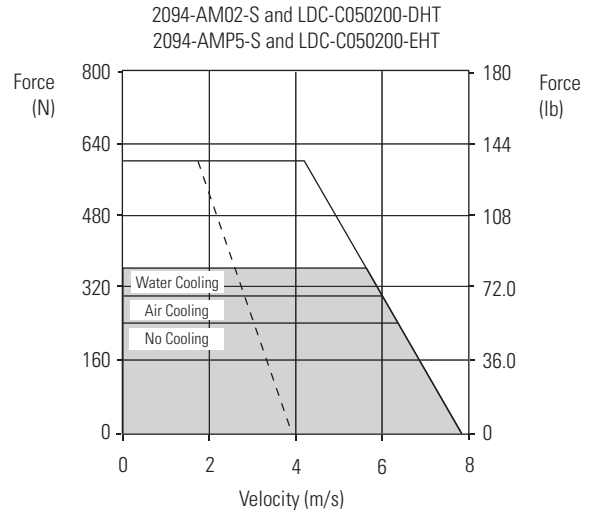
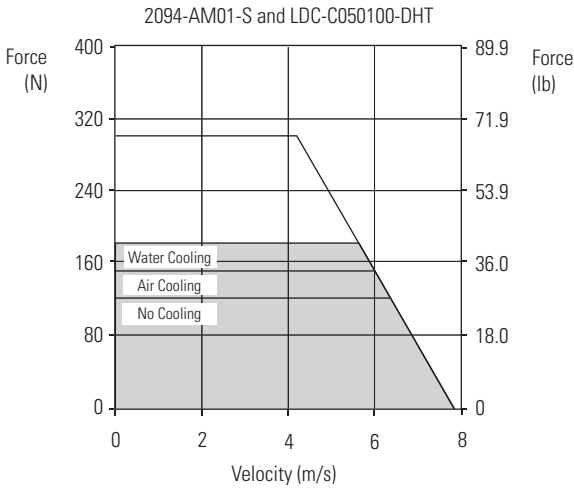
(1) Values represent the range between no cooling (low value) and water cooling (high value).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 (230V) Drives/LDC-Series Linear Motor Curves

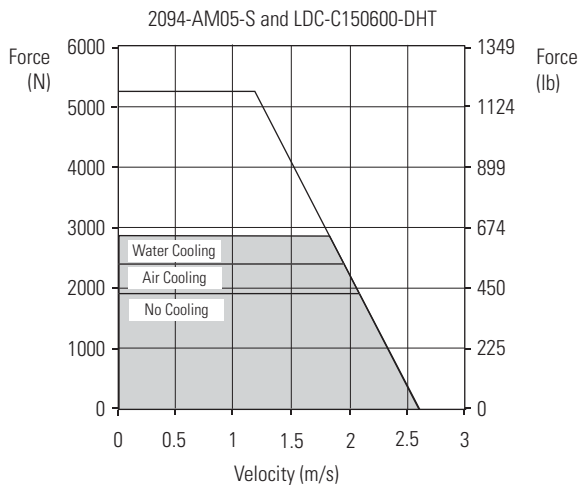
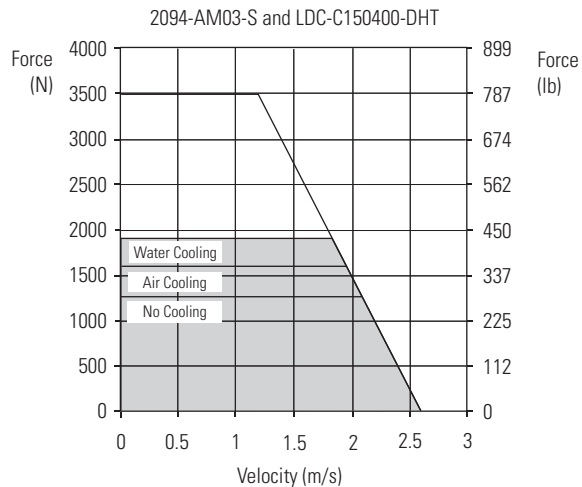
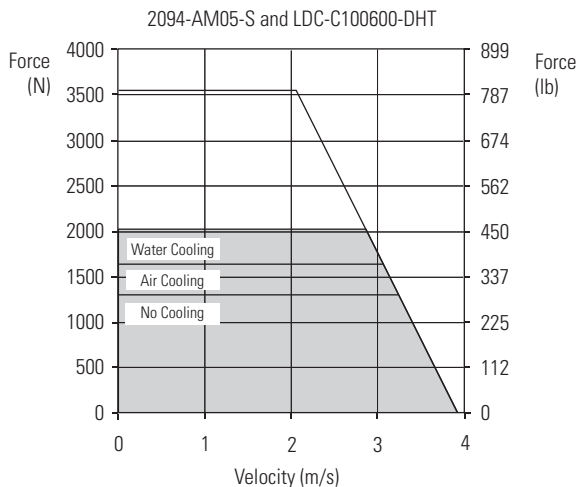
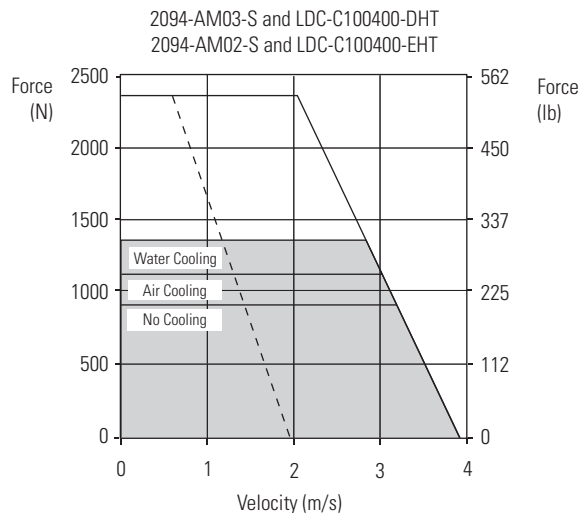
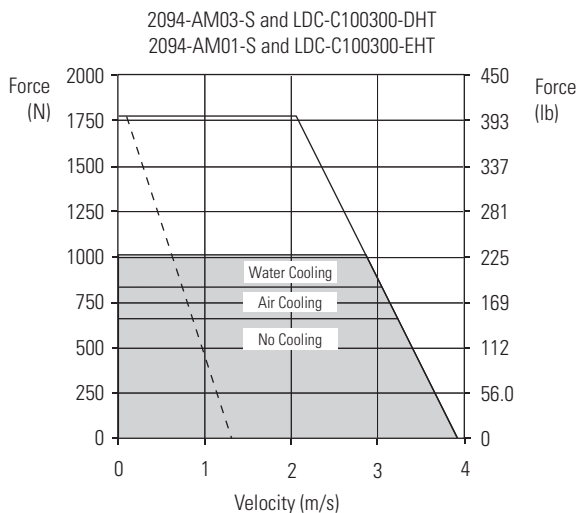


Kinetix 6000 (230V) Drives/LDC-Series Linear Motor Curves, Continued



= Intermittent operating region (LDC-Cxxxxx-DHT)
 = Intermittent operating region (LDC-Cxxxxx-EHT)
 = Continuous operating region

Kinetix 6000 (230V) Drives/LDC-Series Linear Motor Curves, Continued



= Intermittent operating region (LDC-Cxxxxx-DHT)
 = Intermittent operating region (LDC-Cxxxxx-EHT)
 = Continuous operating region

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives with LDC-Series Linear Motors

This section provides system combination information for the Kinetix 6000 and Kinetix 6200/6500 (460V) drives when matched with LDC-Series iron-core linear motors. Included are power and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Linear Motor Cable Combinations

Linear Motor	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
LDC-C030100-DHT, LDC-C030200-DHT, LDC-C030200-EHT	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Sin/Cos or TTL Encoder Feedback
LDC-C050100-DHT, LDC-C050200-DHT, LDC-C050200-EHT, LDC-C050300-DHT, LDC-C050300-EHT		
LDC-C075200-DHT, LDC-C075200-EHT, LDC-C075300-DHT, LDC-C075300-EHT, LDC-C075400-DHT, LDC-C075400-EHT		
LDC-C100300-DHT, LDC-C100300-EHT, LDC-C100400-DHT, LDC-C100400-EHT, LDC-C100600-DHT		
LDC-C150400-DHT, LDC-C150600-DHT		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPWM7DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

LDC-Series Performance Specifications with Kinetix 6200/6500 (460V) Drives

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current ⁽¹⁾ Amps 0-pk	System Continuous Stall Force ⁽¹⁾ N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Kinetix 6200/ Kinetix 6500 460V Drives
LDC-C030100-DHT	10.0 (32.8)	4.1...6.1	74...111 (17...25)	12.1	188 (42)	0.37...0.55	2094-BM01-M
LDC-C030200-DHT		8.1...12.2	148...222 (33...50)	24.3	375 (84)	0.74...1.11	2094-BM02-M
LDC-C030200-EHT		4.1...6.1		12.1			2094-BM01-M
LDC-C050100-DHT	10.0 (32.8)	3.9...5.9	119...179 (27...40)	11.7	302 (68)	0.59...0.89	2094-BM01-M
LDC-C050200-DHT		7.9...11.8	240...359 (54...81)	23.3	600 (135)	1.20...1.79	2094-BM02-M
LDC-C050200-EHT		3.9...5.9		11.6			2094-BM01-M
LDC-C050300-DHT		11.8...17.7	363...544 (82...122)	35.9	941 (212)	1.81...2.72	2094-BM02-M
LDC-C050300-EHT		3.9...5.9		12.0			2094-BM01-M

(1) Values represent the range between no cooling (low value) and water cooling (high value).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

LDC-Series Performance Specifications with Kinetix 6200/6500 (460V) Drives, Continued

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current ⁽¹⁾ Amps 0-pk	System Continuous Stall Force ⁽¹⁾ N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Kinetix 6200/ Kinetix 6500 460V Drives
LDC-C075200-DHT	10.0 (32.8)	7.7...11.5	348...523 (78...117)	22.9	882 (198)	1.74...2.61	2094-BM02-M
LDC-C075200-EHT		3.8...5.7		11.5			2094-BM01-M
LDC-C075300-DHT		11.5...17.2	523...784 (117...176)	35.6	1368 (308)	2.61...3.92	2094-BM02-M
LDC-C075300-EHT		3.8...5.7		11.9			2094-BM01-M
LDC-C075400-EHT		7.7...11.5	697...1045 (157...235)	23.7	1824 (410)	3.48...5.22	2094-BM02-M
LDC-C100300-DHT	10.0 (32.8)	11.1...16.7	674...1012 (152...227)	34.3	1767 (397)	3.37...5.06	2094-BM02-M
LDC-C100300-EHT		3.7...5.6		11.4			2094-BM01-M
LDC-C100400-EHT		7.4...11.1	899...1349 (202...303)	22.8	2356 (530)	4.49...6.74	2094-BM02-M
LDC-C100600-EHT		11.1...16.7	1349...2023 (303...455)	34.3	3534 (794)	6.74...10.11	2094-BM02-M
LDC-C150400-EHT	10.0 (32.8)	7.0...10.6	1281...1922 (288...432)	22.6	3498 (786)	6.40...9.61	2094-BM02-M
LDC-C150600-EHT		10.6...15.8	1922...2882 (432...648)	33.9	5246 (1179)	9.61...14.41	2094-BM02-M

(1) Values represent the range between no cooling (low value) and water cooling (high value).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

LDC-Series Performance Specifications with Kinetix 6000 (460V) Drives

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current ⁽¹⁾ Amps 0-pk	System Continuous Stall Force ⁽¹⁾ N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Kinetix 6000 460V Drives
LDC-C030100-DHT	10.0 (32.8)	4.1...6.1	74...111 (17...25)	12.1	188 (42)	0.37...0.55	2094-BM01-S @ 150%
LDC-C030200-DHT		8.1...12.2	148...222 (33...50)	24.3	375 (84)	0.74...1.11	2094-BM03-S @ 150% 2094-BM02-S @ 250%
LDC-C030200-EHT		4.1...6.1		12.1			2094-BM01-S @ 150%
LDC-C050100-DHT	10.0 (32.8)	3.9...5.9	119...179 (27...40)	11.7	302 (68)	0.59...0.89	2094-BM01-S @ 150%
LDC-C050200-DHT		7.9...11.8	240...359 (54...81)	23.3	600 (135)	1.20...1.79	2094-BM03-S @ 150% 2094-BM02-S @ 250%
LDC-C050200-EHT		3.9...5.9		11.6			2094-BM01-S @ 150%
LDC-C050300-DHT		11.8...17.7	363...544 (82...122)	35.9	941 (212)	1.81...2.72	2094-BM03-S @ 150% 2094-BM02-S @ 250%
LDC-C050300-EHT		3.9...5.9		12.0			2094-BM01-S @ 150%

(1) Values represent the range between no cooling (low value) and water cooling (high value).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

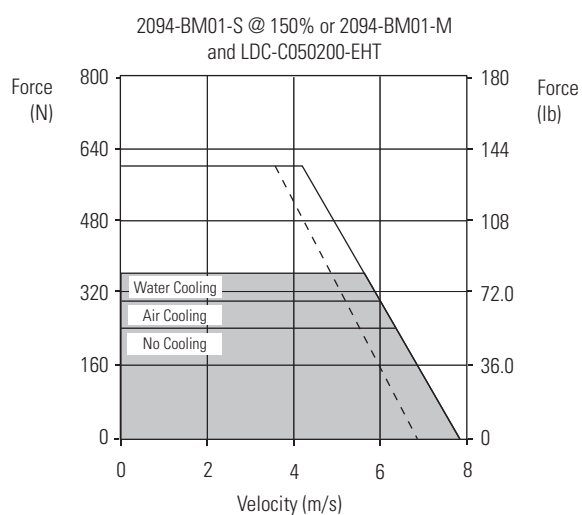
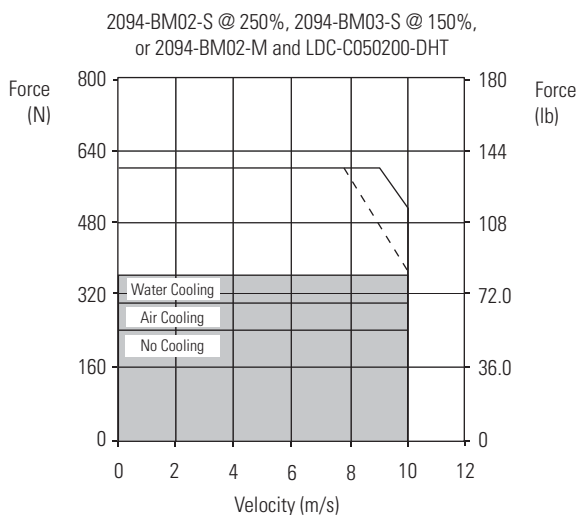
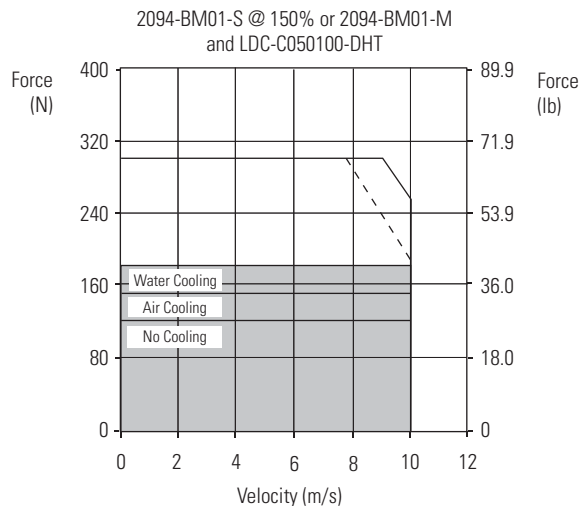
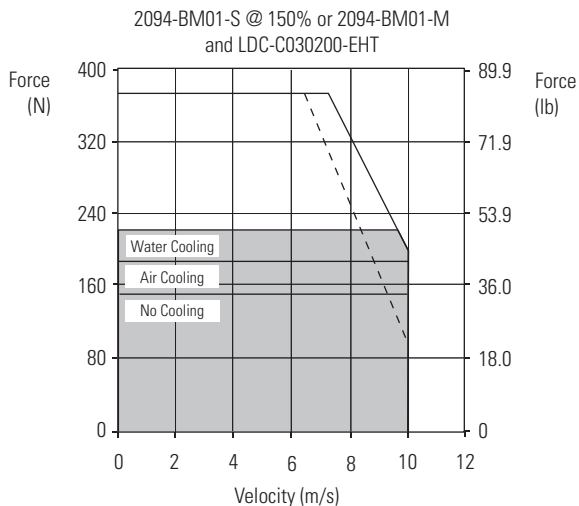
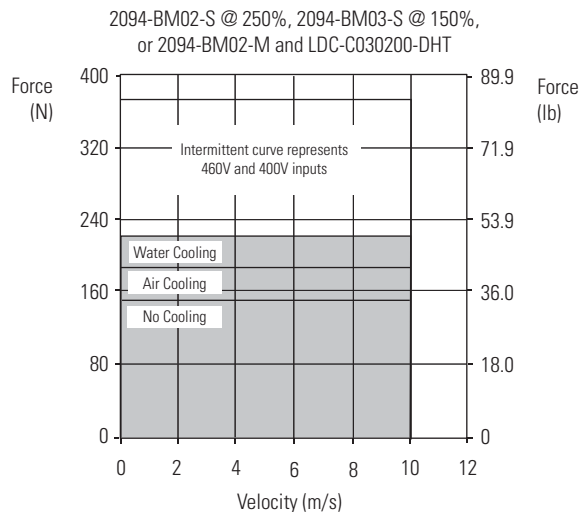
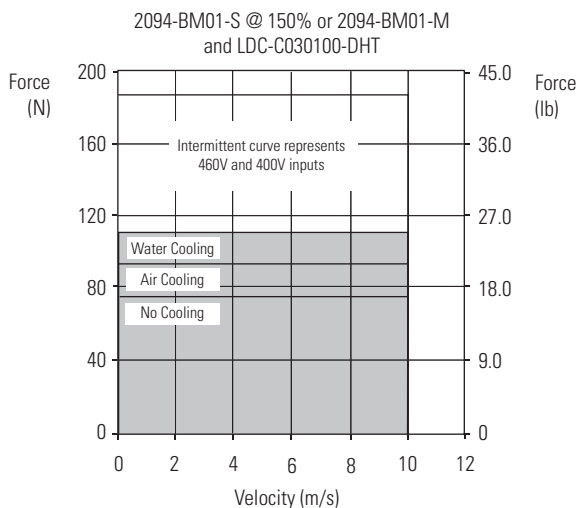
LDC-Series Performance Specifications with Kinetix 6000 (460V) Drives, Continued

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current ⁽¹⁾ Amps 0-pk	System Continuous Stall Force ⁽¹⁾ N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Kinetix 6000 460V Drives
LDC-C075200-DHT	10.0 (32.8)	7.7...11.5	348...523 (78...117)	22.9	882 (198)	1.74...2.61	2094-BM03-S @ 150% 2094-BM02-S @ 250%
LDC-C075200-EHT		3.8...5.7		11.5			2094-BM01-S @ 150%
LDC-C075300-DHT		11.5...17.2	523...784 (117...176)	35.6	1368 (308)	2.61...3.92	2094-BM03-S @ 150% 2094-BM02-S @ 250%
LDC-C075300-EHT		3.8...5.7		11.9			2094-BM01-S @ 150%
LDC-C075400-DHT		15.3...23.0	697...1045 (157...235)	47.4	1824 (410)	3.48...5.22	2094-BM05-S @ 150%
LDC-C075400-EHT		7.7...11.5		23.7			2094-BM03-S @ 150% 2094-BM02-S @ 250%
LDC-C100300-DHT	10.0 (32.8)	11.1...16.7	674...1012 (152...227)	34.3	1767 (397)	3.37...5.06	2094-BM03-S @ 150% 2094-BM02-S @ 250%
LDC-C100300-EHT		3.7...5.6		11.4			2094-BM01-S @ 150%
LDC-C100400-DHT		14.8...22.2	899...1349 (202...303)	45.7	2356 (530)	4.49...6.74	2094-BM05-S @ 150%
LDC-C100400-EHT		7.4...11.1		22.8			2094-BM03-S @ 150% 2094-BM02-S @ 250%
LDC-C100600-DHT		22.2...33.3	1349...2023 (303...455)	68.5	3534 (794)	6.74...10.11	2094-BM05-S @ 150%
LDC-C100600-EHT		11.1...16.7		34.3			2094-BM03-S @ 150% 2094-BM02-S @ 250%
LDC-C150400-DHT	10.0 (32.8)	14.1...21.1	1281...1922 (288...432)	45.2	3498 (786)	6.40...9.61	2094-BM03-S @ 150%
LDC-C150400-EHT		7.0...10.6		22.6			2094-BM03-S @ 150% 2094-BM02-S @ 250%
LDC-C150600-DHT		21.1...31.7	1922...2882 (432...648)	67.8	5246 (1179)	9.61...14.41	2094-BM05-S @ 150%
LDC-C150600-EHT		10.6...15.8		33.9			2094-BM03-S @ 150% 2094-BM02-S @ 250%

(1) Values represent the range between no cooling (low value) and water cooling (high value).

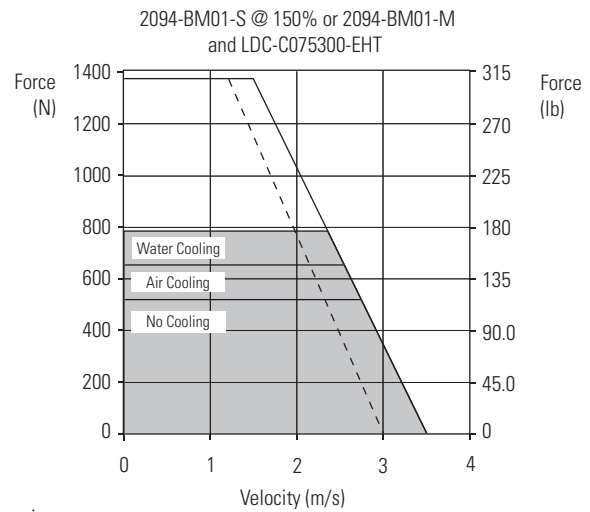
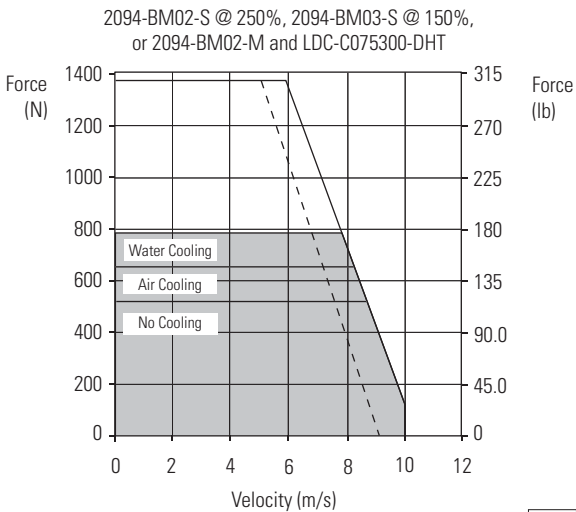
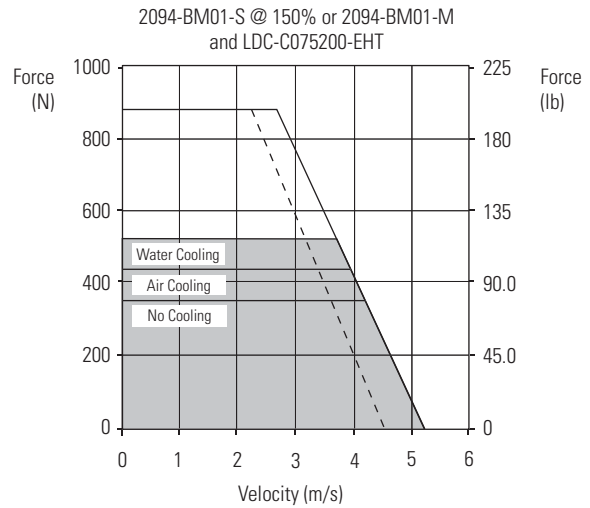
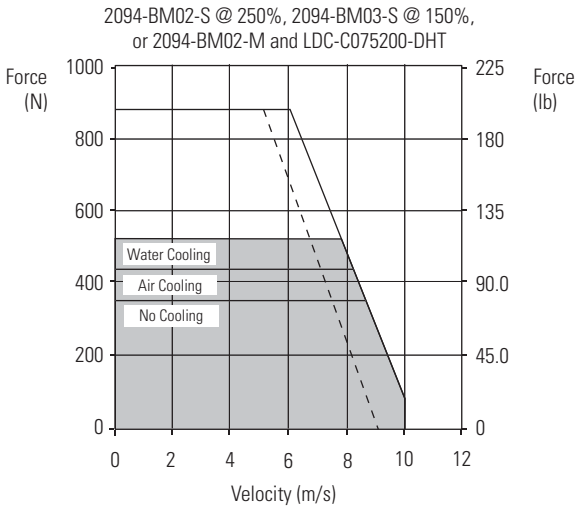
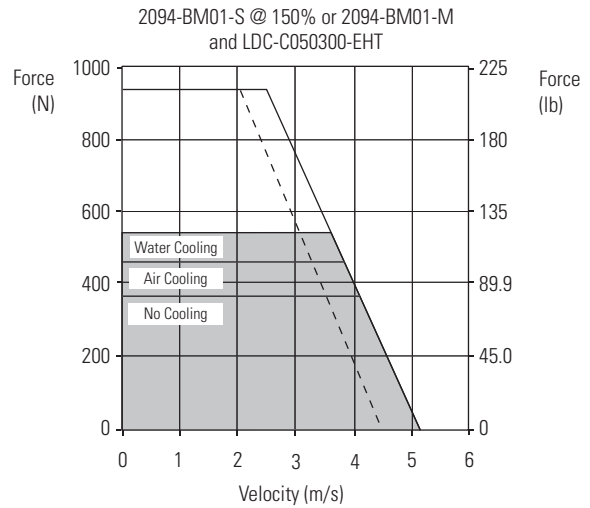
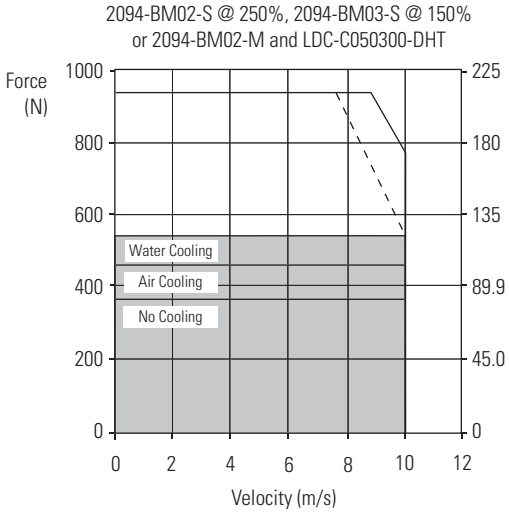
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/LDC-Series Linear Motor Curves



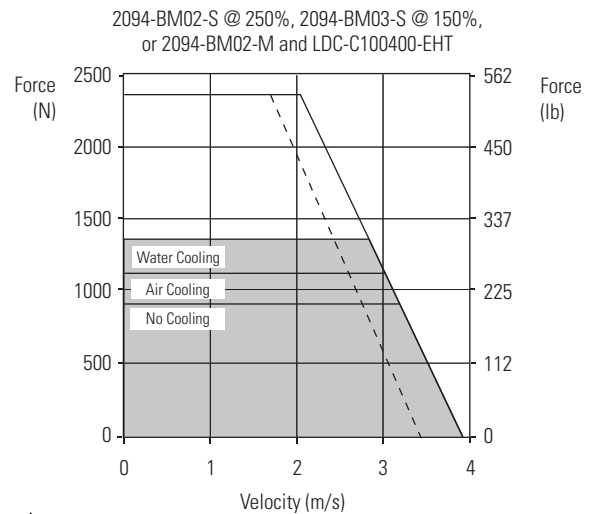
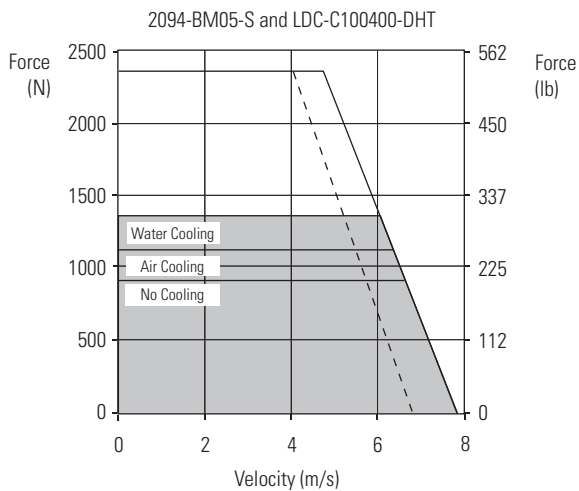
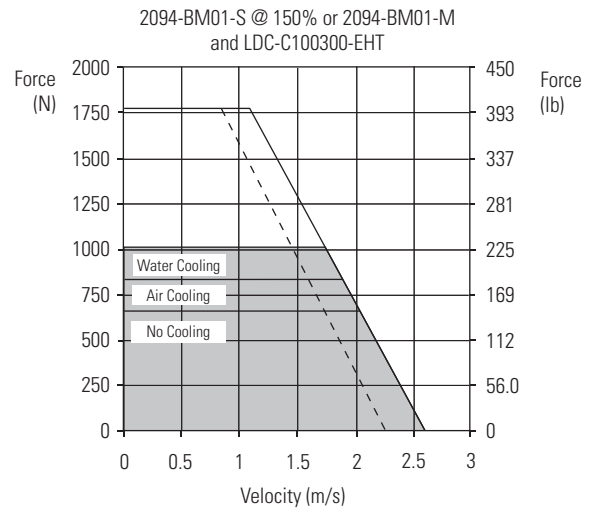
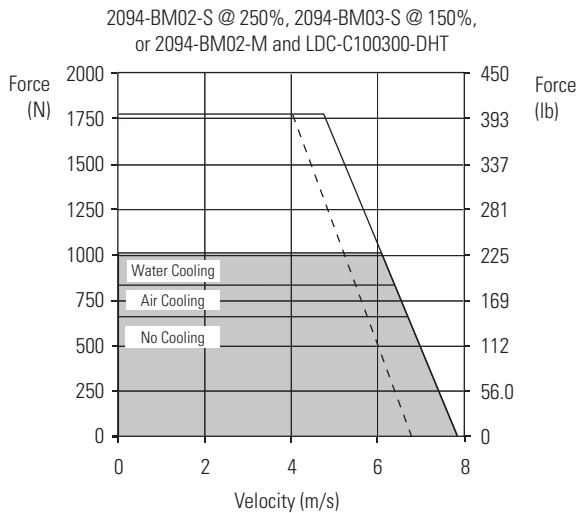
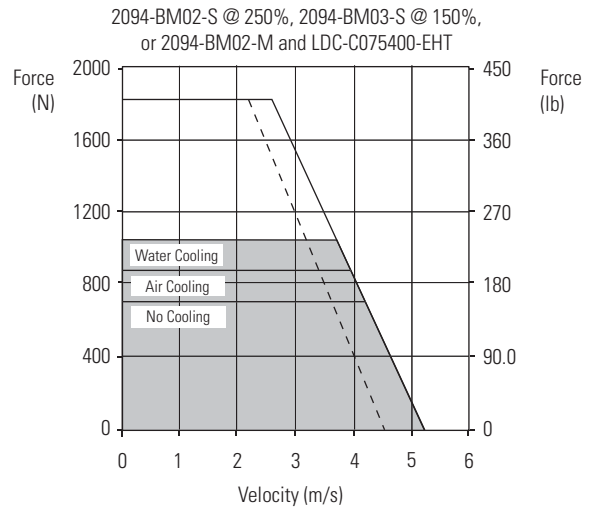
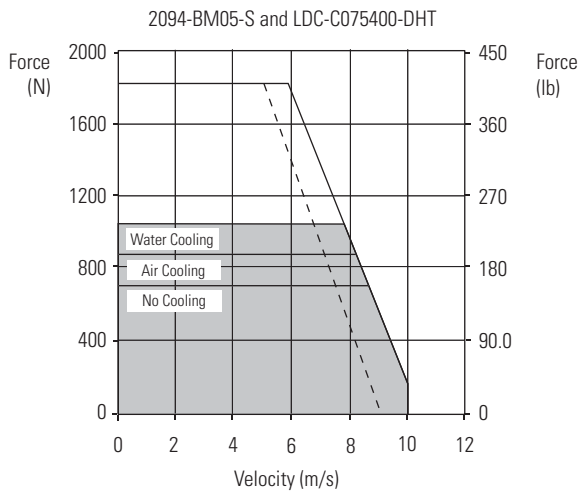
- = Intermittent operating region
- = Intermittent operating region with 400V AC (rms) input voltage
- = Continuous operating region

