Installation Instructions

Original Instructions

Allen-Bradley by ROCKWELL AUTOMATION

CENTERLINE 2100 Motor Control Center Units with Horizontal Operating Handles

Catalog Number 2100

About This Publication

Use these instructions to install CENTERLINE® 2100 MCC units with horizontal operating handles.

ATTENTION: All covers and doors must be in place before you apply power to the MCC. If units are removed, they must be replaced with the appropriate items such as units, doors, and unit support pans. If the unit is not replaced, the arc-resistant rating does not apply.

For more information on the CENTERLINE 2100 Motor Control Center (MCC), refer to the CENTERLINE 2100 Low Voltage Motor Control Centers Instruction Manual, publication 2100-IN012.

To install units with vertical operating handles, refer to the CENTERLINE 2100 Motor Control Center (MCC) Units with Vertical Operating Handles Installation Instructions, publication 2100-IN014.

Rockwell Automation

Important User Information

Read this document and the documents that are 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 the requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, put 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 that is 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 that are 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. regarding the 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 causes severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

Before You Begin

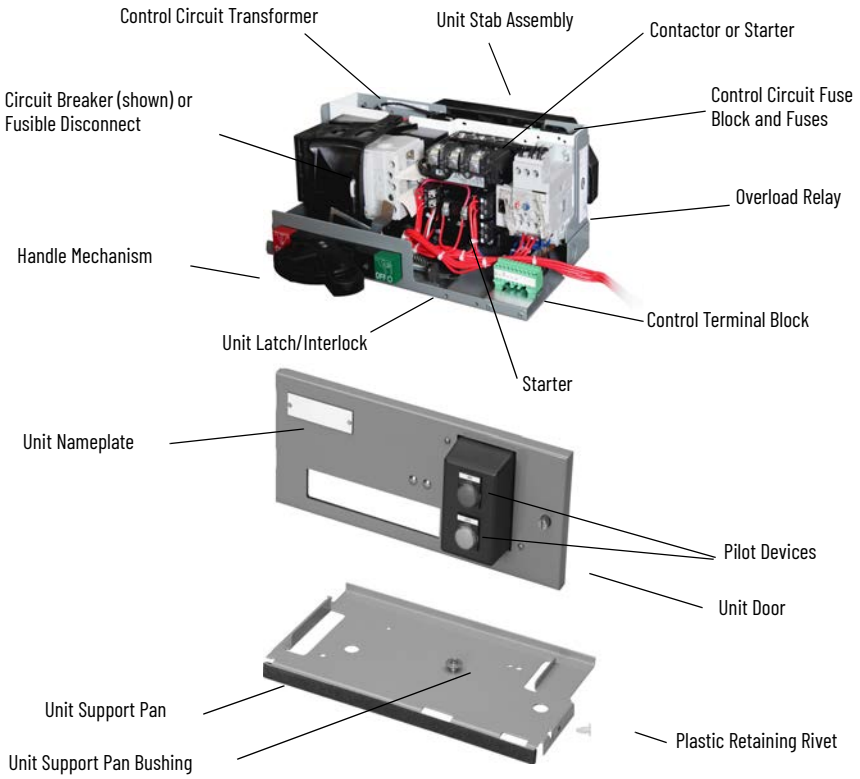
Follow this procedure before you begin installing your unit.

1. Remove all packaging material from the unit.
2. Read the unit installation instructions.
3. Manually exercise all switches, control auxiliary switches, circuit breakers, their respective operators, unit interlocks, trip mechanisms (test by pushing the 'Push to Trip' button), and any other operating mechanisms to verify proper operation.

IMPORTANT Plug-in units with horizontal operating handles cannot be used in sections with series letters A...D. In sections with series letters E...J, these units can be plugged into only the top 5.5 space factors. There is no vertical bus in the bottom 0.5 space factor.

IMPORTANT Sections with series letters E...J require retrofit kit, catalog number 2100H-R1, for 0.5 space factor, or catalog number 2100H-R2 for 1.0 or larger space factor. See CENTERLINE 2100 Motor Control Centers Retrofitting Units with Horizontal Operating Handles into Series E...J Sections, publication 2100-IN065, for more information.

