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 (non-flex) 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 (non-flex) 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 65 for catalog numbers and descriptions.

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

Catalog Numbers - 2090-Series Motor/Actuator Cable

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.

Motor Power/Brake, Feedback, and Extension Cables

2090 - C *xx* M*x* D*x* - C*x* A*x* *xx*

Cable Length
Refer to Technical Specifications - 2090-Series Motor/Actuator Cables beginning on page 30.

Cable Type
AA = Standard, non-flex
AF = Continuous-flex

Encoder Type (applies to feedback cables)
CB = Serial incremental/Serial absolute - battery backup
CC = Serial incremental/Incremental
CD = SIN/COS High-resolution/Incremental
CE = SIN/COS High-resolution/Resolver

Wire Gauge Size (applies to power cables)
16, 14, 12, 10, 8, 6, 4, and 2 AWG

Drive-end Connector Type
DF = Drive-end, flying-lead
DD = Drive-end, D-sub connector
E7 = Extension receptacle (SpeedTec ready)

Motor-end Connector Type
M6 = Circular plastic connector
M4 = Threaded DIN connector
M7 = SpeedTec DIN connector

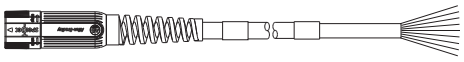
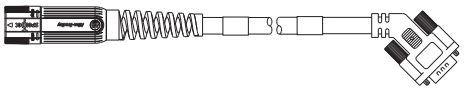
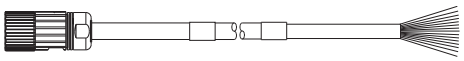
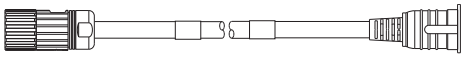
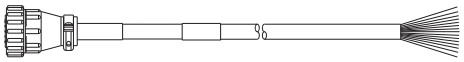
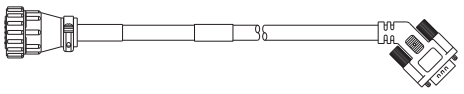
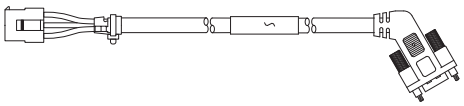
Cable Type
PB = Motor power with brake wires
PW = Motor power only
FB = Motor feedback only

Accessory Component
C = Cable

Bulletin Number

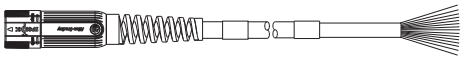
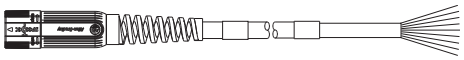
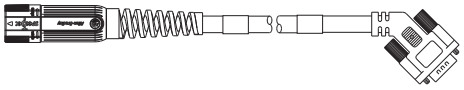
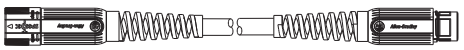
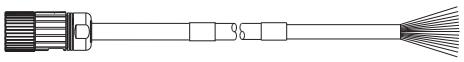
2090-Series Motor/Actuator Cables Overview

Feedback Cable Descriptions (standard, non-flex)

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 17.

Feedback Cable Descriptions (continuous-flex)

Continuous-flex 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*	• Drive-end (male) connector, extension (E7) (1) • Motor-end SpeedTec DIN cable plug (M7)		
2090-CFBM7E7-CEAF*xx*			
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 16.

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* that are intended for high-resolution or incremental encoder applications.

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/B15*xxx* and MPL-A/B2*xxx* 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) LDAT-S*xxxxxx-xDx* and LDAT-S*xxxxxx-xBx* (1) MPAS-A/B*xxxx* and MPMA-A/B*xxxx* (1) MPAR-A/B*xxxxx* 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 • O-ring on motor connector not required • Adapts to SpeedTec-ready connectors only	
MPS-A/B*xxxx*	SpeedTec-ready DIN with 3 m (9.8 ft) cable extensions		
HPK-B/E*xxxxx*	SpeedTec-ready DIN	Customer supplied	2090-CFBM7DF-CEAA*xx* 2090-CFBM7DD-CEAA*xx* 2090-CFBM7DF-CEAF*xx* 2090-CFBM7DD-CEAF*xx*

