

2090-Series Single Motor Cables

Allen-Bradley single motor cables combine motor power, feedback, and brake conductors all in a single shielded cable. Standard (non-flex) motor cables with rugged SpeedTec DIN connectors are designed for use with Kinetix 5500 and Kinetix 5700 drive systems, and intended for static applications. Continuous-flex rated cables, intended for rolling and reverse bending applications, are also available.

IMPORTANT Due to the unique characteristics of single-cable technology, which is designed for and tested with the Kinetix 5000 drive families and Kinetix VP motors, building your own cables or using third-party cable is not an option.

IMPORTANT Flying-lead motor power, feedback, and (optional) brake conductors terminate at the drive by using the 2198-KITCON-DSL feedback connector kit. Refer to the Kinetix Servo Drives Specifications Technical Data, publication [GMC-TD003](#), for more information on the 2198-KITCON-DSL connector kit that is used with the Kinetix 5500 and Kinetix 5700 servo drives.

IMPORTANT Continuous-flex single motor cables have a minimum bend radius of 10 times the cable diameter.

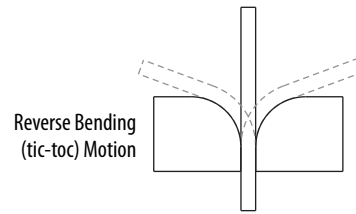
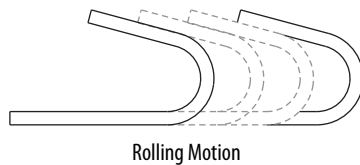


These 2090-Series motor cables with SpeedTec DIN connectors, designed by Rockwell Automation for optimal performance with Kinetix 5000 drive families and Kinetix VP servo motors, offer best-in-class features and standards compliance. The single-cable design includes power, feedback, and brake conductors. The continuous-flex cable option, cable lengths in 1 m (3.3 ft) increments, and SpeedTec connectors provide machine builders with complete control of the cable requirements in their machines.

Single Motor Cable Features

- NFPA-79 compliant
- UL Listings: 10 AWG cable - Flexible VFD servo cable, 18 and 14 AWG cables - PLTC-ER
- UL AWM, style 21840, 1000V, 105 °C construction
- CSA AWM I/II A/B, 1000V, 105 °C construction
- Low capacitance design to maximize system power density
- Cable construction permits power and signal conductors in a single cable
- 1/4-turn SpeedTec connection system
- Encoder communication data pair with state of the art noise rejection
- DESINA compliant jacket (orange) coloring for easy identification and separation of cables in a machine
- Continuous-flex cables are suitable for 20 million flex-cycles in linear flexing applications and 10 million cycles in bending (tic-toc) applications (see Types of Cable Flexing on [page 3](#))
- TPE jacket with superior mechanical and chemical properties
- Cable features overall tinned copper braid with aluminum/polyester tape, delivering 100% coverage for excellent EMC/EMI performance
- Cables are included in the Rockwell Automation® servo system Declaration of Conformity (DoC)
- The 2090-CSxM1DE cables, which are used with Kinetix 5700 servo drives, include the 2198-KITCON-DSL feedback connector kit that is pre-assembled with the feedback conductors.

Types of Cable Flexing



Catalog Numbers - 2090-Series Single Motor Cables

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 - C Sx M1 Dx - xx Ax xx	
↑	Cable Length Refer to Technical Specifications - 2090-Series Single Motor Cables beginning on page 7 .
↑	Cable Type AA = Standard, non-flex AF = Continuous-flex
↑	Wire Gauge Size (applies to power conductors) 18, 14, 10 AWG
↑	Drive-end Connector Type DF = Drive-end, flying-leads (lead length optimized for Kinetix 5500 drives) DE = Drive-end, flying-lead power/brake wires and pre-wired feedback connector kit (optimized for Kinetix 5700 drives) DG = Drive-end, flying-leads (longer leads optimized for Kinetix 5500 or Kinetix 5700 drives)
↑	Motor-end Connector Type M1 = Single SpeedTec DIN connector
↑	Cable Type SB = Single motor power with brake wires SW = Single motor power only
↑	Accessory Component C = Cable
↑	Bulletin Number

2090-Series Single Motor Cables Overview

2090-CSxM1DF and 2090-CSxM1DG single motor cables with flying leads provide power, feedback, and brake conductors in a single shielded cable. Refer to Technical Specifications - 2090-Series Single Motor Cables on [page 7](#) for cable descriptions, weights, and standard cable lengths.

