Model 6 Motor Control Centers

Quick Start Guide

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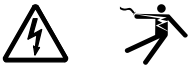
Safety Information

Read these instructions carefully and examine the equipment to become familiar with the device before attempting to install, operate, service, or maintain it. The following special messages may appear throughout this user guide or on the equipment to warn of hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

NOTE: Provides additional information to clarify or simplify a procedure.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Electrical equipment should be transported, stored, installed, and operated only in the environment for which it is designed.

Introduction

This bulletin contains instructions on handling, installing, maintaining, and modifying, a new Model 6 Motor Control Center (MCC).

Additional information related to expanding a Model 6 MCC, retrofit of various components in a Model 6 MCC, and other related topics can be found in instruction bulletin 80459-641-01, Model 6 Motor Control Centers.

Arc-Rated MCC

The arc-rated Model 6 MCC has a device-limited arc resistant rating up to 65 kA at 600 V. The rating requires specific up-stream circuit protection. For information on up-stream protective device requirements, see instruction bulletin 80459-641-01, Model 6 Motor Control Centers.

Safety Precautions

Carefully read and follow the safety precautions before attempting to lift, move, install, use, or maintain Model 6 MCCs and their components.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Qualified electrical personnel must perform work in accordance with all applicable national and local electrical codes.
- Perform such work only after reading and understanding all of the instructions contained in this bulletin.
- Turn off all power supplying this equipment before working on or inside equipment.
- Assume that all circuits are live until they have been completely deenergized, tested, locked out, and/or tagged out. Pay particular attention to the design of the power system. Consider all sources of power, including the possibility of backfeeding.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

POTENTIAL COMPROMISE OF SYSTEM AVAILABILITY, INTEGRITY, AND CONFIDENTIALITY

- Change default passwords to help prevent unauthorized access to device settings and information.
- Disable unused ports/services and default accounts, where possible, to minimize pathways for malicious attacks.
- Place networked devices behind multiple layers of cyber defenses (such as firewalls, network segmentation, and network intrusion detection and protection).
- Use cybersecurity best practices (for example: least privilege, separation of duties) to help prevent unauthorized exposure, loss, modification of data and logs, interruption of services, or unintended operation.

these instructions can result in death, serious injury, equipment damage, or data loss.

⚠ **WARNING:** This product can expose you to chemicals including Nickel compounds, which are known to the State of California to cause cancer, and Bisphenol A (BPA), which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Moisture Contamination Avoidance and Mitigation

This bulletin provides supplemental instructions for moisture contamination avoidance and mitigation. Please read and follow the instructions in this addendum before performing the instructions in the product manual.

Safety Precautions

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Store the equipment in a clean, dry (including no condensation), well-ventilated area with an ambient temperature of approximately 70°F (21°C).
- If heaters are furnished in the assembly, energize them from an external source. When energizing heaters from an external source, remove the primary and secondary overcurrent protective devices from the control power transformer.
- If heaters are not installed in the assembly, and the area is cold and damp, use a temporary heating source within the assembly. A range of 200–250 watts of heat per section is recommended.
- Avoid greasy, smoky heaters that can deposit carbon on insulation, which could lead to tracking and insulation breakdown.
- If moisture, condensation, or chemical ingress is observed, do not energize the equipment. If the equipment is already energized, de-energize it immediately.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

FIRE HAZARD

Remove all flammable material in the vicinity of the heaters, such as packaging, accessories in boxes, and documentation, before energizing the heaters.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Shipping, Receiving, and Storage Requirements

This equipment does not achieve its ratings until it is installed per record/as-built drawings, installed per the instructions contained in this document, and has operational environmental controls with appropriate settings to help mitigate environmental influences. This equipment can also be stored in a climate controlled area that uses both heating and cooling to maintain acceptable environmental conditions. Indoor and outdoor rated equipment is not suitable for outdoor storage.

- The equipment should be treated as if it is in storage until it is installed and operational. The storage area should be clean, dry (75% or less relative humidity), and climate controlled with proper ventilation.

- To keep the equipment dry, the use of heaters is required in some cases (for example, during seasonal or low periods of electrical loading and equipment de-energization).
  - Consult the Engineer of Record for the appropriate environmental control settings or means to mitigate environmental influences.
  - If so equipped, ensure that the thermostats and/or humidistats are set to mitigate condensation. A range of 200–250 watts of heat per section is suggested.
  - If heaters are being used with the equipment that were not included in the equipment by Schneider Electric, they must be clean and free of debris and grease. Greasy and/or smoky heaters can contaminate electrical insulation and lead to dielectric breakdown and/or tracking.
- Shipping packaging is not suitable for and cannot be used by itself for equipment storage unless otherwise indicated on the shipping packaging labeling.
- When receiving equipment, the equipment may be at a lower temperature than the ambient air temperature. Allow time for the equipment temperature, including the temperature of internal components, to rise to the ambient air temperature before making openings in or otherwise disturbing the packaging. Condensation can occur on and inside the equipment if warm air contacts cold surfaces of the equipment. Moisture damage can occur, destroying the dielectric capabilities of the equipment and rendering it unusable.
- The factory shipping wrap around the equipment on shipping pallets is not suitable for non-enclosed over-the-road transportation that risks exposing the equipment to the elements. The factory shipping wrap around the equipment should remain on the equipment until the equipment is ready to be inspected and stored or inspected and installed. After receiving the equipment and allowing it to acclimate to the environment, remove the packaging and inspect the equipment for damage that may have occurred in transit. If damage is found or suspected, immediately file a claim with the carrier and notify a Schneider Electric representative.
- Follow these guidelines every time the equipment is moved to a new storage location or to its final destination.

Installation, Operation, and Maintenance Requirements

This equipment does not achieve its ratings until it is installed per record/as-built drawings, installed per the instructions contained in this document, and has operational environmental controls with appropriate settings to help mitigate environmental influences. This equipment can also be operated in a climate controlled area that uses both heating and cooling to maintain acceptable environmental conditions. Indoor and outdoor rated equipment is not suitable for outdoor storage.

In some cases (such as seasonal electrical loading, de-energized equipment, and standby/alternate power sources), the heat generated by equipment loading is insufficient to prevent condensation and alternate heat sources are required. If environmental controls such as a thermostat or humidistat are used, ensure their settings are sufficient to mitigate condensation and remain operational at all times. Consult the Engineer of Record for the appropriate environmental control settings.

Exposure to Moisture, Chemicals, and Condensation

If liquids such as moisture, chemicals, and condensation contact the electronics, circuit breaker, fuses, bussing, or other electrical components, do not attempt to clean or repair the equipment as this may lead to unrepairable damage. If the equipment is energized, de-energize it. If equipment is not energized, do not energize it. Contact the Schneider Electric Customer Care Center at 888-778-2733.

Technical Documentation for Individual Devices

⚠⚠DANGER

HAZARD OF INCORRECT OPERATION OR CIRCUIT PROTECTION

Before setup or adjustment of any circuit protection or control device, read and understand the specific instructions for the device.

Failure to follow these instructions will result in death or serious injury.

Model 6 MCCs contain a wide variety of control and power distribution devices, for example, variable frequency drives, circuit breakers, overload relays. Proper configuration and adjustment of these devices is critical to the function of the MCC and the control and protection of electrical loads. Technical documentation for each Individual device is available from the Schneider Electric Download Center.

The Schneider Electric Customer Care Center may also be called at 888-778-2733, Monday–Friday, 8:00 a.m. to 8:00 p.m. ET., or contact a local Schneider Electric representative.

Schneider Electric Literature List

The following Schneider Electric publications may be useful in the maintenance and regular operation of the Model 6 MCC. A local Schneider Electric representative can provide them upon request. Or, download these documents from the Schneider Electric Download Center.

Additional instructional documents are listed in instruction bulletin 80459-641-01, Model 6 Motor Control Centers.

Technical support is available Monday through Friday from 8:00 AM to 8:00 PM ET. Call 888-778-2733.

Table 1 - MCC-Related Literature

Document Number	Title	URL	QR Code
80459-641-01	Model 6 MCC Instruction Bulletin	se.com/us/en/download/document/80459-641-01	
80459-654-01	Model 6 Arc-Rated Motor Control Centers	se.com/us/en/download/document/80459-654-01	
80459-655-01	Closed Door Racking (CDR) Unit for Square D™ Model 6 Low Voltage Motor Control Center	se.com/us/en/download/document/80459-655-01	
80459-656-01	1600 A Splice Instructions for Model 6 Motor Control Centers	se.com/us/en/download/document/80459-656-01	
80466-258-01	Installing a Pull Box Kit into the Square D Model 6 Arc Rated (AR) Motor Control Center (MCC)	se.com/us/en/download/document/80466-258-01	

Receiving, Handling, and Storing the MCC

See requirements for Moisture Contamination Avoidance and Mitigation, page 10 for additional information on receiving and inspecting electrical equipment.

Most MCCs are shipped in one-, two-, or three-section shipping blocks with the MCC sections laying on their side on a pallet. At the customer's request, MCCs can be shipped in a standing position. Some heavier MCC sections are only shipped in a standing position.

Receiving the MCC

Inspect the MCC for damage as soon as it is received. Delivery of the equipment to a carrier at any of the Schneider Electric plants or other shipping point constitutes delivery to the purchaser. Title and all risk of loss or damage in transit shall pass to the purchaser at that time. Refer to the Schneider Electric Conditions of Sale for more details. All claims for loss and damage must be made by the purchaser to the carrier.

If the packaging material is removed, replace it for protection until the MCC is installed.

Handling the MCC

⚠WARNING

TIP OVER HAZARD

- Before installing or uninstalling this product, read and follow the product instructions for handling.
- This product has a high center of gravity. Use properly rated lifting equipment to move the product and prevent tipping.
- During the installation, secure the product to the mounting surface. Follow instructions in Securing Structures to the Floor.
- This product must be handled and installed only by qualified personnel.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Equipment Needed

Adequate equipment, such as a fork truck, crane, or rods and pipe rollers, must be available for handling MCCs. Approximate MCC Shipping Weights, page 15 lists the approximate shipping weights of sections equipped with typical units. For more exact shipping weights for the particular set-up, contact the MCC Technical Assistance Group at 800-634-2003.

Table 2 - Approximate MCC Shipping Weights

Enclosure Type		Depth	One Section	Two Sections	Three Sections
1, 1A, 12		15 in. (381 mm)	600 lb (272 kg)	1200 lb (544 kg)	1800 lb (816 kg)
3R Non-Walk-In		15 in. (381 mm) (26.6 in. / 676 mm overall)	900 lb (408 kg)	1800 lb (816 kg)	2700 lb (1225 kg)
1, 1A, 12		20 in. (508 mm)	750 lb (340 kg)	1500 lb (680 kg)	2250 lb (1021 kg)
3R Non-Walk-In		20 in. (508 mm) (31.6 in. / 803 mm overall)	1050 lb (476 kg)	2100 lb (953 kg)	3150 lb (1429 kg)
18-Pulse Drive	50 in. W (1270 mm)	20 in. (508 mm)	N/A	2107 lb (956 kg)	—
	65 in. W (1651 mm)			2816 lb (1277 kg)	

Moving the MCC

⚠WARNING

TIP OVER HAZARD

While moving the MCC:

- Follow all manufacturer-specified instructions and precautions when moving heavy equipment.
- Verify that the moving equipment is rated to handle the weight.
- Fork trucks, when available, provide a convenient method of moving MCCs. Use extended forks when lifting 42 in. (1067 mm), minimum.
- Secure the load to the lifting equipment before moving.
- When removing an MCC from a shipping pallet, carefully balance and secure it using a properly rated strap.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

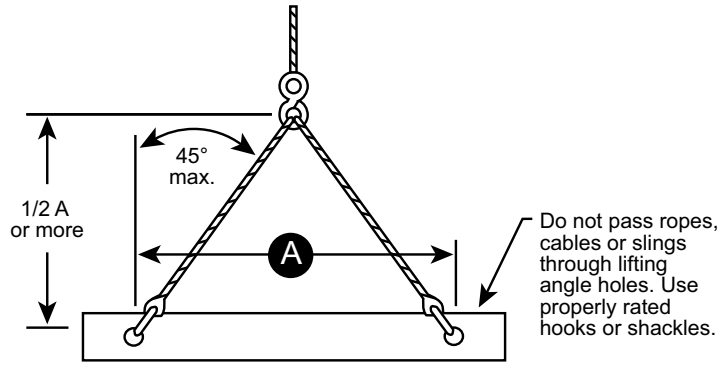
⚠WARNING

HANDLING AND LIFTING HAZARD

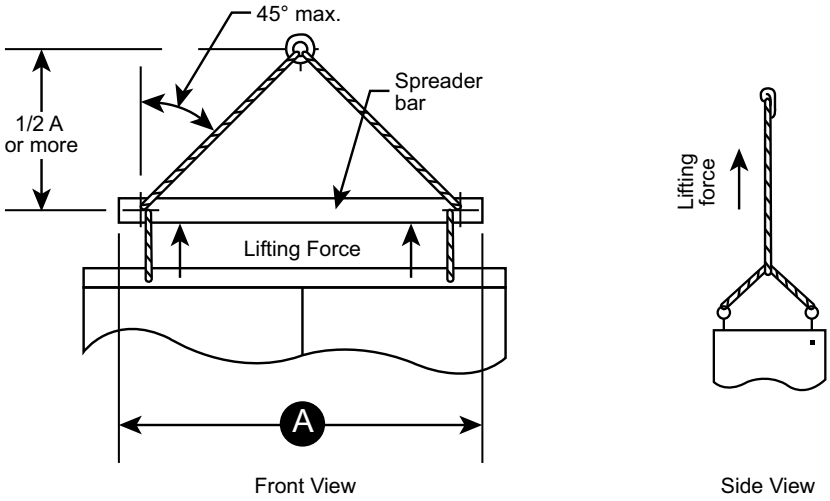
- Product must only be lifted by qualified personnel.
- Keep area below equipment clear of any personnel or property.
- Inspect lifting angle for any damage. Do not lift if damage is found.
- Select rigging lengths to compensate for unequal weight distribution.
- Limit sling angle to less than 45° maximum angle between the vertical and lifting cables (see Proper Use of Sling to Lift MCCs).
- Do not pass ropes, cables or slings through lifting angle holes. Use properly rated hooks or shackles.
- Use only properly rated lifting equipment to lift product.
- Lift from upright position only. Keep lifting force vertical.
- Do not attempt to lift or attach lifting means to sections equipped with pull boxes.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Figure 1 - Proper Use of Sling to Lift MCCs



Single Lifting Angle



Two Lifting Angles

The lifting angle(s) on standard Model 6 MCCs may be removed and discarded. On arc rated MCCs, MCC sections with ArcBlok main breakers, or MCCs with ventilated top plates, the lifting angle(s) must be removed. To prevent entrance of foreign materials, replace all hardware that secured the lifting angle.

Plug-In Units

Some MCC units can weigh up to 200 pounds and require two or more persons or special handling equipment. Lift only by supporting bottom and/or side panels of the unit. Refer to instruction bulletin 80459-641-01, Model 6 Motor Control Centers, for details on unit installation and removal and additional lifting information.

Storing the MCC

NOTICE
HAZARD OF MOISTURE INGRESS AND CORROSION Never store MCCs outdoors. Outdoor storage is inadequate, even with the protection of a tarpaulin. **Failure to follow these instructions can result in equipment damage.**

If the MCC cannot be placed into service upon receipt, store it in a clean, dry, ventilated building free from temperature extremes.

See requirements for Moisture Contamination Avoidance and Mitigation, page 10 for additional information on storage of electrical equipment.

Installing the MCC

This section explains how to locate, install, and join Model 6 MCC enclosures, and how to splice power and ground bus. Refer to MCC front elevation drawings supplied by Schneider Electric for location/placement of shipping splits/sections within each MCC line-up.

Locating the MCC

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.
- When moving MCC sections, follow the instructions in Handling the MCC. The MCC has a high center of gravity, which may cause it to tilt.
- MCC structures must be secured to the mounting surface. Follow instructions in Securing Structures to the Floor.

Failure to follow these instructions will result in death or serious injury.

MCCs are designed for use in non-hazardous locations. Choose a location for installation that is well ventilated and free from excess humidity, dust, and dirt. The temperature of the area should be no less than 0°C (32°F) and no greater than 40°C (104°F). Protect the MCC from the entrance of water or any moisture. If necessary, protect the MCC from condensation by ordering internal space heaters.

Space Requirements

Install MCCs in an area with a minimum of 3 ft. (0.9 m) of free space in front of front-of-board construction. An additional 3 ft. (0.9 m) is necessary in the rear of back-to-back construction. This free space provides adequate room to remove and install units. (More space may be required for some applications; refer to applicable local and national installation codes.) Provide at least 0.5 in. (13 mm) of space between the back of front-of-board MCCs and a wall. For damp locations, provide at least 6 in. (152 mm).

⚠⚠ DANGER

BURN HAZARD FROM HOT GASES

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- Model 6 MCCs with the arc-rated option have pressure-relief roof flaps for top venting of arc fault gases. These MCCs require a minimum of 28.5 in. (724 mm) from the top plate of the MCC to the nearest obstruction (minimum ceiling height of 10 ft. (3 m) including base channel).

Failure to follow these instructions will result in death or serious injury.

Model 6 MCCs with the arc-rated option have pressure-relief roof flaps for top venting of arc fault gases. These MCCs require a minimum of 28.5 in. (724 mm) from the top plate of the MCC to the nearest obstruction (minimum ceiling height of 10 ft. (3 m) including base channel).

Aligning the MCC

A smooth, level surface must be provided for installation. An uneven foundation may cause misalignment of shipping blocks, units, and doors. The surface under an MCC must be of a non-combustible material, unless bottom plates are installed in each vertical section.

Joining Type 1 / Type 1 Gasketed / Type 12 Sections

Before positioning the MCC sections, check for damaged bus bars and insulators. If the bus is bent or insulators are broken, do not install the MCC. Report any damage to the carrier.

NOTE: A joining hardware kit is tied to the right front corner channel of each shipping split. Captive splice bars are preassembled on the horizontal bus on the left side of each shipping split.

Positioning the MCC

To mount and splice a new MCC section to an existing Model 6 section, or to join shipping splits:

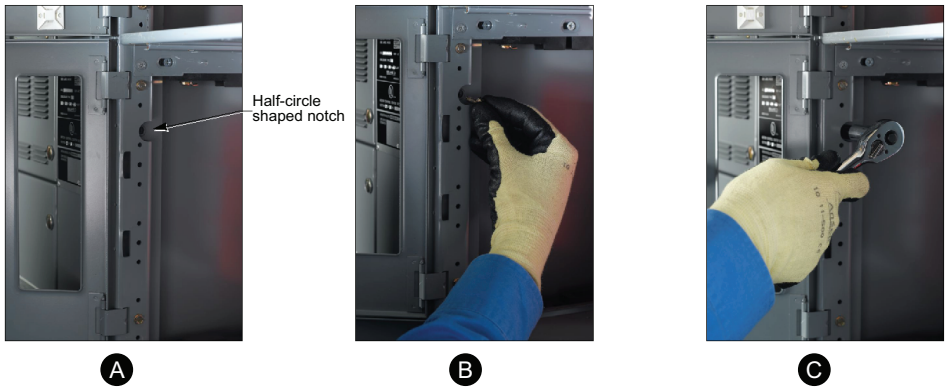
1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. Remove the top and bottom horizontal wireway covers in all sections, providing access to each section's front splicing bolts.
3. Gain access to each section's bus splicing provisions by removing the panels of the two-piece bus barriers in the sections adjacent to a splice connection (the left and right sections). See Removal and Installation of Horizontal Bus Barrier Panels, page 89.
4. Make provisions for fastening the structure(s) to the floor. Refer to MCC drawings (included with the MCC) for locations of anchor fasteners.
5. Supporting the MCC by its base channels and/or lifting angles, lift it into place. The front edges of the base channels must be aligned to form a continuous front in a straight line. Use a chalk line, string or other method to align the front base channels in a straight line.
6. Using the notches in the base channels, carefully move the sections in to alignment with a crowbar. Use caution when moving MCC sections, as they are top heavy. See Handling the MCC, page 14.

Joining Corner Channels

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. The hardware kit for joining sections is tied to the right front corner channel of each shipping split.

3. Locate the four half-circle shaped notches on the inside surface of the front and rear corner channels (see Joining Corner Channels, page 21 , View A).

