Motion Control Accessories

This chapter includes compatibility tables, dimensions, specifications, and catalog numbers for the accessories that support the Kinetix Motion Control drive families.

2090-Series Motor/Actuator Cables

A wide variety of motor/actuator cables with rugged DIN connectors are available for connecting your motion control system. Standard motor power and feedback cables are available for all Allen-Bradley servo motors and actuators. Continuous-flex rated cables, intended for moving applications, are also available. Continuous-flex extension and standard transition cables are also available for your applications that require them.

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 442 for catalog numbers and descriptions.

IMPORTANT	Standard (non-flex) cables have a regular maintenance and installation bend radius of 10 times (10x) the cable diameter. For flexing applications, continuous-flex cables have an operational bend radius of 12 times (12x) the cable diameter.

2090-Series Motor/Acutator Cables with SpeedTec DIN Connectors Overview

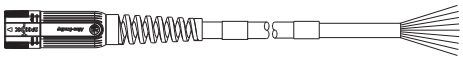
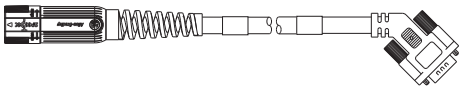
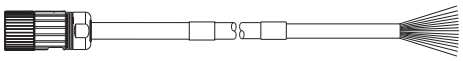
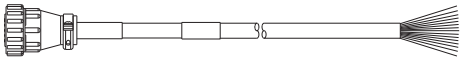
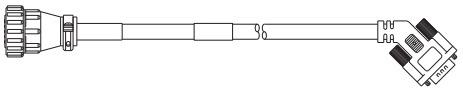
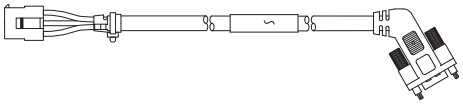
2090-Series motor/actuator cables with SpeedTec DIN connectors let OEMs and end-users standardize their machines on a common motor cable family. These cables, designed by Rockwell Automation for optimal performance with Allen-Bradley servo drives, servo motors, and linear actuators, offer best-in-class features and standards compliance. Innovative features, configuration options, and accessories provide machine builders with complete control of the cable requirements in their machines.

SpeedTec DIN Cable Features

- NFPA 79 Compliant
- UL Listed bulk cable with 600V insulation rating for use in cable trays and exposed run applications. Also carries applicable Canadian approvals
  - Type TC-ER: Power-only and power-with-brake cables
  - Type PLTC-ER: Feedback cable optimized for high-resolution feedback motors
- SpeedTec connection system yields ¼-turn quick connections with positive metallic keying
- DESINA compliant jacket coloring (orange for power, green for feedback) for easy identification and separation of cables in a machine
- Cables are included in the Rockwell Automation servo system Declaration of Conformity (DoC)
- Continuous flex cables are suitable for 20 million flex-cycles
  - Continuous-flex cables are available in standard and extension cable configurations
- Comprehensive accessories optimize the use of cables in machines

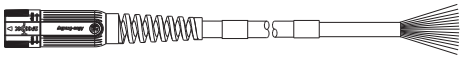
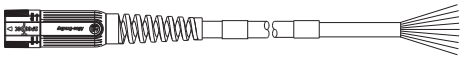
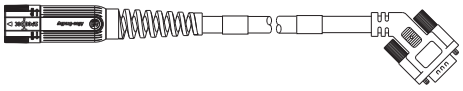
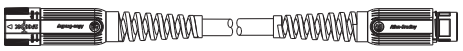
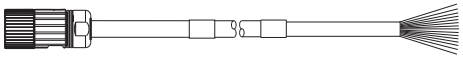
2090-Series Motor/Actuator Cables Overview

Feedback Cable Descriptions (standard, non-flex cable)

Standard Cable Cat. No.	Description	Cable Configuration	Motor/Actuator Connector
		Motor/Acutator End — Drive End	
2090-CFBM7DF-CEAA*xx*	• Drive-end flying-leads (DF) • High-resolution or resolver applications (CE)		SpeedTec DIN (M7)
2090-CFBM7DD-CEAA*xx*	• Drive-end 15-pin connector (DD) • High-resolution or resolver applications (CE)		
2090-XXNFMF-S*xx*	• Drive-end flying-leads • High-resolution or incremental applications		Threaded DIN (M4)
2090-CFBM4E2-CATR	• Drive-end bayonet (E2), transition (TR) cable (1) • Motor-end threaded DIN (M4) • All feedback types (CA)		
2090-CFBM6DF-CBAA*xx*	• Drive-end flying-leads (DF) • High-resolution, battery backup or Incremental applications (CB)		Circular Plastic (M6)
2090-CFBM6DD-CCAA*xx*	• Drive-end 15-pin connector (DD) • Incremental applications only (CC)		
2090-DANFCT-S*xx*	• Drive-end 20-pin connector • High-resolution applications		Rectangular Plastic

(1) Threaded DIN connector (motor end) and bayonet connector for 2090-XXNFMP-S*xx* cable. Refer to 2090-Series Motor Power and Feedback Transition Cables on page 400.

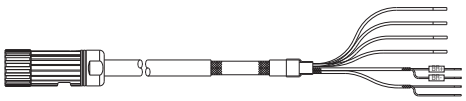
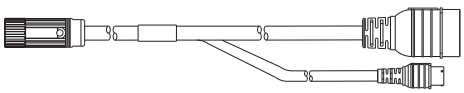
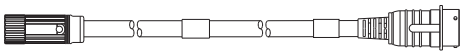
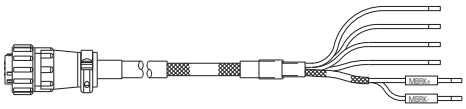
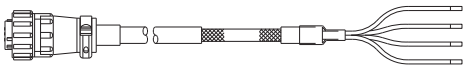
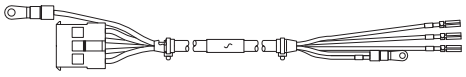
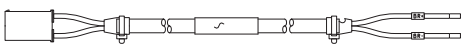
Feedback Cable Descriptions (continuous-flex)

Standard Cable Cat. No.	Description	Cable Configuration	Motor/Actuator Connector
		Motor/Acutator End — Drive End	
2090-CFBM7DF-CDAF*xx*	• Drive-end flying-leads (DF) • High-resolution or incremental applications (CD)		SpeedTec DIN (M7)
2090-CFBM7DF-CEAF*xx*	• Drive-end flying-leads (DF) • High-resolution or resolver applications (CE)		
2090-CFBM7DD-CEAF*xx*	• Drive-end 15-pin connector (DD) • High-resolution or resolver applications (CE)		
2090-CFBM7E7-CDAF*xx* 2090-CFBM7E7-CEAF*xx*	• Drive-end (male) connector, extension (E7) (1) • Motor-end SpeedTec DIN cable plug (M7)		
2090-CFBM4DF-CDAF*xx*	• Drive-end flying-leads • High-resolution or incremental applications		Threaded DIN (M4)

(1) SpeedTec DIN connector (motor end) and male connector for extending SpeedTec or threaded DIN cable. Refer to SpeedTec DIN Continuous-flex Extension Cables on page 399.

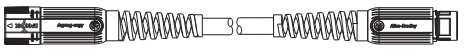
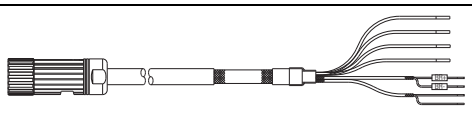
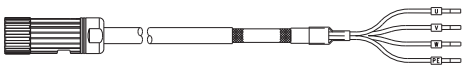
IMPORTANT Feedback cables with the CE designation, for example 2090-CFBM7DF-CEAA*xx*, are intended for high-resolution encoder or resolver applications and have fewer conductors than feedback cables with the CD designation, for example 2090-CFBM7DF-CDAF*xx*, which are intended for high-resolution or incremental encoder applications.

Power/Brake Cable Descriptions (standard, non-flex)

Standard Cable Cat. No.	Description	Cable Configuration		Motor/Actuator Connector
		Motor/Acutator End	Drive End	
2090-CPBM7DF-*xx*AA*xx*	• Drive-end flying-leads (DF) • Power/brake wires (PB)			SpeedTec DIN (M7)
2090-CPWM7DF-*xx*AA*xx*	• Drive-end flying-leads (DF) • Power wires only (PW)			
2090-XXNPMF-*xx*S*xx*	• Drive-end flying-leads • Power/brake wires			Threaded DIN (M4)
2090-CPBM4E2-*xx*TR	• Drive-end bayonet (E2), transition (TR) cable (1) • Motor-end threaded DIN (M4) • Power/brake wires (PB)			
2090-CPWM4E2-*xx*TR	• Drive-end bayonet (E2), transition (TR) cable (1) • Motor-end threaded DIN (M4) • Power wires only (PW)			
2090-CPBM6DF-16AA*xx*	• Drive-end flying-leads (DF) • Power/brake wires (PB)			Circular Plastic (M6)
2090-CPWM6DF-16AA*xx*	• Drive-end flying-leads (DF) • Power wires only (PW)			
2090-DANPT-16S*xx*	• Drive-end flying-leads • Power wires only			Rectangular Plastic
2090-DANBT-18S*xx*	Drive-end flying-lead brake wires			

(1) Threaded DIN connector (motor end) and bayonet connector for 2090-XXNFMP-S*xx* cable. Refer to 2090-Series Motor Power and Feedback Transition Cables on page 400.

Power/Brake Cable Descriptions (continuous-flex)

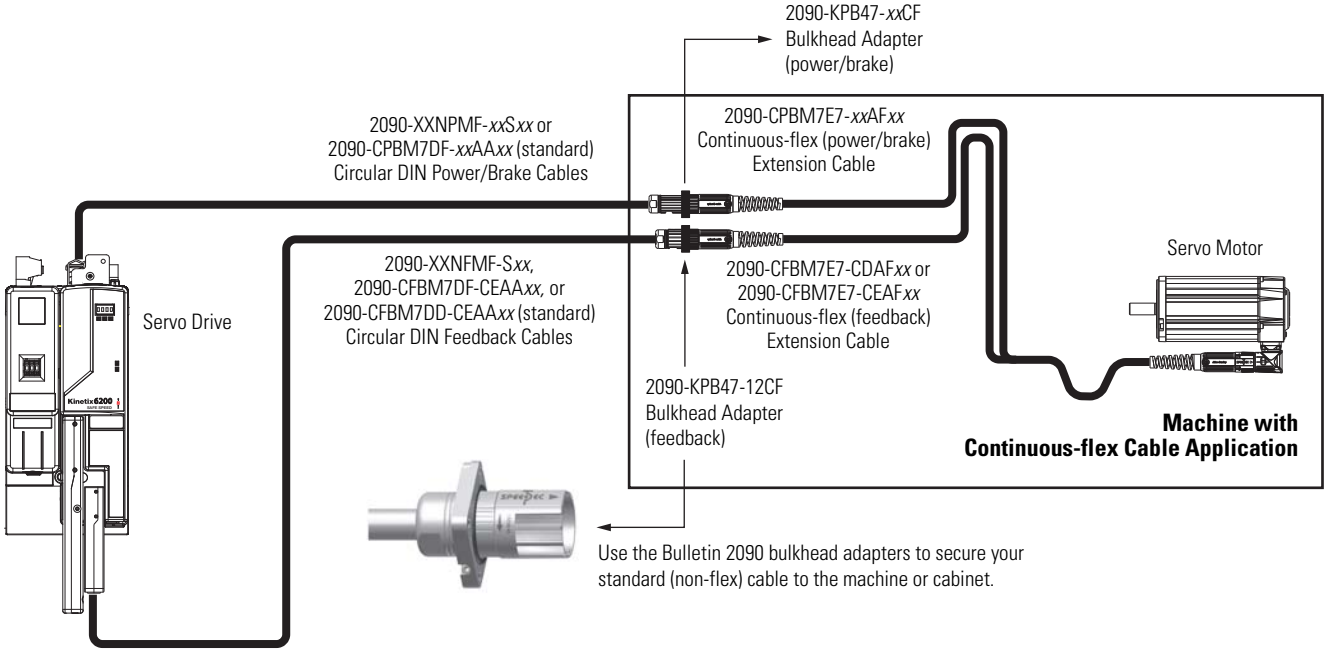
Standard Cable Cat. No.	Description	Cable Configuration		Motor/Actuator Connector
		Motor/Acutator End	Drive End	
2090-CPBM7DF-*xx*AF*xx*	• Drive-end flying-leads (DF) • Power/brake wires (PB)			SpeedTec DIN (M7)
2090-CPWM7DF-*xx*AF*xx*	• Drive-end flying-leads (DF) • Power wires only (PW)			
2090-CPBM7E7-*xx*AF*xx*	• Drive-end (male) connector, extension (E7) (1) • Motor-end SpeedTec DIN cable plug (M7)			
2090-CPBM4DF-*xx*AF*xx*	• Drive-end flying-leads (DF) • Power/brake wires (PB)			Threaded DIN (M4)
2090-CPWM4DF-*xx*AF*xx*	• Drive-end flying-leads (DF) • Power wires only (PW)			

(1) SpeedTec DIN connector (motor end) and male connector for extending SpeedTec or threaded DIN cable. Refer to SpeedTec DIN Continuous-flex Extension Cables on page 399.

SpeedTec DIN 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, 10, and 8 AWG.

Typical Extension Cable Application with Bulkhead Adapter



Continuous-flex Extension Feedback Cables

Continuous-flex Cable Cat. No.	Description	Applications
2090-CFBM7E7-CDAF*xx*	Feedback extension cable, SpeedTec DIN (male/female) connectors	Intended for high-resolution or incremental encoder applications.
2090-CFBM7E7-CEAF*xx*		Intended for high-resolution encoder or resolver applications.

Continuous-flex Extension Power Cables

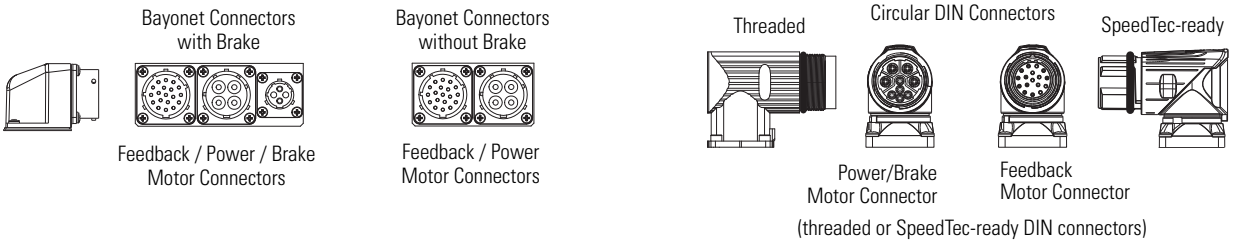
Continuous-flex Cable Cat. No.	Description
2090-CPBM7E7-16AF*xx*	Power/brake extension cable, SpeedTec DIN (male/female) connectors
2090-CPBM7E7-14AF*xx*	
2090-CPBM7E7-10AF*xx*	
2090-CPBM7E7-08AF*xx*	

2090-Series Motor Power and Feedback Transition Cables

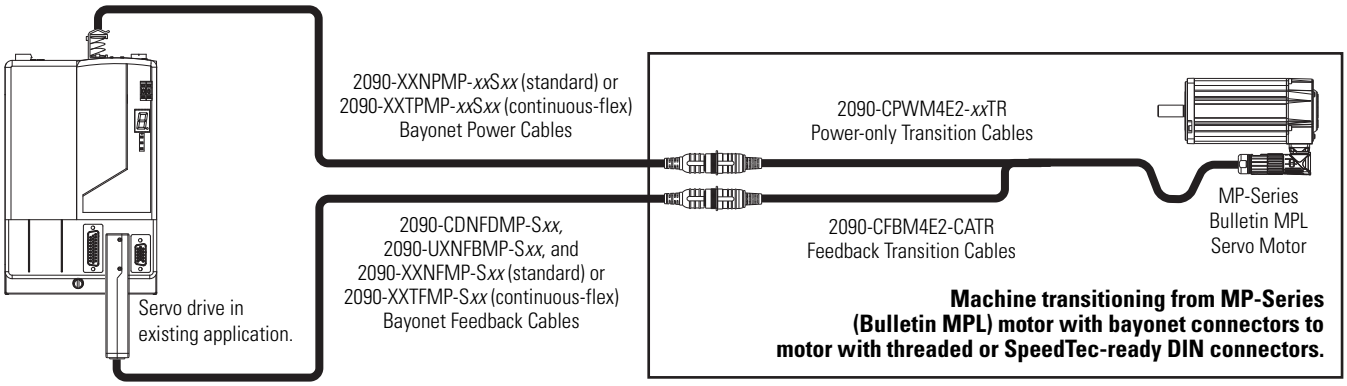
Motor power/brake and feedback transition cables support installations where MP-Series (Bulletin MPL) motors with bayonet connectors were recently replaced by the same motor with circular DIN connectors. These 0.5 m (19.7 in.) cables provide a seamless transition between your new motor and existing power, 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.

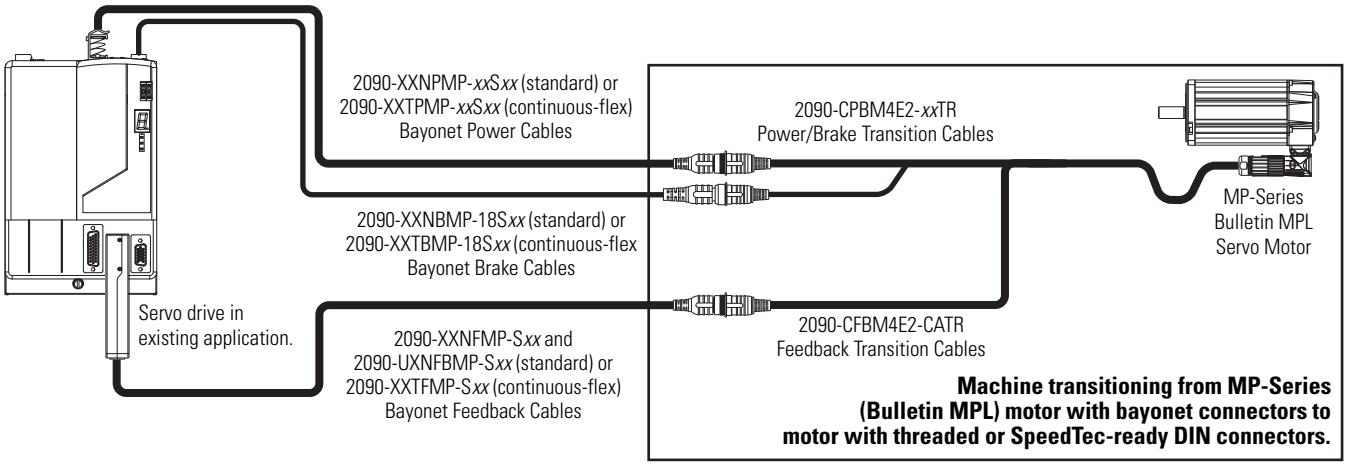
Bayonet and Circular DIN Motor Connectors



Transition Cable Application (power-only cable)



Transition Cable Application (power/brake cable)



Circular DIN Connector Compatibility Overview

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

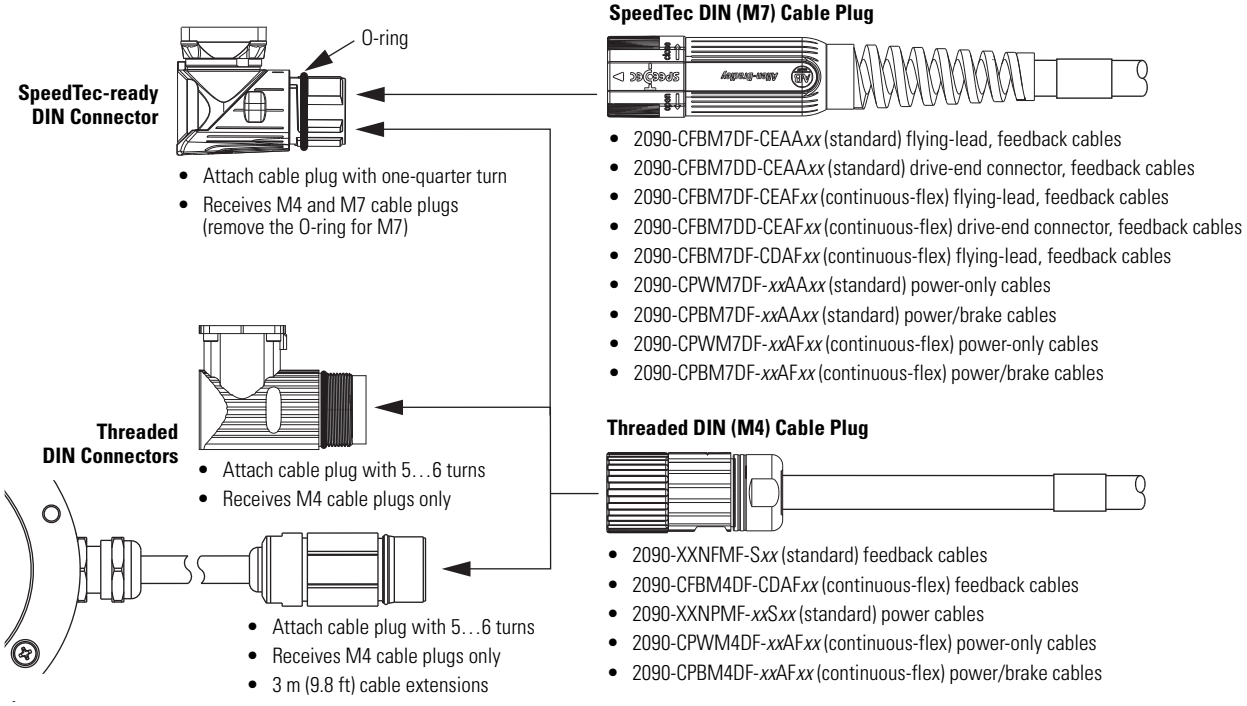
Motor/Actuator Cat. No.	Connector Type	Power-only or Power/Brake Cables	Feedback Cables
MPL-A/B3*xxx*, MPL-A/B4*xxx*, MPL-A/B45*xxx*, MPL-A/B5*xxx* MPL-B6*xxx*, MPL-B8*xxx*, and MPL-B9*xxx* MPM-A/B*xxxx* MPF-A/B*xxxx* RDB-B*xxxx* (1) MPAR-A/B3*xxxx* MPAI-A/B*xxxxx* LDC-C*xxxxxxx* and LDL-*xxxxxxx* (1)	SpeedTec-ready DIN	2090-CP*x*M7DF-*xx*AA*xx* 2090-CP*x*M7DF-*xx*AF*xx*	2090-CFBM7DF-CEAA*xx* 2090-CFBM7DD-CEAA*xx* 2090-CFBM7DF-CEAF*xx* 2090-CFBM7DD-CEAF*xx* 2090-CFBM7DF-CDAF*xx*
		• M7 cable plugs • Remove the O-ring • Adapts to SpeedTec-ready connectors only	
MPL-A/B15*xxx* and MPL-A/B2*xxx* MPAS-A/B*xxxx* MPMA-A/B*xxxx* MPAR-A/B1*xxxx* and MPAR-A/B2*xxxx* HPK-B/E*xxxxx*	Threaded DIN	2090-XXNPMF-S*xx* or 2090-CP*x*M4DF-*xx*AF*xx*	2090-XXNFMF-S*xx* or 2090-CFBM4DF-CDAF*xx*
		• M4 cable plugs • Adapts to threaded or SpeedTec-ready connectors • O-ring dampens the effects of vibration to create a more secure connection	
MPS-A/B*xxxx*	Threaded DIN with 3 m (9.8 ft) cable extensions		

(1) The LDC-Series and LDL-Series linear motors and Bulletin RDB direct-drive motors have SpeedTec-ready DIN (M7) motor connectors, but require the additional conductors included with 2090-CFBM7DF-CDAF*xx* (continuous-flex) feedback cables. For standard (non-flex) applications, use 2090-XXNFMF-S*xx* feedback cables.

IMPORTANT Motors equipped with SpeedTec-ready DIN connectors are fully compatible with threaded DIN (M4) cable plugs. SpeedTec-ready DIN motor connectors are also compatible with SpeedTec DIN (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 DIN (M4) cable plugs.

Typical Circular DIN Cable Applications



2090-Series 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-*xx*2*x*AA) are being discontinued and require 2090-XXNFMP-S*xx* (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-A15*xxx*-V/E*x*4*x*AA, MPL-A2*xxx*-V/E*x*4*x*AA	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-CFBM4DF-CDAF*xx* (continuous-flex)
MPL-B15*xxx*-V/E*x*4*x*AA, MPL-B2*xxx*-V/E*x*4*x*AA	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*		
MPL-A3*xxx*-M/S*x*7*x*AA, MPL-A4*xxx*-M/S*x*7*x*AA, MPL-A45*xxx*-M/S*x*7*x*AA, MPL-A5*xxx*-M/S*x*7*x*AA	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*		2090-CFBM7DF-CEAA*xx* or 2090-CFBM7DD-CEAA*xx* (standard) 2090-CFBM7DF-CEAF*xx* 2090-CFBM7DD-CEAF*xx* (continuous-flex)
MPL-B3*xxx*-M/S*x*7*x*AA, MPL-B4*xxx*-M/S*x*7*x*AA, MPL-B45*xxx*-M/S*x*7*x*AA, MPL-B5*xxx*-M/S*x*7*x*AA, MPL-B6*xxx*-M/S*x*7*x*AA, MPL-B8*xxx*-M/S*x*7*x*AA, MPL-B9*xxx*-M/S*x*7*x*AA	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* 2098-IPD-HV*xxx* 2099-BM*xx*-S		
MPL-A15*xxx*-H*x*4*x*AA, MPL-A2*xxx*-H*x*4*x*AA	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*	Incremental (1) Feedback	2090-XXNFMF-S*xx* (standard) 2090-CFBM4DF-CDAF*xx* (continuous-flex)
MPL-B15*xxx*-H*x*4*x*AA, MPL-B2*xxx*-H*x*4*x*AA	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*		
MPL-A3*xxx*-H*x*7*x*AA, MPL-A4*xxx*-H*x*7*x*AA, MPL-A45*xxx*-H*x*7*x*AA	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*		2090-XXNFMF-S*xx* (standard) 2090-CFBM7DF-CDAF*xx* (continuous-flex)
MPL-B*xxxx*-R*x*7*x*AA	2094-BC*xx*-M*xx*-S or 2094-BM*xx*-S	Resolver Feedback (1)	2090-CFBM7DF-CEAA*xx* (standard) 2090-CFBM7DF-CEAF*xx* (continuous-flex)

(1) Not all MP-Series low-inertia motors are available with incremental and resolver feedback options.

For cable configuration illustrations and feature descriptions, by catalog number, refer to 2090-Series Motor/Actuator Cables Overview beginning on page 397.
Cable length *xx* is in meters. Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

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-*xx*2*x*AA) are being discontinued and require 2090-XXNPMP-*xx*S*xx* (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-A15*xxx*-*xx*4*x*AA, MPL-A2*xxx*-*xx*4*x*AA	2090-XXNPMF-16S*xx* (standard) 2090-CP*x*M4DF-16AF*xx* (continuous-flex)
MPL-A3*xxx*-*xx*7*x*AA	2090-CP*x*M7DF-16AA*xx* (standard) 2090-CP*x*M7DF-16AF*xx* (continuous-flex)
MPL-A420P-*xx*7*x*AA, MPL-A430H-*xx*7*x*AA	
MPL-A4530F-*xx*7*x*AA, MPL-A4540C-*xx*7*x*AA	
MPL-A430P-*xx*7*x*AA, MPL-A4530K-*xx*7*x*AA, MPL-A4540F-*xx*7*x*AA	2090-CP*x*M7DF-14AA*xx* (standard) 2090-CP*x*M7DF-14AF*xx* (continuous-flex)
MPL-A4560F-*xx*7*x*AA	2090-CP*x*M7DF-12AA*xx* (standard)
MPL-A520K-*xx*7*x*AA	2090-CP*x*M7DF-10AA*xx* (standard) 2090-CP*x*M7DF-10AF*xx* (continuous-flex)
MPL-A540K-*xx*7*x*AA, MPL-A560F-*xx*7*x*AA	2090-CP*x*M7DF-08AA*xx* (standard) 2090-CP*x*M7DF-08AF*xx* (continuous-flex)

MP-Series (460V) Low Inertia Motors	Power Cable Cat. No.
MPL-B15*xxx*-*xx*4*x*AA, MPL-B2*xxx*-*xx*4*x*AA	2090-XXNPMF-16S*xx* (standard) 2090-CP*x*M4DF-16AF*xx* (continuous-flex)
MPL-B3*xxx*-*xx*7*x*AA	2090-CP*x*M7DF-16AA*xx* (standard) 2090-CP*x*M7DF-16AF*xx* (continuous-flex)
MPL-B4*xxx*-*xx*7*x*AA	
MPL-B45*xxx*-*xx*7*x*AA	
MPL-B520K-*xx*7*x*AA	
MPL-B540D-*xx*7*x*AA, MPL-B540K-*xx*7*x*AA, MPL-B560F-*xx*7*x*AA	2090-CP*x*M7DF-14AA*xx* (standard) 2090-CP*x*M7DF-14AF*xx* (continuous-flex)
MPL-B580F-*xx*7*x*AA, MPL-B580J-*xx*7*x*AA	2090-CP*x*M7DF-10AA*xx* (standard) 2090-CP*x*M7DF-10AF*xx* (continuous-flex)
MPL-B640F-*xx*7*x*AA	
MPL-B660F-*xx*7*x*AA, MPL-B680D-*xx*7*x*AA, MPL-B960B-*xx*7*x*AA, MPL-B980B-*xx*7*x*AA	2090-CP*x*M7DF-08AA*xx* (standard) 2090-CP*x*M7DF-08AF*xx* (continuous-flex)
MPL-B680F-*xx*7*x*AA, MPL-B860D-*xx*7*x*AA, MPL-B880C-*xx*7*x*AA,	2090-CPBM7DF-06AA*xx* (standard)
MPL-B880D-*xx*7*x*AA	2090-CPBM7DF-04AA*xx* (standard)
MPL-B960C-*xx*7*x*AA, MPL-B960D-*xx*7*x*AA, MPL-B980C-*xx*7*x*AA, MPL-B980D-*xx*7*x*AA	
MPL-B980E-*xx*7*x*AA	2090-CPBM7DF-02AA*xx* (standard)

For cable configuration illustrations and feature descriptions, by catalog number, refer to 2090-Series Motor/Actuator Cables Overview beginning on page 397.
Cable length *xx* is in meters. Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

MP-Series Food Grade Motors

Motor Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
MPF-A*xxxx*-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-CFBM7DF-CEAA*xx* or 2090-CFBM7DD-CEAA*xx* (standard) 2090-CFBM7DF-CEAF*xx* 2090-CFBM7DD-CEAF*xx* (continuous-flex)
MPF-B*xxxx*-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* 2098-IPD-HV*xxx*		

MP-Series (230V) Food Grade Motors	Power Cable Cat. No.
MPF-A310P, MPF-A320H, MPF-A320P, and MPF-A330P	2090-CP*x*M7DF-16AA*xx* (standard) 2090-CP*x*M7DF-16AF*xx* (continuous-flex)
MPF-A430H	
MPF-A430P, MPF-A4530K and MPF-A4540F	2090-CP*x*M7DF-14AA*xx* (standard) 2090-CP*x*M7DF-14AF*xx* (continuous-flex)
MPF-A540K	2090-CP*x*M7DF-08AA*xx* (standard) 2090-CP*x*M7DF-08AF*xx* (continuous-flex)

MP-Series (460V) Food Grade Motors	Power Cable Cat. No.
MPF-B310P, MPF-B320P, and MPF-B330P	2090-CP*x*M7DF-16AA*xx* (standard) 2090-CP*x*M7DF-16AF*xx* (continuous-flex)
MPF-B430P, MPF-B4530K, and MPF-B4540F	
MPF-B540K	2090-CP*x*M7DF-10AA*xx* (standard) 2090-CP*x*M7DF-10AF*xx* (continuous-flex)

MP-Series Stainless Steel Motors

Motor Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
MPS-A*xxxx*-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-B*xxxx*-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* 2098-IPD-HV*xxx*		

MP-Series (230V) Stainless Steel Motors	Power Cable Cat. No.
MPS-A330P	2090-XXNPMF-16S*xx* (standard) 2090-CP*x*M4DF-16AF*xx* (continuous-flex)
MPS-A4540F	

MP-Series (460V) Stainless Steel Motors	Power Cable Cat. No.
MPS-B330P	2090-XXNPMF-16S*xx* (standard) 2090-CP*x*M4DF-16AF*xx* (continuous-flex)
MPS-B4540F	
MPS-B560F	2090-XXNPMF-14S*xx* (standard) 2090-CP*x*M4DF-14AF*xx* (continuous-flex)

For cable configuration illustrations and feature descriptions, by catalog number, refer to 2090-Series Motor/Actuator Cables Overview beginning on page 397.
Cable length *xx* is in meters. Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

MP-Series Medium Inertia Motors

Motor Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
MPM-A*xxxxx*-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-CFBM7DF-CEAA*xx* or 2090-CFBM7DD-CEAA*xx* (standard) 2090-CFBM7DF-CEAF*xx* 2090-CFBM7DD-CEAF*xx* (continuous-flex)
MPM-B*xxxxx*-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-A*xxxxx*-2	2094-AC*xx*-M*xx*-S or 2094-AM*xx*-S	Resolver Feedback (1)	2090-CFBM7DF-CEAA*xx* (standard) 2090-CFBM7DF-CEAF*xx* (continuous-flex)
MPM-B*xxxxx*-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-CP*x*M7DF-16AA*xx* (standard) 2090-CP*x*M7DF-16AF*xx* (continuous-flex)
MPM-A1302F	2090-CP*x*M7DF-14AA*xx* (standard) 2090-CP*x*M7DF-14AF*xx* (continuous-flex)
MPM-A1304F	2090-CP*x*M7DF-12AA*xx* (standard)
MPM-A1651F	2090-CP*x*M7DF-10AA*xx* (standard) 2090-CP*x*M7DF-10AF*xx* (continuous-flex)
MPM-A1652F, MPM-A1653F	2090-CP*x*M7DF-08AA*xx* (standard) 2090-CP*x*M7DF-08AF*xx* (continuous-flex)
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-CP*x*M7DF-16AA*xx* (standard) 2090-CP*x*M7DF-16AF*xx* (continuous-flex)
MPM-B1153E, MPM-B1153F	
MPM-B1302F, MPM-B1302M, MPM-B1304C, MPM-B1304E	
MPM-B1651C, MPM-B1652C	
MPM-B1153T	2090-CP*x*M7DF-14AA*xx* (standard) 2090-CP*x*M7DF-14AF*xx* (continuous-flex)
MPM-B1302T, MPM-B1304M	
MPM-B1651F, MPM-B1653C	
MPM-B1651M, MPM-B1652E, MPM-B1652F, MPM-B1653E	2090-CP*x*M7DF-10AA*xx* (standard) 2090-CP*x*M7DF-10AF*xx* (continuous-flex)
MPM-B2152C, MPM-B2153B	
MPM-B1653F	2090-CP*x*M7DF-08AA*xx* (standard) 2090-CP*x*M7DF-08AF*xx* (continuous-flex)
MPM-B2152F, MPM-B2152M, MPM-B2153E, MPM-B2153F, MPM-B2154B, MPM-B2154E, MPM-B2154F	

For cable configuration illustrations and feature descriptions, by catalog number, refer to 2090-Series Motor/Actuator Cables Overview beginning on page 397.
Cable length *xx* is in meters. Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

RDD-Series Direct Drive Motors

Motor Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
RDB-B*xxxx*-7/3	2094-BC*xx*-M*xx*-S or 2094-BM*xx*-S 2094-BC*xx*-M*xx*-M or 2094-BM*xx*-M 2099-BM*xx*-S	Multi-turn High Resolution Absolute or Single-turn High Resolution Encoder Feedback	2090-XXNFMF-S*xx* (standard) 2090-CFBM7DF-CDAF*xx* (continuous-flex)

RDD-Series (400V Class) Direct Drive Motors	Power Cable Cat. No.
RDB-B21519, RDB-B21529	2090-CPWM7DF-16AA*xx* (standard) 2090-CPWM7DF-16AF*xx* (continuous-flex)
RDB-B29014, RDB-B29016, RDB-B29024	
RDB-B2151C, RDB-B21539	2090-CPWM7DF-14AA*xx* (standard) 2090-CPWM7DF-14AF*xx* (continuous-flex)
RDB-B29019, RDB-B29034	
RDB-B2152C	2090-CPWM7DF-12AA*xx* (standard)
RDB-B29026	
RDB-B2153C	2090-CPWM7DF-10AA*xx* (standard) 2090-CPWM7DF-10AF*xx* (continuous-flex)
RDB-B29036, RDB-B41014	
RDB-B29029, RDB-B41016, RDB-B41024	2090-CPWM7DF-08AA*xx* (standard) 2090-CPWM7DF-08AF*xx* (continuous-flex)
RDB-B29039, RDB-B41018, RDB-B41026, RDB-B41035	2090-CPBM7DF-06AA*xx* (standard)

For cable configuration illustrations and feature descriptions, by catalog number, refer to 2090-Series Motor/Actuator Cables Overview beginning on page 397.
Cable length *xx* is in meters. Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

HPK-Series Asynchronous Servo Motors

Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
HPK-B*xxxxx*-M/S HPK-E*xxxxx*-M/S	2099-BM*xx*-S	Multi-turn High Resolution Absolute or Single-turn High Resolution Encoder Feedback	2090-XXNFMF-S*xx* (standard) 2090-CFBM4DF-CDAF*xx* (continuous-flex)

HPK-Series Asynchronous Servo Motors	Power Cable Cat. No.
All HPK-B*xxxx* or HPK-E*xxxx* motors	Customer Supplied

For cable configuration illustrations and feature descriptions, by catalog number, refer to 2090-Series Motor/Actuator Cables Overview beginning on page 397.
Cable length *xx* is in meters. Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

TL-Series Low Inertia Motors

Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
TLY-A*xxxx*-H	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* 2071-A*xx*	Incremental	2090-CFBM6DF-CBAA*xx* (flying lead) or 2090-CFBM6DD-CCAA*xx* (premolded connector)
TLY-A*xxxx*-B	2093-AC05-MP*x* or 2093-AM*xx* 2097-V3*xxxx*	Multi-turn High Resolution Absolute Encoder Feedback	
	2071-A*xx*		2090-CFBM6DF-CBAA*xx* (flying lead)
TL-A*xxxx*-B	2071-A*xx*		2090-DANFCT-S*xx*

TL-Series (230V) Motors	Power Cable Cat. No.
TLY-A*xxxx*-H	2090-CPBM6DF-16AA*xx* (power and brake)
TLY-A*xxxx*-B	2090-CPWM6DF-16AA*xx* (power without brake)
TL-A*xxxx*-B	2090-DANPT-16S*xx*

TL-Series (230V) Motors	Brake Cable Cat. No.
TL-A*xxxx*-B motors	2090-DANBT-18S*xx*

For cable configuration illustrations and feature descriptions, by catalog number, refer to 2090-Series Motor/Actuator Cables Overview beginning on page 397.
Cable length *xx* is in meters. Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.
For N-Series retrofit cable information, refer to Transition Plates for N-Series Retrofit on page 81.

