

# 2090-Series Motor/Actuator Cables

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

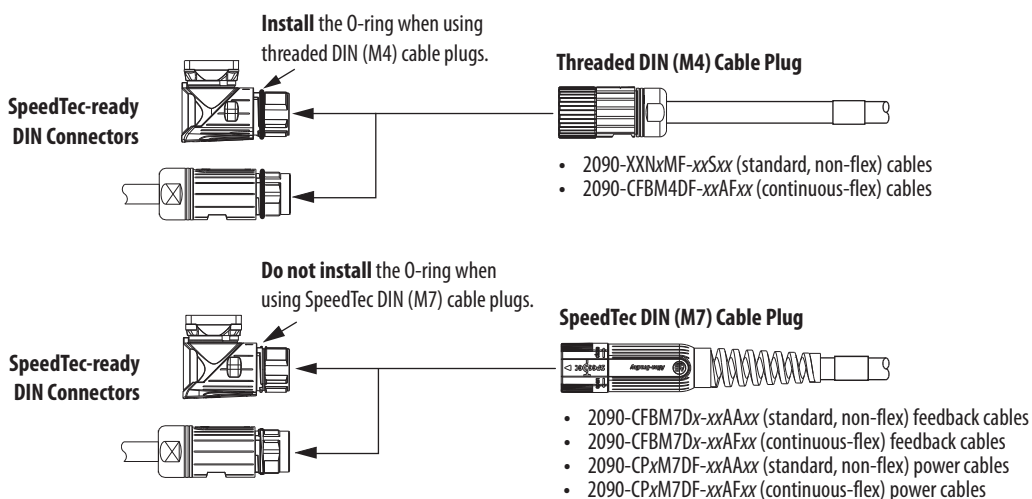
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## Verify the O-ring Installation for Threaded DIN Cable Plugs

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.

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### IMPORTANT

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

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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).

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**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.

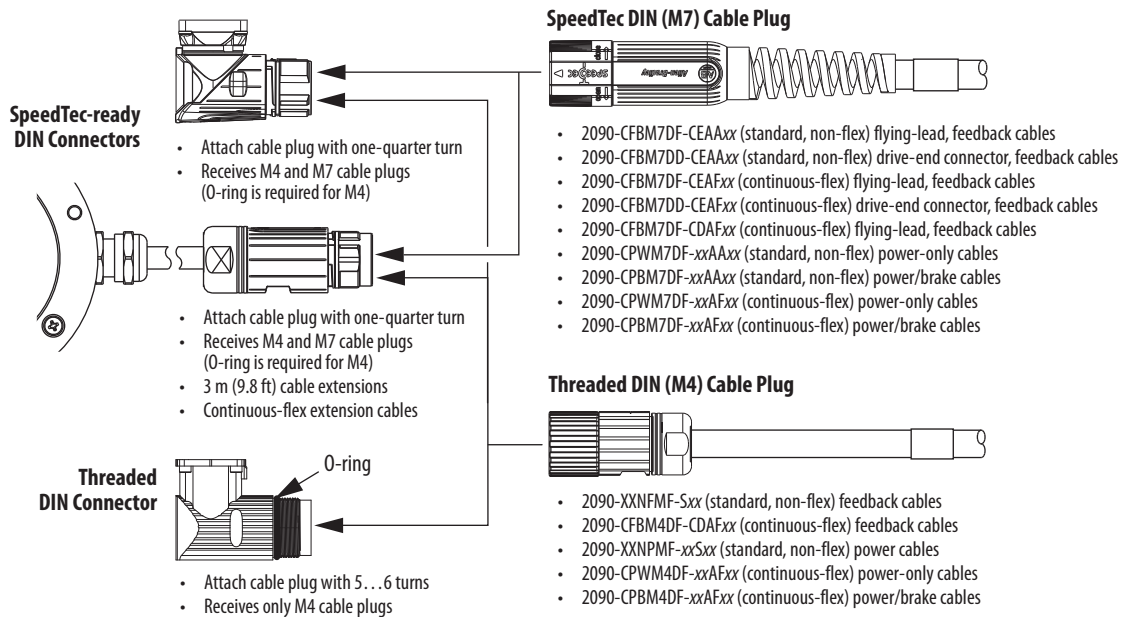
**IMPORTANT** Standard (non-flex) cables can be bent or reformed during installation and maintenance. Continuous-flex cables can be flexed repeatedly within a specified bend radius when properly installed.  
Do not use standard cables in a continuous-flex operation.