Figure 2 - Joining Corner Channels



4. Using four of the 3/4 in. x 1/4-20 hex head thread-forming screws supplied in the hardware kit, join the front vertical corner channels by inserting the screws through the clearance holes located within the halfcircle shaped notches and into the mating threadforming hole (see Joining Corner Channels, page 21, View B).

   NOTE: Insert the screws from whichever side provides the easiest access to the holes; either side will allow proper joining of the channels.

5. Tighten the screws (see Joining Corner Channels, page 21, View C).
6. Repeat steps 3–5 to connect the rear corner channels.

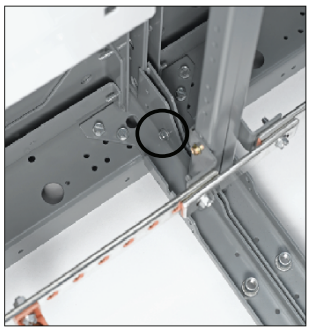
   NOTE: In some instances, holes in the rear channels will only be accessible from the rear of the MCC with the MCC back plates removed. If the MCC is not rear accessible, install as many screws as possible from the front of the MCC (typically via the vertical wireway).

Joining Section Side Channels

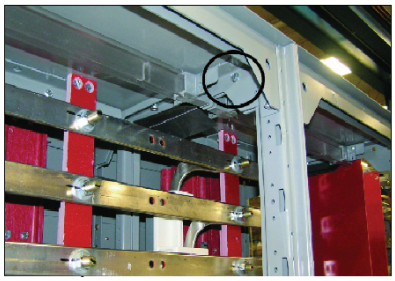
1. Locate two clearance holes for 1/4-20 hardware on the inside surface of the bottom section side channels (see Joining Section Side Channels, page 22, Views A and B). These can be accessed after removal of the bottom wireway cover.

Figure 3 - Joining Section Side Channels

A Front Bottom Side Channel Connection



B Rear Bottom Side Channel Connection



C Top Side Channel Connection

D Top Rear Side Channel Connection (Shown with MCC back plates removed.)

2. Use two of the four 1-1/4 in. x 1/4-20 hex head thread-forming screws supplied in the hardware kit to join the bottom section side channels. The screw installed at the front is installed from the right-hand section (see Joining Section Side Channels, page 22, View A).
3. The screw installed at the rear is installed from the left-hand section (see Joining Section Side Channels, page 22, View B).
4. Locate two clearance holes for 1/4-20 hardware on the inside surface of the top section side channels. The front clearance hole is in the left section and is accessible after removal of the top wireway cover (see Joining Section Side Channels, page 22, View C).
5. The rear clearance hole is in the right section. In most cases, it will be necessary to remove the section back plate or the top plate to gain access to the rear clearance hole and install the screw (see Joining Section Side Channels, page 22, View D).

Securing Structures to the Floor

Non-Seismic Applications

Each MCC section must be fastened to the floor (mounting surface) in two places using 1/2 in. or 3/4 in., grade five or higher, bolts, and flat washers (furnished by customer). 0.88 in. diameter base channel mounting holes provide clearance for 1/2 in. expansion anchors. Refer to MCC drawings (included with the MCC) for locations of anchor fasteners.

Seismic Hazard(1) Designated Locations

Each section must be anchored per detail supplied by engineer of record to the loadbearing path of the building structural system. Use anchorage designed by and supplied by others. Seismic test units were anchored with 1/2–13 SAE Grade 5 hardware and Belleville conical washers.1/2 in. and 3/4 in. Belleville washers are supplied with equipment for use with the seismic anchorage. Refer to MCC drawings (included with the MCC) for locations of anchor fasteners. Refer to instruction bulletin 80459-641-01, Model 6 Motor Control Centers, for additional information on anchoring MCC sections.

Anchor Point Access for ArcBlok 1200 with Bottom-Feed, Line-Side, Isolation Cable Vault

The front cover and rear panel assembly of each ArcBlok bottomfeed cable vault are removable to allow access to section anchor points.

1. Remove and retain the 3/8-16 Keps nuts securing the cable vault front cover.
2. Remove the cable vault front cover.
3. Remove and retain the 3/8-16 Keps nuts securing the cable vault rear panel. The rear panel is accessible from inside the cable vault after the front cover is removed.
4. Remove the rear panel from the inside of the cable vault.
5. Install the anchor hardware.
6. Reinstall the rear panel and front cover using the 3/8-16 Keps nuts retained in steps 1 and 3.

Anchor Point Access for ArcBlok 2500 with Bottom-Feed, Line-Side, Isolation Cable Vault

The front cover and rear access panel of each ArcBlok bottom-feed cable vault are removable to allow access to section anchor points.

1. Unplug the terminal block of ArcBlok Event Indicator and put it on the right side of the cable vault. Do not disconnect wires from the terminal block.
2. Remove and retain the 1/4-20 hardware securing the cable vault front cover.
3. Remove and retain the cable vault front cover.
4. Remove and retain the 1/4-20 hardware securing the cable vault rear access panel.
5. Remove and retain the rear access panel from the inside of the cable vault.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Replace all covers after section is anchored.
- Do not turn on power if the covers are uninstalled.
- Torque cover hardware to 95–105 lb-in. (10.7–11.9 N•m).

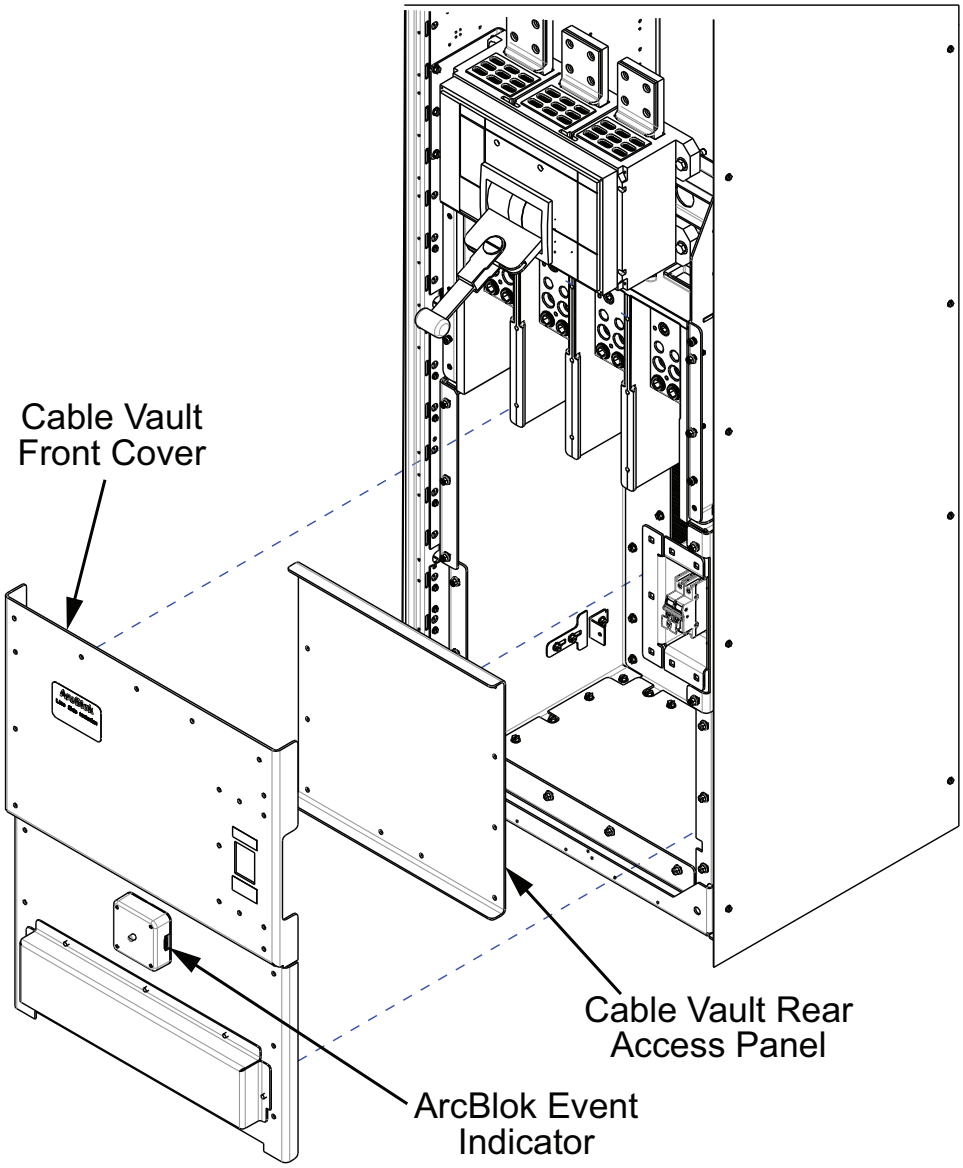
Failure to follow these instructions will result in death or serious injury.

6. Install the anchor hardware.
7. Reinstall the rear access panel using 1/4-20 hardware retained in step 4. Torque hardware to 95–105 lb-in. (10.7–11.9 N•m).
8. Reinstall the cable vault front cover using 1/4-20 hardware retained in step 2 and 3.

(1) Seismic hazard for site specific locations as defined by the current edition of the International Building Code or NFPA 5000 or relevant local building code or consulting engineer of record.

9. Re-plug the terminal block of ArcBlok Event Indicator removed in step 1.

Figure 4 - Cable Vault Rear Access Panel



Securing Structures to a Wall

Seismic Hazard Designated Locations

When specified or required for the application (all seismic hazard areas with S_s in excess of 2.67 g), each section must be laterally braced at the top (bracing supplied by others) and connected to the load-bearing path of the building system per detail supplied by engineer of record. Refer to the current International Building Code or NFPA 5000 for location specific values of S_s.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Turn off power supplying equipment before installing lateral bracing.
- Bolts must not penetrate top plate by more than 0.50 in. (13 mm)
- On arc-rated MCCs, do not block roof flaps with lateral restraint components.

Failure to follow these instructions will result in death or serious injury.

Remove the lifting angle and fasten each section to the lateral restraint system (supplied by others) using the same attachment points used to secure the lifting angle. Re-use bolts and lock washer supplied with the lifting angle or hardware supplied by others as appropriate. Pay particular attention to the limitation on the depth the bolt can penetrate below the surface of the top plate. The bolts must not penetrate the top plate of the enclosure by more than 0.50 in. Refer to instruction bulletin 80459-641-01, Model 6 Motor Control Centers, for additional lifting angle attachment point information.

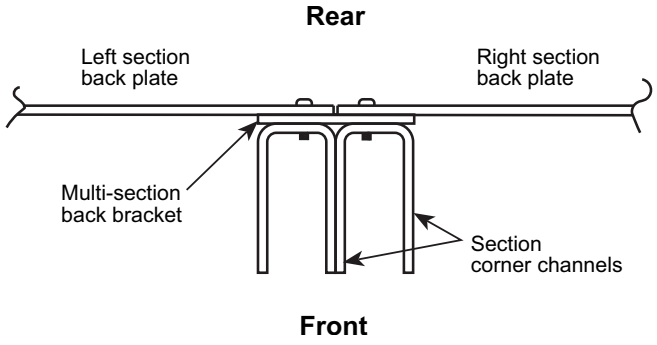
Each section must also be anchored at the base. See the instruction label located on the inside of the bottom horizontal wireway cover.

Joining Type 3R Sections

This section provides instructions for joining Type 3R MCC sections.

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. Remove the right section back plate (see 3R Multi-Section Back Bracket, page 25).

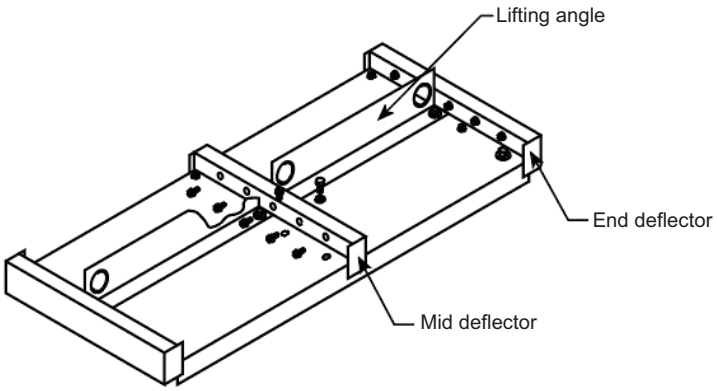
Figure 5 - 3R Multi-Section Back Bracket



3. After placing the structures side-by-side, join them as described in Joining Type 1 / Type 1 Gasketed / Type 12 Sections, page 20.
4. Re-attach the back plate (removed in step 2) to the right section using the additional hardware supplied. Attach the right side to the multi-section bracket (see 3R Multi-Section Back Bracket, page 25).

5. Install the mid deflector, ensuring both top plate flanges are covered (see Mid and End Deflectors, page 26).

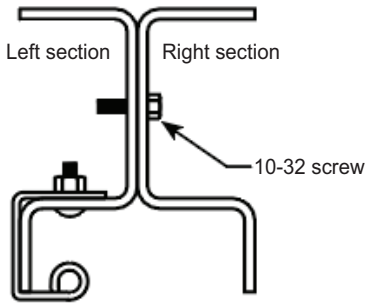
Figure 6 - Mid and End Deflectors



Top View

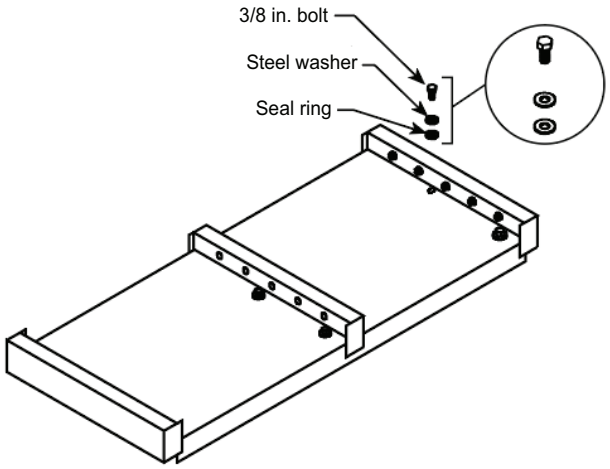
6. Using the six 10-32 screws supplied, secure the left front vertical channel of the Type 3R extension to the right front vertical channel of the Type 3R extension (see Secure the Vertical Channels, page 26).

Figure 7 - Secure the Vertical Channels



7. If the lifting angle is to be removed from the sections after installation, replace all hardware in the order shown (see Replace Lifting Angle Hardware, page 27).

Figure 8 - Replace Lifting Angle Hardware



Splicing MCC Power Bus

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

Applicable to All MCC Power Bus Splices

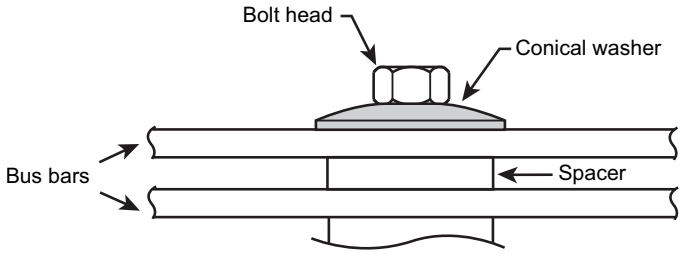
1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. Remove the horizontal wireway covers and slide or remove the horizontal bus barriers to gain access to the captive splice connectors (see Horizontal Wireway Covers and Bus Barriers Removed, page 28). See Removal and Installation of Horizontal Bus Barrier Panels, page 89.

Figure 9 - Horizontal Wireway Covers and Bus Barriers Removed

3. Locate integral splice plates. Splice plates are generally located on the left end of the MCC main bus in each shipping split. With some constructions, the splice assembly may be included as a kit-packaged in a carton and secured inside the MCC structure.

4. When reinstalling splice hardware after completing the splice connection, make sure the original conical washers are reinstalled with the concave side facing the horizontal bus (see Conical Washer Under the Bolt Head, page 29).

Figure 10 - Conical Washer Under the Bolt Head



5. Before energizing the equipment, place the horizontal bus barriers into the closed position and replace all covers.

Refer to instruction bulletin 80459-641-01, Model 6 Motor Control Centers, for additional details on installing MCC power bus splices.

Type 1, 1A and Type 12 Enclosures

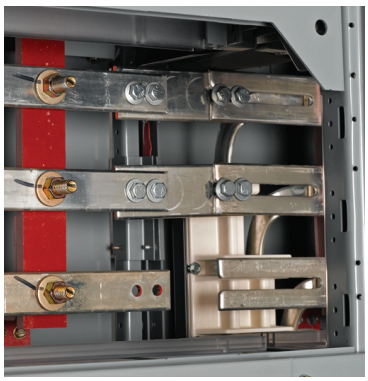
Power Bus Splicing MCCs with Single Bar/Phase Splice Kit (600 and 800 A Copper Horizontal Bus, 65,000 A Short Circuit or Less)

NOTE: Splice connections used on 600 and 800 A horizontal bus bars in MCCs with short circuit current ratings less than or equal to 65 kA consist of a single splice bar per phase. These splice bars are used in MCC sections that do not include fork type bus (see Correct Application of Splice (shown installed) for 600/800 A, Non-Fork Bus, page 30).

DO NOT use the single bar splice connection with fork-type bus bars (see Incorrect Application of Single-Bar Splice on Fork-Type Bus, page 30 for details on installing splice kits on MCCs equipped with fork-type bus.

Figure 11 - Correct Application of Splice (shown installed) for 600/800 A, Non-Fork Bus

Figure 12 - Incorrect Application of Single-Bar Splice on Fork-Type Bus



To splice the power bus, follow these steps.

1. Remove all four bolts from the integral splice bar.
2. Move the single splice bar to the left and align the two left holes in the splice bar with the corresponding holes in the horizontal bus on the left section.
3. Reinstall the four bolts into the horizontal bus on the left and right sections.
4. Torque all bolts on both ends to 31–32 lb-ft. (41.87–43.22 N•m).
5. Return to Step 1 for all phases and for the neutral bus (if supplied).

Power Bus Splicing MCCs with Multiple Bar/Phase Splice Kit

NOTE: On the integral splice bar assembly, located on the left side of each phase bus, the number of splice bars used on each phase is one greater than the number of main horizontal bus bars. The rear-most splice bar includes captive nuts. The following instructions apply to fork-type bus.

To splice the power bus:

1. Remove the two left bolts. Loosen, but do not remove, the two right bolts on the splice assembly.

   NOTE: Do not remove the two right bolts from the splice assemblies. Doing so will permit splice bars to fall from the splice assembly. If this occurs, reassemble the splice bars in the proper order before continuing.

2. Slide the splice assembly to the left until the two left holes are in line with the corresponding holes in the horizontal bus on the left section.
3. Reinstall the two left bolts through the splice bars and into the horizontal bus.
4. Torque all bolts on both ends to 31–32 lb-ft. (41.87–43.22 N•m).
5. Return to step 1 for all phases and for the neutral bus (if supplied).

Splicing Power Bus in Type 3R Enclosures

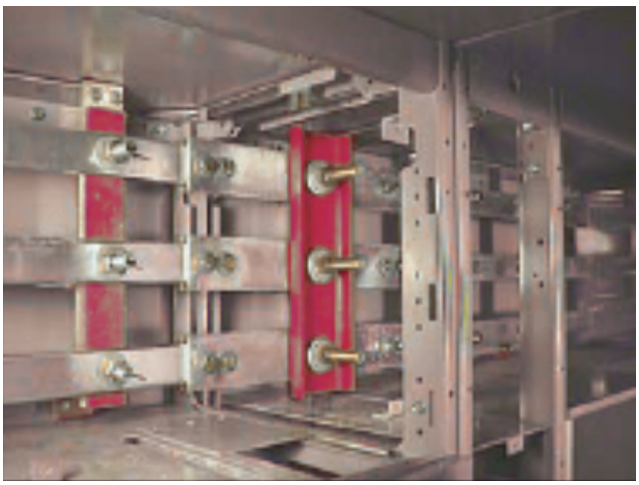
NOTE: On the integral splice bar assembly, located on the left side of each phase bus, the number of splice bars used on each phase is one greater than the number of main horizontal bus bars. The rear-most splice bar includes captive nuts.

To splice the power bus:

1. Remove the two left bolts from each splice assembly. Then loosen, but do not remove, the two right bolts of each splice assembly. If the bus has optional 85,000 A bus bracing supplied (see 85,000 A Bracing Option, page 32), also loosen the center nut of each splice assembly.

   NOTE: Do not remove the two right bolts or the center bolt (if applicable) from the splice assemblies. Doing so will permit splice bars or spacers (if applicable) to fall from the splice assembly. If this occurs, reassemble the splice bars and spacers (if applicable) in the proper order before continuing.