Single Motor Cable Descriptions (flying leads)

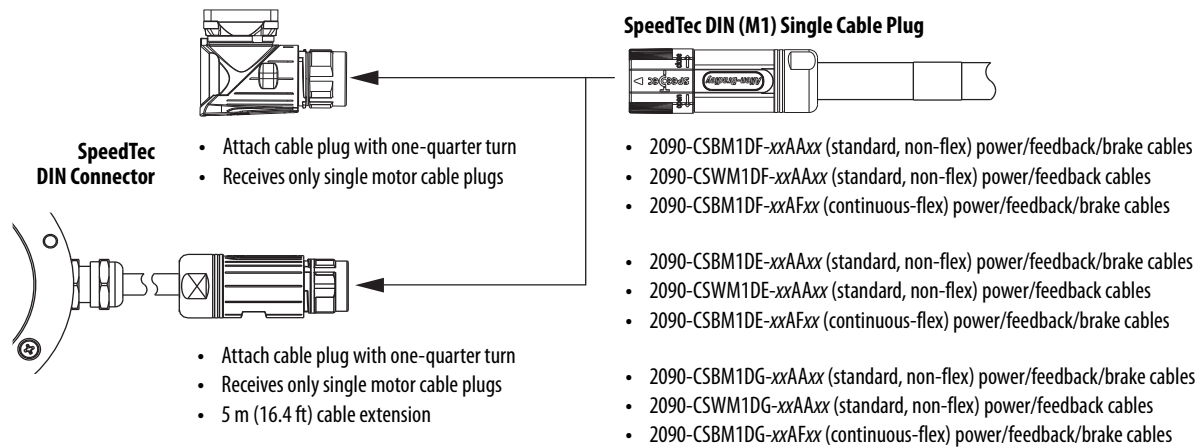
Cable Cat. No.	Description	Cable Configuration		Motor Connector
		Motor End	Drive End	
2090-CSBM1DF-xxAAxx 2090-CSBM1DF-xxAFxx 2090-CSBM1DG-xxAAxx 2090-CSBM1DG-xxAFxx	<ul style="list-style-type: none"> Drive-end flying-leads (DF) (DG = longer lead lengths) Power/feedback/brake wires (SB) Standard, non-flex (AA) Continuous-flex (AF) 			SpeedTec DIN
2090-CSWM1DF-xxAAxx 2090-CSWM1DG-xxAAxx	<ul style="list-style-type: none"> Drive-end flying-leads (DF) (DG = longer lead lengths) Power/feedback wires only (SW) 			

2090-CSxM1DE single motor cables also provide power, feedback, and brake conductors in a single shielded cable. However, 2090-CSxM1DE cables include the 2198-KITCON-DSL feedback connector kit that is pre-assembled with the feedback conductors. See Technical Specifications - 2090-Series Single Motor Cables on [page 7](#) for cable descriptions, weights, and standard cable lengths.

Single Motor Cable Descriptions (feedback connector kit)

Cable Cat. No.	Description	Cable Configuration		Motor Connector
		Motor End	Drive End	
2090-CSBM1DE-xxAAxx 2090-CSBM1DE-xxAFxx	<ul style="list-style-type: none"> Drive-end feedback connector kit (DE) Power/feedback/brake wires (SB) Standard, non-flex (AA) Continuous-flex (AF) 			SpeedTec DIN
2090-CSWM1DE-xxAAxx	<ul style="list-style-type: none"> Drive-end feedback connector kit (DE) Power/feedback wires only (SW) 			

Typical Single Motor Cable Applications



The cable technology used in single cables is the same regardless of the catalog number. What is different about each cable is the lead preparation and feedback conductor terminations.

- 2090-CSxM1DF cable conductors have flying-leads and lead preparation that is designed specifically for Kinetix 5500 servo drives. No on-site lead preparation is required.
- 2090-CSxM1DE cables include the 2198-KITCON-DSL connector kit. The kit is pre-assembled with the feedback conductors and lead preparation for the flying-lead power conductors is designed specifically for Kinetix 5700 servo drives. No on-site lead preparation is required.
- 2090-CSxM1DG cable conductors have flying-leads and lead preparation that is designed for either Kinetix 5500 or Kinetix 5700 servo drives. No on-site lead preparation is required, however, 2090-CSxM1DG cable leads are longer than 2090-CSxM1DF cable leads to accommodate either drive family.