ATTENTION: When you install units for CENTERLINE 2100 Motor Control Centers (MCC) with ArchShields™ baffles, you must make sure that you are installing a unit that has the same arc resistance rating as the MCC in which it is being installed. Units that are not 100 ms arc-duration-rated, or not device limited with bus ratings of at least 1600 A, must not be installed in sections that are 100 ms arc-duration-rated, or device limited with bus ratings of at least 1600 A. If the incorrect unit is installed, the arc-resistant rating does not apply. The 0.5 space factor units and doors are not available in ArcShield units that are 100 ms arc-duration-rated or device limited with bus ratings of at least 1600 A. Do not use 0.5 space factor units in 100 ms arc-duration-rated or device limited with bus ratings of at least 1600 A, MCC sections.



Recommended Tools

We recommend having a screwdriver available for installation.

You need a 5/16 in. and a 3/8 in. socket wrench for installing ArcShield units.

Ground the Unit

Follow this procedure to ground the unit.

ATTENTION: If this unit is installed in a series E...J section without a vertical plug-in ground bus, it is necessary to either install a vertical plug-in ground bus kit, catalog number 2100H-GS1, 2100H-79U, or 2100H-79UT, or ground the unit to the structure ground bus.
Follow NFPA 70E safety guidelines when working on energized equipment.
To avoid personal injury and damage to the unit, be certain that the unit operating handle is in the OFF/O position before proceeding.

1. Determine the minimum size grounding-conductor required from the following table.

Grounding Connector (Minimum size #AWG)	Current Ratings (A)	Horsepower Rated Units (NEMA Size)
10	0...60	1, 2
8	61...100	3
6	101...200	4
4	201...300	5
3	301...400	-

2. To ground the unit to the structure ground bus, attach a unit grounding conductor between the unit chassis and the structure ground bus.

The size of the grounding connector is based on the unit current rating.

Install the Unit Support Pan

Follow this procedure to install the support pan.

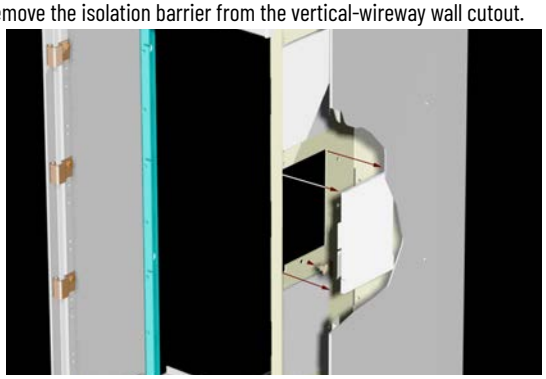
IMPORTANT The unit support pans above (or wireway pan for the topmost units in a section) and below the unit compartment must be in place before installing the unit.

ATTENTION: All covers and doors must be in place before you apply power to the MCC. If units are removed, they must be replaced with the appropriate items such as units, doors, and unit support pans.

ATTENTION: If power sources are connected to the motor control center, use extreme caution when you insert units. All buses and the line sides of the inserted units are energized, and contact with these parts can cause injury and death.
Follow NFPA 70E safety guidelines when working on energized equipment.

1. For ArcShield sections with 100 ms arc duration rating, and device limited with bus ratings of 1600 A and above, remove the vertical wireway baffle and set aside for installation later.

2. If present, remove the isolation barrier from the vertical-wireway wall cutout.

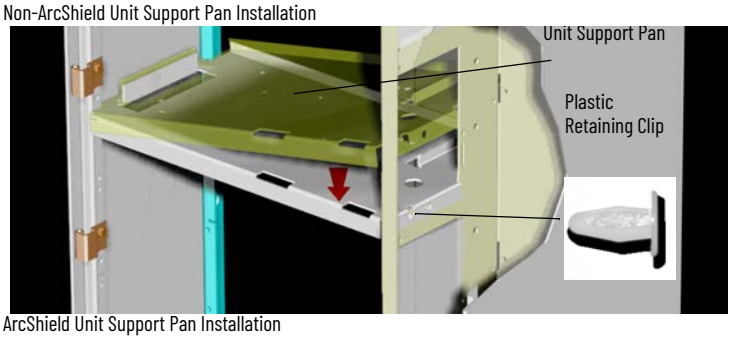


3. De-energize the unit in the space below where the unit support pan is to be installed.
4. Open the unit door above and below where the unit support pan is to be installed.
5. Place the unit support pan into the unit space, hold the right side of the support pan approximately 4 in. (102 mm) higher than the left side.
6. Place the left front corner of the support pan into the slot on the front of the left sidesheet flange.
7. Place the left rear corner of the support pan into the slot of the left sidesheet C-channel.
8. Lower the right edge of the unit support pan into the vertical-wireway wall cutout, and press down firmly.
9. Secure the support pan.