IMPORTANT TL-A*xxxx*-B motors have rectangular plastic connectors and are intended for use with Kinetix 3 (Bulletin 2071) servo drives. The TLY-A*xxxx* 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-A*xxxxx*-V/A or MPMA-A	2093-AC05-MP*x* or 2093-AM*xx* 2094-AC*xx*-M*xx*-S or 2094-AM*xx*-S 2098-DSD-*xxx*	Multi-turn High Resolution Absolute Encoder Feedback	2090-XXNFMF-S*xx* (standard) 2090-CFBM4DF-CDAF*xx* (continuous-flex)
MPAS-A*xxxxx*-A or MPMA-A	2097-V3*xxxx*		
MPAS-A*xxxxx*-V	2071-A*xx*		
MPAS-B*xxxxx*-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*		
MPAS-B*xxxxx*-A or MPMA-B	2097-V3*xxxx*		

MP-Series (230V) Integrated Linear Stages	Power Cable Cat. No.
MPAS-A*xxxxx*-V/A or MPMA-A	2090-XXNPMF-16S*xx* (standard) 2090-CP*x*M4DF-16AF*xx* (continuous-flex)

MP-Series (460V) Integrated Linear Stages	Power Cable Cat. No.
MPAS-B*xxxxx*-V/A or MPMA-B	2090-XXNPMF-16S*xx* (standard) 2090-CP*x*M4DF-16AF*xx* (continuous-flex)

For cable configuration illustrations and feature descriptions, by catalog number, refer to 2090-Series Motor/Actuator Cables Overview beginning on page 397.
Cable length *xx* is in meters. Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

TL-Series Electric Cylinders

Actuator Cat. No.	Drive Compatibility	Feedback Type	Motor Feedback Cable
TLAR-A*xxxxx*	2093-AC05-MP*x* or 2093-AM*xx* 2097-V3*xxxx* 2071-A*xx*	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-A*xxxxx*	2090-CPBM6DF-16AA*xx* (power and brake) standard 2090-CPWM6DF-16AA*xx* (power without brake) standard

For cable configuration illustrations and feature descriptions, by catalog number, refer to 2090-Series Motor/Actuator Cables Overview beginning on page 397.
Cable length *xx* is in meters. Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

MP-Series Electric Cylinders

Actuator Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
MPAR-A1*xxxx* MPAR-A2*xxxx*	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)
MPAR-B1*xxxx* MPAR-B2*xxxx*	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*		
MPAR-A3*xxxx*	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*		2090-CFBM7DF-CEAA*xx* or 2090-CFBM7DD-CEAA*xx* (standard) 2090-CFBM7DF-CEAF*xx* 2090-CFBM7DD-CEAF*xx* (continuous-flex)
MPAR-B3*xxxx*	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) Electric Cylinders	Power Cable Cat. No.
MPAR-A1*xxxx* MPAR-A2*xxxx*	2090-XXNPMF-16S*xx* (standard) 2090-CP*x*M4DF-16AF*xx* (continuous-flex)
MPAR-A3*xxxx*	2090-CP*x*M7DF-16AA*xx* (standard) 2090-CP*x*M7DF-16AF*xx* (continuous-flex)

MP-Series (460V) Electric Cylinders	Power Cable Cat. No.
MPAR-B1*xxxx* MPAR-B2*xxxx*	2090-XXNPMF-16S*xx* (standard) 2090-CP*x*M4DF-16AF*xx* (continuous-flex)
MPAR-B3*xxxx*	2090-CP*x*M7DF-16AA*xx* (standard) 2090-CP*x*M7DF-16AF*xx* (continuous-flex)

MP-Series Heavy Duty Electric Cylinders

Actuator Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
MPAI-A3*xxxx* MPAI-A4*xxxx*	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-CFBM7DF-CEAA*xx* or 2090-CFBM7DD-CEAA*xx* (standard) 2090-CFBM7DF-CEAF*xx* 2090-CFBM7DD-CEAF*xx* (continuous-flex)
MPAI-B3*xxxx* MPAI-B4*xxxx*	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) Heavy Duty Electric Cylinders	Power Cable Cat. No.
MPAI-A3*xxxx* MPAI-A4*xxxx*	2090-CP*x*M7DF-16AA*xx* (standard) 2090-CP*x*M7DF-16AF*xx* (continuous-flex)

MP-Series (460V) Heavy Duty Electric Cylinders	Power Cable Cat. No.
MPAI-B3*xxxx* MPAI-B4*xxxx*	2090-CP*x*M7DF-16AA*xx* (standard) 2090-CP*x*M7DF-16AF*xx* (continuous-flex)

For cable configuration illustrations and feature descriptions, by catalog number, refer to 2090-Series Motor/Actuator Cables Overview beginning on page 397.
Cable length *xx* is in meters. Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

LDC-Series Linear Motors

Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
LDC-C*xxxxxx-xx*T*x*1 (230V operation)	2093-AC05-MP*x* or 2093-AM*xx* 2094-AC*xx*-M*xx*-S or 2094-AM*xx*-S 2098-DSD-*xxx* 2071-A*xx*	Sin/Cos or TTL Encoder Feedback	2090-XXNFMF-S*xx* (standard) 2090-CFBM7DF-CDAF*xx* (continuous-flex)
LDC-C*xxxxxx-xx*T*x*1 (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-C*xxxxxx-xx*T*x*1	2090-CPWM7DF-16AA*xx* (standard) 2090-CPWM7DF-16AF*xx* (continuous-flex)

For cable configuration illustrations and feature descriptions, by catalog number, refer to 2090-Series Motor/Actuator Cables Overview beginning on page 397.
Cable length *xx* is in meters. Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

LDL-Series Linear Motors

Cat. No.	Drive Compatibility	Feedback Type	Feedback Cable Cat. No.
LDL-*xxxxxx-xx*T*x*1	2093-AC05-MP*x* or 2093-AM*xx* 2094-AC*xx*-M*xx*-S or 2094-AM*xx*-S 2098-DSD-*xxx* 2071-A*xx*	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-xx*T*x*1	2090-CPWM7DF-16AA*xx* (standard) 2090-CPWM7DF-16AF*xx* (continuous-flex)

For cable configuration illustrations and feature descriptions, by catalog number, refer to 2090-Series Motor/Actuator Cables Overview beginning on page 397.
Cable length *xx* is in meters. Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

2090-Series Motor/Actuator Cable Specifications

Power Cable Specifications

Power Cables (1) Cat. No.	**Cable Type/ Jacket Color**	**Description**	**Wire Size** AWG	**Weight, approx.** kg/m (lb/ft)	**Standard Cable Lengths** m (ft)
2090-XXNPMF-16S*xx*	Standard cable Industrial TPE, Black	Four conductor, 600V, shielded cable for three-phase power with additional four conductors, 18 AWG, shielded, for motor brake and spares.	16	0.276 (0.186)	1 (3.2), 2 (6.5), 3 (9.8), 4 (13.1), 5 (16.4); 7 (22.9), 9 (29.5), 12 (39.4), 15 (49.2), 20 (65.6); 25 (82.0), 30 (98.4), 40 (131.2), 60 (196.8), 90 (295.3)
2090-XXNPMF-14S*xx*			14	0.315 (0.212)	
2090-CPBM7DF-16AA*xx*	Standard cable Industrial TPE, Orange (DESINA, RAL 2003)	Four conductor, 600V, shielded cable for three-phase power with additional two conductors 18 AWG for motor brake.	16	0.212 (0.143)	
2090-CPBM7DF-14AA*xx*			14	0.261 (0.175)	
2090-CPBM7DF-12AA*xx*			12	0.349 (0.235)	
2090-CPBM7DF-10AA*xx*			10	0.492 (0.331)	
2090-CPBM7DF-08AA*xx*			8	0.708 (0.476)	
2090-CPBM7DF-06AA*xx*			6	1.038 (0.698)	
2090-CPBM7DF-04AA*xx*		Four conductor, 600V, shielded cable for three-phase power with additional two conductors 16 AWG for motor brake.	4	1.549 (1.041)	
2090-CPBM7DF-02AA*xx*			2	2.166 (1.455)	
2090-CPWM7DF-16AA*xx*		Four conductor, 600V, shielded cable for three-phase power.	16	0.136 (0.091)	
2090-CPWM7DF-14AA*xx*			14	0.185 (0.124)	
2090-CPWM7DF-12AA*xx*			12	0.248 (0.167)	
2090-CPWM7DF-10AA*xx*			10	0.418 (0.281)	
2090-CPWM7DF-08AA*xx*			8	0.644 (0.433)	
2090-CPWM6DF-16AA*xx*	Standard cable Industrial TPE, Black		16	0.138 (0.093)	1 (3.2), 2 (6.5), 3 (9.8), 4 (13.1); 5 (16.4), 7 (22.9), 9 (29.5), 12 (39.4); 15 (49.2), 20 (65.6), 25 (82.0), 30 (98.4)
2090-DANPT-16S*xx*			16		
2090-CPBM6DF-16AA*xx*		Four conductor, 600V, shielded cable for three-phase power with additional two conductors 18 AWG for motor brake.	16	0.180 (0.121)	
2090-CPBM4DF-16AF*xx*	Continuous-flex cable Industrial TPE, Orange (DESINA, RAL 2003)		16	0.228 (0.153)	1 (3.2), 2 (6.5), 3 (9.8), 4 (13.1), 5 (16.4), 7 (22.9); 9 (29.5), 12 (39.4), 15 (49.2), 20 (65.6), 25 (82.0), 30 (98.4); 40 (131.2), 50 (164.0), 60 (196.8), 75 (264.0), 90 (295.3)
2090-CPBM7DF-16AF*xx*			16		
2090-CPBM7DF-14AF*xx*			14	0.289 (0.194)	
2090-CPBM7DF-10AF*xx*			10	0.513 (0.345)	
2090-CPBM7DF-08AF*xx*			8	0.697 (0.468)	
2090-CPWM4DF-16AF*xx*		Four conductor, 600V, shielded cable for three-phase power.	16	0.154 (0.104)	
2090-CPWM7DF-16AF*xx*			16		
2090-CPWM7DF-14AF*xx*			14	0.196 (0.132)	
2090-CPWM7DF-10AF*xx*			10	0.452 (0.304)	
2090-CPWM7DF-08AF*xx*			8	0.666 (0.448)	

(1) 2090-CP*x*M4DF-*xx*A*xxx* and 2090-CP*x*M7DF-*xx*A*xxx* power cables are UL Listed, bulk cable, type TC-ER.

Brake Cable Specifications

Brake Cables Cat. No.	Cable Type/ Jacket Color	Description	Wire Size AWG	Weight, approx. kg/m (lb/ft)	Standard Cable Lengths m (ft)		
2090-DANBT-18S*xx*	Standard cable Industrial TPE, Black	Two conductor, 600V, 18 AWG, shielded cable for motor brake.	18	0.070 (0.047)	1 (3.2) 2 (6.5) 3 (9.8) 4 (13.1)	5 (16.4) 7 (22.9) 9 (29.5) 12 (39.4)	15 (49.2) 20 (65.6) 25 (82.0) 30 (98.4)

Feedback Cable Specifications

Feedback Cables (1) (2) Cat. No.	Cable Type/ Jacket Color	Description	Wire Size AWG	Weight, approx. kg/m (lb/ft)	Standard Cable Lengths m (ft)		
2090-XXNFMF-S*xx*	Standard cable Industrial TPE, Black	Threaded DIN connector (motor end) to flying leads (drive end), 30V.	28 Feedback 16 Power, 5V 22 Power, 9V	0.120 (1.35)	1 (3.2) 2 (6.5) 3 (9.8) 4 (13.1) 5 (16.4)	7 (22.9) 9 (29.5) 12 (39.4) 15 (49.2) 20 (65.6)	25 (82.0) 30 (98.4) 40 (131.2) 60 (196.8) 90 (295.3)
2090-CFBM7DD-CEAA*xx*	Standard cable Industrial TPE, Green (DESINA, RAL 6018)	SpeedTec DIN connector (motor end) to premolded connector (drive end), 600V.	22 All conductors	0.136 (0.092)			
2090-CFBM7DF-CEAA*xx*		SpeedTec DIN connector (motor end) to flying leads (drive end), 600V.					
2090-UXNFM-S*xx* (3)	Standard cable Industrial TPE, Black	Flying-leads (motor end) to premolded connector (drive end), 30V.	28 Feedback 16 Power, 5V 22 Power, 9V	0.120 (1.35)	1 (3.2) 3 (9.8) 9 (29.5)	15 (49.2) 30 (98.4)	
2090-CFBM6DF-CBAA*xx*		Circular plastic connector (motor end) to premolded connector (drive end), 300V.	28 Feedback 16 Power, 5V 22 BAT+		1 (3.2) 2 (6.5) 3 (9.8) 4 (13.1)	5 (16.4) 7 (22.9) 9 (29.5) 12 (39.4)	15 (49.2) 20 (65.6) 25 (82.0) 30 (98.4)
2090-CFBM6DD-CCAA*xx*		Circular plastic connector (motor end) to premolded connector (drive end), 300V.	28 Feedback 16 Power, 5V				
2090-DANFCT-S*xx*		Rectangular plastic connector (motor end) to premolded connector (drive end), 30V.	28 Feedback 16 Power, 5V 22 BAT+	0.130 (0.088)			
2090-CFBM4DF-CDAF*xx*	Continuous-flex cable Industrial TPE, Green (DESINA, RAL 6018)	Threaded DIN connector (motor end) to flying leads (drive end), 600V.	26 Feedback 16 Power, 5V 22 Power, 9V	0.177 (0.119)	1 (3.2) 2 (6.5) 3 (9.8) 4 (13.1) 5 (16.4) 7 (22.9)	9 (29.5) 12 (39.4) 15 (49.2) 20 (65.6) 25 (82.0) 30 (98.4)	40 (131.2) 50 (164.0) 60 (196.8) 75 (264.0) 90 (295.3)
2090-CFBM7DF-CDAF*xx*		SpeedTec DIN connector (motor end) to flying leads (drive end), 600V.					
2090-CFBM7DF-CEAF*xx*			22 All conductors	0.143 (0.096)			
2090-CFBM7DD-CEAF*xx*		SpeedTec DIN connector (motor end) to premolded connector (drive end), 600V.					

(1) 2090-CFBM7*xx*-CEA*xxx* feedback cables are UL Listed, bulk cable, type PLTC-ER.

(2) 2090-CFBM4DF-CDA*xxx* and 2090-CFBM7*xx*-CDA*xxx* feedback cables are UL Listed, bulk cable, type CM.

(3) Use with 2090-KFBM4-CAAA (threaded) or 2090-KFBM7-CAAA (SpeedTec) DIN connector kit.

Continuous-flex Extension Cable Specifications

Extension Cable (1) (2) Cat. No.	Cable Type/ Jacket Color	Description	Weight, approx. kg/m (lb/ft)	Standard Cable Lengths m (ft)
2090-CPBM7E7-16AF*xx*	Power with brake Industrial TPE, Orange (DESINA, RAL 2003)	SpeedTec DIN connector plug on motor end to SpeedTec DIN receptacle for mating with 2090-Series standard power/brake cable, 600V.	0.228 (0.153)	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)
2090-CPBM7E7-14AF*xx*			0.289 (0.194)	
2090-CPBM7E7-10AF*xx*			0.513 (0.345)	
2090-CPBM7E7-08AF*xx*			0.697 (0.468)	
2090-CFBM7E7-CDAF*xx*	Feedback Industrial TPE, Green (DESINA, RAL 6018)	SpeedTec DIN connector plug on motor end to SpeedTec DIN receptacle for mating with 2090-Series standard feedback cable, 600V.	0.153 (0.103)	
2090-CFBM7E7-CEAF*xx*			0.143 (0.096)	

(1) 2090-CPBM7E7-*xx*AF*xx* extension power cables are UL Listed, bulk cable, type TC-ER.

(2) 2090-CFBM7E7-CDAF*xx* extension feedback cables are UL Listed, bulk cable, type CM.
2090-CFBM7E7-CEAF*xx* extension feedback cables are UL Listed, bulk cable, type PLTC-ER.

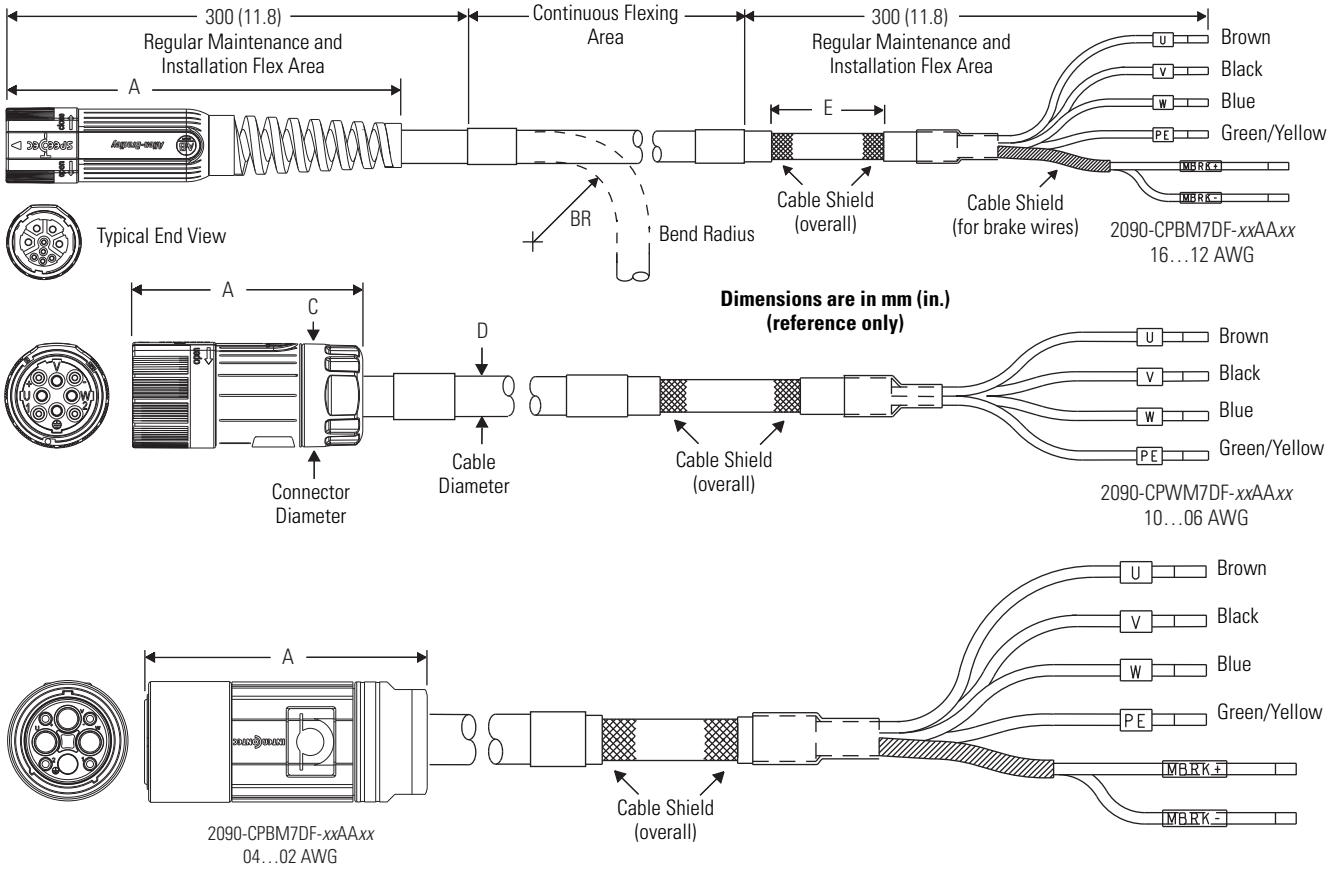
Power and Feedback Transition Cable Specifications

Transition Cable Cat. No.	Cable Type/ Jacket Color	Description	Standard Cable Lengths mm (in.)
2090-CPBM4E2-14TR	Power with brake Industrial TPE, Black	Threaded DIN connector on motor end to bayonet receptacle for mating with existing bayonet cable, 600V.	500 (19.7)
2090-CPBM4E2-10TR			
2090-CPBM4E2-08TR			
2090-CPBM4E2-04TR			
2090-CPWM4E2-14TR	Power (only) Industrial TPE, Black		
2090-CPWM4E2-10TR			
2090-CPWM4E2-08TR			
2090-CPWM4E2-04TR			
2090-CFBM4E2-CATR	Feedback Industrial TPE, Black	Threaded DIN connector on motor end to bayonet receptacle for mating with existing bayonet cable, 300V.	

Notes:

Motor Power Cable Dimensions

Power Cable Dimensions, Standard (SpeedTec DIN connector)

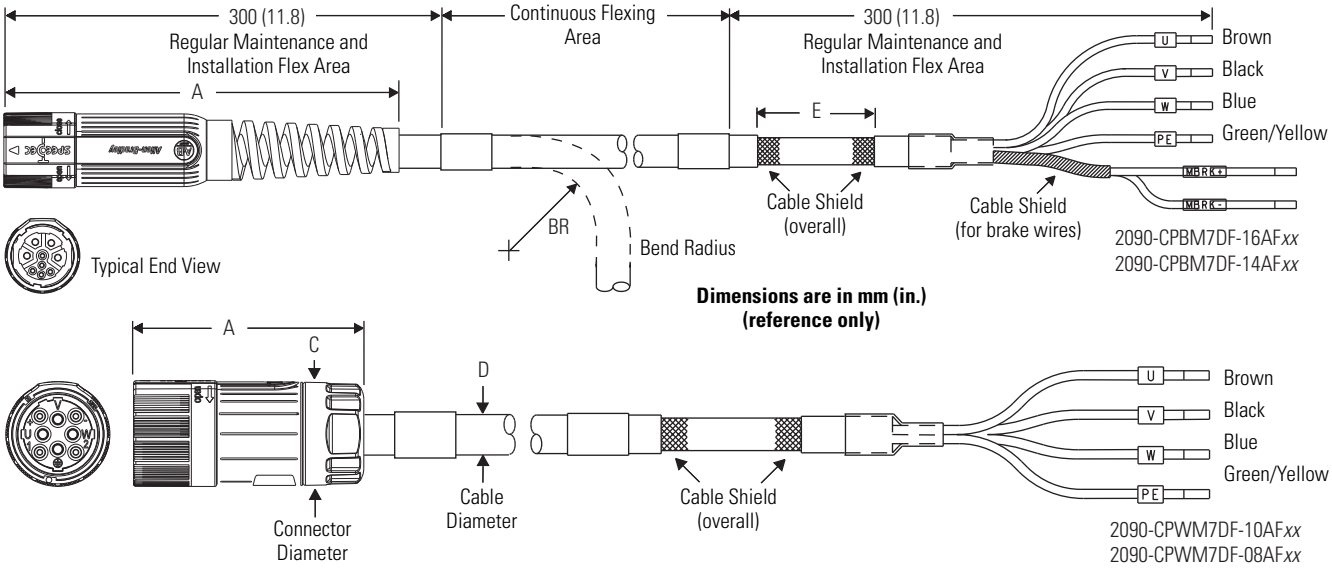


Power Cable Dimensions (standard)

Power Cable Cat. No.	A mm (in.)	BR (1) mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2090-CPBM7DF-16AA*xx*	147 (5.8)	115 (4.5)	28 (1.1)	11.6 (0.46)	150 (5.9)
2090-CPWM7DF-16AA*xx*		95 (3.7)		9.2 (0.36)	
2090-CPBM7DF-14AA*xx*		130 (5.1)		12.7 (0.50)	
2090-CPWM7DF-14AA*xx*		105 (4.1)		10.3 (0.40)	
2090-CPBM7DF-12AA*xx*	80 (3.15)	140 (5.5)		14.3 (0.56)	
2090-CPWM7DF-12AA*xx*		115 (4.5)		11.2 (0.44)	
2090-CPBM7DF-10AA*xx*	100 (3.9)	170 (6.7)	45 (1.8)	16.8 (0.66)	90 (3.5)
2090-CPWM7DF-10AA*xx*		155 (6.1)		15.3 (0.60)	
2090-CPBM7DF-08AA*xx*		205 (8.0)		20.1 (0.79)	
2090-CPWM7DF-08AA*xx*		190 (7.5)		18.7 (0.74)	
2090-CPBM7DF-06AA*xx*		250 (9.8)		24.3 (0.96)	
2090-CPBM7DF-04AA*xx*	150 (5.9)	290 (11.4)	63 (2.5)	28.8 (1.13)	
2090-CPBM7DF-02AA*xx*		330 (13.0)		32.7 (1.29)	

(1) Standard cables have a regular maintenance and installation bend radius of 10 times (10x) the cable diameter.

Power Cable Dimensions, Continuous-flex (SpeedTec DIN connector)

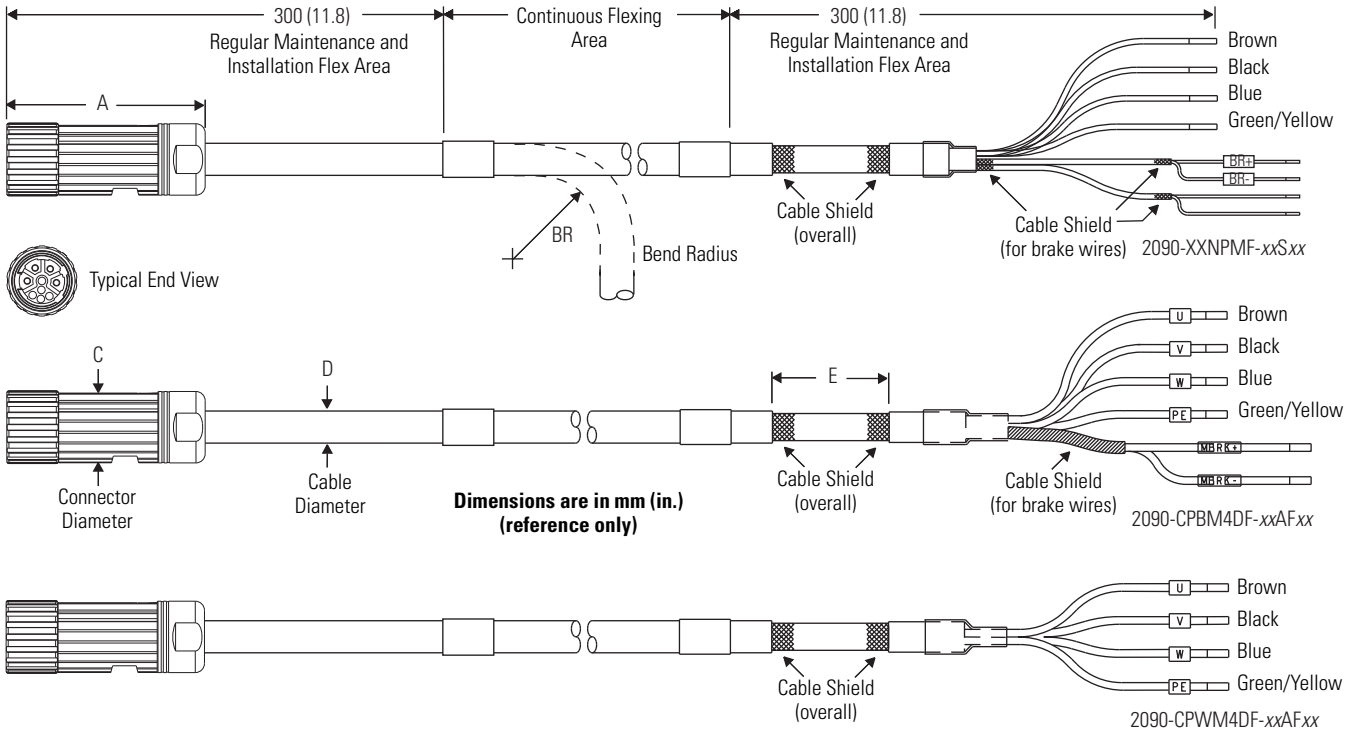


Power Cable Dimensions (continuous-flex rated)

Power Cable Cat. No.	A mm (in.)	BR (1) mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2090-CPBM7DF-16AF*xx*	147 (5.8)	150 (6.0)	28.0 (1.1)	12.5 (0.49)	150 (5.9)
2090-CPWM7DF-16AF*xx*		120 (5.0)		9.7 (0.38)	
2090-CPBM7DF-14AF*xx*		165 (6.5)		13.7 (0.54)	
2090-CPWM7DF-14AF*xx*		125 (5.0)		10.4 (0.41)	
2090-CPBM7DF-10AF*xx*	100 (3.9)	187 (7.4)	45.0 (1.8)	17.8 (0.70)	90 (3.5)
2090-CPWM7DF-10AF*xx*				15.7 (0.62)	
2090-CPBM7DF-08AF*xx*		250 (9.8)		20.6 (0.81)	
2090-CPWM7DF-08AF*xx*		242 (9.5)		20.2 (0.79)	

(1) Continuous-flex cables have an operational bend radius of 12 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 (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-16S*xx*	75 (2.9)	142 (5.6)	28.0 (1.1)	14 (0.55)	150 (5.9)
2090-XXNPMF-14S*xx*		148 (5.8)		15 (0.59)	90.0 (3.5)
2090-XXNPMF-10S*xx*	96 (3.8)	187 (7.4)	45.0 (1.8)	19 (0.75)	

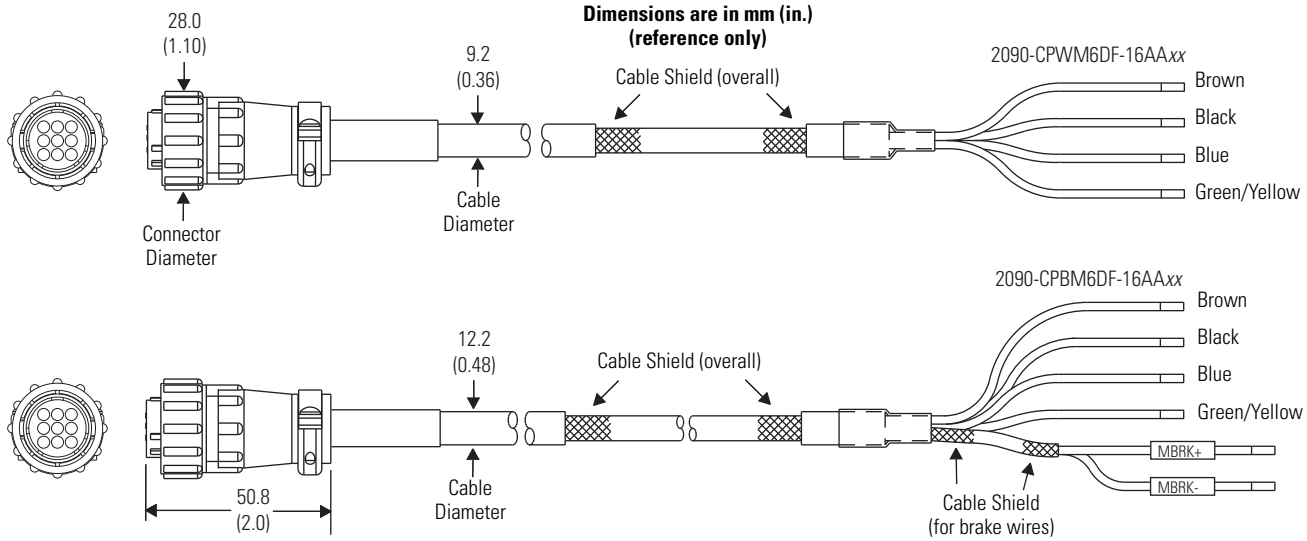
(1) Standard cables have a regular maintenance and installation bend radius of 10 times (10x) the cable diameter.

Power Cable Dimensions (continuous-flex rated)

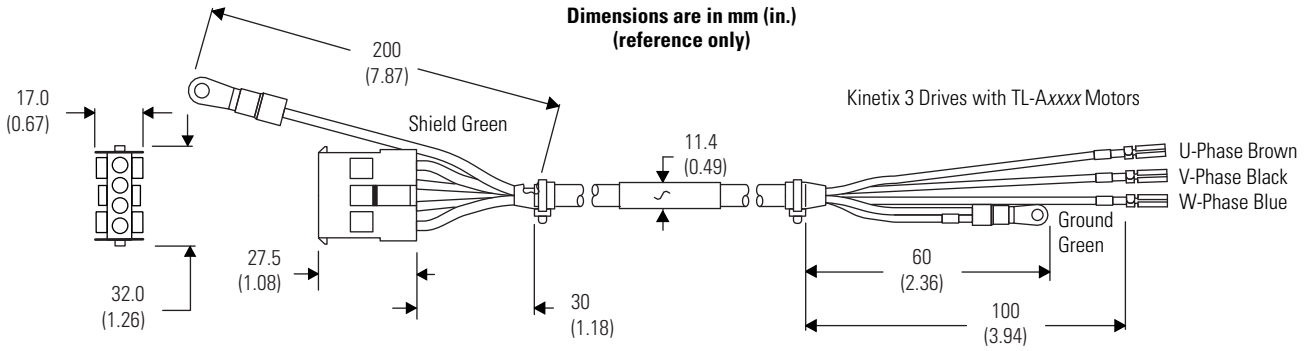
Power Cable Cat. No.	A mm (in.)	BR (1) mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2090-CPBM4DF-16AF*xx*	75 (2.9)	150 (6.0)	28.0 (1.1)	12.5 (0.49)	150 (5.9)
2090-CPWM4DF-16AF*xx*		120 (5.0)		9.7 (0.38)	

(1) Continuous-flex cables have an operational bend radius of 12 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-CP*x*M6DF-16AA*xx*)

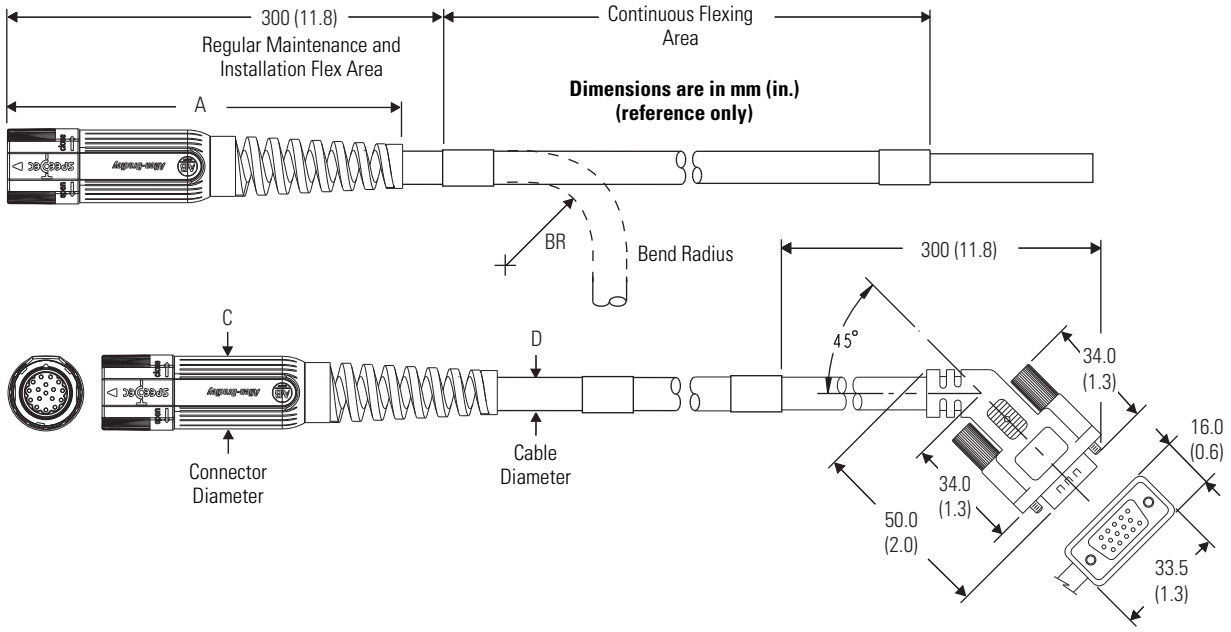


Power Cable Dimensions (catalog number 2090-DANPT-16S*xx*)



Motor Feedback Cable Dimensions

Feedback Cable Dimensions (SpeedTec DIN connector)



Feedback Cable Dimensions (standard)

Feedback Cable Cat. No.	**A** mm (in.)	**BR** (1) mm (in.)	**C** mm (in.)	**D** mm (in.)
2090-CFBM7DF-CEAA*xx*	147 (5.8)	100 (4.0)	28.0 (1.1)	9.8 (0.38)
2090-CFBM7DD-CEAA*xx*				

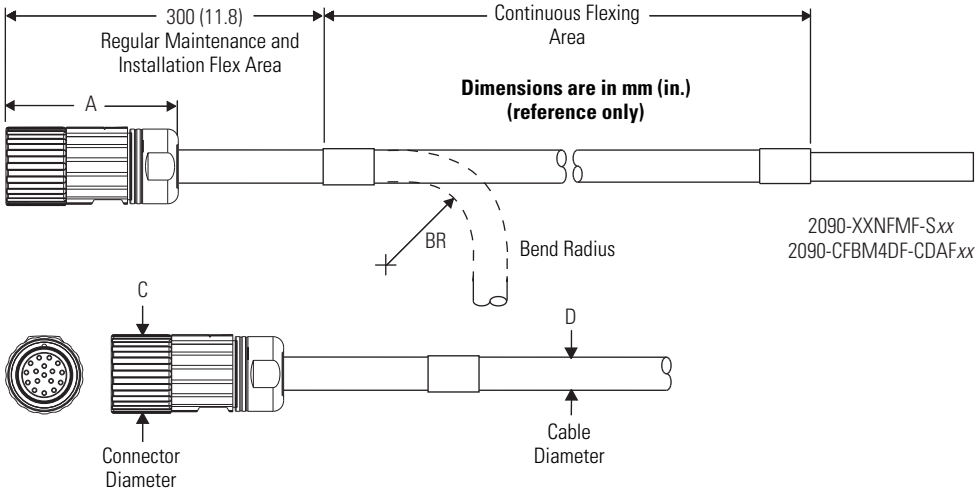
(1) Standard cables have a regular maintenance and installation bend radius of 10 times (10x) the cable diameter.

Feedback Cable Dimensions (continuous-flex rated)

Feedback Cable Cat. No.	**A** mm (in.)	**BR** (1) mm (in.)	**C** mm (in.)	**D** mm (in.)
2090-CFBM7DF-CEAF*xx*	147 (5.8)	125 (4.9)	28.0 (1.1)	10.3 (0.40)
2090-CFBM7DD-CEAF*xx*				
2090-CFBM7DF-CDAF*xx*		140 (5.5)		11.7 (0.46)

(1) Continuous-flex cables have an operational bend radius of 12 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 (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-S*xx*	57.0 (2.2)	100 (4.0)	26.0 (1.0)	10.0 (0.40)

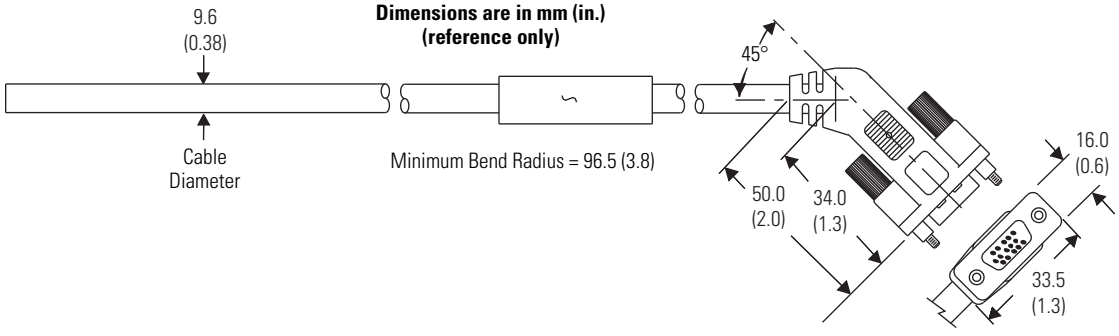
(1) Standard cables have a regular maintenance and installation bend radius of 10 times (10x) the cable diameter.

Feedback Cable Dimensions (continuous-flex rated)

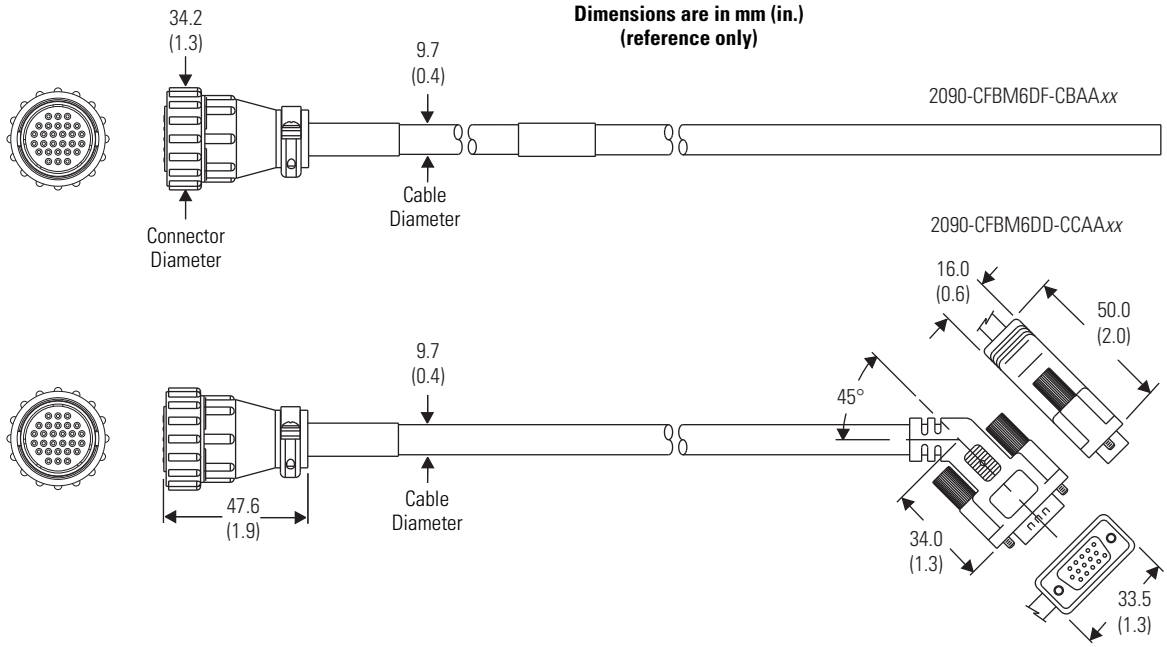
Feedback Cable Cat. No.	**A** mm (in.)	**BR** (1) mm (in.)	**C** mm (in.)	**D** mm (in.)
2090-CFBM4DF-CDAF*xx*	57.0 (2.2)	140 (5.5)	26.0 (1.0)	11.7 (0.46)

(1) Continuous-flex cables have an operational bend radius of 12 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.