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/LDC-Series Linear Motor Curves, Continued



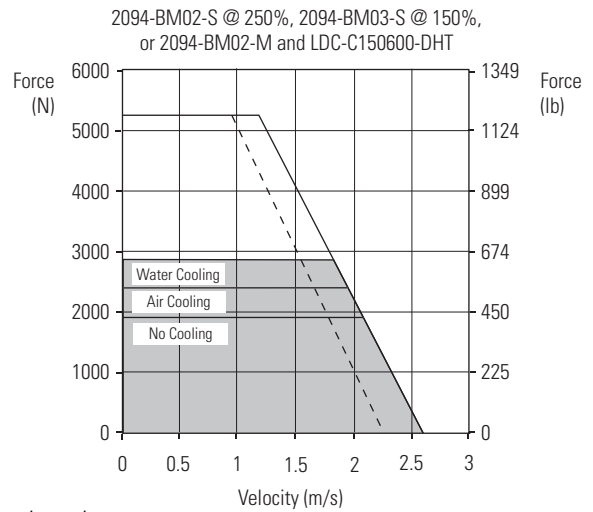
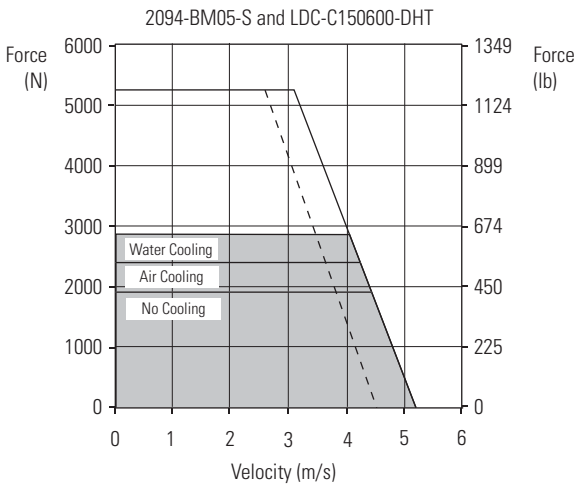
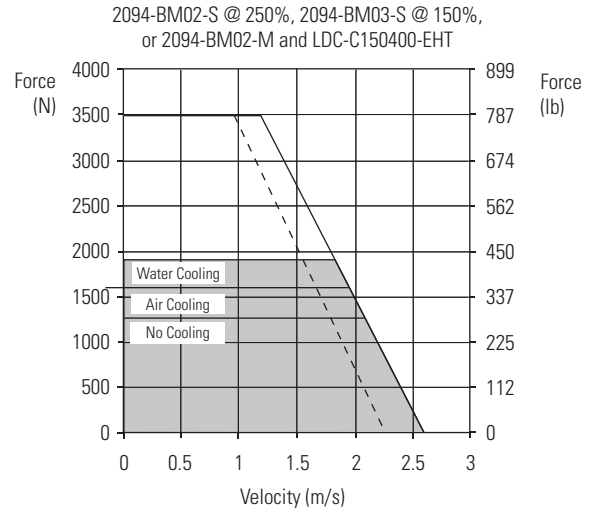
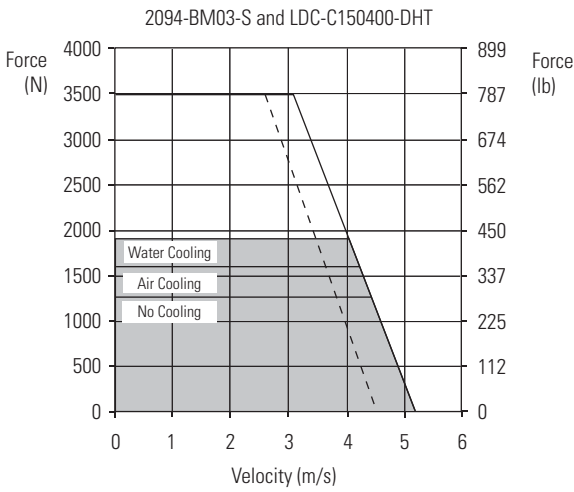
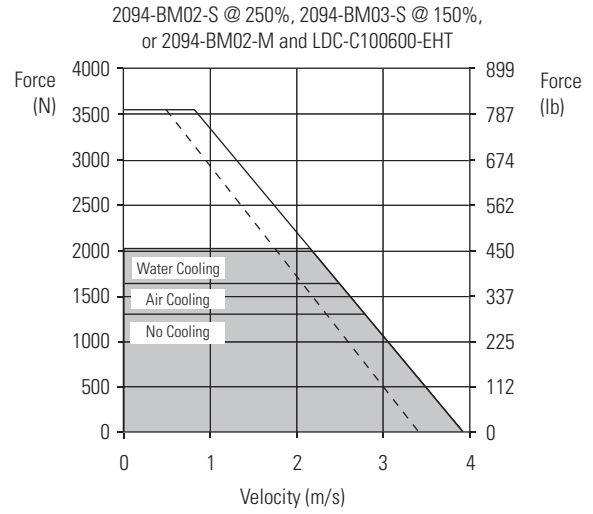
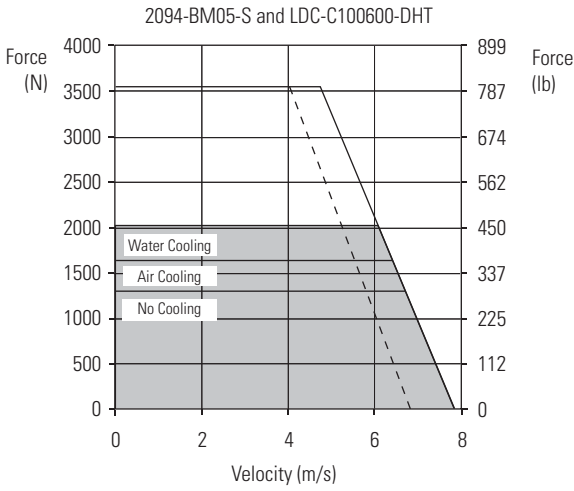
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 = Intermittent operating region with 400V AC (rms) input voltage
 = Continuous operating region

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/LDC-Series Linear Motor Curves, Continued



- = Intermittent operating region
- = Intermittent operating region with 400V AC (rms) input voltage
- = Continuous operating region

Kinetix 6000 and Kinetix 6200/6500 (460V) Drives/LDC-Series Linear Motor Curves, Continued



= Intermittent operating region
 = Intermittent operating region with 400V AC (rms) input voltage
 = Continuous operating region

Kinetix 6000 (230V) Drives with LDL-Series Linear Motors

This section provides system combination information for the Kinetix 6000 (230V) drives when matched with LDL-Series ironless linear motors. Included are power and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Linear Motor Cable Combinations

Linear Motors	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
LDL-N030120-DHT, LDL-N030240-DHT, LDL-N030240-EHT	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Sin/Cos or TTL Encoder Feedback
LDL-N050120-DHT, LDL-N050240-DHT, LDL-N050240-EHT, LDL-N050360-DHT, LDL-N050360-EHT, LDL-N050480-DHT, LDL-N050480-EHT		
LDL-N075480-DHT, LDL-N075480-EHT		
LDL-T030120-DHT, LDL-T030240-DHT, LDL-T030240-EHT		
LDL-T050120-DHT, LDL-T050240-DHT, LDL-T050240-EHT, LDL-T050360-DHT, LDL-T050480-DHT, LDL-T050480-EHT		
LDL-T075480-EHT, LDL-T075480-EHT		

(1) Use low-profile connector kit (catalog number 2090-K6CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16S_{xx}) or continuous-flex (catalog number 2090-CPWM7DF-16AF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length *xx* is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

LDL-Series Performance Specifications with Kinetix 6000 (230V) Drives

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Kinetix 6000 230V Drives
LDL-N030120-DHT	10.0 (32.8)	3.0	63 (14)	9.9	209 (47)	0.31	2094-AMP5-S
LDL-N030240-DHT		6.0	126 (28)	19.9	417 (94)	0.63	2094-AM01-S
LDL-N030240-EHT		3.0		9.9			2094-AMP5-S
LDL-T030120-DHT		3.0	72 (16)	9.9	239 (54)	0.36	2094-AMP5-S
LDL-T030240-DHT		6.0	144 (32)	19.9	479 (108)	0.72	2094-AM01-S
LDL-T030240-EHT		3.0		9.9			2094-AMP5-S

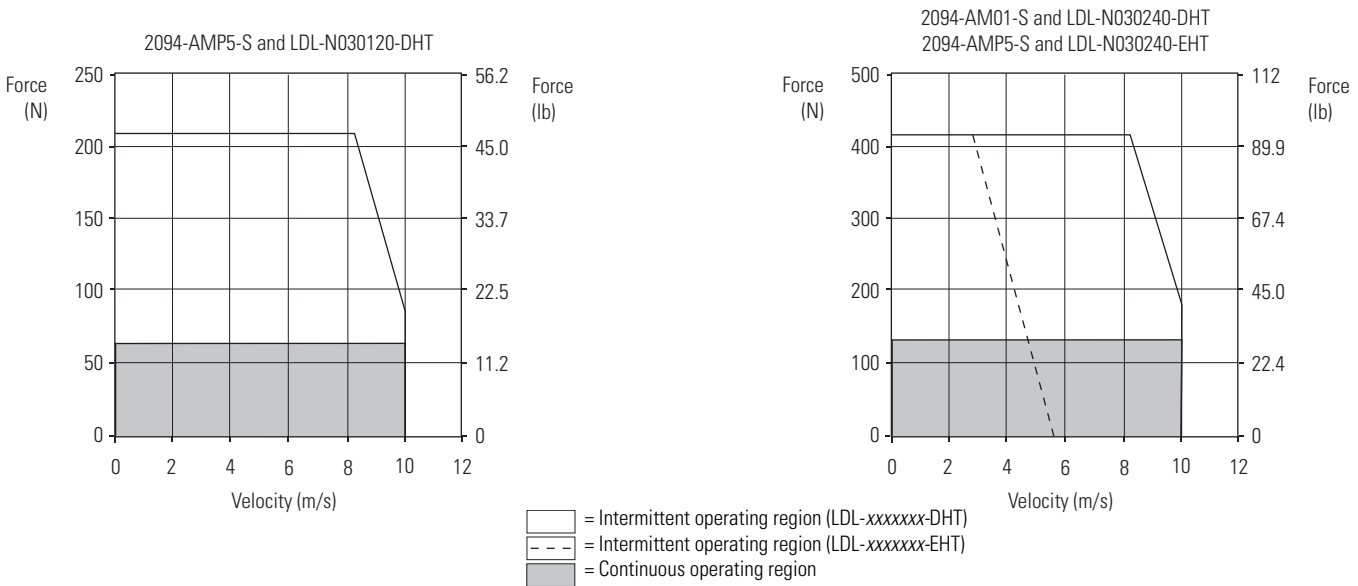
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

LDL-Series Performance Specifications with Kinetix 6000 (230V) Drives, Continued

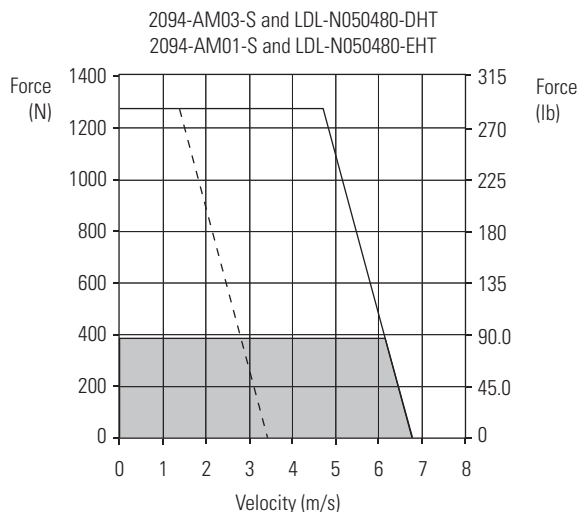
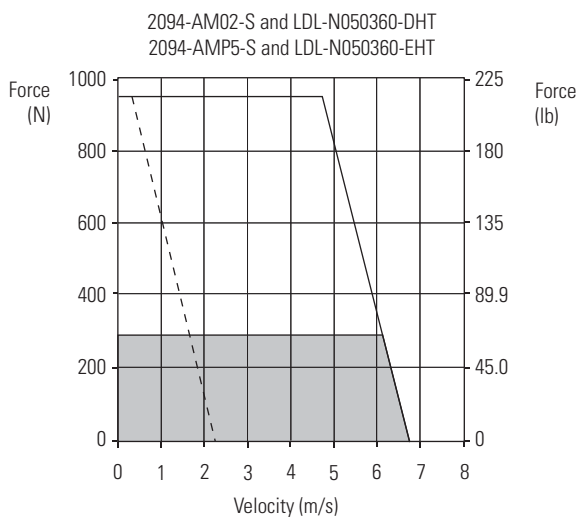
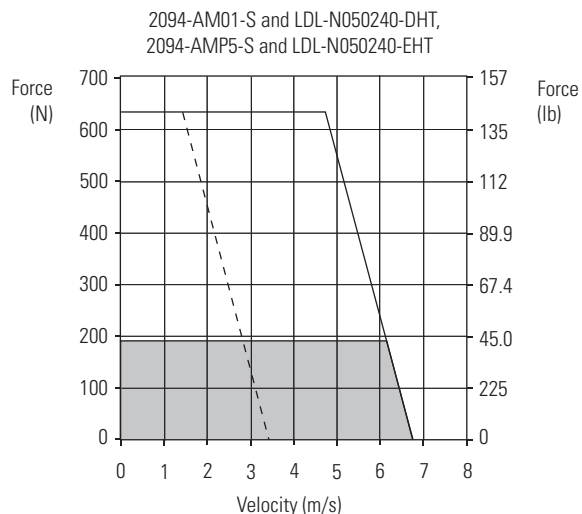
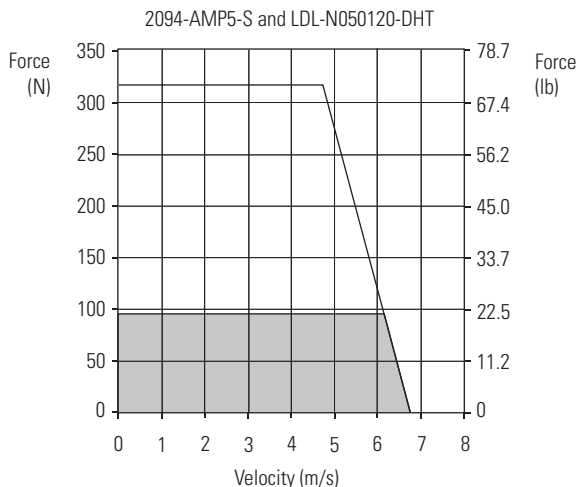
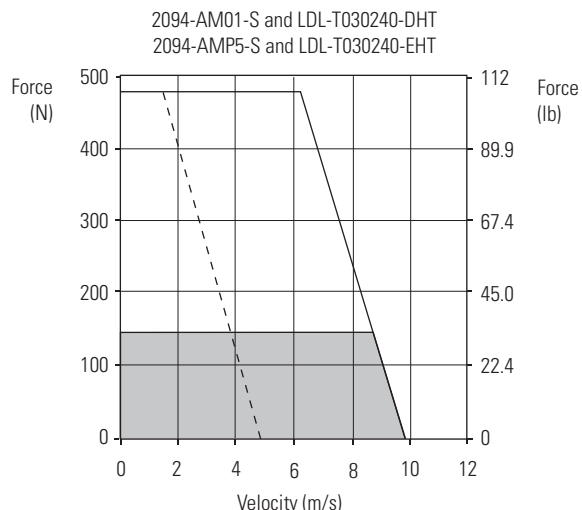
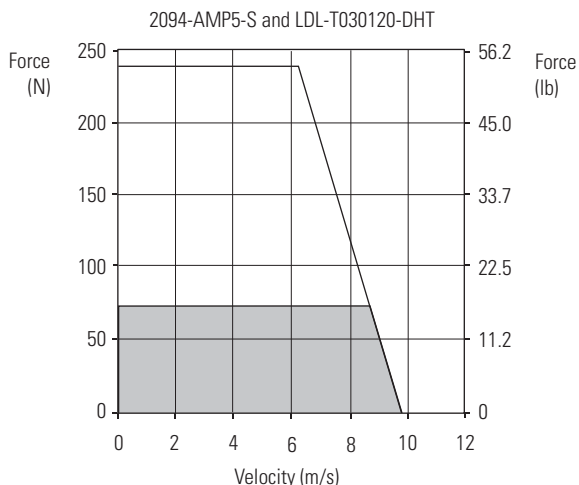
Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Kinetix 6000 230V Drives	
LDL-N050120-DHT	10.0 (32.8)	2.7	96 (22)	9.1	317 (71)	0.48	2094-AMP5-S	
LDL-N050240-DHT		5.5	191 (43)	18.1	635 (143)	0.95	2094-AM01-S	
LDL-N050240-EHT		2.7		9.1			2094-AMP5-S	
LDL-N050360-DHT		8.2	287 (65)	27.2	952 (214)	1.43	2094-AM02-S	
LDL-N050360-EHT		2.7		9.1			2094-AMP5-S	
LDL-N050480-DHT		10.9	383 (86)	36.3	1269 (285)	1.91	2094-AM03-S	
LDL-N050480-EHT		5.5		18.1			2094-AM01-S	
LDL-T050120-DHT		2.7	110 (25)	9.1	364 (82)	0.55	2094-AMP5-S	
LDL-T050240-DHT		5.5	220 (49)	18.1	728 (164)	1.10	2094-AM01-S	
LDL-T050240-EHT		2.7		9.1			2094-AMP5-S	
LDL-T050360-DHT		8.2	329 (74)	27.2	1093 (246)	1.64	2094-AM02-S	
LDL-T050480-DHT		10.9	439 (99)	36.3	1457 (327)	2.19	2094-AM03-S	
LDL-T050480-EHT		5.5		18.1			2094-AM01-S	
LDL-N075480-DHT		10.0 (32.8)	9.9	519 (117)	32.8	1723 (387)	2.59	2094-AM03-S
LDL-N075480-EHT			4.9		16.4			2094-AM01-S
LDL-T075480-DHT			9.9	596 (134)	32.8	1977 (444)	2.98	2094-AM03-S
LDL-T075480-EHT	4.9		16.4		2094-AM01-S			




Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 6000 (230V) Drives/LDL-Series Linear Motor Curves

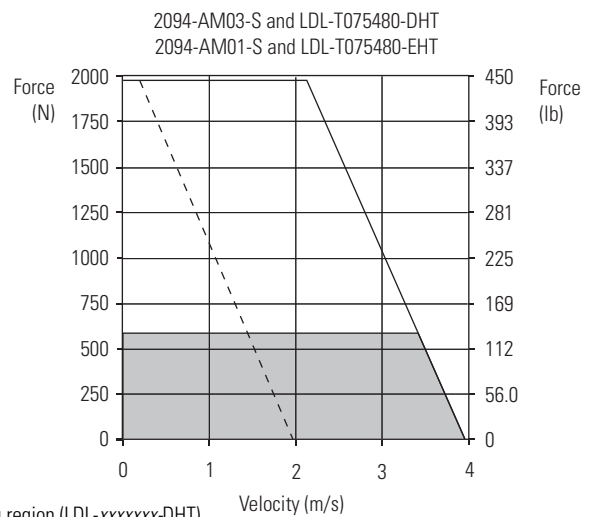
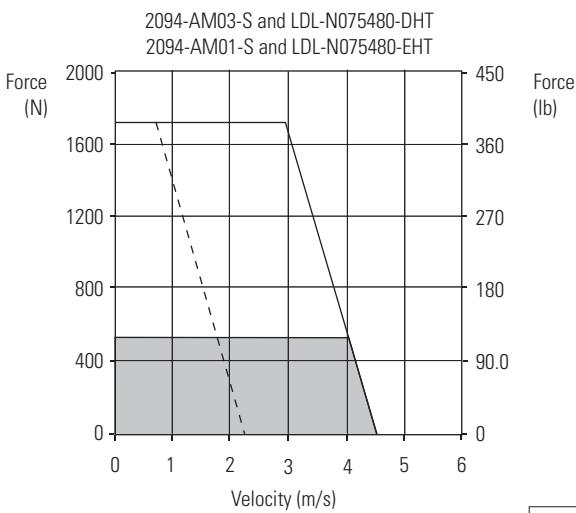
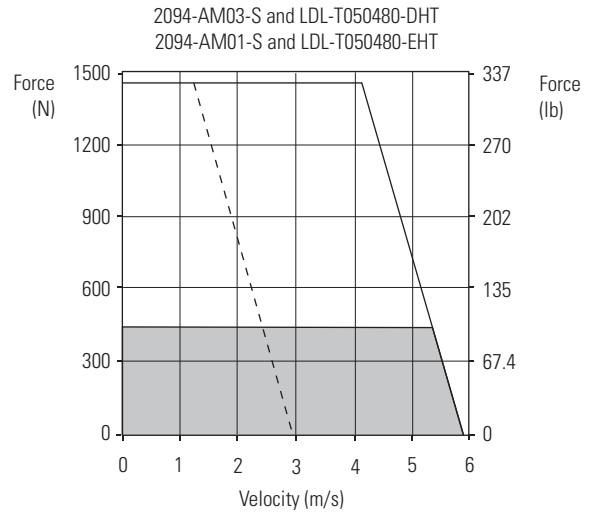
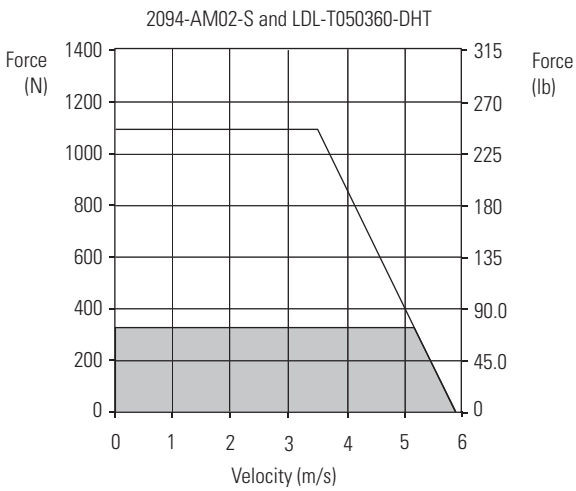
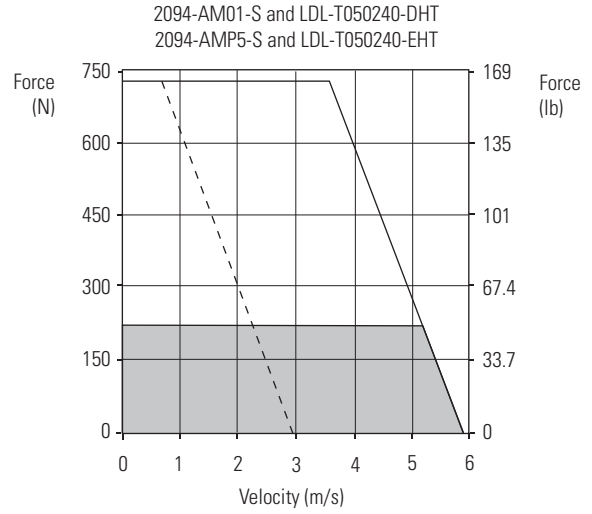
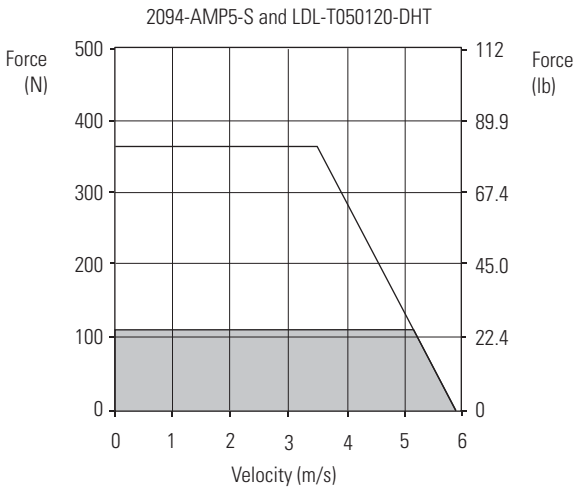


Kinetix 6000 (230V) Drives/LDL-Series Linear Motor Curves, Continued



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 = Intermittent operating region (LDL-xxxxxx-EHT)
 = Continuous operating region

Kinetix 6000 (230V) Drives/LDL-Series Linear Motor Curves, Continued



- = Intermittent operating region (LDL-xxxxxx-DHT)
- = Intermittent operating region (LDL-xxxxxx-EHT)
- = Continuous operating region

Kinetix 2000 (230V) Drives with MP-Series Integrated Linear Stages

This section provides system combination information for the Kinetix 2000 drives when matched with MP-Series (230V) integrated direct-drive or ballscrew linear stages. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Linear Stage Cable Combinations

Linear Stage	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAS-Axxx1-V05SxA	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPAS-Axxx2-V20SxA		2090-XXNFMF-Sxx ⁽³⁾ Incremental Feedback
MPAS-A6xxxB-ALMx2C, MPAS-A8xxxE-ALMx2C, MPAS-A9xxxK-ALMx2C		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Linear Stage Performance Specifications with Kinetix 2000 (230V) Drives

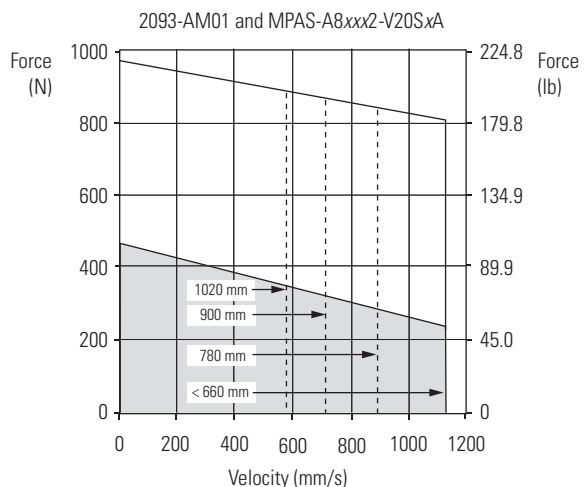
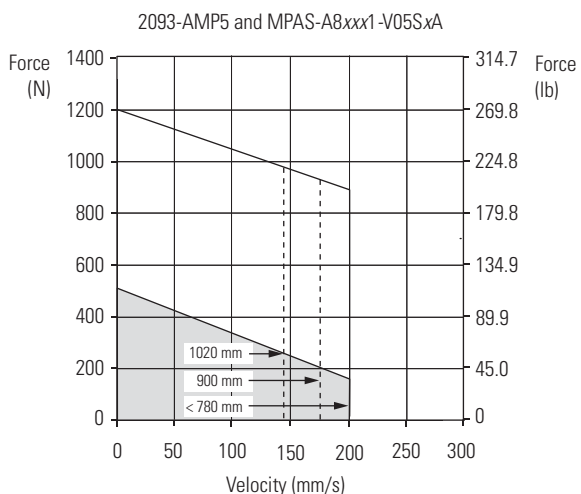
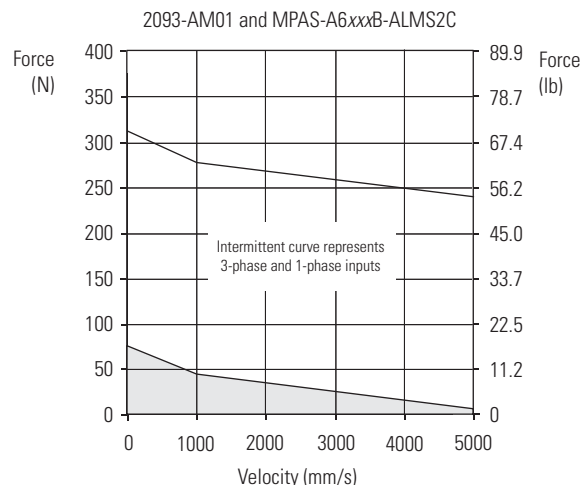
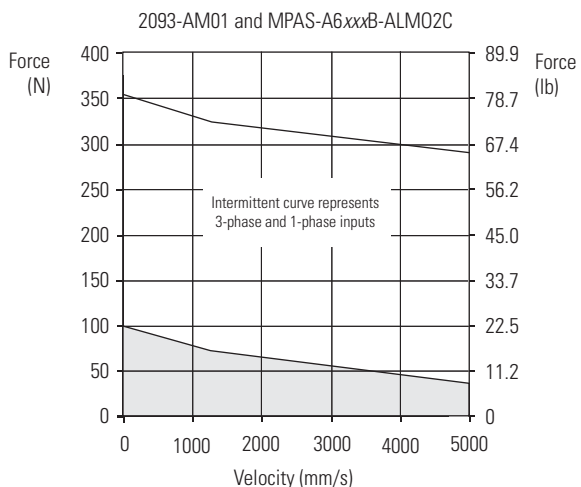
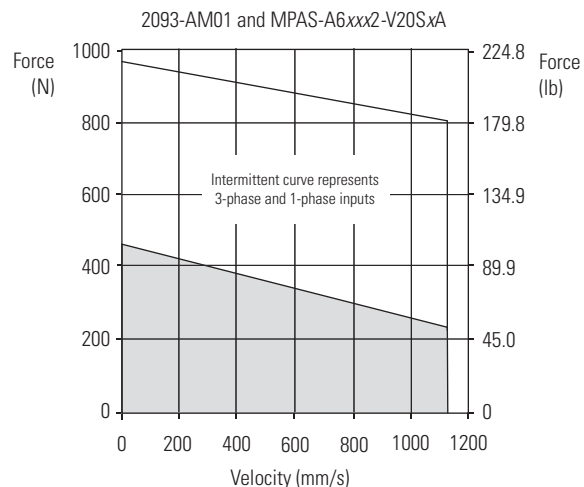
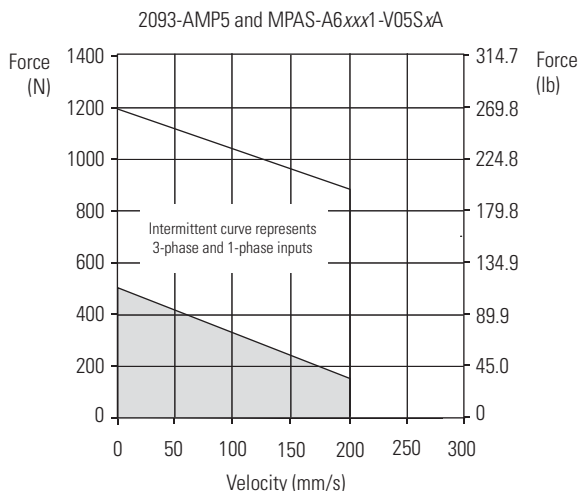
Linear Stage	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Stage Rated Output kW	Kinetix 2000 230V Drives
MPAS-Axxxx1-V05SxA	200 (7.9) ⁽¹⁾	1.41	238 (53.5)	4.20	835 (188)	0.37	2093-AMP1
		2.83	477 (100)	6.10	1212 (272)		2093-AMP2
		3.09	521 (117)				2093-AMP5
MPAS-Axxxx2-V20SxA	1124 (44.3) ⁽²⁾	2.83	288 (64.7)	8.48	902 (203)	0.62	2093-AMP2
		4.24	432 (97.1)	9.10	968 (218)		2093-AMP5
		4.54	462 (104)				2093-AM01
MPAS-A6xxxB-ALM02C	5000 (200)	2.8	45.7 (10.3)	8.5	182 (40.9)	0.32	2093-AMP2
		4.2	79.6 (17.9)	12.7	284 (63.8)		2093-AMP5
		5.3	105 (23.6)	15.8	359 (80.7)		2093-AM01
MPAS-A6xxxB-ALMS2C	5000 (200)	2.8	37.6 (8.45)	8.5	173 (38.9)	0.29	2093-AMP2
		4.2	71.8 (16.1)	12.7	275 (61.8)		2093-AMP5
		4.7	83.0 (18.6)	14.2	312 (70.1)		2093-AM01
MPAS-A8xxxE-ALM02C	5000 (200)	2.8	63.2 (14.2)	8.5	197 (44.3)	0.53	2093-AMP2
		4.2	106 (23.8)	12.7	306 (68.8)		2093-AMP5
		7.0	189 (42.5)	18.5	456 (103)		2093-AM01
MPAS-A8xxxE-ALMS2C	5000 (200)	2.8	54.3 (12.2)	8.5	188 (42.3)	0.48	2093-AMP2
		4.2	96.8 (21.8)	12.7	297 (66.8)		2093-AMP5
		6.3	159 (35.7)	16.7	399 (89.7)		2093-AM01
MPAS-A9xxxK-ALM02C	5000 (200)	2.8	108 (24.3)	8.5	303 (68.1)	0.77	2093-AMP2
		4.2	172 (38.7)	12.7	465 (105)		2093-AMP5
		6.7	285 (64.1)	18.3	680 (153)		2093-AM01
MPAS-A9xxxK-ALMS2C	5000 (200)	2.8	97.0 (21.8)	8.5	294 (66.1)	0.69	2093-AMP2
		4.2	161 (36.2)	12.7	456 (103)		2093-AMP5
		6.1	245 (55.1)	16.5	601 (135)		2093-AM01

(1) For 900 mm stroke length, maximum speed is 176 mm/s (6.9 in./s). For 1020 mm stroke length, maximum speed is 143 mm/s (5.6 in./s).