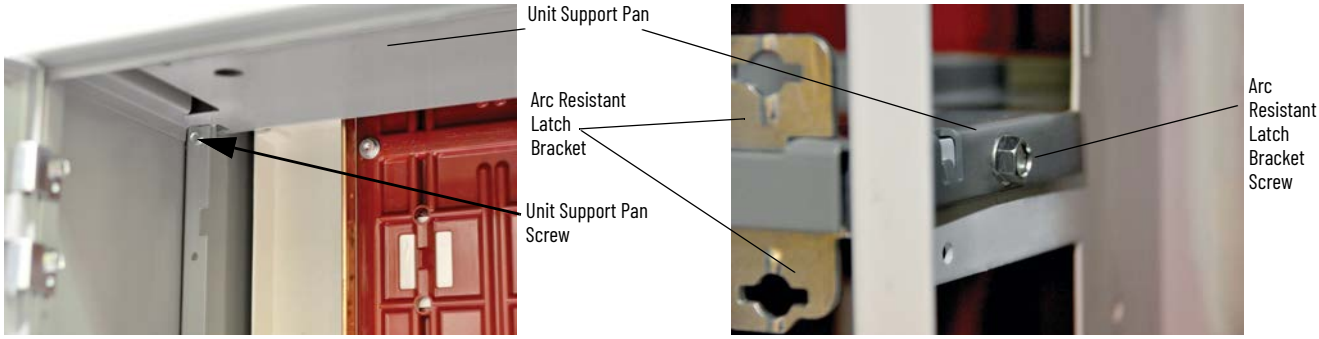
See the table for more instructions.

For	Follow This Step
Non-ArcShield units	Insert the white plastic retaining-clip through the holes in the vertical wireway wall and pan. Work from inside the vertical wireway as shown. See Non-ArcShield Unit Support Pan Installation.
All ArcShield units	Secure the unit support pan to the right unit support with the ¼-20 self-tapping screw that is supplied with the bracket. Tighten to 55 lb•in (6 N•m) with a 3/8 in. socket wrench. See ArcShield Unit Support Pan Installation.
ArcShield units that are 100 ms arc-duration-rated or device limited with bus ratings of at least 1600 A	Secure the left-rear corner of the unit support pan with a 10-32 self-tapping screw and tighten to 32 lb•in. (3.6 N•m) by using a 5/16 in. socket wrench.

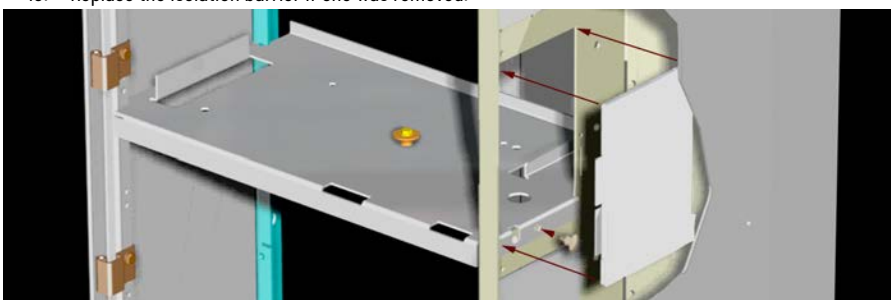
Non-ArcShield Unit Support Pan Installation



ArcShield Unit Support Pan Installation



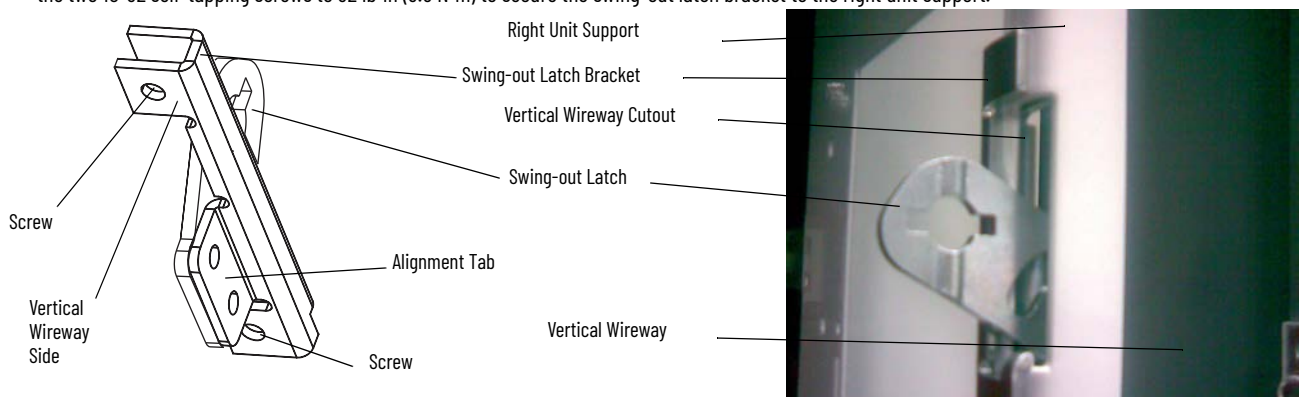
10. Replace the isolation barrier if one was removed.