   Figure 13 - 85,000 A Bracing Option

2. Slide the splice assembly to the left until the two left holes are in line with the corresponding holes in the horizontal bus in the left section.
3. Re-install the two left bolts through the splice assembly and into the horizontal bus.
4. Torque the splice connection bolts at horizontal bus connections to 31–32 lb-ft. (41.87–43.22 N•m). Torque 85 kA support nuts (if applicable) to 68–72 lb-ft. (92.2–97.6 N•m).
5. Return to step 1 for all phases and the neutral bus (if supplied).

Power Bus Splicing of 2500 A Bus with 100,000 A Short Circuit Rating

NOTE: On the integral splice bar assembly, located on the left side of each phase bus, the number of splice bars used on each phase is one greater than the number of main horizontal bus bars. Splice bars are held captive on the horizontal bus by a splice bar carrier assembly. The rear of the carrier assembly includes captive nuts (see Wireway Covers Removed and Horizontal Bus Barriers Open, page 33).

Figure 14 - Wireway Covers Removed and Horizontal Bus Barriers Open

To splice the power bus:

1. Remove all four bolts from each splice assembly.
2. Slide the splice assembly (splice bars and carrier assembly) to the left until the two left holes are in line with the corresponding holes in the horizontal bus on the left section.
3. Reinstall all four bolts through the splice assembly and into the horizontal bus.
4. Torque all bolts on both ends to 31–32 lb-ft. (41.87–43.22 N•m).
5. Return to step 1 for all phases and the neutral bus (if supplied).

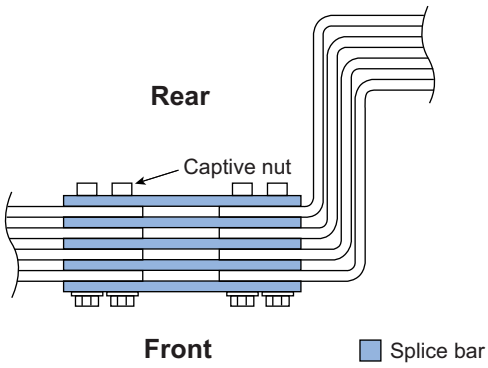
Splicing Offset or 3000/3200 A Horizontal Bus

- In all structures with an offset or 3000/3200 A horizontal bus, splice bars are provided as a kit. This kit is packaged in a carton and shipped inside the structure. The kit contains all splice bars and mounting hardware necessary for horizontal bus splicing.
- Use the splice kit only if splicing is to be done on the left (while facing the structure). If the splice is not on the left, remove the kit before energizing and retain it for future expansion. If a structure is to be spliced to another structure on the right, follow splicing instructions provided for that structure application.
- On the integral splice bar assembly, located on the left side of each phase bus, the number of splice bars used on each phase is one greater than the number of main horizontal bus bars. The rear-most splice bar includes captive nuts.

To splice a horizontal bus on the left side of the structure:

1. Position the rear splice bar (the bar with captive nuts; see Splice Offset Horizontal Bus, page 34) against the back face of the rear horizontal bus bar.

Figure 15 - Splice Offset Horizontal Bus



2. Install a plain splice bar between each lamination of horizontal bus; install the last bar against the front face of the horizontal bus (see Splice Offset Horizontal Bus, page 34).
3. Align the four mounting holes in the splice bus and the horizontal bus.
4. Install four splice bolts, two on each side of the splice assembly.
5. For 600–2500 A main bus splices, torque the bolts to 31-32 lb-ft. (41.87-43.22 N•m). For 3000/3200 A main bus splices, torque the bolts to 68–72 lb-ft. (92.2–97.6 N•m). Torque the center nut on 85 kA braced, 3R splice bar assemblies to 68–72 lb-ft. (92.2–97.6 N•m).
6. Repeat step 1 for all phases and the neutral bus (if supplied).

Ground Bus Splicing

NOTE: The MCC horizontal ground bus is located at the bottom of each MCC structure. It can be accessed by removing the bottom horizontal wireway cover or other bottom located cover on the structure. The ground bus splice plate is located on the right end of the ground bus in each shipping split.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

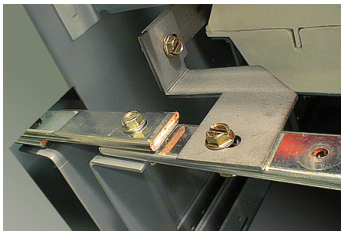
Failure to follow these instructions will result in death or serious injury.

Type 1, Type 12, and Type 3R

To splice the ground bus:

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. Remove ground bar bolts from the right and left sections.
3. Slide the ground splice bar into the right section, aligning the mounting holes (see Type 1, Type 12, and Type 3R, page 35).

Figure 16 - Ground Bar Bolt Replaced



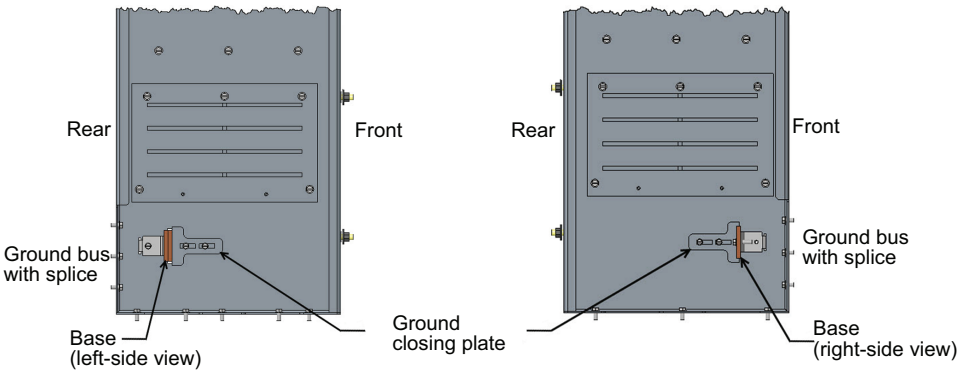
4. Replace the ground bar bolts (see Type 1, Type 12, and Type 3R, page 35) in the right and left sections. Torque both bolts to 60–75 lb-in. (6.75–8.44 N•m).
5. Replace all covers and barriers, and close all doors.

Bottom-Feed ArcBlok Main Sections–1200 A

To splice the ground bus, follow these steps:

1. Remove the cable vault front cover to access the ground bus assembly.
2. Remove the ground bar bolts in the cable vault and in the adjacent MCC section.
3. Slide the ground splice bar into the right section, aligning the mounting holes.
4. Replace the ground bar bolts (see Ground Bar Bolt Replaced, page 35) in the right and left sections.
5. Torque the ground bar bolts to 60–75 lb-in. (6.75–8.44 N•m).
6. Place the ground closing plates into position to seal the cable vault (see Location of Ground Closing Plates, page 36). Slide the closing plates against the ground bar where the bar passes into the next section. Where there is not a splice to an adjacent section, completely cover the unused ground bus opening with the closing plate.

Figure 17 - Location of Ground Closing Plates

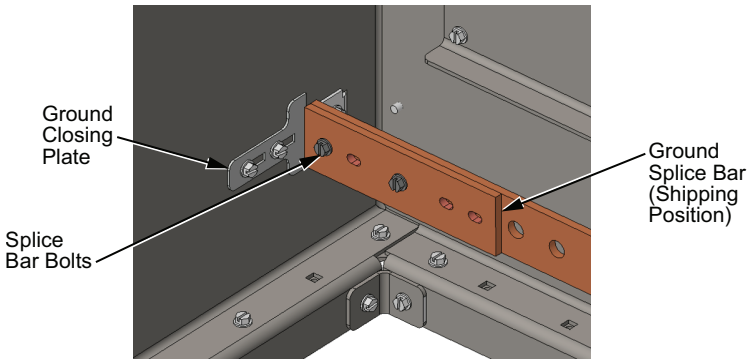


7. Replace all covers and barriers, and close all doors.

Bottom-Feed ArcBlok Main Sections–1600, 2000, and 2500 A

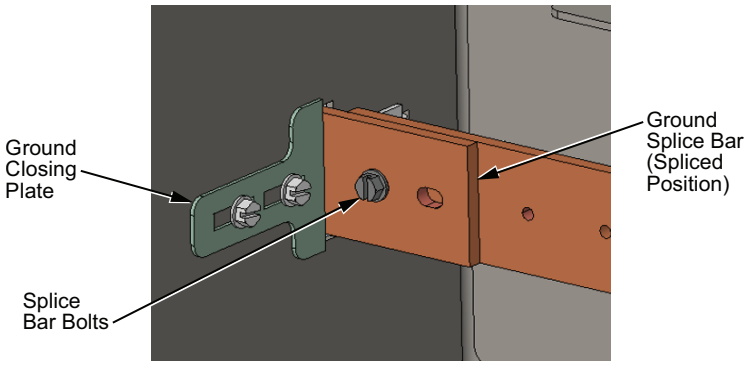
1. Remove the cable vault front cover to access the ground bus assembly.
2. For splicing to left adjacent section (if applicable):
   - Remove the bolts for the ground splice bar located on the left-side of the cable vault and the ground splice bar located on the right-side of the left adjacent section. (see Removing Bolts for Ground Splice Bar, page 37).

Figure 18 - Removing Bolts for Ground Splice Bar



   - Discard the ground splice bar on the right side of the left adjacent section.
   - Loosen the ground closing plate hardware on the left side of the cable vault and slide the closing plate forward to reveal open slot in cable vault.
   - Slide the ground splice bar located inside the cable vault to the left so that it aligns with the mounting hole of the ground bus in the left adjacent section.
   - Re-install one ground splice bar bolt in both sections, (see Re-install Ground Splice Bar Bolt, page 37).

Figure 19 - Re-install Ground Splice Bar Bolt



   - Torque the ground splice bar bolts to 60–75 lb-in. (6.75–8.44 N•m).
   - Slide the closing plate against the ground splice bar and tighten the ground closing plate hardware.

3. For splicing to right adjacent section (if applicable):
   - Remove the bolts for the ground splice bar located on the right-side of the cable vault.
   - If applicable, remove the bolts for the ground splice bar located on the left-side of the right adjacent section and discard the ground splice bar.
   - Loosen the ground closing plate hardware on the right side of the cable vault and slide the closing plate forward to reveal open slot in cable vault.
   - Slide the ground splice bar located inside the cable vault to the right so that it aligns with the mounting hole of the ground bus in the right adjacent section.
   - Re-install one ground splice bar bolt in both sections.
   - Torque the ground splice bar bolts to 60–75 lb-in. (6.75–8.44 N•m).
   - Slide the closing plate against the ground splice bar and tighten the ground closing plate hardware.
4. Replace all covers and barriers and close all doors.

Incoming Power Conductors

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

Standard MCC Mains

Conduit entry space is provided at the top and bottom of the MCC structure. The top plates (and closing plates in bottom, if present) are removable for convenience in wiring and cutting conduit openings). A hinged door or cover allows access to the main lug, main circuit breaker, or main switch compartment. In some cases, the horizontal wireway cover must be removed.

Optional, top-located pull boxes are available if additional wiring space is required.

Main Circuit Breaker Units with ArcBlok 1200

- Incoming power wires must use conduit connections to enter the ArcBlok-equipped main circuit breaker unit.
- Top-feed MCC main circuit breaker units with ArcBlok 1200 include a required, 18 in., high pull box (see Top and Bottom Incoming Main Breakers with ArcBlok, page 40, View A).
- Conduit connection is required at the top plate of the pull box or on the bottom plate of the MCC structure for bottom feed mains (see Top and Bottom Incoming Main Breakers with ArcBlok, page 40, View B).
- Seal around incoming wires using duct seal putty at conduit connections where the wires enter the pull box or cable vault.

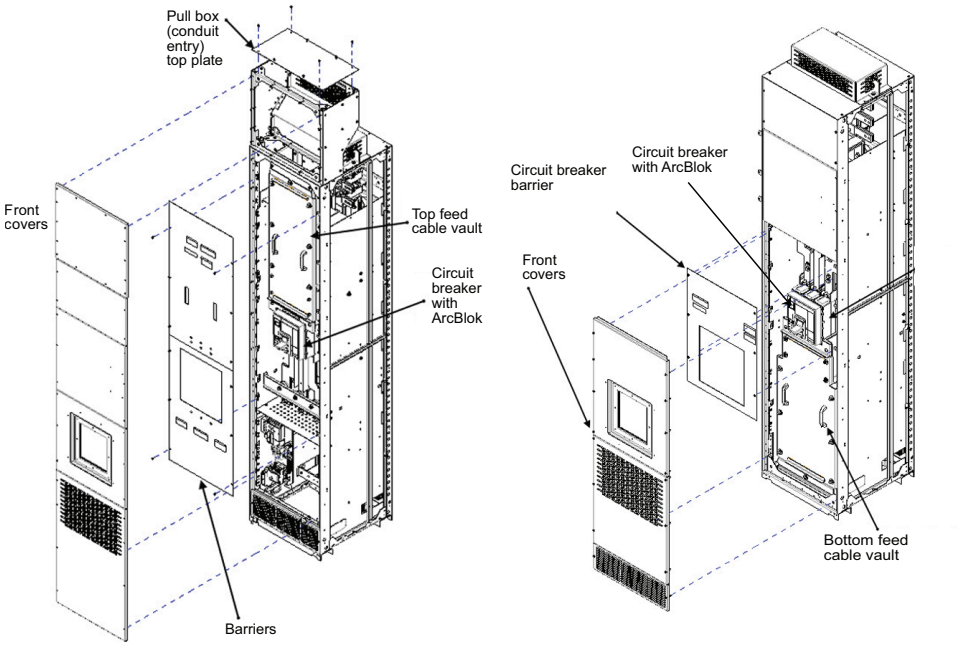
Main Circuit Breaker Units with ArcBlok 2500

- Arcblok 2500 is only available in bottom-feed MCC units.
- Incoming power wires must use conduit connections on the bottom plate of the MCC structure to enter the ArcBlok-equipped main circuit breaker unit.
- Seal around incoming wires using duct seal putty at conduit connections where the wires enter the cable vault.

Wire Connections with ArcBlok 1200

- Breaker wire terminals are located behind the ArcBlok lug cover which is accessible after removal of the cable vault cover (see Top and Bottom Incoming Main Breakers with ArcBlok, page 40, Views A and B).

Figure 20 - Top and Bottom Incoming Main Breakers with ArcBlok



- Verify all incoming wires are correctly installed in wire terminals and tightened to required torque values. Torque requirements are found on labels on the main device or on a separate label inside the unit.
- Replace the lug cover after completing wire installation and before reinstalling the cable vault cover.

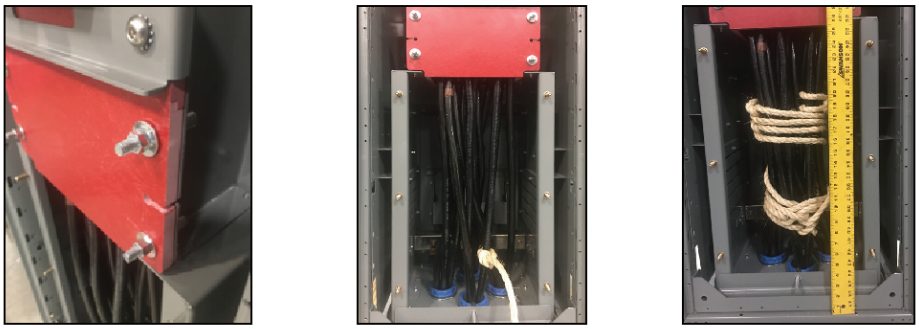
Cable Lacing with ArcBlok 1200

NOTE: Cable lacing is required with ArcBlok mains.

All cables must be laced and secured prior to installing the cable vault front cover.

1. For lacing material, select a sisal or hemp rope with a minimum of 2500 pounds of pull strength (625 pounds working load). Apply tape to any frayed end of the rope before lacing cables.
2. Lace the cables from all phases together in one bundle with a continuous length of rope. The ArcBlok lug cover must be in place and fastened prior to lacing (see Cable Lacing, page 41, View A). Make sure interphase barriers are inserted in the grooves of the ArcBlok lug cover.

Figure 21 - Cable Lacing



A ArcBlok Lug Cover in Place Prior to Lacing

B First Cable Lacing Loop

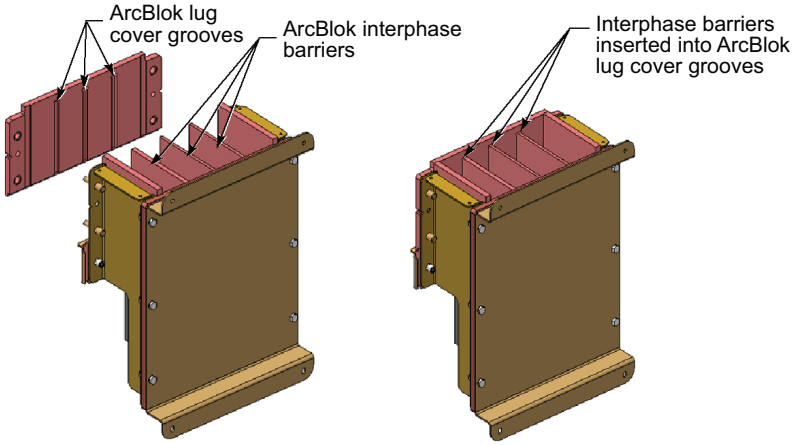
C Upper and Lower Cable Lacing Groups

3. Lacing will require two looping groups: an initial, lower group and a second group closer to the ArcBlok.
4. Attach one end of the rope to the lower side of one of the cables, (see Cable Lacing, page 41, View B).
5. After attaching the rope, make a loop in it and pull the loop around the entire cable bundle from behind. Pull the loose end of the rope through the loop.
6. Continue to pull the rope through the loop until the rope is tight. Make a second loop and pass behind the cables using the same procedure. Put the loose end of the rope through the loop and pull the loop tight. This completes the first loop group.
7. Start the second (upper) loop group by first pulling the rope around the cable bundle, then repeat the procedure described in step 6 for the upper loop group. The spacing between the upper and lower loop groups should be no less than 4 in. (102 mm) (see Cable Lacing, page 41, View C).
8. Ensure the cable bundles do not dislodge the interphase barriers from the grooves of the ArcBlok lug cover (see ArcBlok Interphase Barriers and Lug Cover Grooves, page 42).
9. After the entire cable bundle has been laced, tie the loose end of the rope securely to the upper loop group, then cut and tape the loose end to prevent fraying. Make sure the rope is not obstructing the cable vault front cover or rear panel damper flap.

10. While keeping the ArcBlok lug cover in place, remove all cover hardware.

    NOTE: Make sure the interphase barriers remain inserted into the grooves of the ArcBlok lug cover (see ArcBlok Interphase Barriers and Lug Cover Grooves, page 42).

Figure 22 - ArcBlok Interphase Barriers and Lug Cover Grooves



11. Place the cable vault front cover on top of the ArcBlok lug cover.
12. Install 3/8–16 Keps™ nuts and torque them to 20–23 lb-ft. (27–31 N•m).