(2) For 780 mm stroke length, maximum speed is 889 mm/s (35.0 in./s). For 900 mm stroke length, maximum speed is 715 mm/s (28.2 in./s). For 1020 mm stroke length, maximum speed is 582 mm/s (22.9 in./s).

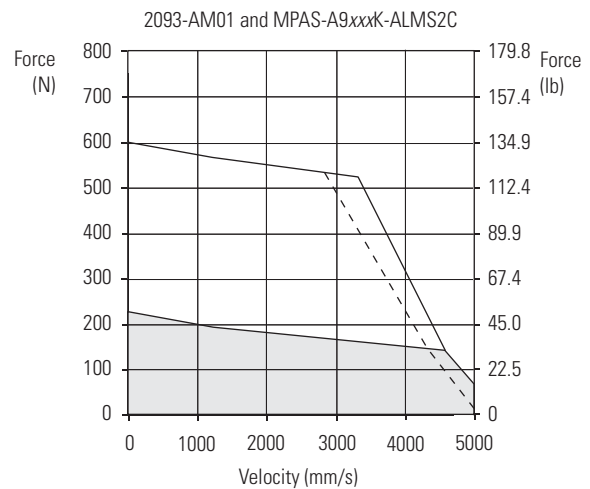
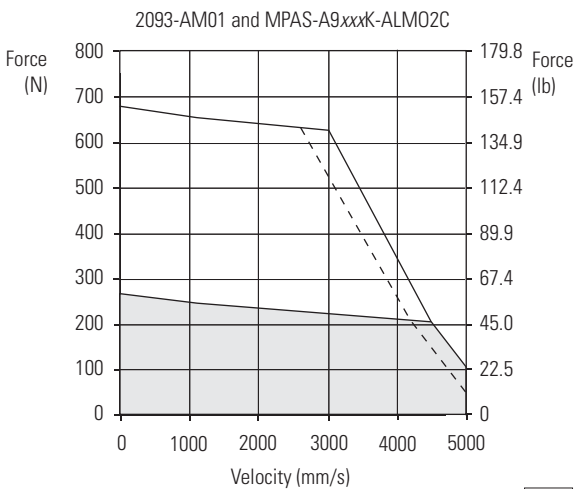
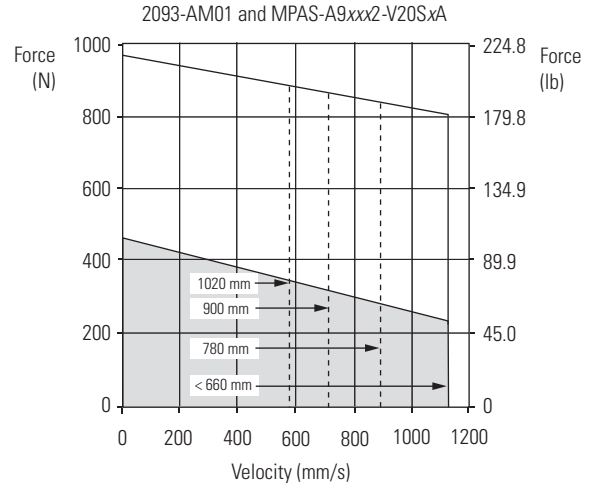
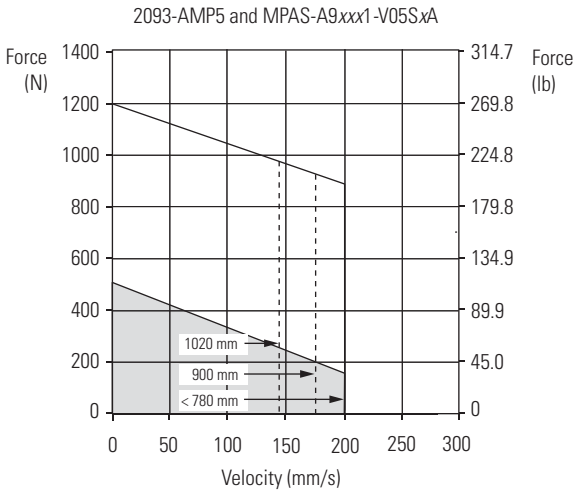
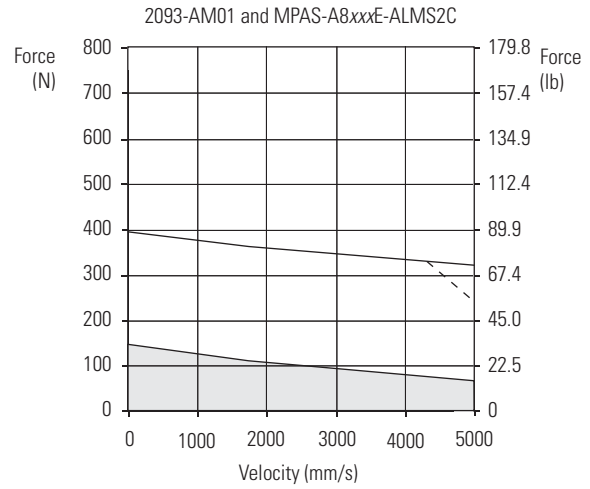
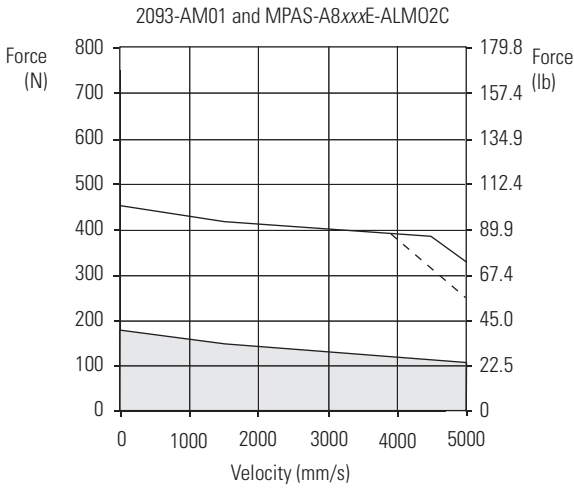
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 2000 (230V) Drives/MP-Series Integrated Linear Stage Curves



- = Intermittent operating region
- = Continuous operating region
- = System operation for specified stroke length

Kinetix 2000 (230V) Drives/MP-Series Integrated Linear Stage Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = System operation (single-phase input)
- = System operation for specified stroke length

Kinetix 2000 (230V) Drives with MP-Series Electric Cylinders

This section provides system combination information for the Kinetix 2000 drives when matched with MP-Series (230V) electric cylinders. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Electric Cylinder Cable Combinations

Electric Cylinder	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAR-A1 _{xxx} B MPAR-A1 _{xxx} E	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Absolute High-resolution Feedback
MPAR-A2 _{xxx} C MPAR-A2 _{xxx} F		
MPAR-A3 _{xxx} E MPAR-A3 _{xxx} H	2090-XXNPMF-16S _{xx} ⁽⁴⁾	2090-XXNFMF-S _{xx} ⁽⁵⁾ Absolute High-resolution Feedback

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16S_{xx}) or continuous-flex (catalog number 2090-CPxM4DF-16AF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM4DF-CDAF_{xx}).

(4) These cables are available as standard (catalog number 2090-XXNPMF-16S_{xx}) or continuous-flex (catalog number 2090-CPxM7DF-16AF_{xx}).

(5) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

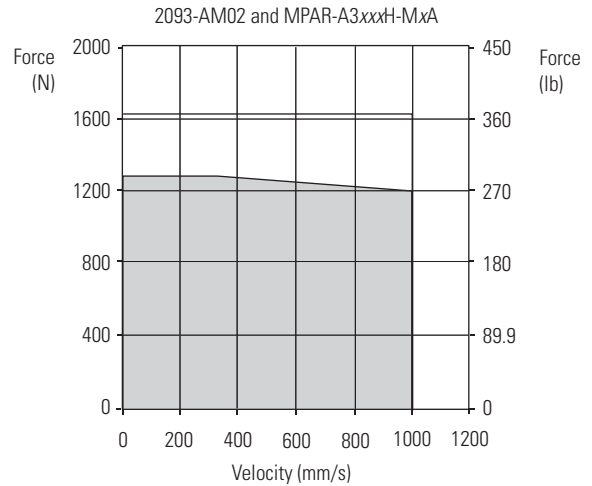
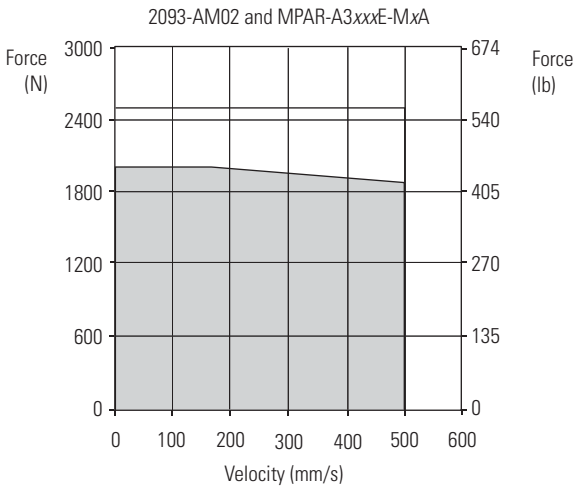
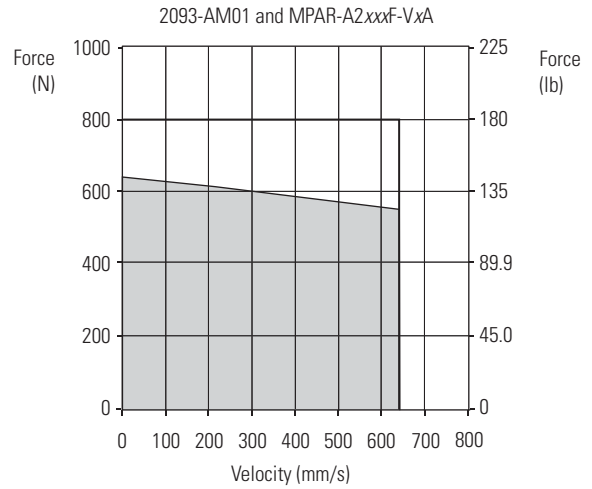
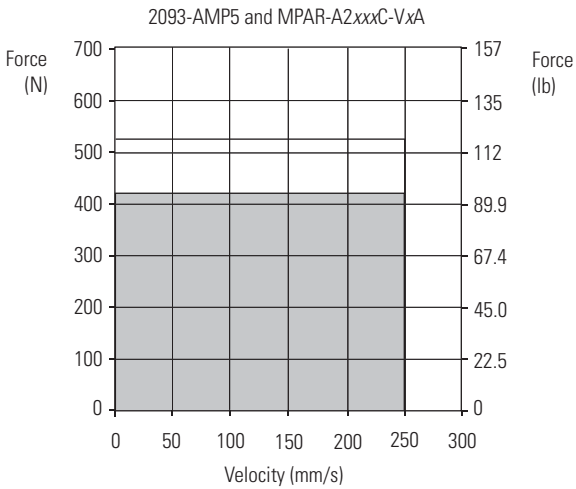
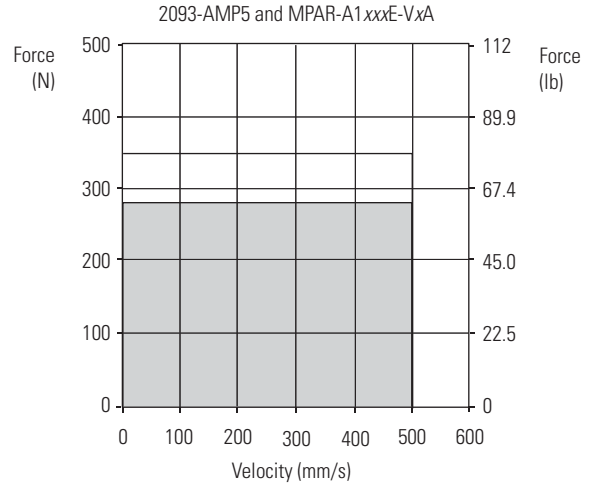
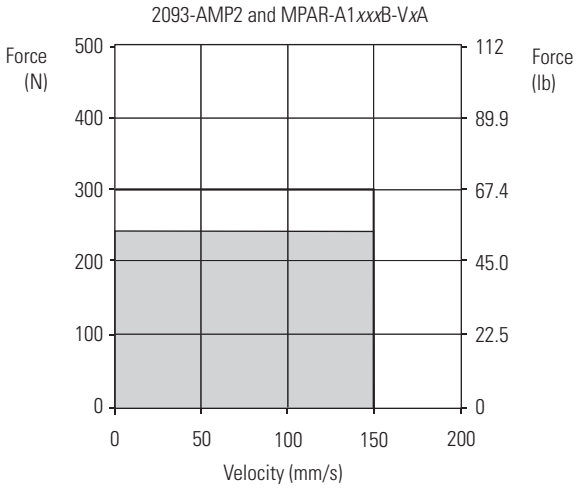
Cable length *xx* is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Electric Cylinder Performance Specifications with Kinetix 2000 Drives

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 2000 Drives
MPAR-A1 _{xxx} B	150	1.15	240 (53.9)	1.34	300 (67.4)	0.036	2093-AMP2
MPAR-A1 _{xxx} E	500	2.15	280 (62.9)	2.48	350 (78.7)	0.140	2093-AMP5
MPAR-A2 _{xxx} C	250	2.41	420 (94.4)	2.71	525 (118)	0.105	
MPAR-A2 _{xxx} F	640	4.54	640 (144)	5.41	800 (180)	0.409	2093-AM01
MPAR-A3 _{xxx} E	500	10.33	2000 (450)	12.34	2500 (562)	1.000	2093-AM02
MPAR-A3 _{xxx} H	1000	12.2	1300 (292)	16.4	1625 (365)	1.300	

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 2000 Drives/MP-Series Electric Cylinder Curves



= Intermittent operating region
 = Continuous operating region

Kinetix 2000 (230V) Drives with MP-Series Heavy Duty Electric Cylinders

This section provides system combination information for the Kinetix 2000 drives when matched with MP-Series (230V) heavy-duty electric cylinders. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Electric Cylinder Cable Combinations

Electric Cylinder	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAI-A3xxxC MPAI-A3xxxE MPAI-A3xxxR MPAI-A3xxxS	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPAI-A4xxxC MPAI-A4xxxE MPAI-A4xxxR MPAI-A4xxxS		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM7DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Electric Cylinder Performance Specifications with Kinetix 2000 Drives

Performance Specifications with Ball Screw Electric Cylinders

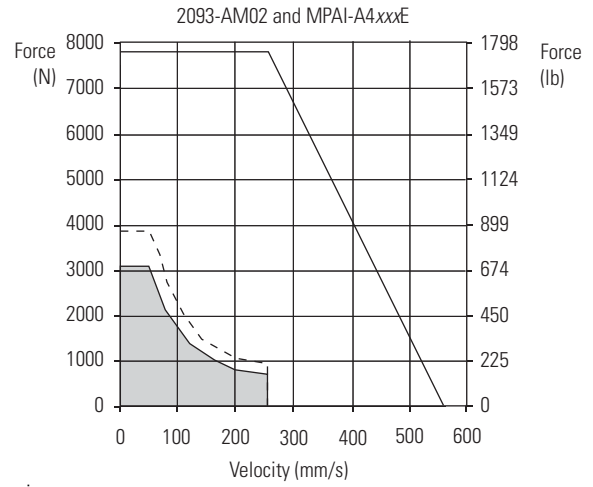
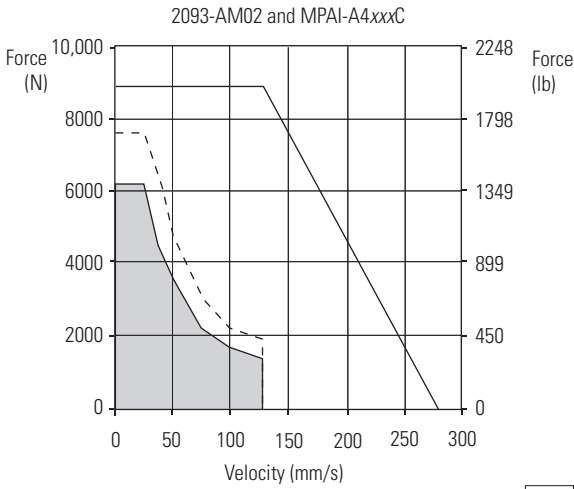
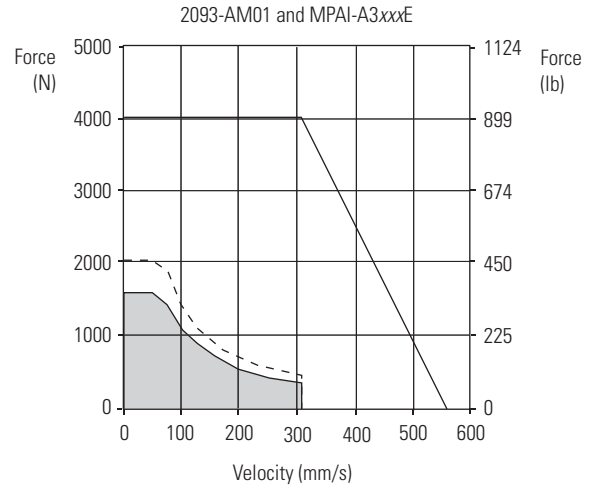
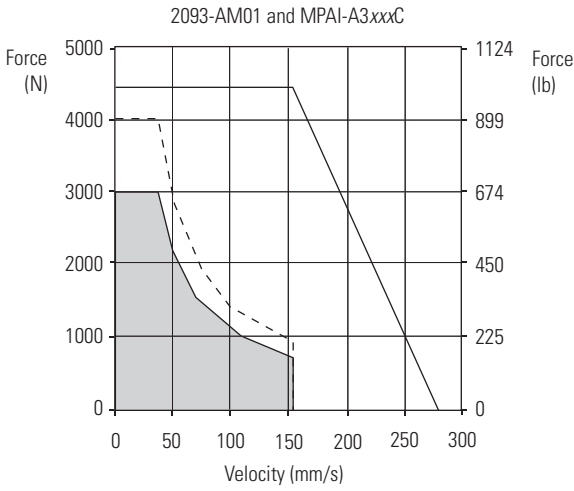
Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 2000 Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-A3xxxC	279 (11)	5.61	4003 (900)	3176 (714)	8.40	4448 (1000)	0.39	2093-AM01
MPAI-A3xxxE	559 (22)		2002 (450)	1588 (357)	14.14	4003 (900)		
MPAI-A4xxxC	279 (11)	10.89	7784 (1750)	6179 (1389)	17.07	8896 (2000)	0.43	2093-AM02
MPAI-A4xxxE	559 (22)		3892 (875)	3092 (695)	27.44	7784 (1750)		

Performance Specifications with Roller Screw Electric Cylinders

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 2000 Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-A3xxxR	279 (11)	5.61	3781 (850)	3003 (675)	14.14	7562 (1700)	0.39	2093-AM01
MPAI-A3xxxS	559 (22)		1891 (425)	1499 (337)		3781 (850)		
MPAI-A4xxxR	279 (11)	10.89	7340 (1650)	5827 (1310)	27.44	14,679 (3300)	0.43	2093-AM02
MPAI-A4xxxS	559 (22)		3670 (825)	2914 (655)		7340 (1650)		

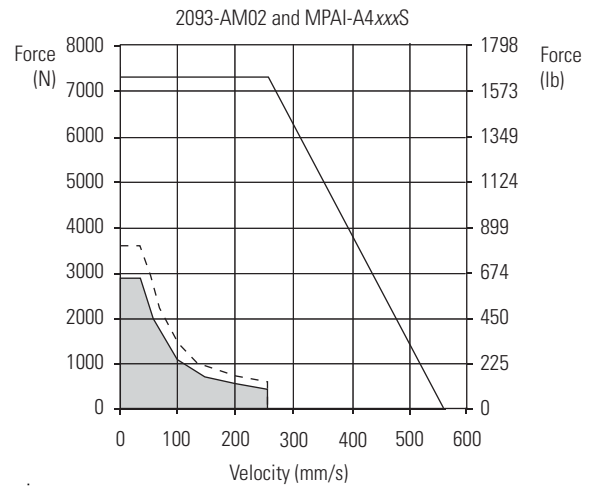
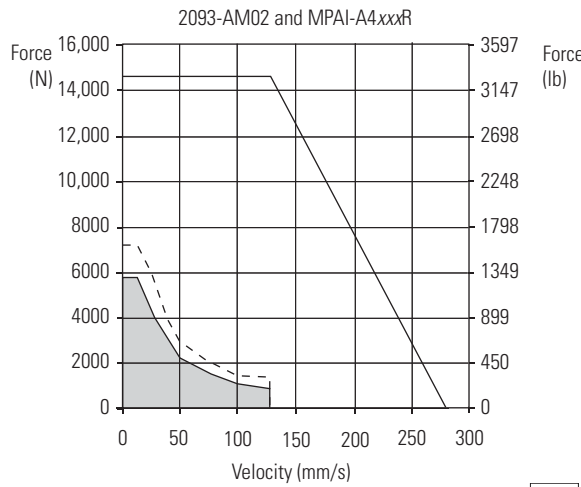
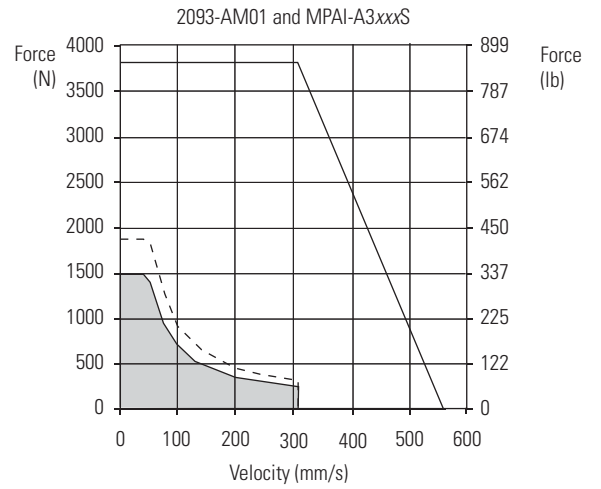
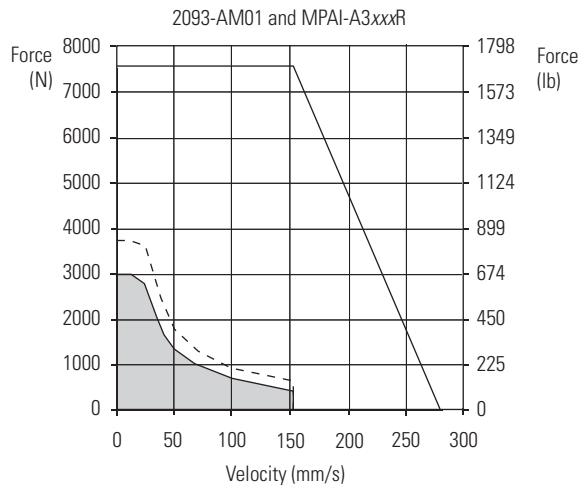
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.8 or later.

Kinetix 2000 Drives/MP-Series Heavy Duty (ball screw) Electric Cylinder Curves



= Intermittent operating region
 = Continuous operating region @ 25 °C (77 °F)
 = Continuous operating region @ 40 °C (104 °F)

Kinetix 2000 Drives/MP-Series Heavy Duty (roller screw) Electric Cylinder Curves



= Intermittent operating region
 = Continuous operating region @ 25 °C (77 °F)
 = Continuous operating region @ 40 °C (104 °F)

Kinetix 2000 (230V) Drives with TL-Series Electric Cylinders

This section provides system combination information for the Kinetix 2000 drives when matched with TL-Series (230V) electric cylinders. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Electric Cylinder Cable Combinations

Electric Cylinder	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
TLAR-A1xxxB TLAR-A1xxxE	2090-CPWM6DF-16AAxx (standard) (without brake)	2090-CFBM6DF-CBAAxx (standard) Absolute High-resolution Feedback
TLAR-A2xxxC TLAR-A2xxxF	2090-CPBM6DF-16AAxx (standard) (with brake)	
TLAR-A3xxxE TLAR-A3xxxH		

(1) The TLY-Axxxx-B motors with 17-bit high-resolution encoder feedback (mounted to the electric cylinder) require the 2090-CFBM6DF-CBAAxx flying-lead feedback cable and 2090-K2CK-D15M connector kit with 2090-DA-BAT2 battery. Refer to Breakout Components and Connector Kits beginning on [page 418](#) for more information.