## 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.

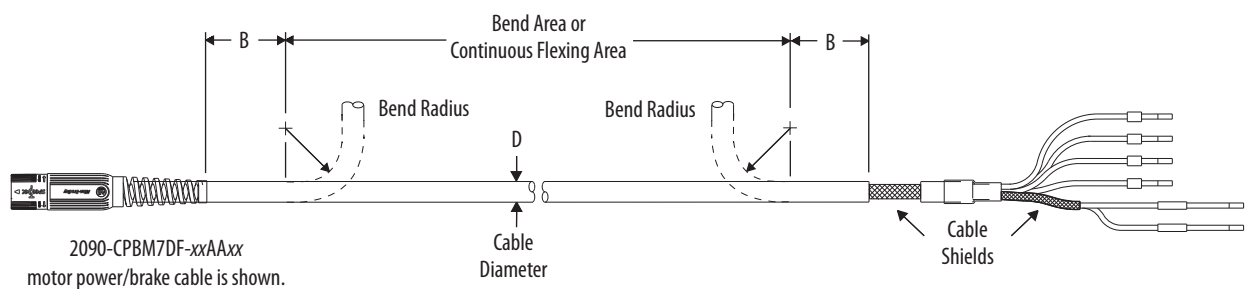
**Table 1 - Motor Power and Feedback Cable Bend Radius Definitions**

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"> <li>Do not begin a static bend inside dimension B.</li> <li>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"> <li>The bend area is where standard (non-flex) or continuous-flex cables can be bent to their specified bend radius.</li> </ul> </li> </ul>
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"> <li>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.</li> <li>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"> <li>The continuous flexing area is where continuous-flex cables can be flexed repeatedly.</li> </ul> </li> </ul>

### 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.

**Table 2 - Power/Brake Cable Specifications (standard, non-flex)**

Cable Type	Cable Cat. No.	Wire Size AWG	D mm (in.)	B <sup>(1)</sup> mm (in.)
Power/brake cables (standard, non-flex)	2090-CPBM7DF-16AAxx	16	11.6 (0.47)	81.2 (3.2)
	2090-CPBM7DF-14AAxx	14	12.7 (0.50)	88.9 (3.5)
	2090-CPBM7DF-12AAxx	12	14.3 (0.56)	100 (3.9)
	2090-CPBM7DF-10AAxx	10	16.8 (0.66)	118 (4.6)
	2090-CPBM7DF-08AAxx	8	20.1 (0.79)	141 (5.5)
	2090-CPBM7DF-06AAxx	6	24.3 (0.96)	170 (6.7)
	2090-CPBM7DF-04AAxx	4	28.8 (1.13)	202 (7.9)
	2090-CPBM7DF-02AAxx	2	32.7 (1.29)	229 (9.0)
Power-only cables (standard, non-flex)	2090-CPWM7DF-16AAxx	16	9.20 (0.36)	64.4 (2.5)
	2090-CPWM7DF-14AAxx	14	10.3 (0.40)	72.1 (2.8)
	2090-CPWM7DF-12AAxx	12	11.2 (0.44)	78.4 (3.1)
	2090-CPWM7DF-10AAxx	10	15.3 (0.6)	107 (4.2)
	2090-CPWM7DF-08AAxx	8	18.7 (0.74)	131 (5.2)