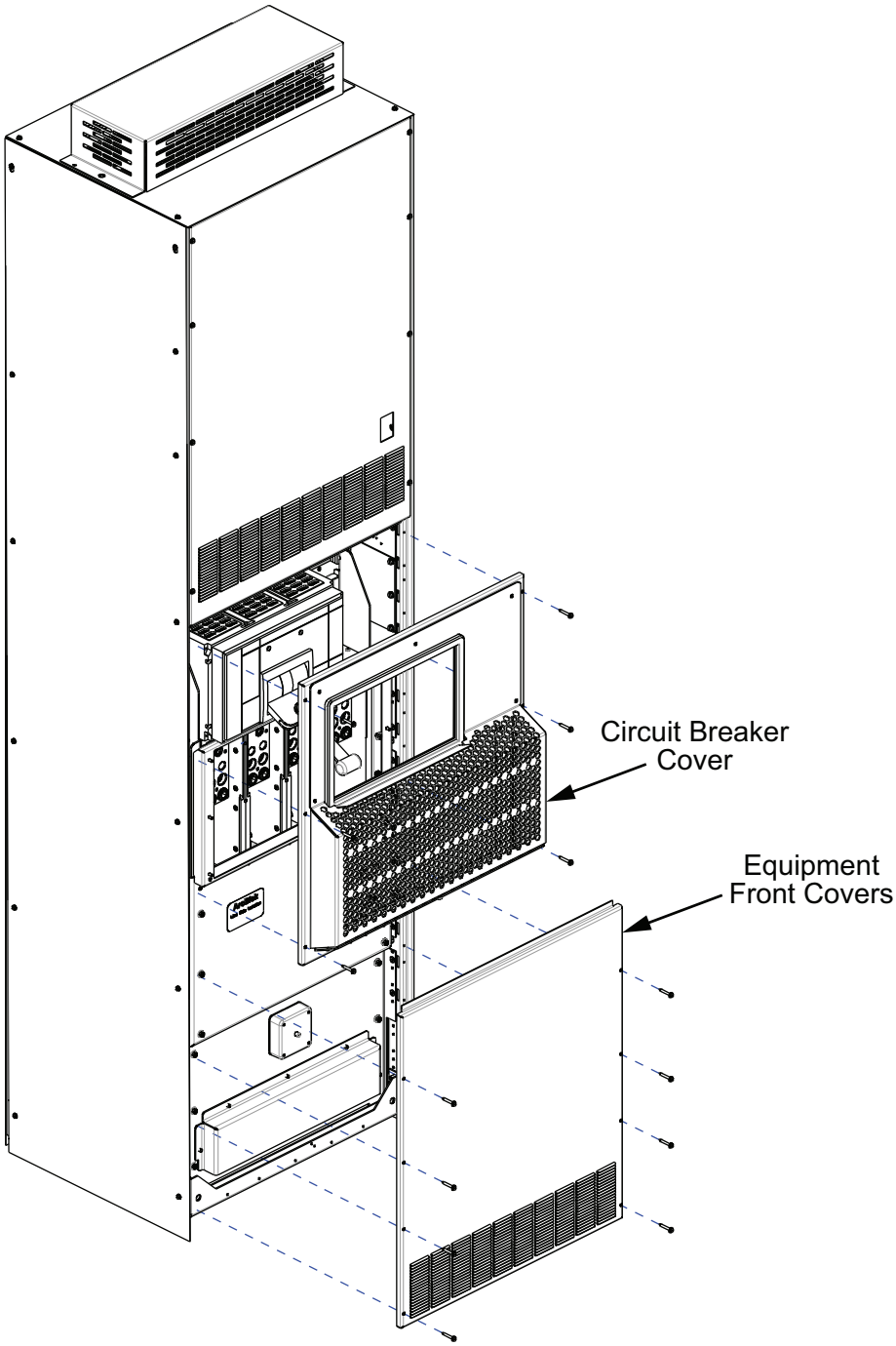
    NOTE: These instructions are for bottom feed main breakers. For top feed breakers, reverse references to the “upper” and “lower” loop groups.

Wire Connections with ArcBlok 2500

- Locate and terminate all conduit in the MCC enclosure in the “available conduit area” designated on the equipment drawing.

- The conduit area is available towards the front of the section inside the cable vault.
  1. Remove and retain the 10–32 size hardware securing the equipment breaker cover.
  2. Remove and retain the breaker cover.

Figure 23 - Removing Equipment Front Covers

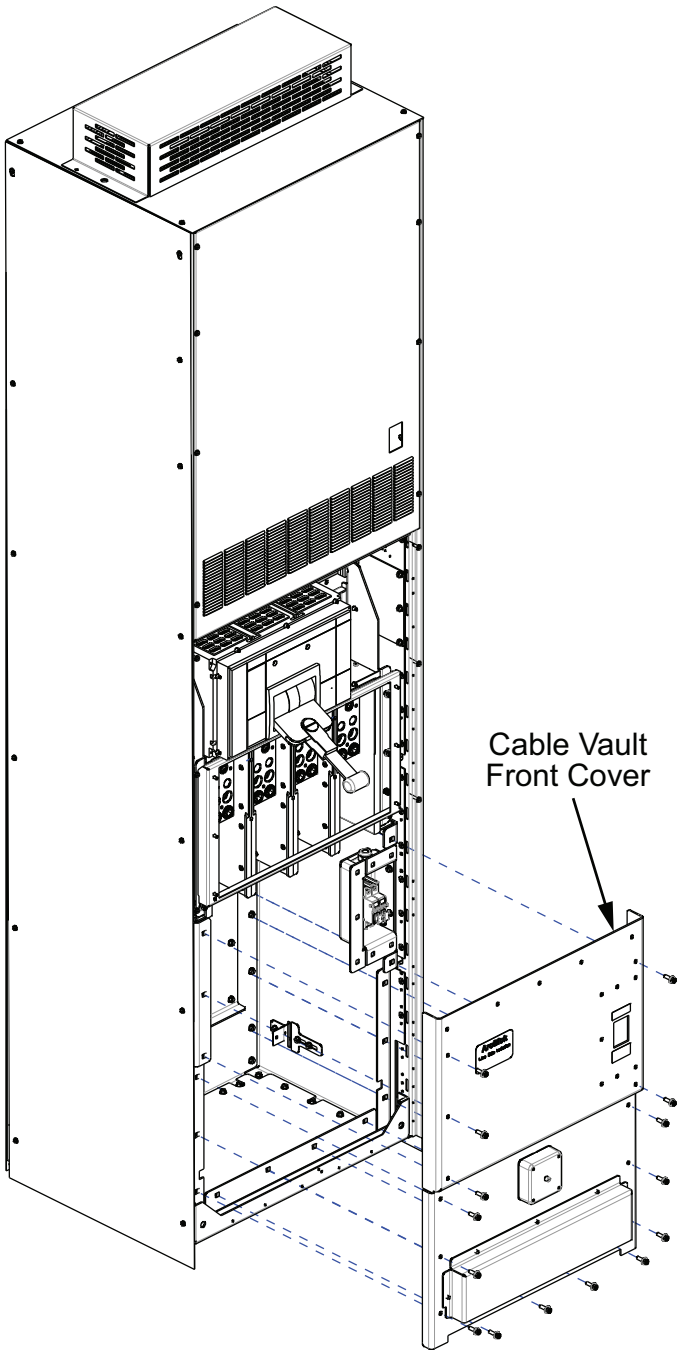


  3. Remove and retain 10–32 size hardware securing the equipment lower front cover.
  4. Remove and retain the equipment lower front cover.
  5. Unplug the terminal block of the ArcBlok Event Indicator and put it on the right side of the cable vault. Do not disconnect wires from the terminal block.
  6. Remove and retain 1/4–20 size hardware securing the cable vault front cover.

7. Remove and retain the cable vault front cover.

NOTICE
DAMAGE TO EVENT INDICATOR Do not damage ArcBlok event indicator while installing or uninstalling the cable vault front cover. Call Schneider Electric Services if the event indicator is damaged. **Failure to follow these instructions can result in equipment damage.**

Figure 24 - Removing Cable Vault Front Cover



⚠⚠DANGER

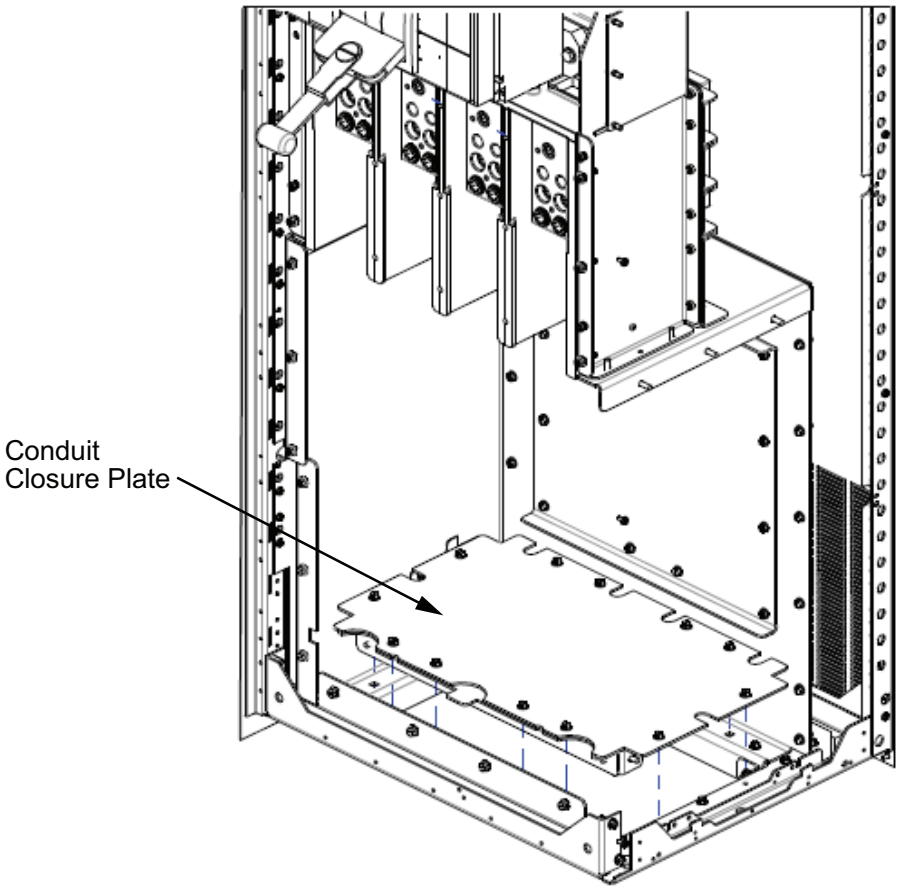
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Replace conduit closure plate after creating the conduit holes.
- Do not turn on power if conduit closure plate is not installed.

Failure to follow these instructions will result in death or serious injury.

◦ Remove and retain the conduit closure plate for reuse. The customer must create any holes necessary for conduit entering the bottom of the MCC. After creating the holes, reinstall the conduit closure plate (see Bottom-fed ArcBlok Main Bottom Conduit Closure Plate, page 45).

Figure 25 - Bottom-fed ArcBlok Main Bottom Conduit Closure Plate



8. Pull the cables inside the cable vault and terminate them on the ArcBlok lugs shown in Lug Cross Section Showing Hole Placement, page 46. Torque all wire-binding screws to 842 lb–in. (95 N•m).

NOTICE

DAMAGE TO PHASE BARRIERS

Do not apply excessive force to the phase barriers during cable installation. Damage to the phase barriers can occur. Call Schneider Electric Services if the phase barriers are damaged.

Failure to follow these instructions can result in equipment damage.

a. Use a proper insulation stripping tool to strip a length of insulation from the end of the cable sufficient to fit into the full length of the lug barrel. Be careful not to nick or ring the strands.

b. Thoroughly clean aluminum cable contact surfaces with a wire brush, or scrub them with an abrasive cloth to remove oxides and foreign matter.

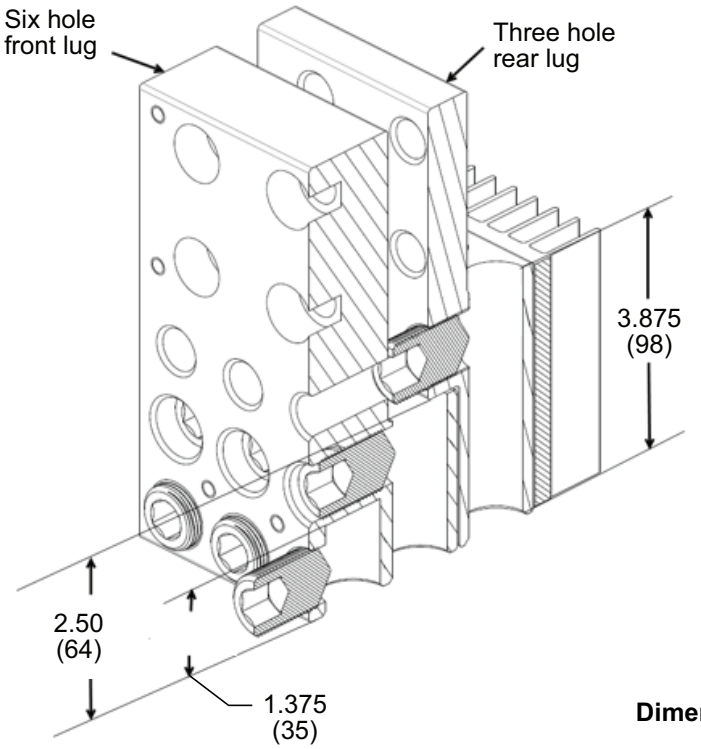
c. Immediately apply an acceptable joint compound to the bare aluminum surfaces.

d. Install the rear cables into the rear three-hole lug. Wire strip length: 3.875 in. (98 mm).

e. Install the cables into the front six-hole lug. Wire strip length: 2.50 in. (64mm) for the rear three holes. Wire strip length: 1.375 in. (35 mm) for the front three holes.

f. Screw any unused wire binding screws in completely. Screw in all wire binding screws without cables installed so they are not in the way of the Thermal Interface Module (TIM) (see TIM Sleeve, page 47).

Figure 26 - Lug Cross Section Showing Hole Placement



9. Cable entry into the cable vault must use conduit connections installed on the conduit closure plate. The conduits must be sealed using duct seal putty.

10. Install the Thermal Interface Module (TIM):

    a. Verify TIM mating surfaces and lugs are clean and undamaged. Clean with a dry, lint-free rag.

    b. Install one TIM per phase and neutral using 1/4-20 size captive screws as shown in TIM Sleeve, page 47. Slide the plastic sleeve around each TIM against the top of the phase barriers. Sleeve must be flush with the top of the phase barriers. Torque all six TIM screws in a star pattern to 60 lb-in. (6.8 Nm).

    NOTE: The TIM mounting screws are not completely removable.

Figure 27 - Thermal Interface Module (TIM) Installation

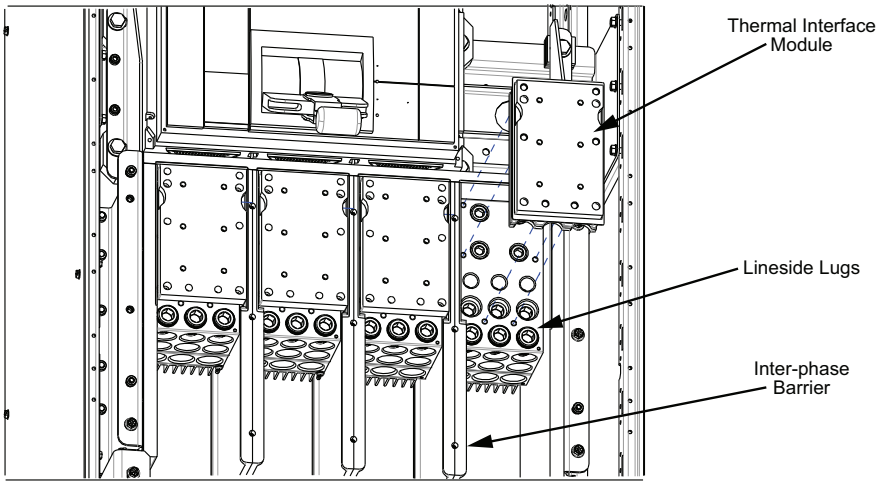
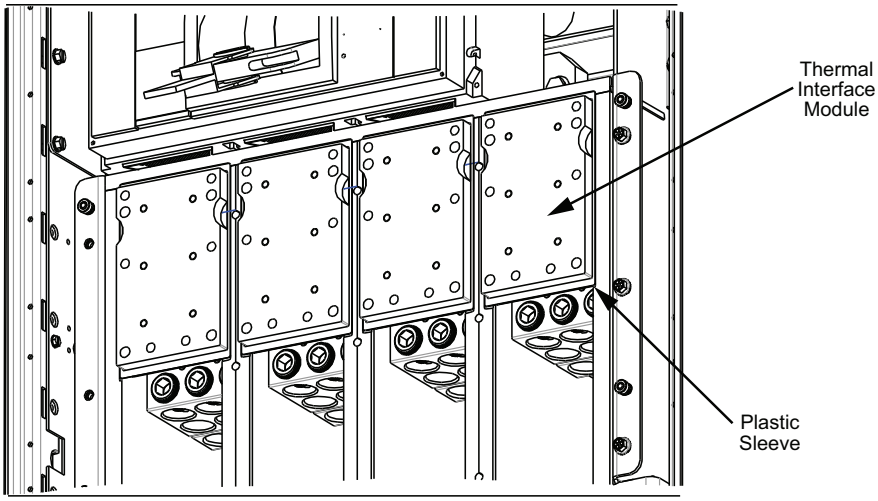
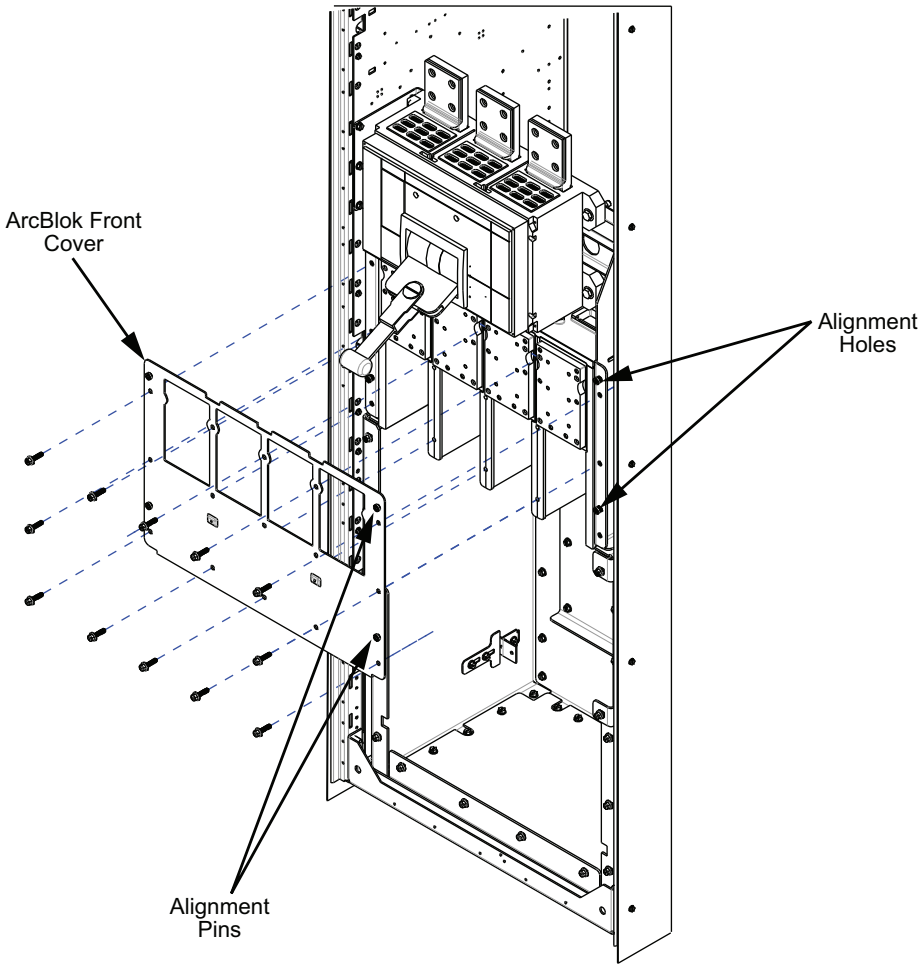


Figure 28 - TIM Sleeve



11. Install the ArcBlok module front cover assembly to enclose the ArcBlok module using 1/4-20 size screws provided as shown in ArcBlok Front Cover Installation, page 48. Install the cover by aligning the four alignment pins in the cover with the holes in the module side plates. Fasten five screws on the top row and another five in the middle row of the front cover. Use the remaining five screws for the bottom row while installing the cable vault front cover as mentioned in step 13. Torque all ten screws on the front cover to 60 lb-in. (6.8 Nm).

Figure 29 - ArcBlok Front Cover Installation



NOTICE

DAMAGE TO TAPE ON THERMAL INTERFACE MODULE (TIM)

Do not damage the tape on the TIM during installation of the ArcBlok front cover during this step. Call Schneider Electric Services if cover assembly is damaged.

Failure to follow these instructions can result in equipment damage.