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Electric Cylinder (non-brake) Performance Specifications with Kinetix 2000 Drives

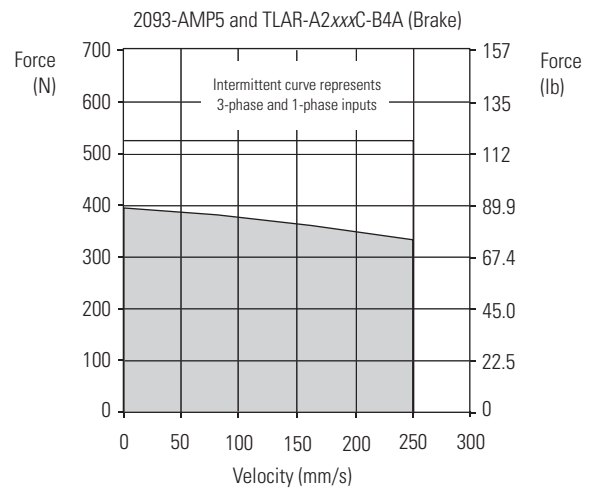
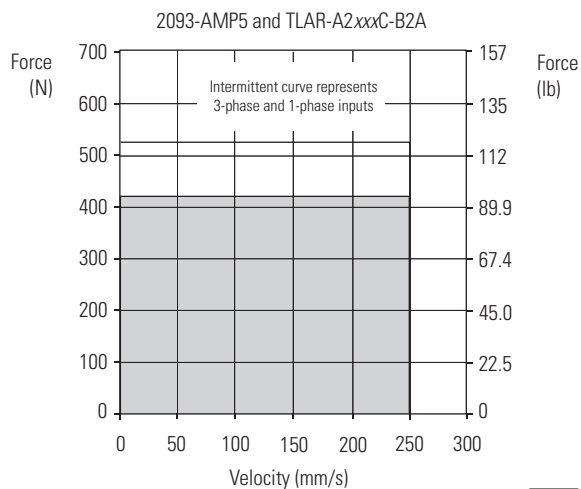
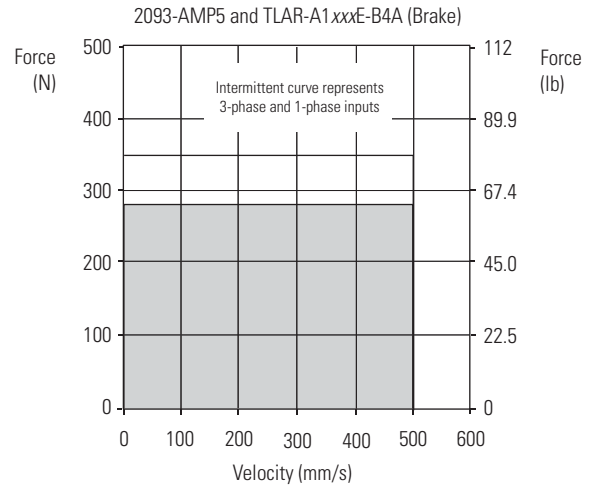
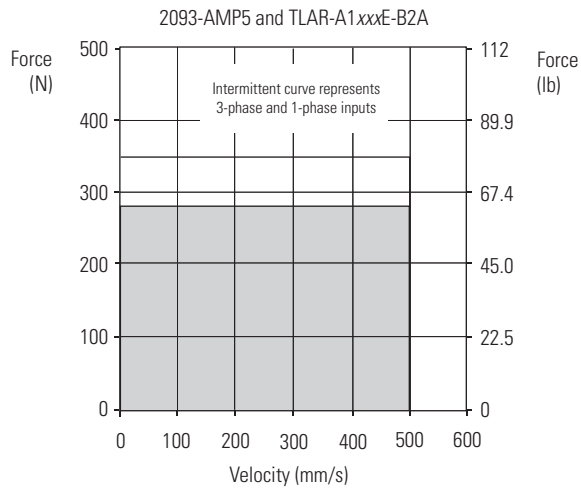
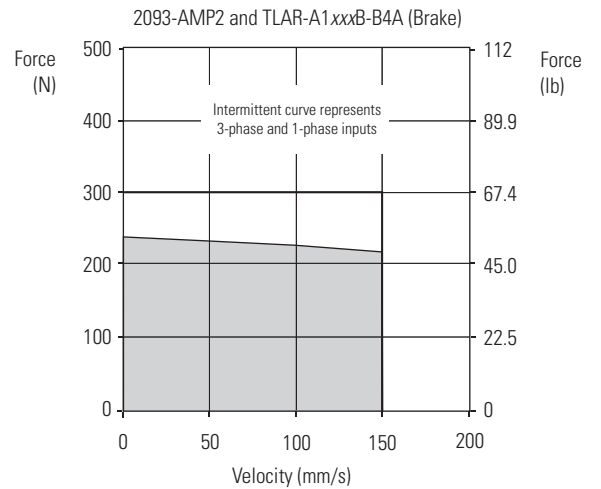
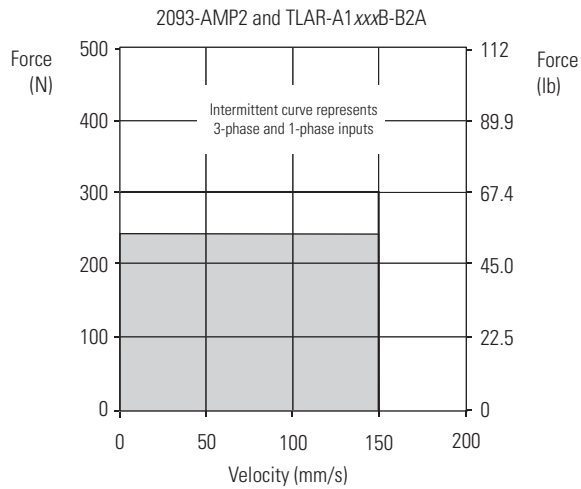
Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 2000 230V Drives
TLAR-A1xxxB	150	1.36	240 (53.9)	1.79	300 (67.4)	0.036	2093-AMP2
TLAR-A1xxxE	500	2.59	280 (62.9)	3.03	350 (78.7)	0.140	2093-AMP5
TLAR-A2xxxC	250	3.03	420 (94.4)	3.41	525 (118)	0.105	
TLAR-A2xxxF	640	5.50	640 (144)	7.25	800 (180)	0.350	2093-AM01
TLAR-A3xxxE	500	10.0	2000 (450)	12.9	2500 (562)	0.930	2093-AM02
TLAR-A3xxxH	1000		1300 (292)	17.2	1625 (365)		

Electric Cylinder (brake) Performance Specifications with Kinetix 2000 Drives

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Kinetix 2000 230V Drives
TLAR-A1xxxB	150	1.18	240 (53.9)	1.79	300 (67.4)	0.036	2093-AMP2
TLAR-A1xxxE	500	2.24	280 (62.9)	3.03	350 (78.7)	0.140	2093-AMP5
TLAR-A2xxxC	250	2.68	420 (94.4)	3.41	525 (118)	0.105	
TLAR-A2xxxF	640	4.95	640 (144)	7.25	800 (180)	0.350	2093-AM01
TLAR-A3xxxE	500	10.0	2000 (450)	12.9	2500 (562)	0.930	2093-AM02
TLAR-A3xxxH	1000		1300 (292)	17.2	1625 (365)		

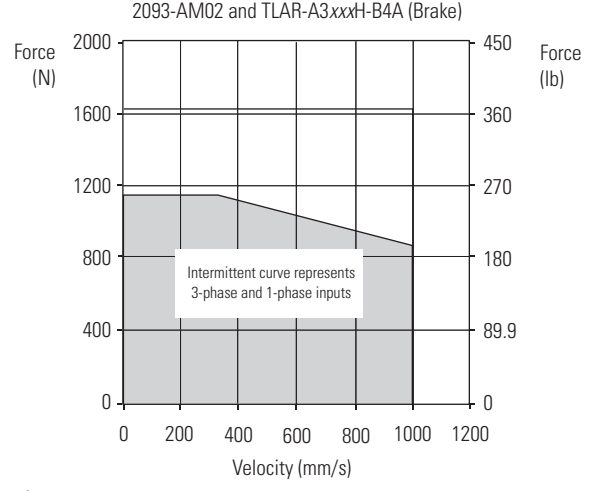
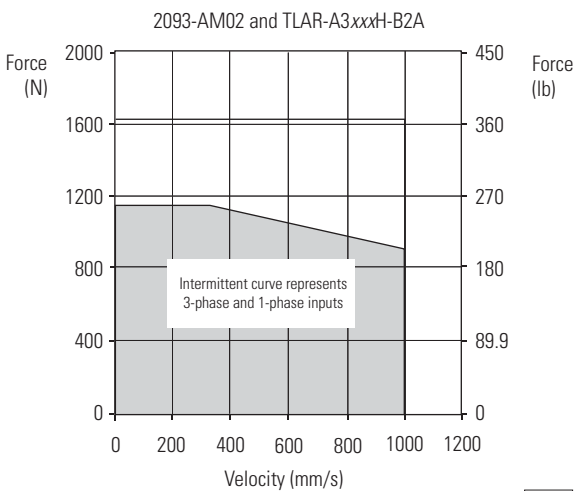
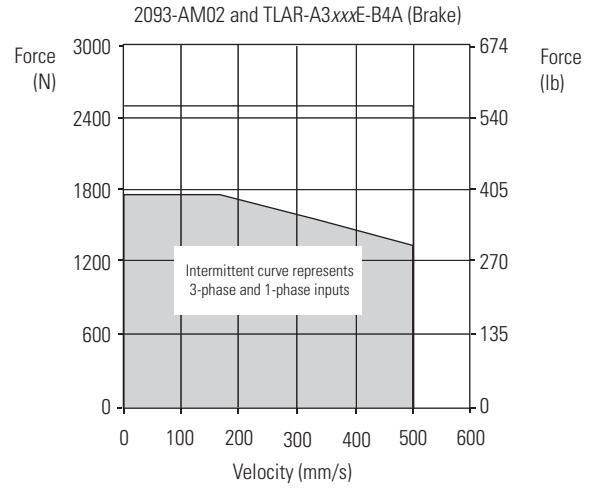
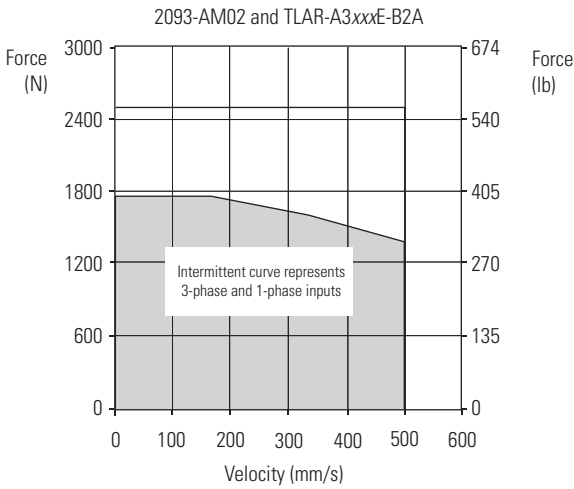
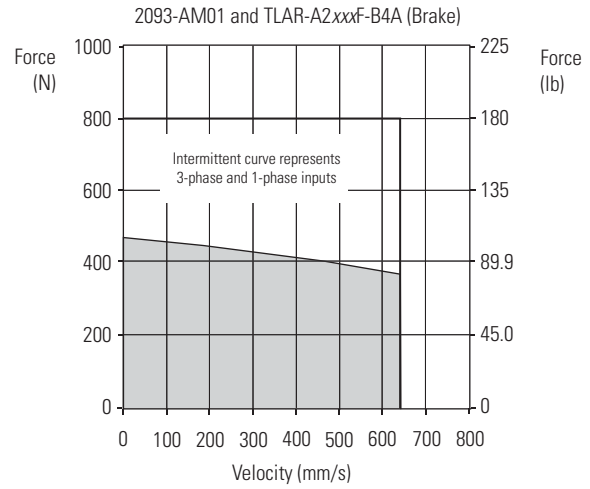
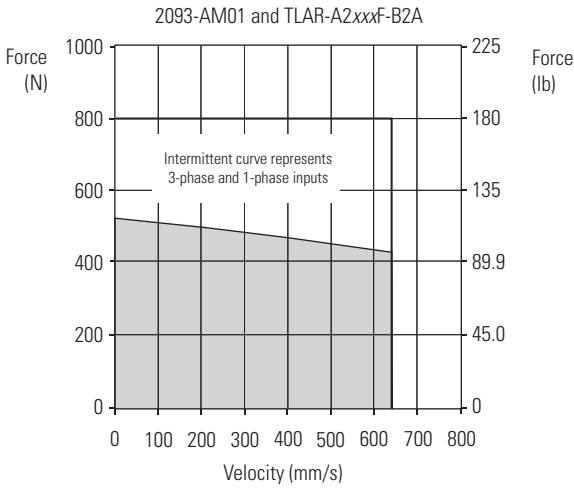
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 2000 (230V) Drives/TL-Series Electric Cylinder Curves



= Intermittent operating region
 = Continuous operating region

Kinetix 2000 (230V) Drives/TL-Series Electric Cylinder Curves, Continued



□ = Intermittent operating region
 ■ = Continuous operating region

Kinetix 2000 (230V) Drives with LDC-Series Linear Motors

This section provides system combination information for the Kinetix 2000 drives when matched with LDC-Series iron-core linear motors. Included are power and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Linear Motor Cable Combinations

Linear Motor	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
LDC-C030100-DHT, LDC-C030200-DHT, LDC-C030200-EHT	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Sin/Cos or TTL Encoder Feedback
LDC-C050100-DHT, LDC-C050200-DHT, LDC-C050200-EHT, LDC-C050300-DHT, LDC-C050300-EHT		
LDC-C075200-DHT, LDC-C075200-EHT, LDC-C075300-DHT, LDC-C075300-EHT, LDC-C075400-DHT, LDC-C075400-EHT		
LDC-C100300-DHT, LDC-C100300-EHT, LDC-C100400-DHT, LDC-C100400-EHT, LDC-C100600-DHT		
LDC-C150400-DHT, LDC-C150600-DHT		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPWM7DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

LDC-Series Performance Specifications with Kinetix 2000 (230V) Drives

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current ⁽¹⁾ Amps 0-pk	System Continuous Stall Force ⁽¹⁾ N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Kinetix 2000 230V Drives
LDC-C030100-DHT	10.0 (32.8)	4.1...6.1	74...111 (17...25)	12.1	188 (42)	0.37...0.55	2093-AMP5
LDC-C030200-DHT		8.1...12.2	148...222 (33...50)	24.3	375 (84)	0.74...1.11	2093-AM01
LDC-C030200-EHT		4.1...6.1		12.1			2093-AMP5
LDC-C050100-DHT	10.0 (32.8)	3.9...5.9	119...179 (27...40)	11.7	302 (68)	0.59...0.89	2093-AMP5
LDC-C050200-DHT		7.9...11.8	240...359 (54...81)	23.3	600 (135)	1.20...1.79	2093-AM01
LDC-C050200-EHT		3.9...5.9		11.6			2093-AMP5
LDC-C050300-DHT		11.8...17.7	363...544 (82...122)	35.9	941 (212)	1.81...2.72	2093-AM02
LDC-C050300-EHT		3.9...5.9		12.0			2093-AMP5

(1) Values represent the range between no cooling (low value) and water cooling (high value).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

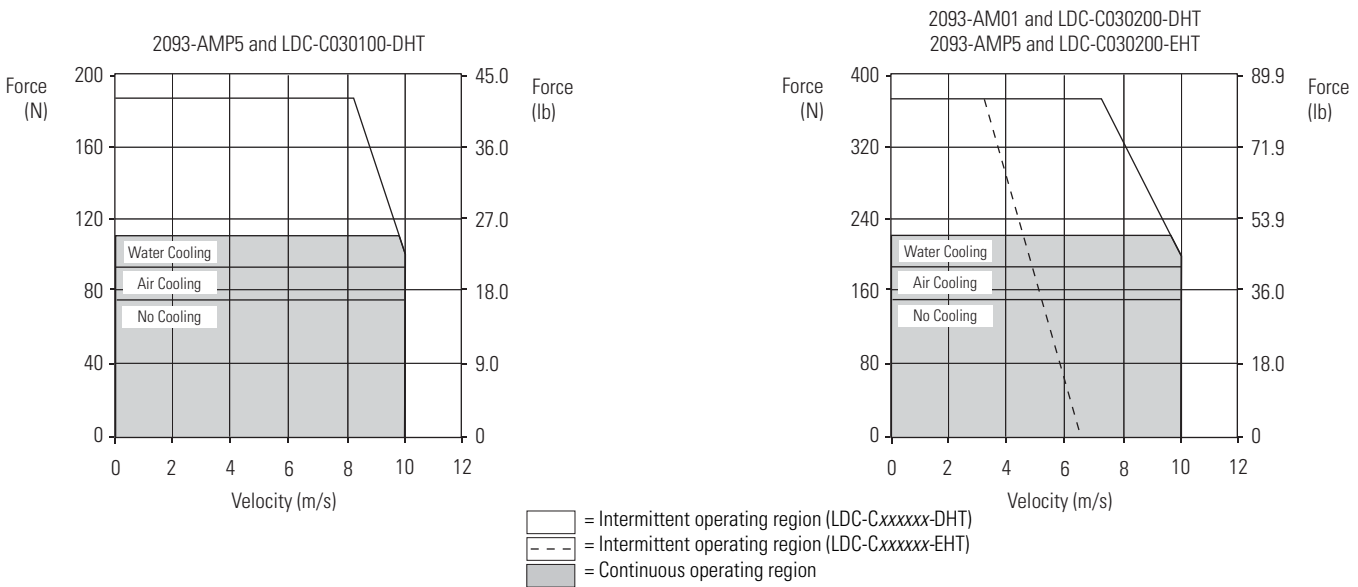
LDC-Series Performance Specifications with Kinetix 2000 (230V) Drives, Continued

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current ⁽¹⁾ Amps 0-pk	System Continuous Stall Force ⁽¹⁾ N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Kinetix 2000 230V Drives
LDC-C075200-DHT	10.0 (32.8)	7.7...11.5	348...523 (78...117)	22.9	882 (198)	1.74...2.61	2093-AM01
LDC-C075200-EHT		3.8...5.7		11.5			2093-AMP5
LDC-C075300-DHT		11.5...17.2	523...784 (117...176)	35.6	1368 (308)	2.61...3.92	2093-AM02
LDC-C075300-EHT		3.8...5.7		11.9			2093-AMP5
LDC-C075400-DHT		15.3...23.0	697...1045 (157...235)	47.4	1824 (410)	3.48...5.22	2093-AM02
LDC-C075400-EHT		7.7...11.5		23.7			2093-AM01
LDC-C100300-DHT	10.0 (32.8)	11.1...16.7	674...1012 (152...227)	34.3	1767 (397)	3.37...5.06	2093-AM02
LDC-C100300-EHT		3.7...5.6		11.4			2093-AMP5
LDC-C100400-DHT		14.8...22.2	899...1349 (202...303)	45.7	2356 (530)	4.49...6.74	2093-AM02
LDC-C100400-EHT		7.4...11.1		22.8			2093-AM01
LDC-C100600-DHT		22.2...33.3	1349...2023 (303...455)	68.5	3534 (794)	6.74...10.11	2093-AM02
LDC-C150400-DHT		10.0 (32.8)	14.1...21.1	1281...1922 (288...432)	45.2	3498 (786)	6.40...9.61
LDC-C150600-DHT	21.1...31.7		1922...2882 (432...648)	67.8	5246 (1179)	9.61...14.41	2093-AM02

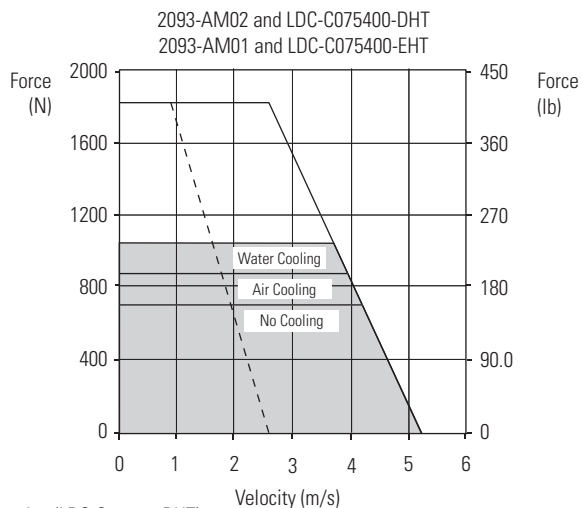
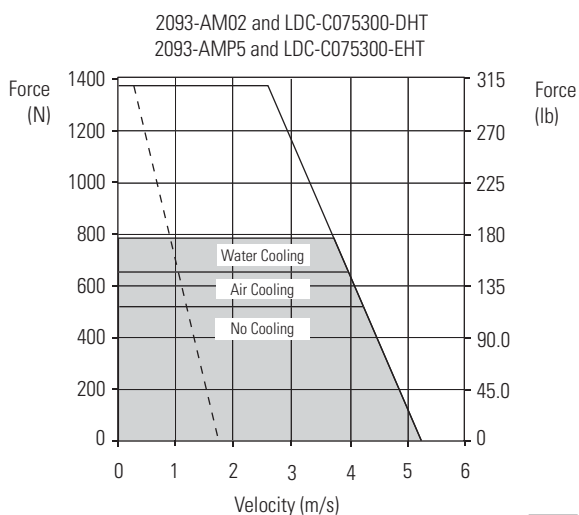
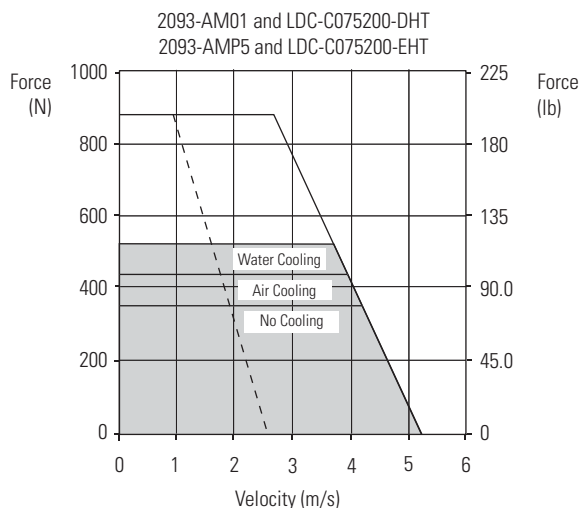
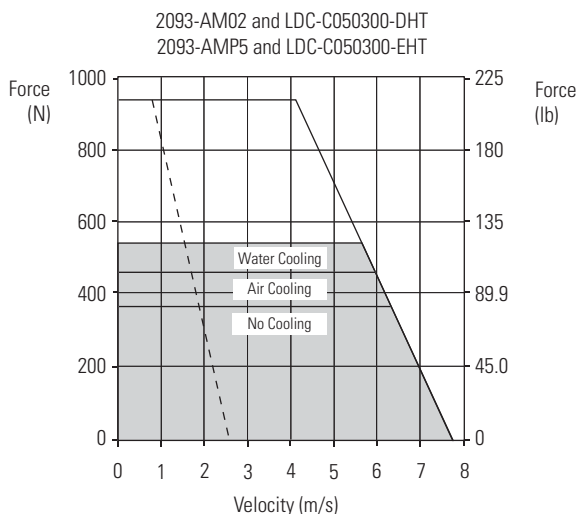
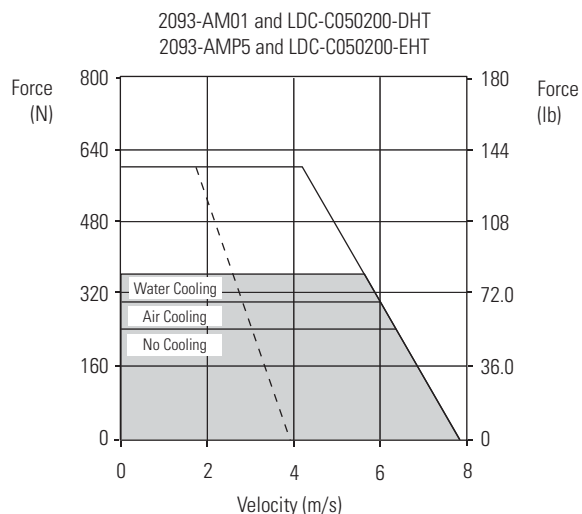
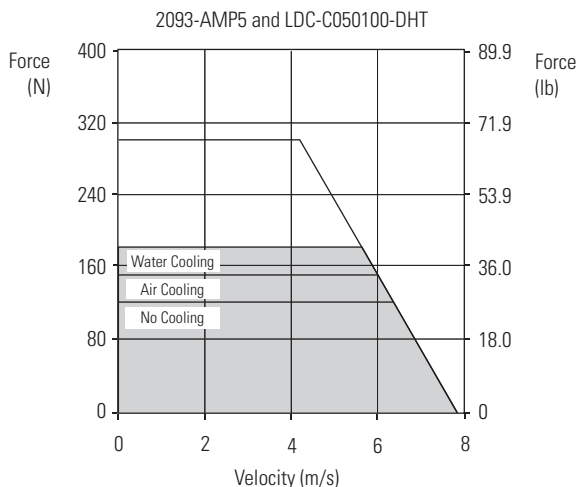
(1) Values represent the range between no cooling (low value) and water cooling (high value).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 2000 (230V) Drives/LDC-Series Linear Motor Curves

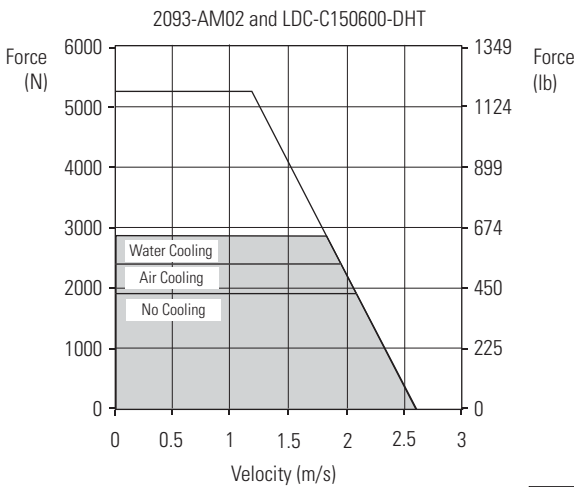
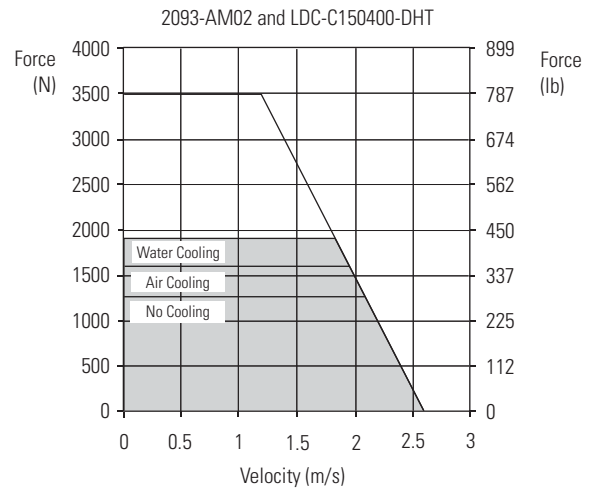
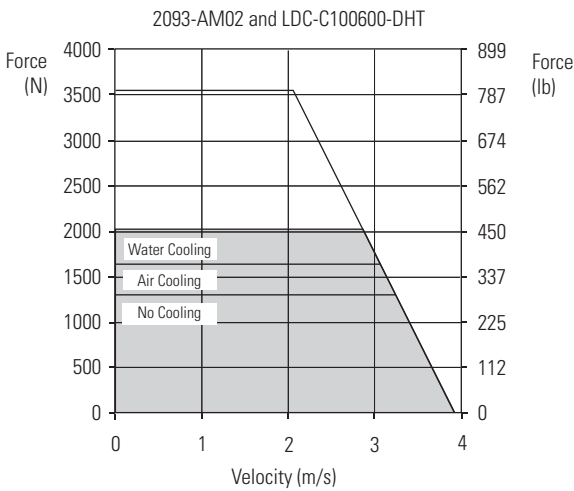
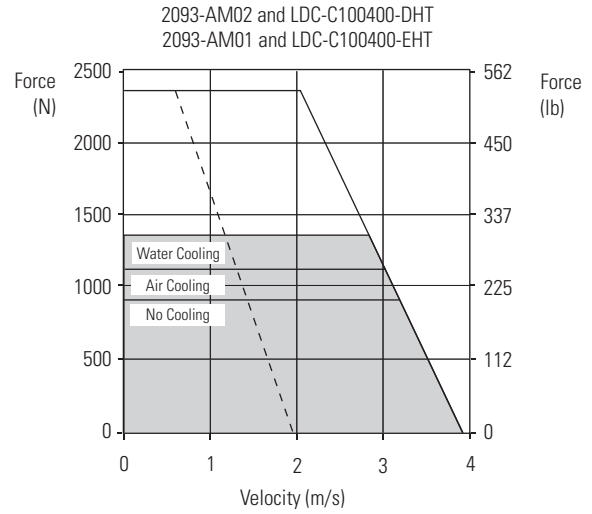
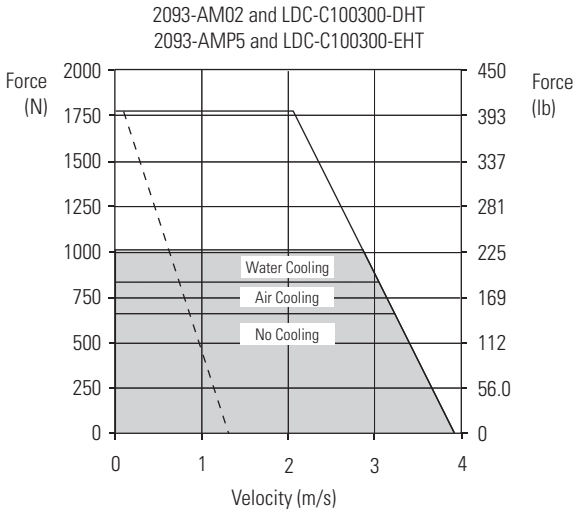


Kinetix 2000 (230V) Drives/LDC-Series Linear Motor Curves, Continued



- = Intermittent operating region (LDC-Cxxxxx-DHT)
- = Intermittent operating region (LDC-Cxxxxx-EHT)
- = Continuous operating region

Kinetix 2000 (230V) Drives/LDC-Series Linear Motor Curves, Continued



- = Intermittent operating region (LDC-Cxxxxx-DHT)
- = Intermittent operating region (LDC-Cxxxxx-EHT)
- = Continuous operating region

Kinetix 2000 (230V) Drives with LDL-Series Linear Motors

This section provides system combination information for the Kinetix 2000 drives when matched with LDL-Series ironless linear motors. Included are power and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Linear Motor Cable Combinations

Linear Motors	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
LDL-N030120-DHT, LDL-N030240-DHT, LDL-N030240-EHT	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Sin/Cos or TTL Encoder Feedback
LDL-N050120-DHT, LDL-N050240-DHT, LDL-N050240-EHT, LDL-N050360-DHT, LDL-N050360-EHT, LDL-N050480-DHT, LDL-N050480-EHT		
LDL-N075480-DHT, LDL-N075480-EHT		
LDL-T030120-DHT, LDL-T030240-DHT, LDL-T030240-EHT		
LDL-T050120-DHT, LDL-T050240-DHT, LDL-T050240-EHT, LDL-T050360-DHT, LDL-T050480-DHT, LDL-T050480-EHT		
LDL-T075480-EHT, LDL-T075480-EHT		

(1) Use low-profile connector kit (catalog number 2090-K2CK-D15M) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16S_{xx}) or continuous-flex (catalog number 2090-CPWM7DF-16AF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length *xx* is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

LDL-Series Performance Specifications with Kinetix 2000 (230V) Drives

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Kinetix 2000 230V Drives
LDL-N030120-DHT	10.0 (32.8)	3.0	63 (14)	9.9	209 (47)	0.31	2093-AMP5
LDL-N030240-DHT		6.0	126 (28)	19.9	417 (94)	0.63	2093-AM01
LDL-N030240-EHT		3.0		9.9			2093-AMP5
LDL-T030120-DHT		3.0	72 (16)	9.9	239 (54)	0.36	2093-AMP5
LDL-T030240-DHT		6.0	144 (32)	19.9	479 (108)	0.72	2093-AM01
LDL-T030240-EHT		3.0		9.9			2093-AMP5

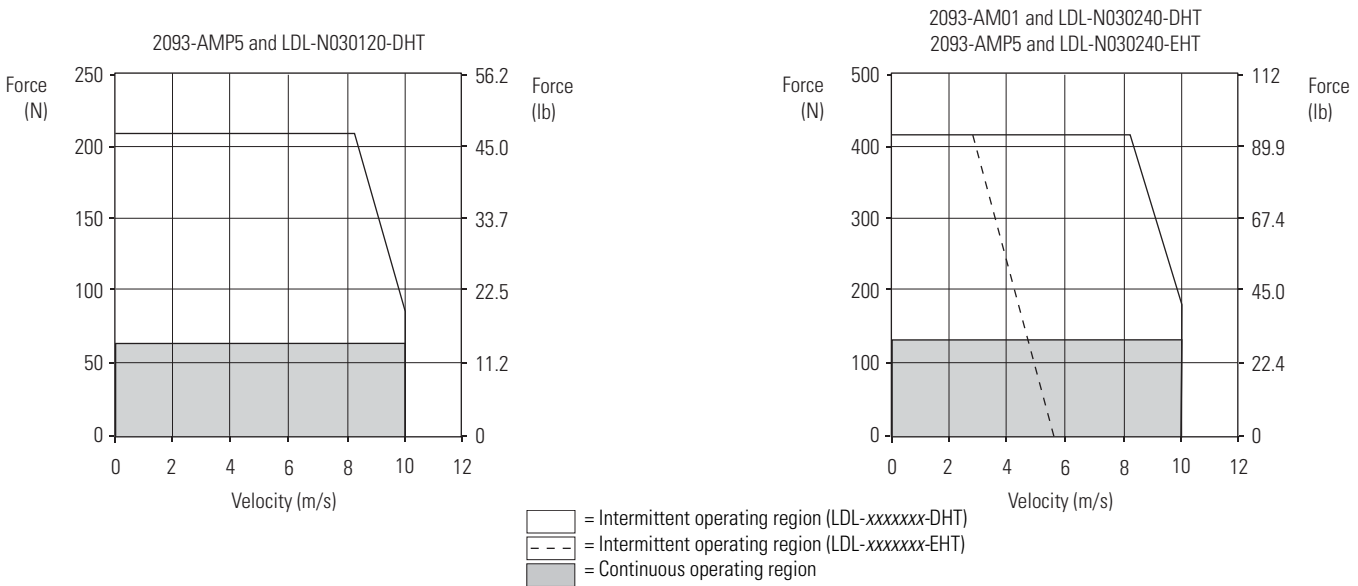
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