IMPORTANT To avoid problems securing the cable in the shield clamp and routing the flying leads to the motor power, feedback, and brake connector plugs, make sure that you are using the cable that is best suited for your application.

- Use 2090-CSxM1DF cables with Kinetix 5500 servo drives (2198-KITCON-DSL connector kit is included with the drive)
- Use 2090-CSxM1DE cables with Kinetix 5700 servo drives (2198-KITCON-DSL connector kit is pre-wired to the feedback conductors)
- Use 2090-CSxM1DG cables with Kinetix 5500 or Kinetix 5700 servo drives (when used with Kinetix 5700 drives, the 2198-KITCON-DSL connector kit is ordered separately)

Technical Specifications - 2090-Series Single Motor Cables

Single Motor Cable Specifications

Cable Cat. No.	Cable Type/ Jacket Color	Description	Wire Size AWG	Weight, approx kg/m (lb/ft)	Kinetix 5500 Drives Standard Cable Lengths m (ft)	Kinetix 5700 Drives Standard Cable Lengths m (ft)
2090-CSBM1DF-18AAxx 2090-CSBM1DE-18AAxx 2090-CSBM1DG-18AAxx	Standard (non-flex) cable, Industrial TPE, Orange (DESINA, RAL 2003)	1000V hybrid cable with four power, two feedback (digital communication), and two brake conductors.	18	0.212 (0.143)	01 (3.3) . . . 50 (164) in 1.0 m (3.3 ft) increments	01 (3.3) . . . 90 (295) in 1.0 m (3.3 ft) increments
2090-CSBM1DF-14AAxx 2090-CSBM1DE-14AAxx 2090-CSBM1DG-14AAxx			14	0.261 (0.175)		
2090-CSWM1DF-18AAxx 2090-CSWM1DE-18AAxx 2090-CSWM1DG-18AAxx		1000V hybrid cable with four power and two feedback (digital communication) conductors.	18	0.136 (0.091)		
2090-CSWM1DF-14AAxx 2090-CSWM1DE-14AAxx 2090-CSWM1DG-14AAxx			14	0.185 (0.124)		
2090-CSBM1DF-18AFxx 2090-CSBM1DE-18AFxx 2090-CSBM1DG-18AFxx	Continuous-flex cable, Industrial TPE, Orange (DESINA, RAL 2003)	1000V hybrid cable with four power, two feedback (digital communication), and two brake conductors.	18	0.212 (0.143)	01 (3.3) . . . 50 (164) ⁽¹⁾ in 1.0 m (3.3 ft) increments	
2090-CSBM1DF-14AFxx 2090-CSBM1DE-14AFxx 2090-CSBM1DG-14AFxx			14	0.261 (0.175)		
2090-CSBM1DF-10AFxx 2090-CSBM1DE-10AFxx 2090-CSBM1DG-10AFxx			10	0.551 (0.370)		

(1) Applies to all Kinetix 5500 (frame 2 and 3) drives. For Kinetix 5500 (frame 1) drives in continuous-flex applications, 30 m (98 ft) is maximum cable length.