Install Swing-out Latch Brackets

Swing-out latch brackets are used on all latch positions for all units with horizontal handles.

1. Work from the inside of the vertical wireway cutout and place the swing-out latch bracket on the back of the front flange of the right unit support.
2. Align the latch bracket with the slot in the right unit support so that the alignment tab of the bracket is resting on the bottom of the slot.
3. Work from the inside of the vertical wireway and tighten the two 10-32 self-tapping screws to 32 lb•in (3.6 N•m) to secure the swing-out latch bracket to the right unit support.



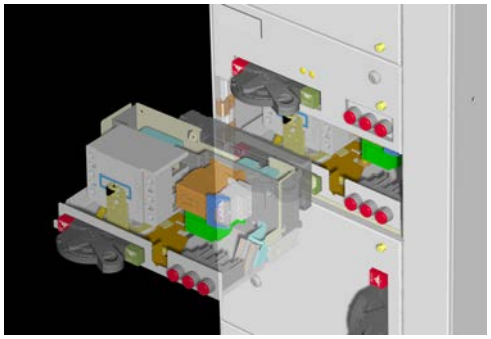
Install the Unit

Follow this procedure to install the unit.

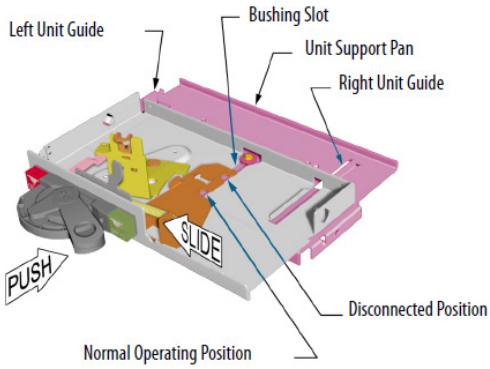
ATTENTION: De-energize all units before installing or removing.
When you install or remove MCC units, when possible, de-energize, lockout, and tag-out all sources of power to the MCC. If the MCC units are installed or removed with power that is applied to the main power bus, follow established electrical safety work practices. See the NFPA 70E Standard for Electrical Safety in the Workplace publication.
Review your company safety lockout and tag-out procedure.
If power sources are connected to the motor control center, use extreme caution when you insert units. All buses and the line sides of the inserted units are energized, and contact with these parts can cause injury or death.
All covers and doors must be in place before you apply power to the MCC. If units are removed, they must be replaced with the appropriate items such as units, doors, and unit support pans.

ATTENTION: Plug-in MCC units can be heavy or awkward to handle. Use an assistant or a platform lift device if necessary to help you handle the unit.

1. Remove the protective caps from the stab openings or open the manual shutters if present (automatic shutters open as the units are inserted).
   Reposition your hands as necessary to properly support the unit while you are installing the unit into the MCC.
2. Place the unit on the bottom unit-support pan, slide the unit interlock to the left, and push the unit into the section until it is in the desired position, then release the unit interlock.



Unit devices have been omitted for clarity.



IMPORTANT There are two positions available (normal operating and disconnected). In the normal operating position, the power and ground stabs are connected to their respective busses. In the disconnected position, the unit is partially removed from the MCC and the intermediate slot in the interlock plate is in line with the bushing that is located in the unit support pan. When the unit is locked in this position, the unit power and ground stabs are disengaged. This position can be used to help prevent insertion of a unit into the MCC.