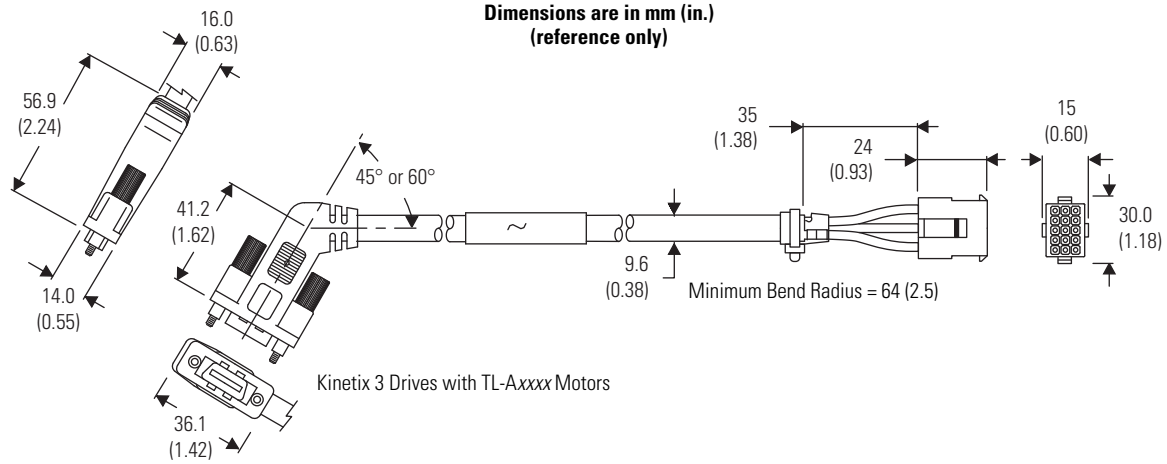
Feedback Cable Dimensions (catalog number 2090-UXNFM-S*xx*)



Feedback Cable Dimensions (catalog numbers 2090-CFBM6DF-CBAA*xx* and 2090-CFBM6DD-CCAA*xx*)

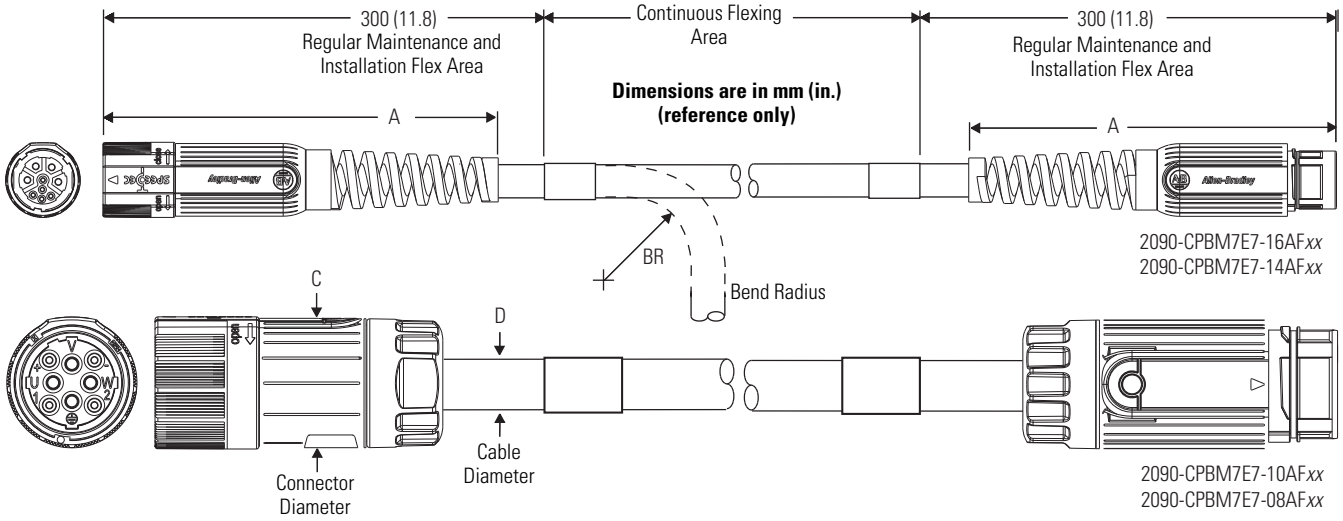


Feedback Cable Dimensions (catalog number 2090-DANFCT-S*xx*)



Extension Cable Dimensions

Power Cable Dimensions (SpeedTec DIN)

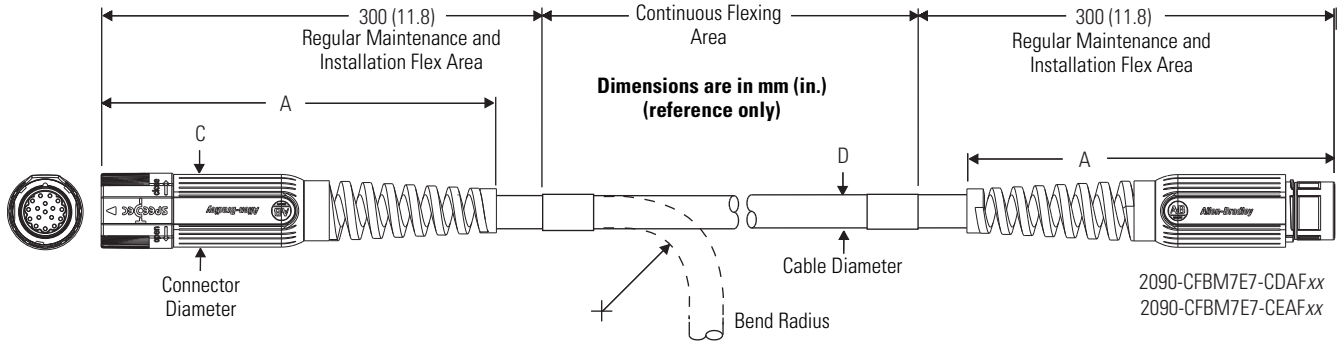


Power Cable Dimensions (continuous-flex rated)

Power Cable Cat. No.	**A** mm (in.)	**BR** [(1)] mm (in.)	**C** mm (in.)	**D** mm (in.)
2090-CPBM7E7-16AF*xx*	147 (5.8)	150 (5.9)	28.0 (1.1)	12.5 (0.49)
2090-CPBM7E7-14AF*xx*		165 (6.5)		13.7 (0.54)
2090-CPBM7E7-10AF*xx*	97 (3.8)	215 (8.5)	45.0 (1.8)	17.8 (0.70)
2090-CPBM7E7-08AF*xx*		250 (9.8)		20.6 (0.81)

(1) Continuous-flex cables have an operational bend radius of 12 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)



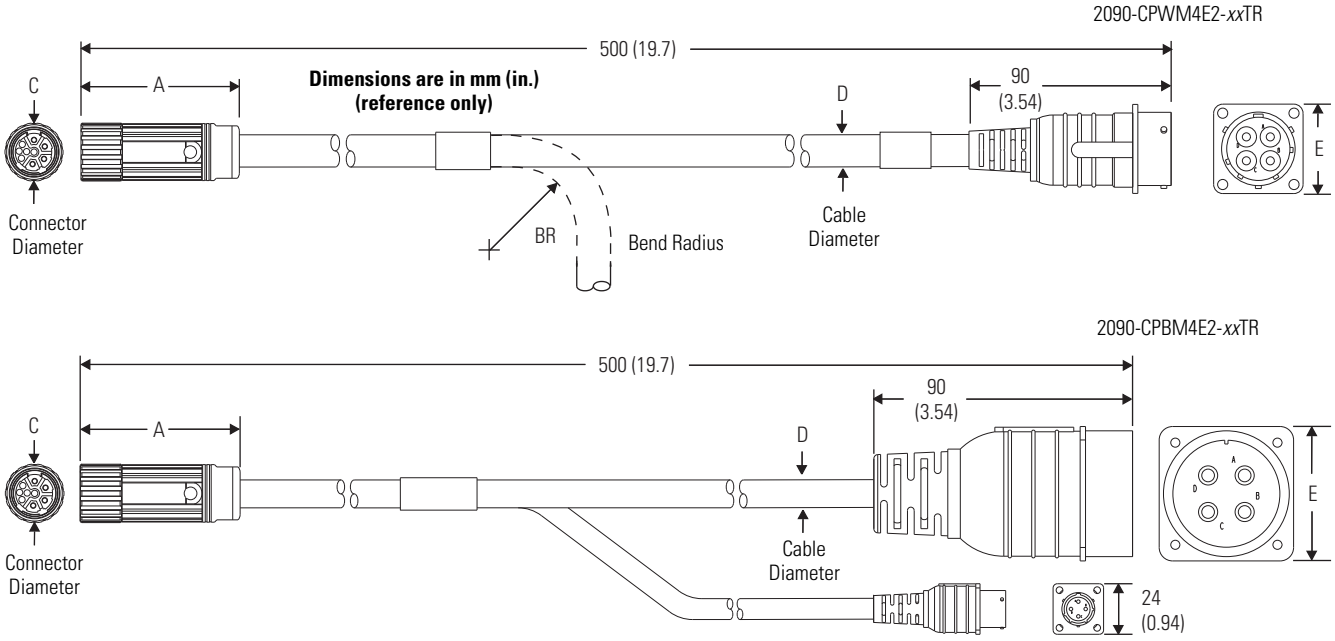
Feedback Cable Dimensions (continuous-flex rated)

Feedback Cable Cat. No.	**A** mm (in.)	**BR** [(1)] mm (in.)	**C** mm (in.)	**D** mm (in.)
2090-CFBM7E7-CDAF*xx*	147 (5.8)	140 (5.5)	28.0 (1.1)	11.7 (0.46)
2090-CFBM7E7-CEAF*xx*		125 (4.9)		10.3 (0.40)

(1) Continuous-flex cables have an operational bend radius of 12 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

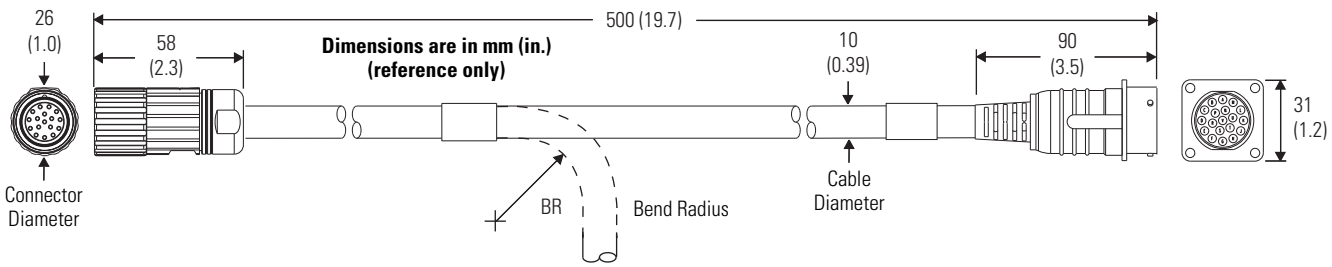


Power Cable Dimensions (standard)

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)	45.0 (1.77)	18.7 (0.74)	46.0 (1.81)
2090-CPWM4E2-10TR	95 (3.74)	156 (6.14)		15.6 (0.61)	31.0 (1.22)
2090-CPBM4E2-08TR	80 (3.15)	205 (8.07)		20.5 (0.81)	46.0 (1.81)
2090-CPWM4E2-08TR	95 (3.74)	189 (7.44)		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)				

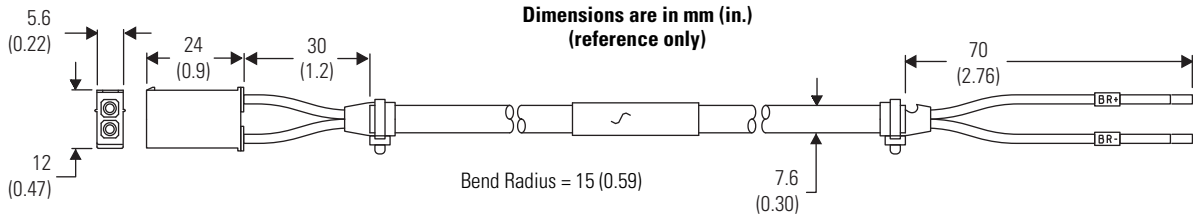
(1) Standard cables have a regular maintenance and installation bend radius of 10 times (10x) the cable diameter.

Feedback Cable Dimensions (catalog number 2090-CFBM4E2-CATR)



Motor Brake Cable Dimensions

Brake Cable Dimensions (catalog number 2090-DANBT-18S*xx*)



2090-Series Motor-end Cable Connector Kits

Motor-end connector kits are available for building your own cables. Kits are available for bayonet, circular DIN (M4 and M7), and circular plastic (M6) cable connectors.

Bayonet Motor-end Cable Connector Kits

Motor Series	Connector Kit Cat. No.	Description
MPL-A/B3*xxx-xx2x*AA, MPL-A/B4*xxx-xx2x*AA, MPL-A/B45*xxx-xx2x*AA MPL-A520K-*xx2x*AA MPL-B520K-*xx2x*AA, MPL-B540K-*xx2x*AA, MPL-B540D-*xx2x*AA, MPL-B560F-*xx2x*AA, and MPL-B580F-*xx2x*AA	2090-MPPC-S	Straight Power Connector Kit, 12 AWG max
MPL-B6*xxx-xx2x*AA, MPL-B8*xxx-xx2x*AA, MPL-B960B-*xx2x*AA, MPL-B960C-*xx2x*AA, MPL-B980B-*xx2x*AA, MPL-B980C-*xx2x*AA	2090-MPPC-08S	Straight Power Connector Kit, 8 AWG max
MPL-A/B3*xxx-xx2x*AA, MPL-A/B4*xxx-xx2x*AA, MPL-A/B45*xxx-xx2x*AA, MPL-A/B5*xxx-xx2x*AA MPL-B6*xxx-xx2x*AA, MPL-B8*xxx-xx2x*AA, MPL-B9*xxx-xx2x*AA	2090-MPFC-S	Straight Feedback Connector Kit
All MPL-A/B*xxx-xx2x*AA	2090-MPBC-S	Straight Brake Connector Kit

Circular DIN Motor-end Cable Connector Kits

Feedback Cable Connector Kits

2090-KFBM4-CAAA
2090-KFBM7-CAAA
Motor-end Connector Kits

Connector pins and sockets in these kits are soldered.

M23 Cable Plug Connector Kits

2090-KFBE7-CAAA
Motor-end Connector Kits

M23 Cable Extension Connector Kits

Power Cable Connector Kits

2090-KPBM4-12AA
2090-KPBM4-06AA
2090-KPBM7-12AA
2090-KPBM7-06AA
Motor-end Connector Kits

Connector pins and sockets in these kits are crimped.

M23 or M40 Cable Plug Connector Kits

2090-KPBE7-12AA
2090-KPBE7-06AA
Motor-end Connector Kits

M23 or M40 Cable Extension Connector Kits

Motor-end Connector Kit Cross-reference Tables

The tables beginning on page 426 provide a cross-reference for the circular DIN (M4 and M7) connector kits above to the compatible motor series catalog number. Also provided are the bulkhead adapters for securing the cables as they pass through the cabinet and crimping tools required for properly attaching the power wires to sockets and pins.

Connector kits and crimping tools are also available for circular plastic (M6) connectors. Refer to page 427 for the compatible motor series and crimp tool catalog numbers.

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/B3*xx*, MPL-A/B4*xx*, MPL-A/B45*xx*, MPL-B520, MPL-B540, MPL-B560
				MPM-A/B115*xx*, MPM-A/B130*xx*, MPM-B1651C, MPM-B1651F, MPM-B1652C, MPM-B1653C
				MPF-A/B3*xx*, MPF-A/B4*xx*, MPF-A/B45*xx*
				RDB-B130*xx*, RDB-B165*xx*, RDB-B21519, RDB-B2151C, RDB-B21529, RDB-B2152C, RDB-B21539, RDB-B2901*x*, RDB-B29024, RDB-B29026, RDB-B29034
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-A5*xx*, MPL-B580, MPL-B6*xx*, MPL-B860, MPL-B880C, MPL-B960B, MPL-B980B
				MPM-A1651F, MPM-B1651M, MPM-B1652E, MPM-A/B1652F, MPM-B1653E, MPM-A/B1653F, MPM-A/B215*xx*
				MPF-A/B5*xx*
				RDB-B2151F, RDB-B2152F, RDB-B2153C, RDB-B2153E, RDB-B29029, RDB-B29036, RDB-B410*xx*
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-A/B3*xx*, MPL-A/B4*xx*, MPL-A/B45*xx*, MPL-B520, MPL-B540, MPL-B560
				MPM-A/B115*xx*, MPM-A/B130*xx*, MPM-B1651C, MPM-B1651F, MPM-B1652C, MPM-B1653C
				MPF-A/B3*xx*, MPF-A/B4*xx*, MPF-A/B45*xx*
				RDB-B130*xx*, RDB-B165*xx*, RDB-B21519, RDB-B2151C, RDB-B21529, RDB-B2152C, RDB-B21539, RDB-B2901*x*, RDB-B29024, RDB-B29026, RDB-B29034
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-A5*xx*, MPL-B580, MPL-B6*xx*, MPL-B860, MPL-B880C, MPL-B960B, MPL-B980B
				MPM-A1651F, MPM-B1651M, MPM-B1652E, MPM-A/B1652F, MPM-B1653E, MPM-A/B1653F, MPM-A/B215*xx*
				MPF-A/B5*xx*
				RDB-B2151F, RDB-B2152F, RDB-B2153C, RDB-B2153E, RDB-B29029, RDB-B29036, RDB-B410*xx*

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/B15*xx*, MPL-A/B2*xx*
				MPF-A/B3*xx*, MPF-A/B4*xx*, MPF-A/B45*xx*, MPF-A/B5*xx*
				MPS-A/B3*xx*, MPS-A/B45*xx*, MPS-B5*xx*
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/B5*xx*

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	N/A (soldered contacts)	2090-KFB47-CF	MPL-A/B3*xx*, MPL-A/B4*xx*, MPL-A/B45*xx*, MPL-A/B5*xx* MPL-B6*xx*, MPL-B8*xx*, MPL-B9*xx* MPM-A/B115*xx*, MPM-A/B130*xx*, MPM-A/B165*xx*, MPM-A/B215*xx* MPF-A/B3*xx*, MPF-A/B4*xx*, MPF-A/B45*xx*, MPF-A/B5*xx* RDB-B130*xx*, RDB-B165*xx*, RDB-B215*xx*, RDB-B290*xx*, RDB-B410*xx*,
2090-KFBE7-CAAA	Extension cable connector SpeedTec plug, M23 connector			MPL-A/B3*xx*, MPL-A/B4*xx*, MPL-A/B45*xx*, MPL-A/B5*xx*, MPL-B6*xx*, MPL-B8*xx*, MPL-B9*xx*
				MPM-A/B115*xx*, MPM-A/B130*xx*, MPM-A/B165*xx*, MPM-A/B215*xx*
				MPF-A/B3*xx*, MPF-A/B4*xx*, MPF-A/B45*xx*, MPF-A/B5*xx*
				RDB-B130*xx*, RDB-B165*xx*, RDB-B215*xx*, RDB-B290*xx*, RDB-B410*xx*
2090-KFBM4-CAAA	Motor-end cable connector Threaded plug, M23 connector			MPL-A/B15*xx* or MPL-A/B2*xx* MPF-A/B3*xx*, MPF-A/B4*xx*, MPF-A/B45*xx*, MPF-A/B5*xx* MPS-A/B3*xx*, MPS-A/B45*xx*, MPS-A/B5*xx*

Power and Feedback Cable Connector Kits (circular plastic)

Connector Kit Cat. No.	Description	Crimp Tool Cat. No.	Bulkhead Adapter Cat. No.	Motor Series
2090-KPBM6-16AA	Straight Power Connector Kit	58495-1 (Tyco AMP)	N/A	All TLY-A*xxx* motors All TLAR-A*xxx* electric cylinders
2090-KFBM6-AA	Straight Feedback Connector Kit	58448-1 (Tyco AMP)	N/A	

2090-Series Bulkhead Adapter Kits

These bulkhead adapter kits let you secure your cables as they pass through the cabinet and apply to circular DIN (M4 and M7) power and feedback cables.

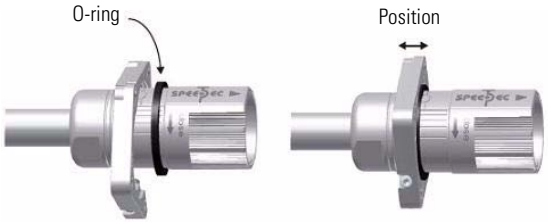
Circular DIN Power Cable Compatibility

Bulkhead Adapter Cat. No.	Standard (non-flex) Power Cable Cat. No.	Continuous-flex Power Cable Cat. No.	Description		Connector Diameter mm (in.)
2090-KPB47-12CF	2090-CPWM7DF-16AA*xx*	2090-CPWM7DF-16AF*xx*	Power only	SpeedTec DIN	28.0 (1.1)
	2090-CPWM7DF-14AA*xx*	2090-CPWM7DF-14AF*xx*			
	2090-CPWM7DF-12AA*xx*	N/A			
	2090-CPBM7DF-16AA*xx*	2090-CPBM7DF-16AF*xx*	Power/brake		
	2090-CPBM7DF-14AA*xx*	2090-CPBM7DF-14AF*xx*			
	2090-CPBM7DF-12AA*xx*	N/A			
	N/A	2090-CPBM7E7-16AA*xx*			
	N/A	2090-CPBM7E7-14AA*xx*			
	N/A	2090-CPWM4DF-16AF*xx*	Power only	Threaded DIN	
	N/A	2090-CPBM4DF-16AF*xx*	Power/brake		
	2090-XXNPMF-16S*xx*	N/A			
2090-KPB47-06CF	2090-CPWM7DF-10AA*xx*	2090-CPWM7DF-10AF*xx*	Power only	SpeedTec DIN	45.0 (1.8)
	2090-CPWM7DF-08AA*xx*	2090-CPWM7DF-08AF*xx*			
	2090-CPBM7DF-10AA*xx*	2090-CPBM7DF-10AF*xx*	Power/brake		
	2090-CPBM7DF-08AA*xx*	2090-CPBM7DF-08AF*xx*			
	2090-CPBM7DF-06AA*xx*	N/A			

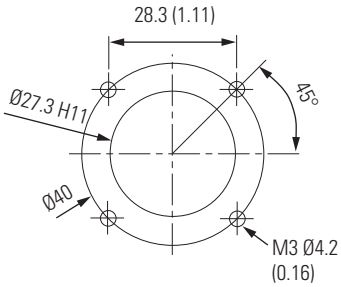
Circular DIN Feedback Cable Compatibility

Bulkhead Adapter Cat. No.	Standard (non-flex) Feedback Cable Cat. No.	Continuous-flex Feedback Cable Cat. No.	Description		Connector Diameter mm (in.)
2090-KPB47-12CF	2090-CFBM7DF-CEAA*xx*	2090-CFBM7DF-CEAF*xx*	Feedback	SpeedTec DIN	28.0 (1.1)
	2090-CFBM7DD-CEAA*xx*	2090-CFBM7DD-CEAF*xx*			
	N/A	2090-CFBM7DF-CDAF*xx*			
	N/A	2090-CFBM7E7-CDAF*xx*			
	N/A	2090-CFBM7E7-CEAF*xx*			
2090-KFB47-CF	2090-CFBM4DF-CEAA*xx*	N/A		Threaded DIN	26.0 (1.0)
	N/A	2090-CFBM4DF-CDAF*xx*			
	2090-XXNFMF-S*xx*	N/A			

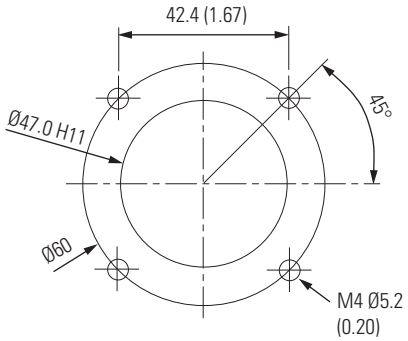
Bulkhead Adapter Kit Mounting Dimensions



Dimensions are in mm (in.)



2090-KFB47-CF and 2090-KPB47-12CF
(M23) Bulkhead Adapter Kits

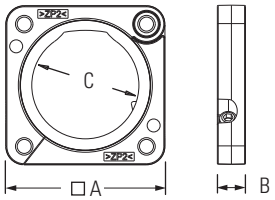


2090-KPB47-06CF
(M40) Bulkhead Adapter Kits

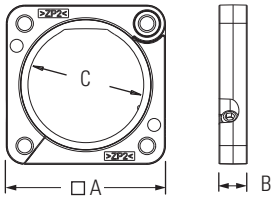
Bulkhead Adapter Kit Dimensions

Dimensions are in mm (in.)

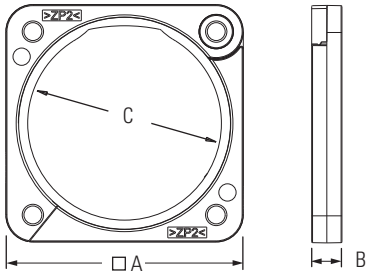
2090-KFB47-CF
Bulkhead Adapter



2090-KPB47-12CF
Bulkhead Adapter



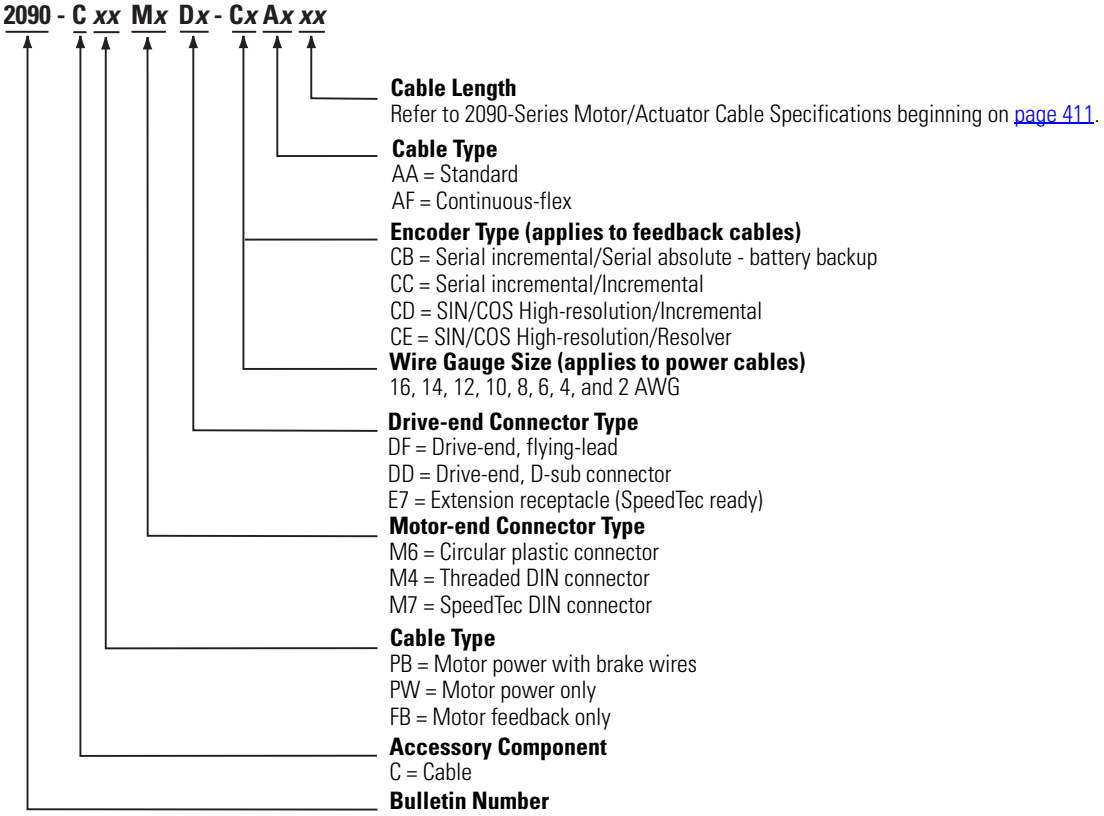
2090-KPB47-06CF
Bulkhead Adapter



Bulkhead Adapter Cat. No.	**Size**	**Dimension A** mm (in.)	**Dimension B** mm (in.)	**Dimension C (reference)** mm (in.)
2090-KFB47-CF	M23	36.8 (1.44)	6.5 (0.26)	23.0 (0.90)
2090-KPB47-12CF				26.0 (1.02)
2090-KPB47-06CF	M40	54.8 (2.16)	7.0 (0.28)	43.0 (1.69)

2090-Series Motor/Actuator Cable Catalog Numbers

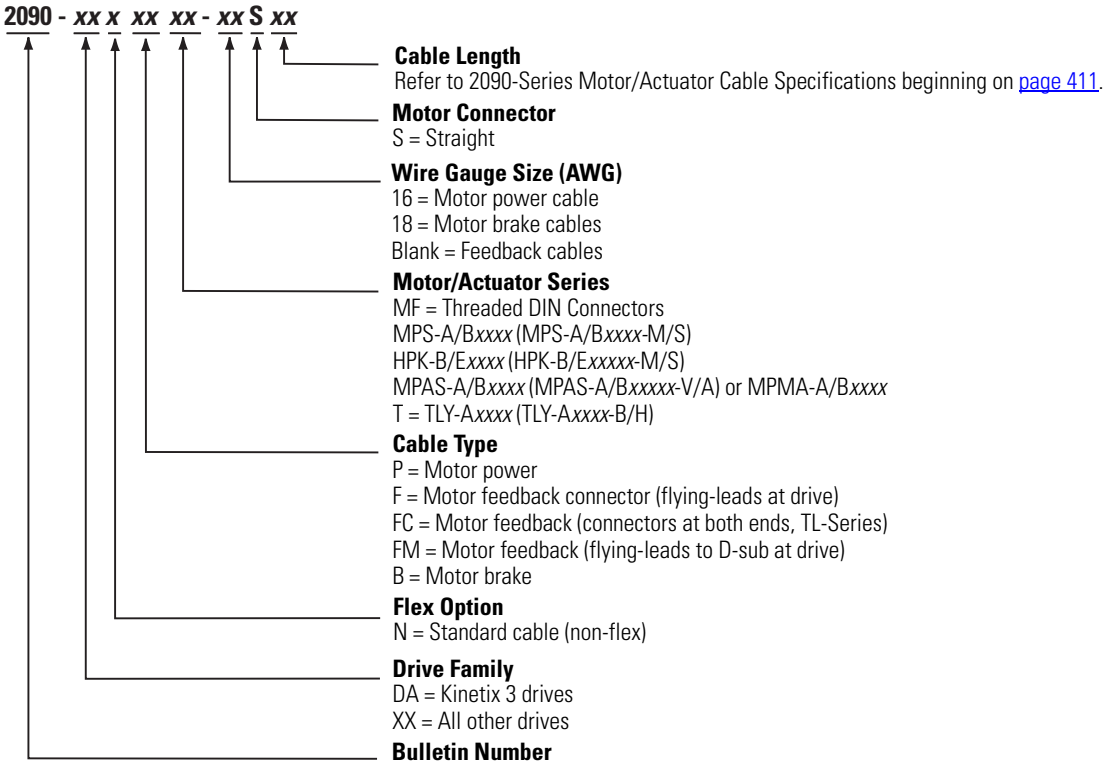
Motor Power/Brake, Feedback, and Extension Cables



Transition Cables

Cat. No.	Cable Type	Description
2090-CPBM4E2-14TR	Power/brake	Threaded DIN connector (M4) on motor-end to bayonet receptacle (E2) 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



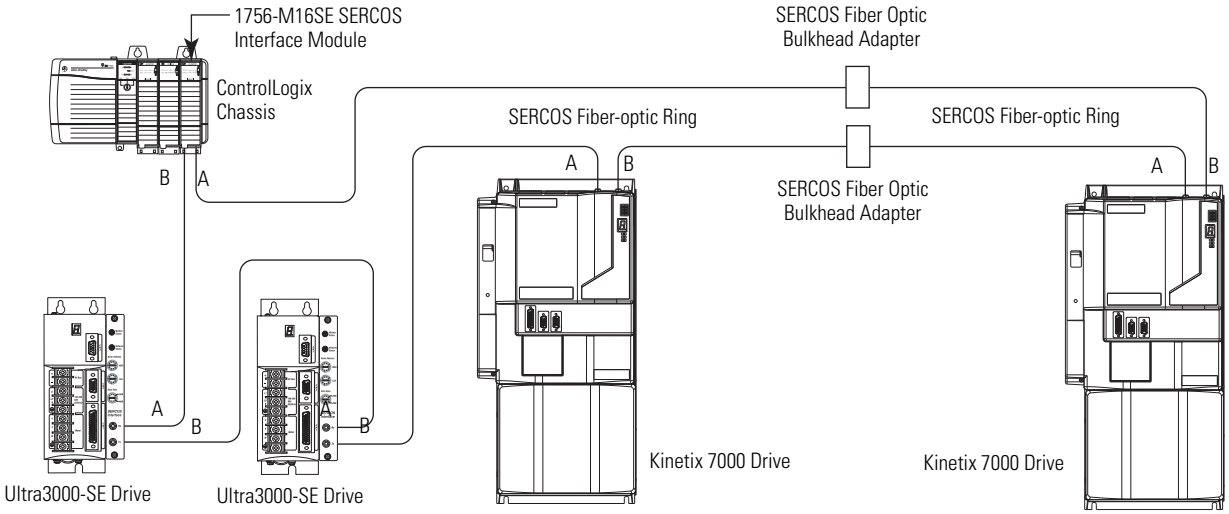
2090-Series Interface Cables

A wide variety of communication and interface cables are available for connecting servo drives to ControlLogix and CompactLogix controller modules, and to other Allen-Bradley products.

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



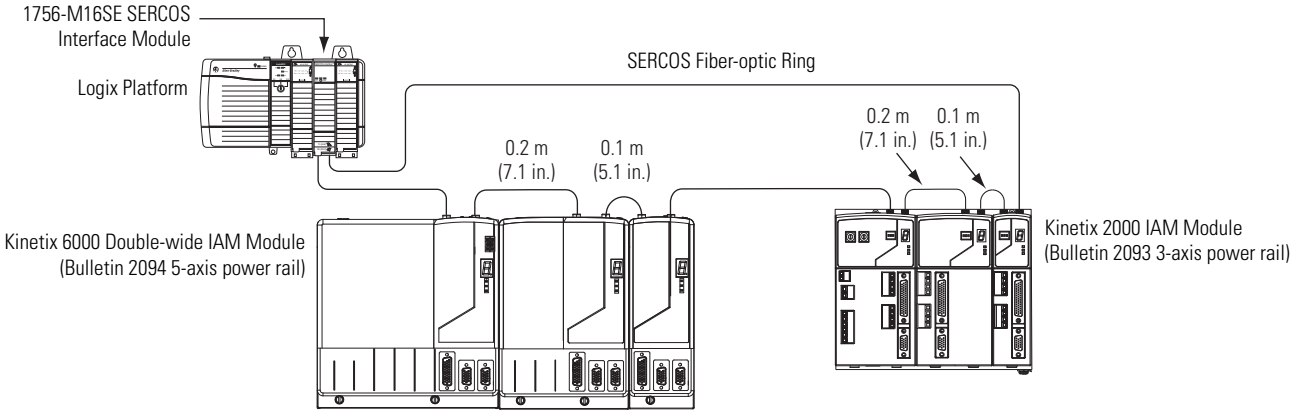
IMPORTANT To avoid signal loss, do not use bulkhead adapters to connect glass cables. Use bulkhead adapters for making plastic-to-plastic cable connections only.

Multi-axis servo drives with SERCOS interface have specific cable lengths for making drive-to-drive connections for single-wide and double-wide modules.

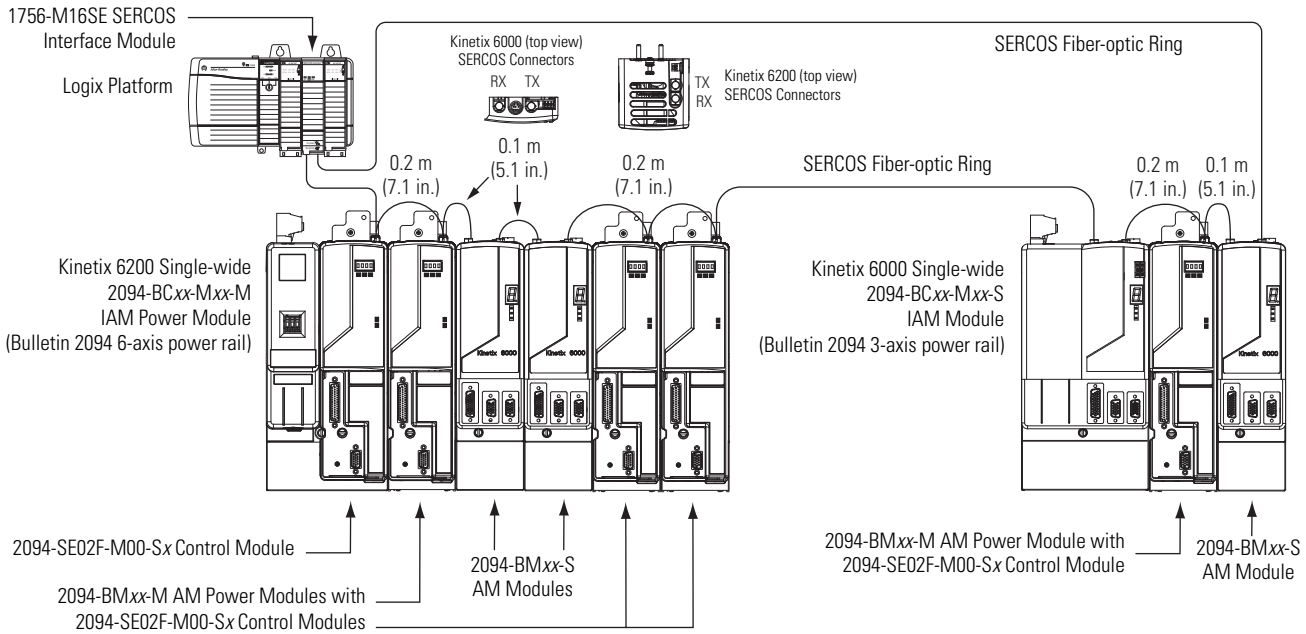
Drive-to-Drive Cable Length for Multi-axis Drive Families

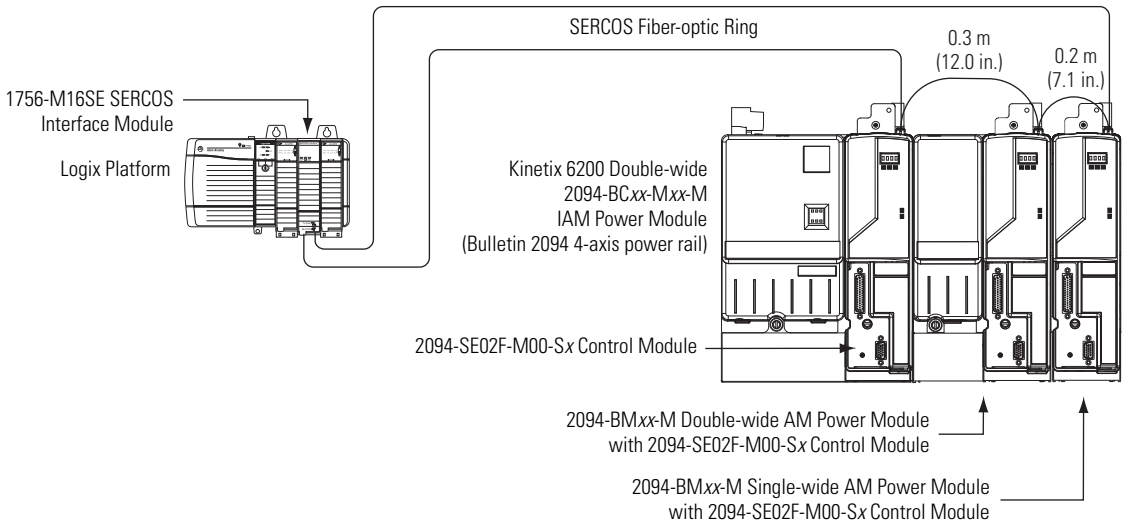
IAM Module	Adjacent AM Module		Cable Cat. No.	Cable Length m (in.)
Kinetix 2000	2093-AMP1, 2093-AMP2, or 2093-AMP5	Single-wide	2090-SCEP0-1	0.1 (5.1)
	2093-AM01 or 2093-AM02	Double-wide	2090-SCEP0-2	0.2 (7.1)
Kinetix 6000	2094-AM*xx*-S, 2094-BMP5-S, 2094-BM01-S, or 2094-BM02-S	Single-wide	2090-SCEP0-1	0.1 (5.1)
	2094-BMP5-M, 2094-BM01-M, or 2094-BM02-M		2090-SCEP0-2	0.2 (7.1)
	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 (7.1)
	2094-AM*xx*-S, 2094-BMP5-S, 2094-BM01-S, or 2094-BM02-S		2090-SCEP0-1	0.1 (5.1)
	2094-BM03-M and 2094-BM05-M	Double-wide	2090-SCEP0-3	0.3 (12.0)

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)

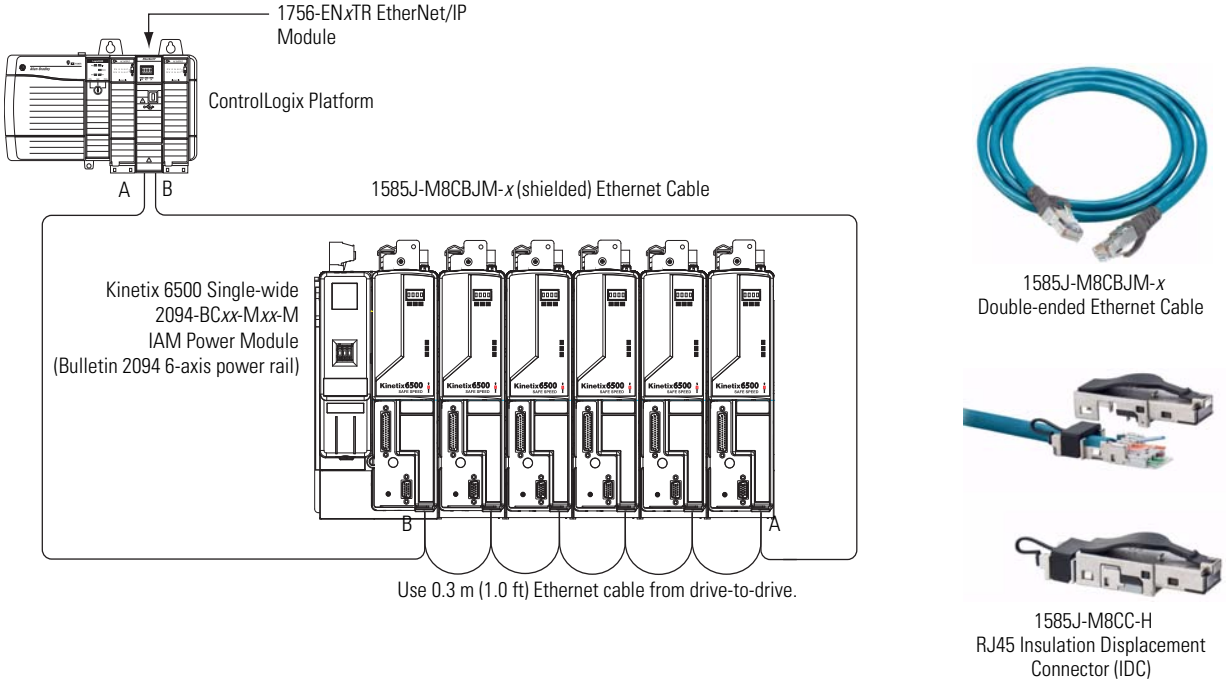


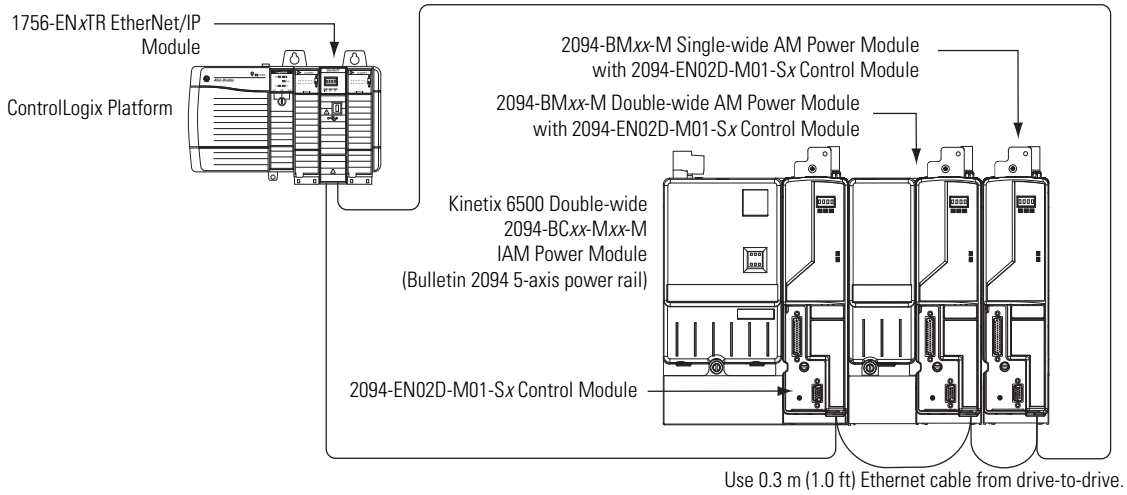


Ethernet Cable Connection Examples

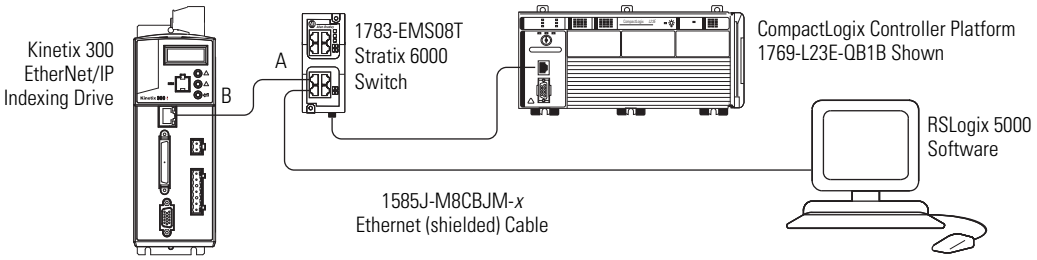
Shielded Ethernet cable is available in lengths up to 78 m (256 ft). However, the total length of Ethernet cable (point A to point B) connecting drive-to-drive, drive-to-controller, or drive-to-switch must not exceed 100 m (328 ft).