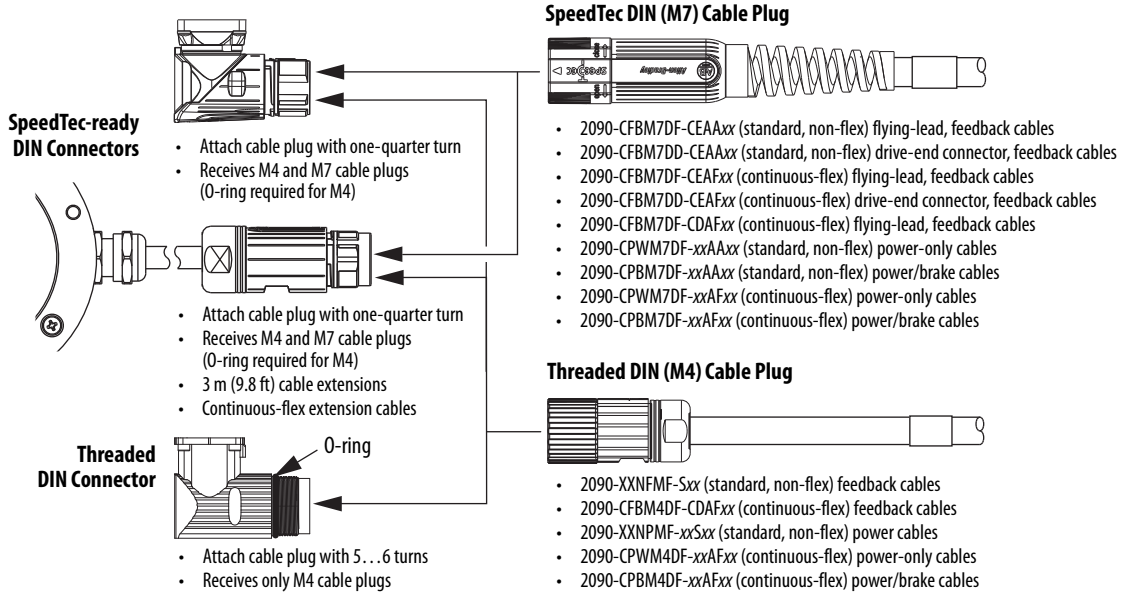
(1) The LDC-Series™ and LDL-Series™ linear motors, LDAT-S*xxxxxx-xBx* linear thrusters, Bulletin MPAS and MPMA linear stages (direct-drive only), and Bulletin RDB direct-drive motors have SpeedTec-ready DIN (M7) motor connectors, but require the additional conductors included with 2090-CFBM7DF-CDAF*xx* (continuous-flex) and 2090-XXNFMF-S*xx* standard (non-flex) cables.

IMPORTANT

Motors equipped with SpeedTec-ready DIN (M7) connectors are fully compatible with threaded DIN (M4) cable plugs.

- SpeedTec-ready DIN motor connectors are also compatible with SpeedTec DIN (M7/E7) extension cable plugs.
- Motors equipped with threaded DIN (M4) connectors are compatible with only threaded DIN (M4) cable plugs.

Typical Circular DIN Cable Applications



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 (non-flex) cable, Industrial TPE, Black	Two conductor, 600V, 18 AWG, shielded cable for motor brake.	18	0.070 (0.047)	01 (3.2) 02 (6.5) 03 (9.8) 04 (13.1)	05 (16.4) 07 (22.9) 09 (29.5) 12 (39.4)	15 (49.2) 20 (65.6) 25 (82.0) 30 (98.4)