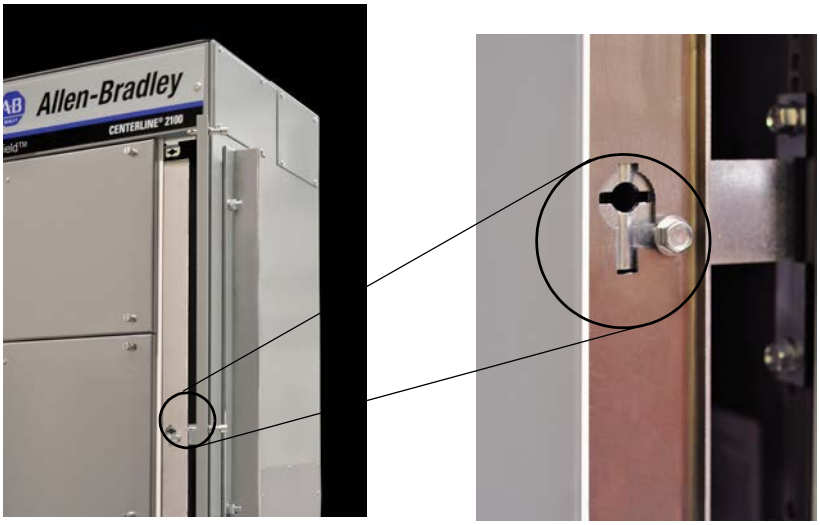
ATTENTION: For proper operation of the latch/interlock mechanism, a style 3 unit-support pan with bushing must be used below the unit. If the unit support pan with bushing is not used, the unit could be removed under load, which can result in injury or death.

For the CENTERLINE 2100 MCC units with swing-out door latches, it is necessary to rotate the movable portion of the latch bracket to a vertical orientation to avoid interference when installing the unit.

IMPORTANT Be sure to comply with the National Electric Code 6.7 ft (2 m) unit handle-to-floor height limitation, as identified in NEC 2005 Article 404.8(A) and UL standard 845, for units in the topmost location of a vertical section.

A unit operating-handle extender kit, catalog number 2100H-NE1, is available for any handles higher than 6.7 ft (2 m) off the ground.

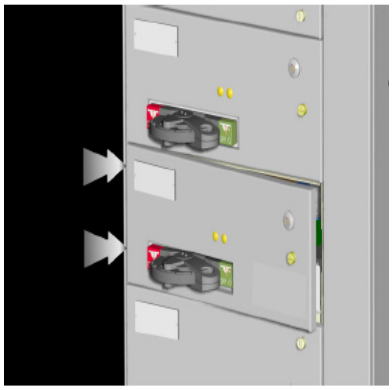
3. Install other cables or devices.
4. For ArcShield sections that are 100 ms arc-duration-rated and device limited with bus ratings of at least 1600 A, replace the vertical wireway baffle.



Install the Door

Follow these procedures to install the door.

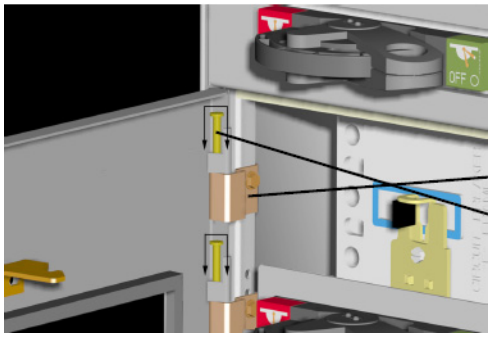
1. Position the door over the unit opening while holding the right side of the door slightly toward you and push in the left side until it is flush with the front of the structure.



2. Swing the door open and slide each hinge pin through the door and structure hinges.

For Units With	Follow This Step
A control station	Slide the hinge pin through the tab on the control station wiring first, then into the closest hinge.
ArcShield units that are 100 ms arc-duration-rated or device limited with bus ratings of at least 1600 A	Two hinges are required for each hinge leaf. 1. The upper hinge on each door must be removed from the structure to install/remove the uppermost hinge pin. 2. Insert the hinge pin through the upper hinge, then through the hinge leaf and lower hinge. 3. Install the upper hinge on the MCC structure with the ¼-20 self-tapping screw that is provided and tighten to 55 lb•in (6 N•m) with a 3/8 in. socket wrench.

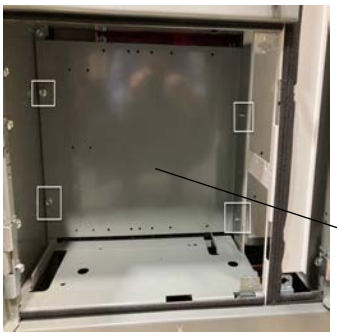
Hinge for Standard Units and ArcShield Units with Device Limited Rating with a maximum bus size of 1200 A



Hinge for ArcShield Units with 100 ms Arc Duration Rating and Device Limited with bus ratings of at least 1600 A

3. If a control station is present, place it in the door cutout and tighten the captive screws.

ATTENTION: For all MCCs with a bus of 1600 A and above, blank doors must have an isolation plate that is installed over the vertical bus support. Failure to do so will void the Arc Resistant rating. Consult with Rockwell Automation for more information.