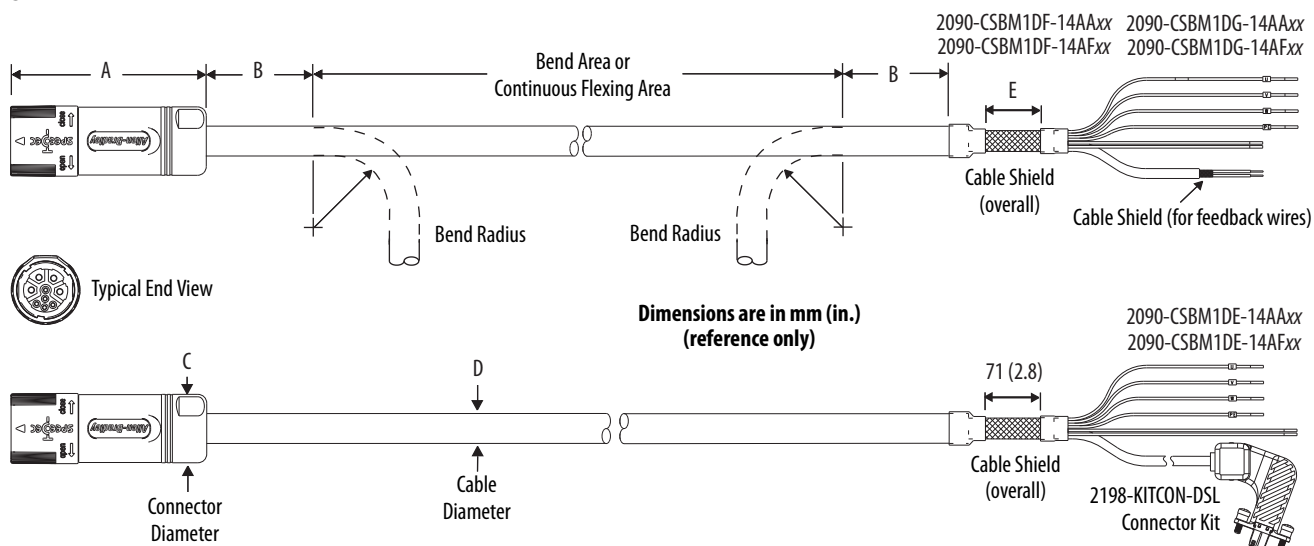
Dimensions - 2090-Series Single Motor Cables

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

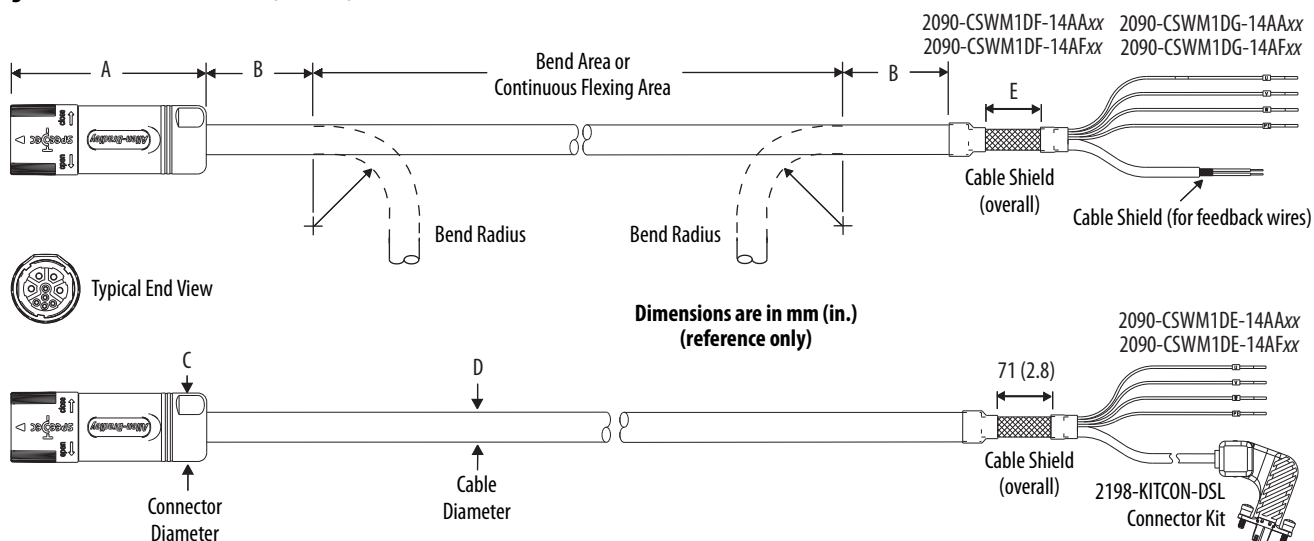
Single Cable Bend Radius Definitions

Type of Bend Radius	Type of Cable	Description
Static bend radius	Standard (non-flex)	The static (installation) bend radius and dimension B are 7 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 single motor cables is 10 times the cable diameter.</p> <ul style="list-style-type: none"> Secure the continuous-flexing area, at least 7 cable diameters (dimension B) from each end of the cable, with a rigid mount that helps prevent the cable from 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.