Drive-to-Drive Ethernet Cable Length Example (Kinetix 6500 drives)





Ethernet Cable Example for Single-axis Connections (Kinetix 300 drives)



Interface Cable Applications and Standard Lengths

Cat. No.	Descriptions		Standard Cable Lengths m (ft)
2090-UXPC-D09*xx*	Ultra3000/5000 serial interface cable to computer		1 (3.2) 3 (9.8) 9 (29.5) 15 (49.2) 30 (98.4)
2090-U3CC-D44*xx* (1)	Single-axis flying-lead cable, Ultra3000 drive to 1756-M02AE module		
2090-U3AE-D44*xx* (1)	Two-axis pre-wired cable, Ultra3000 drive to 1756-M02AE module		
2090-CCMDSDS-48AA*xx*	Kinetix 3 control interface cable for drive-to-drive configurations		1 (3.2) 0.3 (0.98)
2090-CCMPCDS-23AA*xx*	Kinetix 3 serial interface cable to personal computer		1 (3.2) 3 (9.8)
2090-CCMCNDS-48AA*xx*	Kinetix 3 control interface cable to MicroLogix controller		
2090-DAIO-D50*xxx*	Kinetix 3 control interface I/O cable (flying leads)		
2090-U5PM-D09*xx*	Ultra5000 drive to PanelView 300 Micro DF-1 terminal and MicroLogix system		1 (3.2) 3 (9.8) 9 (29.5)
2090-U5PV-D09*xx*	Ultra5000 drive to PanelView Standard DF-1 terminal		
2090-SCEP*x-x*	SERCOS fiber optic plastic cables suitable only for in-cabinet duty. Connectors are provided at both ends		0-1 (5.1 in.) (2) 0-2 (7.1 in.) (2) 0-3 (1.0) (2) 1-0 (3.2) 3-0 (9.8) 5-0 (16.4) 8-0 (26.2) 10-0 (32.8) 15-0 (49.2) 20-0 (65.5) 25-0 (82.0) 32-0 (105.0)
2090-SCNP*x-x*	SERCOS fiber optic plastic cables suitable for on-machine duty. Connectors are provided at both ends		
2090-SCVP*x-x*	SERCOS fiber optic plastic cables suitable for outdoor and conduit duty. Connectors are provided at both ends		
2090-SCVG*x-x*	SERCOS fiber optic glass cables suitable for outdoor and conduit duty. Connectors are provided at both ends		50-0 (164.2) 100-0 (328.3) 150-0 (492.5) 200-0 (656.7)
2090-S-BLHD	SERCOS fiber optic cable bulkhead adapter (2 per pack)		
1585J-M8CBJM-*x*	Double-ended (shielded) Ethernet cables for use when programming the safety configuration and the Logix EtherNet/IP network module		0M3 = 0.3 (1.0) 0M4 = 0.4 (1.3) 0M6 = 0.6 (2.0) 1 (3.2) 2 (6.6) 5 (16.4) 10 (32.8)
1585J-M8CB-*x*	Single-ended (shielded) Ethernet cables for use when programming the safety configuration and the Logix EtherNet/IP network module		2 (6.6) 5 (16.4) 10 (32.8)
1585J-M8CC-H	RJ45 insulation displacement connector (IDC) for use when making your own cables		100 (328) 300 (984) 600 (1968)
1585J-C8CB-S*xxx*	Shielded Ethernet (bulk) cable for use when making your own cables		
1202-C02	Drive-to-drive safety cable for connecting single-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 and 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) 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.

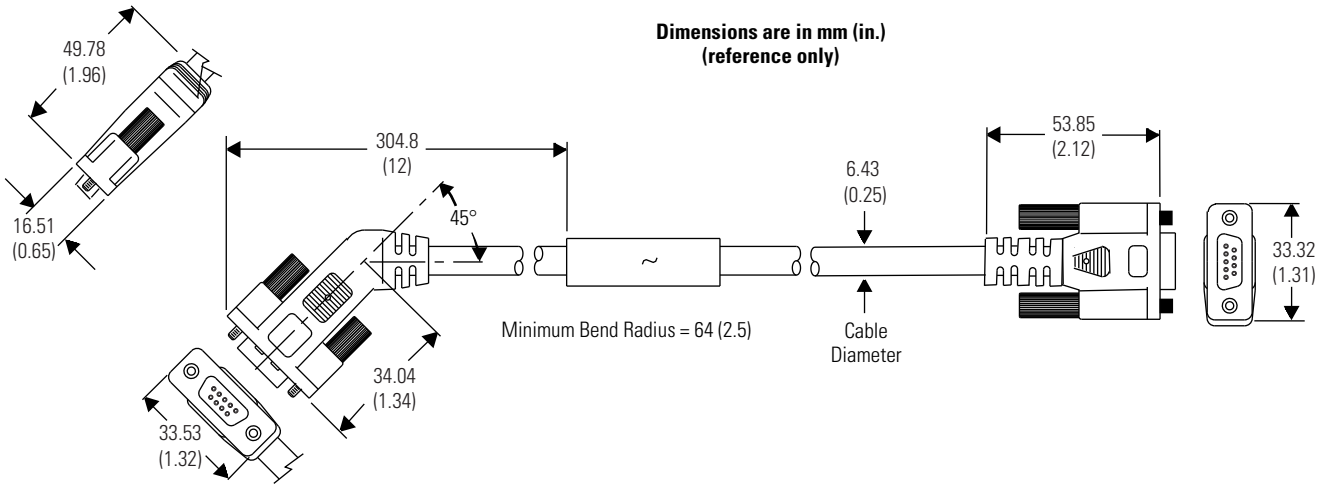
(2) Only available as 2090-SCEP*x-x*.

Interface Cable Specifications

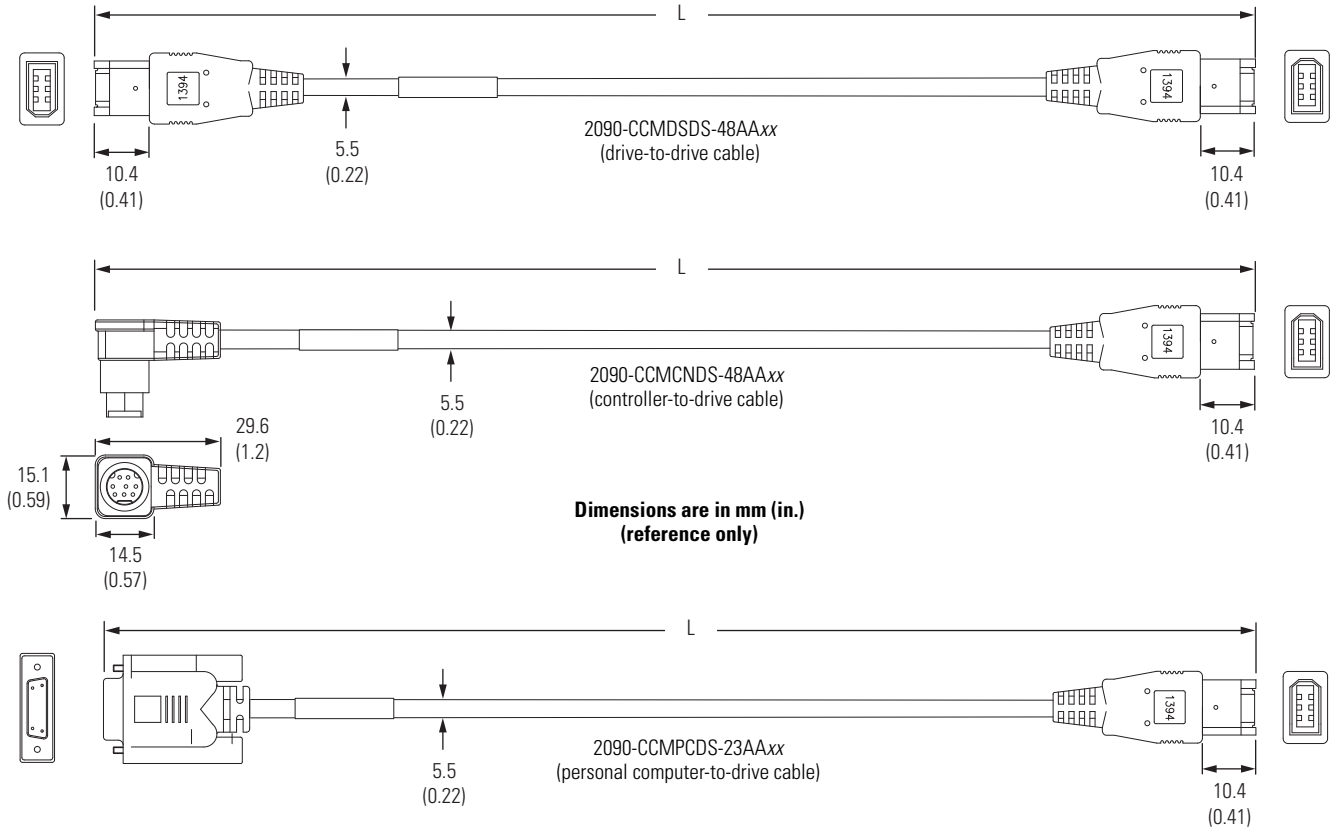
Interface Cable Cat. No.	Description	Specifications		
		Ratings	**Shield**	**Jacket Material**
2090-UXPC-D09*xx*	Ultra3000/5000 serial interface to computer	90 °C (194 °F), 30V	Aluminum Polyester 100% coverage Braid shield coverage, 85% min	TPE
2090-DAIO-D50*xx*	Kinetix 3 control interface I/O cable, flying leads			
2090-U3CC-D44*xx*	Single-axis flying lead Ultra3000 drive to 1756-M02AE module	80 °C (176 °F), 30V		
2090-U3AE-D44*xx*	Two-axis pre-wired Ultra3000 drive to 1756-M02AE module			
2090-CCMPCDS-23AA*xx*	Kinetix 3 serial interface to personal computer	80 °C (176 °F), 300V		PVC
2090-CCMCNDS-48AA*xx*	Kinetix 3 control interface to MicroLogix controller			
2090-CCMDSDS-48AA*xx*	Kinetix 3 control interface for drive-to-drive configurations			
2090-U5PM-D09*xx*	Ultra5000 drive to PanelView 300 Micro DF-1 terminal and MicroLogix system	60 °C (140 °F), 30V		
2090-U5PV-D09*xx*	Ultra5000 drive to PanelView Standard DF-1 terminal	80 °C (176 °F), 30V		TPE
2090-*x*XNRB-*xx*F*xxx*	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-M*xx*SE 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*		-20…75 °C (-4...67 °F)		Kevlar and PVC

Interface Cable Dimensions

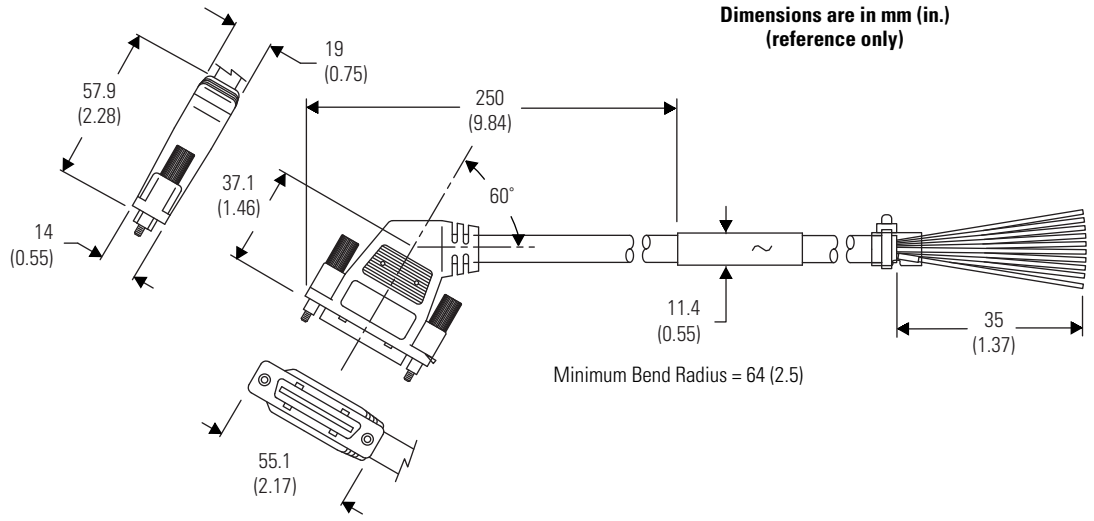
Serial Interface Cable Dimensions (catalog number 2090-UXPC-D09*xx*)



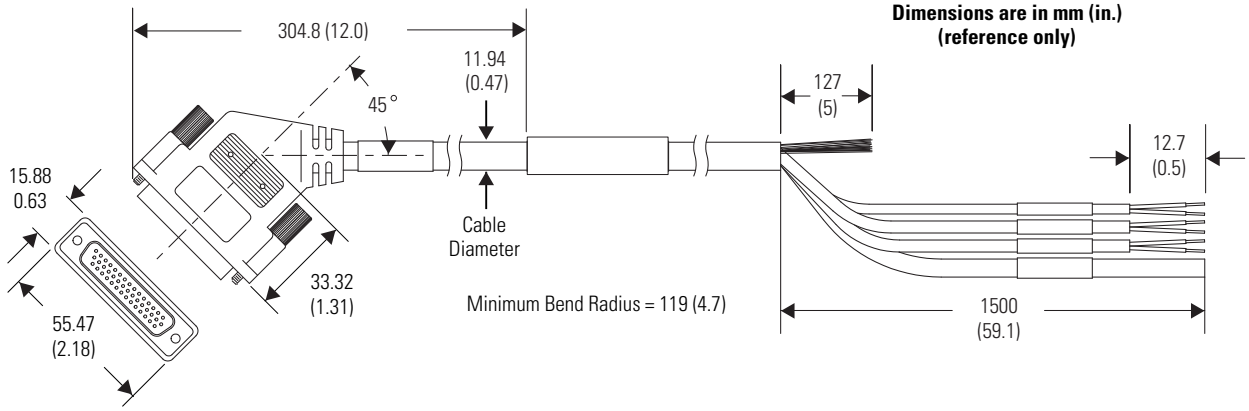
Control and Configuration Serial Cable Dimensions



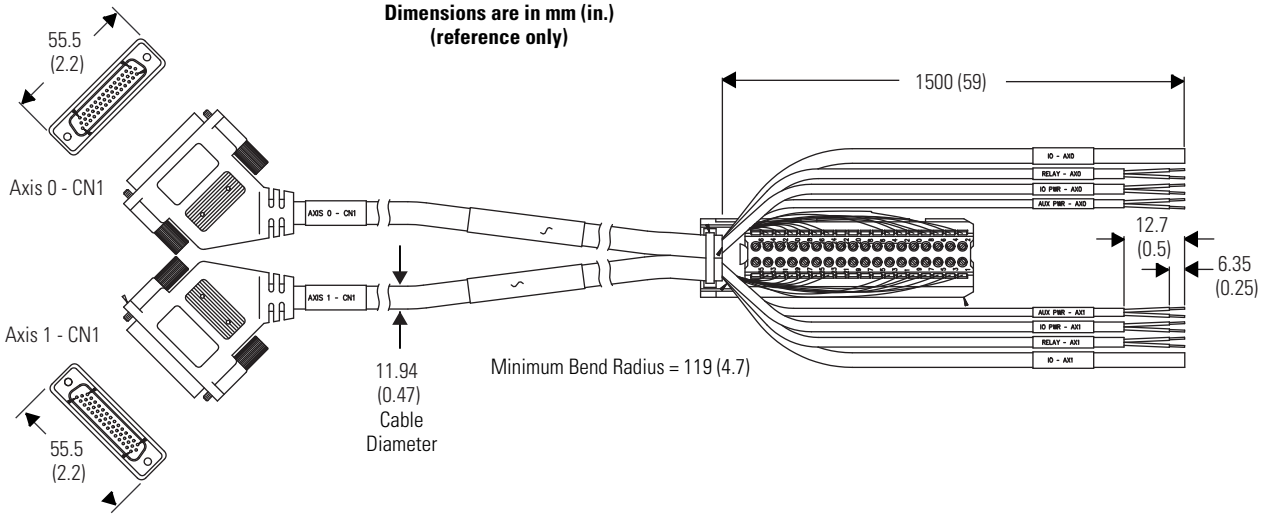
Control Interface Cable Dimensions (catalog number 2090-DAIO-D50*xx*)



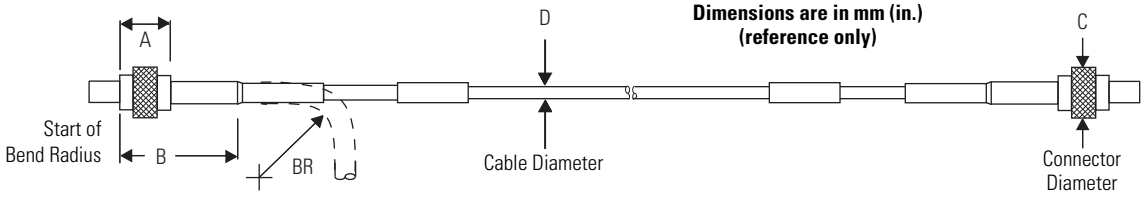
Control Interface Cable Dimensions (catalog number 2090-U3CC-D44*xx*)



ControlLogix 1756-M02AE Card Encoder Cable Dimensions (catalog number 2090-U3AE-D44*xx*)



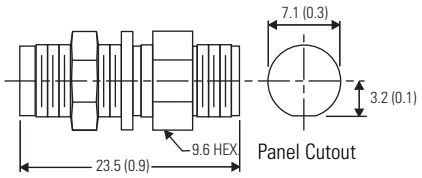
SERCOS interface Fiber-optic Cable Dimensions



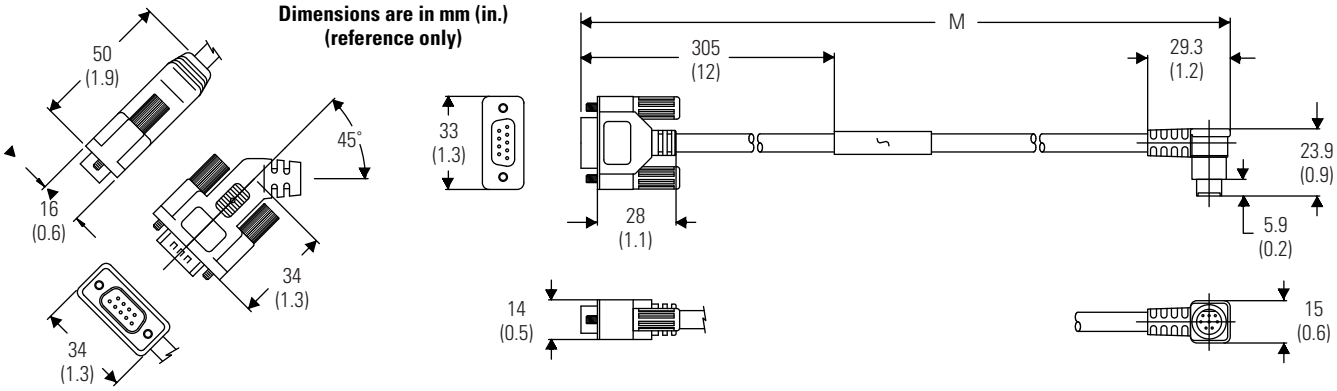
Fiber-optic Cable Cat. No.	A mm (in.)	B mm (in.)	BR (1) mm (in.)	C mm (in.)	D mm (in.)
2090-SCEP*x-x*	7 (0.27)	25 (1.0)	25 (1.0)	10 (0.39)	2.2 (0.09)
2090-SCNP*x-x*					
2090-SCVP*x-x*			40 (1.6)		5.0 (0.2)
2090-SCVG*x-x*			30 (1.2)		

(1) Standard cables have a regular maintenance and installation bend radius of 10 times (10x) the cable diameter.

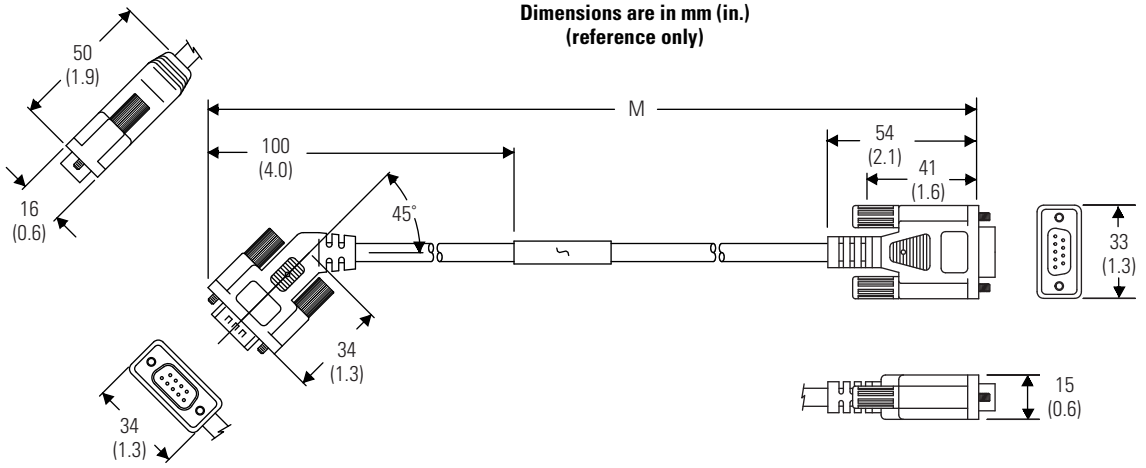
Bulkhead Adapter Dimensions (2090-S-BLHD)



Ultra5000 Drive to PanelView Terminal Cable Dimensions (catalog number 2090-U5PM-D09*xx*)

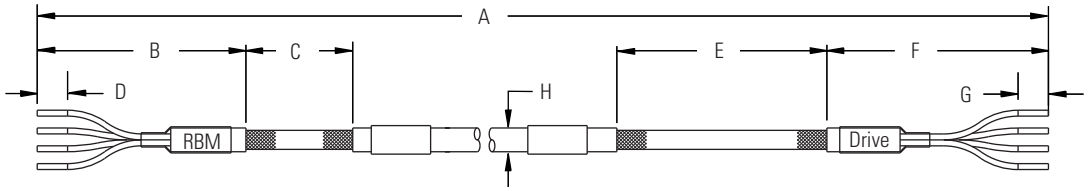


Ultra5000 Drive to PanelView Terminal Cable Dimensions (catalog number 2090-U5PV-D09*xx*)



RBM Module Interface Cable Dimensions

Dimensions are in mm (in.)
(reference only)



RBM Module 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)					74 (2.9)		19 (0.75)
2090-UXNRB-8F1P4	1395 (54.9)					117 (4.6)		
2090-UXNRB-6F1P5	1527 (60.1)					129 (5.1)		23 (0.90)

2090-Series Interface 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.

SERCOS Interface Fiber-optic Cables

2090 - S C x x x-x

Cable Length
Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

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

Control and Configuration Serial Interface Cables

2090 - C *xx* *xx* DS *xx* - AA *xx*

Cable Length
Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

Cable Type
AA = Standard (non-flex)

Communication Method
23 = RS232 (with ASCII messaging)
48 = RS485 (with Modbus-RTU)
Blank = N/A

Connector Type (drive end of cable)
DS = Drive-side connector

Connector Type (other end of cable)
PC = DB-9-pin serial connector for personal computer connections
CN = 9-pin mini-DIN connector for MicroLogix 1100 or 1400 controller connections
DS = Drive-side connector

Cable Type
CM = Communication
S0 = Safe off

Accessory Component
C = Cable

Bulletin Number

Control and Serial Interface Cables

2090 - *xx* *xx* - D*xx* *xx*

Cable Length
Refer to 2090-Series Motor/Actuator Cable Specifications beginning on page 411.

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
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 = Kinetix 3

Bulletin Number

Breakout Components and Connector Kits

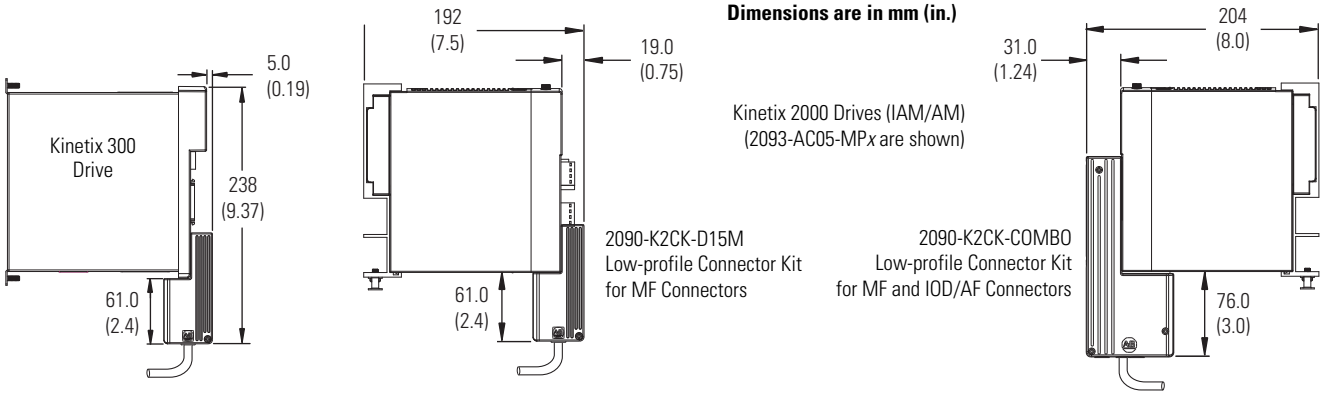
This section contain examples, descriptions, dimensions, specifications, and catalog numbers for breakout components and connector kits.

Low-profile Connector Kit Examples

Use these examples to identify the best solution for wiring flying-lead feedback and I/O cables to servo drives or Line Interface Modules (LIM).

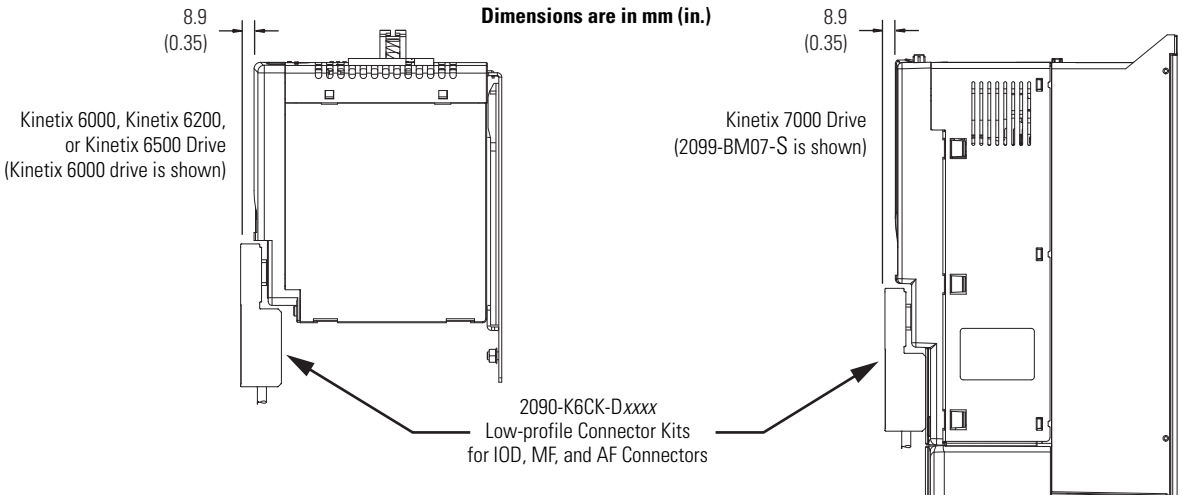
In this example, the Kinetix 2000 (IAM/AM) is shown with catalog number 2090-K2CK-D15M, for use with the motor feedback (MF) connector. Also shown is catalog number 2090-K2CK-COMBO for use with the motor feedback (MF) and I/O (IOD/AF) connectors. Refer to Low-profile Connector Kit Components on page 443 for more information.

Kinetix 2000 (IAM/AM) and Kinetix 300 Examples



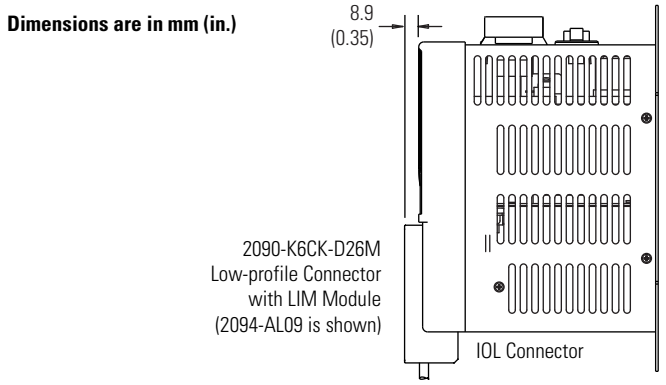
In this example, the Kinetix 6000 and Kinetix 7000 drives are shown with low-profile connector kits (catalog numbers 2090-K6CK-D*xxx*). Use these kits with the I/O (IOD), motor feedback (MF), and auxiliary feedback (AF) connectors. The 2090-K6CK-D*xxx* kits also apply to the Kinetix 6200 and Kinetix 6500 drives. The Refer to Low-profile Connector Kit Components on page 443 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

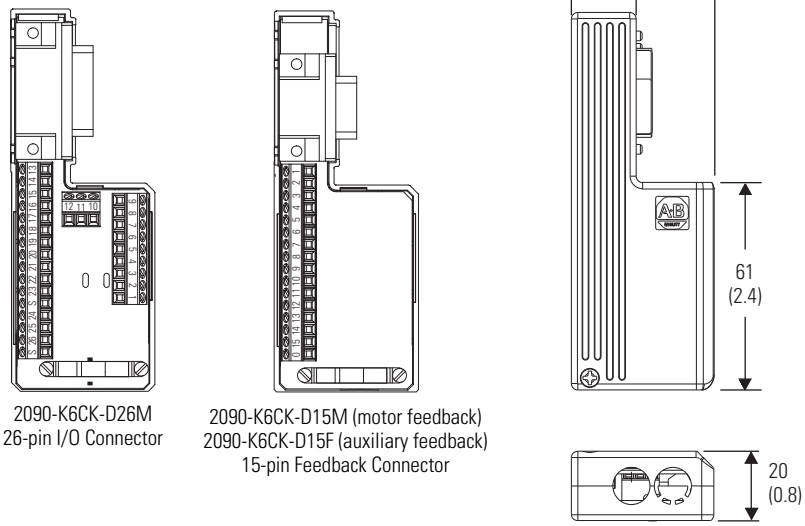
Low-profile connector kits are designed for use with the Kinetix 2000 IAM/AM, Kinetix 6000 IAM/AM, and Kinetix 7000 drives, and LIM modules. Use this table to identify the low-profile connector kit for your feedback or I/O connector.

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-A*xxxx*-B high-resolution motors and 17-bit encoders.	2090-XXNFMF-S*xx* 2090-CFBM4DF-CDAF*xx* 2090-CFBM7DF-CEAA*xx* 2090-CFBM7DF-CEAF*xx* 2090-CFBM7DF-CDAF*xx* 2090-CFBM6DF-CBAA*xx*
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-A*xxxx*-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-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-B*xxxx*-R or MPM-A/B*xxxxx*-2 (resolver feedback) motors.	2090-CFBM7DF-CEAA*xx* 2090-CFBM7DF-CEAF*xx*
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.	Customer Supplied
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.	
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)

Dimensions are in mm (in.)

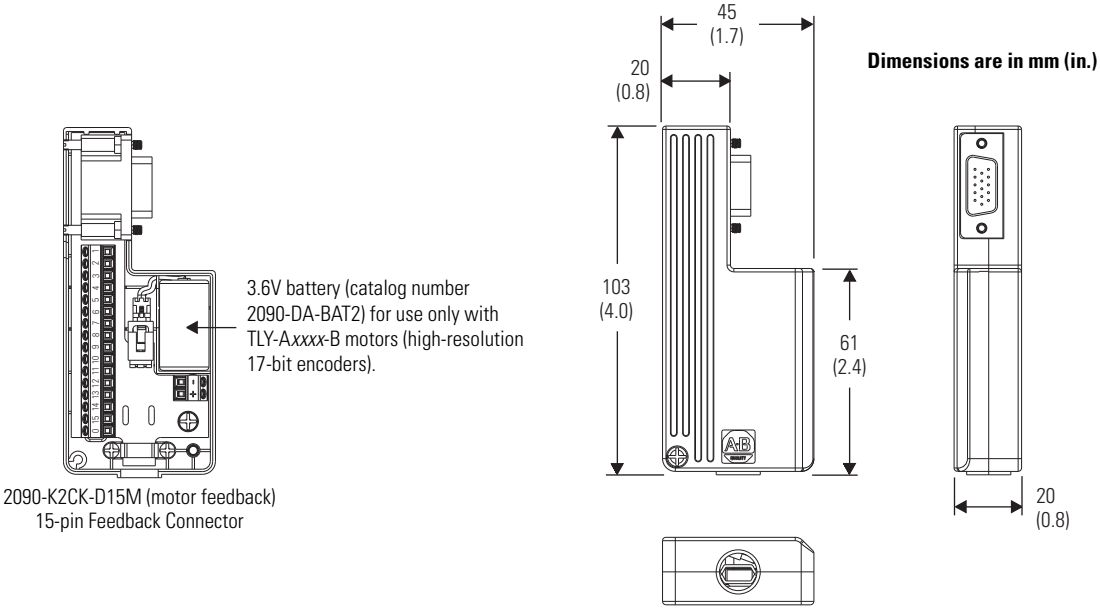


2090-K6CK-D26M
26-pin I/O Connector

2090-K6CK-D15M (motor feedback)
2090-K6CK-D15F (auxiliary feedback)
15-pin Feedback Connector

Low-profile Connector Kit Dimensions (catalog number 2090-K2CK-D15M)

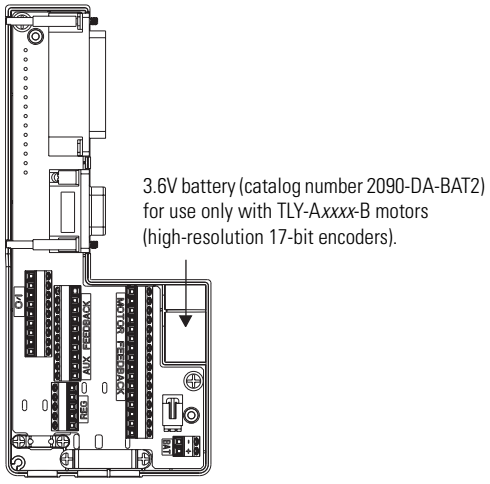
Dimensions are in mm (in.)



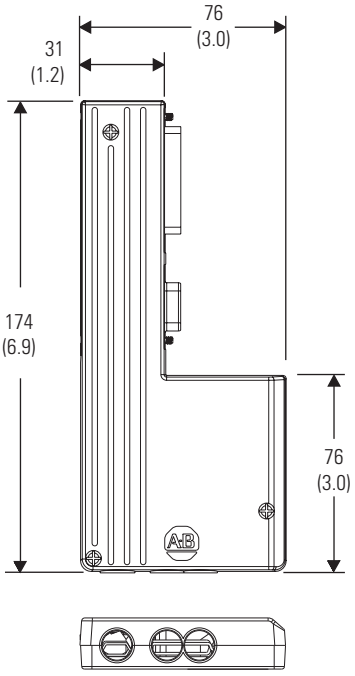
3.6V battery (catalog number 2090-DA-BAT2) for use only with TLY-A*xxxx*-B motors (high-resolution 17-bit encoders).

2090-K2CK-D15M (motor feedback)
15-pin Feedback Connector

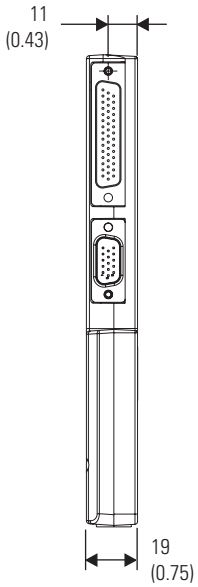
Low-profile Connector Kit Dimensions (catalog number 2090-K2CK-COMBO)



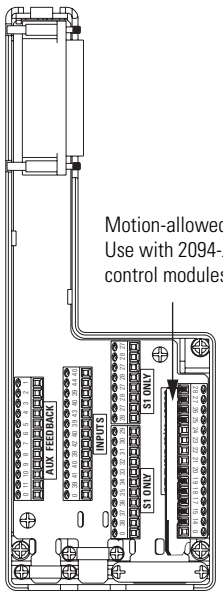
2090-K2CK-COMBO (motor feedback and I/O)
15-pin and 44-pin Connector



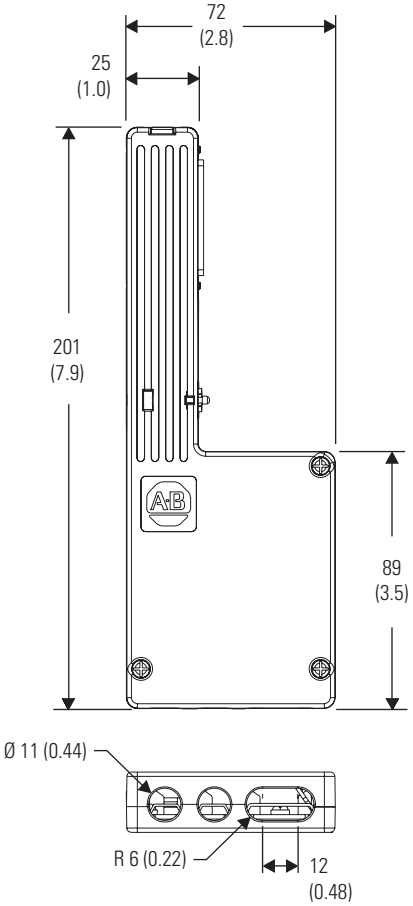
Dimensions are in mm (in.)



