Installation Instructions

Original Instructions

Allen-Bradley
by ROCKWELL AUTOMATION

Kinetix 2090 Single Motor Cables

Catalog Numbers 2090-CSBM1DF, 2090-CSWM1DF, 2090-CSBM1DE, 2090-CSWM1DE, 2090-CSBM1DG, 2090-CSWM1DG, 2090-CSBM1E1

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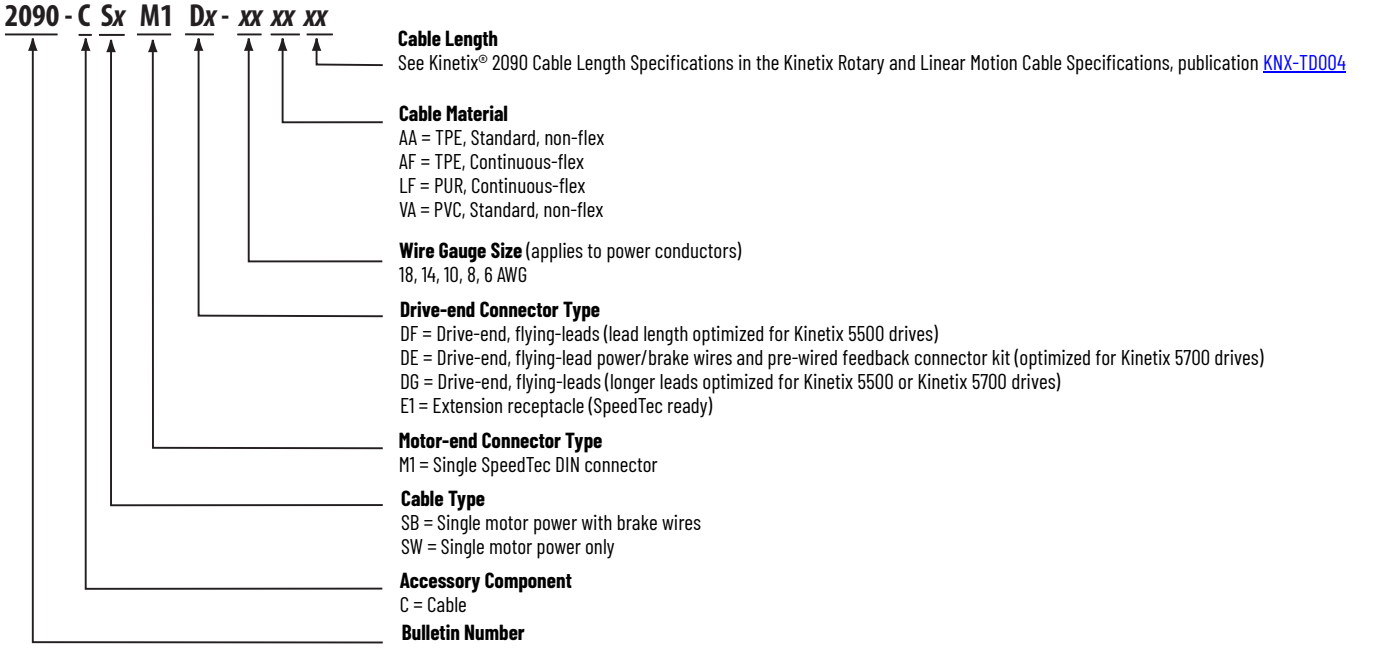
Summary of Changes

This publication contains new and updated information as indicated in the following table.

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Updated connector kit catalog number.	4

Catalog Numbers - Kinetix 2090 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.



Rockwell Automation

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. Cables retain this shape until you straighten the cable. 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 remains in the cable is straightened out within the next 24 hours. This practice makes the cable easier to install.

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

- 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.
- To avoid electrical shock, make sure that 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.

- The maximum cable length between the drive and the motor varies, depending on the application, but never exceeds 50 m (164 ft) for Kinetix 5500 drives and 90 m (295 ft) for Kinetix 5700 drives. See Kinetix 5700, 5500, 5300, 5100, and ArmorKinetix Servo Drives Specifications, publication KNX-TD003, for additional information.
- 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 can freely dissipate heat.