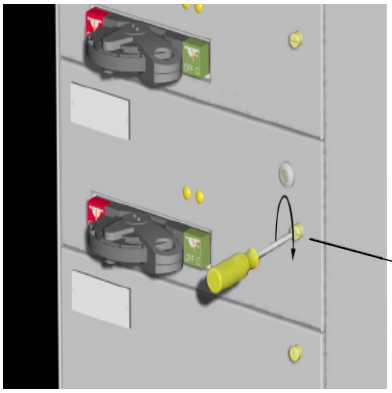
4. Rotate the movable portion of the swing-out latch bracket in the counter-clockwise direction unit it stops, close the door, and secure the latch.

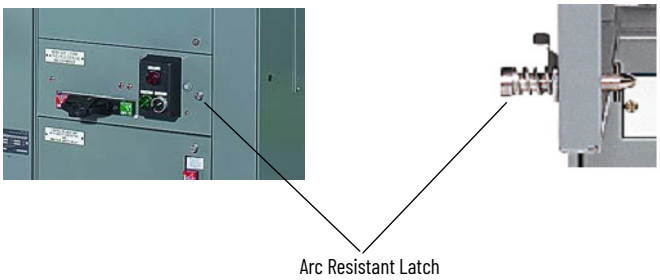
See CENTERLINE 2100 Low Voltage Motor Control Centers Instruction Manual, publication 2100-IN012, for more information on proper door latch orientations.

For	Follow This Step
Non-arc resistant latches	Turn each door latch ¼ turn until it catches on the unit support pan or structure and holds the door closed.
Units that are equipped with arc-resistant door latches	Orient the slot of the latch so that it is horizontal, then push in the latch and rotate ¼ turn.

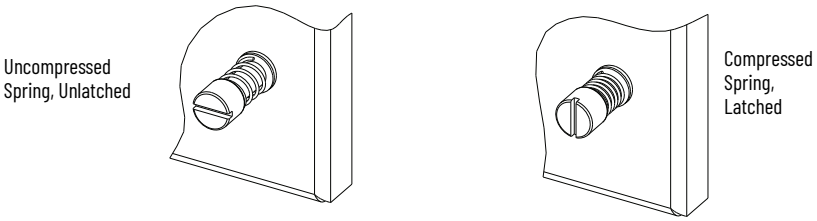
Latches can require a flat-head screwdriver to open and close.

IMPORTANT If this unit is installed in a series E...J section, it is necessary to install a longer latch assembly to latch into the wireway opening. The latch is included in the plug-in unit retrofit kit, catalog number 2100H-R1, or 2100H-R2.





When properly latched, the slots on the arc-resistant latches are vertical and the latch springs are compressed. The spacing of the spring coils is decreased.



Additional Resources

These documents contain more information about related products from Rockwell Automation.

Resource	Description
CENTERLINE 2100 Low Voltage Motor Control Centers Instruction Manual, publication 2100-IN012	Provides general instructions for MCC Units.
CENTERLINE 2100 Motor Control Center Units with Vertical Operating Handles, publication 2100-IN014	Provides information on the installation of units with vertical operating handles.
Safety Guidelines for the Application, Installation, and Maintenance of Solid- state Control Installation Instructions, publication SGI-1.1	Provides safety guidelines for the application, installation, and maintenance of solid-state control.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation® industrial system.
Product Certifications website, http://www.rockwellautomation.com/products/certification	Provides declarations of conformity, certificates, and other certification details.

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

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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Waste Electrical and Electronic Equipment (WEEE)

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

Rockwell Otomasyon Ticaret A.Ş. Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400 EEE Yönetmeliğine Uygundur

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AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2663 0600, Fax: (32) 2 663 0640
ASIA PACIFIC: Rockwell Automation SEA Pte Ltd, 2 Corporation Road, #04-05, Main Lobby, Corporation Place, Singapore 618494, Tel: (65) 6510 6608, FAX: (65) 6510 6699
UNITED KINGDOM: Rockwell Automation Ltd., Pitfield, Kiln Farm, Milton Keynes, MK11 3DR, United Kingdom, Tel: (44)(1908) 838-800, Fax: (44)(1908) 261-917

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