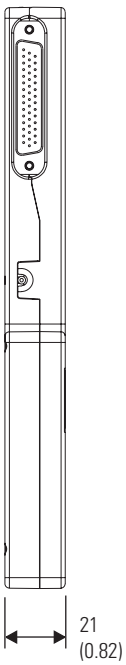
Low-profile Connector Kit Dimensions (catalog number 2090-K6CK-D44M)



2090-K6CK-D44M
(auxiliary feedback, safety, and I/O)
44-pin Connector



Dimensions are in mm (in.)

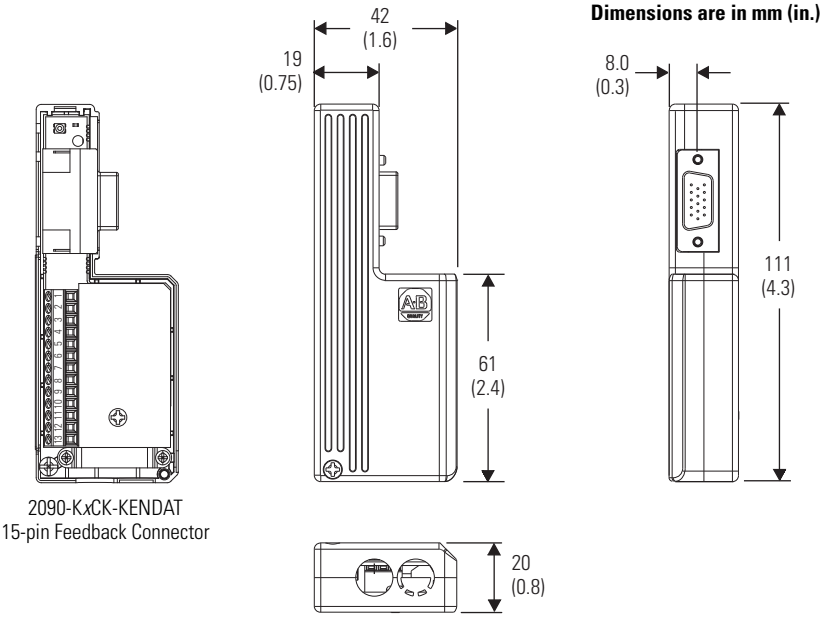


Low-profile Feedback Modules

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) used to enable operation of drives with EnDat feedback. Use with any Kinetix 6000 IAM/AM module and compatible motors with Endat encoders.	2090-XXNFMF-S*xx* 2090-CFBM4DF-CDAF*xx* 2090-CFBM7DF-CDAF*xx*
2090-K7CK-KENDAT	Low-profile feedback module (15-pin, male, D-sub) used to enable operation of drives with EnDat feedback. Use with any Kinetix 7000 drive and compatible motors with Endat encoders.	

Low-profile Feedback Module Dimensions (catalog number 2090-K*x*CK-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 - K*x*CK - *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, used to enable operation of drives with EnDat feedback

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

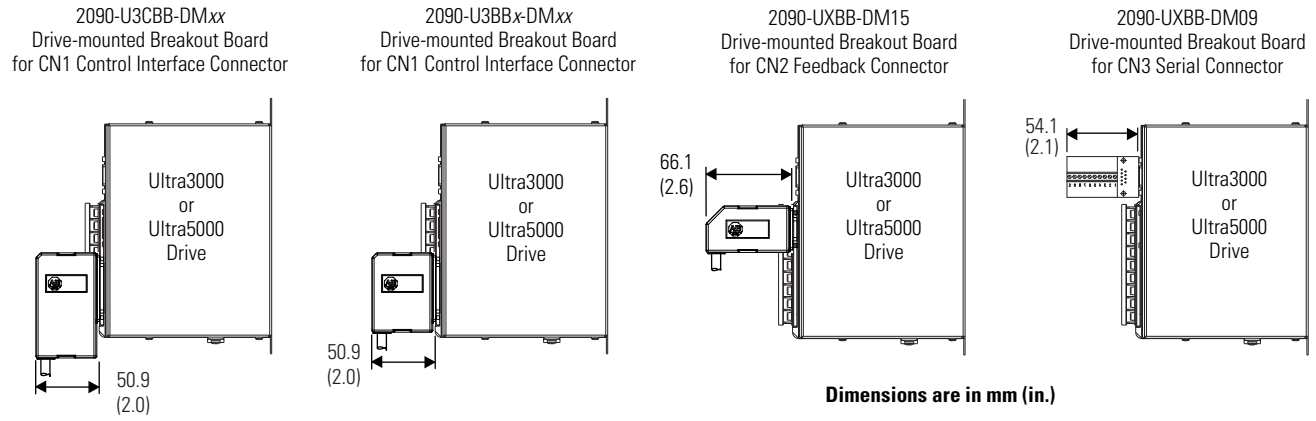
Bulletin Number

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 Kinetix 3 drives.

In this example, the Ultra3000/5000 drives are shown with drive-mounted breakout board kits (catalog number 2090-U*xxx*-DM*xx*). 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 448 for more information.

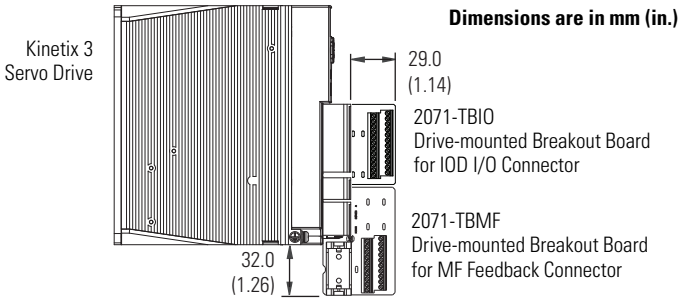
Ultra3000/5000 Drive-mounted Breakout Board Examples



TIP 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 Kinetix 3 drives are shown with drive-mounted breakout boards (catalog numbers 2071-TBMF and 2071-TBIO). Use the 2071-TBMF breakout board with 2090-CFBM6DF-CBAA*xx* feedback cables or when your motor or actuator has high-resolution encoder feedback. Use the 2071-TBIO breakout board for making flying-lead cable connections to twenty-four of the most commonly used terminals in the 50-pin IOD connector. Refer to Drive-mounted Breakout Board Components on page 448 for more information.

Kinetix 3 Drive-mounted Breakout Board Examples



Drive-mounted Breakout Board Components

Drive-mounted breakout boards are designed for use with Ultra3000, Ultra5000, and Kinetix 3 drives. Use this table to identify the drive-mounted breakout board for your serial, I/O or feedback connector.

IMPORTANT The 2090-XXNFMF-S*xx* and 2090-CFBM*x*DF-*xx*A*xxx* flying-lead feedback cables require 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 24…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.
2071-TBIO	50-pin, drive-mounted breakout board for Kinetix 3 IOD I/O connector.
2071-TBMF	20-pin, drive-mounted breakout board for Kinetix 3 MF 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 mm^2 (16 to 26 AWG) wire. For applications that require a 44-pin drive-mounted breakout board that accepts 4 to 0.34 mm^2 (12 to 22 AWG) wire, contact your local Allen-Bradley representative.

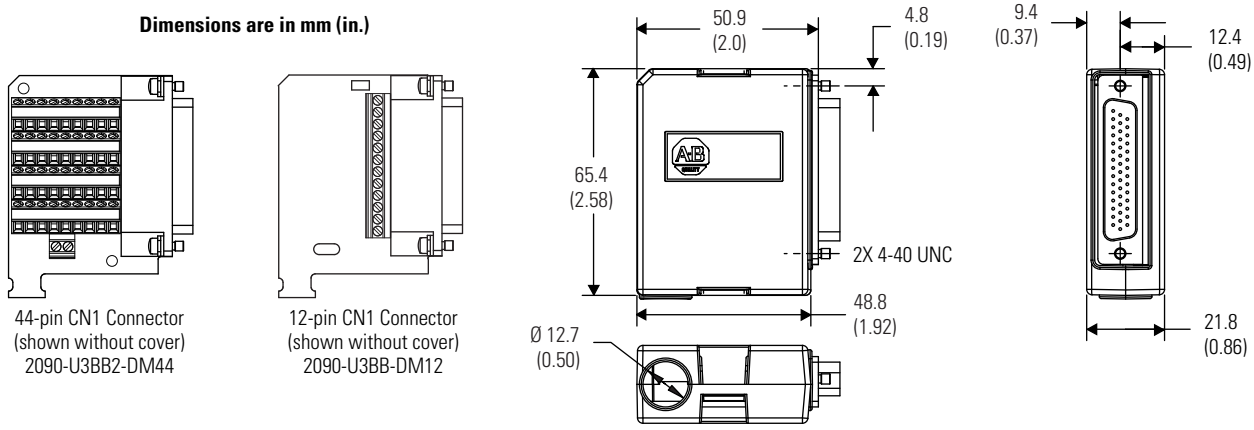
(3) Only for use with the Ultra3000 (2098-DSD-005*x-xx*, 2098-DSD-010*x-xx*, 2098-DSD-020*x-xx*) drives. Requires an external +24V DC power supply. For specifications, refer to the CN1 Control Interface Breakout Boards with Integral 24V to 5V Auxiliary Power Converter Installation Instructions, publication 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-DM*xx* 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-HV*xxx*-SE/DN) SERCOS/DeviceNet interface drives due to space restrictions when connecting the SERCOS or DeviceNet interface cables.

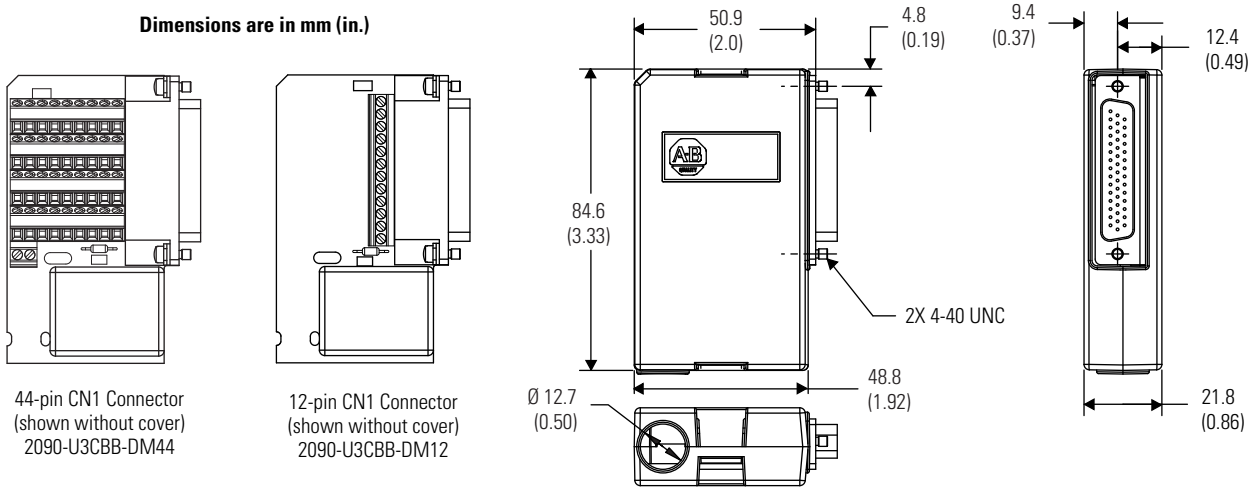
Drive-mounted Breakout Board Dimensions (catalog numbers 2090-U3BB-DM12 and 2090-U3BB2-DM44)



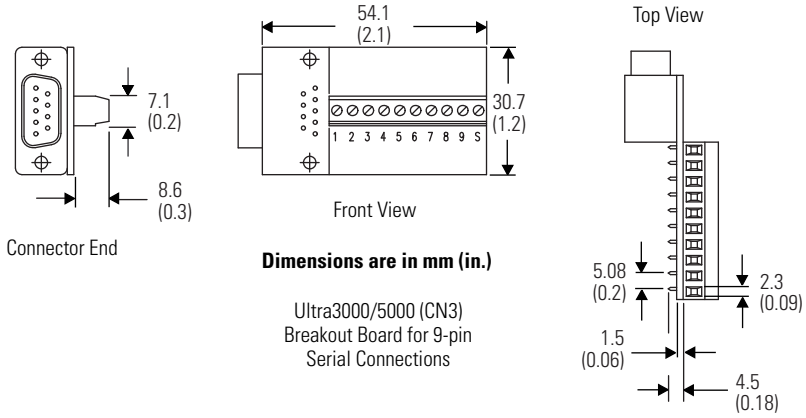
These (CN1) breakout boards apply to Ultra3000 drives (catalog numbers 2098-DSD-005, 2098-DSD-010, and 2098-DSD-020) in applications where a 24...5V DC converter for control power is required. The 12-pin board is intended for use with SERCOS drives, but may be used in non-SERCOS applications with minimal I/O requirements.

IMPORTANT Do not use the 2090-U3CBB-DM*xx* when wiring to the Ultra3000 (2098-DSD-030-SE/DN, 2098-DSD-075-SE/DN, 2098-DSD-150-SE/DN, or 2098-DSD-HV*xxx*-SE/DN) drives.

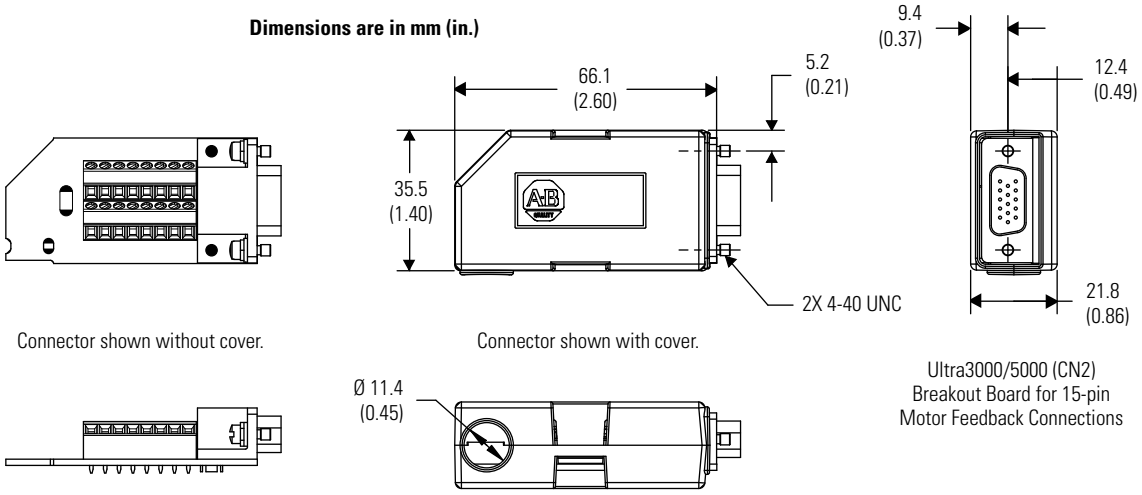
Drive-mounted Breakout Board Dimensions (catalog numbers 2090-U3CBB-DM12 and 2090-U3CBB-DM44)



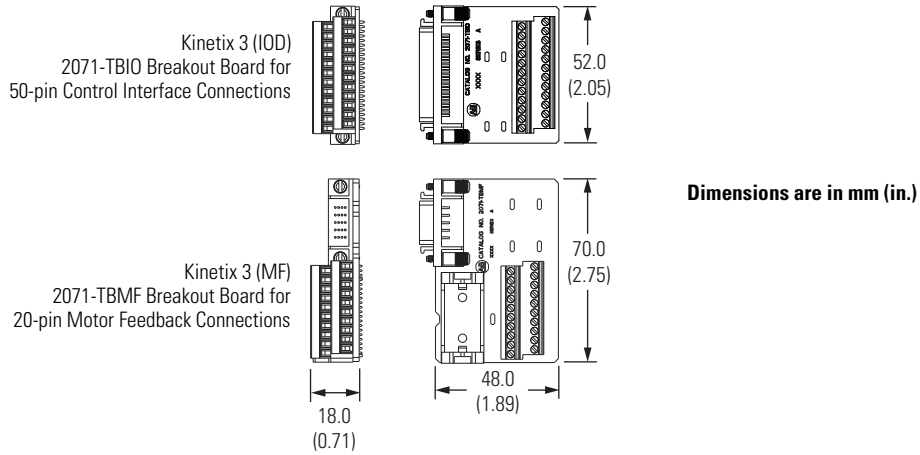
Drive-mounted Breakout Board Dimensions (catalog number 2090-UXBB-DM09)



Drive-mounted Breakout Board Dimensions (catalog number 2090-UXBB-DM15)



Drive-mounted Breakout Board Dimensions (catalog numbers 2071-TBMF and 2071-TBIO)



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 24…5V auxiliary power converter

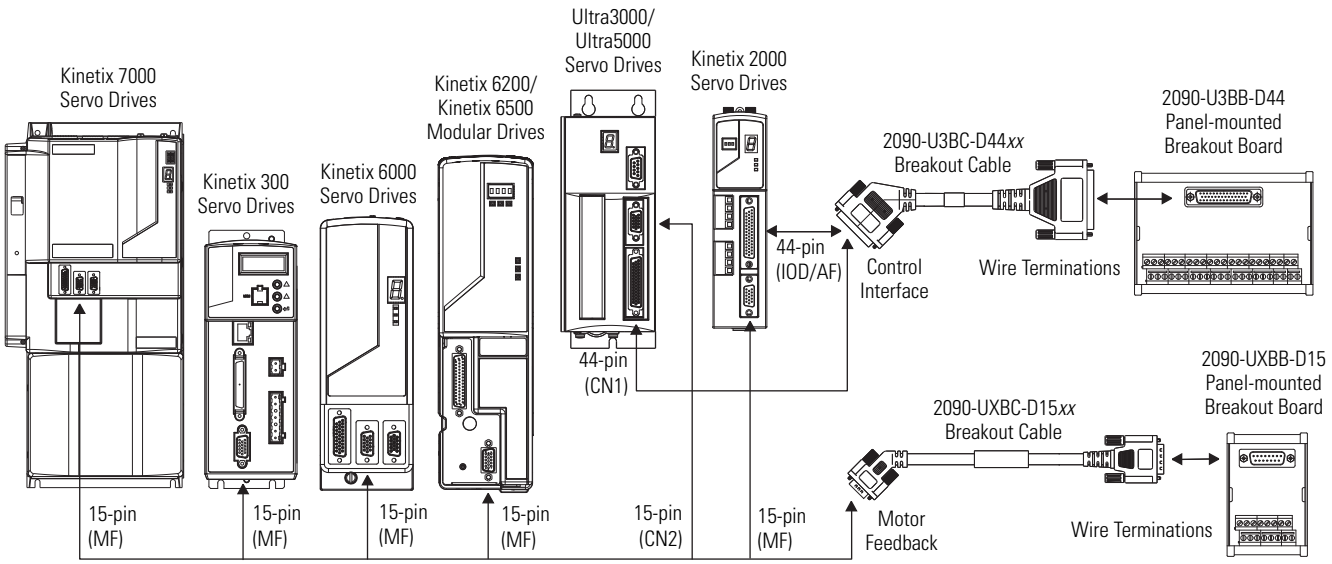
Drive
UX = Ultra3000 and Ultra5000 drives
U3 = Ultra3000 drives

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 452 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-D15*xx*	DIN rail terminal block (catalog number 2090-U*x*BB-D*xx*) and cable (catalog number 2090-U*x*BC-D*xxxx*) 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-S*xx* 2090-CFBM4DF-CDAF*xx* 2090-CFBM7DF-CEAA*xx* 2090-CFBM7DF-CEAF*xx* 2090-CFBM6DF-CBAA*xx*
	Terminal block and cable for motor feedback connector (15-pin, male, D-sub). Use with Kinetix 6000 drives, MPL-B*xxxx*R, and MPM-A/B*xxxxx*-2 (resolver feedback) motors.	2090-CFBM7DF-CEAA*xx*
2090-U3BK-D44*xx*	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 Kinetix 300 drives (CN1 connector) or Kinetix 2000 drives (IOD/AF connector) for control interface connections.

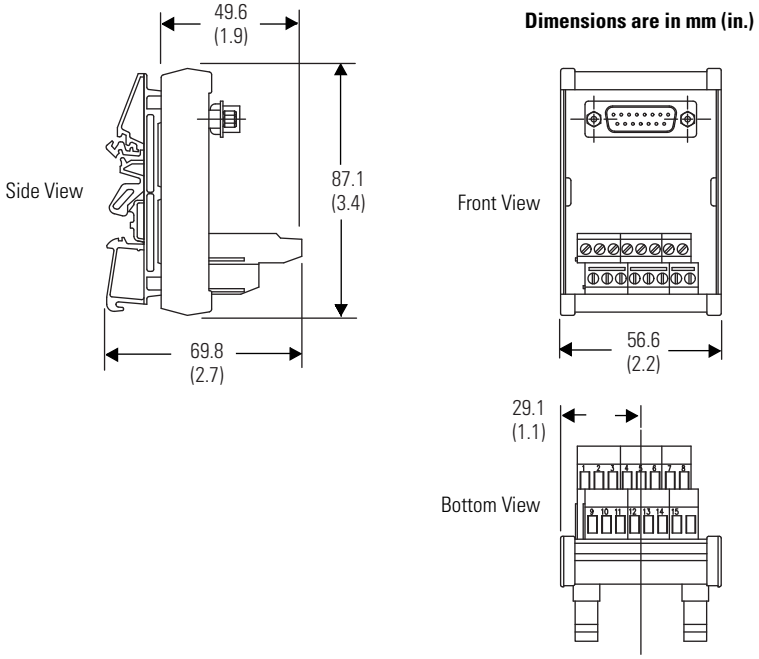
IMPORTANT The flying-lead compatible cables listed above require either 2090-UXBB-DM15 (drive-mounted) or 2090-UXBB-D15 (panel-mounted) breakout board connector kits to complete feedback and I/O connections to the drive.

Panel-mounted Breakout Cables

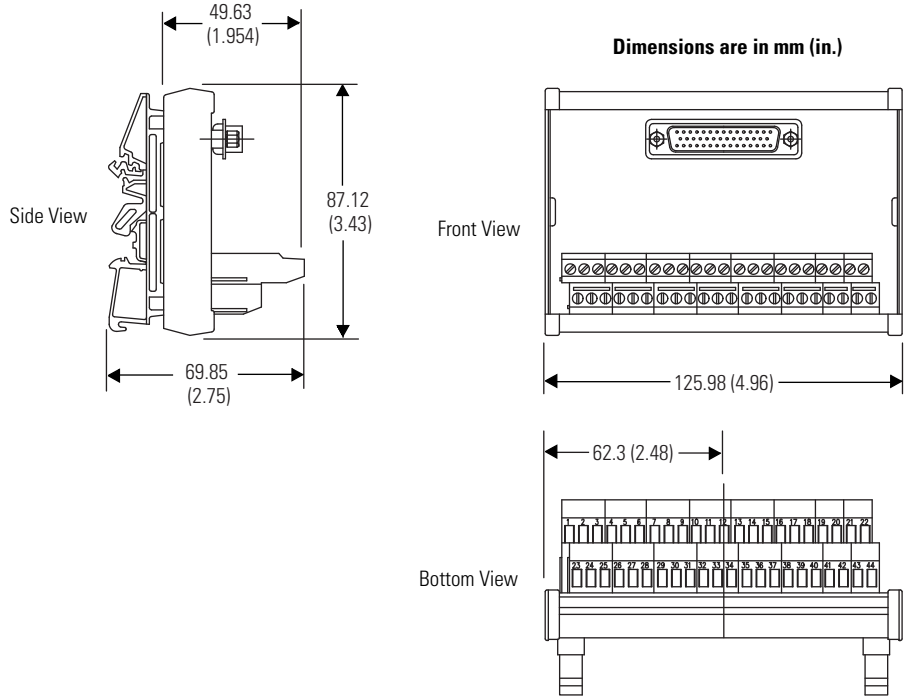
Cat. No.	Description
2090-UXBC-D15*xx*	15-pin cable with D-sub connector. Use with any Kinetix 300, Kinetix 2000, Kinetix 6000, Kinetix 6200, Kinetix 6500, or Kinetix 7000 drives (MF connector) or Ultra3000/5000 drives (CN2 connector) for motor feedback connections.
2090-U3BC-D44*xx* (1)	44-pin cable 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.

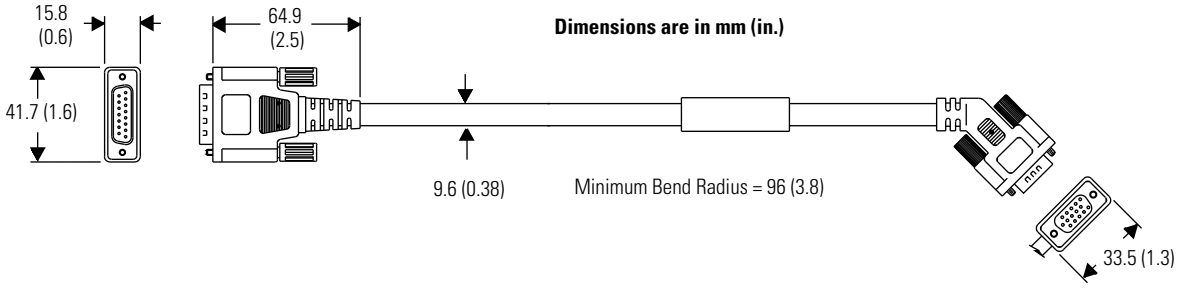
Panel-mounted Breakout Board Dimensions (catalog number 2090-UXBB-D15)



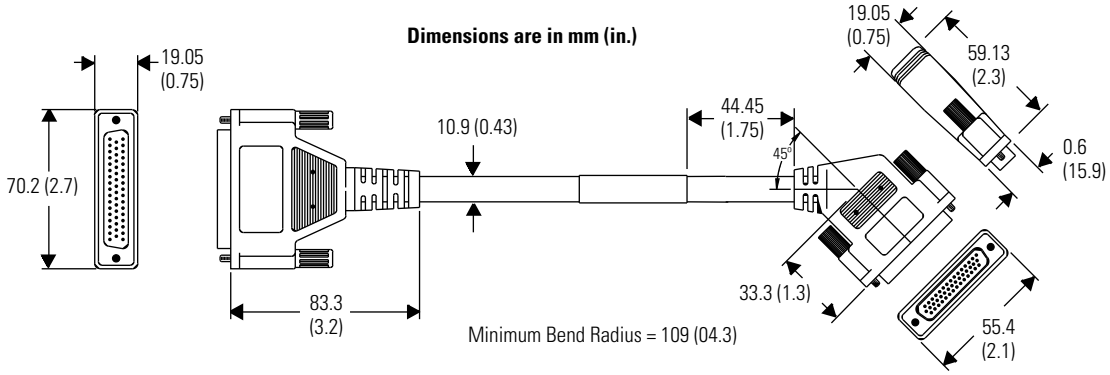
Panel-mounted Breakout Board Dimensions (catalog number 2090-U3BB-D44)



Panel-mounted Breakout Cable Dimensions (catalog number 2090-UXBC-D15*xx*)



Panel-mounted Breakout Cable Dimensions (catalog number 2090-U3BC-D44*xx*)

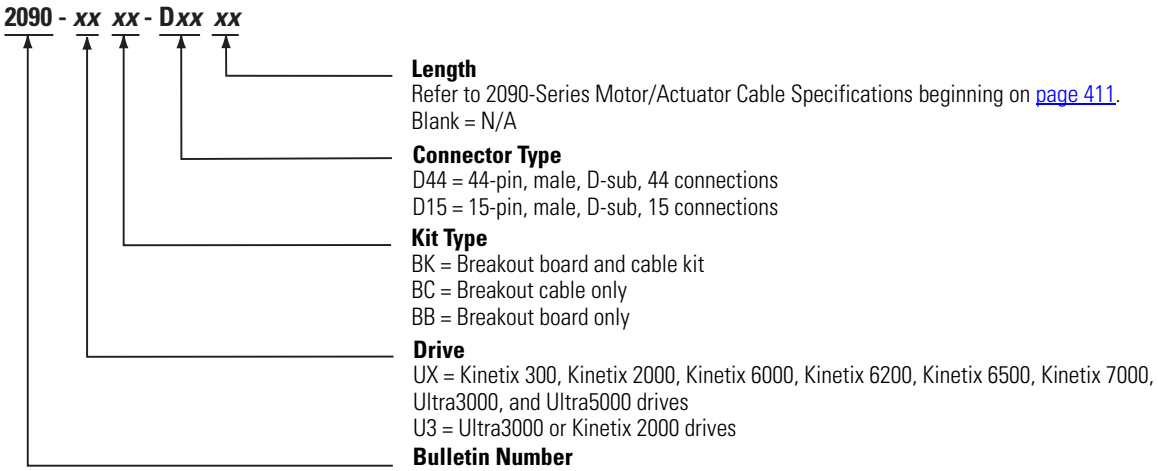


Panel-mounted Breakout Cable Specifications

Breakout Cable	Description	Specifications			Standard Cable Lengths m (ft)
		Rating ° C (° F)	Shield Coverage	Jacket Material	
2090-UXBC-D15*xx*	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	1 (3.2) 3 (9.8) 9 (29.5) 15 (49.2)
2090-U3BC-D44*xx*	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.



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
Kinetix 3	9101-1476	Mating Connector Kit (50-pin mini-D solder cup) IOD
	9101-1477	Mating Connector Kit (20-pin mini-D solder cup) MF
Ultra5000	2090-U5CK-TB	Mating Connector Kit (28 and 15 position spring terminal) CN1A and CN1B

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-PRS*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
2094-BC01-M01-S 2094-BC01-M01-M			1
2094-BC02-M02-S 2094-BC02-M02-M			1
2094-BC04-M03-S 2094-BC04-M03-M			2
2094-BC07-M05-S 2094-BC07-M05-M			2

AM Module Cat. No.		Converter Slot Used	Inverter Slots Used
2094-AMP5-S	230V	0	1
2094-AM01-S			1
2094-AM02-S			1
2094-AM03-S			1
2094-AM05-S			1
2094-BMP5-S 2094-BMP5-M	460V		1
2094-BM01-S 2094-BM01-M			1
2094-BM02-S 2094-BM02-M			1
2094-BM03-S 2094-BM03-M			2
2094-BM05-S 2094-BM05-M			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-*x*, and 2094-BC07-M05-*x*) and axis modules (2094-BM03-*x* and 2094-BM05-*x*) are double-wide modules and require two slots on the power rail.

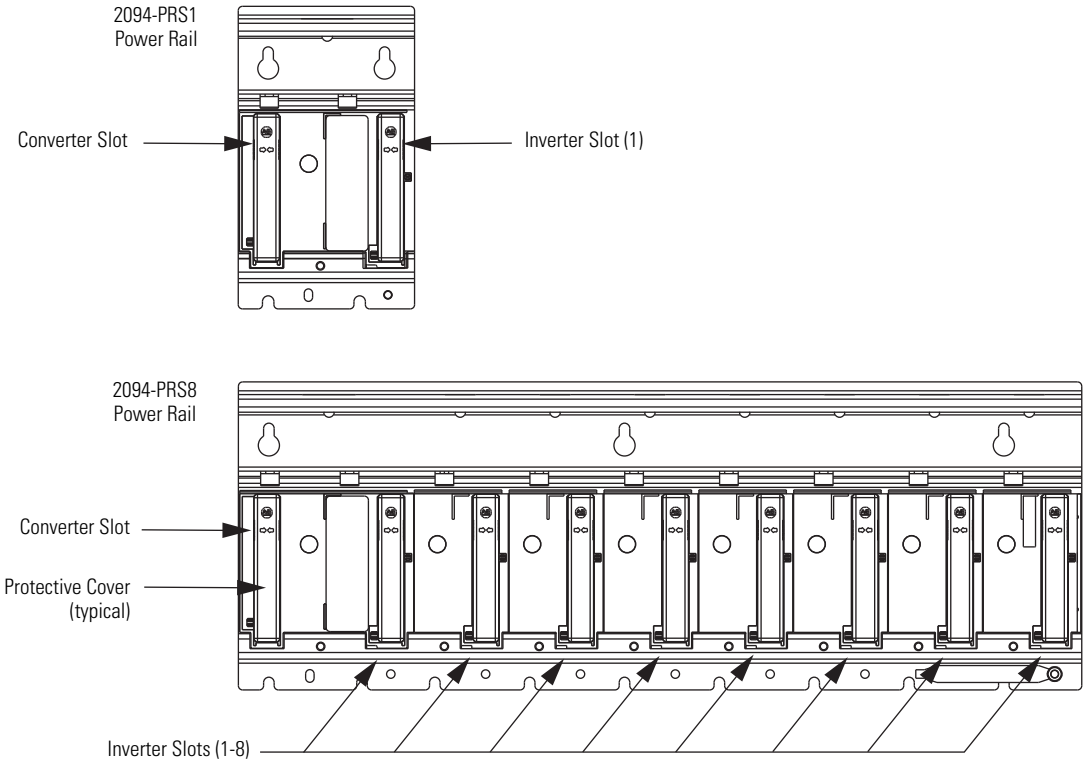
The leftmost slot on each power rail is the converter slot and only used by the IAM module. All other slots are inverter slots and are used by the IAM, AM, or shunt module (refer to the figure below). The power rail catalog number indicates the number of available inverter slots.

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

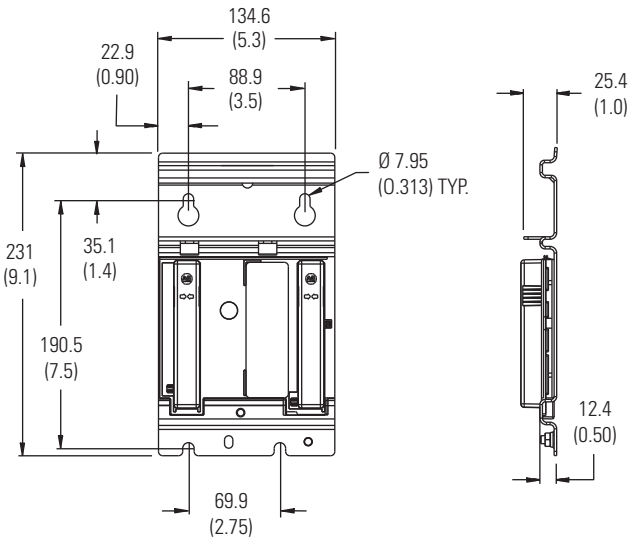


TIP The Bulletin 2094 power rails ship with a protective cover over the converter and inverter slot pins.

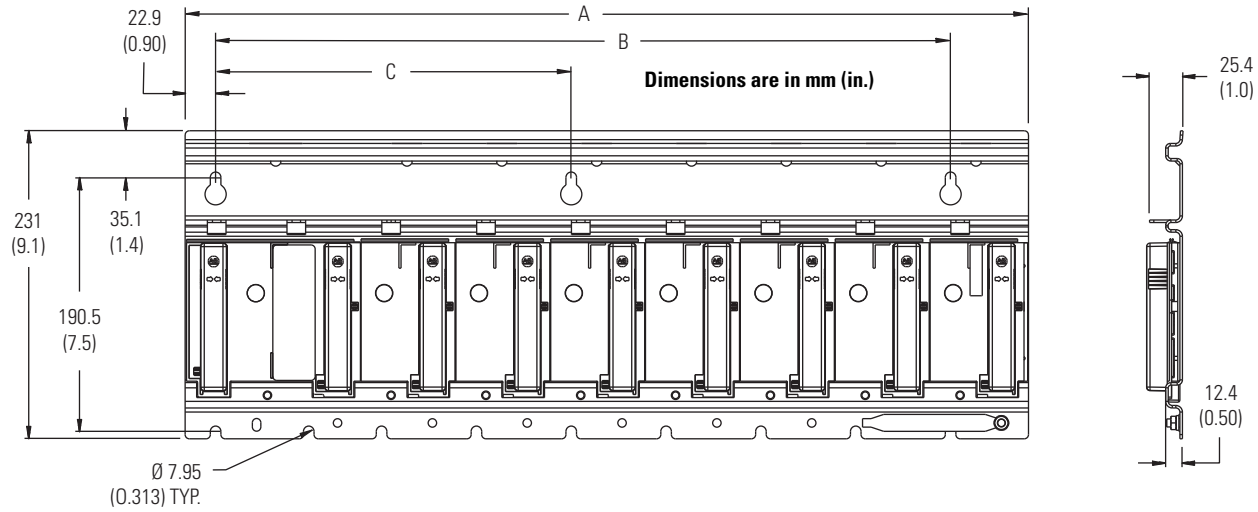
Power Rail Dimensions

Dimensions (catalog number 2094-PRS1)

Dimensions are in mm (in.)



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 458.			
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.

2094 - PRS *x*

Module Capacity
1 = IAM and no additional modules
2 = IAM and up to 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
6 = IAM and up to 5 additional modules
7 = IAM and up to 6 additional modules
8 = IAM and up to 7 additional modules

Power Rail
PRS = Power Rail, available in 1, 2, 3, 4, 5, 6, 7, and 8 axis capacity

Bulletin Number

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 460 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 494.

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.

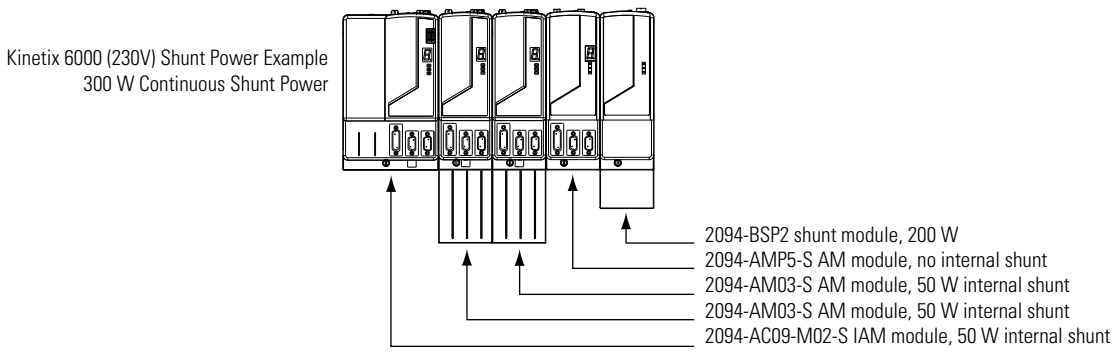
IAM Module Cat. No. 2094-	Number of Axis Modules Qty	Shunt Module Cat. No.	Specifications				External Passive Shunt Module (1)	System Continuous Shunt Power W
			Resistance Ω	Peak Current A	Peak Power kW	Continuous Power W		
AC05-MP5-S	0 to 7	N/A (2)	–	–	–	–	N/A (2)	0
AC05-M01-S			–	–	–	–		0
AC09-M02-S			–	–	–	–		50 (3)
AC16-M03-S			–	–	–	–		200 plus (4)
AC32-M05-S			–	–	–	–		
AC*xx*-M*xx*-S	0 to 6	2094-BSP2	28.75	14.1	5.7	200	N/A (2)	200 plus (5)
AC*xx*-M*xx*-S	0 to 6	2094-BSP2	4	101.3	41	300	1394-SR9A	300 (6)
AC*xx*-M*xx*-S						900	1394-SR9AF	900 (6)
AC*xx*-M*xx*-S						1800	1394-SR36A	1800 (6)
AC*xx*-M*xx*-S						3600	1394-SR36AF	3600 (6)

(1) Refer to External Shunt Modules beginning on page 494 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 BC04-M03-M			–	–	–	–		200 plus (4)
BC07-M05-S BC07-M05-M			–	–	–	–		
BC*xx*-M*xx-x*	1 to 6	2094-BSP2	28.75	28	22.5	200	N/A (2)	200 plus (5)
BC*xx*-M*xx-x*	1 to 6	2094-BSP2	4	201.3	162	300	1394-SR9A	300 (6)
BC*xx*-M*xx-x*						900	1394-SR9AF	900 (6)
BC*xx*-M*xx-x*						1800	1394-SR36A	1800 (6)
BC*xx*-M*xx-x*						3600	1394-SR36AF	3600 (6)

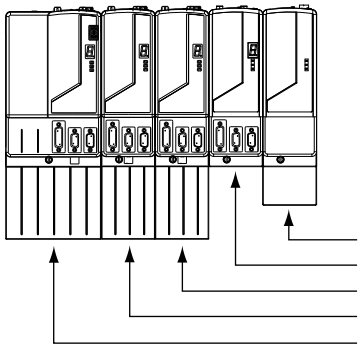
(1) Refer to External Shunt Modules beginning on page 494 for shunt module specifications.
(2) Module not part of system configuration.
(3) Shunt power equals 50 or the sum of the AM module internal shunt ratings.
(4) Shunt power equals 200 plus the sum of the AM module internal shunt ratings.
(5) Shunt 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.