NOTICE

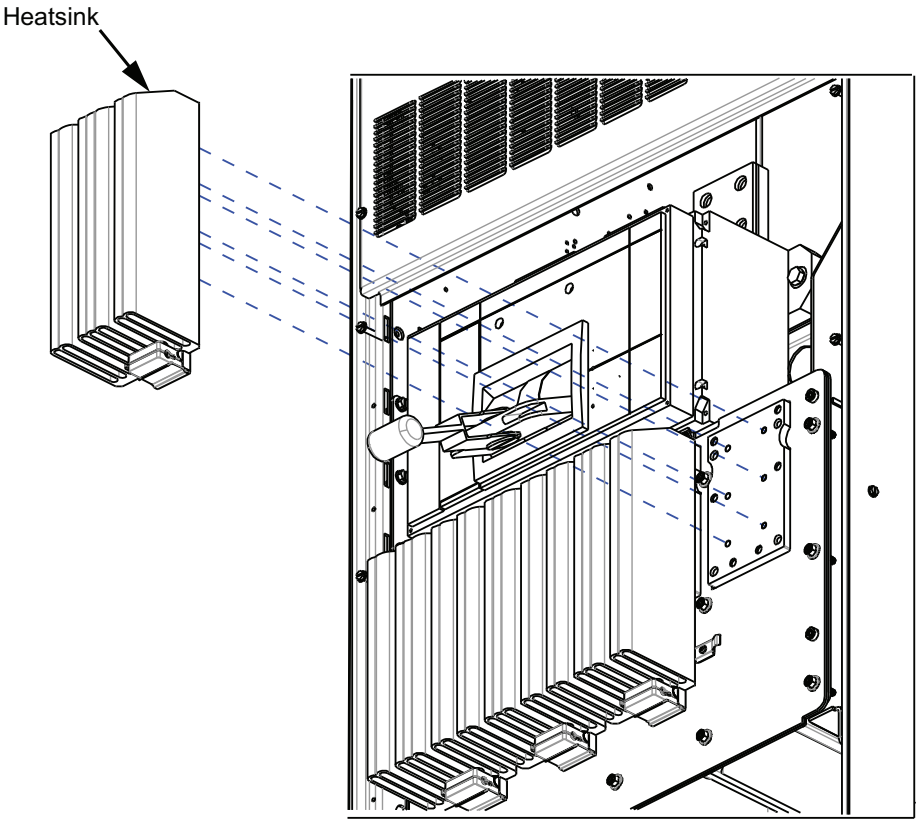
DAMAGE TO ARCBLOK MODULE FRONT COVER ASSEMBLY

Do not apply excessive force to the ArcBlok module front cover assembly during installation. Call Schneider Electric Services if cover assembly is damaged.

Failure to follow these instructions can result in equipment damage.

12. Install one heatsink per phase and neutral on the front surface of the TIM using 1/4-20 size captive screws as shown in ArcBlok Heat Sink Installation, page 49. Torque all six screws on the heatsink in a star pattern to 60 lb-in. (6.8 N•m).

Figure 30 - ArcBlok Heat Sink Installation



⚠CAUTION

RISK OF BURNS FROM HOT SURFACES OR HEATSINKS

Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices when working near heatsinks. See NFPA 70E, NOM-029-STPS or CSA Z462 or local equivalent.

Failure to follow these instructions can result in injury or equipment damage.

13. Install the thermal sensor (if used) as labeled per phase in the thermal sensor mounting clip available underneath the heatsink with the temperature probe towards the base of the heat sink as shown in Thermal Sensor Installation, page 50.

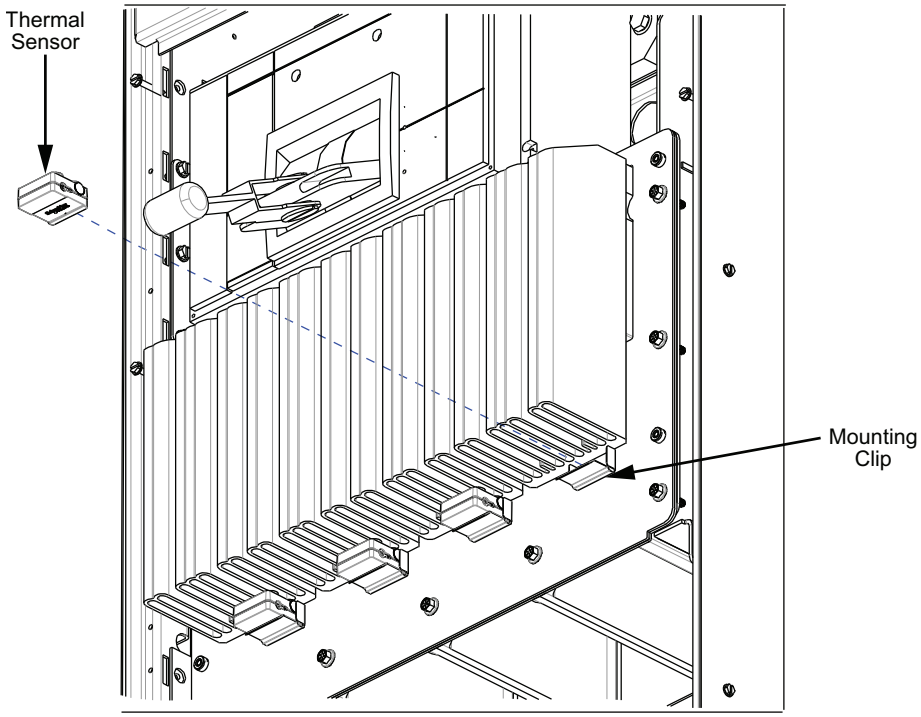
NOTICE

DAMAGE TO SENSOR SPRING LOADED PROBE

Do not damage or let the sensor spring loaded probe tip out of place during the installation to avoid temperature data discrepancy. Call Schneider Electric Services if the sensor is damaged.

Failure to follow these instructions can result in equipment damage.

Figure 31 - Thermal Sensor Installation



14. Perform substeps:
    a. Reinstall the cable vault front cover using (15) 1/4-20 size screws retained in step 5 (see Reinstall Cable Vault Front Cover, page 51).
    b. Locate (5) 1/4-20, x 1 in. long screws from ArcBlok Module kit and install at the top edge of the cable vault front cover to fasten the ArcBlok front cover. Torque all screws on cable vault front cover to 60 lb-in. (6•8 Nm) (see Reinstall Cable Vault Front Cover, page 51).

Figure 32 - Reinstall Cable Vault Front Cover

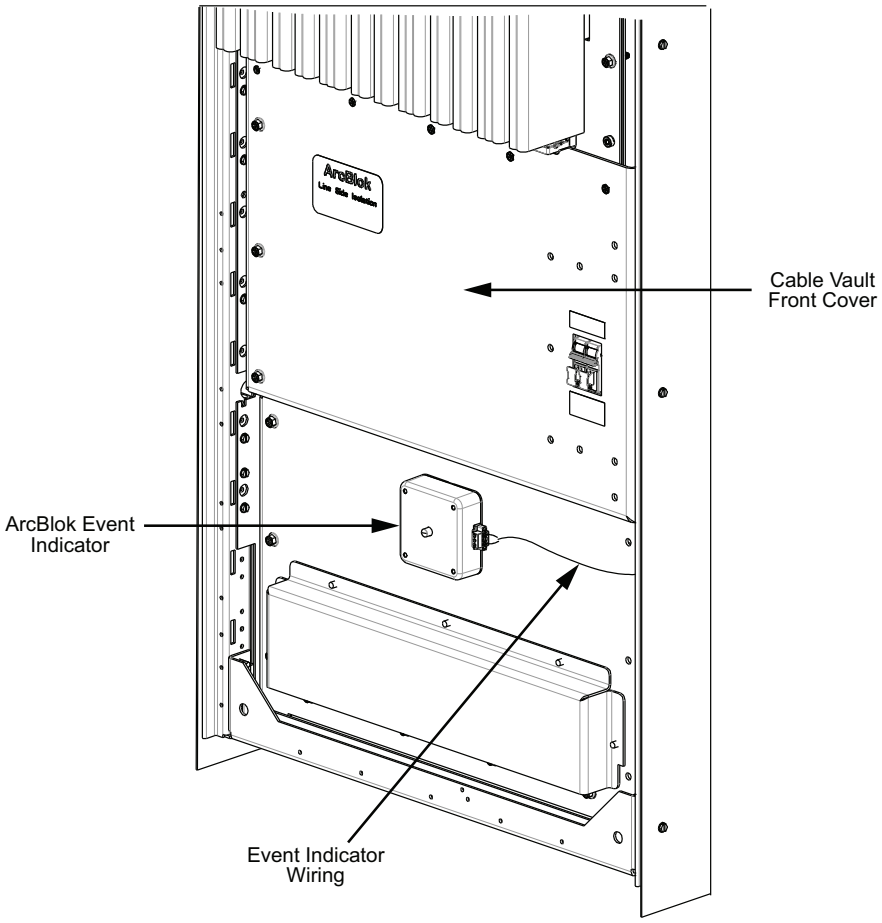
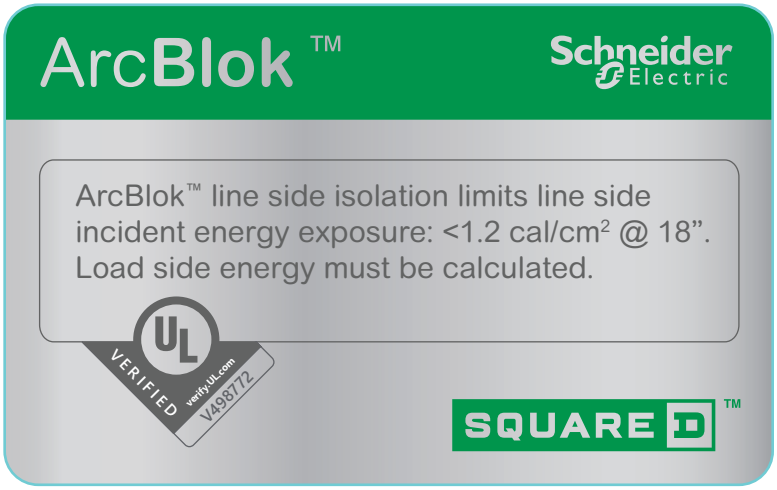


Figure 33 - Cable Vault Front Cover Labels



⚠⚠DANGER

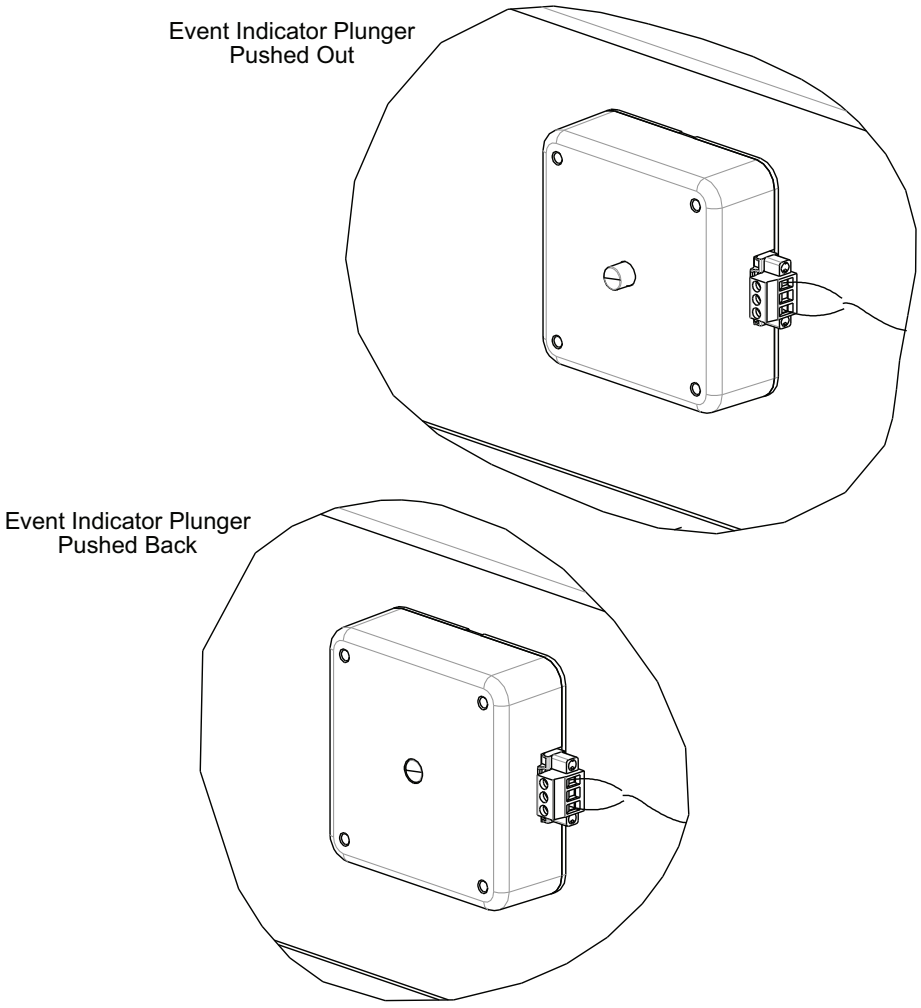
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSAZ462.
- This equipment must be installed and serviced by qualified electrical personnel.
- Read instruction bulletin and become familiar with the equipment before installing, operating, servicing, or troubleshooting the equipment.
- Turn off all power supplying this equipment before working inside this cable vault.
- Always use a properly rated voltage sensing device to confirm power is off.
- Do not turn on power without this cover installed. Incident Energy levels greater than 1.2 cal/cm^2 are present if cover is uninstalled.
- Replace all devices, doors, and covers before turning on power to this equipment.
- Apply torque to cable vault hardware to 60 lb-in. (6.8 N•m).

Failure to follow these instructions will result in death or serious injury.

15. Re-plug the terminal block of the ArcBlok Event Indicator removed in step 4.
16. Make sure the ArcBlok Event Indicator plunger is pushed back as shown in ArcBlok Event Indicator, page 53.

Figure 34 - ArcBlok Event Indicator



17. Reinstall the equipment front covers and breaker cover using 1/4–20 size hardware retained in steps 1 and 2.

Cable Lacing with ArcBlok 2500

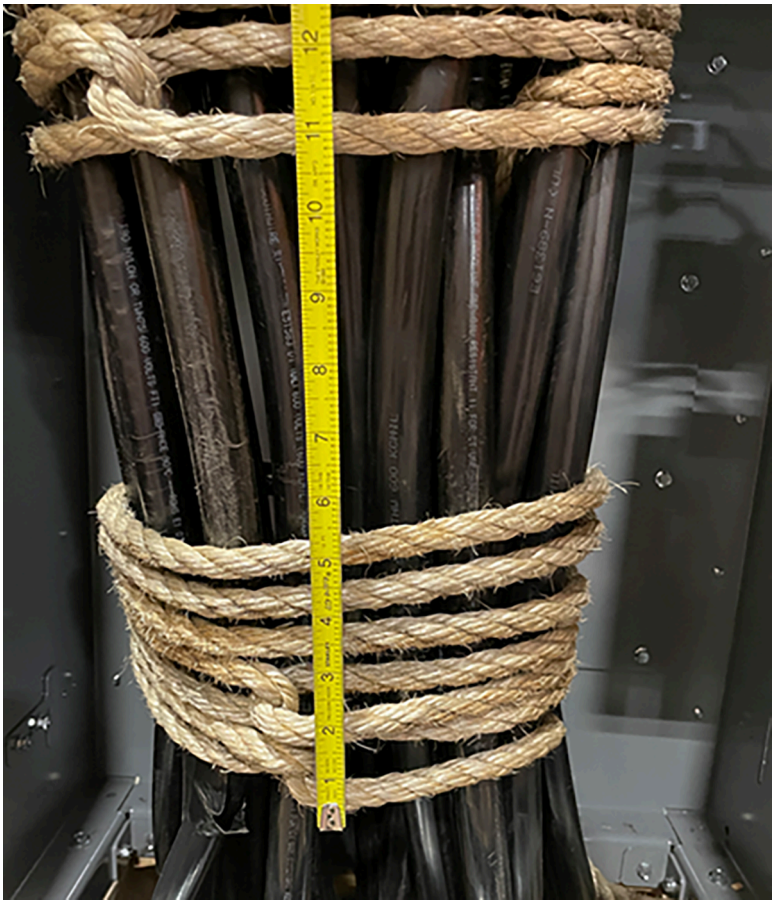
NOTICE
RISK OF LOOSE CABLES Lace and secure all cables. Cable restraint is required on the line-side of the ArcBlok section. **Failure to follow these instructions can result in equipment damage.**

Cable restraint is required on the line-side of the ArcBlok section. All cables must be laced and secured prior to installing the cable vault front cover.

1. Wrap cables using 1/2 in. (13 mm) diameter sisal rope or equivalent.
2. Lace the cables from all phases together in one bundle with a continuous length of rope.
3. Lacing requires two sets of looping groups: an entry loop group and a second loop group nearer to the ArcBlok.

4. Attach one end of the rope to on of the cables about 10 in. (254 mm) from the floor.
5. After attaching the rope, make a loop in it and pull the loop around the entire cable bundle from behind. Pull the loose end of the rope through the loop and continue to pull it until the rope is tight.
6. Make a second loop and pass behind the cables using the same procedure. Put the loose end of the rope through the loop and pull the loop tight. Repeat this step one additional time.
7. Start the second (upper) loop group by first pulling the rope around the cable bundle, then repeat the procedure described in step 6 for the upper loop group. The spacing between the upper and lower loop groups must be no more than 5 1/2 in. (139 mm). See Upper and Lower Loop Group Spacing, page 54.

Figure 35 - Upper and Lower Loop Group Spacing



8. After the entire cable bundle has been laced, tie the end of the rope securely to the looping groups, then cut and tape the end to prevent fraying. Make sure the rope is not obstructing the cable vault front cover, fuse disconnect switch wiring, or ArcBlok Event Indicator plunger.

Vent Hood and Pull Box Installation

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.
- Do not drill or cut in the top area of the motor control center.
- Avoid contaminating the motor control center with dust or debris.
- DO NOT lift the MCC section by the vent hood or pull box or by attaching lifting angles to either one.

Failure to follow these instructions will result in death or serious injury.

Vent Hood

This section contains instructions for installing a vent hood over the top plate vents on an MCC.

NOTE:

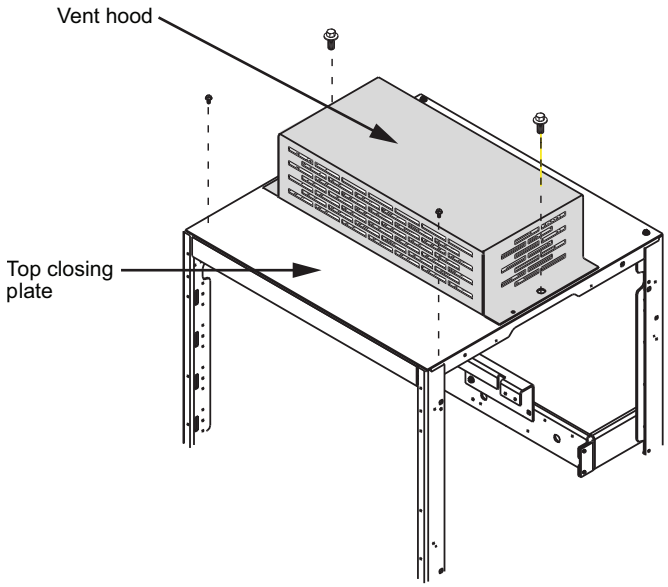
- Do not install the vent hood until the MCC is in its final location.
- Retain all hardware.

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. Remove the 3/8 in. (9.525 mm) bolts and washers that hold the lifting angle in place, and then remove the lifting angle.

   NOTE: The vent hood is attached to the top of the MCC section for shipping. It must be relocated during MCC installation.
3. Remove the two 10-32 screws that secure the vent hood and top plate to the top of the MCC section.
4. Remove the vent hood and reinstall the 10-32 screws into the top plate.

5. Position the vent hood on the top of the MCC section as shown in Reposition and Attach the Vent Hood, page 56.

Figure 36 - Reposition and Attach the Vent Hood



6. Secure the vent hood using the two 3/8 in. (9.525 mm) bolts and washers removed in step 2. Torque the bolts to 28–33 lb-in. (3.164–3.729 N•m).

Standard Pull Box

This section contains instructions for installing pull boxes on low voltage MCCs. Pull boxes are either 12 or 18 in. (304.8 or 457.2 mm) high and mount on the top of the MCC.