Feedback Cable Specifications

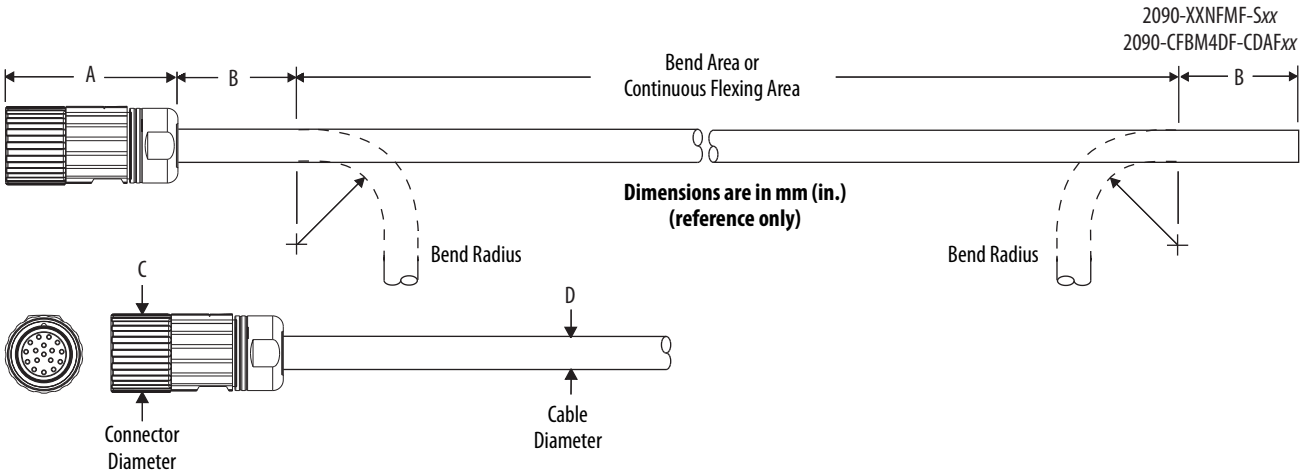
Feedback Cables (1) (2) Cat. No.	Cable Type/ Jacket Color	Description	Wire Size AWG	Weight, approx kg/m (lb/ft)	Standard Cable Lengths m (ft)		
2090-XXNFMF-S*xx*	Standard (non-flex) cable, Industrial TPE, Black	Threaded DIN connector (motor end) to flying leads (drive end), 30V.	28 Feedback 16 Power, 5V 22 Power, 9V	0.120 (1.35)	01 (3.2) 02 (6.5) 03 (9.8) 04 (13.1) 05 (16.4)	07 (22.9) 09 (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 (non-flex) 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 (non-flex) 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)	01 (3.2) 03 (9.8) 09 (29.5)	15 (49.2) 30 (98.4)	
2090-CFBM6DF-CBAA*xx*		Circular plastic connector (motor end) to flying leads (drive end), 300V.	28 Feedback 16 Power, 5V 22 BAT+		01 (3.2) 02 (6.5) 03 (9.8) 04 (13.1)	05 (16.4) 07 (22.9) 09 (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)	01 (3.2) 02 (6.5) 03 (9.8) 04 (13.1) 05 (16.4) 07 (22.9)	09 (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.

Feedback Cable Dimensions (threaded DIN connector)



Feedback Cable Dimensions (standard, non-flex)

Feedback Cable Cat. No.	**A** mm (in.)	**B** (1) mm (in.)	**C** mm (in.)	**D** mm (in.)
2090-XXNFMF-S*xx*	57.0 (2.2)	70 (2.7)	26.0 (1.0)	10.0 (0.40)

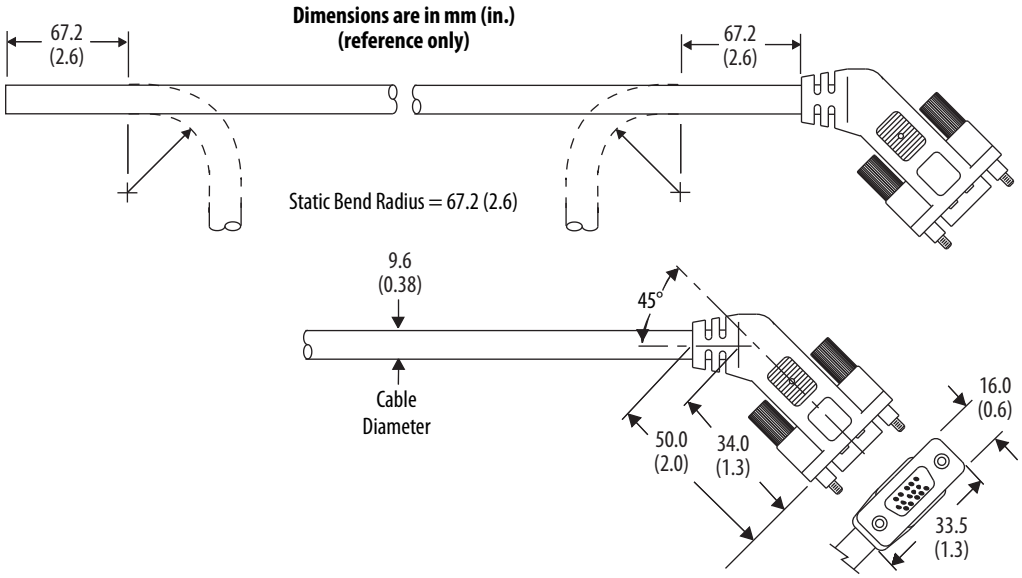
(1) Dimension B (static bend radius) is based on the cable diameter. Refer to Motor Power and Feedback Cable Bend Radius Definitions on page 32 for more information.

Feedback Cable Dimensions (continuous-flex rated)

Feedback Cable Cat. No.	**A** mm (in.)	**B** (1) mm (in.)	**Continuous Bend Radius** (1) mm (in.)	**C** mm (in.)	**D** mm (in.)
2090-CFBM4DF-CDAF*xx*	57.0 (2.2)	81.9 (3.2)	140 (5.5)	26.0 (1.0)	11.7 (0.46)

(1) Dimension B (static bend radius) and Continuous Bend Radius are based on the cable diameter. Refer to Motor Power and Feedback Cable Bend Radius Definitions on page 32 for more information.

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



2090-Series Bulkhead Adapter Kits

These bulkhead adapter kits let you secure your cables as they pass through the cabinet. Adapter kits apply to 2090-Series motor/actuator cables and 2090-Series integrated drive-motor hybrid cables.

2090-Series Motor/Actuator 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			

2090-Series Motor/Actuator 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			

2090-Series Integrated Motor-Drive Hybrid Cable Compatibility

Bulkhead Adapter Cat. No.	Hybrid Cable Cat. No.	Description		Connector Diameter mm (in.)
2090-KPB47-12CF	2090-CHBIFS8-12AA*xx*	Hybrid	SpeedTec	25.4 (1.0)
	2090-CHBP8S8-12AA*xx*			

Low-profile Connector Kit Components

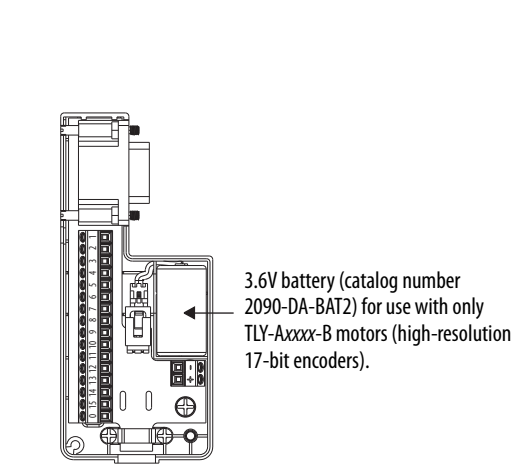
Low-profile connector kits are designed for use with the Kinetix 300/350, Kinetix 6000, Kinetix 6200/6500, Kinetix 2000, and Kinetix 7000 drives, and LIM modules. Use this table to identify the low-profile connector kit for your feedback or I/O connector.

IMPORTANT The flying-lead compatible cables listed below require connector kits to complete feedback and I/O connections to the drive.

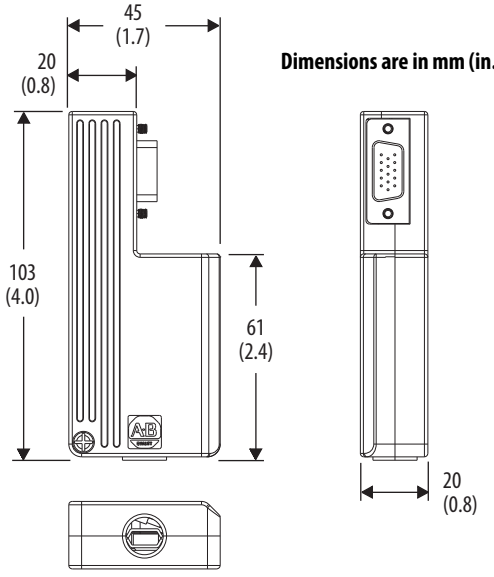
Cat. No.	Description	Cable Compatibility
2090-K2CK-D15M	Low-profile connector kit for motor feedback (15-pin, male, D-sub). Use with any Kinetix 2000 IAM/AM module or Kinetix 300/350 drive and compatible motors with incremental or high-resolution feedback. Does not include 3.6V battery (catalog number 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 I/O (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 6200/6500, 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.	
2090-K6CK-D44S0	Low-profile connector kit for I/O and cascading safe torque-off signals (44-pin, male, D-sub). For use with any Kinetix 6200 or Kinetix 6500 (safe torque-off, -S0 control module). Refer to Kinetix 6200 and Kinetix 6500 Safe-off Components on page 93 for example diagrams.	2090-CS0DSDS-AA*xx*

Dimensions - Low-profile Connector Kits

Catalog Number 2090-K2CK-D15M



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



Dimensions are in mm (in.)

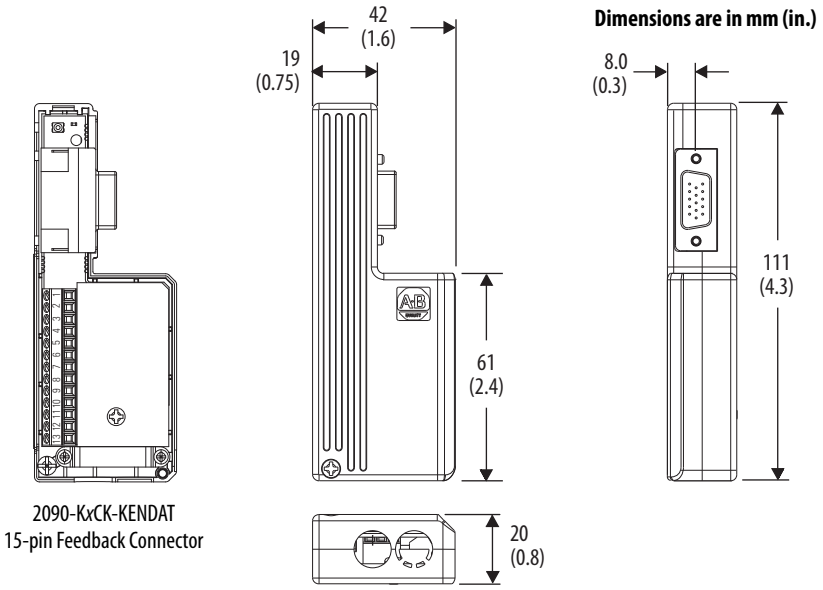
Low-profile Feedback Modules

These low-profile feedback modules are designed for use with the Kinetix 6000 and Kinetix 7000 servo 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.	

Dimensions - Low-profile Feedback Modules

Catalog Number 2090-K*x*CK-KENDAT



2090-K*x*CK-KENDAT
15-pin Feedback Connector

Panel-mounted Breakout Board Components

Breakout boards, cables, and kits (designed for DIN rail mounting on the panel) and for use with Kinetix drives as specified in the description 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 300/350, Kinetix 2000, Kinetix 6000, Kinetix 6200/6500, or Kinetix 7000 drives (MF connector) or Ultra3000 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*xxxx*-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 300/350, Kinetix 2000, Kinetix 6000, Kinetix 6200/6500, or Kinetix 7000 drives (MF connector) or Ultra3000 drives (CN2 connector) for motor feedback connections.
2090-U3BB-D44	44-pin terminal block with D-sub connector. Use with Ultra3000 drives (CN1 connector) or Kinetix 2000 drives (IOD/AF connector) for control interface connections.

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

Panel-mounted Breakout Cables

Cat. No.	Description
2090-UXBC-D15*xx*	15-pin cable with D-sub connector. Use with any Kinetix 300/350, Kinetix 2000, Kinetix 6000, Kinetix 6200/6500, or Kinetix 7000 drives (MF connector) or Ultra3000 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 Rockwell Automation sales representative if these signals are required for your application.