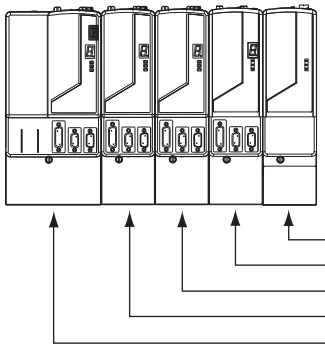
2094-BSP2 shunt module, 200 W
2094-AM02-S AM module, no internal shunt
2094-AM03-S AM module, 50 W internal shunt
2094-AM03-S AM module, 50 W internal shunt
2094-AC16-M03-S IAM module, 200 W internal

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 for Kinetix 6000 Drives (without external shunt)

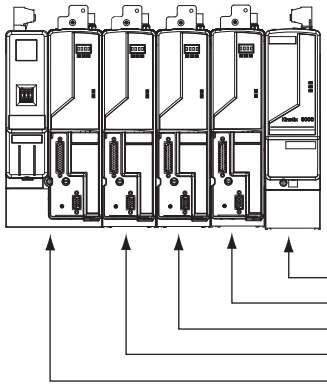
Kinetix 6000 (460V) Shunt Power Example
400 W Continuous Shunt Power



2094-BSP2 shunt module, 200 W
2094-BMP5-S AM module, 50 W internal shunt
2094-BM01-S AM module, 50 W internal shunt
2094-BM01-S AM module, 50 W internal shunt
2094-BC02-M02-S IAM module, 50 W internal shunt

Shunt Power Example for Kinetix 6200 or Kinetix 6500 Drives (without external shunt)

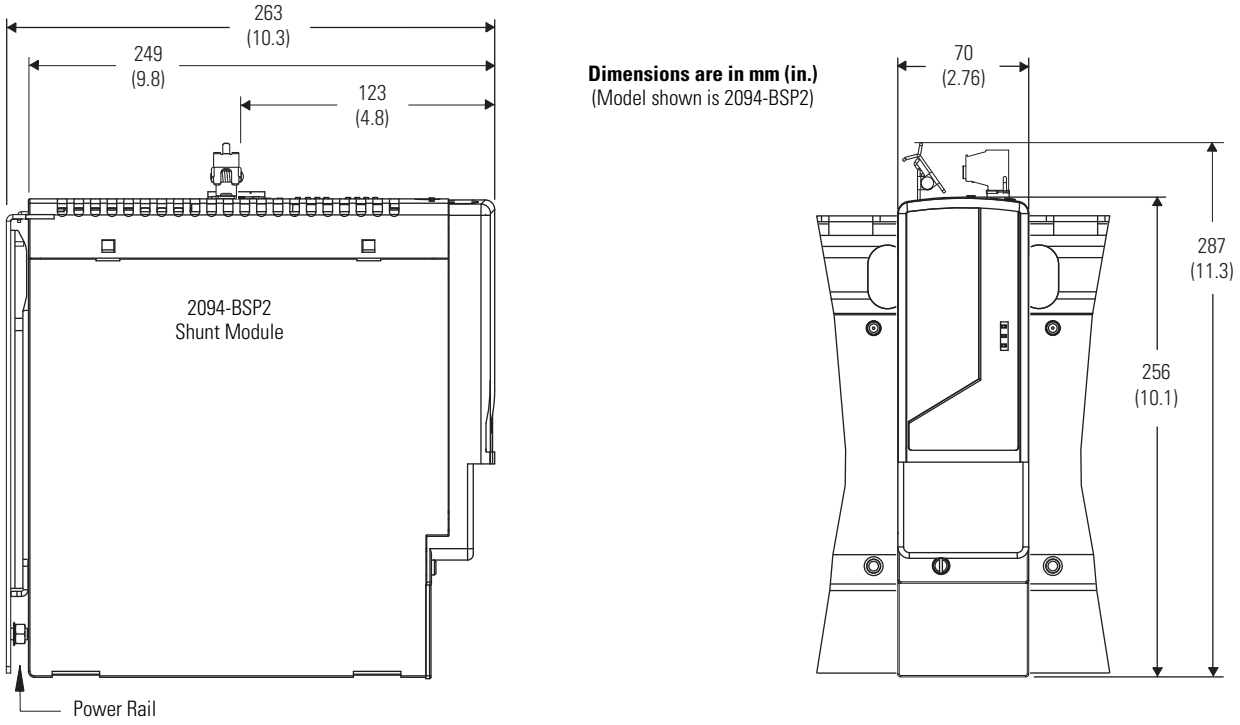
Kinetix 6200/Kinetix 6500 (460V)
Shunt Power Example
400 W Continuous Shunt Power



2094-BSP2 shunt module, 200 W
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.

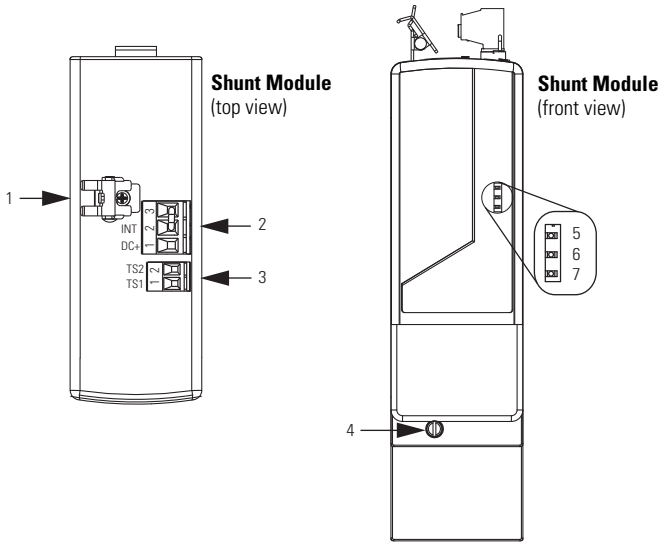
Shunt Module Dimensions



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 465.

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.

2094 - BSP2

Input Voltage/kW Rating
BSP2 = 230/460V input voltage, 200 W

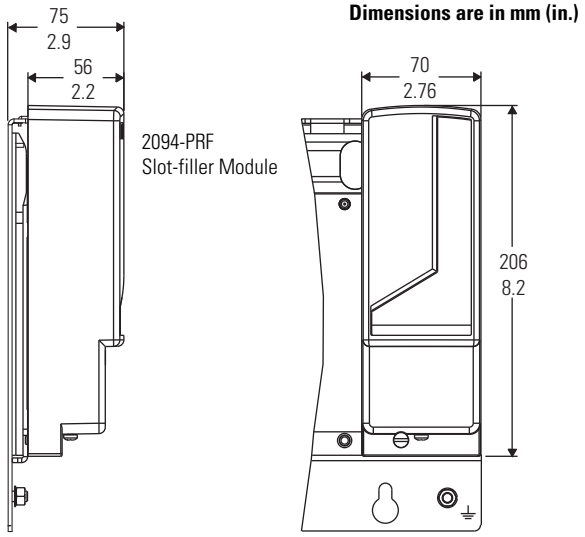
Bulletin Number

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.

2094 - PRF

Power Rail Filler

Bulletin Number

Connector Sets

Kinetix 6000, Kinetix 6200, Kinetix 6500 Drive Families

Drive Module	Drive Cat. No.	Description	Cat. No.
IAM Module (converter connectors)	2094-AC05-M*xx*-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) module.	2094-ANCON-1
	2094-AC16-M03-S and 2094-AC32-M05-S		2094-XNCON-2
	2094-BC01-M*xx*-S and 2094-BC02-M02-S 2094-BC01-M*xx*-M and 2094-BC02-M02-M		2094-BNCON-1
	2094-BC04-M03-S and 2094-BC07-M05-S 2094-BC04-M03-M and 2094-BC07-M05-M		2094-XNCON-2
IAM/AM Module (inverter connectors)	2094-AC05-M*xx*-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 and AM (inverter) modules. 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-BC04-M03-M, 2094-BM03-M		2094-ANINV-2
	2094-BC01-M*xx*-S and 2094-BC02-M02-S 2094-BC01-M*xx*-M and 2094-BC02-M02-M 2094-BMP5-S, 2094-BM01-S, 2094-BM02-S 2094-BMP5-M, 2094-BM01-M, 2094-BM02-M		2094-XNINV-1
	2094-BC07-M05-S, 2094-BM05-S 2094-BC07-M05-M, 2094-BM05-M		2094-BNINV-2
Shunt Module	2094-BSP2	Includes external shunt resistor (RC) and external thermal switch (TS) replacement connectors for the shunt module.	2094-XNSHT-1

Kinetix 3, Kinetix 300, and Kinetix 7000 Drive Families

Drive Family	Drive Cat. No.	Description	Cat. No.
Kinetix 3	2071-A*xx*	Includes general purpose input power (IPD), shunt resistor (BC), and motor power (MP) replacement connectors for Kinetix 3 drives.	2071-CONN1
Kinetix 300	2097-V3*xxxx*	Includes AC input power (IPD), back-up power (CPD), shunt and DC bus (BC), motor power (MP), and safe-off (STO) replacement connectors for Kinetix 300 drives.	2097-CONN1
Kinetix 7000	2099-BM*xx*-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
	2094-AL*xx*S, 2094-BL*xx*S, and 2094-XL75S-C*x*	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 Components

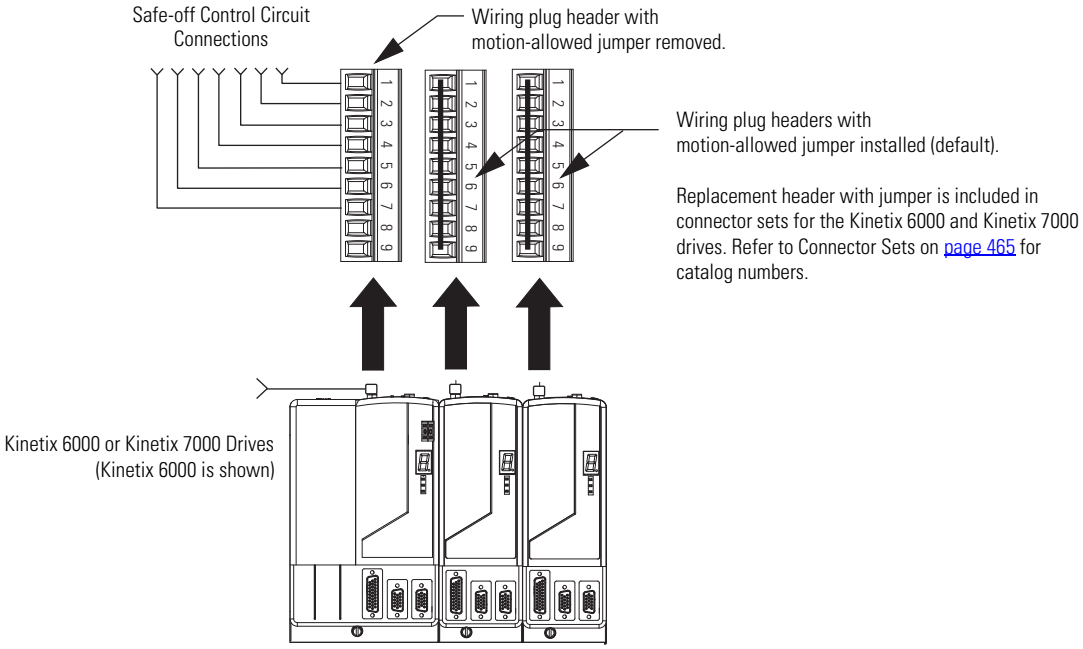
The safe-off feature is available with Kinetix 6000 and Kinetix 7000 drives.

You can implement the safe-off function in a single drive or extend it to as many as eight drives in a multiple safety drive configuration. The safe-off connector can also be jumpered to effectively remove the safe-off function (this is the default setting). For more information on wiring safe-off connections, 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.

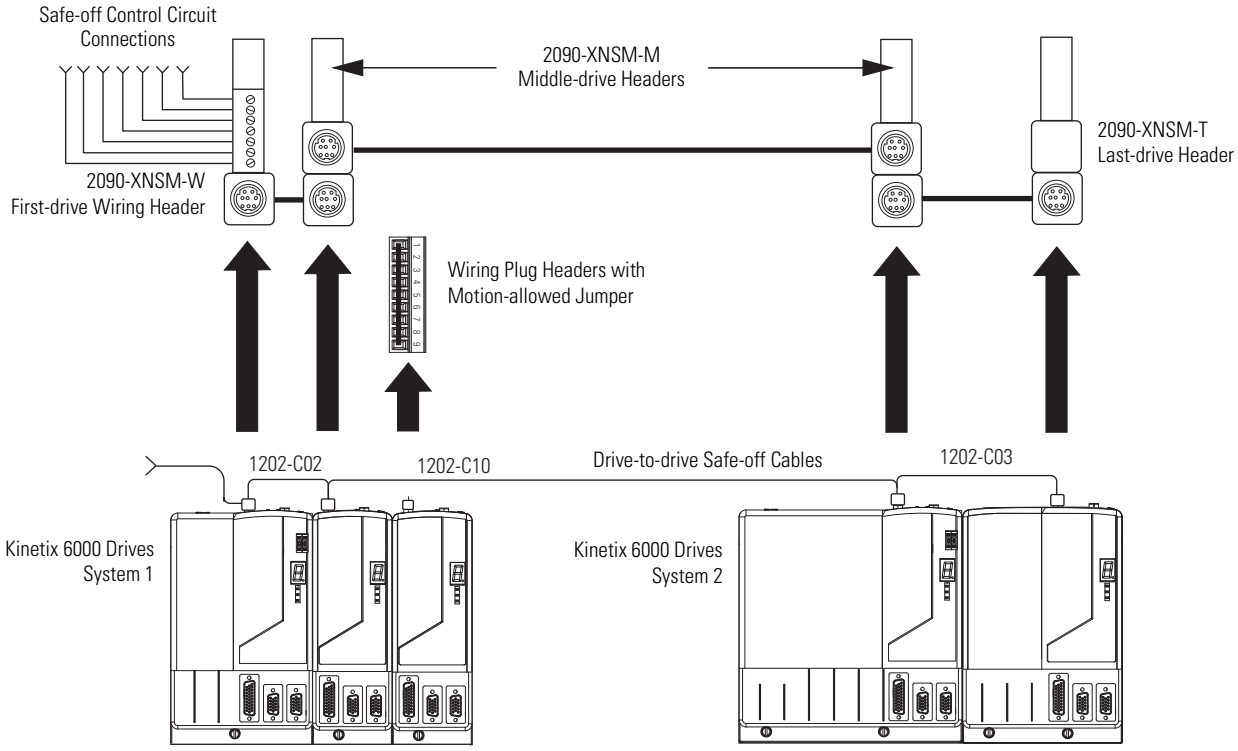
Typical Single Drive Safe-off Configuration



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.

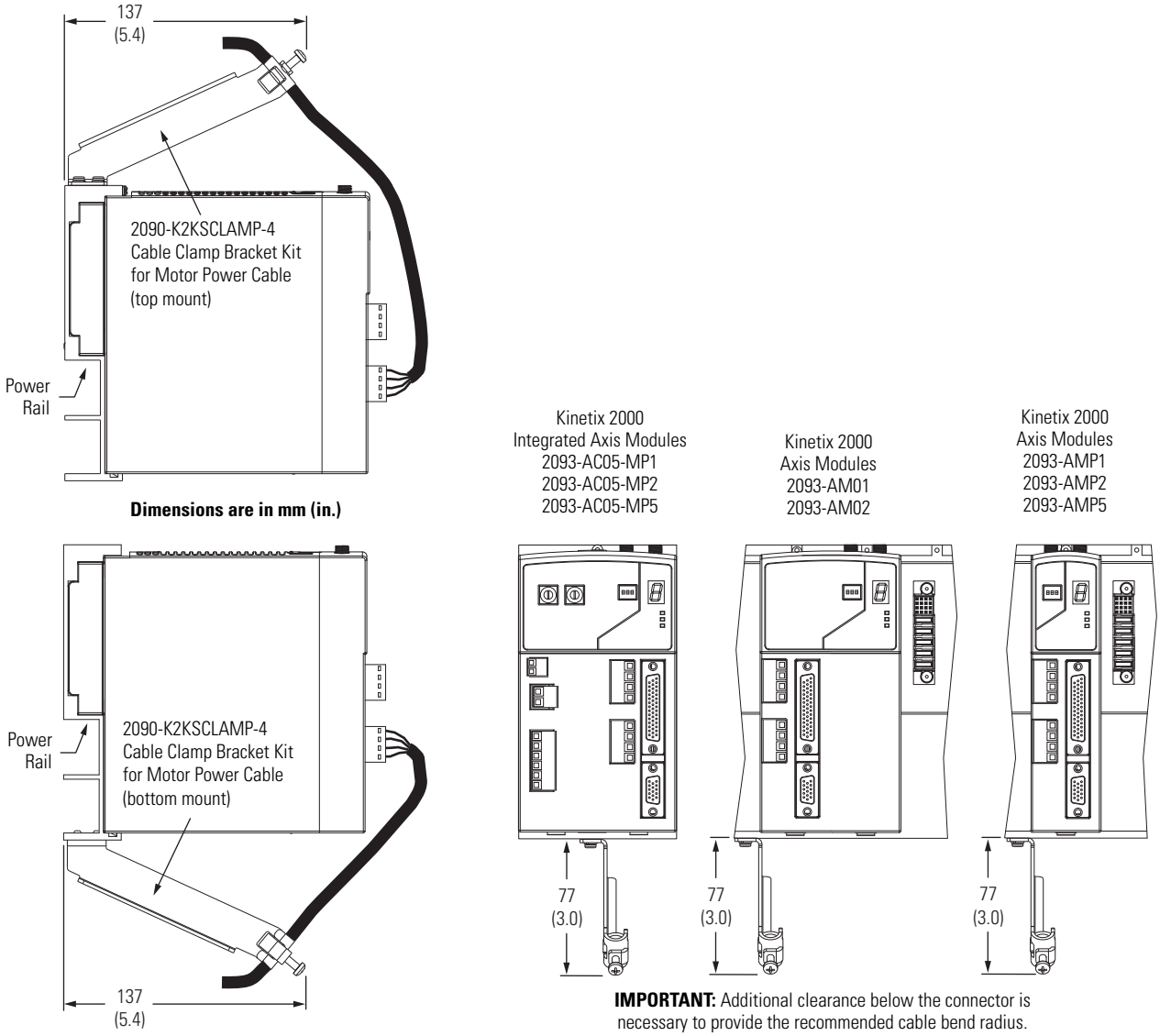
Safe-off Components

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
Drive-to-drive safety cable for connecting single-wide Kinetix 6000 drives.	1202-C02
Drive-to-drive safety cable for connecting double-wide Kinetix 6000 drives.	1202-C03
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.	1202-C10

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)



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-AL*xx*S and 2094-XL75S-C*x*). The number of brackets required for use with the power rail and LIM are shown in the table below.

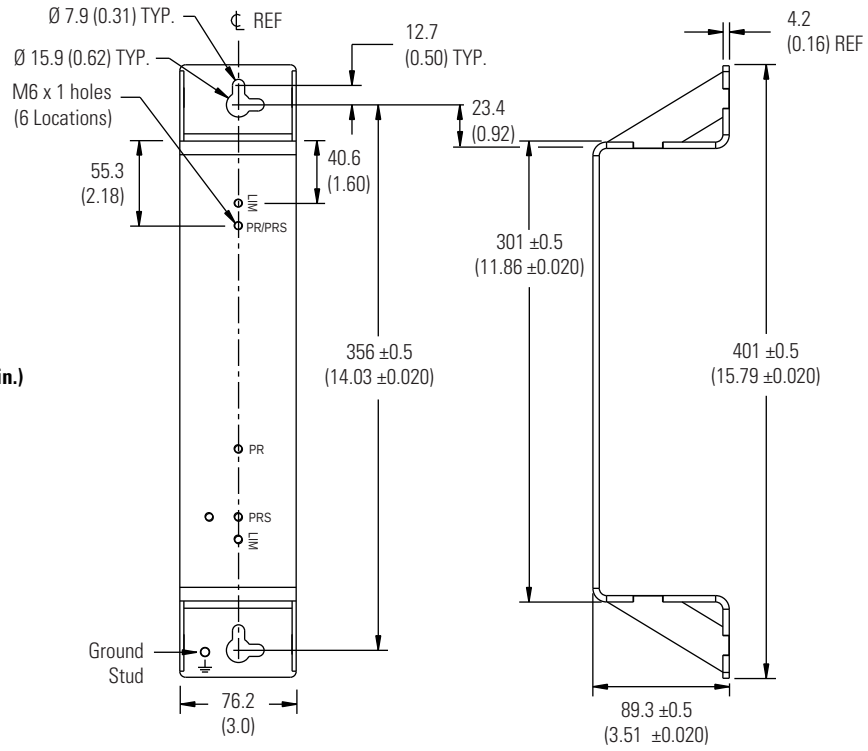
Module to Mount	Brackets Required
LIM (2094-AL*xx*S and -XL75S-C*x*)	2
Power Rail (PRS*x*) 1-4 axis	2
Power Rail (PRS*x*) 5-8 axis	3

IMPORTANT The 2094-BL*xx*S, 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 470.

Dimensions (catalog number 2094-XNBRKT-1)

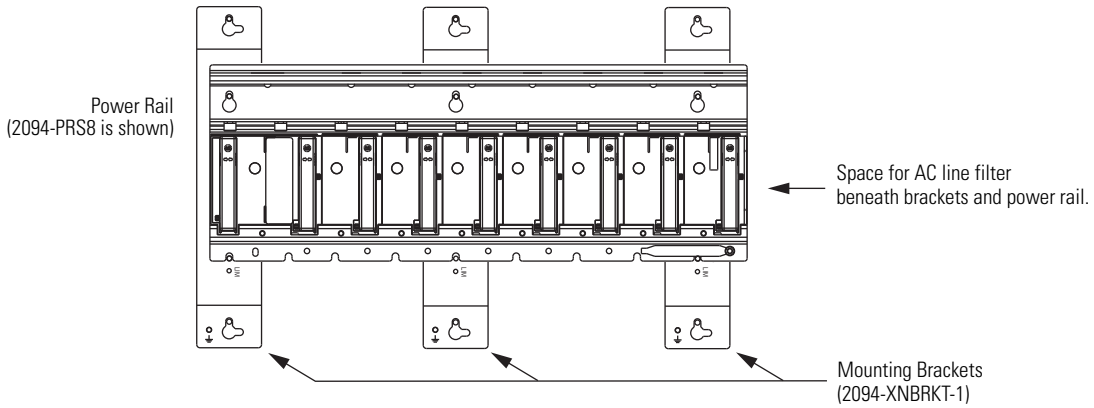


Dimensions are in mm (in.)

Mounting Bracket Configurations

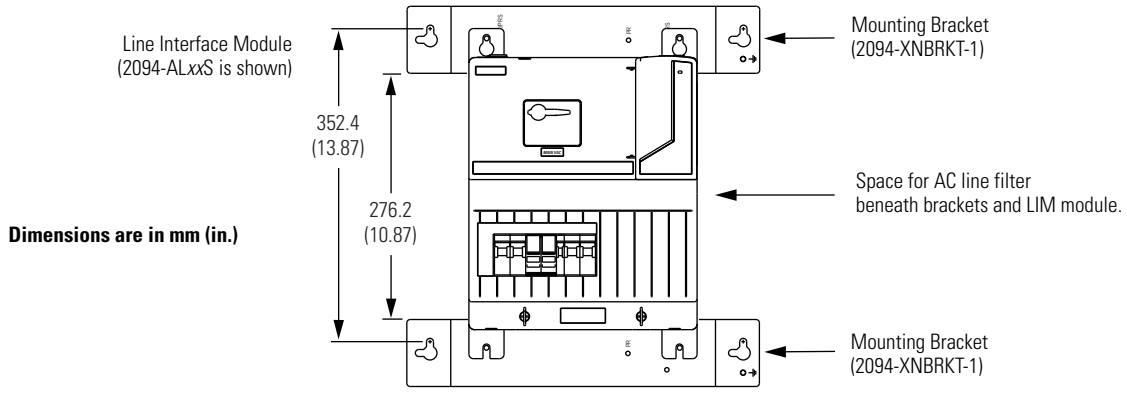
In the figure below, the power rail (catalog number 2094-PRS*x*) is shown mounted on Bulletin 2094 Mounting Brackets.

Power Rail on 2094 Mounting Brackets



In the figure below, the LIM module (catalog numbers 2094-AL*xx*S or 2094-XL75S-C*x*) is shown mounted on Bulletin 2094 Mounting Brackets.

LIM Module on 2094 Mounting Brackets



IMPORTANT Only the 2094-AL*xx*S and 2094-XL75S-C*x* Line Interface Modules are compatible with the 2094 Mounting Brackets. The 2094-BL*xx*S, 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-BM*xx*-S drives.
2099-K7KCP-1	DC-DC converter cassette kit. Replacement DC-DC converter for 2099-BM*xx*-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	• Square flange • 3/8 in. solid-shaft • 17-pin connector • 5…12V operating voltage	• Absolute feedback for position control • RS-485 interface • Hiperface interface compatible • IP66 (IEC 529)
842HR-SJDZ115FWYD		

Refer to 842HR Sine Cosine/Serial Encoders catalog, publication C116-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	• 5/8 in. through-shaft • 3/8 in. bolt on 2.5…4.0 in. diameter radius • 10-pin connector • 5V DC input /5V DC DLD output (3487)
844D-B5CC1CS	2048 PPR	
844D-B5CC1DR	5000 PPR	

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	• 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

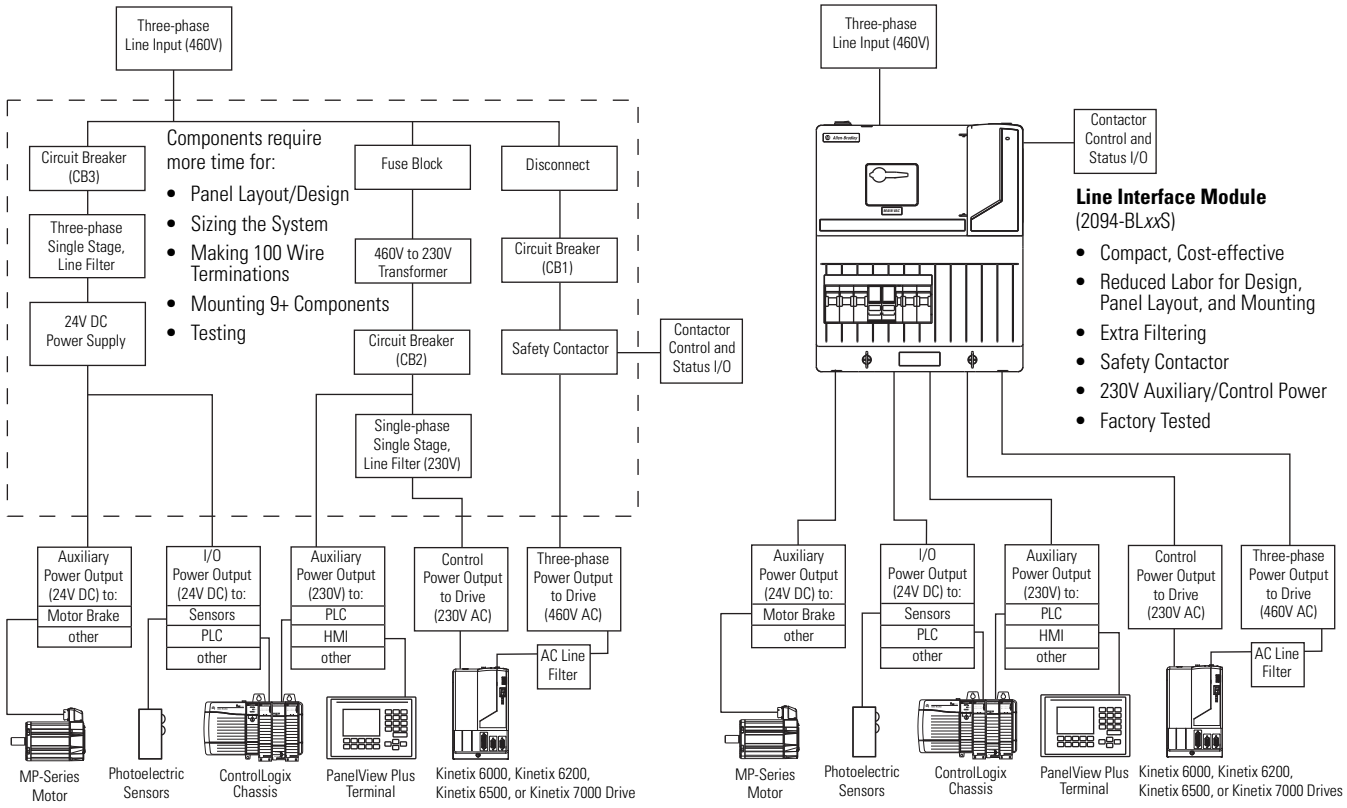
Cat. No.	Resolution	Description
845T-DN13EFW	1024 PPR	• Square flange • 3/8 in. w/flat shaft • 5V DC input /5V DC DLD output • Channel A, B, and Z signals • 10-pin connector
845T-DN13ECS	2048 PPR	

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-BL*xx*S 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-BL*xx*S)



An example comparing the 2094-AL*xx*S 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.

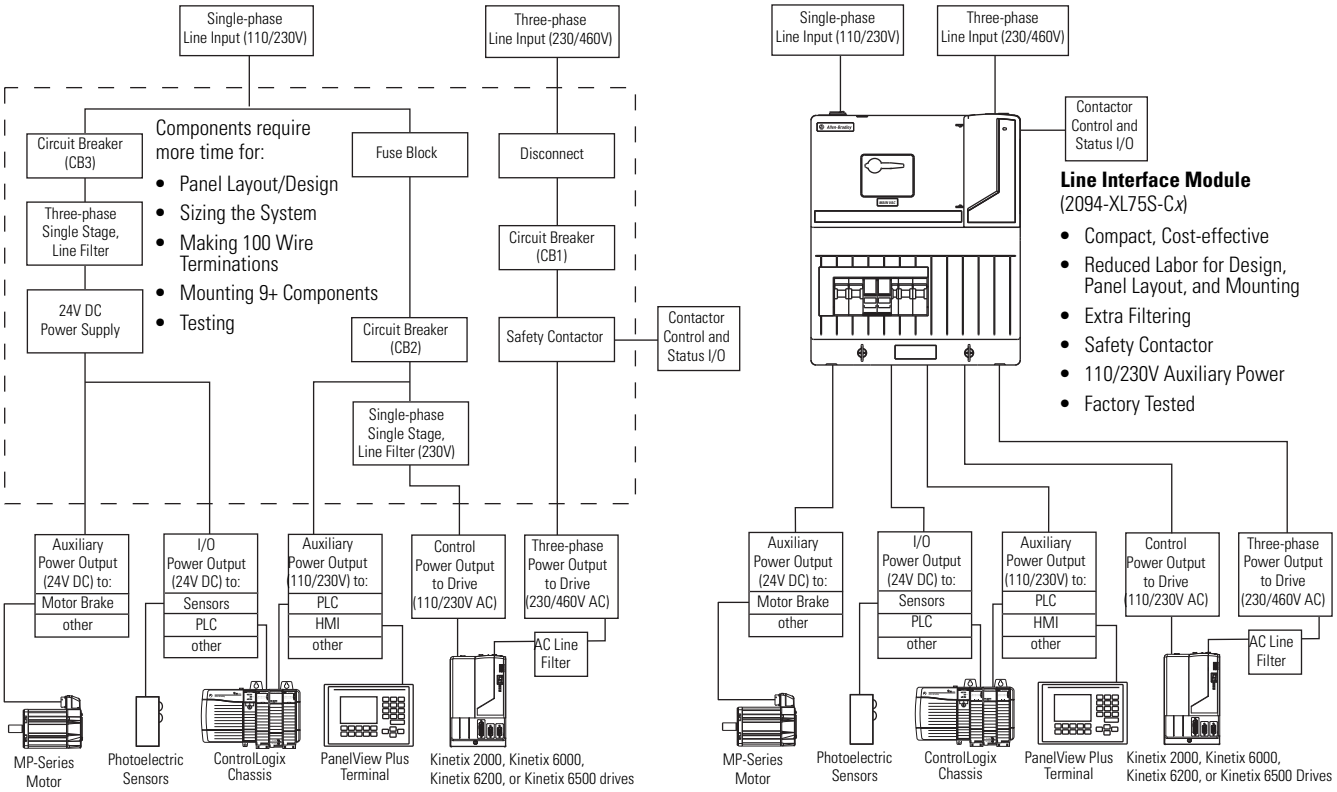
Examples comparing the 2094-AL09 and 2094-BL02 modules to discrete components would also be similar to the examples above and include the features that apply to those models.

Drive/LIM Module Compatibility

Drive Family	Drive Cat. No.	Compatible LIM Module Cat. No.
Kinetix 2000	2093-AC05-M*xx*	2094-AL*xx*S, 2094-XL75S-C2, 2094-AL09
Kinetix 6200/ Kinetix 6500	2094-BC*xx*-M*xx*-M	2094-BL*xx*S, 2094-BL02, 2094-XL75S-C*x*
Kinetix 6000	2094-*x*C*xx*-M*xx*-S	2094-AL*xx*S, 2094-AL09, 2094-BL*xx*S, 2094-BL02, 2094-XL75S-C*x*
Kinetix 7000	2099-BM06-S, 2099-BM07-S, 2099-BM08-S	2094-BL75S

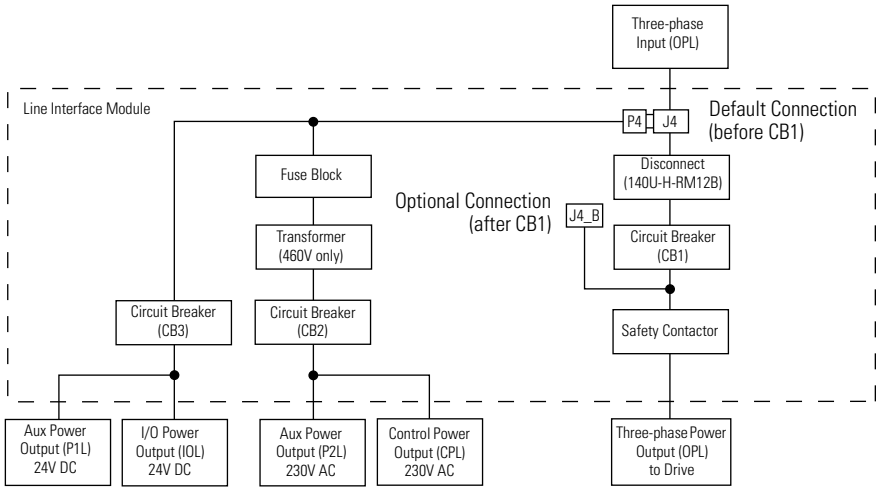
In this example, the 2094-XL75S-C1 and 2094-XL75S-C2 modules are compared to a similar configuration of discrete components. Both of these units provide a connector for an external (customer-supplied) auxiliary and control power input. The 2094-XL75S-C1 module is designed for 110V auxiliary and control 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-C*x*)



Branch circuit protection for the 2094-AL*xx*S and 2094-BL*xx*S 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-AL*xx*S and 2094-BL*xx*S)



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-AL*xx*S and 2094-BL*xx*S) 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-AL*xx*S, 2094-BL*xx*S, and 2094-XL75S-C*x*) 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-AL*xx*S, 2094-BL*xx*S, and 2094-XL75S-C*x* only).
- Internal line filter (catalog numbers 2094-AL09 and 2094-BL02). External (customer-supplied) line filter (catalog numbers 2094-AL*xx*S, 2094-BL*xx*S, and 2094-XL75S-C*x).*
- 2094 mounting bracket compatibility for additional panel space saving. Using mounting brackets (catalog number 2094-XNBRKT-1) in your system (2094-AL*xx*S and 2094-XL75S-C*x* modules only) lets you mount the AC line filter behind the LIM module. Refer to Bulletin 2094 Mounting Brackets on page 469 for specifications.
- Plugable connectors let you remove and replace each connector for easy wiring.

Line Interface Module Selection

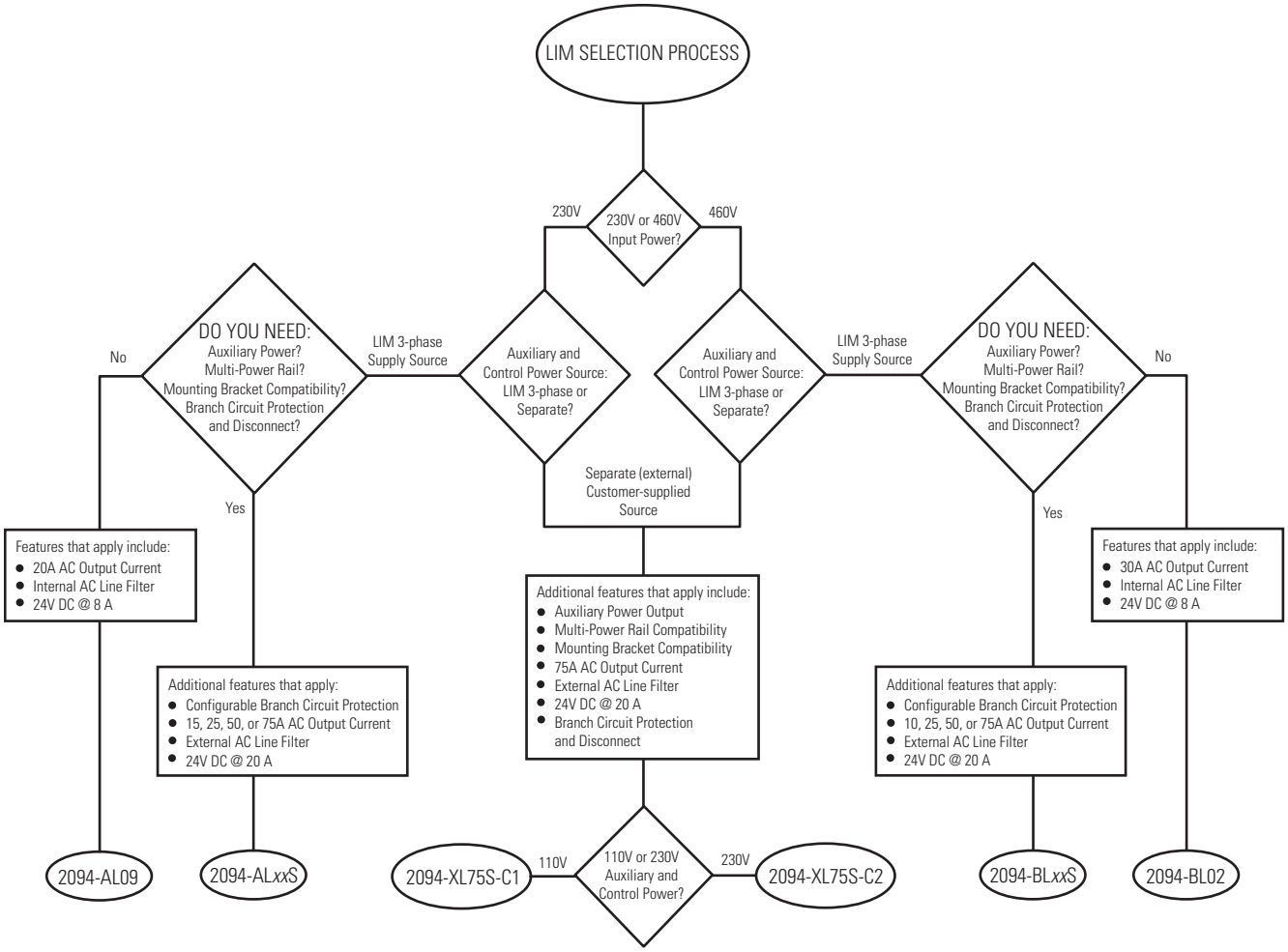
This table provides a summary of the features available with each Line Interface Module. Use this table and Line Interface Module Selection Flowchart on page 477 to select a LIM module for your drive system.

Features	Line Interface Module Cat. No.					
	2094-AL*xx*S	**2094-BL*xx*S**	**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		
Power to Multiple Power Rails (2)						
DC Line Filter						
Mounting Bracket Compatibility		No				
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-AL*xx*S and 2094-BL*xx*S)

Designators	Attribute	2094-AL*xx*S (230V)				2094-BL*xx*S (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)	Contactor control voltage (3)	21.6…26.4V DC				21.6…26.4V DC			
	Contactor control current (3)	12…9 mA				12…9 mA			
	Contactor pickup current (4)	N/A (Internal)				N/A (Internal)			
	Contactor hold-in current (4)	N/A (Internal)				N/A (Internal)			
	Contactor voltage	N/A (Internal)				N/A (Internal)			
	Contactor pickup time	18.5 ms (min) 30.0 ms (max)				18.5 ms (min) 30.0 ms (max)			
	Contactor 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-C*x*)

Designators	Attribute	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.

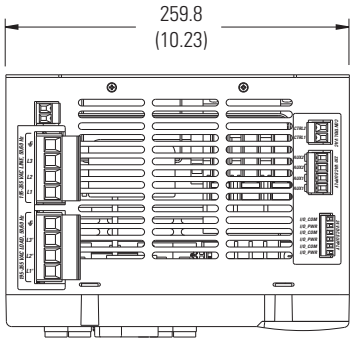
(2) Current provided by auxiliary VAC input.