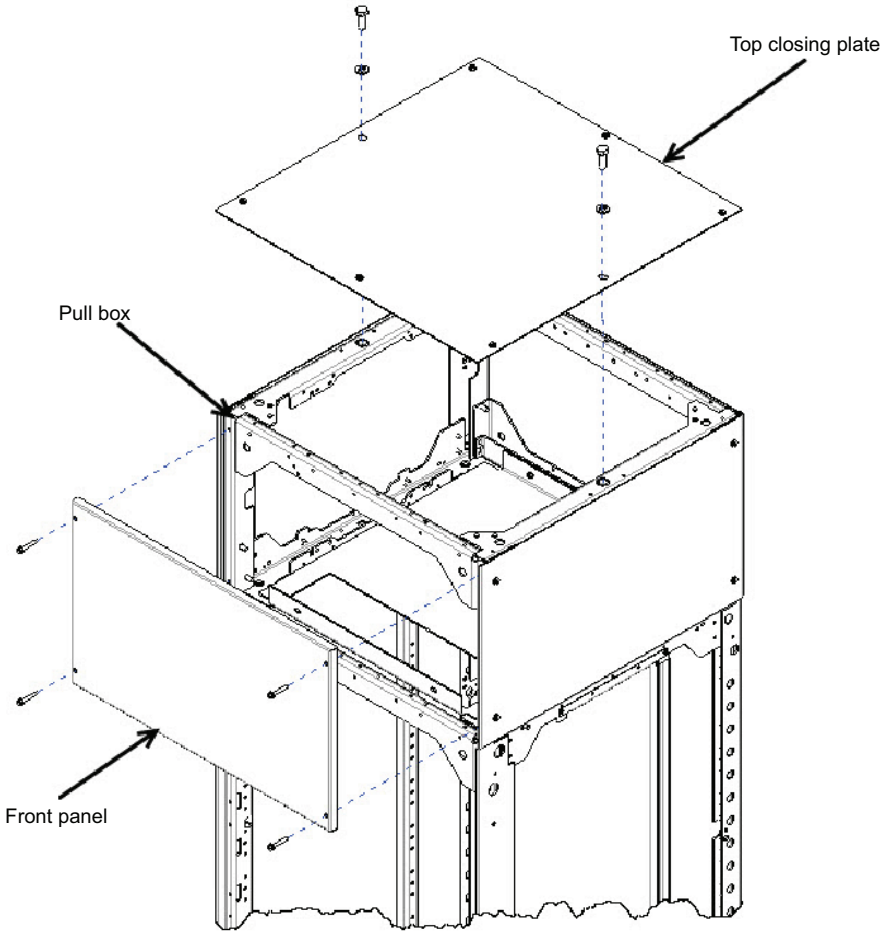
NOTE:

- Do not install the pull box until the MCC is in its final location.
- Retain all hardware.

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm power is off.
2. Remove the 3/8 in. (9.525 mm) bolts and washers that hold the lifting angle in place, and then remove the lifting angle.
3. Remove the 10-32 screws securing the top closing plate to the top of the MCC section.
4. Remove the top closing plate from the structure.

5. Remove the front panel from the pull box. Position the pull box on top of the MCC section as shown in Install the Pull Box, page 57.

Figure 37 - Install the Pull Box



6. Install the two 3/8 in. (9.525 mm) bolts and washers that were removed in step 2. Place them through the pull box lower side channels and into the top of the MCC section. Torque the bolts to 28–33 lb-in. (3.164–3.729 N•m).
7. Re-install the pull box front panel removed in step 5 and the top closing plate removed in step 4 (see Install the Pull Box, page 57).

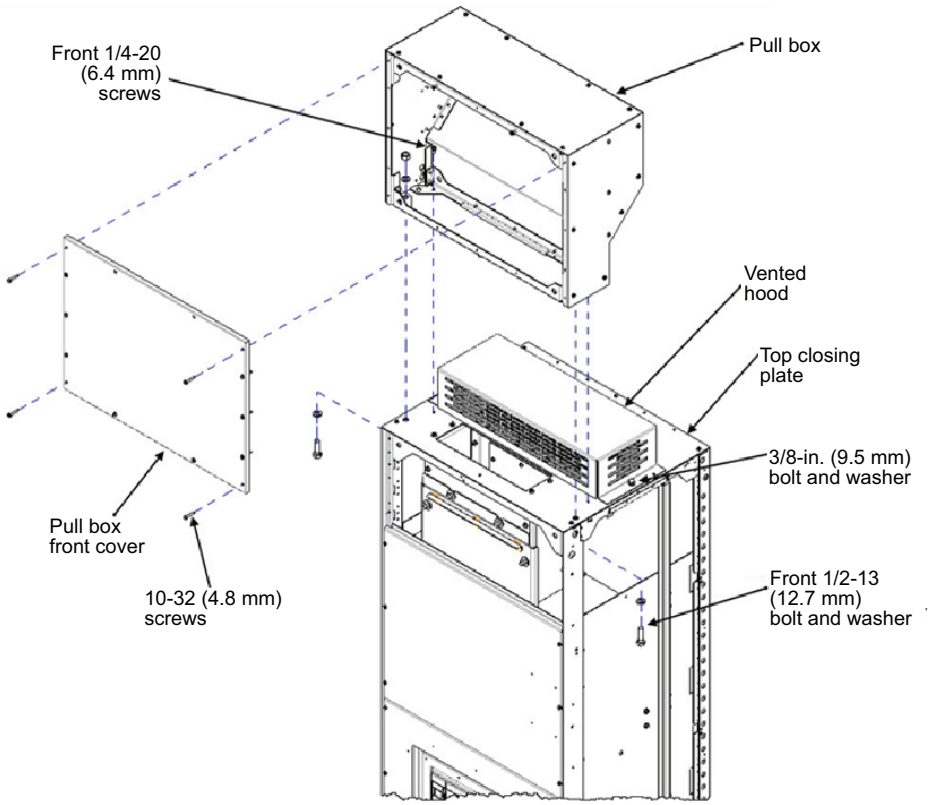
Vented Pull Box

Follow the same instructions for standard pull box installation, except remove and discard the top closing plate from the MCC section. The vented pull box comes with a solid top plate.

ArcBlok 1200 Main Breaker Pull Box (Top Incoming)

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm power is off.
2. Remove the 3/8 in. (9.5 mm) bolts and washers that hold the lifting angle in place, and then remove the lifting angle.
3. Remove the 10/32 in. (4.8 mm) screws and vented hood.
4. Remove the 10/32 in (4.8 mm) screws from the top horizontal wireway cover, and then remove the wireway cover.
5. Remove the pull box front cover for installation access (see ArcBlok 1200 Main Breaker Pull Box, page 58).

Figure 38 - ArcBlok 1200 Main Breaker Pull Box



6. Install 1/2 in. (12.7 mm) bolts and washers from inside the MCC section through the top closing plate and to the front pull box channel. Complete the connection with a washer and nut on the inside of the pull box.
7. Install two 1 /4 in (6.4 mm) screws on the pull box rear channel and to the top closing plate.
8. Install the two 3/8 in. (9.5 mm) bolts and washers that were removed in step 2. Place them through the lower side flanges of the vented hood, and into the top of the MCC section. Torque the bolts to 28–33 lb-in. (3.164–3.729 N•m).
9. Re-install the pull box front cover removed in step 5 (see ArcBlok 1200 Main Breaker Pull Box, page 58) and the top horizontal wireway cover removed in step 4.

Load and Control Wiring

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

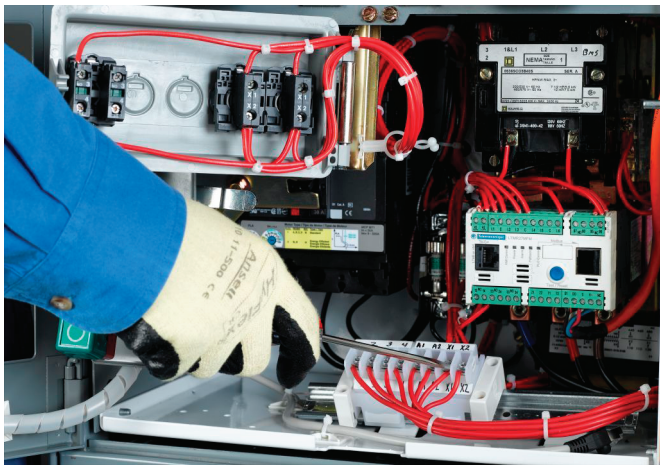
The top and bottom horizontal wireways and the vertical wireway are convenient areas to run incoming line, load, and control wires (see Wiring in the Top Horizontal Wireway, page 59). Openings between sections permit wire to pass from one section into the next for interwiring.

Figure 39 - Wiring in the Top Horizontal Wireway

Control and power wires are routed to each unit via the vertical wireway. When supplied, grommeted wire ports must be opened to route wire to the unit. The Hshaped cut pattern is pre-scored for easy opening. Using a small knife, cut through the center tabs and complete the H-shaped slice. When cutting, be sure not to damage the wires located near the grommet.

Pull-apart control terminals (see Pull-apart Type Terminal Blocks, page 60) are mounted on a 35 mm DIN rail located adjacent to the wiring ports toward the front of the unit. Terminate field control wiring on the removable portion of the block.

Figure 40 - Pull-apart Type Terminal Blocks



Wire Connections - Load and Control

Verify all incoming wires are correctly installed in wire terminals and tightened to required torque values. Torque requirements are found on labels on the main device or on a separate label inside the unit.

Modifying Fuse Clip Locations

⚠⚠DANGER

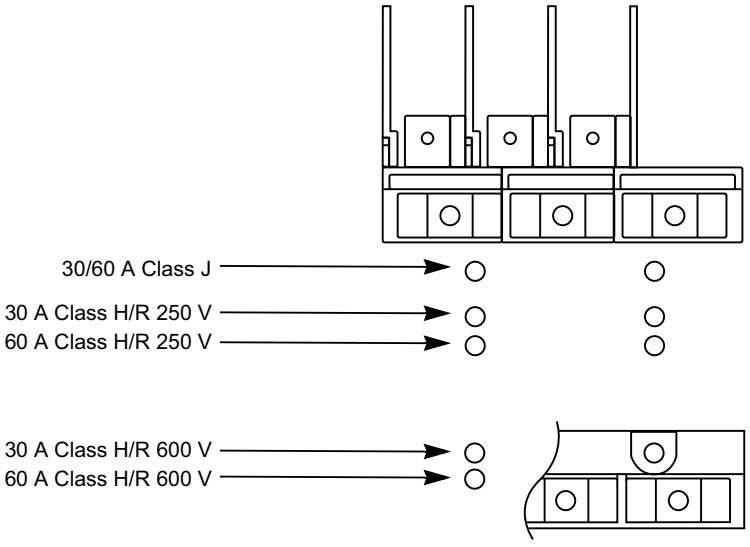
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment and follow lockout/tagout procedures before working on or inside equipment.
- Never operate energized switch with door open.
- Turn off switch before removing or installing fuses or making load side connections.
- Always use a properly rated voltage sensing device at all line and load fuse clips to confirm switch is off.
- Turn off all power supplying switch before doing any other work on or inside switch.
- Do not use renewable link fuses in fused switches.

Failure to follow these instructions will result in death or serious injury.

Install 30 and 60 A fuse bases for the proper fuse size and class and maximum voltage in Size 1 and 2 starter units. The base pan of the disconnect switch has five sets of mounting holes for this purpose. The lower fuse base is installed in the proper mounting holes at the factory (see Size 1 and 2 Fuse Clip Locations, page 61). Additional clips and bases may be required if changing fuse class.

Figure 41 - Size 1 and 2 Fuse Clip Locations



Operation

Included in this section are the pre-operation checklist and energizing procedures.

Pre-operation Checklist

To ensure proper operation of the MCC, check the items listed below before energizing the MCC:

- Complete the initial maintenance procedures beginning with Initial Maintenance of the MCC, page 65 and continuing up to Insulation Test, page 75). This initial maintenance is necessary to detect any shipping damage or loose connections. Do not energize the MCC until initial maintenance is complete.
- Perform an insulation test on the MCC (see Insulation Test, page 75).
- If the MCC is equipped with ground fault protection, properly adjust and test the ground fault protective device before energizing.
- Remove all blocks or other temporary holding means from the electrical devices.
- Remove any secondary shunt bars from the current transformers. Do not operate a current transformer with its secondary open-circuited.
- Manually exercise all switches, circuit breakers, and other operator mechanisms to ensure that they are properly aligned and operate freely.
- Electrically exercise all electrically-operated switches, circuit breakers and other mechanisms (but not under load) to ensure that the devices operate properly. An auxiliary source of control power may be required.
- Verify proper interval and contact operation of the timers.
- Verify that proper overload thermal units are installed by checking the overload selection tables against motor full load current. Motor Logic™, TeSys™ T, and IEC-style overload relays (if supplied) do not require thermal units, but are set at the lowest setting at the factory.
- Verify that all load and remote control connections have been made and that they agree with the wiring diagrams provided.
- Verify that all ground connections are made properly.
- Install the covers and close the doors; ensure all fasteners are engaged.
- Verify that lifting angles have been removed from all sections in the lineup.
- Verify that the proper top plate assembly has been installed per the provided instructions.
- Verify that over-current protection device (OCPD) settings meet the requirements for the electrical system.
- Verify that the required clearances from obstructions above and around the equipment have been met per the requirements outlined in this document.

For ArcBlok 1200 mains:

- Verify all incoming power cables are properly installed and secured:
  - Cable lacing is complete per instructions starting in Cable Lacing with ArcBlok 1200, page 41.
  - The damper and two springs on the cable vault rear panel are installed and functioning properly.
  - Closing plates are installed with conduit.
  - The space between conductors and conduit is sealed with duct seal putty.
- Verify all ArcBlok and cable vault covers are replaced and secured correctly.

For ArcBlok 2500 mains:

Conduct a complete inspection before the MCC is energized to validate that all components function and operate properly. Refer to **Pre-operation Checklist**, page 62. Additional steps are required for ArcBlok Main Section. Complete every step of the checkout procedure listed before energizing the MCC.

1. Verify all incoming power cables are properly installed and secured:
   a. Cables pulling and termination is complete per instructions in Wire Connections with ArcBlok 2500, page 42.
   b. The conduit closure plate is installed with conduits.
   c. The space between conductors and conduits sealed with duct seal putty.
   d. The Thermal Interface Module, ArcBlok Module Front Cover, Heatsinks, and Thermal Sensors are installed correctly as instructed in Wire Connections with ArcBlok 2500, page 42.
2. Verify ArcBlok and Cable vault front and rear covers are replaced and secured correctly.
3. Verify the ArcBlok Event Indicator plunger is pushed back as instructed in ArcBlok Event Indicator, page 53.
4. Refer to deployment guide 7EN42-0247-00 for the Arcblok Event Indicator and CL110 thermal sensor commissioning procedure.

Energizing the MCC

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment and follow lockout/tagout procedures before working on or inside equipment.
- Always use a properly rated voltage sensing device at all line and load fuse clips to confirm switch is off.
- Replace all devices, doors, and covers before turning on power to this equipment.
- Review the Pre-operation Checklist, ensuring that all items check out.

Failure to follow these instructions will result in death or serious injury.

NOTE: If an electrical fault is experienced, do not attempt to re-energize the MCC. Refer to Maintenance After a Fault Has Occurred in instruction bulletin 80459-641-01, Model 6 Motor Control Centers.

To energize the MCC:

1. Review the **Pre-operation Checklist**, page 62 before energizing.
2. Turn off all downstream loads, including distribution equipment and other devices that are remote from the MCC.
3. Verify that all barriers, doors, and covers are closed before energizing the equipment.
4. Energize the equipment in sequence, starting with the MCC main, the feeder units next, and then the motor starter units.
5. With all barriers in place and all unit doors closed and latched, turn on the units by moving the external operator handle with a firm, positive motion.
6. After all unit disconnects are closed, loads such as lighting circuits, starters, contactors, heaters, and motors may be energized.

Initial Maintenance of the MCC

Initial Maintenance: Before energizing any new MCC equipment, perform the maintenance procedures described in this section.

Future Maintenance: Record the installation, initial maintenance, and commissioning date(s) for the MCC. Future maintenance should be performed at least annually, or more frequently if indicated by service conditions or the established maintenance policy. Follow the maintenance procedures in instruction bulletin 80459-641-01, Model 6 Motor Control Centers.

Examining the Enclosure

Examine the interior and exterior of the MCC for moisture, oil, or other foreign material. Eliminate all foreign material and clean the MCC. Clean the interior and exterior of the MCC with a vacuum cleaner. (Do not use compressed air; it will redistribute contaminants to other surfaces.) Check the enclosure for damage that might reduce electrical clearances. Examine the finish of the enclosure. Touch up the paint if necessary. Replace any corroded or damaged enclosure parts.

Maintaining Bus Bars and Incoming Line Compartments

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment and follow lockout/tagout procedures before working on or inside equipment.
- Always use a properly rated voltage sensing device at all line and load fuse clips to confirm switch is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

NOTE: If a three-inch VeriSafe™ Absence of Voltage Tester (AVT) unit is being used to confirm that power is off, refer to the one-line diagram for the MCC to determine which parts of the MCC bus system the AVT monitors. The line side of the breaker main supplying power to MCC lineup or other portions of the MCC bus system might still be powered.

NOTICE

HAZARD OF IMPROPER CLEANING

- Never use a wire brush or sandpaper on the bus; doing so will remove plating and cause oxidation. Use a cleaning fluid approved for such use. Do not use cleaning fluid on insulators.
- Do not attempt to clean bus bars or connectors that are damaged in any way. Replace them with new parts.

Failure to follow these instructions can result in equipment damage.

Follow the steps below at the time of installation to locate and tighten any connections that may have loosened during shipment and handling:

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm power is off.
2. Remove the top and bottom horizontal wireway covers in each section.
3. Expose the bus and bus connections by removing the two-piece bus barrier in each section.
4. Examine all bus bars and connectors. Replace any parts that are badly discolored, corroded, pitted, or otherwise damaged.
5. Verify that all bolts at the bus connection points are in place and properly tightened. See Bus Connection Torque Values, page 66 for torque values.

   Table 3 - Bus Connection Torque Values

Bolted Connection Location	Torque Range
Horizontal bus (all locations)	68–70 lb-ft. (92.29–94.54 N•m)
Horizontal ground bus (all locations)	5–6 lb-ft. (6.75–8.44 N•m)
Splice bars–0.375 in. diameter bolts	31–32 lb-ft. (41.64–43.33 N•m)
Splice bars–0.5 in. diameter bolts	68–70 lb-ft. (92.29–94.54 N•m)

6. Access to load-side bus connections for top-feed ArcBlok main sections will be restricted by the cable vault, so an access panel in the cable vault provides access to B phase bus connections. Bus connections for A and C phases are located at the outer edges of the cable vault.
7. Verify that all main lug, circuit breaker, or fusible switch set screws holding incoming conductors in main lugs are in place and properly tightened. Use a torque wrench and appropriate Allen driver to torque the lug set screws to the correct value. Marking inside the MCC units provides tightening torque information.
8. Inspect all insulators, braces, and barriers; replace any that show signs of damage.