Do not coil a power cable 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 an authoritative directive, such as Engineering Section 310.15(C) of the NEC Handbook.

- 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 prevent accidental contact with other wires or wire shields, or with a ground connection.

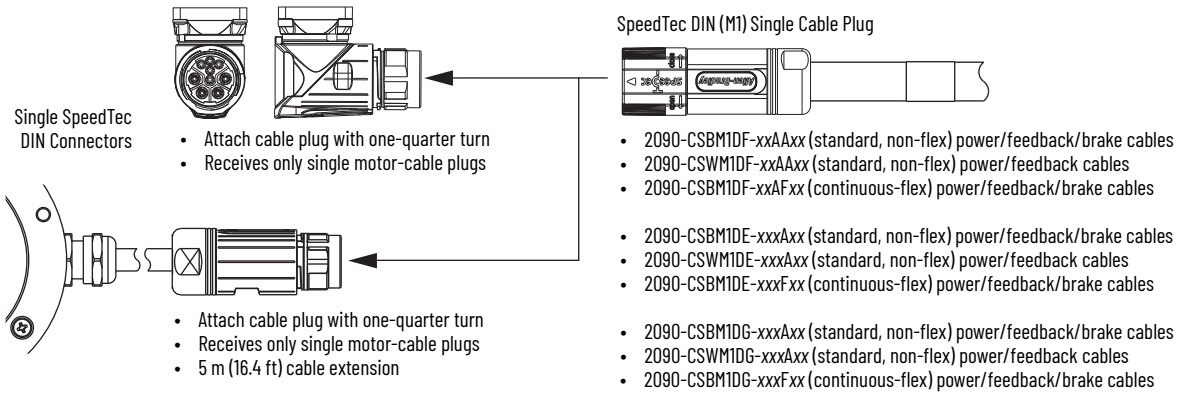
IMPORTANT Standard (non-flex) cables can be bent or reformed during installation and maintenance. Continuous-flex cables can be flexed repeatedly within a specified bend radius when properly installed.

Do not use standard cables in a continuous-flex operation.

Single Motor Cable Applications

SpeedTec DIN single (M1) motor cables are compatible with only Kinetix VP motors.

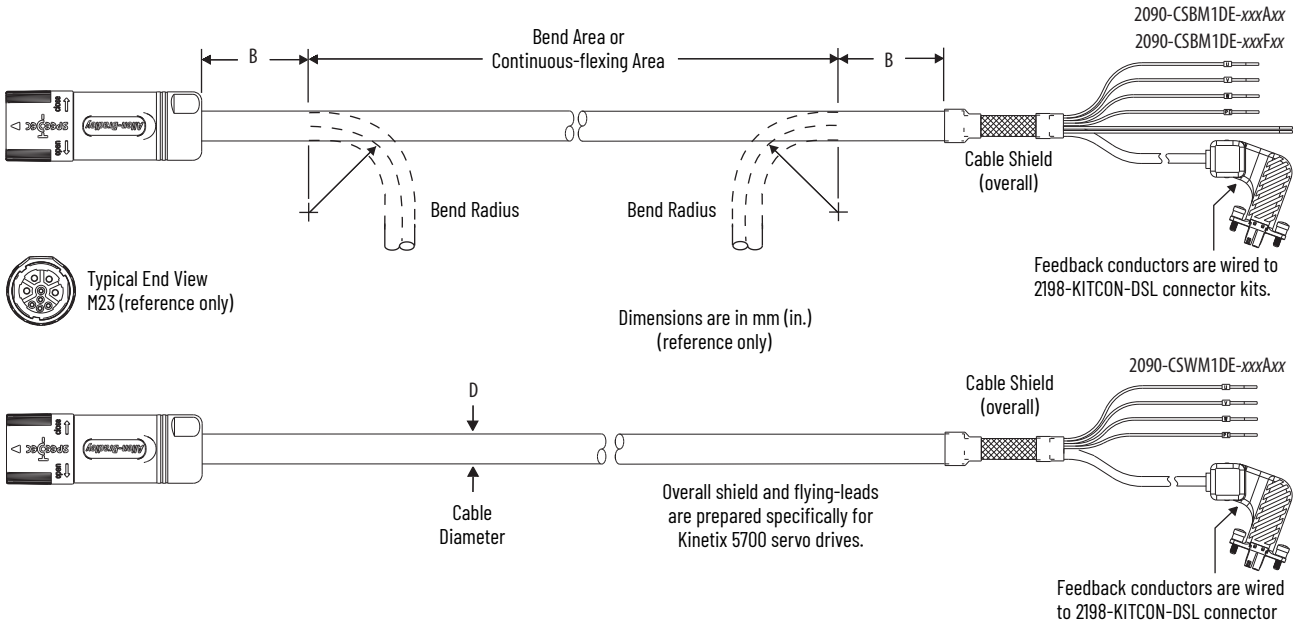
Single Motor Connector and Cable Plug Compatibility