Power Specifications (catalog numbers 2094-AL09 and 2094-BL02)

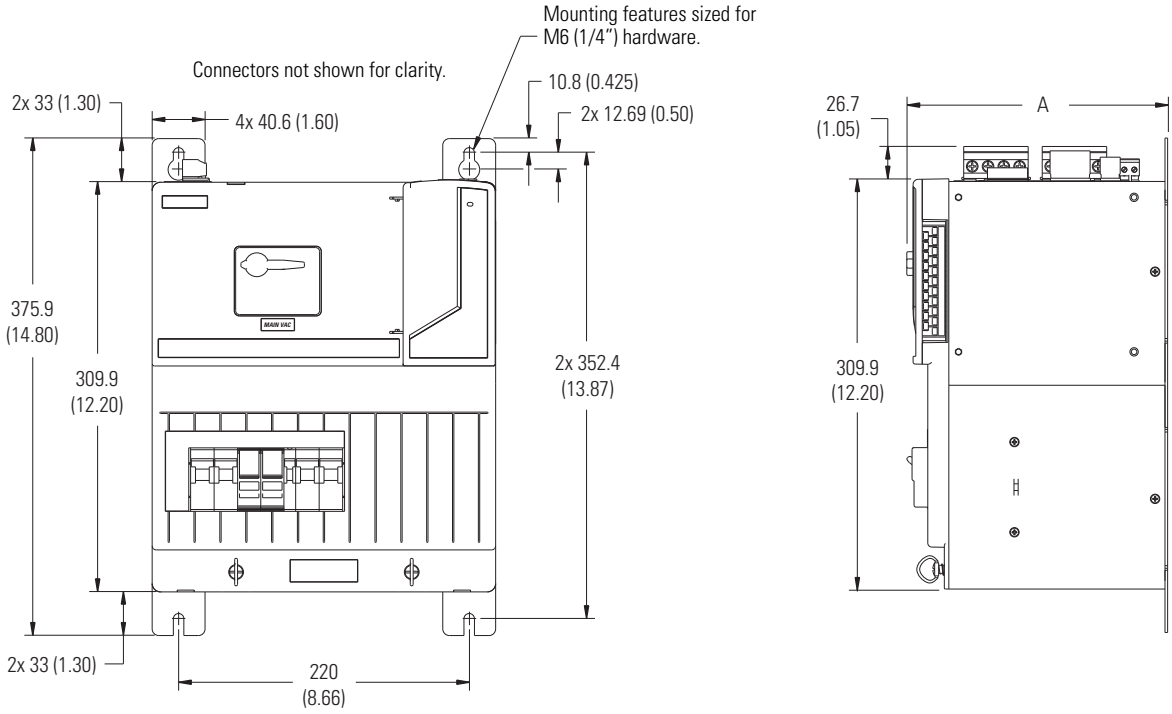
Designator	Attribute	2094-AL09 (230V)	2094-BL02 (460V)
VAC Line (IPL) Connector	AC input voltage	195-265V rms three-phase (230V nom)	380-520V rms three-phase (460V nom)
	AC input frequency	47…63 Hz	
VAC Load (OPL) Connector	Main AC output current	20 A rms	30 A rms
Control Power Output (CPL) Connector	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-AL*xx*S, 2094-BL*xx*S, and 2094-XL75S-C*x*)

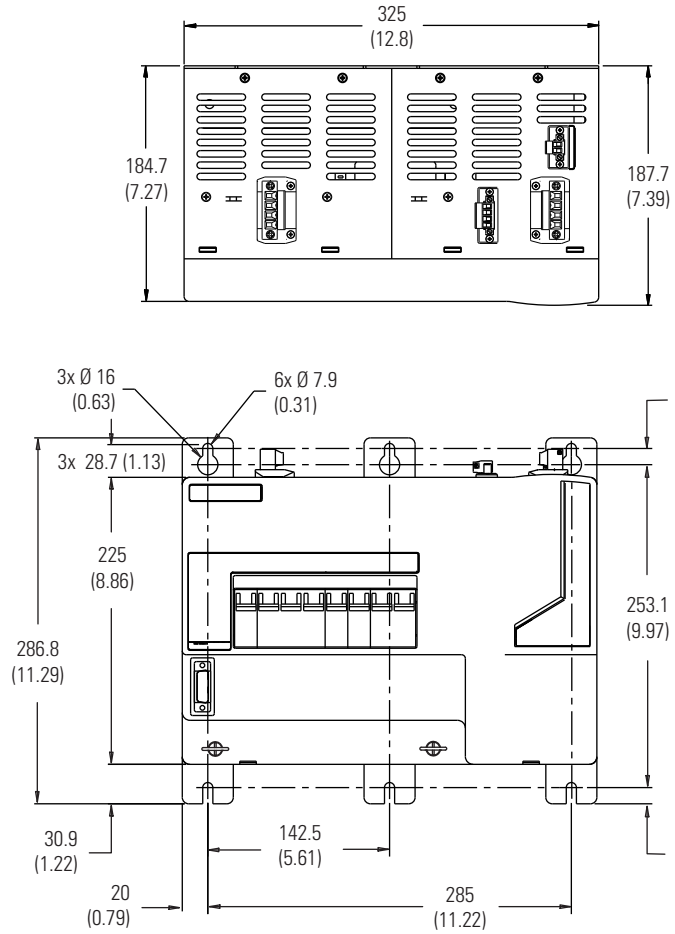


Dimensions are in mm (in.)
2094-XL75S-C*x* is shown

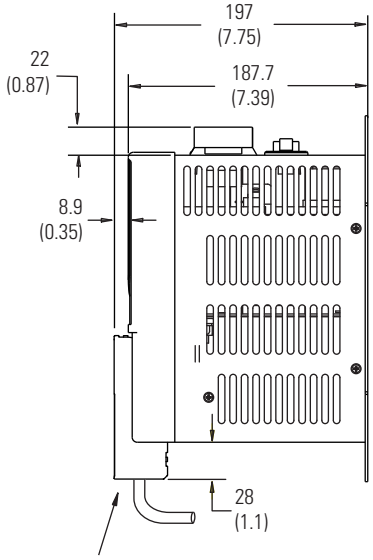


Cat. No.	Dimension A mm (in.)
2094-AL*xx*S	198.3 (7.81)
2094-XL75S-C*x*	
2094-BL*xx*S	248.0 (9.76)

Line Interface Module Dimensions (catalog number 2094-AL09)



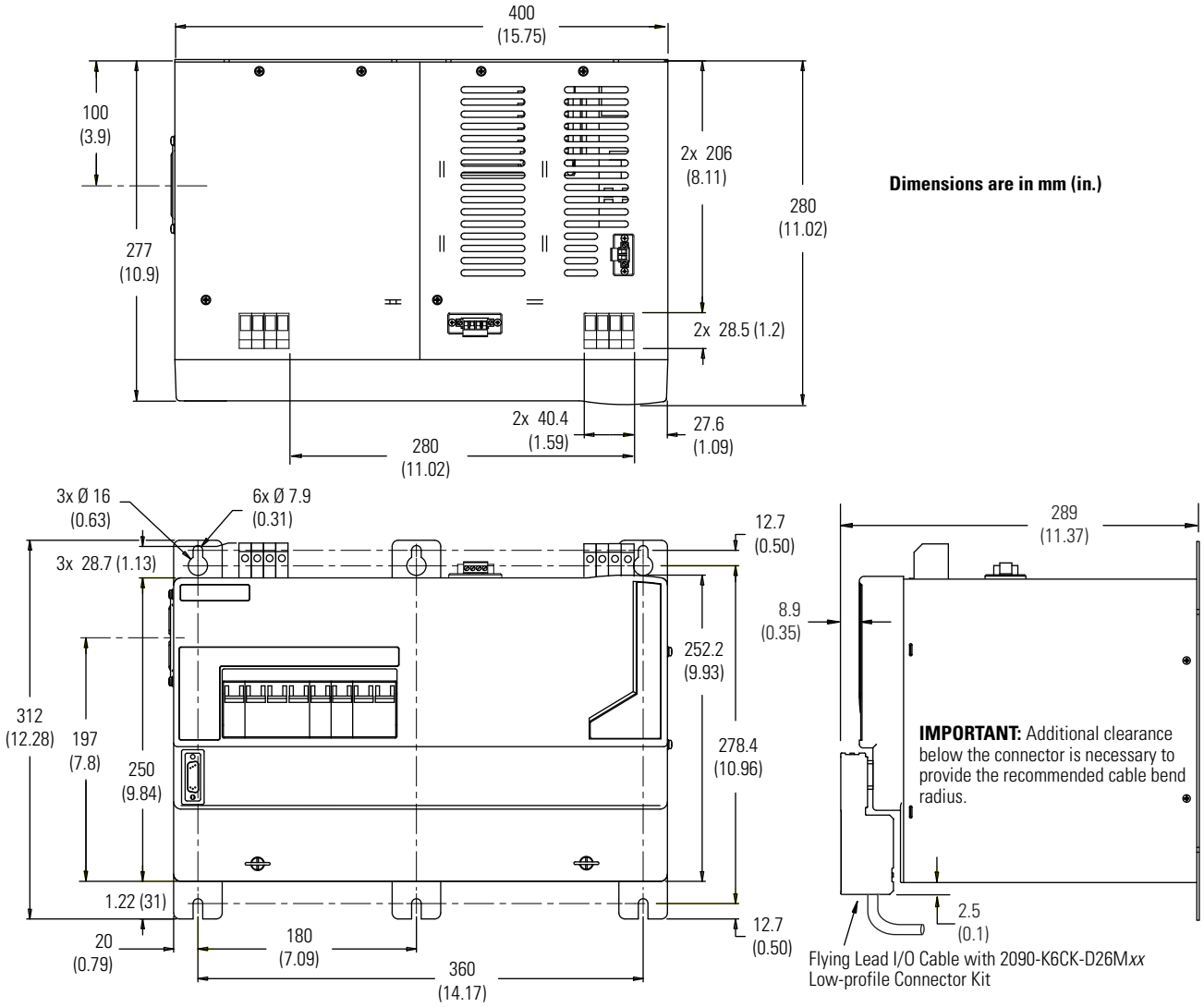
Dimensions are in mm (in.)



Flying Lead I/O Cable with 2090-K6CK-D26M*xx* Low-profile Connector Kit

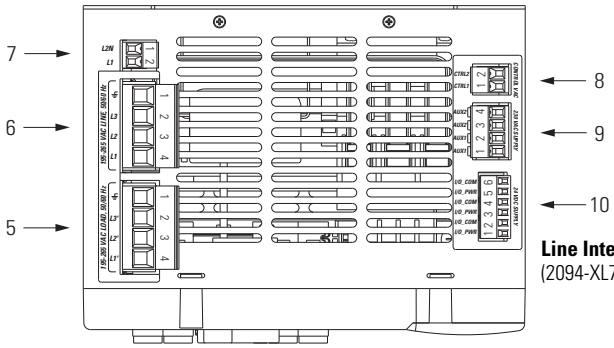
IMPORTANT: Additional clearance below the connector is necessary to provide the recommended cable bend radius.

Line Interface Module Dimensions (catalog number 2094-BL02)

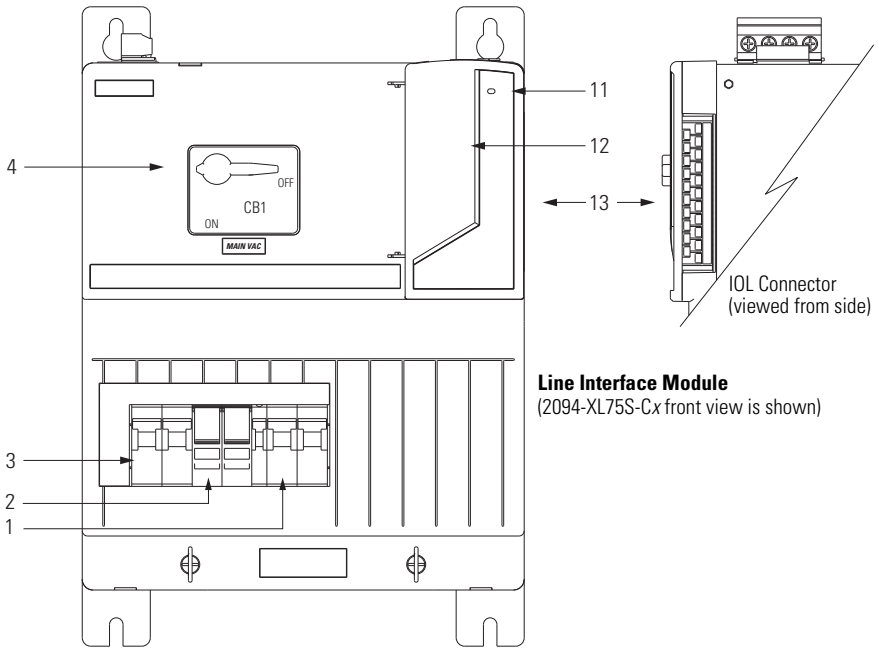


Line Interface Module Connectors and Indicators

Catalog Numbers 2094-AL*xx*S, 2094-BL*xx*S, and 2094-XL75S-C*x*



Line Interface Module
(2094-XL75S-C*x* top view is shown)



Line Interface Module
(2094-XL75S-C*x* front view is shown)

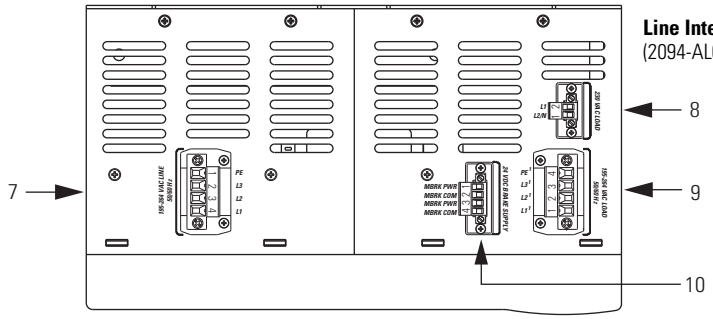
Item	Description
1	CB2 - Control and auxiliary VAC
2	FB1 - Fuse block
3	CB3 - Brake and I/O VAC
4	CB1 - Main VAC disconnect
5	VAC load (OPL) connector
6	VAC line (IPL) connector
7	Auxiliary power input (APL) connector (1)

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-C*x* model.

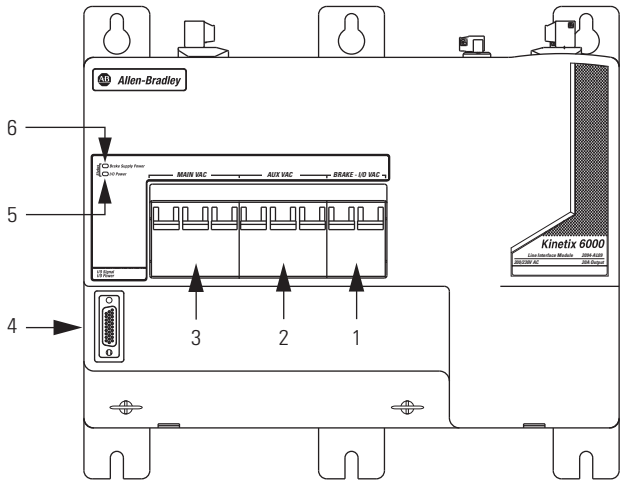
For replacement connector set catalog numbers, refer to Connector Sets on page 465.

Catalog Numbers 2094-AL09 and 2094-BL02



Line Interface Module
(2094-AL09 top 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



Line Interface Module
(2094-AL09 front view is shown)

For I/O connector kit, refer to Low-profile Connector Kit Components on page 443.

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 - *x* L *xxx* - C*x*

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	Drive Cat. No.	AC Line Filter Cat. No.
Kinetix 6000	2094-AC05-MP5-S	2090-XXLF-X330B
	2094-AC05-M01-S	
	2094-AC09-M02-S	
	2094-AC16-M03-S	2090-XXLF-375
	2094-AC32-M05-S	2090-XXLF-3100
	2094-BC01-MP5-S	2090-XXLF-X330B
	2094-BC01-M01-S	
	2094-BC02-M02-S	
	2094-BC04-M03-S	2090-XXLF-375B
	2094-BC07-M05-S	2090-XXLF-3100
Kinetix 6200/ Kinetix 6500	2094-BC01-MP5-M	2090-XXLF-X330B
	2094-BC01-M01-M	
	2094-BC02-M02-M	
	2094-BC04-M03-M	2090-XXLF-375B
	2094-BC07-M05-M	2090-XXLF-3100
Kinetix 300 (2)	2097-V31PR0	2090-XXLF-TC116
	2097-V31PR2	
	2097-V33PR5	2090-UXLF-336

Drive Family	Drive Cat. No.	AC Line Filter Cat. No.
Kinetix 3	2071-AP0…2071-AP4	2090-XXLF-TC116
	2071-AP8 (single-phase)	
	2071-AP8 (three-phase)	2090-XXLF-TC316
	2071-A10…2071-A15	
Kinetix 2000	2093-AC05-M*xx*	2090-XXLF-TC116
		2090-XXLF-TC316
Kinetix 7000	2099-BM06-S	2090-XXLF-TC350
	2099-BM07-S	
	2099-BM08-S	2090-XXLF-TC365
	2099-BM09-S	2090-XXLF-TC3100
	2099-BM10-S	2090-XXLF-TC3150
	2099-BM11-S	2090-XXLF-TC3200
	2099-BM12-S	2090-XXLF-TC3250
8720MC-RPS	8720MC-RPS065-B*x*	8720MC-RFI80
	8720MC-RPS190-B*x*	8720MC-EF190-VB (1)

(1) Line filter unit includes magnetic contactor, harmonic filter, and varistor.

(2) For Bulletin 2097 line filters used with the Kinetix 300 drive family, refer to AC Line Filters on page 345.

AC Line Filter Selection

Drive Family	Drive Cat. No.	AC Line Filter Cat. No.	Motor Cables > 30 m
Ultra3000/ Ultra5000	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

AC Line Filter Specifications

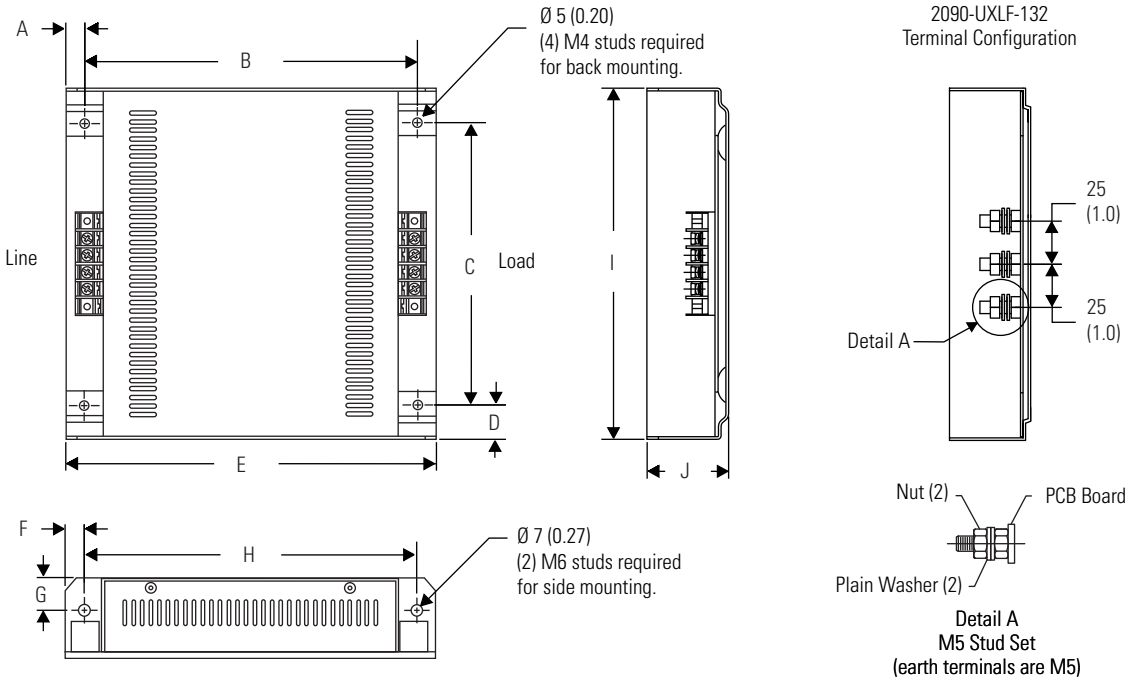
AC Line Filter Cat. No.	Specifications (1) (2)							Dimensions
	Voltage	**Phase**	**Current** A @ 50 °C (122 °F)	**Power Loss** W	**Leakage Current** mA	**Weight, approx.** kg (lb)	**Operating Temperature**	
2090-UXLF-106	250V AC 50/60 Hz	Single	6	3.5	2.26	0.3 (0.66)	-25…85 °C (-13…185 °F)	page 487
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 488
2090-XXLF-TC116			16	–	87	0.80 (1.7)	-25…100 °C (-13…212 °F)	page 492
2090-UXLF-336		Three	36	–	138	2.7 (5.9)	-25…85 °C (-13…185 °F)	page 488
2090-UXLF-350			50	25	138			
2090-UXLF-HV323	520V AC 50/60 Hz		23	20	80	1.6 (3.5)		page 487
2090-UXLF-HV330			30	51	24	1.8 (4.0)		page 489
2090-XXLF-X330B	500V AC 50/60 Hz		30	38	64	2.7 (5.9)		
2090-UXLF-HV350			50	25	35	4.8 (10.6)		page 490
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		16	–	38	0.80 (1.7)	-25…100 °C (-13…212 °F)	page 491
2090-XXLF-TC350			50	–	38	2.4 (5.3)		page 491
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 492
2090-XXLF-TC3200			200	–	76	7.5 (16.5)		
2090-XXLF-TC3250			250	–	76	7.5 (16.5)		
8720MC-RFI80			80	25.9	–	5.3 (11.7)	-25…85 °C (-13…185 °F)	page 493
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

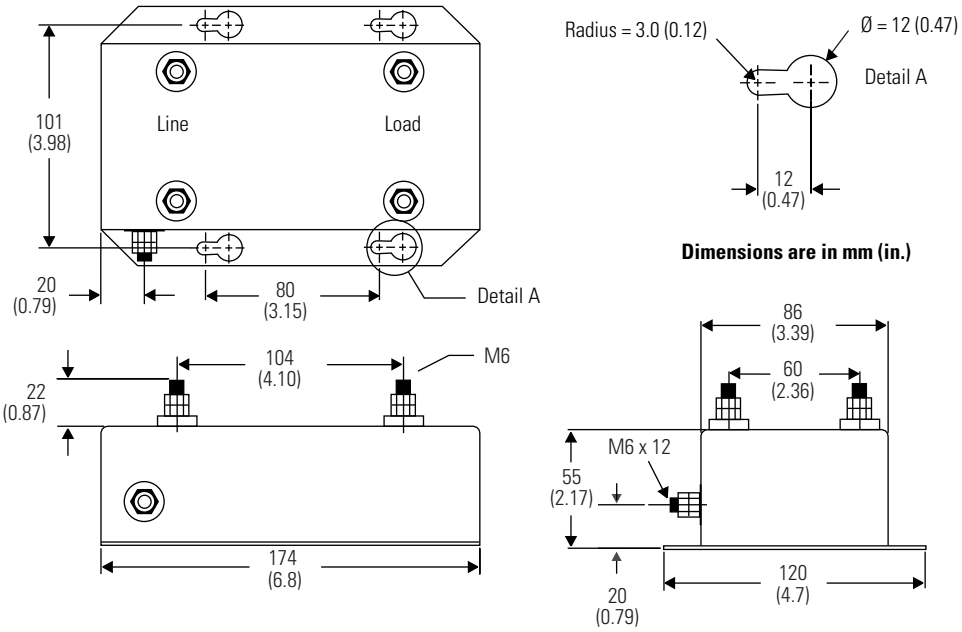
AC Line Filter Dimensions

Dimensions are in mm (in.)



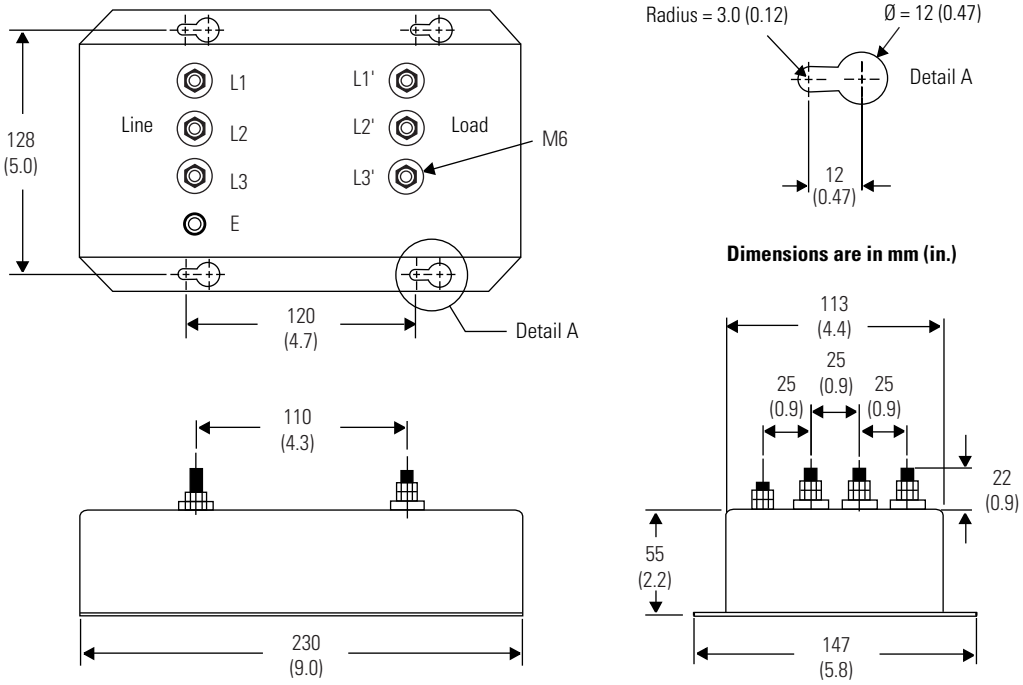
Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	G mm (in.)	H mm (in.)	I mm (in.)	J mm (in.)
2090-UXLF-106	9.0 (0.35)	152.0 (5.99)	55.0 (2.17)	18.0 (0.71)	170.0 (6.69)	9.0 (0.35)	10.0 (0.39)	152.0 (5.99)	92.0 (3.62)	25.0 (0.98)
2090-UXLF-110	11.0 (0.43)	192.0 (7.56)	104.0 (4.0)	20.0 (0.79)	214.0 (8.42)	11.0 (0.43)	16.0 (0.63)	192.0 (7.56)	145.0 (5.71)	40.0 (1.58)
2090-UXLF-123			164.0 (6.46)				19.0 (0.75)		204 (8.04)	47.0 (1.85)
2090-UXLF-132										
2090-UXLF-HV323										

AC Line Filter Dimensions (catalog number 2090-UXLF-136)



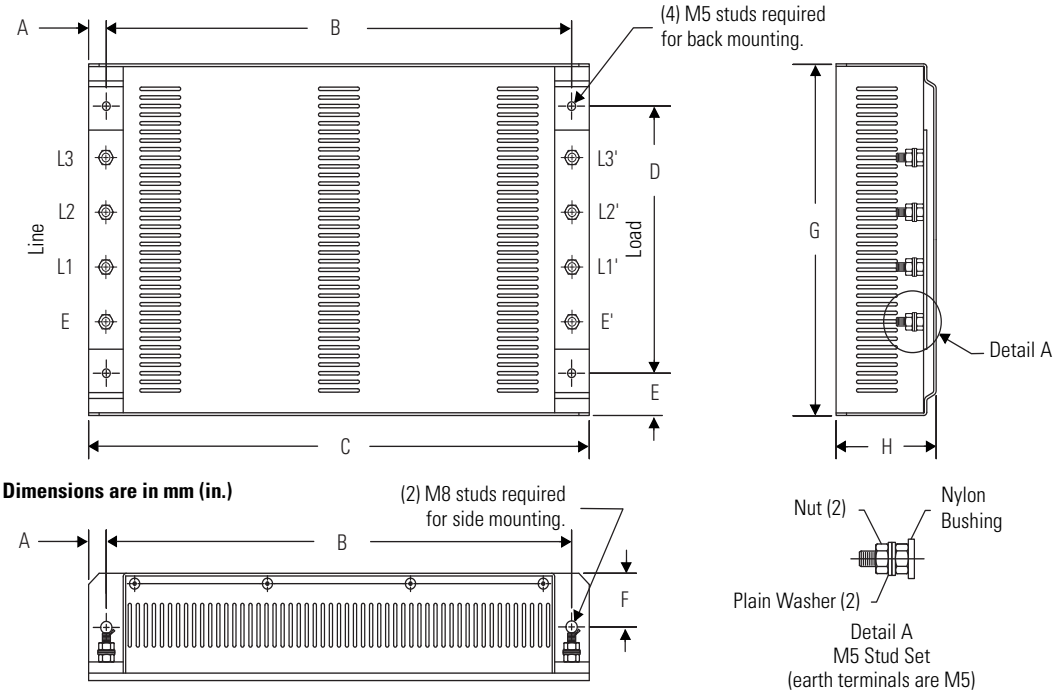
Dimensions are in mm (in.)

AC Line Filter Dimensions (catalog numbers 2090-UXLF-336 and 2090-UXLF-350)



Dimensions are in mm (in.)

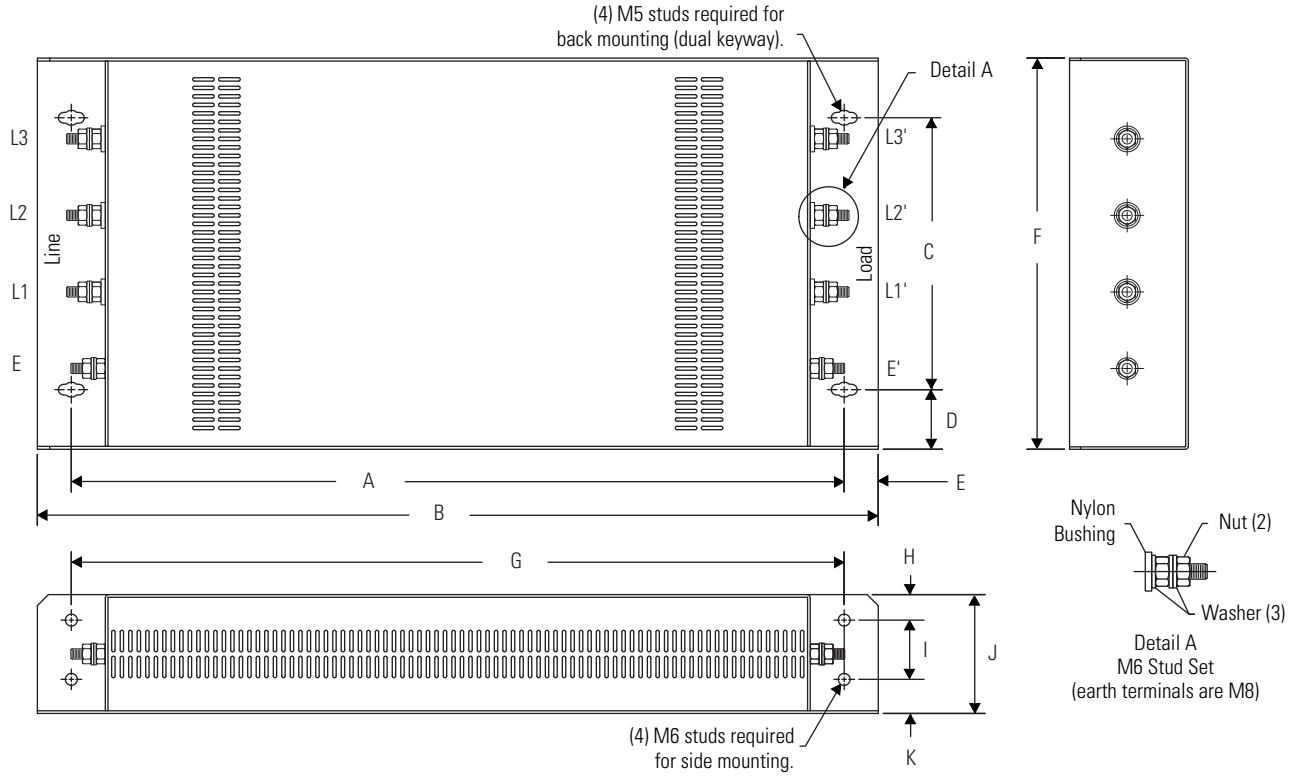
AC Line Filters Dimensions



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)

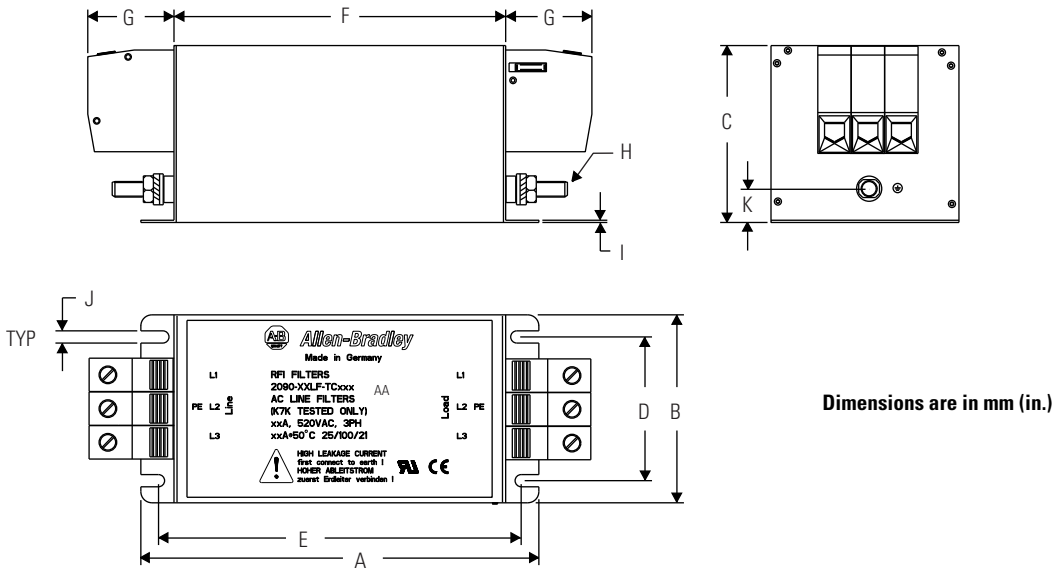
AC Line Filter Dimensions

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)	646 (25.4)				
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)

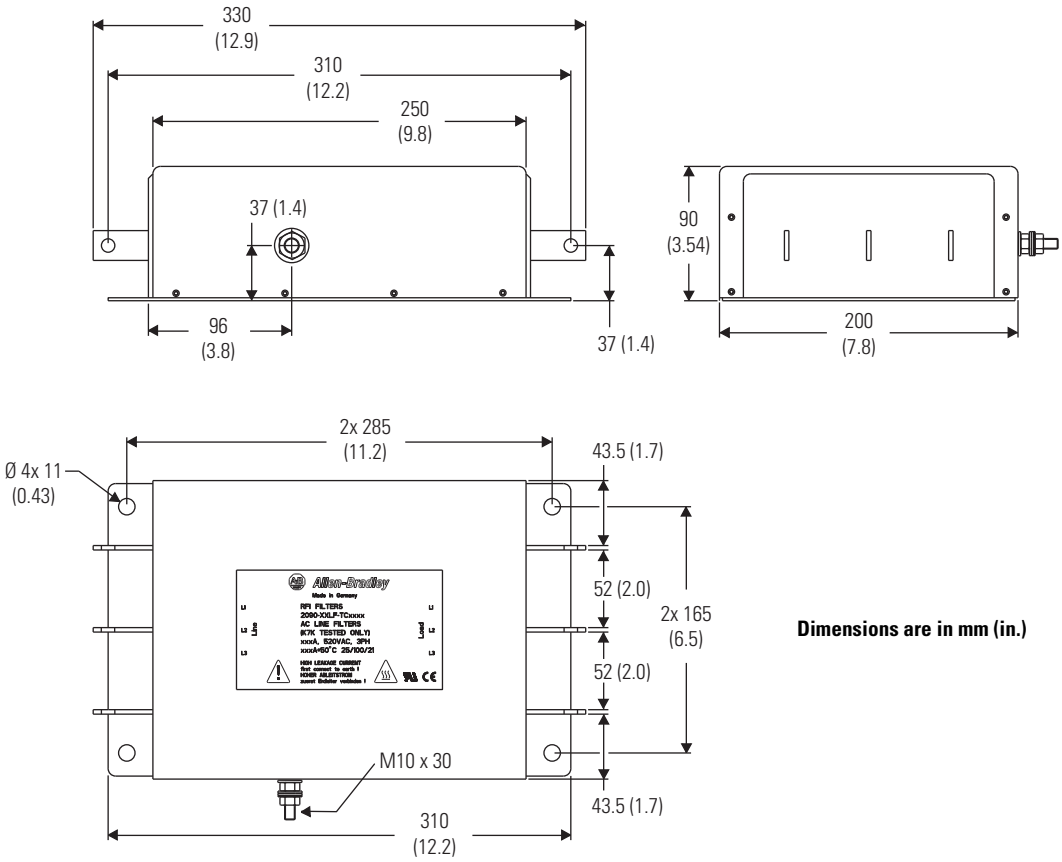
AC Line Filter Dimensions



Dimensions are in mm (in.)

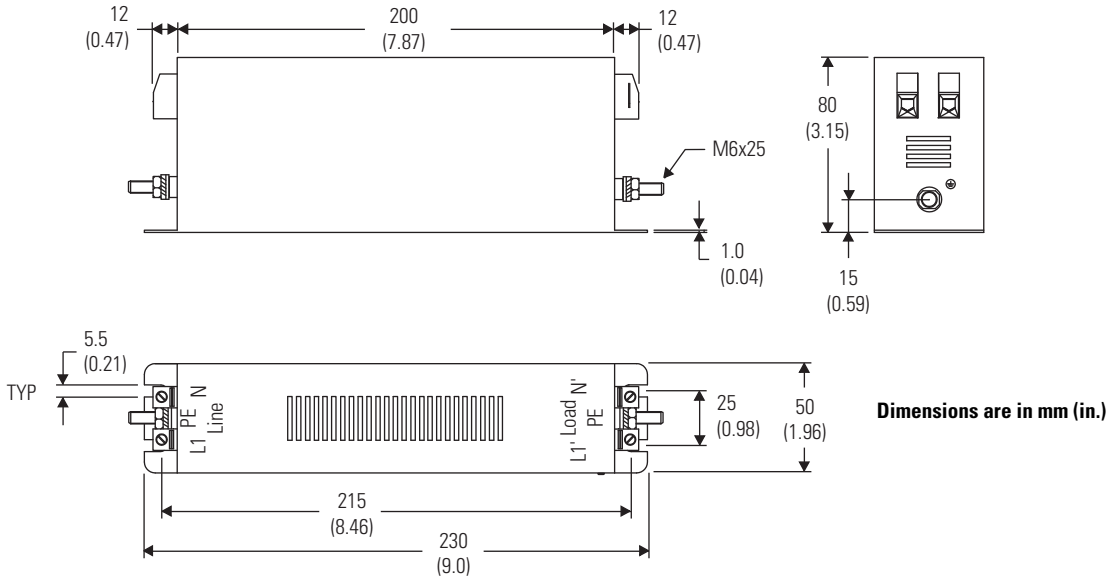
Cat. No.	A mm (in.)	B mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)	F mm (in.)	G mm (in.)	H mm (in.)	I mm (in.)	J mm (in.)	K mm (in.)
2090-XXLF-TC316	230 (9.0)	50 (1.96)	80 (3.15)	25 (0.98)	215 (8.46)	200 (7.87)	12 (0.47)	M6x25	1.0 (0.04)	5.5 (0.21)	15 (0.59)
2090-XXLF-TC350	180 (7.08)	85 (3.35)		65 (2.56)	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)



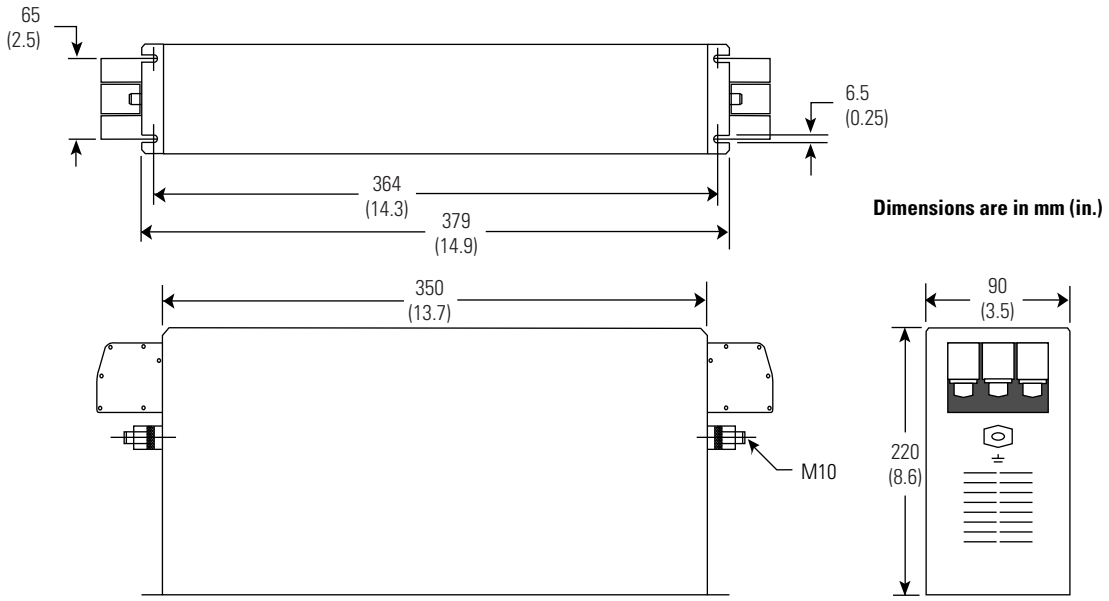
Dimensions are in mm (in.)