LDL-Series Performance Specifications with Kinetix 2000 (230V) Drives, Continued

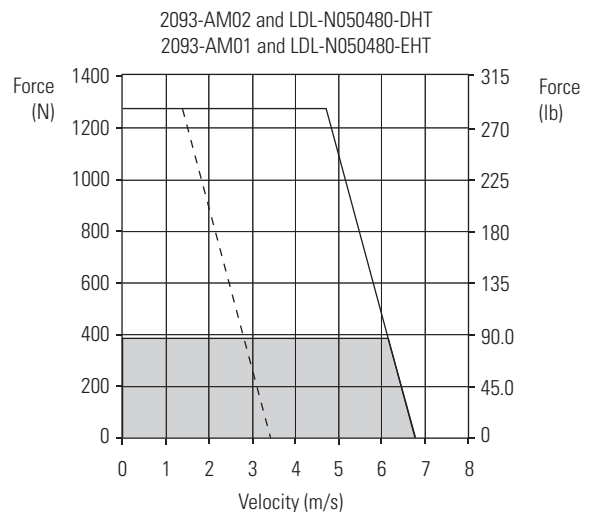
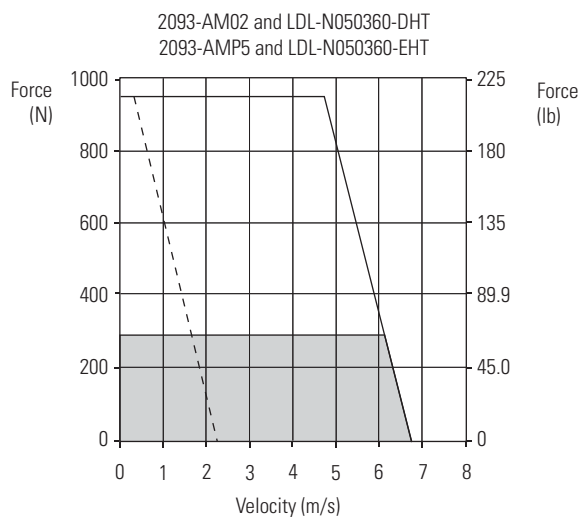
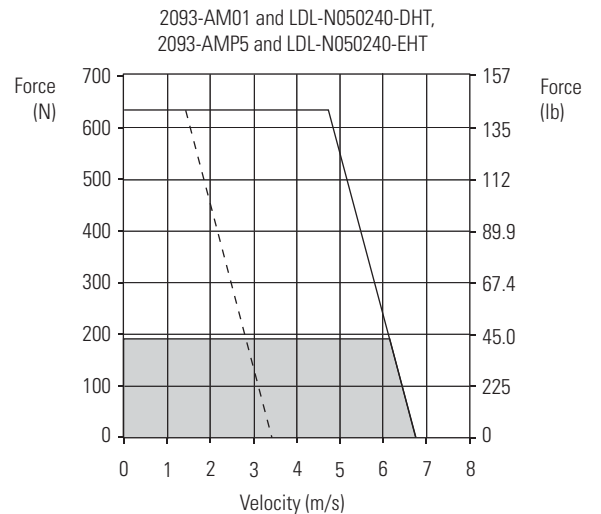
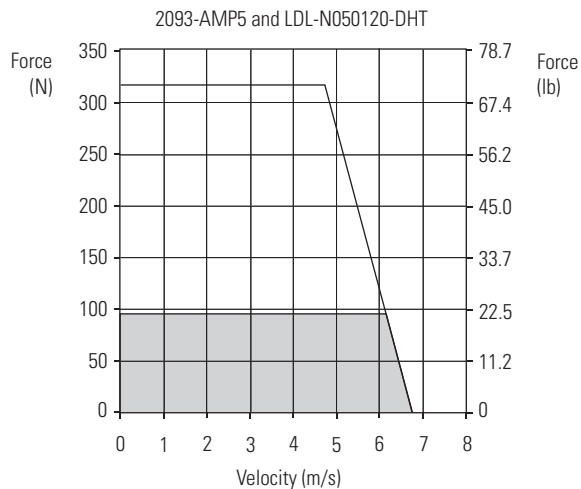
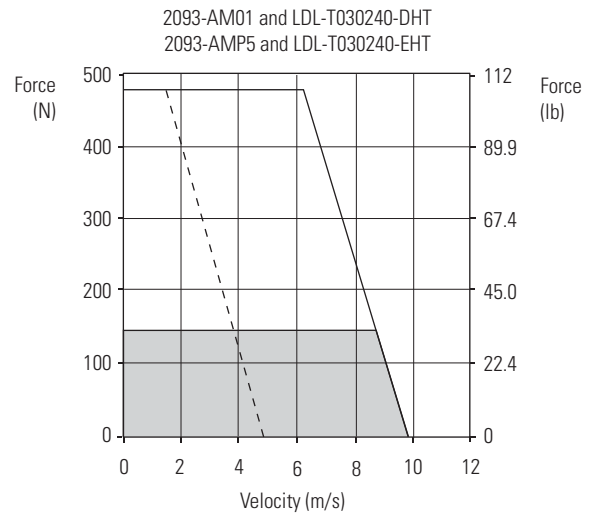
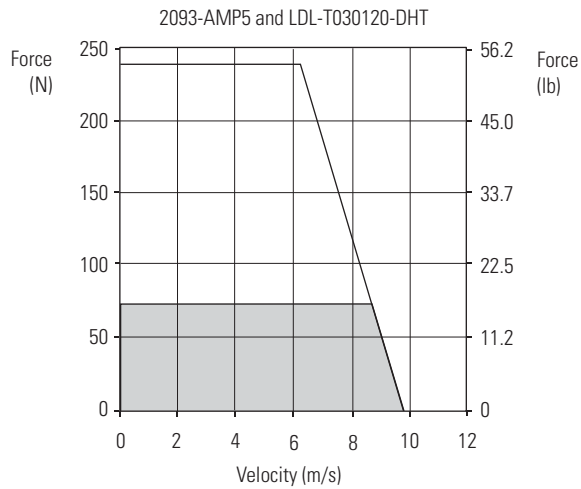
Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Kinetix 2000 230V Drives
LDL-N050120-DHT	10.0 (32.8)	2.7	96 (22)	9.1	317 (71)	0.48	2093-AMP5
LDL-N050240-DHT		5.5	191 (43)	18.1	635 (143)	0.95	2093-AM01
LDL-N050240-EHT		2.7		9.1			2093-AMP5
LDL-N050360-DHT		8.2	287 (65)	27.2	952 (214)	1.43	2093-AM02
LDL-N050360-EHT		2.7		9.1			2093-AMP5
LDL-N050480-DHT		10.9	383 (86)	36.3	1269 (285)	1.91	2093-AM02
LDL-N050480-EHT		5.5		18.1			2093-AM01
LDL-T050120-DHT		2.7	110 (25)	9.1	364 (82)	0.55	2093-AMP5
LDL-T050240-DHT		5.5	220 (49)	18.1	728 (164)	1.10	2093-AM01
LDL-T050240-EHT		2.7		9.1			2093-AMP5
LDL-T050360-DHT		8.2	329 (74)	27.2	1093 (246)	1.64	2093-AM02
LDL-T050480-DHT		10.9	439 (99)	36.3	1457 (327)	2.19	2093-AM02
LDL-T050480-EHT		5.5		18.1			2093-AM01
LDL-N075480-DHT		9.9	519 (117)	32.8	1723 (387)	2.59	2093-AM02
LDL-N075480-EHT		4.9		16.4			2093-AM01
LDL-T075480-DHT		9.9	596 (134)	32.8	1977 (444)	2.98	2093-AM02
LDL-T075480-EHT	4.9	16.4		2093-AM01			

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Kinetix 2000 (230V) Drives/LDL-Series Linear Motor Curves

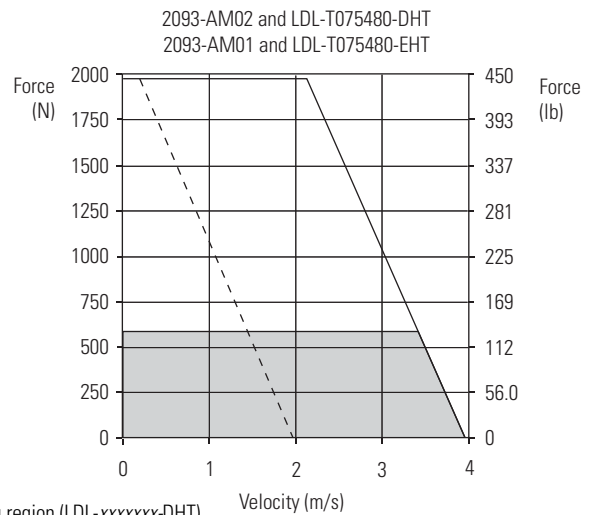
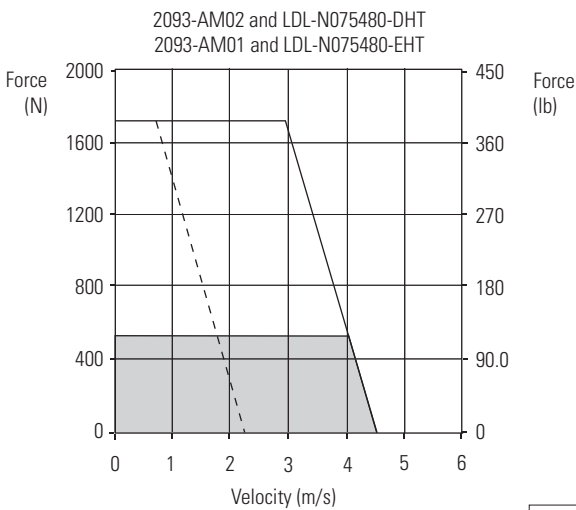
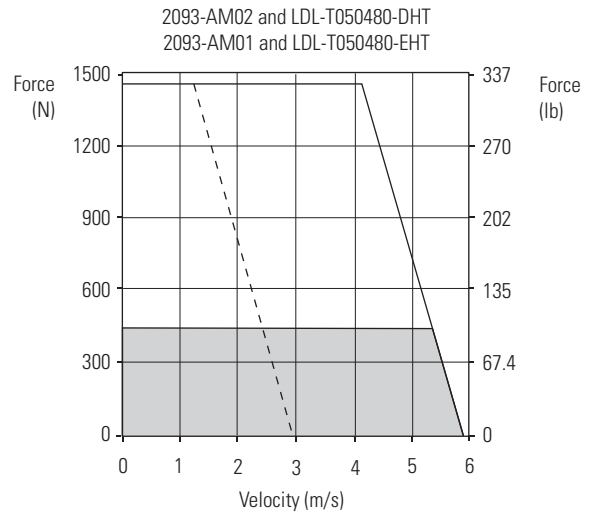
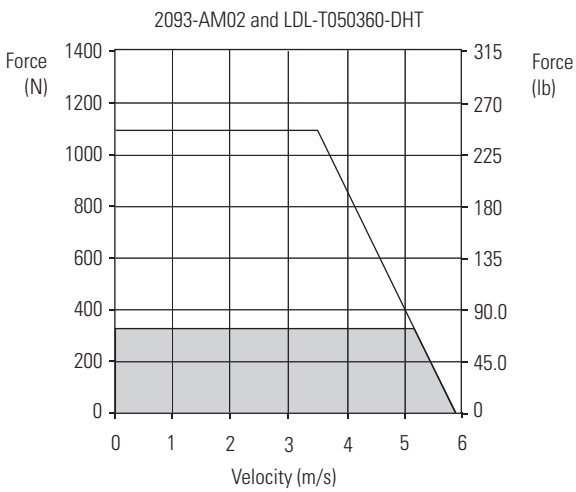
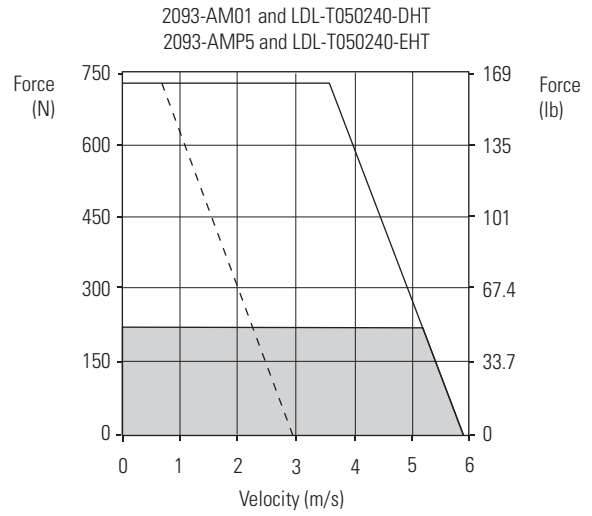
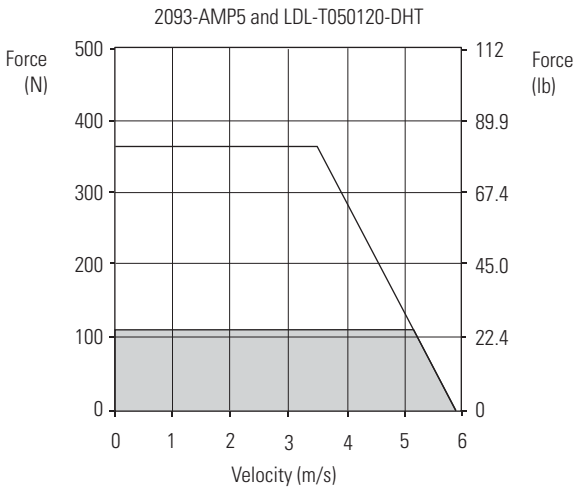


Kinetix 2000 (230V) Drives/LDL-Series Linear Motor Curves, Continued



= Intermittent operating region (LDL-xxxxxxx-DHT)
 = Intermittent operating region (LDL-xxxxxxx-EHT)
 = Continuous operating region

Kinetix 2000 (230V) Drives/LDL-Series Linear Motor Curves, Continued



= Intermittent operating region (LDL-xxxxxx-DHT)
 = Intermittent operating region (LDL-xxxxxx-EHT)
 = Continuous operating region

Ultra3000 (230V) Drives with MP-Series Integrated Linear Stages

This section provides system combination information for the Ultra3000 (230V) drives when matched with MP-Series (230V) integrated direct-drive or ballscrew linear stages. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Linear Stage Cable Combinations

Linear Stage	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAS-Axxxx1-V05SxA, MPAS-Axxxx2-V20SxA	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPAS-A6xxxB-ALMx2C, MPAS-A8xxxE-ALMx2C, MPAS-A9xxxK-ALMx2C		2090-XXNFMF-Sxx ⁽³⁾ Incremental Feedback

(1) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Linear Stage Performance Specifications with Ultra3000 (230V) Drives

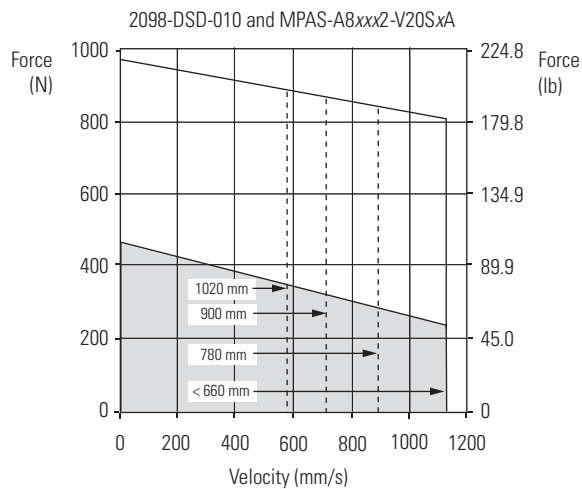
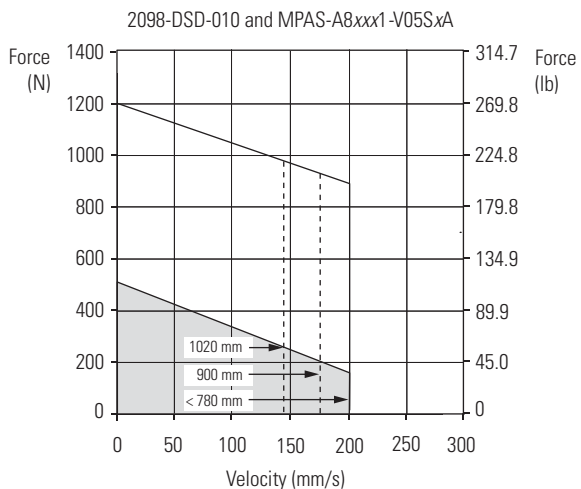
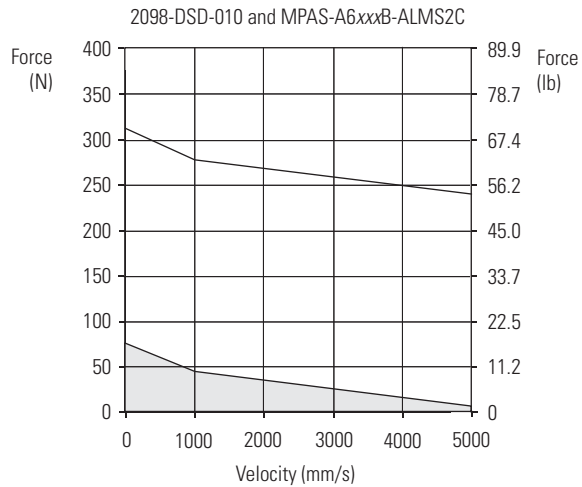
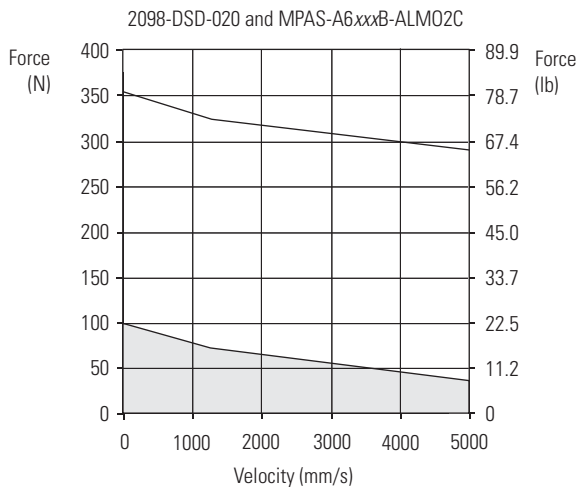
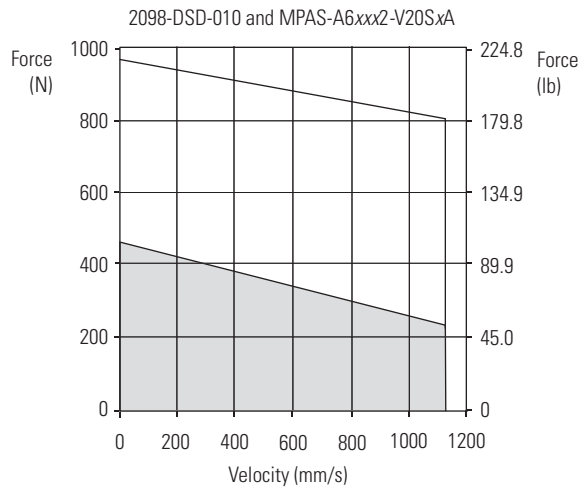
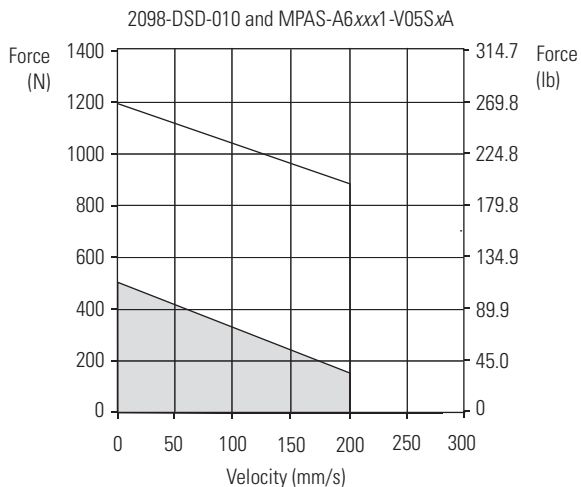
Linear Stage	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Stage Rated Output kW	Ultra3000 230V Drives
MPAS-Axxxx1-V05SxA	200 (7.9) ⁽¹⁾	2.50	422 (94.9)	6.10	1212 (272)	0.37	2098-DSD-005
		3.09	521 (117)				2098-DSD-010
MPAS-Axxxx2-V20SxA	1124 (44.3) ⁽²⁾	2.50	254 (57.1)	7.50	798 (179)	0.62	2098-DSD-005
		4.54	462 (104)	9.10	968 (218)		2098-DSD-010
MPAS-A6xxxB-ALM02C	5000 (200)	2.5	37.8 (8.50)	7.5	159 (35.7)	0.32	2098-DSD-005
		5.0	97.8 (22.0)	15.0	340 (76.4)		2098-DSD-010
		5.3	105 (23.6)	15.8	359 (80.7)		2098-DSD-020
MPAS-A6xxxB-ALMS2C	5000 (200)	2.5	29.6 (6.65)	7.5	150 (33.7)	0.29	2098-DSD-005
		4.7	83.0 (18.7)	14.2	312 (70.1)		2098-DSD-010
MPAS-A8xxxE-ALM02C	5000 (200)	2.5	53.2 (12.0)	7.5	172 (38.7)	0.53	2098-DSD-005
		5.0	129 (29.0)	15.0	366 (82.3)		2098-DSD-010
		7.0	189 (42.5)	18.5	456 (103)		2098-DSD-020
MPAS-A8xxxE-ALMS2C	5000 (200)	2.5	44.3 (10.0)	7.5	163 (36.6)	0.48	2098-DSD-005
		5.0	120 (27.0)	15.0	356 (80.0)		2098-DSD-010
		6.3	159 (35.7)	16.7	399 (89.7)		2098-DSD-020
MPAS-A9xxxK-ALM02C	5000 (200)	2.5	92.4 (20.8)	7.5	266 (59.8)	0.77	2098-DSD-005
		5.0	207 (46.5)	15.0	553 (124)		2098-DSD-010
		6.7	285 (64.1)	18.3	680 (153)		2098-DSD-020
MPAS-A9xxxK-ALMS2C	5000 (200)	2.5	82.0 (18.4)	7.5	257 (57.8)	0.69	2098-DSD-005
		5.0	195 (43.8)	15.0	545 (123)		2098-DSD-010
		6.1	245 (55.1)	16.5	601 (135)		2098-DSD-020

(1) For 900 mm stroke length, maximum speed is 176 mm/s (6.9 in./s). For 1020 mm stroke length, maximum speed is 143 mm/s (5.6 in./s).

(2) For 780 mm stroke length, maximum speed is 889 mm/s (35.0 in./s). For 900 mm stroke length, maximum speed is 715 mm/s (28.2 in./s). For 1020 mm stroke length, maximum speed is 582 mm/s (22.9 in./s).

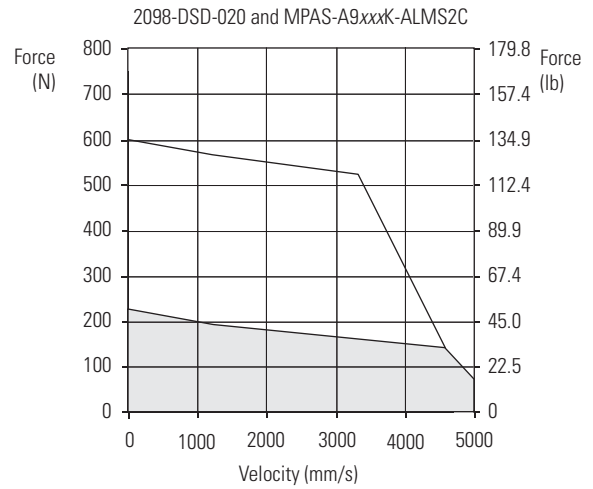
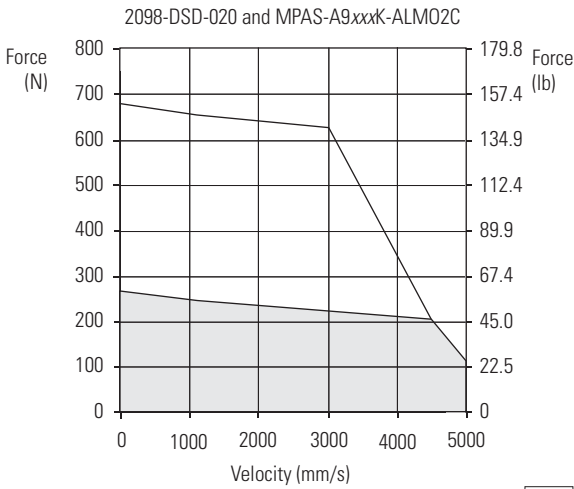
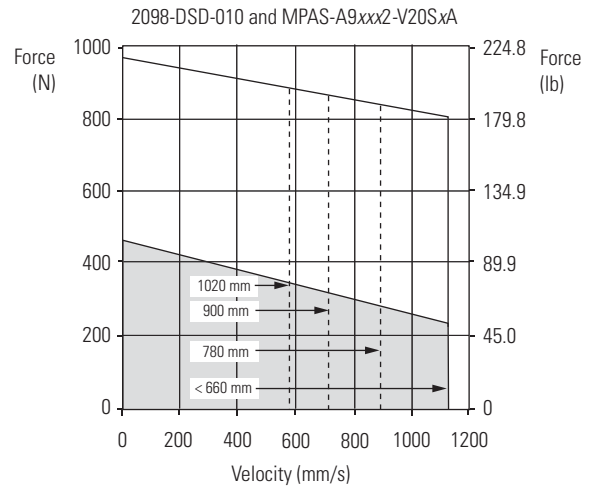
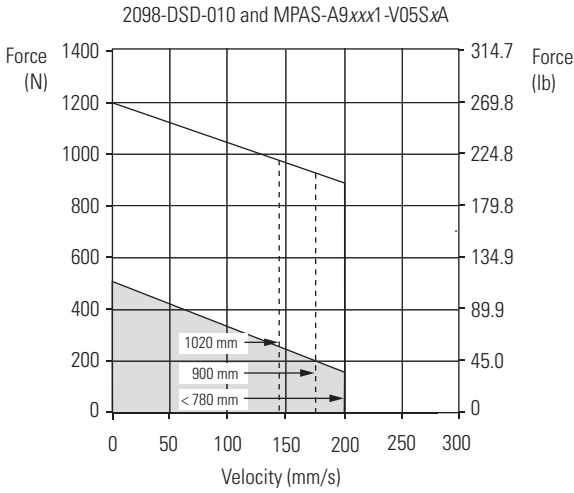
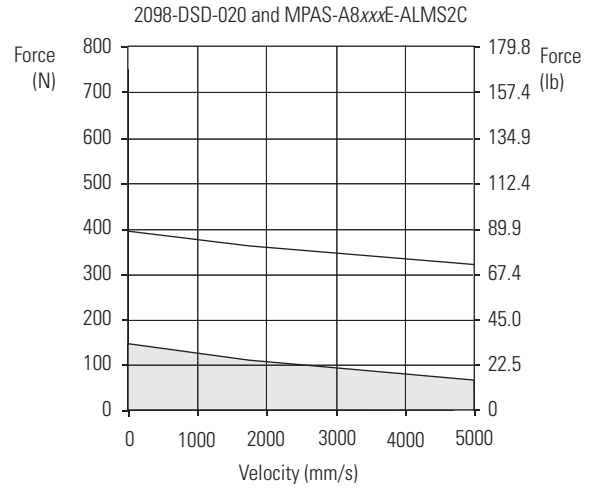
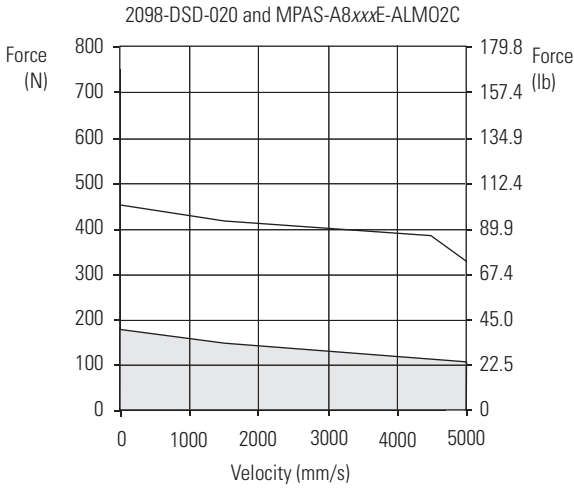
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000 (230V) Drives/MP-Series Integrated Linear Stage Curves



= Intermittent operating region
 = Continuous operating region
 = System operation for specified stroke length

Ultra3000 (230V) Drives/MP-Series Integrated Linear Stage Curves, Continued



= Intermittent operating region
 = Continuous operating region
 = System operation for specified stroke length

Ultra3000 (460V) Drives with MP-Series Integrated Linear Stages

This section provides system combination information for the Ultra3000 (460V) drives when matched with MP-Series (460V) integrated direct-drive or ballscrew linear stages. Included are motor power and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Linear Stage Cable Combinations

Linear Stage	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAS-Bxxxx1-V05SxA, MPAS-Bxxxx2-V20SxA	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPAS-B8xxxF-ALMx2C, MPAS-B9xxL-ALMx2C		2090-XXNFMF-Sxx ⁽¹⁾ Incremental Feedback

(1) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits beginning on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Linear Stage Performance Specifications with Ultra3000 (460V) Drives

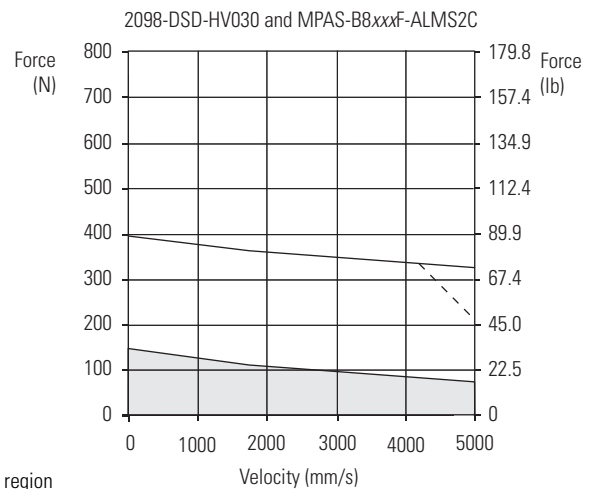
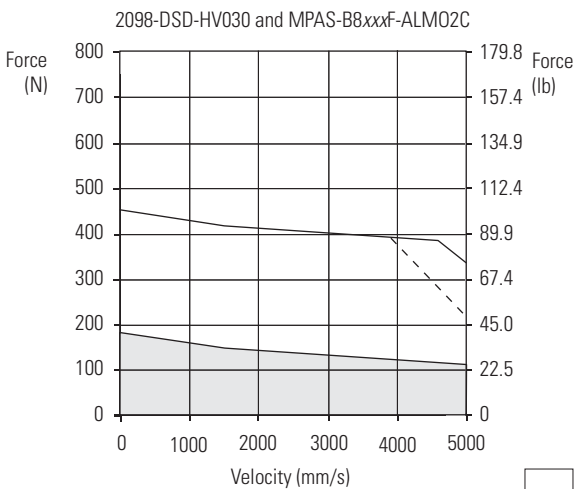
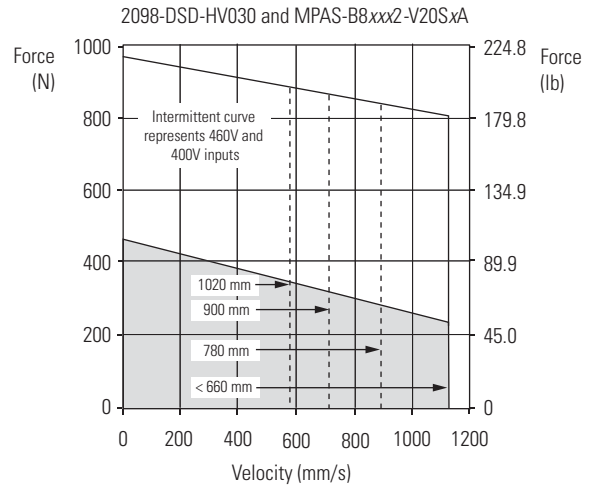
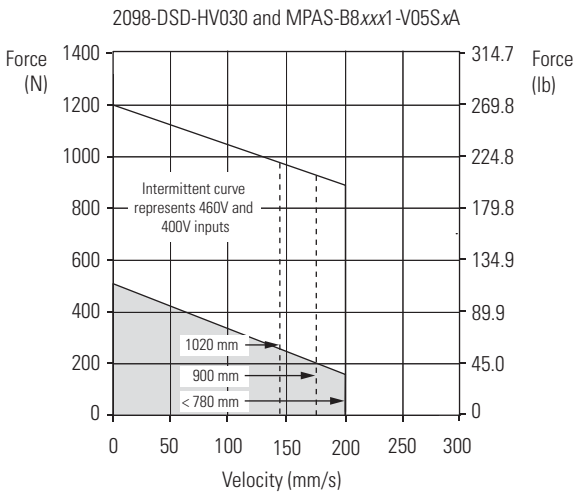
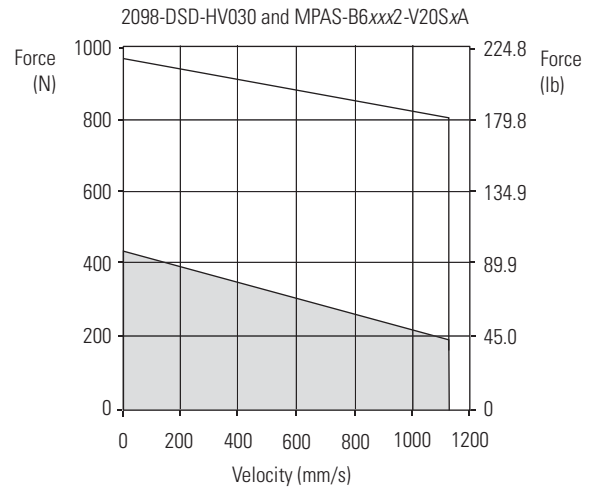
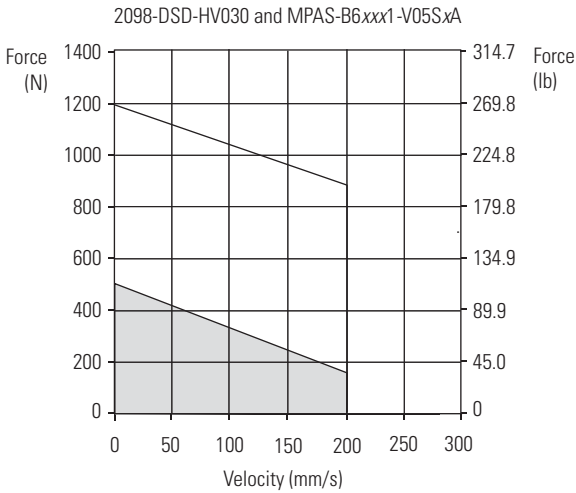
Linear Stage	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Stage Rated Output kW	Ultra3000 460V Drives
MPAS-Bxxxx1-V05SxA	200 (7.9) ⁽¹⁾	1.75	521 (117)	3.50	1212 (272)	0.138	2098-DSD-HV030
MPAS-Bxxxx2-V20SxA	1124 (44.3) ⁽²⁾	3.30	462 (104)	6.60	968 (218)	0.52	2098-DSD-HV030
MPAS-B8xxxF-ALM02C	5000 (200)	3.50	189 (42.5)	9.30	456 (103)	0.527	2098-DSD-HV030
MPAS-B8xxxF-ALMS2C	5000 (200)	3.15	159 (35.7)	8.37	399 (89.7)	0.475	2098-DSD-HV030
MPAS-B9xxL-ALM02C	5000 (200)	3.40	285 (64.1)	9.10	680 (153)	0.768	2098-DSD-HV030
MPAS-B9xxL-ALMS2C	5000 (200)	3.03	245 (55.1)	8.19	601 (135)	0.69	2098-DSD-HV030

(1) For 900 mm stroke length, maximum speed is 176 mm/s (6.9 in./s). For 1020 mm stroke length, maximum speed is 143 mm/s (5.6 in./s).