Single Motor Cable Dimensions (14 AWG) Brake



Single Motor Cable Dimensions (14 AWG) Without Brake

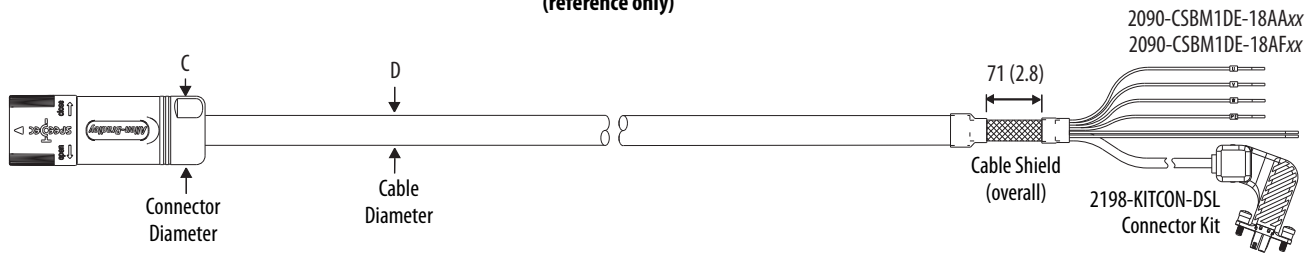
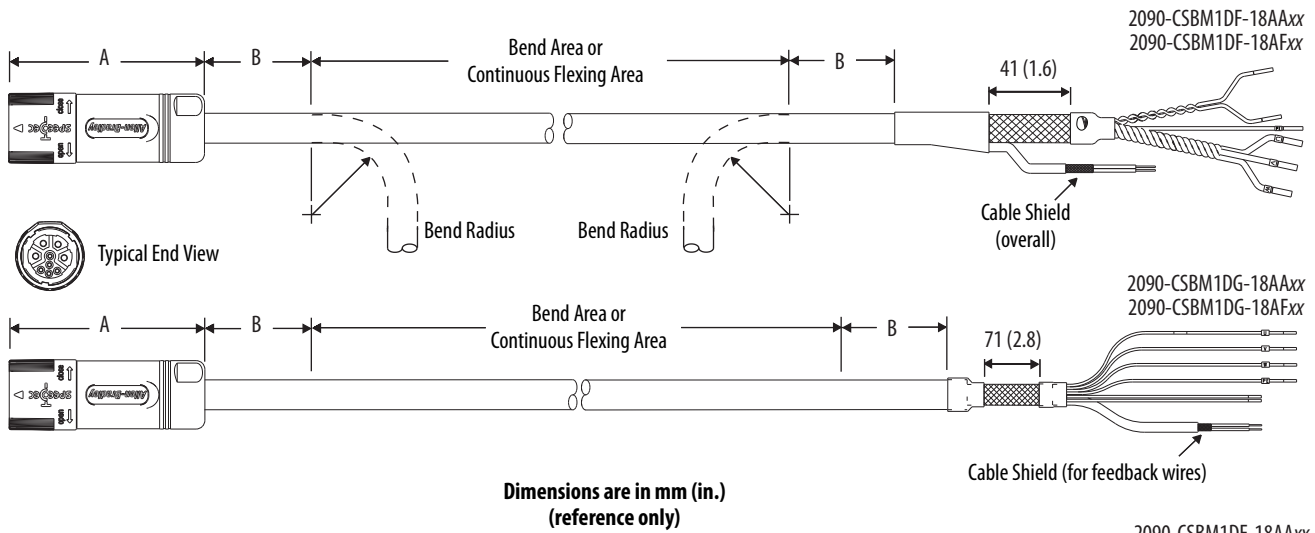


Single Motor Cable Dimensions (14 AWG)