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

**Table 3 - Power/Brake Cable Specifications (continuous-flex)**

Cable Type	Cable Cat. No.	Wire Size AWG	D mm (in.)	B <sup>(1)</sup> mm (in.)	Continuous Bend Radius <sup>(1)</sup> mm (in.)
Power/brake cables (continuous-flex)	2090-CPBM7DF-16AFxx	16	12.5 (0.49)	87.5 (3.4)	150 (5.9)
	2090-CPBM7DF-14AFxx	14	13.7 (0.54)	95.9 (3.8)	164 (6.5)
	2090-CPBM7DF-10AFxx	10	17.8 (0.70)	125 (4.9)	214 (8.4)
	2090-CPBM7DF-08AFxx	8	20.6 (0.81)	144 (5.7)	247 (9.7)
Power-only cables (continuous-flex)	2090-CPWM7DF-16AFxx	16	9.7 (0.38)	67.9 (2.7)	116 (4.6)
	2090-CPWM7DF-14AFxx	14	10.4 (0.41)	72.8 (2.9)	125 (4.9)
	2090-CPWM7DF-10AFxx	10	15.7 (0.62)	110 (4.3)	188 (7.4)
	2090-CPWM7DF-08AFxx	8	20.2 (0.79)	141 (5.5)	242 (9.5)

(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 4 - Power/Brake Cable Pinouts (10, 8, 6, 4, and 2 AWG)**

Power/Brake Cable Type	Cable Cat. No.	Description
Power/brake cables (standard, non-flex)	2090-CPBM7DF-10AAxx, 2090-CPBM7DF-08AAxx, 2090-CPBM7DF-06AAxx	<p>To Motor</p> <p>To Drive</p> <p>U V W PE MBRK+ MBRK-</p> <p>Brown Black Blue Green/Yellow</p> <p>18 AWG White 18 AWG Black</p> <p>Shield</p> <p>Connector Backshell Shielded 360°</p> <p>Twisted Wire Pair Shield Wire Connection</p> <p>360° shield-to-ground connections required.</p>
Power/brake cables (continuous-flex)	2090-CPBM7DF-10AFxx, 2090-CPBM7DF-08AFxx	<p>To Motor</p> <p>To Drive</p> <p>U V W PE MBRK+ MBRK-</p> <p>Brown Black Blue Green/Yellow</p> <p>18 AWG White 18 AWG Black</p> <p>Shield</p> <p>Connector Backshell Shielded 360°</p> <p>Twisted Wire Pair Shield Wire Connection</p> <p>360° shield-to-ground connections required.</p>
Power-only cables (standard, non-flex)	2090-CPWM7DF-10AAxx, 2090-CPWM7DF-08AAxx	<p>To Motor</p> <p>To Drive</p> <p>U V W PE</p> <p>Brown Black Blue Green/Yellow</p> <p>Shield</p> <p>Connector Backshell Shielded 360°</p> <p>Shield Wire Connection</p> <p>360° shield-to-ground connections required.</p>
Power-only cables (continuous-flex)	2090-CPWM7DF-10AFxx, 2090-CPWM7DF-08AFxx	<p>To Motor</p> <p>To Drive</p> <p>U V W PE</p> <p>Brown Black Blue Green/Yellow</p> <p>Shield</p> <p>Connector Backshell Shielded 360°</p> <p>Shield Wire Connection</p> <p>360° shield-to-ground connections required.</p>
Power/brake cables (standard, non-flex)	2090-CPBM7DF-04AAxx, 2090-CPBM7DF-02AAxx	<p>To Motor</p> <p>To Drive</p> <p>U V W PE MBRK+ MBRK-</p> <p>Brown Black Blue Green/Yellow</p> <p>White Black</p> <p>Shield</p> <p>Connector Backshell Shielded 360°</p> <p>Twisted Wire Pair Shield Wire Connection</p> <p>360° shield-to-ground connections required.</p>