(2) For 780 mm stroke length, maximum speed is 889 mm/s (35.0 in./s). For 900 mm stroke length, maximum speed is 715 mm/s (28.2 in./s). For 1020 mm stroke length, maximum speed is 582 mm/s (22.9 in./s).

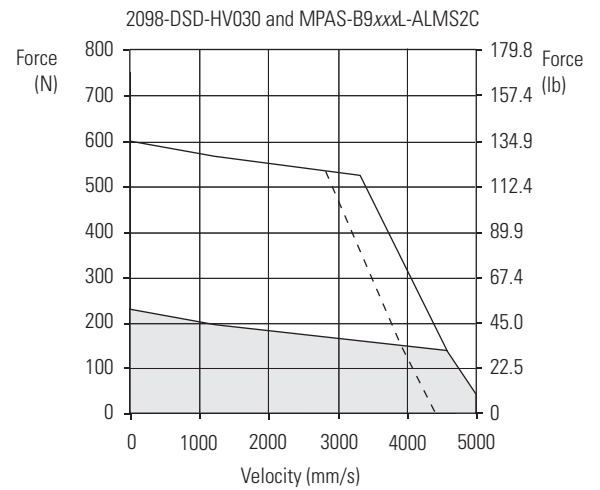
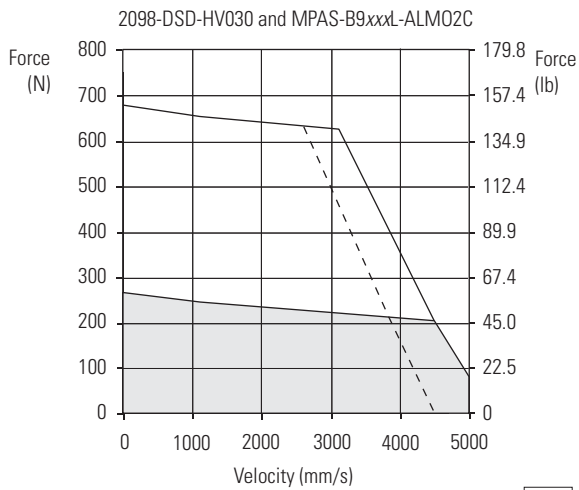
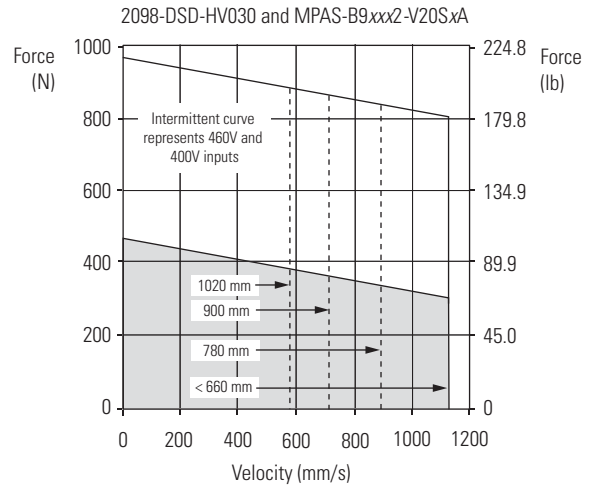
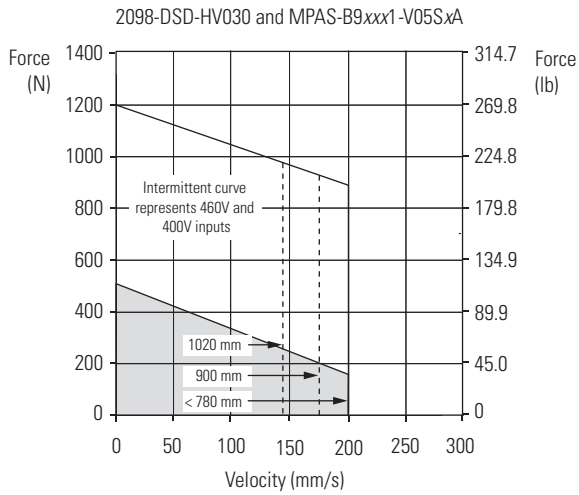
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000 (460V) Drives/MP-Series Integrated Linear Stage Curves



- = Intermittent operating region
- = Continuous operating region
- = System operation with 400V AC (rms) input voltage
- = System operation for specified stroke length

Ultra3000 (460V) Drives/MP-Series Integrated Linear Stage Curves, Continued



- = Intermittent operating region
- = Continuous operating region
- = System operation with 400V AC (rms) input voltage
- = System operation for specified stroke length

Ultra3000 Drives with MP-Series Electric Cylinders

This section provides system combination information for the Ultra3000 drives when matched with MP-Series electric cylinders. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Electric Cylinder Cable Combinations

Electric Cylinders	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAR-A/B1.xxxB MPAR-A/B1.xxxE	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPAR-A/B2.xxxC MPAR-A/B2.xxxF		
MPAR-A/B3.xxxE MPAR-A/B3.xxxH	2090-XXNPMF-16Sxx ⁽⁴⁾	2090-XXNFMF-Sxx ⁽⁵⁾ Absolute High-resolution Feedback

(1) Use drive-mounted breakout board (catalog number 2090-UxBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM4DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM4DF-CDAFxx).

(4) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM7DF-16AFxx).

(5) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Electric Cylinder Performance Specifications with Ultra3000 Drives

Performance Specifications with Ultra3000 (230V) Drives

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Ultra3000 230V Drives
MPAR-A1xxxB	150	1.15	240 (53.9)	1.35	300 (67.4)	0.036	2098-DSD-005
MPAR-A1xxxE	500	2.16	280 (62.9)	2.48	350 (78.7)	0.140	
MPAR-A2xxxC	250	2.42	420 (94.4)	2.72	525 (118)	0.105	2098-DSD-010
MPAR-A2xxxF	640	4.54	640 (144)	5.41	800 (180)	0.410	
MPAR-A3xxxE	500	10.33	2000 (450)	12.34	2500 (562)	1.00	2098-DSD-030 ⁽¹⁾
MPAR-A3xxxH	1000	12.20	1300 (292)	16.40	1625 (365)	1.30	2098-DSD-030

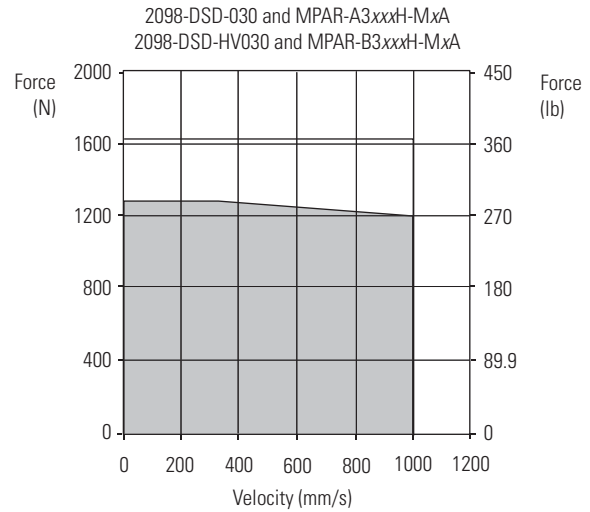
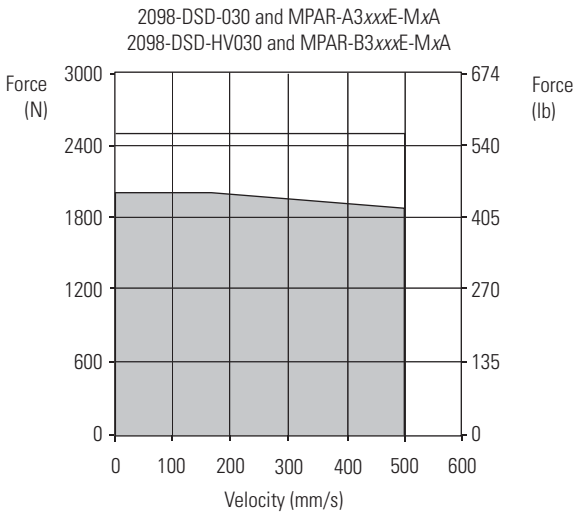
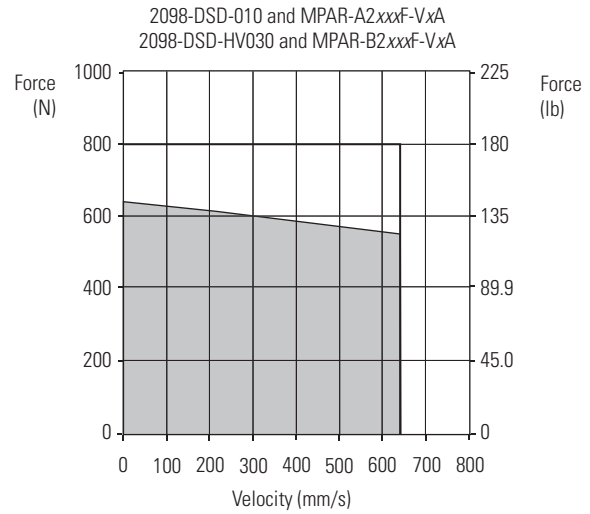
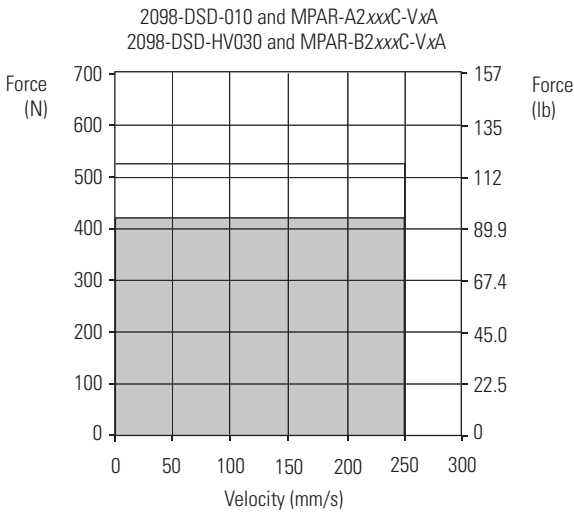
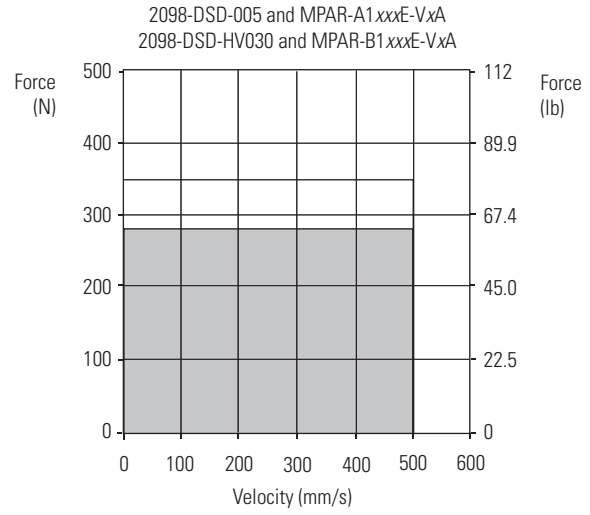
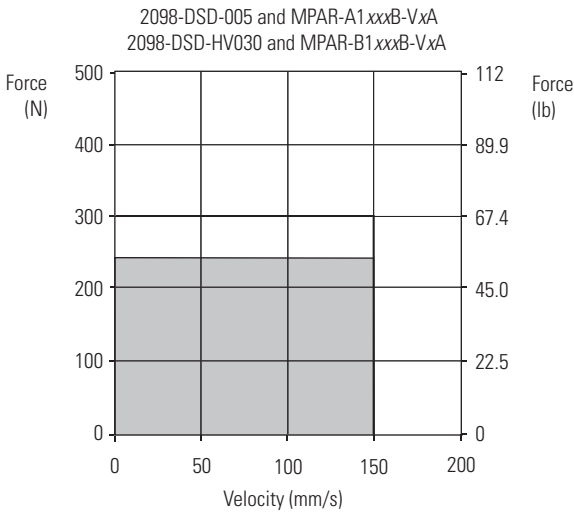
(1) Use of catalog number 2098-DSD020x-xx is acceptable for applications with actuators and continuous force are derated by 5%.

Performance Specifications with Ultra3000 (460V) Drives

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Ultra3000 460V Drives
MPAR-B1xxxB	150	1.15	240 (53.9)	1.35	300 (67.4)	0.036	2098-DSD-HV030
MPAR-B1xxxE	500	1.49	280 (62.9)	1.71	350 (78.7)	0.140	
MPAR-B2xxxC	250	1.67	420 (94.4)	1.90	525 (118)	0.105	
MPAR-B2xxxF	640	3.29	640 (144)	3.93	800 (180)	0.410	
MPAR-B3xxxE	500	5.16	2000 (450)	6.17	2500 (562)	1.00	
MPAR-B3xxxH	1000	6.13	1300 (292)	6.79	1625 (365)	1.30	

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000 Drives/MP-Series Electric Cylinder Curves



□ = Intermittent operating region
■ = Continuous operating region

Ultra3000 Drives with MP-Series Heavy Duty Electric Cylinders

This section provides system combination information for the Ultra3000 drives when matched with MP-Series heavy-duty electric cylinders. Included are power/brake and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Electric Cylinder Cable Combinations

Electric Cylinders	Motor Power/Brake Cable	Motor Feedback Cable ⁽¹⁾
MPAI-A/B3xxxC MPAI-A/B3xxxE MPAI-A/B3xxxR MPAI-A/B3xxxS	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Absolute High-resolution Feedback
MPAI-A/B4xxxC MPAI-A/B4xxxE MPAI-A/B4xxxR MPAI-A/B4xxxS		

(1) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPxM7DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

Electric Cylinder Performance Specifications with Ultra3000 (230V) Drives

Performance Specifications with Ball Screw Electric Cylinders

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Ultra3000 230V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-A3xxxC	279 (11)	5.61	4003 (900)	3176 (714)	8.40	4448 (1000)	0.39	2098-DSD-020
MPAI-A3xxxE	559 (22)		2002 (450)	1588 (357)	14.14	4003 (900)		
MPAI-A4xxxC	279 (11)	10.89	7784 (1750)	6179 (1389)	17.07	8896 (2000)	0.43	2098-DSD-030
MPAI-A4xxxE	559 (22)		3892 (875)	3092 (695)	27.44	7784 (1750)		

Performance Specifications with Roller Screw Electric Cylinders

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Ultra3000 230V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-A3xxxR	279 (11)	5.61	3781 (850)	3003 (675)	14.14	7562 (1700)	0.39	2098-DSD-020
MPAI-A3xxxS	559 (22)		1891 (425)	1499 (337)		3781 (850)		
MPAI-A4xxxR	279 (11)	10.89	7340 (1650)	5827 (1310)	27.44	14,679 (3300)	0.43	2098-DSD-030
MPAI-A4xxxS	559 (22)		3670 (825)	2914 (655)		7340 (1650)		

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.8 or later.

Electric Cylinder Performance Specifications with Ultra3000 (460V) Drives

Performance Specifications with Ball Screw Electric Cylinders

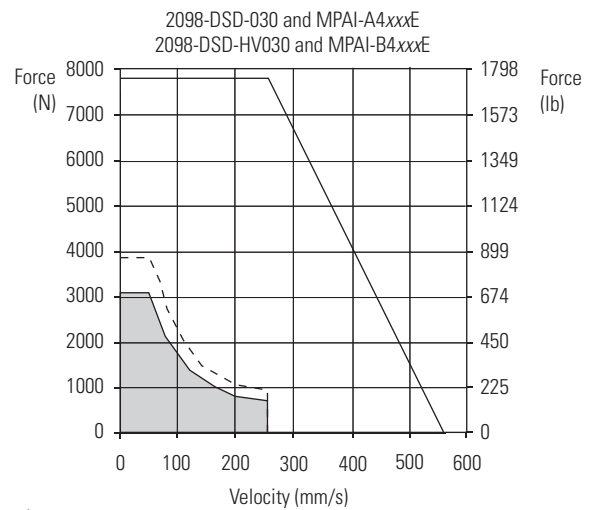
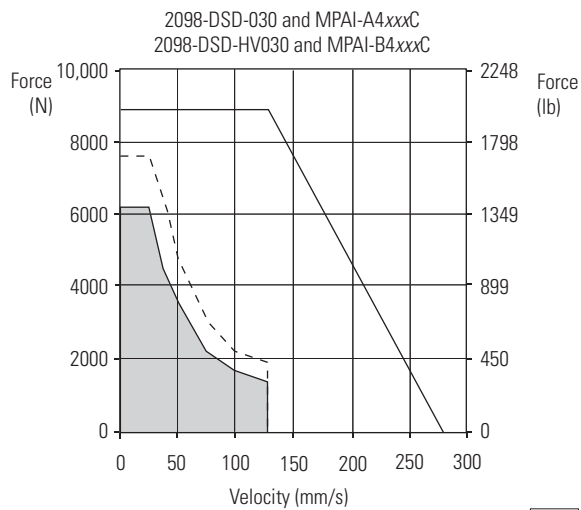
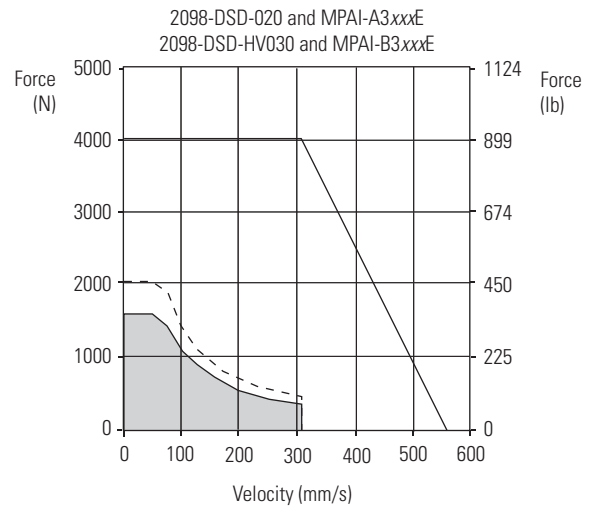
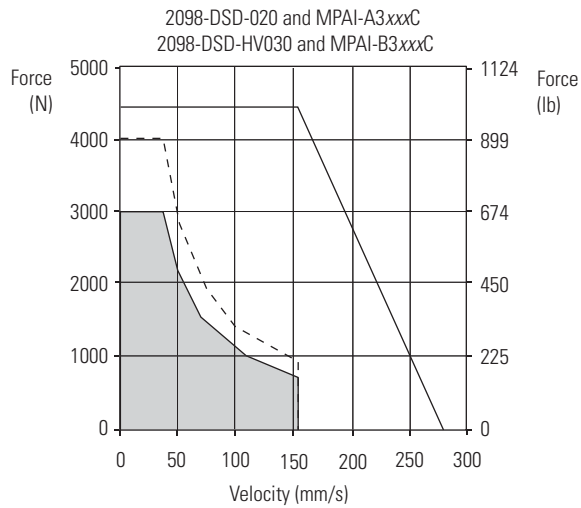
Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Ultra3000 460V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-B3xxxC	279 (11)	2.81	4003 (900)	3176 (714)	4.30	4448 (1000)	0.39	2098-DSD-HV030
MPAI-B3xxxE	559 (22)		2002 (450)	1588 (357)	7.07	4003 (900)		
MPAI-B4xxxC	279 (11)	5.61	7784 (1750)	6179 (1389)	8.68	8896 (2000)	0.43	
MPAI-B4xxxE	559 (22)		3892 (875)	3092 (695)	14.14	7784 (1750)		

Performance Specifications with Roller Screw Electric Cylinders

Electric Cylinder	Maximum Speed mm/s (in./s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)		System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Rated Output kW	Ultra3000 460V Drives
			25 °C (77 °F)	40 °C (104 °F)				
MPAI-B3xxxR	279 (11)	2.81	3781 (850)	3003 (675)	7.07	7562 (1700)	0.39	2098-DSD-HV030
MPAI-B3xxxS	559 (22)		1891 (425)	1499 (337)		3781 (850)		
MPAI-B4xxxR	279 (11)	5.61	7340 (1650)	5827 (1310)	14.14	14,679 (3300)	0.43	
MPAI-B4xxxS	559 (22)		3670 (825)	2914 (655)		7340 (1650)		

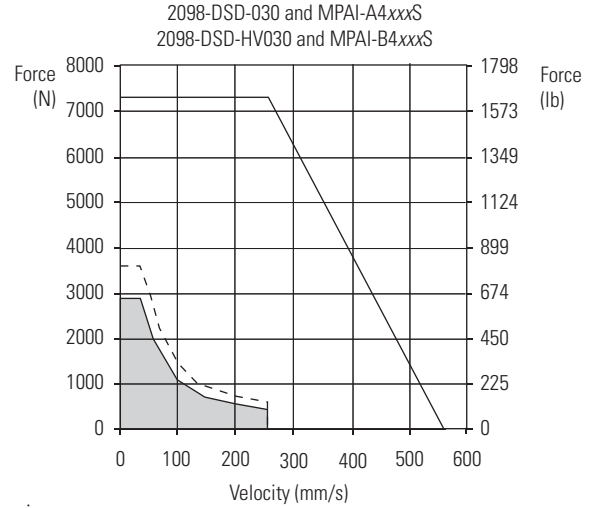
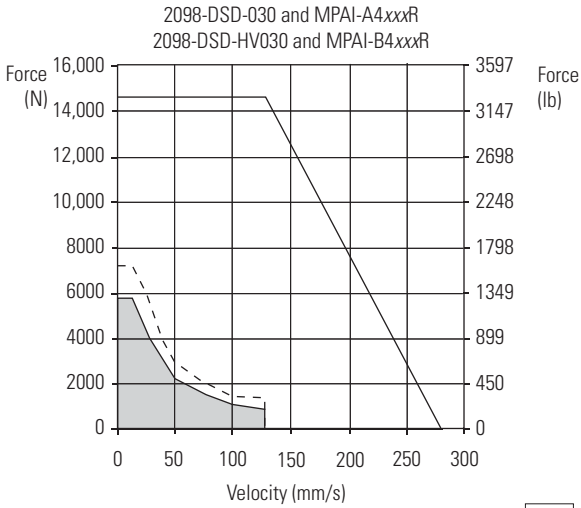
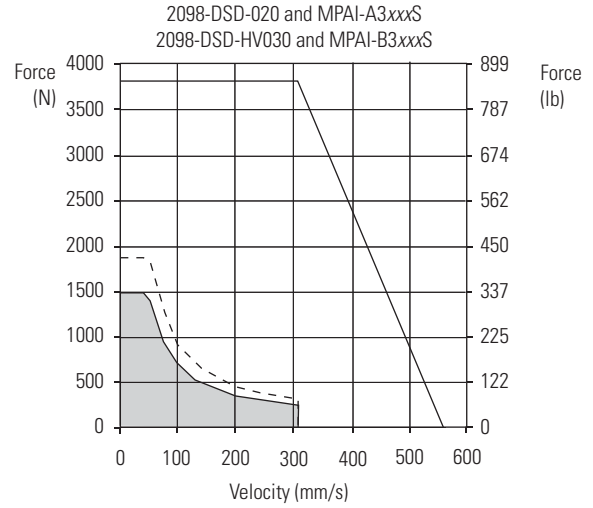
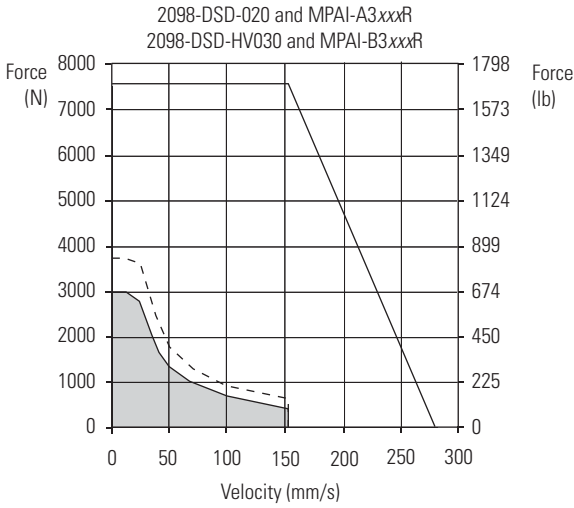
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.8 or later.