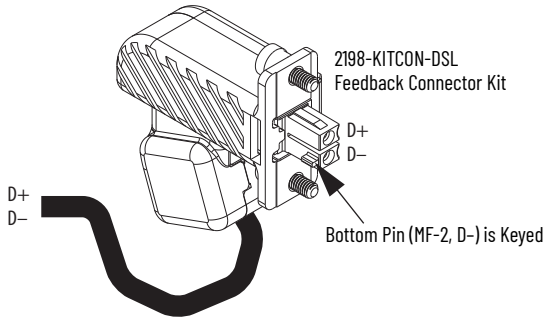
The cable technology used in single cables is the same regardless of the catalog number. What is different about each cable is the lead preparation and feedback conductor terminations.

- 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.

2090-CSxM1DE Motor Cables



DSL Connector Kit Pin Orientation

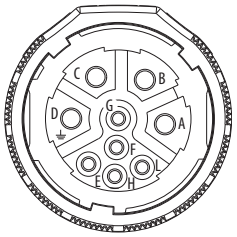
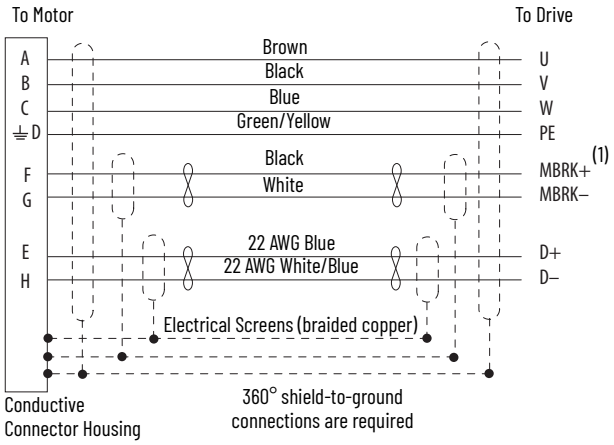
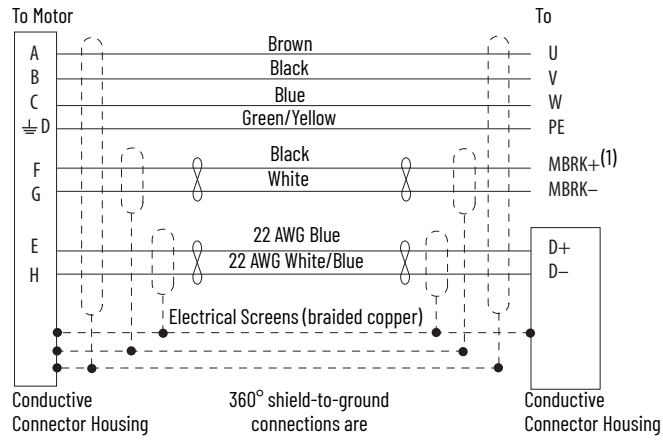


ATTENTION: To avoid damage to the 2198-KITCON-DSL connector kit that is pre-wired to 2090-CSxM1DE cables, use caution when installing the cable and when routing the cable to the drive.