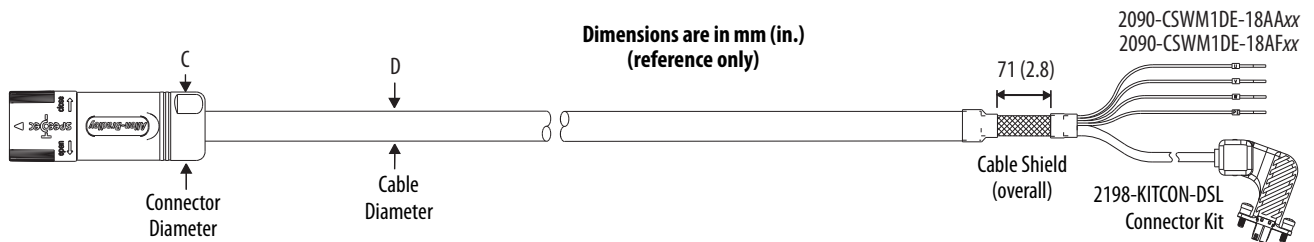
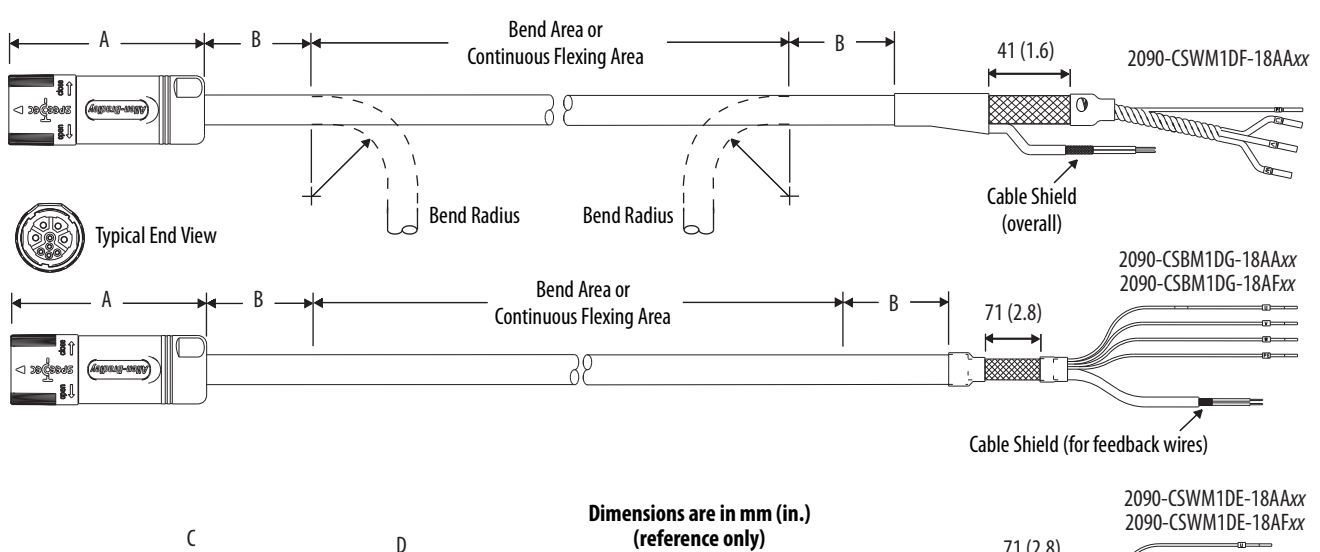
Cable Cat. No.	A mm (in.)	B ⁽¹⁾ mm (in.)	Continuous Bend Radius ⁽¹⁾ mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2090-CSBM1DF-14AAxx	81 (3.2)	105 (4.1)	N/A	30 (1.1)	15 (0.59)	41 (1.6)
2090-CSBM1DE-14AAxx 2090-CSBM1DG-14AAxx						71 (2.8)
2090-CSWM1DF-14AAxx					17 (0.67)	41 (1.6)
2090-CSWM1DE-14AAxx 2090-CSWM1DG-14AAxx						71 (2.8)
2090-CSBM1DF-14AFxx		119 (4.7)	170 (6.7)			41 (1.6)
2090-CSBM1DE-14AFxx 2090-CSBM1DG-14AFxx						71 (2.8)

(1) Dimension B (static bend radius) and Continuous Bend Radius are based on the cable diameter. Refer to Single Cable Bend Radius Definitions on [page 7](#) for more information.