Ultra3000 Drives/MP-Series Heavy Duty (ball screw) Electric Cylinder Curves



- = Intermittent operating region
- = Continuous operating region @ 25 °C (77 °F)
- = Continuous operating region @ 40 °C (104 °F)

Ultra3000 Drives/MP-Series Heavy Duty (roller screw) Electric Cylinder Curves



= Intermittent operating region
 = Continuous operating region @ 25 °C (77 °F)
 = Continuous operating region @ 40 °C (104 °F)

Ultra3000 (230V) Drives with LDC-Series Linear Motors

This section provides system combination information for the Ultra3000 (230V) drives when matched with LDC-Series iron-core linear motors. Included are power and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Linear Motor Cable Combinations

Linear Motor	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
LDC-C030100-DHT, LDC-C030200-DHT, LDC-C030200-EHT	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Sin/Cos or TTL Encoder Feedback
LDC-C050100-DHT, LDC-C050200-DHT, LDC-C050200-EHT, LDC-C050300-DHT, LDC-C050300-EHT		
LDC-C075200-DHT, LDC-C075200-EHT, LDC-C075300-DHT, LDC-C075300-EHT, LDC-C075400-DHT, LDC-C075400-EHT		
LDC-C100300-DHT, LDC-C100300-EHT, LDC-C100400-DHT, LDC-C100400-EHT, LDC-C100600-DHT		
LDC-C150400-DHT, LDC-C150600-DHT		

(1) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPWM7DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

LDC-Series Performance Specifications with Ultra3000 (230V) Drives

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current ⁽¹⁾ Amps 0-pk	System Continuous Stall Force ⁽¹⁾ N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Ultra3000 230V Drives
LDC-C030100-DHT	10.0 (32.8)	4.1...6.1	74...111 (17...25)	12.1	188 (42)	0.37...0.55	2098-DSD-010
LDC-C030200-DHT		8.1...12.2	148...222 (33...50)	24.3	375 (84)	0.74...1.11	2098-DSD-020
LDC-C030200-EHT		4.1...6.1		12.1			2098-DSD-010
LDC-C050100-DHT	10.0 (32.8)	3.9...5.9	119...179 (27...40)	11.7	302 (68)	0.59...0.89	2098-DSD-010
LDC-C050200-DHT		7.9...11.8	240...359 (54...81)	23.3	600 (135)	1.20...1.79	2098-DSD-020
LDC-C050200-EHT		3.9...5.9		11.6			2098-DSD-010
LDC-C050300-DHT		11.8...17.7	363...544 (82...122)	35.9	941 (212)	1.81...2.72	2098-DSD-075
LDC-C050300-EHT		3.9...5.9		12.0			2098-DSD-010

(1) Values represent the range between no cooling (low value) and water cooling (high value).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

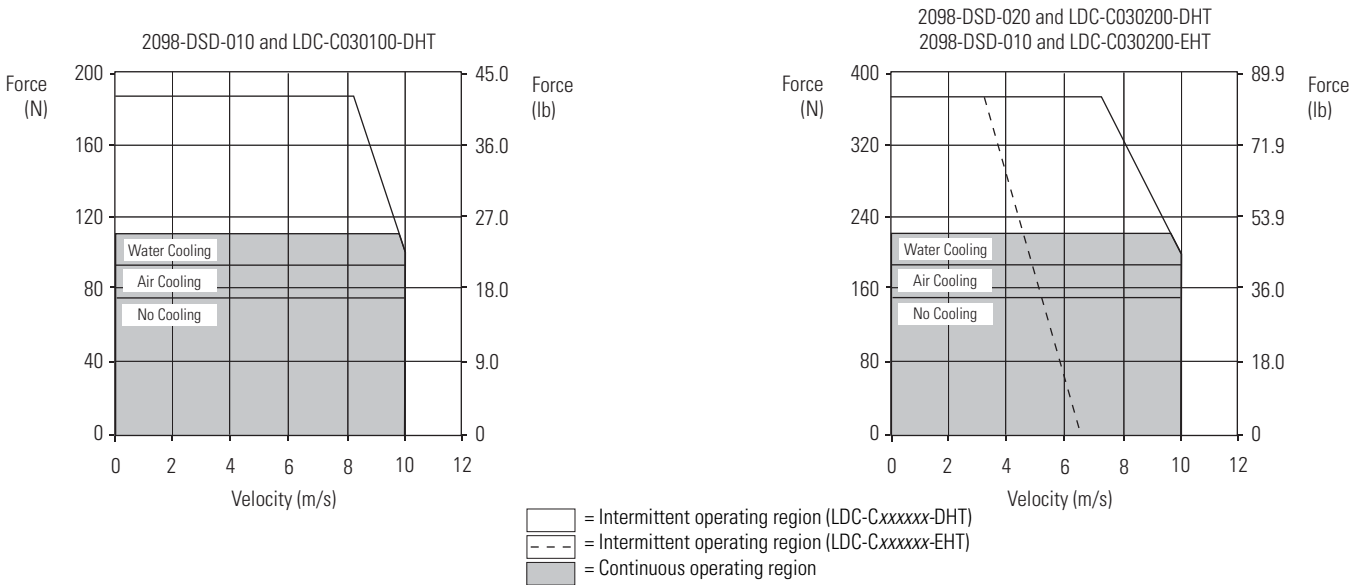
LDC-Series Performance Specifications with Ultra3000 (230V) Drives, Continued

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current (1) Amps 0-pk	System Continuous Stall Force (1) N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Ultra3000 230V Drives
LDC-C075200-DHT	10.0 (32.8)	7.7...11.5	348...523 (78...117)	22.9	882 (198)	1.74...2.61	2098-DSD-020
LDC-C075200-EHT		3.8...5.7		11.5			2098-DSD-010
LDC-C075300-DHT		11.5...17.2	523...784 (117...176)	35.6	1368 (308)	2.61...3.92	2098-DSD-075
LDC-C075300-EHT		3.8...5.7		11.9			2098-DSD-010
LDC-C075400-DHT		15.3...23.0	697...1045 (157...235)	47.4	1824 (410)	3.48...5.22	2098-DSD-075
LDC-C075400-EHT		7.7...11.5		23.7			2098-DSD-020
LDC-C100300-DHT	10.0 (32.8)	11.1...16.7	674...1012 (152...227)	34.3	1767 (397)	3.37...5.06	2098-DSD-075
LDC-C100300-EHT		3.7...5.6		11.4			2098-DSD-010
LDC-C100400-DHT		14.8...22.2	899...1349 (202...303)	45.7	2356 (530)	4.49...6.74	2098-DSD-075
LDC-C100400-EHT		7.4...11.1		22.8			2098-DSD-020
LDC-C100600-DHT		22.2...33.3	1349...2023 (303...455)	68.5	3534 (794)	6.74...10.11	2098-DSD-075
LDC-C150400-DHT		10.0 (32.8)	14.1...21.1	1281...1922 (288...432)	45.2	3498 (786)	6.40...9.61
LDC-C150600-DHT	21.1...31.7		1922...2882 (432...648)	67.8	5246 (1179)	9.61...14.41	2098-DSD-075

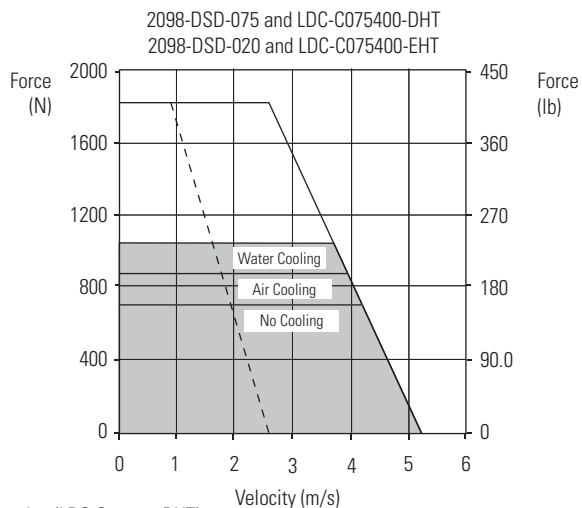
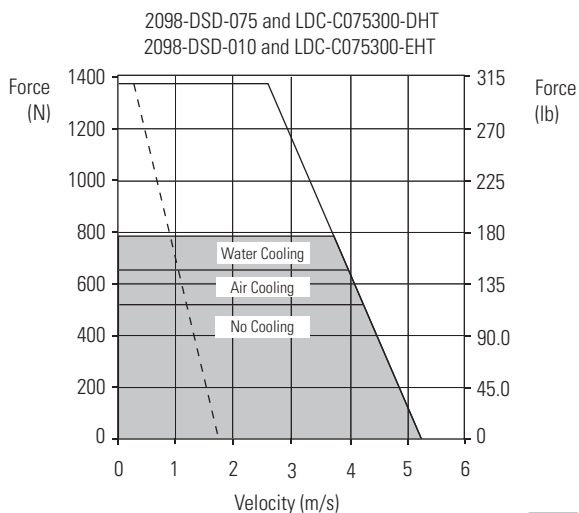
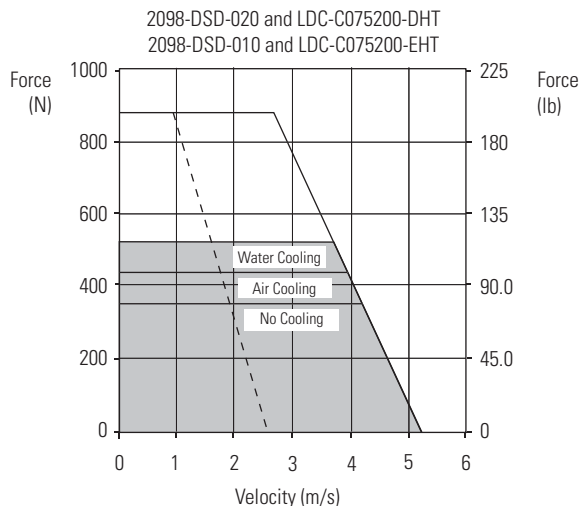
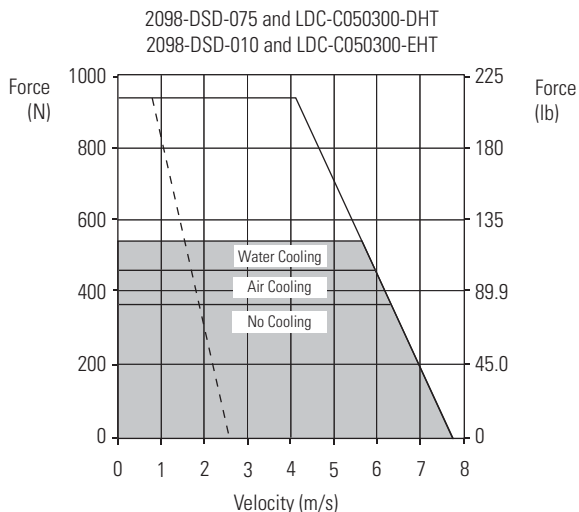
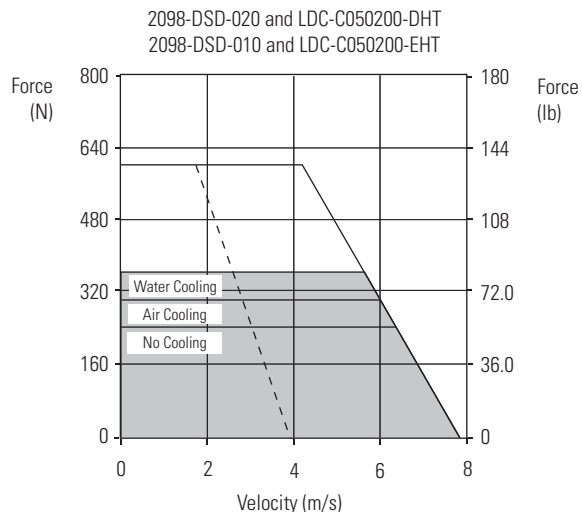
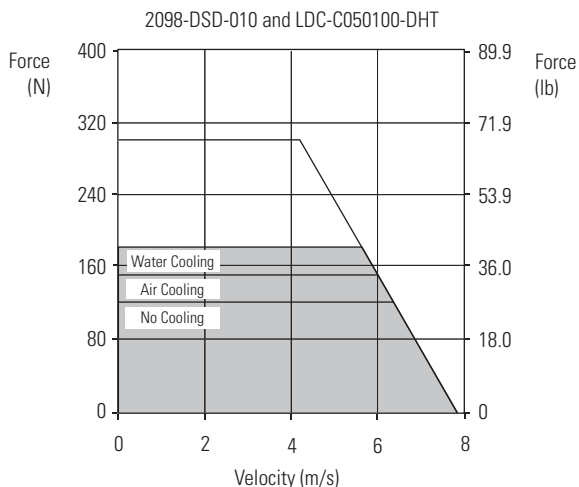
(1) Values represent the range between no cooling (low value) and water cooling (high value).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000 (230V) Drives/LDC-Series Linear Motor Curves



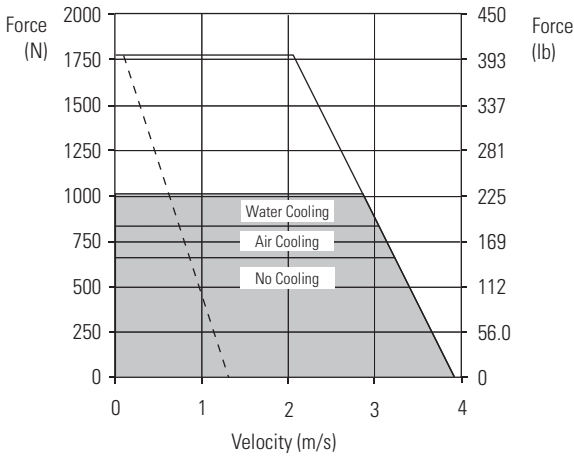
Ultra3000 (230V) Drives/LDC-Series Linear Motor Curves, Continued



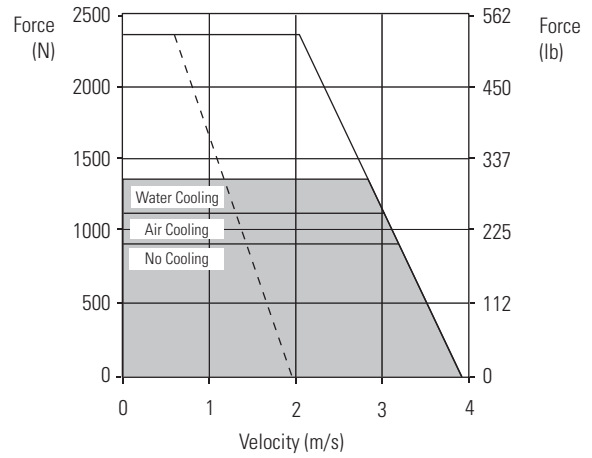
= Intermittent operating region (LDC-Cxxxxx-DHT)
 = Intermittent operating region (LDC-Cxxxxx-EHT)
 = Continuous operating region

Ultra3000 (230V) Drives/LDC-Series Linear Motor Curves, Continued

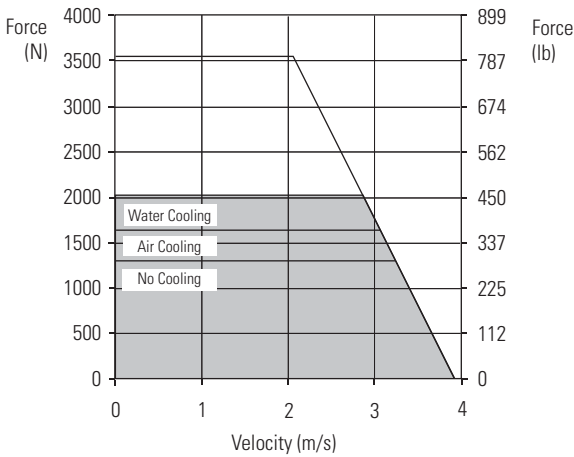
2098-DSD-075 and LDC-C100300-DHT
2098-DSD-010 and LDC-C100300-EHT



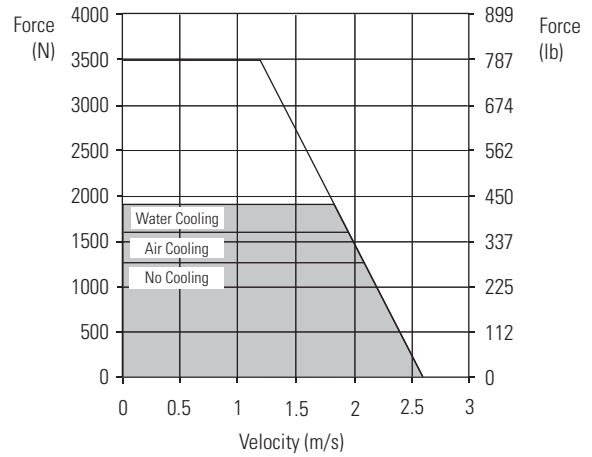
2098-DSD-075 and LDC-C100400-DHT
2098-DSD-020 and LDC-C100400-EHT



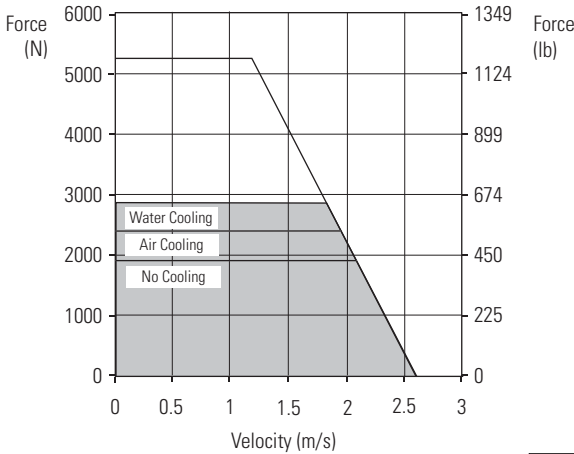
2098-DSD-075 and LDC-C100600-DHT



2098-DSD-075 and LDC-C150400-DHT



2098-DSD-075 and LDC-C150600-DHT



- = Intermittent operating region (LDC-Cxxxxx-DHT)
- = Intermittent operating region (LDC-Cxxxxx-EHT)
- = Continuous operating region

Ultra3000 (460V) Drives with LDC-Series Linear Motors

This section provides system combination information for the Ultra3000 (460V) drives when matched with LDC-Series iron-core linear motors. Included are power and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Linear Motor Cable Combinations

Linear Motor	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
LDC-C030100-DHT, LDC-C030200-DHT, LDC-C030200-EHT	2090-XXNPMF-16S _{xx} ⁽²⁾	2090-XXNFMF-S _{xx} ⁽³⁾ Sin/Cos or TTL Encoder Feedback
LDC-C050100-DHT, LDC-C050200-DHT, LDC-C050200-EHT, LDC-C050300-DHT, LDC-C050300-EHT		
LDC-C075200-DHT, LDC-C075200-EHT, LDC-C075300-DHT, LDC-C075300-EHT, LDC-C075400-DHT, LDC-C075400-EHT		
LDC-C100300-DHT, LDC-C100300-EHT, LDC-C100400-DHT, LDC-C100400-EHT, LDC-C100600-DHT		
LDC-C150400-DHT, LDC-C150600-DHT		

(1) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16S_{xx}) or continuous-flex (catalog number 2090-CPWM7DF-16AF_{xx}).

(3) These cables are available as standard (catalog number 2090-XXNFMF-S_{xx}) or continuous-flex (catalog number 2090-CFBM7DF-CDAF_{xx}).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length *xx* is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

LDC-Series Performance Specifications with Ultra3000 (460V) Drives

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current ⁽¹⁾ Amps 0-pk	System Continuous Stall Force ⁽¹⁾ N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Ultra3000 460V Drives
LDC-C030100-DHT	10.0 (32.8)	4.1...6.1	74...111 (17...25)	12.1	188 (42)	0.37...0.55	2098-DSD-HV030
LDC-C030200-DHT		8.1...12.2	148...222 (33...50)	24.3	375 (84)	0.74...1.11	2098-DSD-HV100
LDC-C030200-EHT		4.1...6.1		12.1			2098-DSD-HV030
LDC-C050100-DHT	10.0 (32.8)	3.9...5.9	119...179 (27...40)	11.7	302 (68)	0.59...0.89	2098-DSD-HV030
LDC-C050200-DHT		7.9...11.8	240...359 (54...81)	23.3	600 (135)	1.20...1.79	2098-DSD-HV100
LDC-C050200-EHT		3.9...5.9		11.6			2098-DSD-HV030
LDC-C050300-DHT		11.8...17.7	363...544 (82...122)	35.9	941 (212)	1.81...2.72	2098-DSD-HV100
LDC-C050300-EHT		3.9...5.9		12.0			2098-DSD-HV030

(1) Values represent the range between no cooling (low value) and water cooling (high value).

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

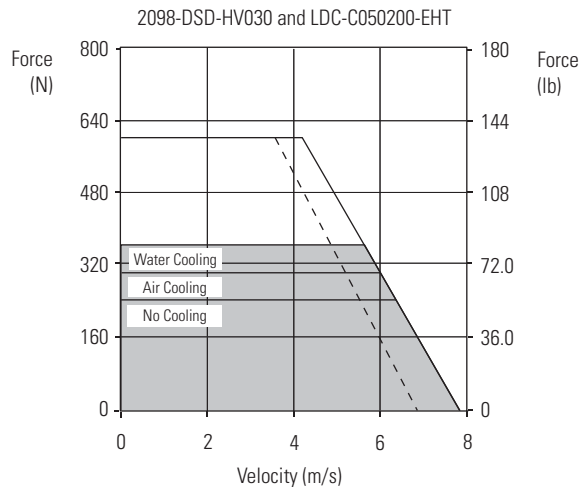
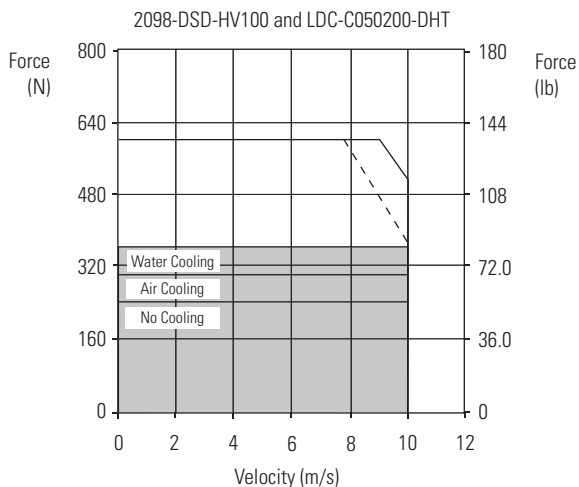
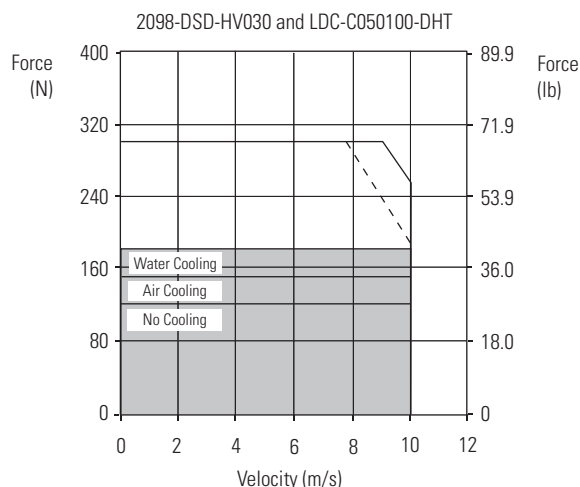
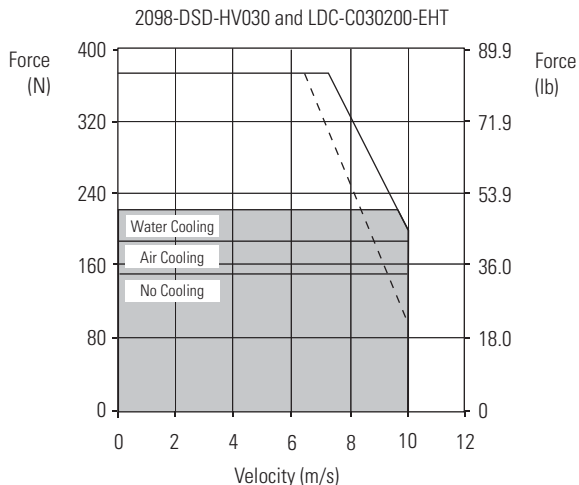
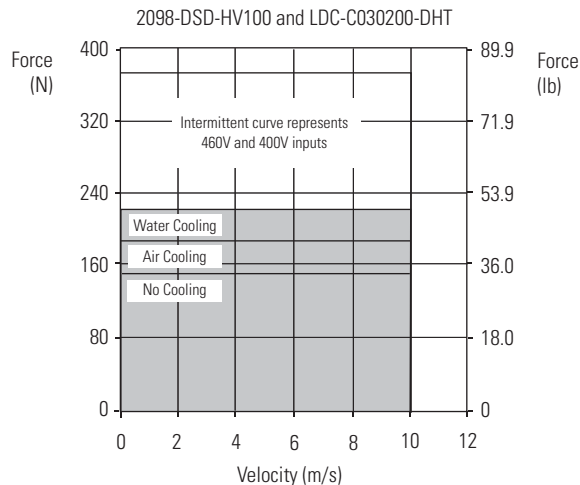
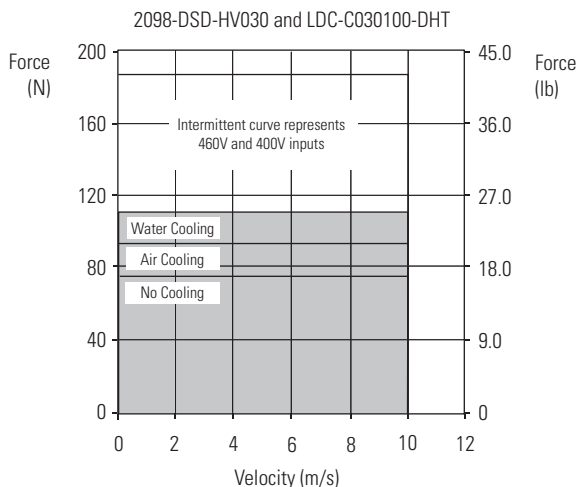
LDC-Series Performance Specifications with Ultra3000 (460V) Drives, Continued

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current (1) Amps 0-pk	System Continuous Stall Force (1) N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Ultra3000 460V Drives
LDC-C075200-DHT	10.0 (32.8)	7.7...11.5	348...523 (78...117)	22.9	882 (198)	1.74...2.61	2098-DSD-HV100
LDC-C075200-EHT		3.8...5.7		11.5			2098-DSD-HV030
LDC-C075300-DHT		11.5...17.2	523...784 (117...176)	35.6	1368 (308)	2.61...3.92	2098-DSD-HV100
LDC-C075300-EHT		3.8...5.7		11.9			2098-DSD-HV030
LDC-C075400-DHT		15.3...23.0	697...1045 (157...235)	47.4	1824 (410)	3.48...5.22	2098-DSD-HV150
LDC-C075400-EHT		7.7...11.5		23.7			2098-DSD-HV100
LDC-C100300-DHT	10.0 (32.8)	11.1...16.7	674...1012 (152...227)	34.3	1767 (397)	3.37...5.06	2098-DSD-HV100
LDC-C100300-EHT		3.7...5.6		11.4			2098-DSD-HV030
LDC-C100400-DHT		14.8...22.2	899...1349 (202...303)	45.7	2356 (530)	4.49...6.74	2098-DSD-HV150
LDC-C100400-EHT		7.4...11.1		22.8			2098-DSD-HV100
LDC-C100600-DHT		22.2...33.3	1349...2023 (303...455)	68.5	3534 (794)	6.74...10.11	2098-DSD-HV220
LDC-C100600-EHT		11.1...16.7		34.3			2098-DSD-HV100
LDC-C150400-DHT	10.0 (32.8)	14.1...21.1	1281...1922 (288...432)	45.2	3498 (786)	6.40...9.61	2098-DSD-HV150
LDC-C150400-EHT		7.0...10.6		22.6			2098-DSD-HV100
LDC-C150600-DHT		21.1...31.7	1922...2882 (432...648)	67.8	5246 (1179)	9.61...14.41	2098-DSD-HV220
LDC-C150600-EHT		10.6...15.8		33.9			2098-DSD-HV100

(1) Values represent the range between no cooling (low value) and water cooling (high value).

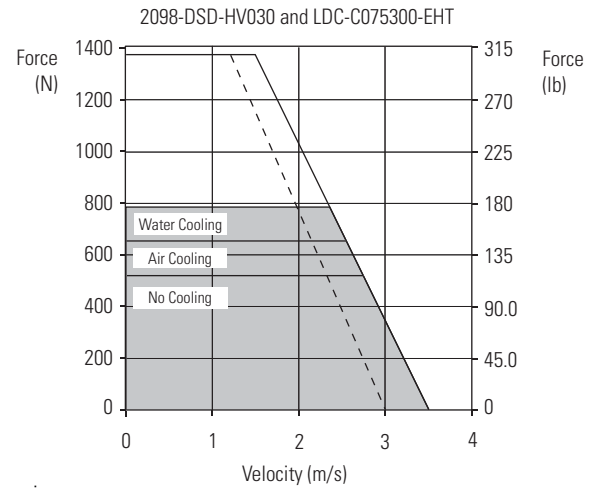
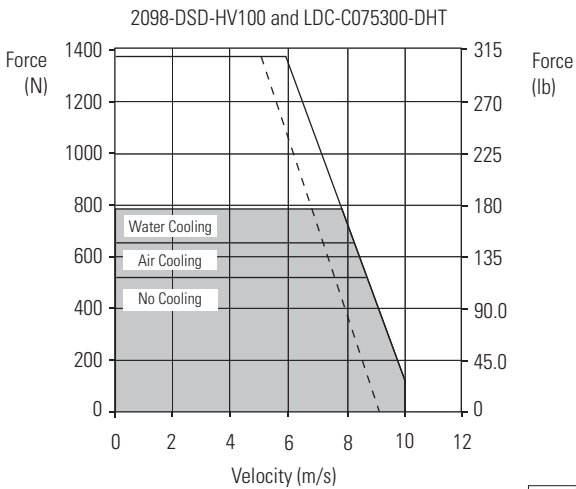
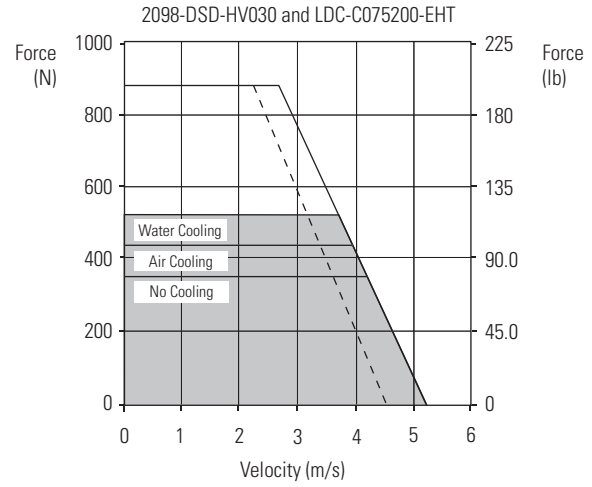
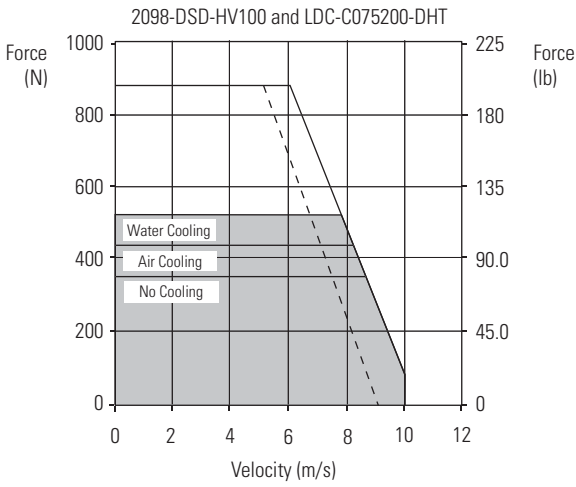
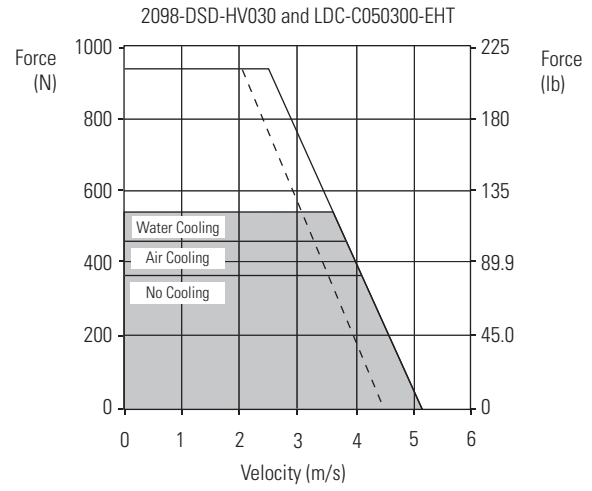
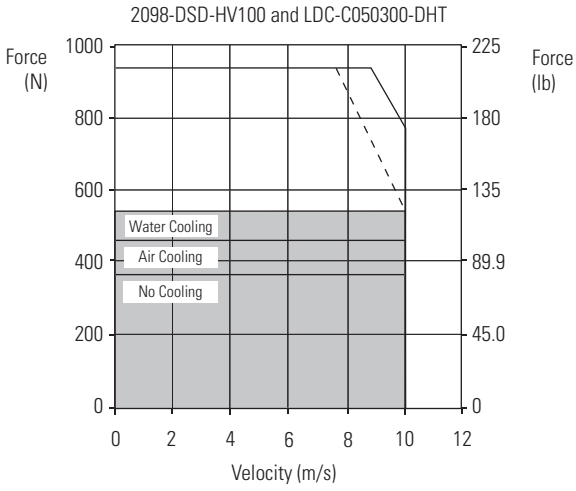
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