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)

Power/Feedback/Brake Cable Pinouts (18 and 14 AWG)

Cable Type	Cable Cat. No.	Description
Standard, non-flex	2090-CSBM1DF-18AAxx, 2090-CSBM1DF-14AAxx, 2090-CSBM1DG-18xAxx, 2090-CSBM1DG-14xAxx	Motor-end Cable View  ● Wire Connection Shield Twisted Wire Pair 
Continuous-flex	2090-CSBM1DF-18AFxx, 2090-CSBM1DF-14AFxx, 2090-CSBM1DG-18xFxx, 2090-CSBM1DG-14xFxx	
Standard, non-flex	2090-CSBM1DE-18xAxx, 2090-CSBM1DE-14xAxx	
Continuous-flex	2090-CSBM1DE-18xFxx, 2090-CSBM1DE-14xFxx	

(1) See Kinetix 2090 Cable Length Specifications beginning on page 9 for brake wire sizes.

Power/Feedback/Brake Cable Specifications (standard, non-flex)

Cable Cat. No.	Wire Size AWG (mm^2)	D mm (in.)	B (1) mm (in.)
2090-CSBM1DF-18AAxx 2090-CSBM1DF-14AAxx	18 (1.0) 14 (2.5)	15.0 (0.59)	105 (4.1)
2090-CSBM1DG-18AAxx 2090-CSBM1DG-14AAxx	18 (1.0) 14 (2.5)		
2090-CSBM1DE-18AAxx 2090-CSBM1DE-14AAxx (series A)	18 (1.0) 14 (2.5)		
2090-CSBM1DE-14AAxx (series B)	14 (2.5)	16.3 (0.64)	114 (4.5)
2090-CSBM1DG-18VAxx 2090-CSBM1DE-18VAxx	18 (1.0)	13.2 (0.52)	92.4 (3.6)
2090-CSBM1DG-14VAxx 2090-CSBM1DE-14VAxx	14 (2.5)	15.2 (0.60)	106.4 (4.2)

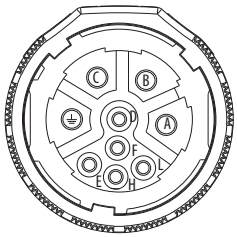
(1) Dimension B is based on the cable diameter. See Bend Radius Definitions on page 3 for more information.

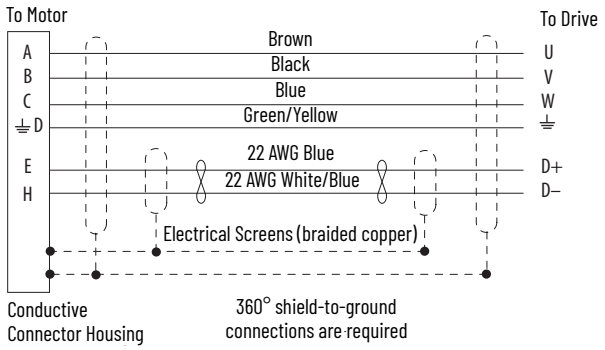
Power/Feedback/Brake Cable Specifications (continuous-flex)

