Installation Instructions

Continuous Flexible Power Cables with DIN SpeedTec Connector

Catalog Numbers 2090-CPBM7DF-*xx*AF*xx*, 2090-CPWM7DF-*xx*AF*xx*

About Flexible Power Cables

Continuous flexible motor power cables, with or without brake connections, can be repeatedly flexed within a specified bend radius when properly installed. The cables have circular SpeedTec connectors at the motor end, and flying leads at the drive end.

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Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls, publication SGI-1.1, available from your local Rockwell Automation sales office or online at http://literature.rockwellautomation.com, describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

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

Before You Begin

Remove all packing material from within and around the item. After unpacking, verify the catalog number against the purchase order., and visually inspect the cable and each connector for damage. If necessary, notify the carrier of any shipping damage immediately.

Cables are stored and shipped in a coil, and will retain this shape unless you allow the cable to straighten itself. To straighten a cable, hang a short cable from its mid-point or lay a long cable on the floor in a straight line. Any coiling that persists in the cable should relax within the next twenty-four hours. Doing this results in a cable that is easier to install.

Observe the following precautions when installing the cables in a servo system. Failure to observe these safety notices could result in personal injury or damage to the motor and equipment.

WARNING

Arcing or unexpected motion can occur if the power, brake, or feedback cables are connected or disconnected while power is applied to the drive.

Always remove power to the servo drive before connecting or disconnecting cables at the drive or at the motor.

ATTENTION

The maximum length of cabling between the drive and the motor must not exceed 90 m (295.5 ft). Also, a maximum of two (2) extension cables may be connected from a motor to a drive.

WARNING

To avoid the hazard of electrical shock, ensure shielded power cables are grounded at a minimum of one point. To prevent the build-up of electrical energy, factory supplied power cables use one of these grounding techniques:

- The overall shield is bonded to the connector housing.
- A section of the overall shield is exposed for connection to ground.
- The overall shield is connected to a ground wire.

If the exposed cable braid or a ground wire is present, connect it to the power cable clamp, housing, or another suitable chassis ground on the drive.

ATTENTION

Do not tightly gather or coil the excess length of a power cable. Heat is generated within a cable whenever power is applied. Always position a power cable so it may freely dissipate any heat.

A power cable should not be coiled, except for temporary use when building or testing a machine. If you temporarily coil a power cable, you must also derate the cable to meet local code or follow a authoritative directive, such as Engineering Section 310.15(C) of the NEC Handbook.

ATTENTION

The examples in this publication show all the available connections, some of which may not be appropriate for your specific installation. Refer to your drive installation or user manual for recommended wire trim lengths, and wiring examples appropriate to your drive and motor application.

Do not connect unused wires. Unused wires may be trimmed and finished as necessary to prevent accidental contact with other wires or wire shields, or with a ground connection.

IMPORTANT

Continuos flexible cables with SpeedTec connectors are incompatible with some MP-Series motors.

Only install cables with a threaded connector on these motors: MPL-A15*x*0, MPL-A2*x*0, MPL-B15*x*0, MPL-B2*x*0, MPS-A330, MPS-A4540, MPS-B330, MPS-B4540, and MPS-B560.

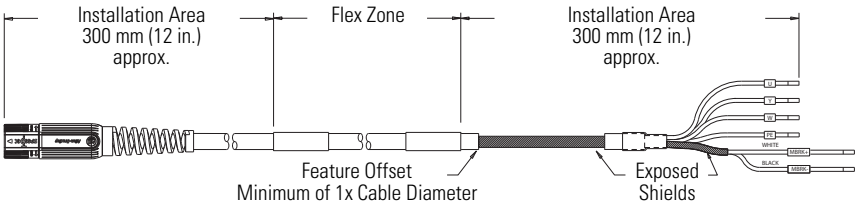
Install Cables

Follow these steps when installing a cable.

1. Identify the recommended installation areas and the correct offset from features before beginning any cable bend. Features include these areas on the cable:

   - Connectors
   - Transitions from exposed wire to insulation (for example, flying leads)
   - Exposed cable ground shields

   The offset from these features should be greater than or equal to (≥1x) the cable diameter.



2090-CPBM7DF-xxAF*xx* shown

2. Keep cable bends within the specified bend radius. Continuous flexible cables have an operational bend radius of twelve times (12x) the cable diameter.

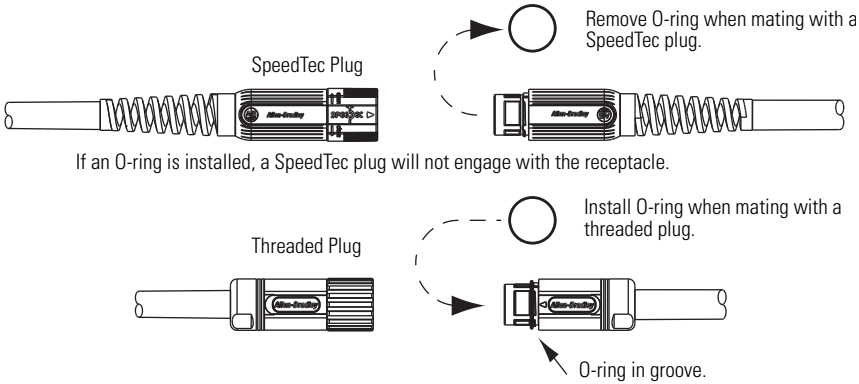
Never bend a cable tighter than the specified bend radius. Refer to Specifications for value.

3. When installing a continuous flexible cable observe these restrictions on the flex zone and installation area:
   - The flex zone is the area in which the cable can repeatedly flex up to its specified bend radius.
   - The installation areas require rigid mounting to prevent the cable from flexing where it connects to other components.