Maintenance on ArcBlok 2500 Main Section If Internal Arc Interruption Occurs

Normal Operation

⚠CAUTION

RISK OF BURNS FROM HOT SURFACES OF HEATSINKS

Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices when working near heatsinks. See NFPA 70E, NOM-029-STPS or CSA Z462, or local equivalent.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

LOW BATTERY INDICATION OR BATTERY NOT DETECTED

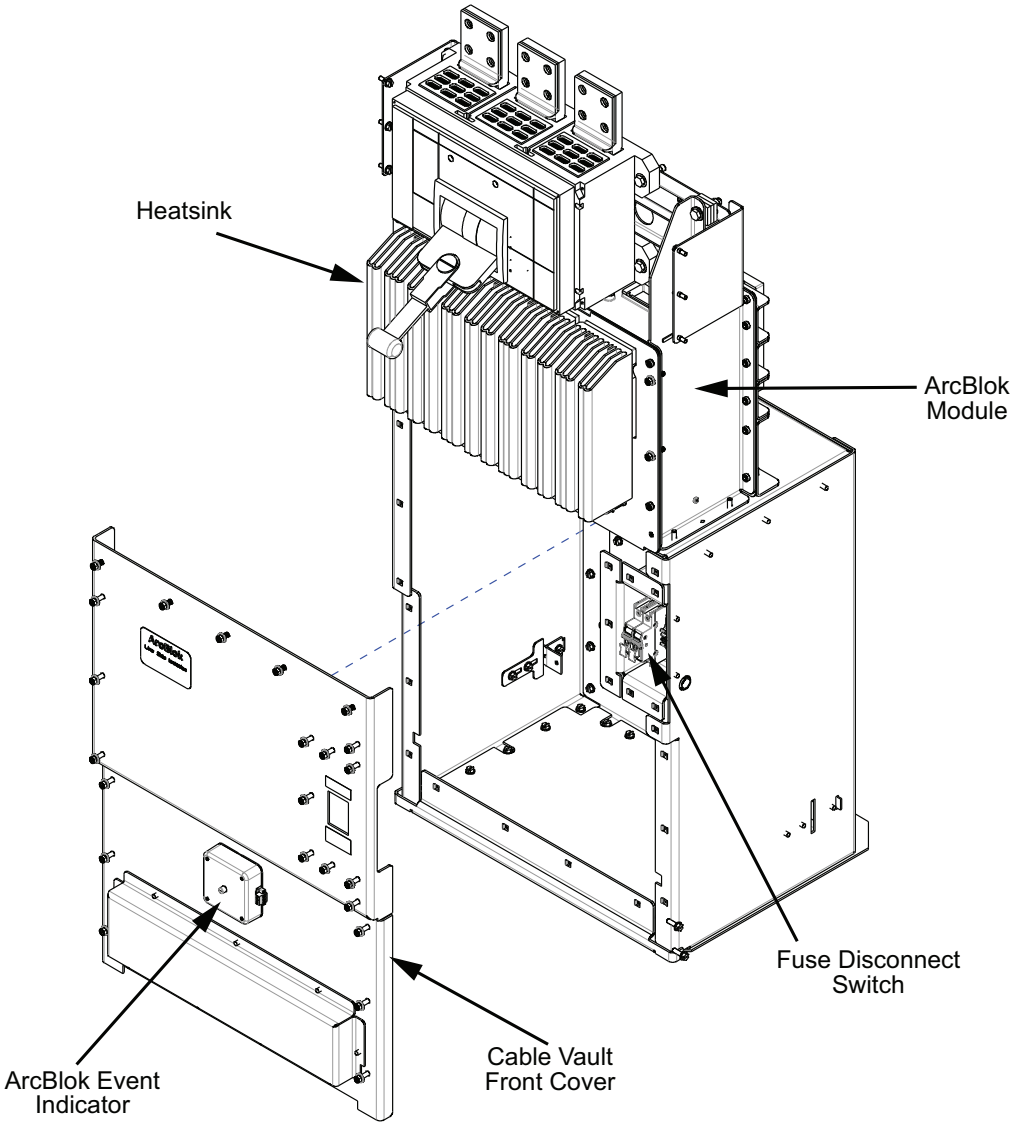
Call Schneider Electric Services when CL110 thermal sensor battery is low, or the sensor is not detected in EcoStruxure PME/SCADA system.

Failure to follow these instructions can result in equipment damage.

Post Internal Arc Interruption

If an internal arc interruption occurs on incoming power of ArcBlok Main device, refer to Return to Service Protocol—R Frame ArcBlok Instruction Bulletin—PKR25993. In addition, inspect the Fuse Disconnect Switch and its wiring inside the cable vault for damage or discoloration. See Inspection Point After an Event, page 68. Contact Schneider Electric Services if any damage or discoloration is found. Refer to deployment guide 7EN42-0247-00 for the ArcBlok Event Indicator and CL110 thermal sensors commissioning procedure.

Figure 42 - Inspection Point After an Event



Initial Maintenance of the Control Units

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment and follow lockout/tagout procedures before working on or inside equipment.
- Always use a properly rated voltage sensing device at all line and load fuse clips to confirm switch is off.
- Do not attempt to remove the unit from the structure with the disconnect in the **ON** position.
- The control unit is interlocked with the MCC structure to prevent the unit from being withdrawn while the disconnect is in the on position. Do not attempt to override the mechanism-to-structure interlock.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

NOTE: If a three-inch VeriSafe AVT unit is being used to confirm that power is off, refer to the one-line diagram for the MCC to determine which parts of the MCC bus system the AVT monitors. The line side of the breaker main supplying power to MCC lineup or other portions of the MCC bus system might still be powered.

During installation, locate and tighten any connections that have become loose during shipment and handling, using the following procedures. If the control unit is being removed from the MCC for maintenance, start with Removing the Standard Control Unit, page 70. If maintenance is performed with the control unit installed, start with Circuit Breaker or Disconnect Switch in Tests and Initial Maintenance Performed with the Control Unit Removed, page 73.

Removing the Standard Control Unit

The Model 6 MCC is designed for convenient and quick control unit removal and replacement. To remove control units:

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. Move the operator mechanism to the OFF position (see Operator Mechanism in the OFF Position, page 70).

Figure 43 - Operator Mechanism in the OFF Position

3. Loosen the fasteners on the door and open it. Use a properly rated voltmeter to check for live circuits. Deenergize any voltage sources.

   NOTE: Arc-rated units have additional fasteners at the topmiddle and bottom-middle of the door that must be loosened to open the door.
4. Release the lock-in device located at the bottom front of the unit (when supplied) by turning the screw on the front of the device until the locking pawl is parallel to the bottom of the unit.
5. Disconnect the power wiring from the starter terminals or, if provided, the power terminal blocks. Tag the terminations for re-installation.
6. Remove the top portion of the pull-apart control terminal blocks to which field wiring is connected.
7. Push the power leads and the top portion of the control pull-apart terminal blocks through the wiring port and into the vertical wireway.

8. Pull forward on the twin handle cam mechanism located at the top front of the unit to rack the unit partially out of the structure (see Pulling the Twin Handle Cam Mechanism Forward, page 71). This action disconnects the power stabs from the vertical bus. Continue pulling forward until the handles are fully extended.

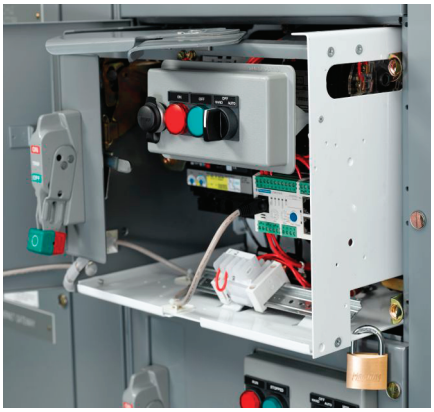
Figure 44 - Pulling the Twin Handle Cam Mechanism Forward

9. The operator mechanism-to-structure interlock prevents the control unit from being withdrawn or inserted with the handle in the ON position (see Operating the Mechanism-to-Structure Interlock, page 71).

Figure 45 - Operating the Mechanism-to-Structure Interlock

10. If the withdrawn unit is left in the structure, use appropriate lock-out procedures to avoid re-loading by non-authorized personnel (see Locked Out Unit, page 71).

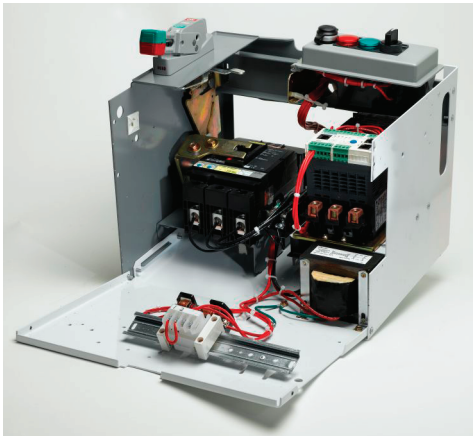
Figure 46 - Locked Out Unit



11. Remove the control unit from the structure for servicing. In units with a full bottom plate, additional accessibility to the components and wiring can be achieved by folding the bottom plate down. To do so, lean the unit on its back, remove the two front screws, and fold the bottom plate down (see Control Unit with Bottom Plate Folded Down, page 72).

    NOTE: Some MCC units can weigh up to 200 lbs. (90 kg) and require two or more persons or special handling equipment. Lift only by supporting bottom and/or side panels of the unit.

Figure 47 - Control Unit with Bottom Plate Folded Down



12. If necessary, the unit door can be taken off its hinges without removing the unit. To do so, drive the hinge pins out of the hinge collars, using a small flat-bladed screwdriver or small punch. Remove the bottom hinge pin first.
13. When reinstalling a hinge pin, make certain that the hooked end is fully engaged into the hinge collar.

Removing the Compac™ 6 Control Unit

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm power is off.
2. Move the operator handle to the **OFF** position.
3. Loosen the fasteners on the door and open it.

    NOTE: Arc-rated units have additional fasteners at the top-middle and bottom-middle of the door that must be loosened to open the door.
4. Check for live circuits using a properly rated voltage sensing device. Deenergize any voltage sources.

    NOTE: Removal of the control station plate may be necessary to perform steps 5 and 6. To remove the control station plate, follow these steps:

    a. Loosen the captive mounting screws holding the plate to the front of the unit.

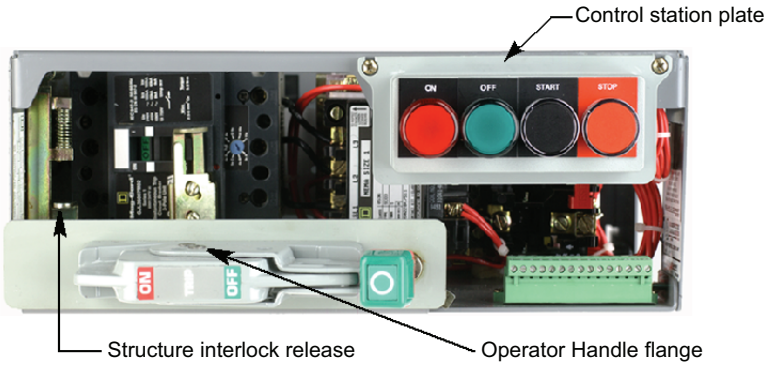
    b. Remove the plate from the unit (see Operator Handle Flange, page 73).

    c. Re-attach the plate after disconnecting the load wires and control terminal block.

    NOTE: Do not disconnect the wires to the control station plate.
5. Disconnect the power wiring from the starter terminals. Tag the terminations for re-installation.

6. Remove the top portion of the pull-apart control terminal block to which field wiring is connected.
7. Push the power leads and the top portion of the control pull-apart terminal blocks through the wiring port and into the vertical wireway.
8. Grasp the operator handle flange and press down on the structure interlock release (see Operator Handle Flange, page 73).

Figure 48 - Operator Handle Flange



9. Firmly pull the unit forward to disengage the power stabs from the vertical bus. The unit should now slide freely from the MCC structure.
10. The operator mechanism-to-structure interlock prevents the control unit from being inserted or withdrawn with the handle in the **ON** position.
11. If the withdrawn unit is left in the structure, use appropriate lock-out procedures to avoid re-loading by non-authorized personnel (see Control Unit with Bottom Plate Folded Down, page 72).
12. Remove the control unit from the structure and place it on a flat surface for servicing.

    NOTE: Partial disassembly of the unit may be necessary to gain access to various electrical connections for servicing.

Tests and Initial Maintenance Performed with the Control Unit Removed

NOTICE
HAZARD OF IMPROPER LUBRICATION • Do not remove the protective lubricant from the stabs. • If additional lubricant is required, order electrical joint compound (Schneider Electric part number PJC7201). **Failure to follow these instructions can result in equipment damage.**

Once the control unit is removed, perform the following tests and initial maintenance:

Circuit Breaker or Disconnect Switch: Verify proper operation of the circuit breaker or disconnect switch. Exercise the push-to-trip feature on the circuit breakers.

Operator Mechanism: Verify proper operation of the operator mechanism (see Operator Mechanism in the Tripped Position, page 74). Test for proper **ON**, **TRIP**, and **OFF** positions. Verify proper door interlock operation.

Figure 49 - Operator Mechanism in the Tripped Position

NOTE: Fusible switch operator mechanisms do not have TRIP positions.

Fuses: Inspect all fuses and fuse clips.

Control Devices: Check for proper operation of starters, relays, timers, and other control devices.

Overload Relay: Manually trip the overload relay to ensure proper operation. Verify that the thermal unit is the proper size for the application. Refer to the thermal unit selection tables in this instruction bulletin.

Wiring and Electrical Connections: Verify that all electrical connections are correct; tighten them if necessary. For any inaccessible electrical connections, please contact Schneider Electric Services. Also inspect all power and control wiring, replacing any wire that has damaged insulation.

Starter Interlocks: Check the mechanical interlocks on reversing, multispeed, or reduced voltage starters.

Special Units: Follow the manufacturer's recommended maintenance procedures for special units (for example: drives, soft starts, and automatic transfer switches).

Reassembly

To reassemble the MCC after testing and maintenance:

1. Reinstall Compac 6 units by reversing removal steps 1–12 in Removing the Compac™ 6 Control Unit, page 72. Reinstall all other units by reversing removal steps 1–13 in Removing the Standard Control Unit, page 70.
2. Confirm the cam mechanism is in the open position; position the mounting slides of the control unit onto the slots of the mid-shelf. Slide the unit inward to engage the cam mechanism.

   For Compac 6 units, position the mounting slides of the control unit onto the slots of the mid-shelf. Slide the unit inward until the unit is halfway in, then move it inward with a quick push. This movement easily overcomes the compression of the stabs as they engage the vertical bus.
3. Replace all barriers and cover plates and close and fasten all doors.

Insulation Test

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment and follow lockout/tagout procedures before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

NOTICE

HAZARD OF OVER-VOLTAGE

Do not use a megohmmeter on:

- Adjustable speed drives
- Solid state soft starters
- Surge protection devices (SPDs)
- AccuSine™ active harmonic filter units
- PowerLogic™ solid state meters
- Capacitor units
- Any devices not designed to withstand megohmmeter voltage

Disconnect all solid state devices such as SPDs, drives, soft starts, capacitors, filters, and circuit monitors before performing megohmmeter tests on the MCC.

Failure to follow these instructions can result in equipment damage.

Before an MCC is energized, take resistance measurements. Use an insulation tester (megohmmeter) with a potential of 500–1000 V.

Take readings between each phase and from each phase to ground, with the branch disconnects off. Make sure the main disconnect is off during all insulation tests.

Readings from a megohmmeter with all disconnects off will typically be 5–20 megohms or higher. Do not energize the MCC if readings below one megohm are found. Contact a local Schneider Electric representative.

Record all megohmmeter readings for future reference. Any sudden change in resistance values (even within the acceptable range) may indicate potential insulation failure. Early detection and replacement of faulty insulating components helps avoid equipment damage.

Motor Circuit Protector (MCP) Settings

The National Electrical Code® (NEC®) and Canadian Electrical Code (CEC) require that magnetic starters, used in combination with adjustable magnetic triponly circuit breakers, have an overload relay in each conductor. TeSys or PowerPacT™ MCPs are the standard motor circuit protectors used in Model 6 MCCs.

Adjusting TeSys or PowerPacT Magnetic Trip Setting

The adjustable magnetic trip setting for all MCPs is factory-set at the lowest trip settting. The trip settings of each MCP will have to be verified for the motor load and adjusted for proper motor start-up.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment and follow lockout/tagout procedures before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

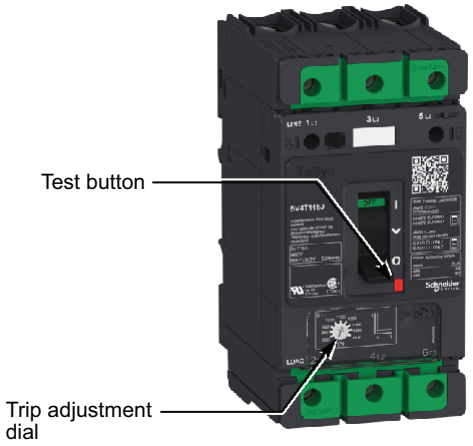
Access the MCP Trip Adjustment

1. Obtaining the motor full load currents from the motor nameplates, select adjustable trip set-points to test start the motors. Further adjustments may be required because of motor load characteristics. Refer to applicable national installation codes for permissible set-points.
2. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
3. Place the unit handle in the **OFF** position and open the door.
4. Use the procedures on the following pages to adjust MCPs.

TeSys B-frame Adjustment Dials

1. While pushing the door interlock lever forward, trip the circuit breaker by pressing the yellow test button (see TeSys B-frame Adjustment Dials, page 77). The disconnect handle will automatically move up, allowing access to the adjustment dial.

Figure 50 - TeSys B-frame Adjustment Dials

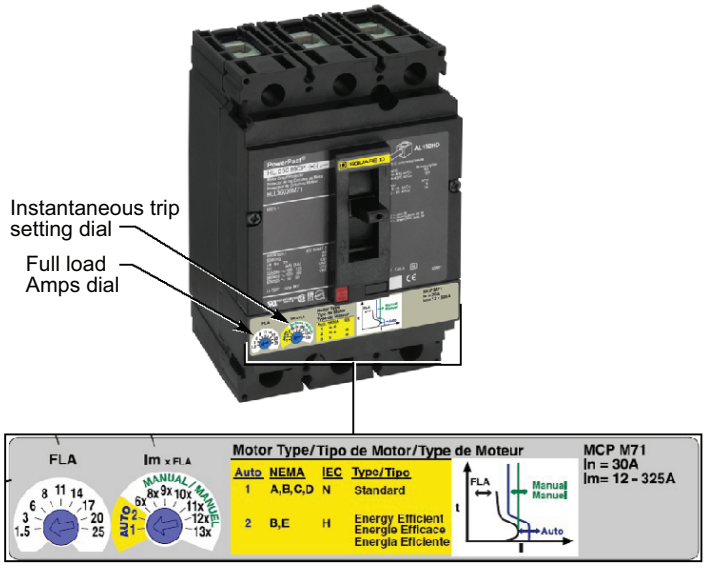


2. After adjusting the trip setting, reset the circuit breaker by moving the disconnect handle to the **ON** position and then to the **OFF** position.

PowerPacT H- and J-frame Adjustment Dials

Set the FLA and Im dials (see PowerPacT H- and J-frame Magnetic Trip Adjustment, page 77). Refer to instruction bulletin 48940-260-01, Motor Circuit Protector (MCP) Settings for PowerPacT H- and J-frame Motor Circuit Protectors for more information.

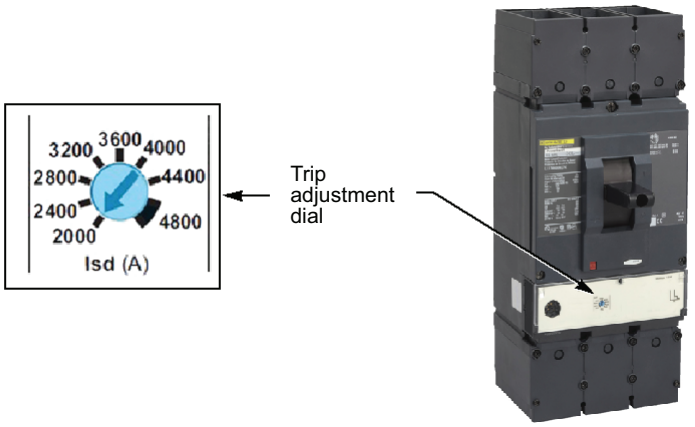
Figure 51 - PowerPacT H- and J-frame Magnetic Trip Adjustment



PowerPacT L-frame Adjustment Dials

Set the trip by adjusting the dial labeled "Isd" as shown in PowerPacT L-frame Adjustment Dials, page 78. The dial is labeled in amperes. Refer to the subsection titled MicroLogic™ 1.3M Electronic Trip Unit Settings in Section 3–Motor-Feeder Applications of instruction bulletin 48940-310-01, MicroLogic 0, 1, 2, and 3 Trip Units User Guide.

Figure 52 - PowerPacT L-frame Adjustment Dials

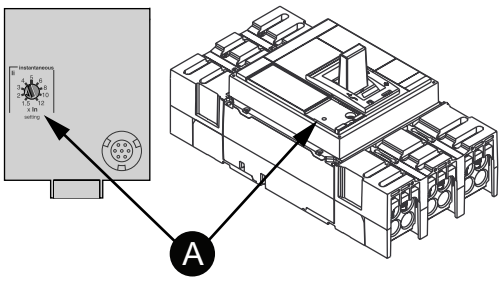


PowerPacT P-frame Adjustment Dials

Make adjustments to P-frame MCPs as follows:

- For P-frame MCPs with MicroLogic ET1.0I and ET1.0M electronic trip units, adjust instantaneous trip (Ii) by adjusting switch A (see PowerPacT P-frame Instantaneous Trip Adjustment, page 78). Switch settings are multiples of the frame rating.

  Figure 53 - PowerPacT P-frame Instantaneous Trip Adjustment

- For P-frame MCPs with other MicroLogic electronic trip units, see instruction bulletin 48049-148-05, PowerPacT P-Frame and NS630b–NS1600 Circuit Breakers.