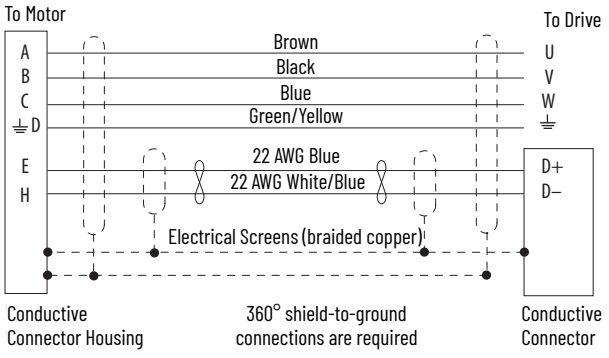
Cable Cat. No.	Wire Size AWG (mm^2)	D mm (in.)	B (1) mm (in.)	Continuous Bend Radius (1) mm (in.)	Continuous Bend Radius Factor	Expected Flex Cycles at Rated Radius
2090-CSBM1DF-18AF*xx* 2090-CSBM1DF-14AF*xx*	18 (1.0) 14 (2.5)	15.0 (0.59) 17.0 (0.67)	105 (4.1) 119 (4.7)	150 (5.9) 170 (6.7)	10x	20 Million
2090-CSBM1DG-18AF*xx* 2090-CSBM1DG-14AF*xx*	18 (1.0) 14 (2.5)	15.0 (0.59) 17.0 (0.67)	105 (4.1) 119 (4.7)	150 (5.9) 170 (6.7)	10x	20 Million
2090-CSBM1DE-18AF*xx* 2090-CSBM1DE-14AF*xx* (series A and B)	18 (1.0) 14 (2.5)	15.0 (0.59) 17.0 (0.67)	105 (4.1) 119 (4.7)	150 (5.9) 170 (6.7)	10x	20 Million
2090-CSBM1DG-18LF*xx* 2090-CSBM1DE-18LF*xx*	18 (1.0)	13.2 (0.52)	92.4 (3.6)	92.4 (3.6)	7x	8 Million
2090-CSBM1DG-14LF*xx* 2090-CSBM1DE-14LF*xx*	14 (2.5)	15.2 (0.60)	106.4 (4.2)	106.4 (4.2)	7x	8 Million

(1) Dimension B and continuous bend radius are based on the cable diameter. See Bend Radius Definitions on page 3 for more information.

Power/Feedback Cable Pinouts (18 and 14 AWG)

<table>
<tr><th>Cable Type</th><th>Cable Cat. No.</th><th>Description</th></tr>
<tr><td>Standard, non-flex</td><td>2090-CSWM1DF-18AAxx, 2090-CSWM1DF-14AAxx,
2090-CSWM1DG-18xAxx, 2090-CSWM1DG-14xAxx</td><td rowspan="2">Motor-end Cable View


● Wire Connection
Shield
Twisted Wire Pair</td><td rowspan="2">


</td></tr>
<tr><td>Standard, non-flex</td><td>2090-CSWM1DE-18xAxx, 2090-CSWM1DE-14xAxx</td></tr>
</table>

Power/Feedback Cable Specifications (standard, non-flex)

Cable Cat. No.	Wire Size AWG (mm^2)	D mm (in.)	B (1) mm (in.)
2090-CSBW1DG-18VA*xx* 2090-CSBW1DE-18VA*xx*	18 (1.0)	12.2 (0.48)	85.4 (3.4)
2090-CSWM1DG-14VA*xx* 2090-CSWM1DE-14VA*xx*	14 (2.5)	13 (0.51)	91 (3.6)
2090-CSWM1DG-18AA*xx* 2090-CSWM1DF-18AA*xx* 2090-CSWM1DE-18AA*xx*	18 (1.0)	15.0 (0.59)	105 (4.1)
2090-CSWM1DG-14AA*xx* 2090-CSWM1DF-14AA*xx* 2090-CSWM1DE-14AA*xx*	14 (2.5)		

(1) Dimension B is based on the cable diameter. See Bend Radius Definitions on page 3 for more information.