4. Identify each connection on a cable by attaching a label around the outer insulation of each wire adjacent to the drive connection.

5. Remove the O-ring on the motor connector when using a power cable with a SpeedTec power plug.

   The type of plug on the cable determines whether an O-ring is required on the receptacle.



IMPORTANT The O-ring dampens the effects of vibration at the cable-to-motor connection. This creates a more secure connection for a cable with a threaded plug.

Schematics and Connector Pinouts for Cables

Schematics show wire colors and connector pinouts necessary to connect the cable to a servo system.

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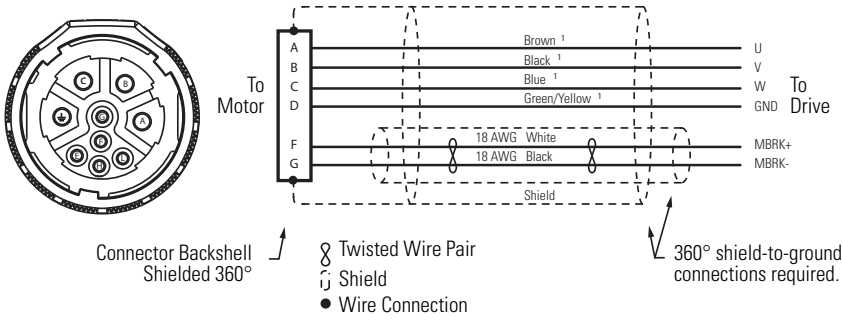
This cable is available in several wire gauges and lengths. Refer to the Kinetix Motion Control Selection Guide, publication GMC-SG001, for this information and additional specifications.



1 Wire gauge and connector keying varies based on motor and power requirements. Refer to Kinetix Motion Control Selection Guide, publication GMC-SG001, for additional information.

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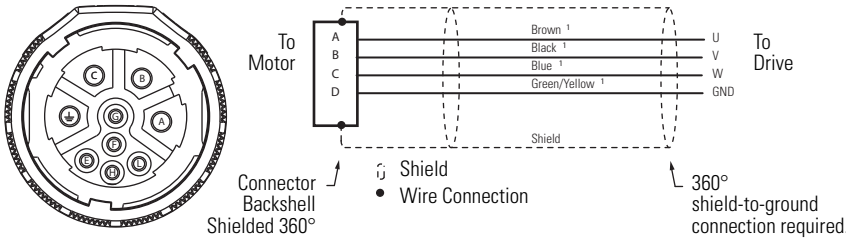

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Specifications

These specifications provide information that is useful when installing a cable. Additional specifications for each cable are available in the Kinetix Motion Control Selection Guide, publication GMC-SG001.

2090-CPBM7DF-*xx*AF*xx* Specifications

Attribute	Value	
Wire Size	16 AWG	14 AWG
Diameter	12.5 mm (0.5 in.)	13.7 mm (0.5 in.)
Bend Radius [1]		
Flex Area	150 mm (6.0 in.)	165 mm (6.5 in.)
Installation Areas [2]	125 mm (5.0 in.)	137 mm (5.5 in.)

1 Apply the multiplier for operational (12 x dia.) and static (10 x dia.) bend radius to cables with a different diameter. Refer to the diagram to locate the areas for flex (operational), and static (installation) bend areas.

2 The installation areas are approximately 300 mm (12 in.) in length at both ends of the cable. Secure this area with a rigid mount that prevents the cable from flexing where it connects to other components.

2090-CPWM7DF-*xx*AF*xx* Specifications

Attribute	Value	
Wire Size	16 AWG	14 AWG
Diameter	9.7 mm (0.4 in.)	10.4 mm (0.4 in.)
Bend Radius [1]		
Flex Area	120 mm (5.0 in.)	125 mm (5.0 in.)
Installation Areas [2]	100 mm (4.0 in.)	105 mm (4.0 in.)

1 Apply the multiplier for operational (12 x dia.) and static (10 x dia.) bend radius to cables with a different diameter. Refer to the diagram to locate the areas for flex (operational), and static (installation) bend areas.

2 The installation areas are approximately 300 mm (12 in.) in length at both ends of the cable. Secure this area with a rigid mount that prevents the cable from flexing where it connects to other components.

Additional Resources

These documents contain additional information concerning related Rockwell Automation products.

Resource	Description
Kinetix 2000 Multi-axis Servo Drive User Manual, publication 2093-UM001	Provides mounting, wiring, and application-based information for a Kinetix multi-axis or an Ultra single-axis servo drive system and its components.
Kinetix 6000 Multi-axis Servo Drives User Manual, publication 2094-UM001	
Kinetix 7000 High Power Servo Drive User Manual, publication 2099-UM001	
Ultra1500 Digital Servo Amplifiers User Manual, publication 2092-UM001	
Ultra3000 Digital Servo Drive Installation Manual, publication 2098-IN003 or Integration Manual, publication 2098-IN005	
Ultra5000 Intelligent Positioning Drives Installation Manual, publication 2098-IN001	
Allen-Bradley Industrial Automation Glossary, publication AG-7.1	A glossary of industrial automation terms and abbreviations.
System Design for Control of Electrical Noise Reference Manual, publication GMC-RM001	Information, examples, and techniques designed to minimize system failures caused by electrical noise.
Kinetix Motion Control Selection Guide, publication GMC-SG001	Specifications, motor/servo-drive system combinations, and accessories for Kinetix motion control products.

You can view or download publications at http://literature.rockwellautomation.com. To order paper copies of technical documentation, contact your local Rockwell Automation distributor or sales representative.

www.rockwellautomation.com

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