Ultra3000 (460V) Drives/LDC-Series Linear Motor Curves



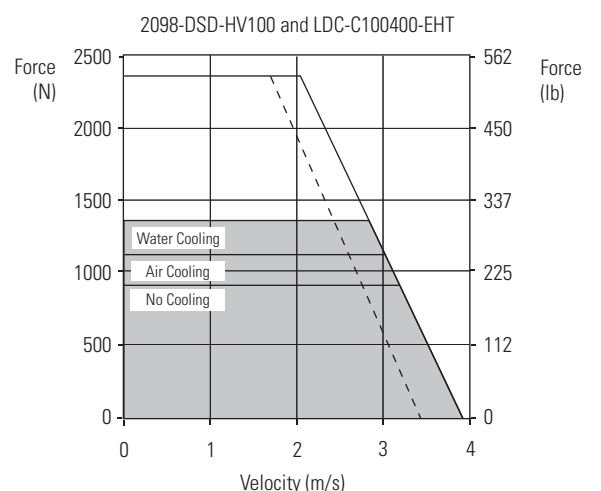
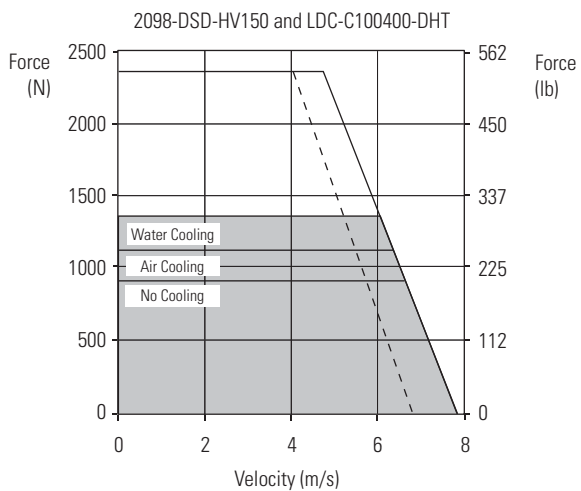
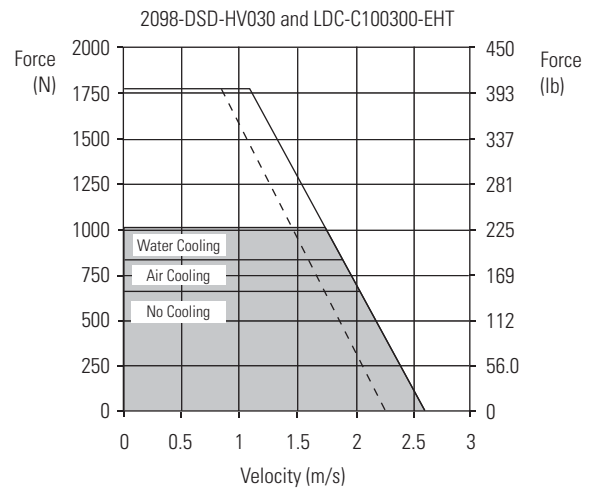
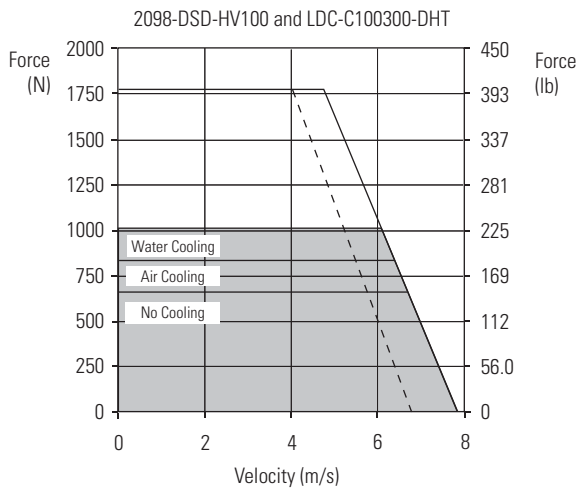
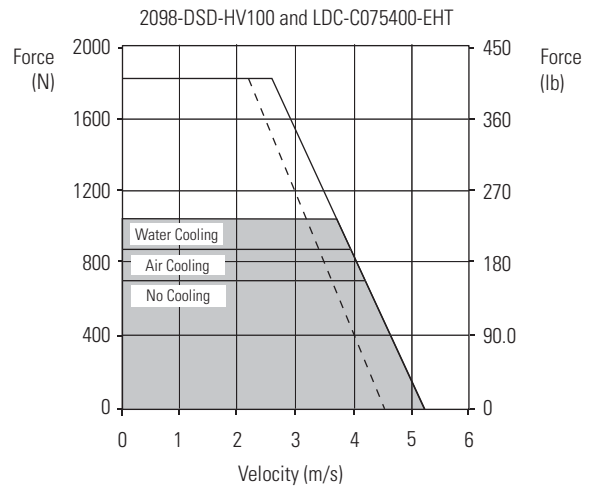
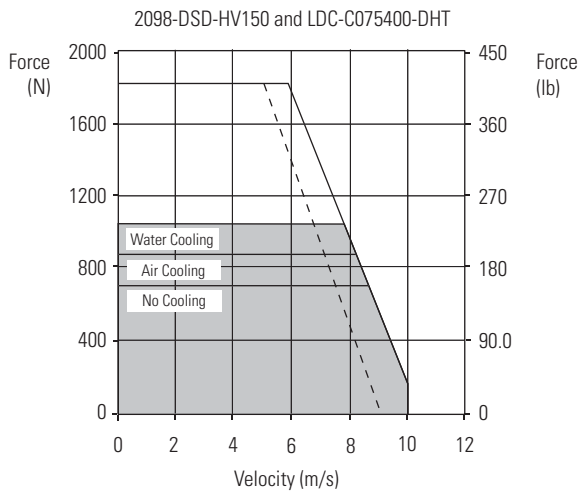
- = Intermittent operating region
- = Intermittent operating region with 400V AC (rms) input voltage
- = Continuous operating region

Ultra3000 (460V) Drives/LDC-Series Linear Motor Curves, Continued



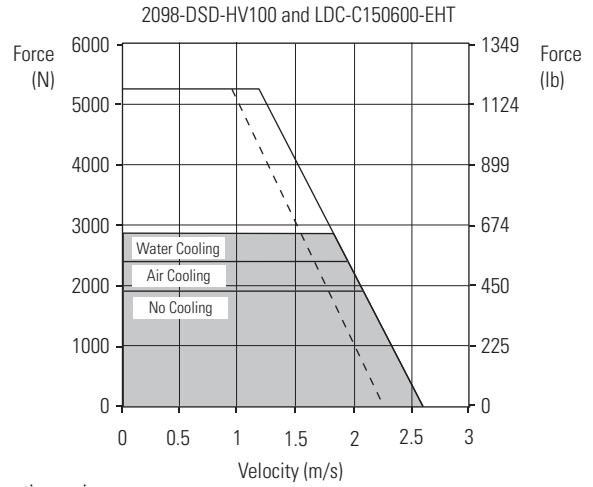
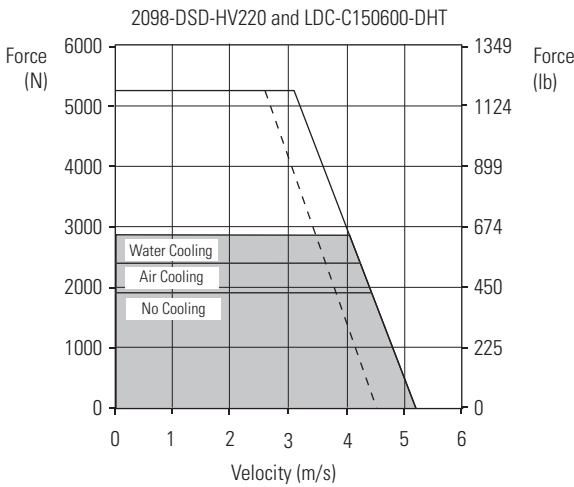
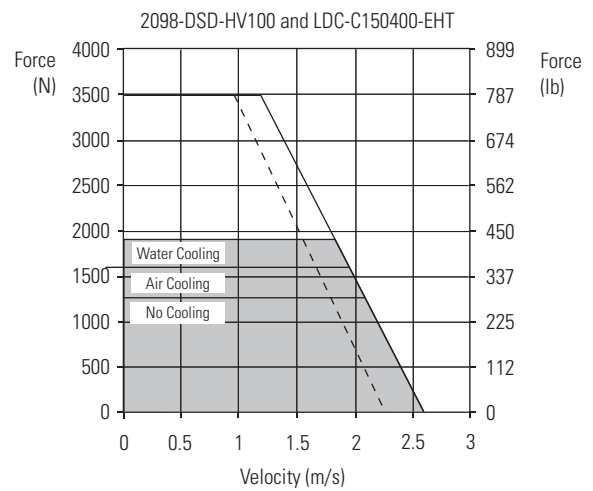
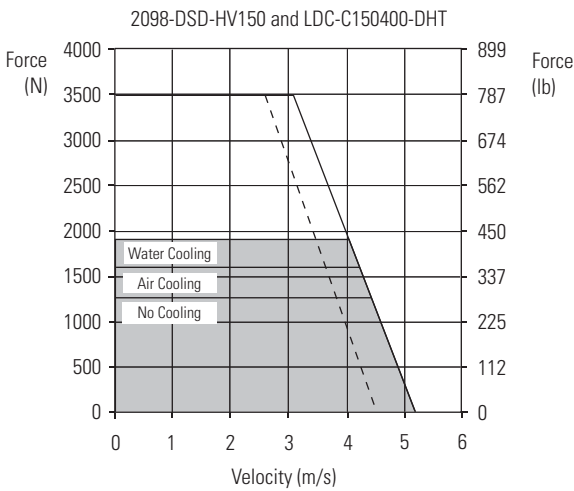
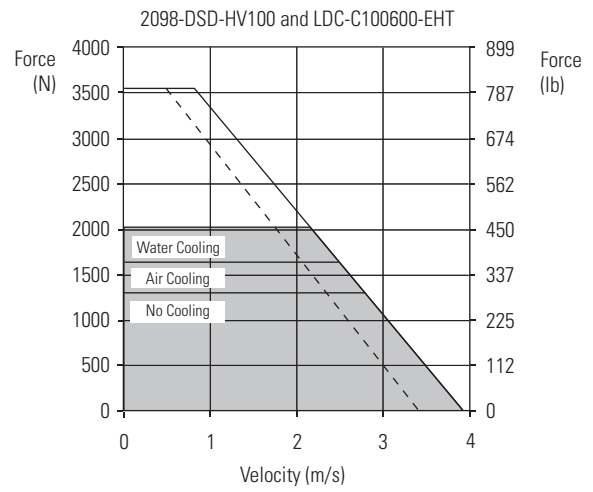
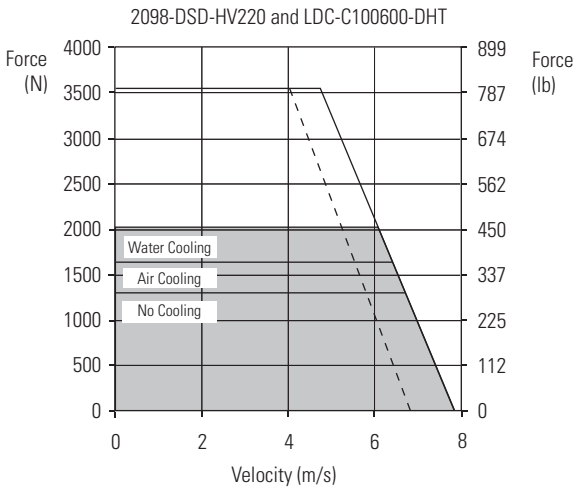
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 = Intermittent operating region with 400V AC (rms) input voltage
 = Continuous operating region

Ultra3000 (460V) Drives/LDC-Series Linear Motor Curves, Continued



- = Intermittent operating region
- = Intermittent operating region with 400V AC (rms) input voltage
- = Continuous operating region

Ultra3000 (460V) Drives/LDC-Series Linear Motor Curves, Continued



- = Intermittent operating region
- = Intermittent operating region with 400V AC (rms) input voltage
- = Continuous operating region

Ultra3000 (230V) Drives with LDL-Series Linear Motors

This section provides system combination information for the Ultra3000 (230V) drives when matched with LDL-Series ironless linear motors. Included are power and feedback cable catalog numbers, system performance specifications, and the optimum force/velocity curves.

Linear Motor Cable Combinations

Linear Motors	Motor Power Cable	Motor Feedback Cable ⁽¹⁾
LDL-N030120-DHT, LDL-N030240-DHT, LDL-N030240-EHT	2090-XXNPMF-16Sxx ⁽²⁾	2090-XXNFMF-Sxx ⁽³⁾ Sin/Cos or TTL Encoder Feedback
LDL-N050120-DHT, LDL-N050240-DHT, LDL-N050240-EHT, LDL-N050360-DHT, LDL-N050360-EHT, LDL-N050480-DHT, LDL-N050480-EHT		
LDL-N075480-DHT, LDL-N075480-EHT		
LDL-T030120-DHT, LDL-T030240-DHT, LDL-T030240-EHT		
LDL-T050120-DHT, LDL-T050240-DHT, LDL-T050240-EHT, LDL-T050360-DHT, LDL-T050480-DHT, LDL-T050480-EHT		
LDL-T075480-EHT, LDL-T075480-EHT		

(1) Use drive-mounted breakout board (catalog number 2090-UXBB-DM15) or panel-mounted breakout components on drive end. Refer to Breakout Components and Connector Kits on [page 418](#).

(2) These cables are available as standard (catalog number 2090-XXNPMF-16Sxx) or continuous-flex (catalog number 2090-CPWM7DF-16AFxx).

(3) These cables are available as standard (catalog number 2090-XXNFMF-Sxx) or continuous-flex (catalog number 2090-CFBM7DF-CDAFxx).

Motor-end connector kits are available for motor power/brake and feedback cables. Refer to Motor-end Connector Kits on [page 411](#) for catalog numbers.

Cable length xx is in meters. Refer to Standard Cable Lengths beginning on [page 393](#).

LDL-Series Performance Specifications with Ultra3000 (230V) Drives

Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Ultra3000 230V Drives
LDL-N030120-DHT	10.0 (32.8)	3.0	63 (14)	9.9	209 (47)	0.31	2098-DSD-010
LDL-N030240-DHT		6.0	126 (28)	19.9	417 (94)	0.63	2098-DSD-020
LDL-N030240-EHT		3.0		9.9			2098-DSD-010
LDL-T030120-DHT		3.0	72 (16)	9.9	239 (54)	0.36	2098-DSD-010
LDL-T030240-DHT		6.0	144 (32)	19.9	479 (108)	0.72	2098-DSD-020
LDL-T030240-EHT		3.0		9.9			2098-DSD-010

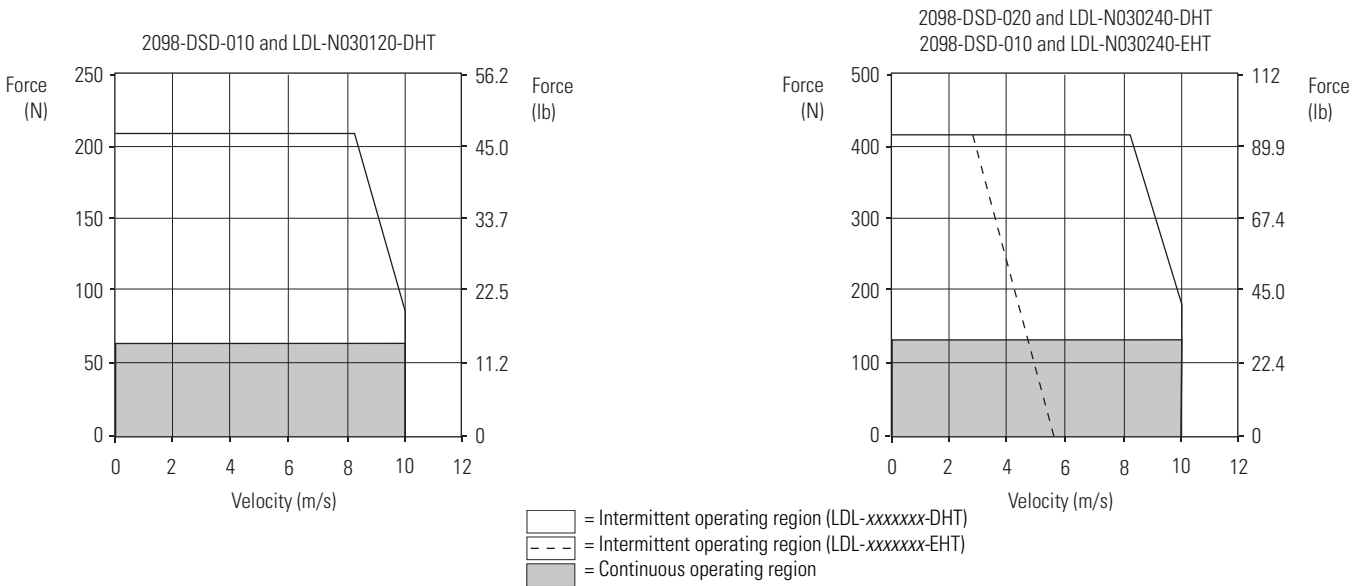
Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

LDL-Series Performance Specifications with Ultra3000 (230V) Drives, Continued

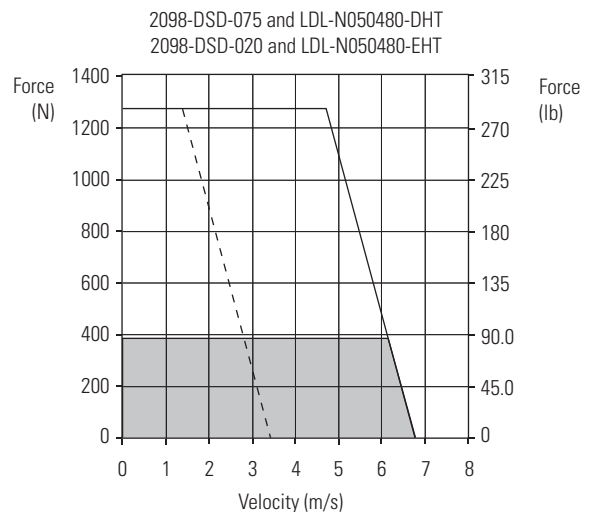
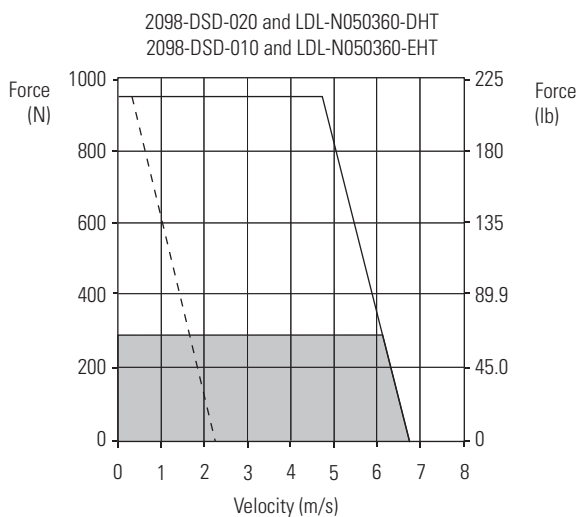
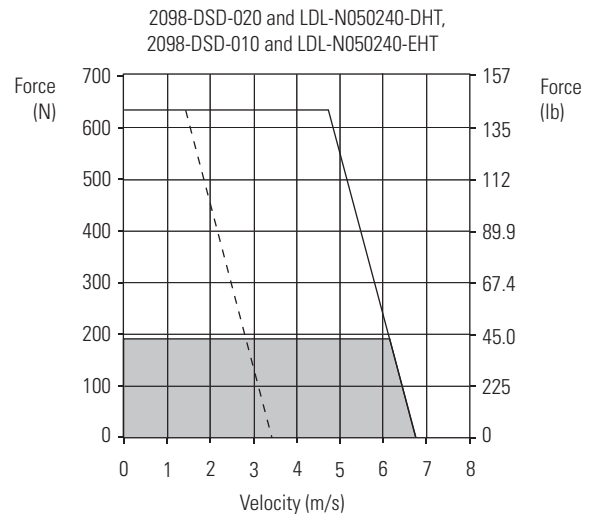
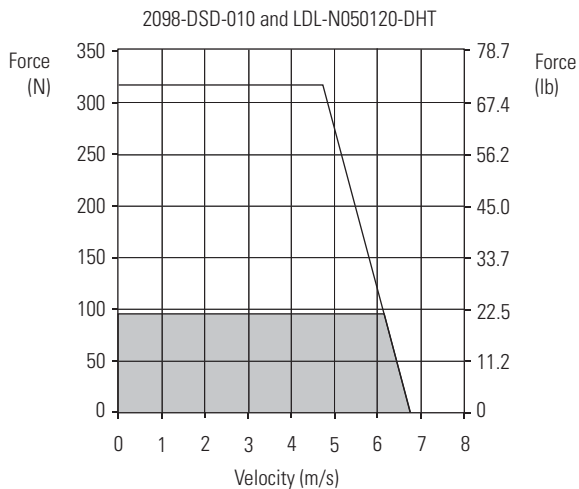
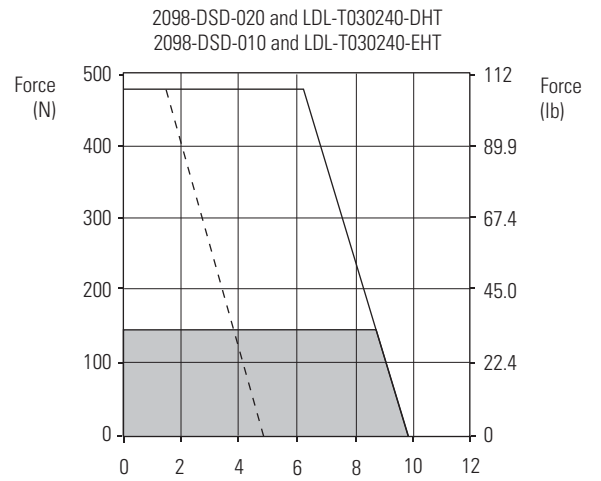
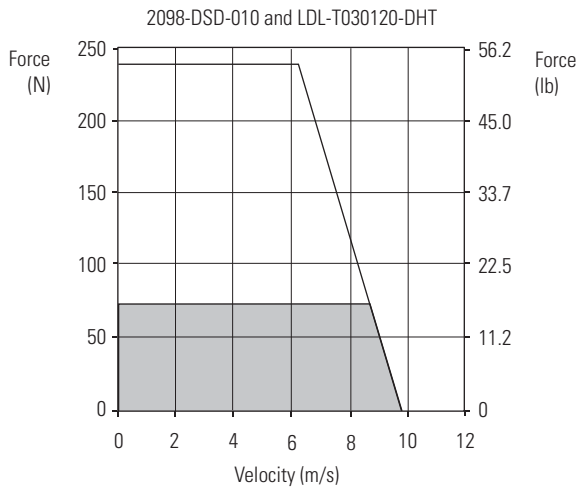
Linear Motor	Maximum Speed m/s (ft/s)	System Continuous Stall Current Amps 0-pk	System Continuous Stall Force N (lb)	System Peak Stall Current Amps 0-pk	System Peak Stall Force N (lb)	Linear Motor Rated Output kW	Ultra3000 230V Drives	
LDL-N050120-DHT	10.0 (32.8)	2.7	96 (22)	9.1	317 (71)	0.48	2098-DSD-010	
LDL-N050240-DHT		5.5	191 (43)	18.1	635 (143)	0.95	2098-DSD-020	
LDL-N050240-EHT		2.7		9.1			2098-DSD-010	
LDL-N050360-DHT		8.2	287 (65)	27.2	952 (214)	1.43	2098-DSD-020	
LDL-N050360-EHT		2.7		9.1			2098-DSD-010	
LDL-N050480-DHT		10.9	383 (86)	36.3	1269 (285)	1.91	2098-DSD-075	
LDL-N050480-EHT		5.5		18.1			2098-DSD-020	
LDL-T050120-DHT		2.7	110 (25)	9.1	364 (82)	0.55	2098-DSD-010	
LDL-T050240-DHT		5.5	220 (49)	18.1	728 (164)	1.10	2098-DSD-020	
LDL-T050240-EHT		2.7		9.1			2098-DSD-010	
LDL-T050360-DHT		8.2	329 (74)	27.2	1093 (246)	1.64	2098-DSD-020	
LDL-T050480-DHT		10.9	439 (99)	36.3	1457 (327)	2.19	2098-DSD-075	
LDL-T050480-EHT		5.5		18.1			2098-DSD-020	
LDL-N075480-DHT		10.0 (32.8)	9.9	519 (117)	32.8	1723 (387)	2.59	2098-DSD-075
LDL-N075480-EHT			4.9		16.4			2098-DSD-020
LDL-T075480-DHT			9.9	596 (134)	32.8	1977 (444)	2.98	2098-DSD-075
LDL-T075480-EHT	4.9		16.4		2098-DSD-020			

Performance specification data and curves reflect nominal system performance of a typical system with actuator at 40 °C (104 °F) and drive at 50 °C (122 °F) ambient and rated line voltage. For additional information on ambient and line conditions, refer to Motion Analyzer software, version 4.7 or later.

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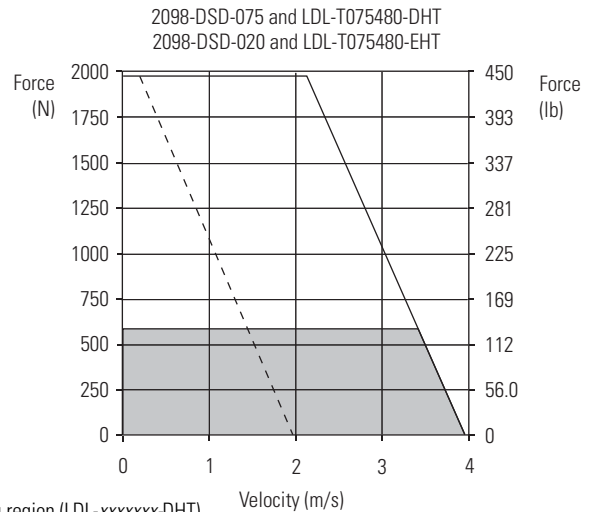
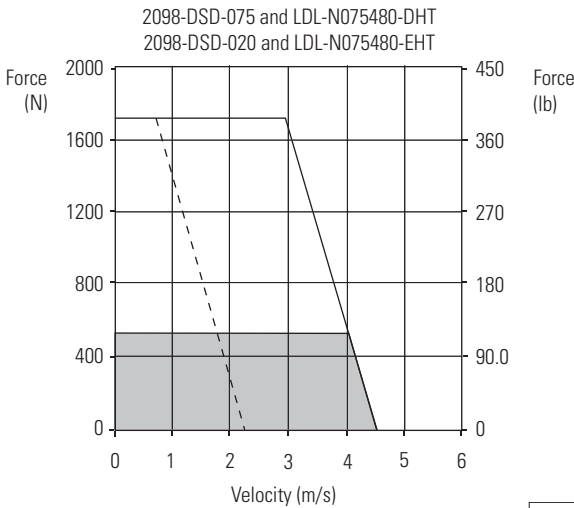
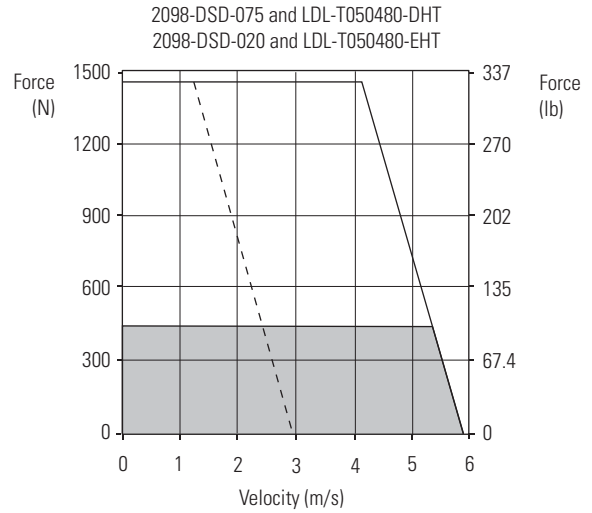
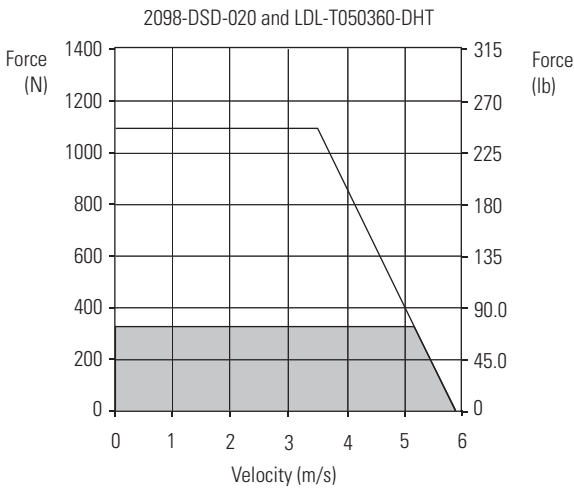
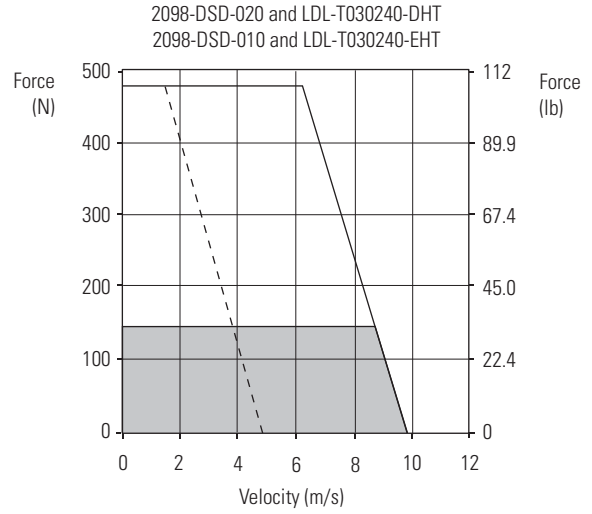
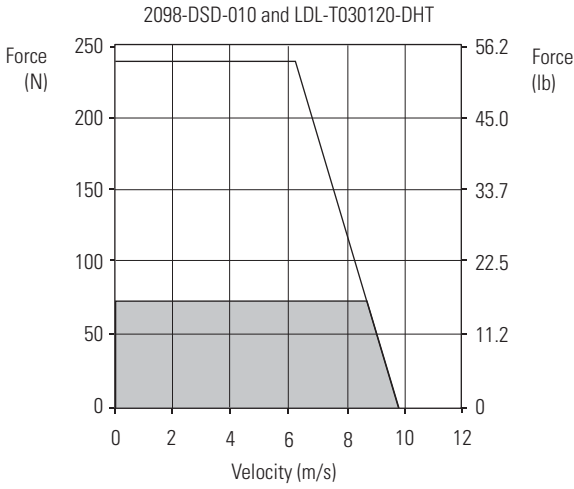


Ultra3000 (230V) Drives/LDL-Series Linear Motor Curves, Continued



= Intermittent operating region (LDL-xxxxxxx-DHT)
 = Intermittent operating region (LDL-xxxxxxx-EHT)
 = Continuous operating region

Ultra3000 (230V) Drives/LDL-Series Linear Motor Curves, Continued



- = Intermittent operating region (LDL-xxxxxx-DHT)
- = Intermittent operating region (LDL-xxxxxx-EHT)
- = Continuous operating region

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