Extension Cable Specifications

Cable Cat. No.	Wire Size AWG (mm^2)	D mm (in.)	B (1) mm (in.)	Continuous Bend Radius (1) mm (in.)	Continuous Bend Radius Factor	Expected Flex Cycles at Rated Radius
2090-CSBM1E1-18AF*xx*	18 (1.0)	15.0 (0.59)	105 (4.1)	150 (5.9)	10x	20 Million
2090-CSBM1E1-18LF*xx*		13.2 (0.52)	92.4 (3.6)	92.4 (3.6)	7x	8 Million
2090-CSBM1E1-18VA*xx*				–	–	–
2090-CSBM1E1-14AF*xx* (series A and B)	14 (2.5)	17.0 (0.67)	119 (4.7)	170 (6.7)	10x	20 Million
2090-CSBM1E1-14LF*xx*		15.2 (0.60)	106.4 (4.2)	106.4 (4.2)	7x	8 Million
2090-CSBM1E1-14VA*xx*				–	–	–
2090-CSBM1E1-10AF*xx* (series A) 2090-CSBM1E1-10AF*xx* (series B)	10 (6.0)	19.0 (0.75) 20.3 (0.80)	133 (5.2) 142 (5.6)	190 (7.5) 203 (8.0)	10x	20 Million
2090-CSBM1E1-10LF*xx*		18 (0.70)	126 (5.0)	126 (5.0)	7x	8 Million
2090-CSBM1E1-10VA*xx*				–	–	–
2090-CSBM1E1-08AF*xx*	8 (10.0)	25.0 (0.98)	200 (8.0)	250 (10.0)	10x	6.5 Million
2090-CSBM1E1-08LF*xx*		21.6 (0.85)	151.2 (5.9)	151.2 (5.9)	7x	8 Million
2090-CSBM1E1-08VA*xx*				–	–	–
2090-CSBM1E1-06AF*xx*	6 (16.0)	25.0 (0.98)	200 (8.0)	250 (10.0)	10x	6.5 Million
2090-CSBM1E1-06LF*xx*		24 (0.94)	168 (6.6)	168 (6.6)	7x	8 Million
2090-CSBM1E1-06VA*xx*				–	–	–

(1) Dimension B and continuous bend radius are based on the cable diameter. See Bend Radius Definitions on page 3 for more information.

Kinetix 2090 Cable Length Specifications

To meet the current requirements of motor brake circuits on Kinetix 5700 servo drive systems with cable lengths that exceed 50 m (164 ft), the 2090-CSBM1DE (series B) cables are available with 18 AWG brake conductors. Series B cables are designed for applications with cable lengths from 51 m (167 ft)...90 m (294 ft) and are available in 1.0 m (3.3 ft) increments. For Kinetix 5700 drive systems requiring cable lengths from 1.0 m (3.3 ft)...50 m (164 ft), the 2090-CSBM1DE (series A) cables are still available.

TPE Single Motor Cables

2090-CSxM1D*x*-*xx*AA/AF*xx* single motor cables use TPE cable material.

TPE Flying-lead Motor Cables

Cable Cat. No.	Drive Compatibility	Brake Conductors AWG (mm^2)	Available Cable Length, max (1) m (ft)
2090-CSBM1DF (series A and B)	Kinetix 5500	22 (0.34)	50 (164)
2090-CSBM1DG	Kinetix 5500 and Kinetix 5700	22 (0.34)	
2090-CSBM1DE-18	Kinetix 5700	22 (0.34)	90 (294)
2090-CSBM1DE-14 (series A) 2090-CSBM1DE-10 (series A)			50 (164)
2090-CSBM1DE-14 (series B) (2) 2090-CSBM1DE-10 (series B) (2)		18 (1.0)	90 (294)
2090-CSBM1DE-08 2090-CSBM1DE-06			

(1) The maximum cable length between the drive and the motor varies, depending on the application, but never exceeds 50 m (164 ft) for Kinetix 5500 drives and 90 m (295 ft) for Kinetix 5700 drives. For details, see Additional Resources on page 10 for the publication number of your servo drive user manual.
(2) Series B cables are used in applications with cable lengths from 51 m (167 ft)...90 m (294 ft).

TPE Extension Motor Cables

Cable Cat. No.	Drive Compatibility	Brake Conductors (series B) AWG (mm^2)	Brake Conductors (series A) AWG (mm^2)	Available Cable Length, max m (ft)
2090-CSBM1E1-18	Kinetix 5500 and Kinetix 5700	–	22 (0.34)	30 (98.4)
2090-CSBM1E1-14		18 (1.0)	22 (0.34)(1)	
2090-CSBM1E1-10				

(1) Series B cables replace series A cables. These series A cables are no longer offered.