AC Line Filter Dimensions (catalog number 2090-XXLF-TC116)

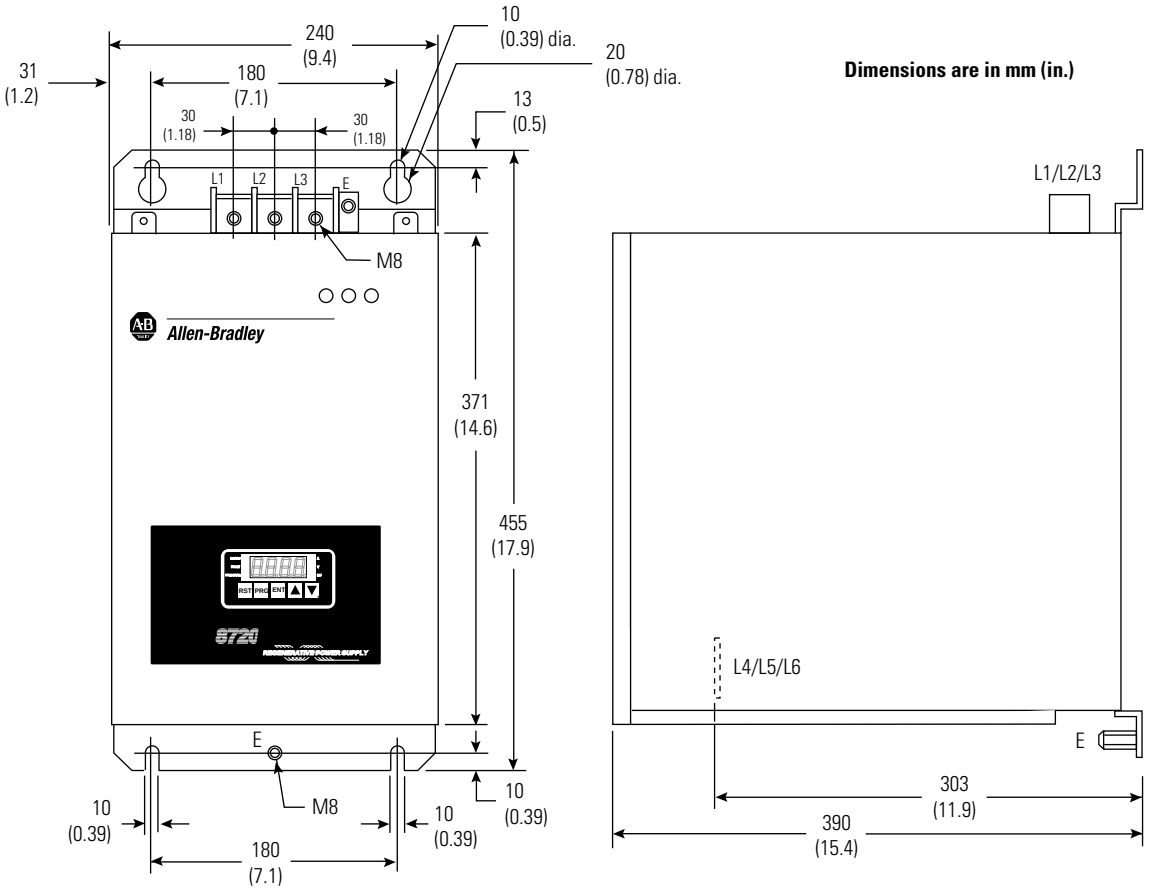


Dimensions are in mm (in.)

AC Line Filter (catalog number 8720MC-RFI80)



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.

Refer to this table for active shunt solutions from Rockwell Automation Encompass Partners and intended for use with Kinetix 2000, Kinetix 6000, Kinetix 6200, Kinetix 6500, and Kinetix 7000 drives.

Rockwell Automation Encompass Partners	Contact Information
Powerohm Resistors, Inc.	5713 13th Street Katy, Texas 77493 Tel: (800) 838-4694 http://www.powerohm.com
Bonitron, Inc.	521 Fairground Court, Nashville, TN 37211 Tel: (615) 244-2825 http://www.bonitron.com

For Bulletin 2097 shunt modules intended for use with Kinetix 300 servo drives, refer to Shunt Resistor Specifications on page 346.

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 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 (1) 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 (2)
2098-*xxx*-075, 2098-*xxx*-150	2090-UCSR-P900			18	10.0	23.3	900	4.08 (9.0)	FWP-10A14F (3)
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 (3)
2098-*xxx*-HV100	2090-SR040-09			40	16.0	20.0		3.63 (8.0)	FWP-5A14F (3)
	2090-SR040-18			40		20.0	1800	8.6 (19.0)	FWP-6.3A14F (3)

(1) Passive shunt solutions for Ultra3000 and Ultra5000 (460V) drives also exist with Rockwell Automation Encompass Partners. Refer to the table below for shunt module solutions outside the specifications in the table above and for the 2098-*xxx*-HV150 and 2098-*xxx*-HV220 servo drives.

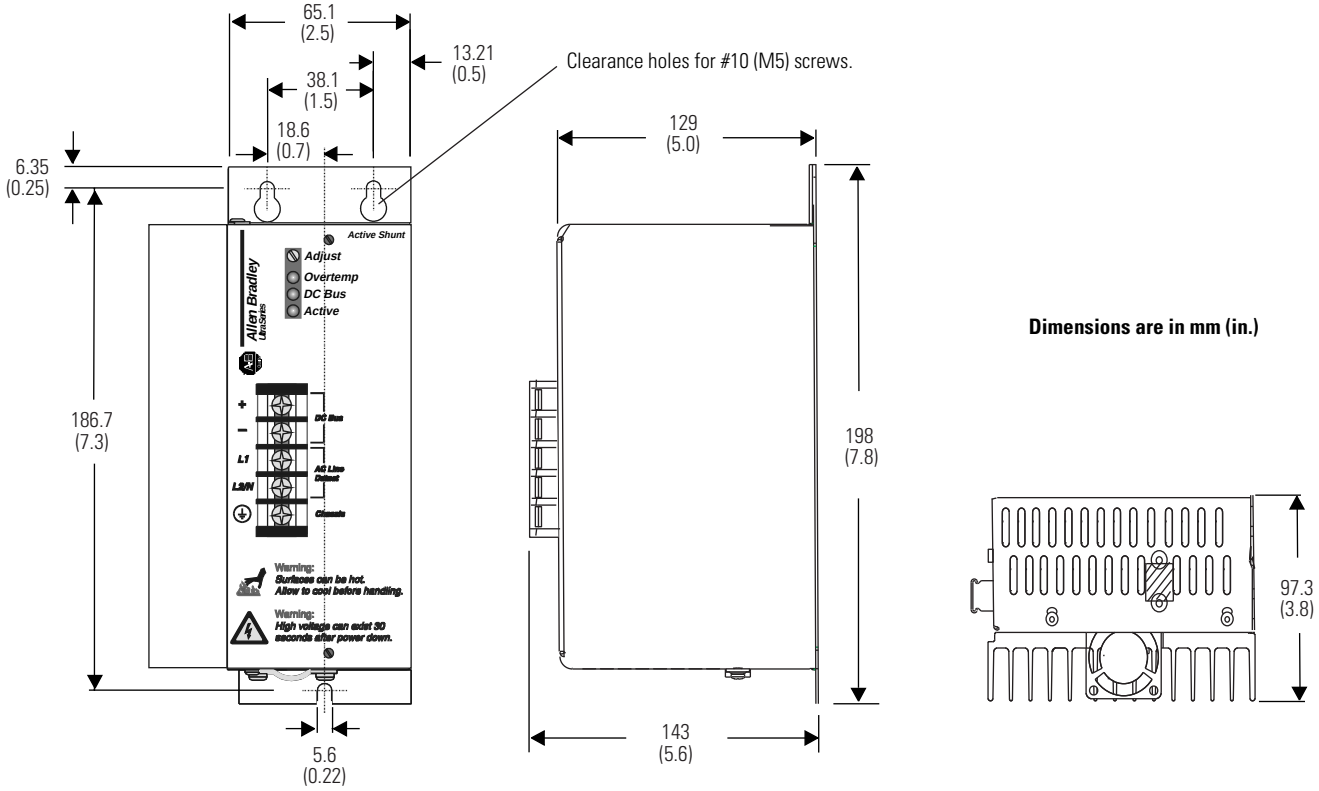
(2) LittelFuse part number.

(3) Bussmann part number.

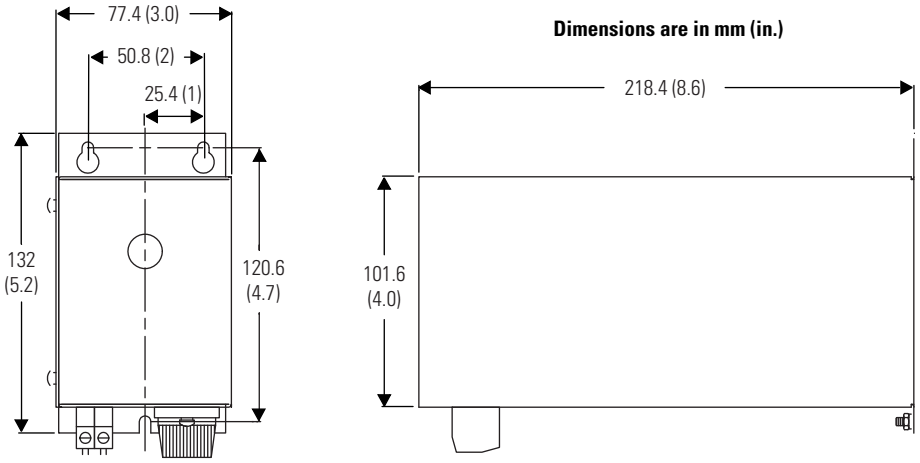
Rockwell Automation Encompass Partners	Contact Information
Powerohm Resistors, Inc.	5713 13th Street Katy, Texas 77493 Tel: (800) 838-4694 http://www.powerohm.com
Bonitron, Inc.	521 Fairground Court, Nashville, TN 37211 Tel: (615) 244-2825 http://www.bonitron.com

Shunt Resistor Kit Dimensions

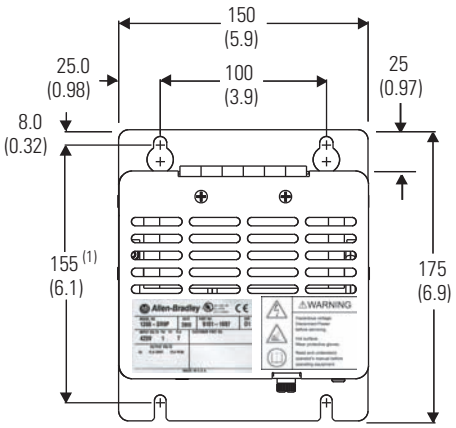
Dimensions (catalog number 2090-UCSR-A300)



Dimensions (catalog number 9101-1183)

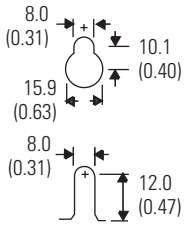


Dimensions (catalog number 2090-UCSR-P900)



Front View

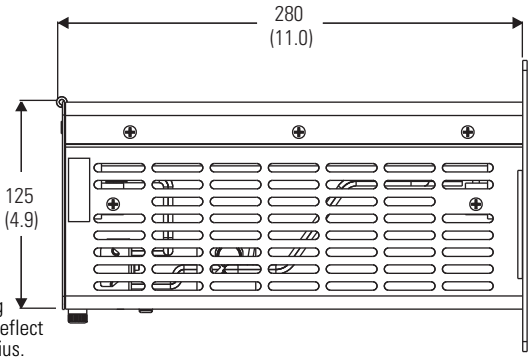
Mounting Hole Detail



All slots accept M6 or 1/4-20 mounting screws.

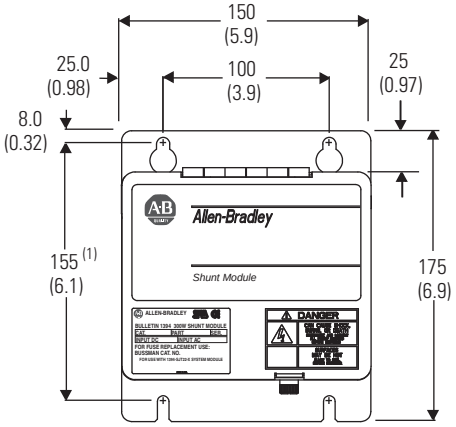
(1) Dimension shown is for mounting hardware location and does not reflect the location of the lower slot radius.

Dimensions are in mm (in.)



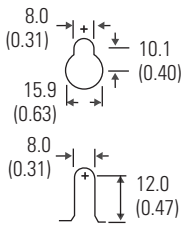
Side View

Dimensions (catalog numbers 2090-SR120-09, 2090-SR040-09, 1394-SR9A, and 1394-SR9AF)



Front View

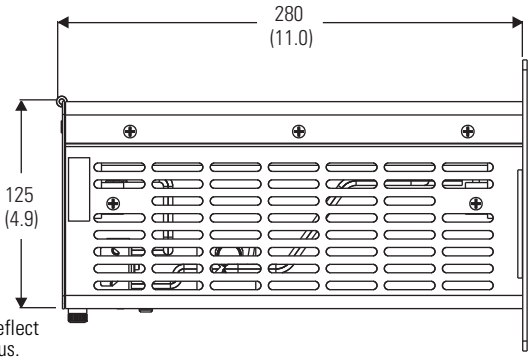
Mounting Hole Detail



All slots accept M6 or 1/4-20 mounting screws.

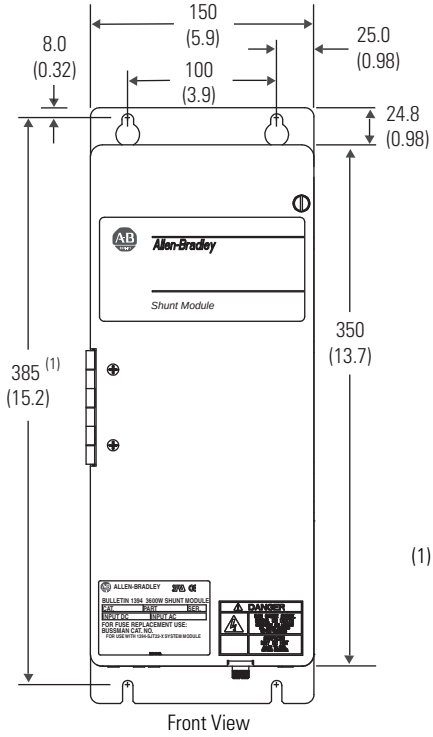
(1) Dimension shown is for mounting hardware location and does not reflect the location of the lower slot radius.

Dimensions are in mm (in.)



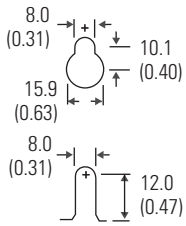
Side View

Dimensions (catalog numbers 2090-SR040-18, 1394-SR36A, and 1394-SR36AF)



Front View

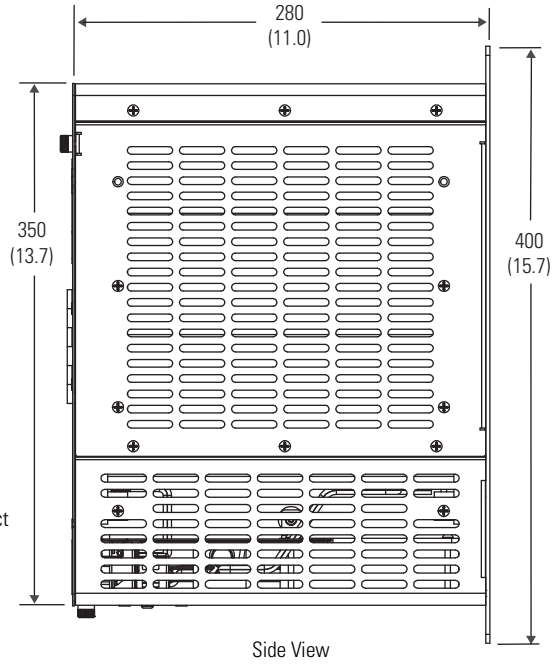
Mounting Hole Detail



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.)



Side View

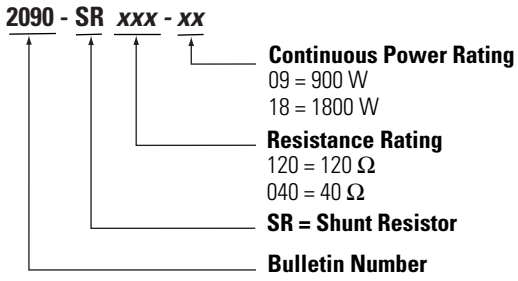
Shunt Module Catalog Numbers

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.

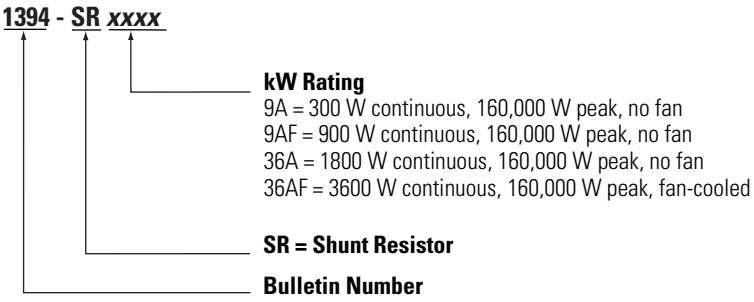
2090 Shunt Resistor Kits for Ultra3000/5000 230V Drives

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					

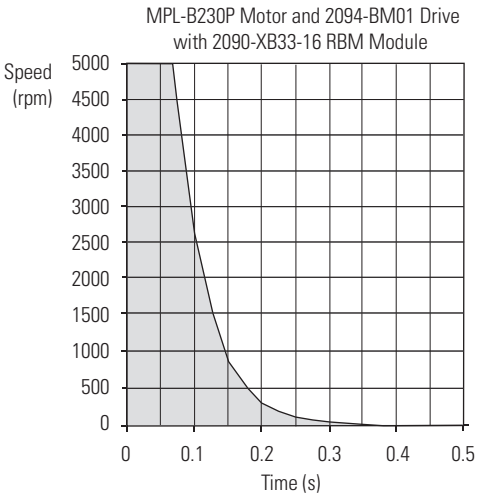
(1) Tolerance = ± 10%.

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:

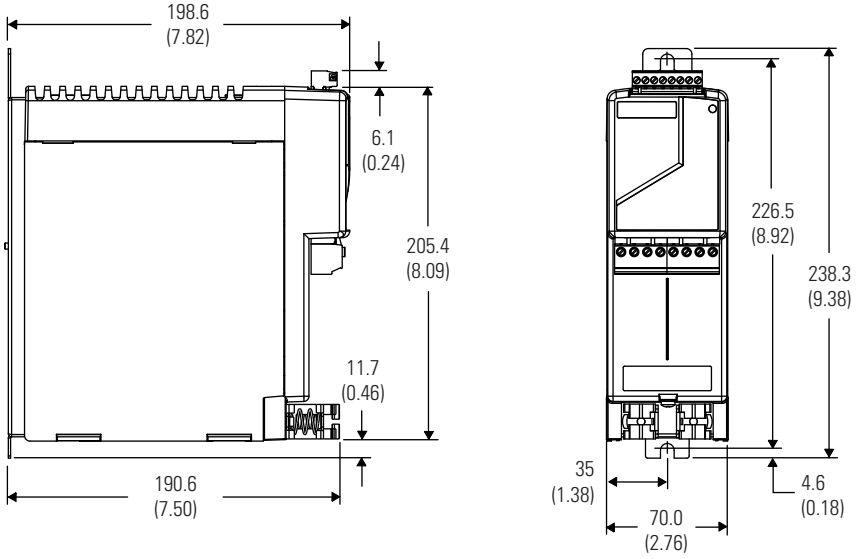
- One minute between braking cycles
- Maximum 15:1 motor inertia
- Maximum motor velocity at the start of braking
- Application must not exceed the current rating of the brake module

Typical RBM Module Curve



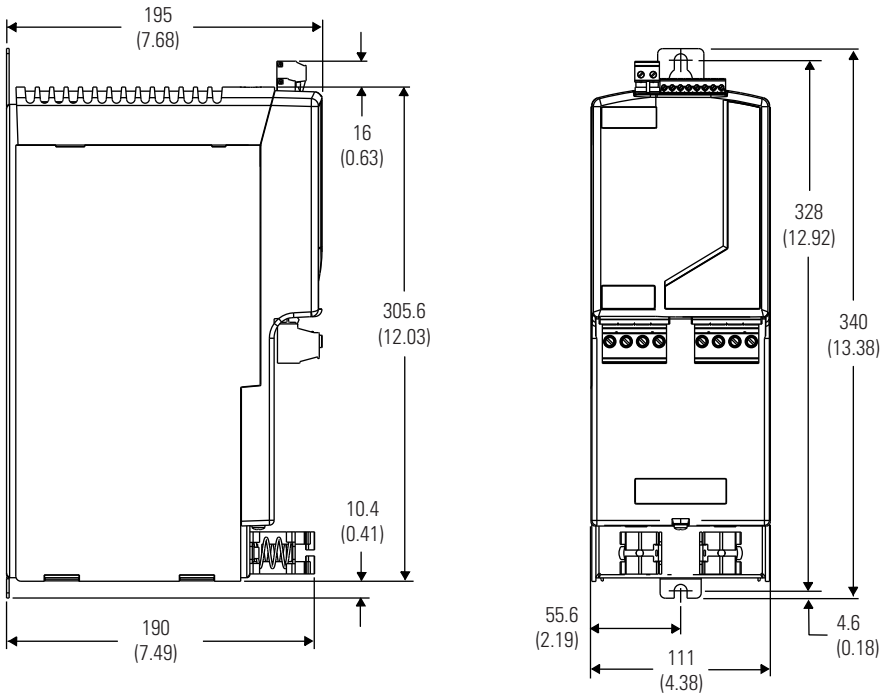
Resistive Brake Module Dimensions

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)

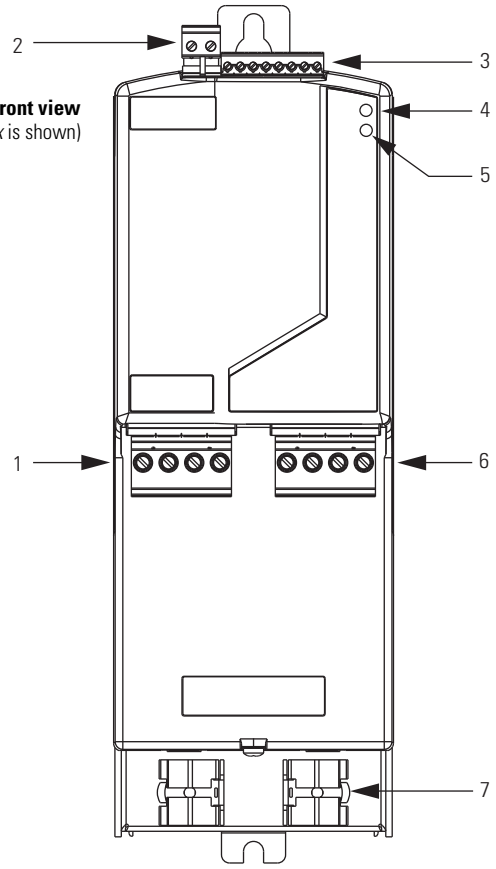


Dimensions are in mm (in.)

RBM Connectors and Indicators

Dimensions (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	Contactor 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.

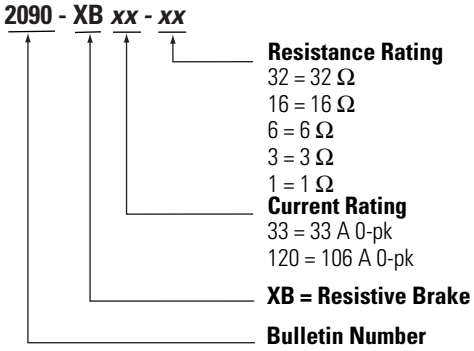
RBM to Drive Interface Cables

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 435
Available cable lengths	page 435
Cable dimensions	page 440
Cable specifications	page 436

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.



8720MC Regenerative Power Supplies

This section contains specifications and catalog number information for the 8720MC-RPS*xxx* Regenerative Power Supplies (RPS). The 8720MC-RPS modules are compatible with Kinetix 6200, Kinetix 6500, 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	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.

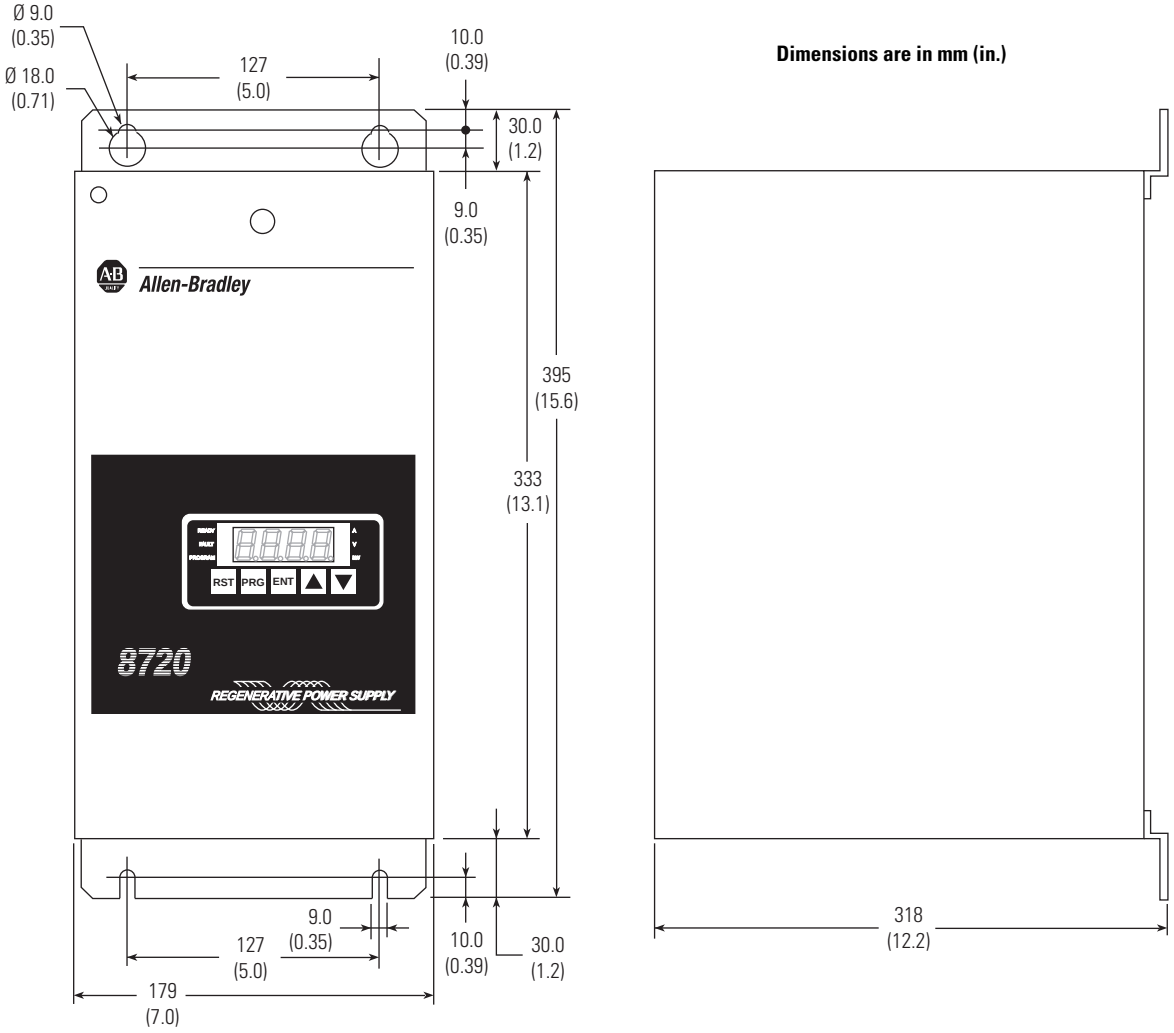
Attribute	8720MC-RPS065	8720MC-RPS190
Capacitance of built-in capacitor	1900 µF	7600 µF
Built-in resistor (value/wattage)	7000 µF (22 Ω/120 W)	25000 µF (10 Ω/400 W)
External resistor (min resistance value) Connect to PR1 and PR2	110000 µF (20 Ω)	165000 µF (10 Ω)
External circuit (min resistance value)	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.

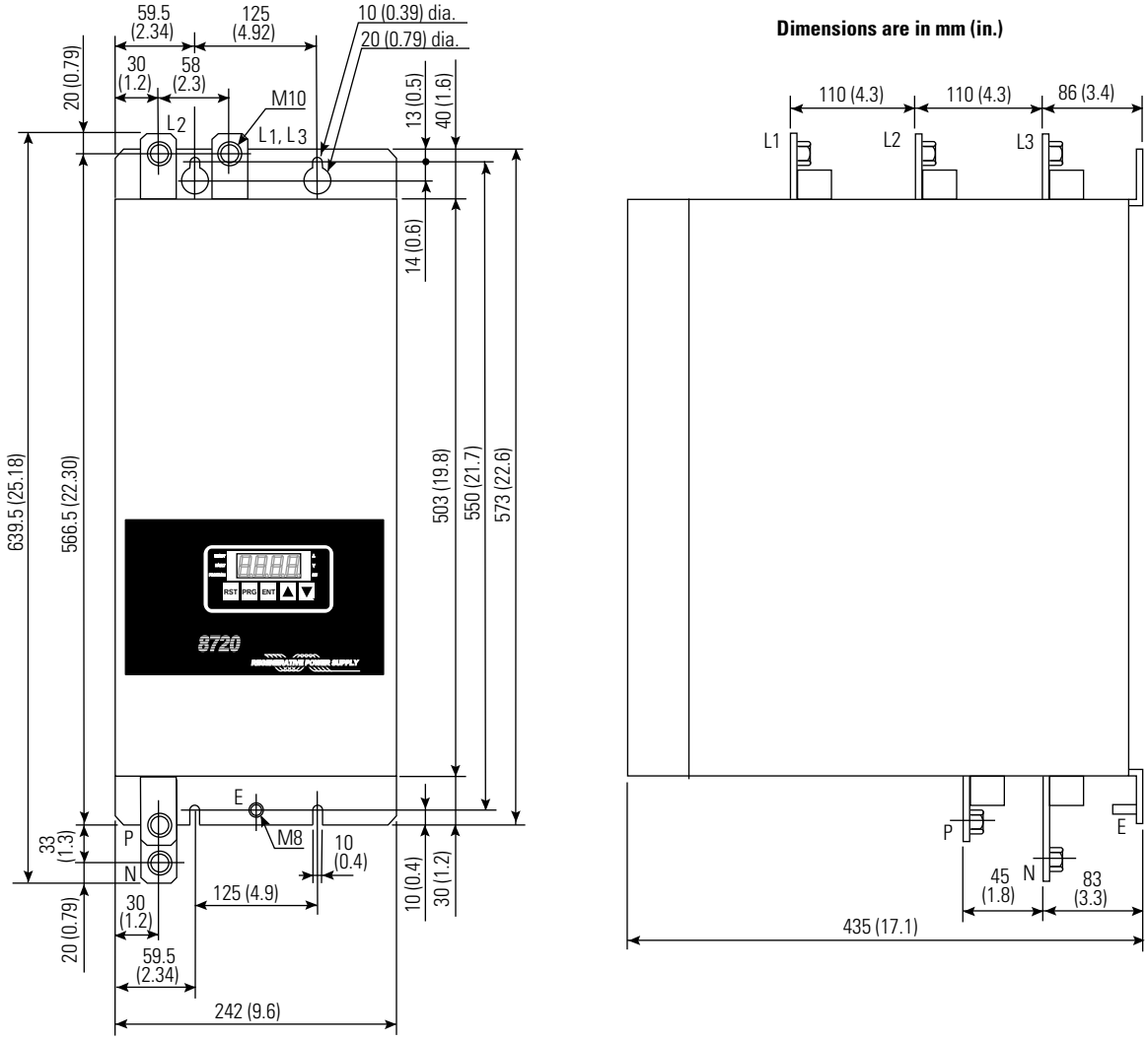
Refer to the wiring instructions in the 8720MC Regenerative Power Supply Installation Manual, publication 8720MC-RM001, for information on how to determine the appropriate precharge/discharge resistance power value (ohms/watt) to accommodate the capacitance of your system.

8720MC Regenerative Power Supply Dimensions

Dimensions (catalog number 8720MC-RPS065)

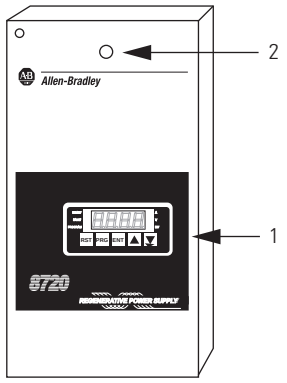


Dimensions (catalog number 8720MC-RPS190)

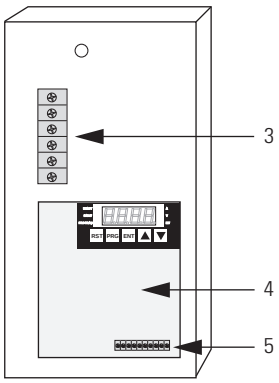


Connectors (catalog number 8720MC-RPS065)

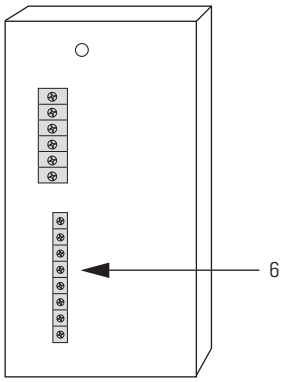
8720MC-RPS065
(with front cover)



8720MC-RPS065
(with front cover removed)



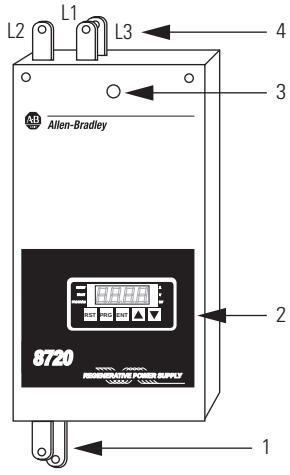
8720MC-RPS065
(front cover and regulator board removed)



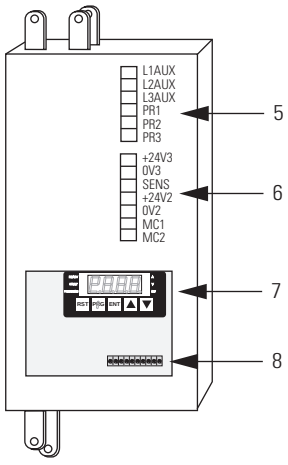
Item	Description
1	Operation panel (master unit only)
2	Power status indicator
3	Main power (TB1) terminal block
4	Regulator board (master unit only)
5	Sequence signal (TB3) terminal block
6	Control power (TB2) terminal block

Connectors (catalog number 8720MC-RPS190)

8720MC-RPS190
(with front cover)



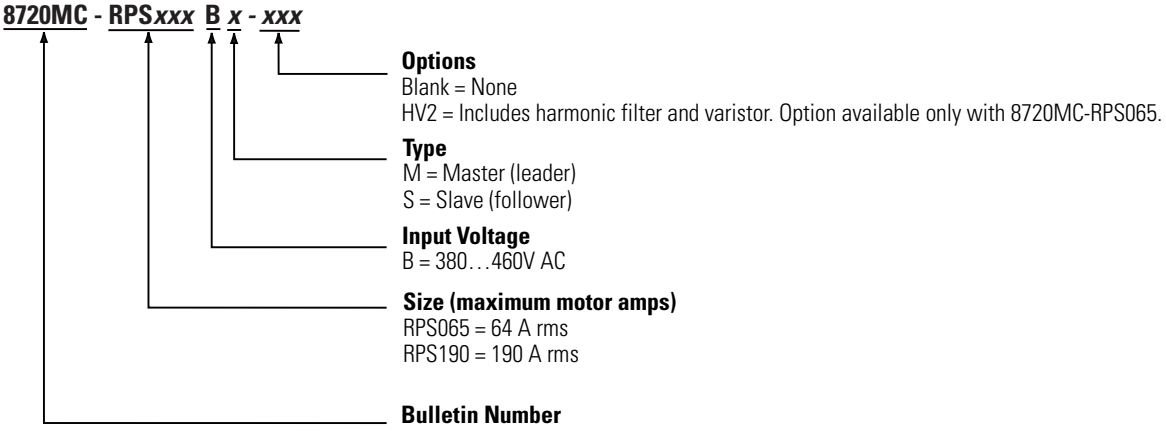
8720MC-RPS190
(with front cover removed)



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.

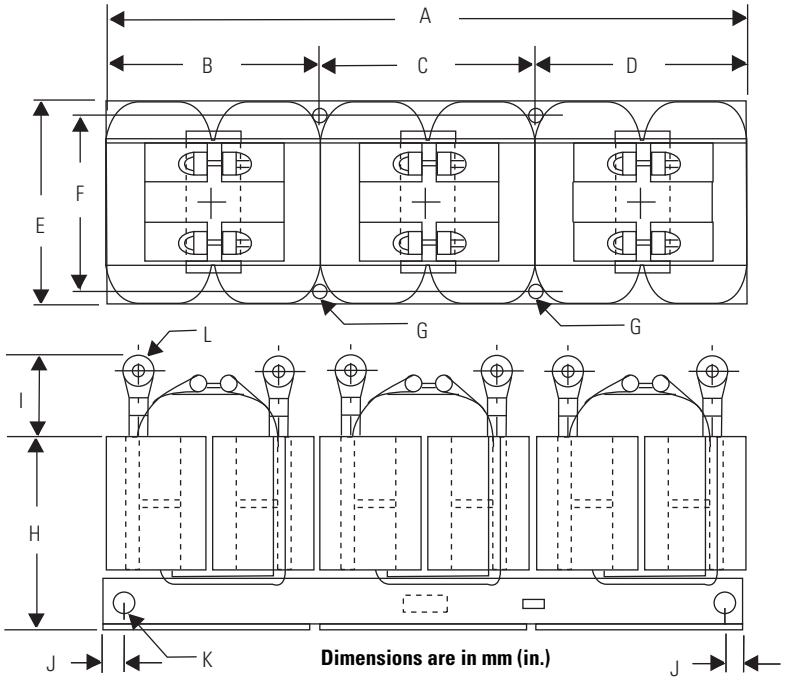
8720MC Line Reactor Specifications

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

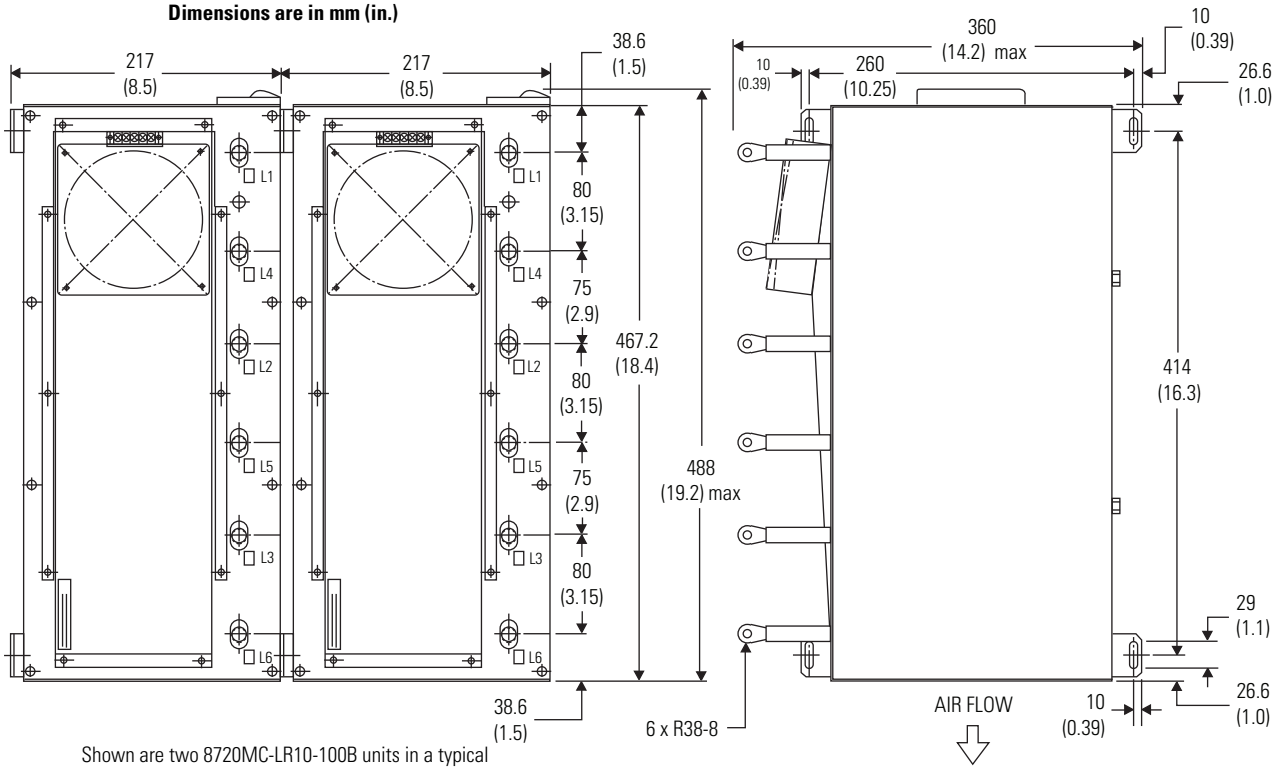
Dimensions (catalog numbers 8720MC-LR03-032B, 8720MC-LR048B, 8720MC-LR062B, and 8720MC-LR070B)



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)



Shown are two 8720MC-LR10-100B units in a typical configuration for use with the 8720MC-RPS190 RPS module.

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.

8720MC - LR*xx x x x*

Voltage
B = 380…460V AC

Current Rating
032 = 32 A
048 = 48 A
062 = 62 A
070 = 70 A
100 = 200 A (two 100 A units)

Enclosure Type
Blank = Open
A = NEMA Type 1

Inductance as % Voltage Drop
03 = 3%
05 = 5%
10 = 10%
14 = 14%

Bulletin Number

Notes: