

2090-Series Motor/Actuator Cables

Catalog Numbers 2090-CPBM7DF, 2090-CPWM7DF, 2090-CPBM7E7, 2090-CFBM7E7, 2090-CFBM7DF, 2090-CFBM7DD

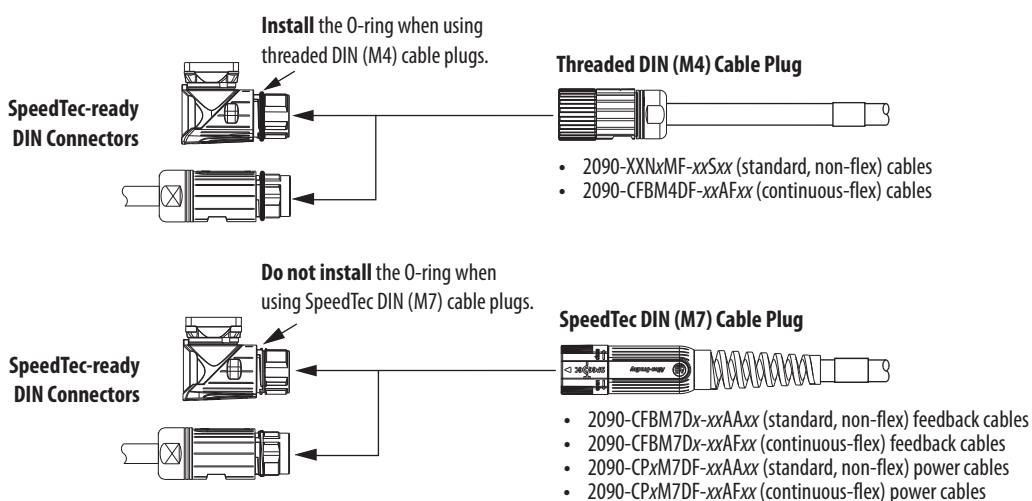
Topic	Page
Verify the O-ring Installation for Threaded DIN Cable Plugs	1
Important User Information	2
Before You Begin	3
Motor/Actuator (M4 and M7) Cable Applications	4
Power/Brake and Feedback Cables	5
Install Continuous-flex Extension Cables	12
Install the Right Angle Cables	15
Additional Resources	18

Verify the O-ring Installation for Threaded DIN Cable Plugs

The type of plug on the connecting cable determines whether an O-ring is required on the motor connector, cable extension, or continuous-flex extension cable receptacles.

IMPORTANT If your motor/actuator includes a SpeedTec-ready DIN (M7) connector and mates with a threaded DIN (M4) cable plug, install the O-ring on the motor/actuator connector before connecting the M4 cable plug.

Figure 1 - O-ring Usage on Threaded DIN (M4) Cables



Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.



WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.



ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.



SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.



BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.



ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).



ATTENTION: The examples in this publication show all available connections. Some connections are not used for specific installations. See your drive installation instructions or user manual for recommended wire trim lengths and wiring examples for your drive and motor application.

Do not connect unused wires. Trim and finish unused wires to help protect against accidental contact with other wires or wire shields, or with a ground connection.

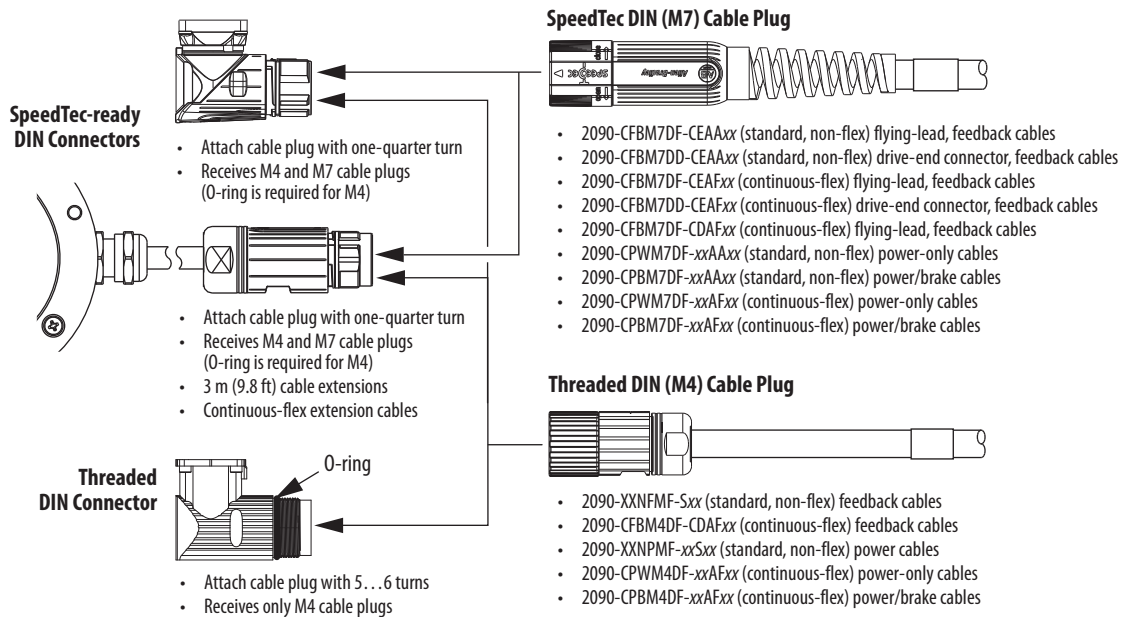
IMPORTANT Standard (non-flex) cables can be bent or reformed during installation and maintenance. Continuous-flex cables can be flexed repeatedly within a specified bend radius when properly installed.
Do not use standard cables in a continuous-flex operation.

Motor/Actuator (M4 and M7) Cable Applications

Observe these guidelines when connecting your cable plug with the mating motor connector, motor extension cable, or an extension cable receptacle:

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

Figure 2 - Motor/Actuator Connector and Cable Plug Compatibility



Power/Brake and Feedback Cables

When installing cable runs between the motor and drive, be careful not to stress the cable by making bends too sharp. See the table below for bend radius definitions, and the sections that follow, when routing cables during system installation.

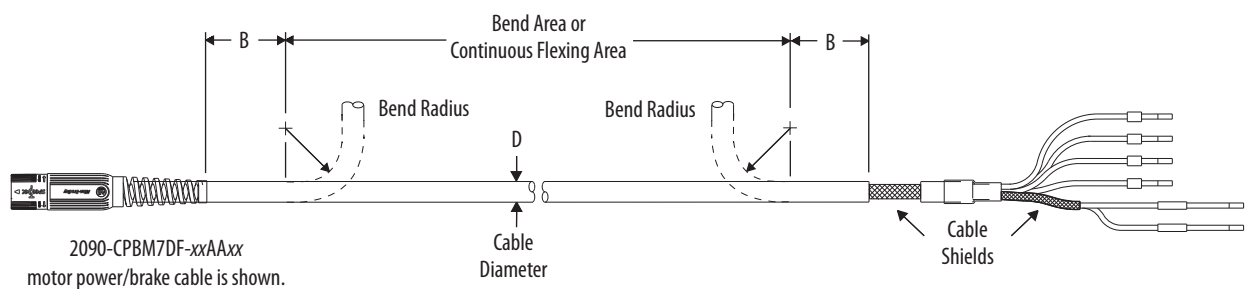
Table 1 - Motor Power and Feedback Cable Bend Radius Definitions

Type of Bend Radius	Type of Cable	Description
Static bend radius	Standard (non-flex)	The static (installation) bend radius and dimension B are seven times the cable diameter:
	Continuous flex	<ul style="list-style-type: none"> Do not begin a static bend inside dimension B. Use this measurement when routing the cable in a non-flex application between motor and drive (the bend area). <ul style="list-style-type: none"> The bend area is where standard (non-flex) or continuous-flex cables can be bent to their specified bend radius.
Continuous bend radius	Continuous flex	<p>The continuous bend radius for Bulletin 2090 motor power and feedback cables is 12 times the cable diameter:</p> <ul style="list-style-type: none"> Secure the continuous-flexing area, at least seven cable diameters (dimension B) from each end of the cable, with a rigid mount that helps protect against cable flexing where it connects to the motor or shield clamp. Use this measurement when routing the cable in a continuous-flex application between motor and drive (the continuous-flexing area). <ul style="list-style-type: none"> The continuous flexing area is where continuous-flex cables can be flexed repeatedly.

Install Motor Power/Brake Cables

This figure illustrates how to measure the bend radius and where cable bends can be made on motor power/brake cables.

Figure 3 - Motor Power/Brake Bend Radius Example



See [Table 2](#) and [Table 3](#) for motor power/brake specifications.

Install Motor Feedback Cables

This figure illustrates how to measure the bend radius and where cable bends can be made on motor feedback cables.

Figure 4 - Motor Feedback Bend Radius Examples

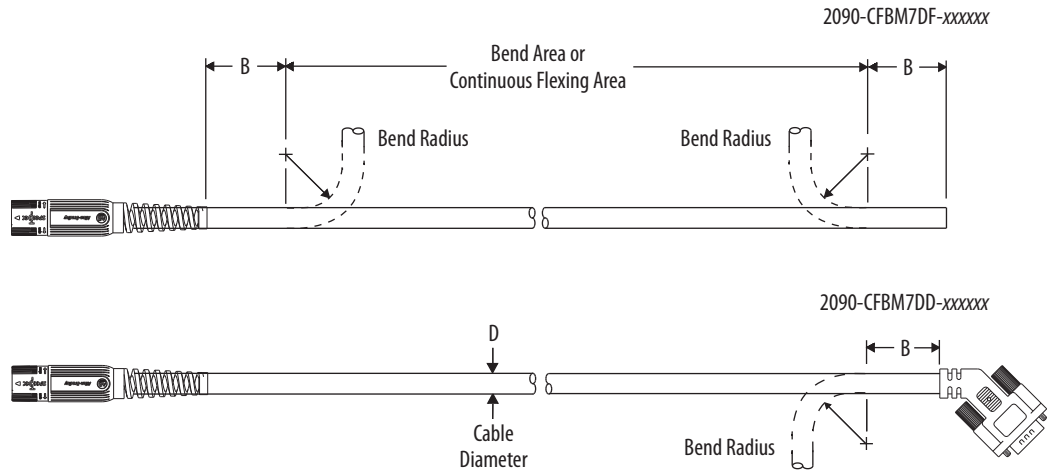
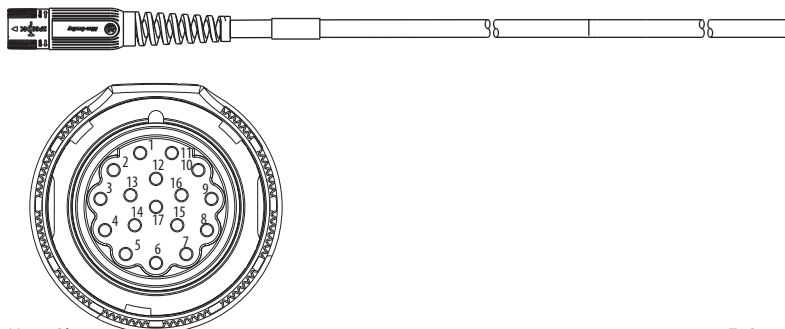
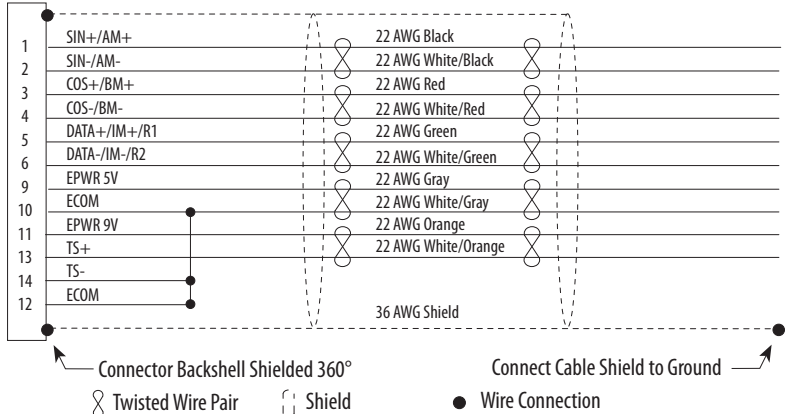




Table 6 - Feedback Cable Specifications

Cable Type	Cable Cat. No.	D mm (in.)	B ⁽¹⁾ mm (in.)	Continuous Bend Radius ⁽¹⁾ mm (in.)
Feedback cables (standard, non-flex)	2090-CFBM7DD-CEAxx	9.8 (0.39)	68.6 (2.7)	N/A
	2090-CFBM7DF-CEAxx			
Feedback cables (continuous-flex)	2090-CFBM7DD-CEAFxx	10.3 (0.40)	72.1 (2.8)	124 (4.9)
	2090-CFBM7DF-CEAFxx			
	2090-CFBM7DF-CDAFxx	11.7 (0.46)	81.9 (3.2)	140 (5.5)

(1) Dimension B (static bend radius) and continuous bend radius are based on the cable diameter. See Motor Power and Feedback Cable Bend Radius Definitions on [page 5](#) for more information.

Table 8 - Feedback Cable Pinouts (flying leads)

Feedback Cable Type	Cable Cat. No.	Description																																							
Feedback cable (standard, non-flex)	2090-CFBM7DF-CEAAxx	 <p>The diagram shows a feedback cable with a motor plug and a circular connector. The connector has 16 pins numbered 1 through 16. The motor plug is labeled 'Motor Plug' and 'To Drive'.</p>																																							
Feedback cable (continuous-flex)	2090-CFBM7DF-CEAFxx	 <p>The diagram shows a continuous-flex feedback cable with a motor plug and a circular connector. The connector has 16 pins numbered 1 through 16. The motor plug is labeled 'Motor Plug' and 'To Drive'. The pinout is as follows:</p> <table border="1"> <thead> <tr> <th>Pin</th> <th>Signal Name</th> <th>Wire Color</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>SIN+ /AM+</td> <td>22 AWG Black</td> </tr> <tr> <td>2</td> <td>SIN- /AM-</td> <td>22 AWG White/Black</td> </tr> <tr> <td>3</td> <td>COS+ /BM+</td> <td>22 AWG Red</td> </tr> <tr> <td>4</td> <td>COS- /BM-</td> <td>22 AWG White/Red</td> </tr> <tr> <td>5</td> <td>DATA+ /IM+ /R1</td> <td>22 AWG Green</td> </tr> <tr> <td>6</td> <td>DATA- /IM- /R2</td> <td>22 AWG White/Green</td> </tr> <tr> <td>9</td> <td>EPWR 5V</td> <td>22 AWG Gray</td> </tr> <tr> <td>10</td> <td>ECOM</td> <td>22 AWG White/Gray</td> </tr> <tr> <td>11</td> <td>EPWR 9V</td> <td>22 AWG Orange</td> </tr> <tr> <td>13</td> <td>TS+</td> <td>22 AWG White/Orange</td> </tr> <tr> <td>14</td> <td>TS-</td> <td>22 AWG White/Orange</td> </tr> <tr> <td>12</td> <td>ECOM</td> <td>36 AWG Shield</td> </tr> </tbody> </table> <p>Connector Backshell Shielded 360°  Twisted Wire Pair  Shield ● Wire Connection Connect Cable Shield to Ground</p>	Pin	Signal Name	Wire Color	1	SIN+ /AM+	22 AWG Black	2	SIN- /AM-	22 AWG White/Black	3	COS+ /BM+	22 AWG Red	4	COS- /BM-	22 AWG White/Red	5	DATA+ /IM+ /R1	22 AWG Green	6	DATA- /IM- /R2	22 AWG White/Green	9	EPWR 5V	22 AWG Gray	10	ECOM	22 AWG White/Gray	11	EPWR 9V	22 AWG Orange	13	TS+	22 AWG White/Orange	14	TS-	22 AWG White/Orange	12	ECOM	36 AWG Shield
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6	DATA- /IM- /R2	22 AWG White/Green																																							
9	EPWR 5V	22 AWG Gray																																							
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