Single Motor Cable Dimensions (18 AWG) Brake



Single Motor Cable Dimensions (18 AWG) Without Brake

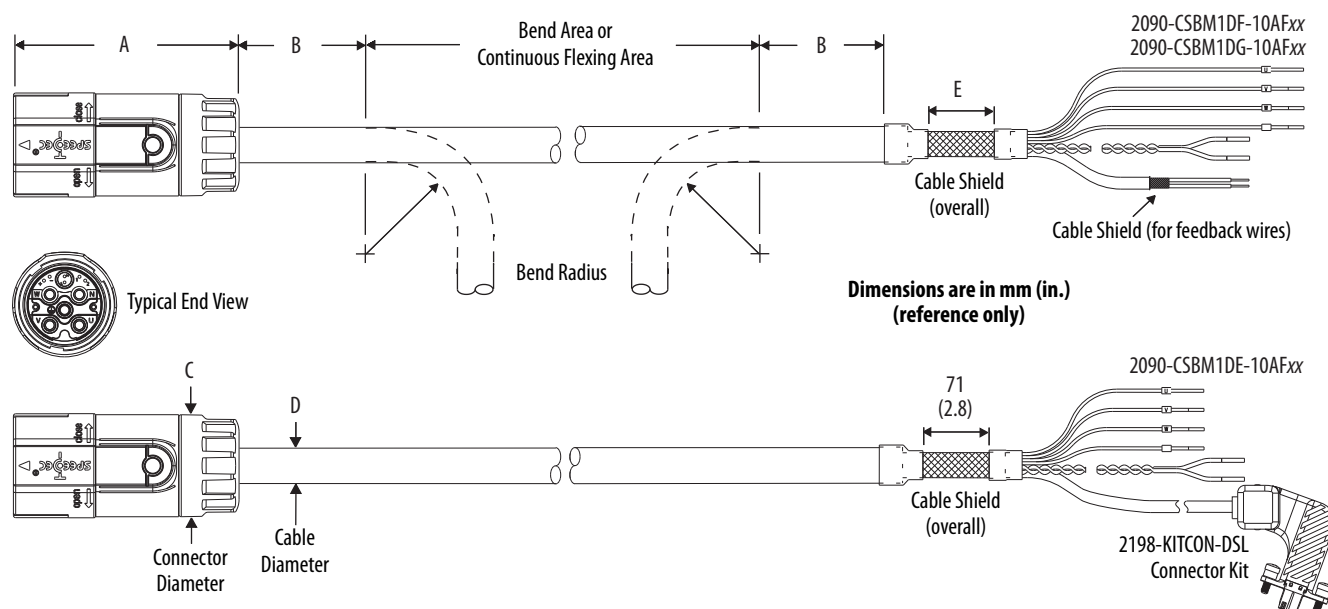


Single Motor Cable Dimensions (18 AWG)

Cable Cat. No.	A mm (in.)	B ⁽¹⁾ mm (in.)	Continuous Bend Radius ⁽¹⁾ mm (in.)	C mm (in.)	D mm (in.)
2090-CSBM1DF-18AAxx 2090-CSBM1DE-18AAxx 2090-CSBM1DG-18AAxx	81 (3.2)	105 (4.1)	N/A	30 (1.1)	15 (0.59)
2090-CSWM1DF-18AAxx 2090-CSWM1DE-18AAxx 2090-CSWM1DG-18AAxx					
2090-CSBM1DF-18AFxx 2090-CSBM1DE-18AFxx 2090-CSBM1DG-18AFxx			150 (5.9)		

(1) Dimension B (static bend radius) and Continuous Bend Radius are based on the cable diameter. Refer to Single Cable Bend Radius Definitions on [page 7](#) for more information.

Single Motor Cable Dimensions (10 AWG)



Single Motor Cable Dimensions (10 AWG)

Cable Cat. No.	A mm (in.)	B ⁽¹⁾ mm (in.)	Continuous Bend Radius ⁽¹⁾ mm (in.)	C mm (in.)	D mm (in.)	E mm (in.)
2090-CSBM1DF-10AFxx	99 (3.9)	133 (5.2)	190 (7.5)	46 (1.8)	19 (0.75)	50.8 (2.0)
2090-CSBM1DE-10AFxx						71 (2.8)
2090-CSBM1DG-10AFxx						

(1) Dimension B (static bend radius) and Continuous Bend Radius are based on the cable diameter. Refer to Single Cable Bend Radius Definitions on [page 7](#) for more information.