Halogen-free PUR and PVC Single Motor Cables

2090-CSxM1D*x*-*xx*VA/LF*xx* single motor cables use halogen-free PUR and PVC cable material.

Halogen-free PUR and PVC Flying-lead Motor Cables

Cable Cat. No.	Drive Compatibility	Brake Conductors AWG (mm^2)	Available Cable Length, max [1] m (ft)
2090-CSBM1DG-18	Kinetix 5500 and Kinetix 5700	22 (0.34)	50 (164)
2090-CSBM1DG-14 2090-CSBM1DG-10		18 (1.0)	
2090-CSBM1DE-18	Kinetix 5700	22 (0.34)	90 (294)
2090-CSBM1DE-14 2090-CSBM1DE-10		18 (1.0)	
2090-CSBM1DE-08 2090-CSBM1DE-06		16 (1.5)	

(1) The maximum cable length between the drive and the motor varies, depending on the application, but never exceeds 50 m (164 ft) for Kinetix 5500 drives and 90 m (295 ft) for Kinetix 5700 drives. For details, see Additional Resources on page 10 for the publication number of your servo drive user manual.

Halogen-free PUR and PVC Extension Motor Cables

Cable Cat. No.	Drive Compatibility	Brake Conductors AWG (mm^2)	Available Cable Length, max [1] m (ft)
2090-CSBM1E1-18	Kinetix 5500 and Kinetix 5700	22 (0.34)	30 (98.4)
2090-CSBM1E1-14 2090-CSBM1E1-10		18 (1.0)	
2090-CSBM1E1-08 2090-CSBM1E1-06		16 (1.5)	

(1) The maximum cable length between the drive and the motor varies, depending on the application, but never exceeds 50 m (164 ft) for Kinetix 5500 drives and 90 m (295 ft) for Kinetix 5700 drives. For details, see Additional Resources on page 10 for the publication number of your servo drive user manual.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Resource	Description
Kinetix Rotary Motion Specifications, publication KNX-TD001	Product specifications for Kinetix VPL, VPC, VPF, VPH, and VPS; Kinetix MPL, MPM, MPF, and MPS; Kinetix TLY and TL; Kinetix HPK; and Kinetix MMA rotary motors.
Kinetix Linear Motion Specifications, publication KNX-TD002	Product specifications for Kinetix MPAS and MPMA linear stages, Kinetix MPAR and MPAI electric cylinders, and Kinetix LDC and LDL linear motors.
Kinetix 5700, 5500, 5300, 5100 Servo Drives Specifications, publication KNX-TD003	Provides product specifications for Kinetix Integrated Motion over the EtherNet/IP network and EtherNet/IP networking servo drive families.
Kinetix Rotary and Linear Motion Cable Specifications Technical Data, publication KNX-TD004	Product specifications for Kinetix 2090 motor and interface cables.
Kinetix Servo Drive Performance Specifications per Ecodesign Regulation (EU) 2019/1781 technical data, publication KNX-TD006	Provides energy efficiency performance data for Rockwell Automation Kinetix Servo drives. This data supports IE2 compliance of Kinetix Servo drives per EU 2019/1781.
Kinetix Halogen-free PUR and PVC Single Motor Cables Quick Reference, publication 2090-QR002	Provides product specifications comparing 2090-CSBM1xx-xxLFxx (Halogen-free PUR) and 2090-CSxM1xx-xxVAxx (PVC) single motor cables.
Kinetix Motion Control Selection Guide, publication KNX-SG001	Overview of Kinetix servo drives, motors, actuators, and motion accessories designed to help make initial decisions for the motion control products best suited for your system requirements.
Kinetix 5500 Servo Drives User Manual, publication 2198-UM001	Provides information on installing, configuring, startup, troubleshooting, and applications for your servo drive system.
Kinetix 5700 Servo Drives User Manual, publication 2198-UM002	
System Design for Control of Electrical Noise Reference Manual, publication GMC-RM001	Provides information, examples, and techniques designed to minimize system failures caused by electrical noise.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.