Modifying MCC Units

Most MCC units are designed for easy removal from the MCC structure. Some units are not removable due primarily to the physical size of the unit.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment and follow lockout/tagout procedures before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

De-Energizing Equipment and Identifying Unit Type

Identify whether the unit intended for modification is a removable style or a fixed position unit. All removable units have stab connections to the vertical bus as shown on the electrical schematics and one-line diagrams provided with the MCC. Most removable units also have a twin handle cam mechanism. One notable exception is the Compac 6 control unit, which is removable but does not have the twin handle cam mechanism.

NOTE: Modifications to arc-rated MCC units or structures can adversely affect the arc containment features and/or performance. Modifications to control circuit wiring are allowed. Modifications specifically covered in this instruction bulletin are allowed. However, additional components, changes to the power circuit, or mechanical modifications to the unit saddle or MCC exteriors must be approved by Schneider Electric. Contact a local Schneider Electric representative for more information.

Modifying Units

If the unit is removable, follow steps 1–10. For step 2, follow the **Removable Unit** instruction.

If the unit is a fixed position unit, follow steps 1–6, step 8, and step 10. For step 2, follow the **Fixed Unit** instruction.

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. **Removable Unit**: Remove the MCC unit from the structure. See the procedure for Initial Maintenance of the Control Units, page 69.

   Fixed Unit: If drilling holes in the back of the MCC unit saddle is required, do not drill through the back of the saddle more than 0.1875 in. (5 mm). Use a drill stop device for this procedure.

3. Perform the required modifications. Use thread-forming screws to mount devices. Do not use bolts and nuts, as they could loosen over time and cause property damage or personal injury. The hardware must not extend beyond the back of the MCC unit saddle more than 0.25 in. (6 mm) or beyond the sides and bottom pan by more than 0.125 in. (3 mm).
4. Maintain proper electrical spacings(2) in the unit.
5. Use a vacuum cleaner to remove all debris left in the unit as a result of the modifications. Do not use compressed air to blow out the unit, because all debris may not be fully removed.
6. Perform the recommended maintenance procedures in Maintaining Bus Bars and Incoming Line Compartments, page 65.
7. **Removable Unit:** Ensure that vertical bus closing plugs are in place (with the exception of one plug where the MCC unit will stab on the vertical bus). If other vertical bus closing plugs are not in the proper position, ensure that all power is removed from the vertical bus and reinstall the vertical bus closing plugs.
8. Use a megohmmeter to perform an insulation test as outlined in Insulation Test, page 75.
9. **Removable Unit:** Look for and clear any obstructions that would not permit proper installation of the MCC unit. Reinstall the unit.
10. Follow the procedures for Energizing the MCC, page 64.

(2) The following minimum spacing requirements are based on Tables 18 and 19 of UL 845, Motor Control Centers (Fifth Edition, October 31, 2018). Through air between live parts (301–600 volts)—In motor control units: 0.375 in. (9.5 mm); in other MCC units: 1.0 in. (25.4 mm). Over (insulation) surface between live parts (301–600 volts)—In motor control units: 0.5 in., (12.7 mm); in other MCC units: 2.0 inches (50.8 mm). Between live parts and grounded metal (0–600 volts)—in motor control units: 0.5 in. (12.7 mm); in other MCC units: 1.0 in. (25.4 mm). Spacing values above can also be used at lower voltages. For conditions other than those noted, contact Schneider Electric.

Moving or Installing Additional MCC Units

Factory assembled MCCs include installed units as shown in the order drawings. On occasion, it may be necessary to relocate a unit from its original position or add a new unit purchased separately. Plug-on units require a midshelf and a unit door are attached to the structure. Follow these instructions for installing or relocating a midshelf and door.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment and follow lockout/tagout procedures before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. Position the midshelf (Shelf and Door Installation, page 82, View A) in the appropriate area of the structure.

   NOTE: Arc-rated MCCs have a midshelf specifically designed for arc-rated MCCs (see Midshelf for Arc-Rated MCCs, page 81). This midshelf includes arc pressure relief flaps and must be used when installing arc-rated MCC units to maintain the arc containment ratings.

   Figure 54 - Midshelf for Arc-Rated MCCs

   NOTE: Some midshelves may be equipped with automatic bus shutters. Instructions for installation and removal of automatic bus shutters can be found in instruction bulletin 80459-641-01, Model 6 Motor Control Centers.
3. Place the mounting foot (Shelf and Door Installation, page 82, View B) of the shelf into the mounting pan slots (C). Secure the shelf at the mounting foot end, the left side, and the right side with flat head screws (Detail A, D).
4. Install the hinge leaves of the door (Detail A, E) into the hinge slots (G), which are on the structure corner channel. Fasten the hinge leaves to the structure corner channel using Torx® head screws (H).
5. Install fastener receptacles (Detail B, J) into the bracket slots (K) and fasten with Torx head screws (H).

Figure 55 - Shelf and Door Installation

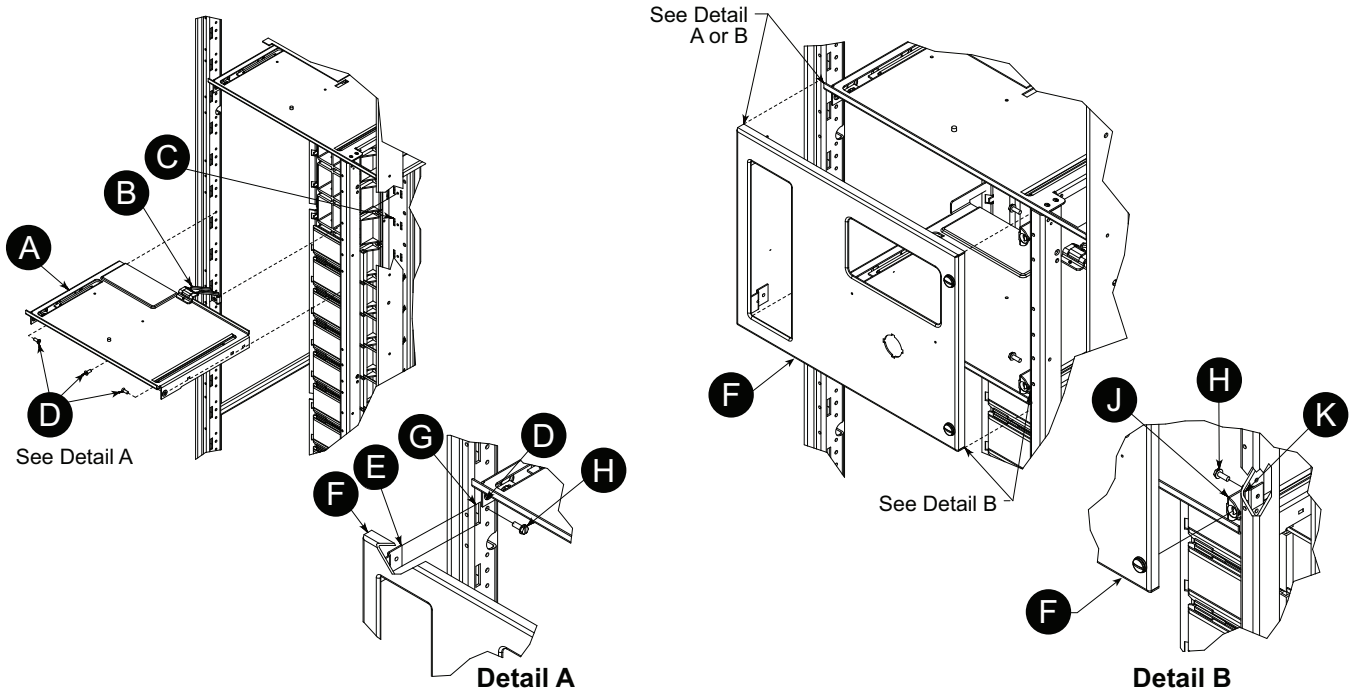


Table 4 - Shelf Installation Kit

Item	Description	Qty	Assemble per
A	Shelf	2(3)	steps 2 and 3
B	Mounting foot	2	step 3
C	Mounting pan slots	2	step 3
D	Flat head screws	4	step 3
E	Hinge leaves		step 4
F	Unit door	1	step 4
G	Hinge slots		step 4
H	Hex head screws	4(4)	steps 4 and 5
J	Quarter turn fastener receptacle	2(4)	step 5
K	Bracket slots		step 5

(3) Shelves are furnished with order. Structure may already have shelf mounted in position.
(4) All necessary hardware for typical shelf installation is included. Door installation may require additional hardware.

Troubleshooting

Misapplication of a device can result in serious issues. For a general table of issues that might be encountered with MCCs, along with their possible causes and remedies, please reference the Troubleshooting section in instruction bulletin 80459-641-01, Model 6 Motor Control Centers.

- Physical damage to the MCC sections or internal parts can usually be quickly located. Schneider Electric can provide replacement parts or repair services.
- Damage caused by water ingress or flood conditions requires replacement of the equipment.

  NOTE: Damaged, arc-rated MCCs must be inspected, repaired, and requalified by Schneider Electric Services personnel to maintain the arc containment ratings.

Contact the Schneider Electric Customer Care Center for repair services, replacement parts, or equipment replacement: se.com/us/en/work/support/, or by calling 888-778-2733, Monday–Friday, 8:00 a.m. to 8:00 p.m. ET.

Thermal Overload Unit Selection

This section identifies the thermal overload units needed for the starters specified in an order. Tables are based on motor full-load amps and provide the catalog number for the appropriate thermal units to be used at that current rating.

Melting Alloy Overload Selection Tables for Combination Starter Units

Table 5 - Size 1

Motor Full-Load Current (A)	Thermal Unit Number	Motor Full-Load Current (A)	Thermal Unit Number
0.56–0.63	B 0.81	4.12–4.70	B 6.90
0.64–0.68	B 0.92	4.71–5.21	B 7.70
0.69–0.77	B 1.03	5.22–5.53	B 8.20
0.78–0.85	B 1.16	5.54–6.17	B 9.10
0.86–0.97	B 1.30	6.18–7.02	B 10.2
0.98–1.09	B 1.45	7.03–7.92	B 11.5
1.10–1.21	B 1.67	7.93–8.61	B 12.8
1.22–1.33	B 1.88	8.62–9.17	B 14
1.34–1.53	B 2.10	9.18–10.0	B 15.5
1.54–1.73	B 2.40	10.1–11.0	B 17.5
1.74–1.89	B 2.65	11.1–11.8	B 19.5
1.90–2.17	B 3.00	11.9–13.5	B 22
2.18–2.53	B 3.30	13.6–15.3	B 25
2.54–2.87	B 3.70	15.4–17.4	B 28
2.88–3.22	B 4.15	17.5–19.4	B 32
3.23–3.49	B 4.85	19.5–22.2	B 36
3.50–3.85	B 5.50	22.3–25.1	B 40
3.86–4.11	B 6.25	25.2–27.0	B 45

Table 6 - Size 2

Motor Full-Load Current (A)	Thermal Unit Number	Motor Full-Load Current (A)	Thermal Unit Number
3.94–4.45	B 6.90	14.0–15.8	B 25
4.46–4.97	B 7.70	15.9–17.9	B 28
4.98–5.28	B 8.20	18.0–19.9	B 32
5.29–5.97	B 9.10	20.0–22.8	B 36
5.98–6.89	B 10.2	22.9–25.4	B 40
6.90–7.92	B 11.5	25.5–28.9	B 45
7.93–8.71	B 12.8	29.0–30.8	B 50
8.72–9.27	B 14.0	30.9–32.5	B 56
9.28–10.2	B 15.5	32.6–34.9	B 62
10.3–11.4	B 17.5	35.0–39.7	B 70
11.5–12.3	B 19.5	39.8–44.7	B 79
12.4–13.9	B 22	—	—

Table 7 - Size 3

Motor Full-Load Current (A)	Thermal Unit Number	Motor Full-Load Current (A)	Thermal Unit Number
14.0–14.9	CC 20.9	36.9–39.8	CC 59.4
15.0–16.2	CC 22.8	39.9–42.3	CC 64.3
16.3–17.2	CC 24.6	42.4–45.7	CC 68.5
17.3–18.7	CC 26.3	45.8–49.2	CC 74.6
18.8–20.2	CC 28.8	49.3–52.8	CC 81.5
20.3–21.7	CC 31.0	52.9–56.8	CC 87.7
21.8–23.3	CC 33.3	56.9–61.2	CC 94.0
23.4–25.2	CC 36.4	61.3–66.1	CC 103
25.3–27.1	CC 39.6	66.2–71.2	CC 112
27.2–29.4	CC 42.7	71.3–76.7	CC 121
29.5–31.6	CC 46.6	76.8–82.9	CC 132
31.7–34.0	CC 50.1	83.0–90.0	CC 143
34.1–36.8	CC 54.5	—	—

Table 8 - Size 4

Motor Full-Load Current (A)	Thermal Unit Number	Motor Full-Load Current (A)	Thermal Unit Number
44.0–46.8	CC 64.3	73.0–78.1	CC 112
46.9–50.6	CC 68.5	78.2–83.9	CC 121
50.7–54.5	CC 74.6	84.0–91.1	CC 132
54.6–58.4	CC 81.5	91.2–97.5	CC 143
58.5–62.9	CC 87.7	97.6–104	CC 156
63.0–67.7	CC 94.0	105–113	CC 167
67.8–72.9	CC 103	114–133	CC 180

Table 9 - Size 5 with CT Type Overloads

Motor Full-Load Current (A)	Thermal Unit Number	Motor Full-Load Current (A)	Thermal Unit Number
40.8–45.5	B 1.03	115–128	B 3.00
45.6–49.9	B 1.16	129–140	B 3.30
51.0–57.5	B 1.30	141–160	B 3.70
57.6–65.9	B 1.45	161–193	B 4.15
66.0–73.1	B 1.67	194–209	B 4.85
73.2–81.5	B 1.88	210–232	B 5.50
81.6–92.3	B 2.10	233–248	B 6.25
92.4–104	B 2.40	249–266	B 6.90
105–114	B 2.65	—	—

Table 10 - Size 6

Motor Full-Load Current (A)	Thermal Unit Number	Motor Full-Load Current (A)	Thermal Unit Number
133–148	B 1.30	272–308	B 2.65
149–174	B 1.45	309–348	B 3.00
175–195	B 1.67	349–397	B 3.30
196–219	B 1.88	398–429	B 3.70
220–239	B 2.10	430–495	B 4.15
240–271	B 2.40	496–520	B 4.85

Melting Alloy Overload Selection Tables for Part Winding Combination Starter Units

Table 11 - Size 1

Motor Full-Load Current (A)	Thermal Unit Number	Motor Full-Load Current (A)	Thermal Unit Number
1.12–1.27	B 0.81	8.24–9.41	B 6.90
1.28–1.37	B 0.92	9.42–10.43	B 7.70
1.38–1.55	B 1.30	10.44–11.07	B 8.20
1.56–1.71	B 1.16	11.08–12.35	B 9.10
1.72–1.95	B 1.30	12.36–14.05	B 10.2
1.96–2.19	B 1.45	14.06–15.85	B 11.5
2.20–2.43	B 1.67	15.86–17.23	B 12.8
2.44–2.67	B 1.88	17.24–18.35	B 14
2.68–3.07	B 2.10	18.36–20.1	B 15.5
3.08–3.47	B 2.40	20.2–22.1	B 17.5
3.48–3.79	B 2.65	22.2–23.7	B 19.5
3.80–4.35	B 3.00	23.8–27.1	B 22
4.36–5.07	B 3.30	27.2–30.7	B 25
5.08–5.75	B 3.70	30.8–34.9	B 28
5.76–6.45	B 4.15	35.0–38.9	B 32
6.46–6.99	B 4.85	39.0–44.5	B 36
7.00–7.71	B 5.50	44.6–50.3	B 40
7.72–8.23	B 6.25	50.4–54.0	B 45

Table 12 - Size 2

Motor Full-Load Current (A)	Thermal Unit Number	Motor Full-Load Current (A)	Thermal Unit Number
7.88–8.91	B 6.90	24.8–27.9	B 22
8.92–9.95	B 7.70	28.0–31.7	B 25
9.96–10.57	B 8.20	31.8–35.9	B 28
10.58–11.95	B 9.10	36.0–39.9	B 32
11.96–13.79	B 10.2	40.0–45.7	B 36
13.80–15.85	B 11.5	45.8–50.9	B 40
15.86–17.43	B 12.8	51.0–61.7	B 45
17.44–18.55	B 14.0	61.8–65.1	B 50
18.56–20.5	B 15.5	65.2–69.9	B 56
20.6–22.9	B 17.5	70.0–79.5	B 62
23.0–24.7	B 19.5	79.6–89.4	B 70

Table 13 - Size 3

Motor Full-Load Current (A)	Thermal Unit Number	Motor Full-Load Current (A)	Thermal Unit Number
28.0–29.9	CC 20.9	73.8–79.7	CC 59.4
30.0–32.5	CC 22.8	79.8–84.7	CC 64.3
32.6–34.5	CC 24.6	84.8–91.5	CC 68.5
34.6–37.5	CC 26.3	91.6–98.5	CC 74.6
37.6–40.5	CC 28.8	98.6–105.7	CC 81.5
40.6–43.5	CC 31.0	105.8–113.7	CC 87.7
43.6–46.7	CC 33.3	113.8–122.5	CC 94.0
46.8–50.5	CC 36.4	122.6–132.3	CC 103
50.6–54.3	CC 39.6	132.4–142.5	CC 112
54.4–58.9	CC 42.7	142.6–153.5	CC 121
59.0–63.3	CC 46.6	153.6–165.9	CC 132
63.4–68.1	CC 50.1	166.0–180.0	CC 143
68.2–73.7	CC 54.5	—	—

Table 14 - Size 4

Motor Full-Load Current (A)	Thermal Unit Number	Motor Full-Load Current (A)	Thermal Unit Number
105–112	CC 74.6	170–181	CC 132
113–122	CC 81.5	182–195	CC 143
123–131	CC 87.7	196–209	CC 156
132–142	CC 94.0	210–227	CC 167
143–153	CC 103	228–247	CC 180
154–157	CC 112	248–266	CC 196
158–169	CC 121	—	—

Table 15 - Size 5 with CT Type Overloads

Motor Full-Load Current (A)	Thermal Unit Number	Motor Full-Load Current (A)	Thermal Unit Number
81.6–91.1	B 1.03	230–257	B 3.00
91.2–101	B 1.16	258-281	B 3.30
102–115	B 1.30	282–321	B 3.70
116–131	B 1.45	322–387	B 4.15
132–146	B 1.67	388–419	B 4.35
147–163	B 1.84	420–465	B 5.60
164–184	B 2.10	466–497	B 6.25
185–209	B 2.40	496–532	B 6.90
210–229	B 2.65	—	—

Removal and Installation of Horizontal Bus Barrier Panels

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

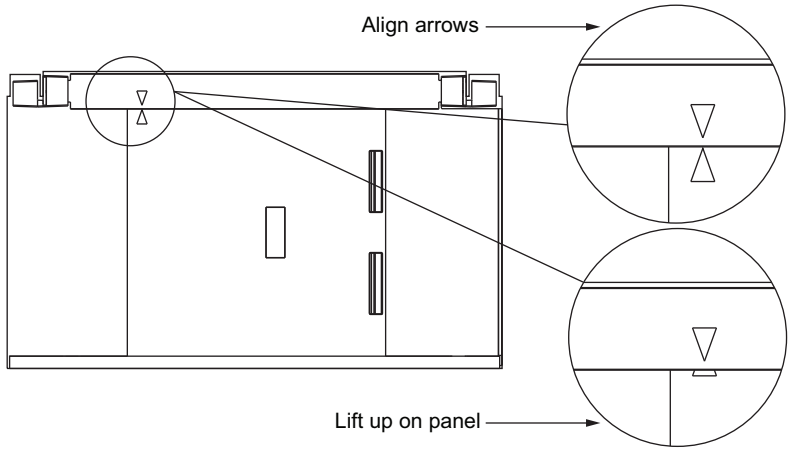
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS, CSA Z462, or local equivalent.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment and follow lockout/tagout procedures before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death or serious injury.

Sliding Barrier Removal

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. With one hand, slide the left panel to the right until it unsnaps from the right panel.
3. Align the arrows on the left panel and top track as shown in Aligning the Arrows on the Panels, page 89. Lift the panel out of the bottom track, and remove the panel.

Figure 56 - Aligning the Arrows on the Panels



4. Align the arrows on the right panel and top track as shown in Aligning the Arrows on the Panels, page 89. Lift the panel out of the bottom track, and remove the panel.

Sliding Barrier Installation

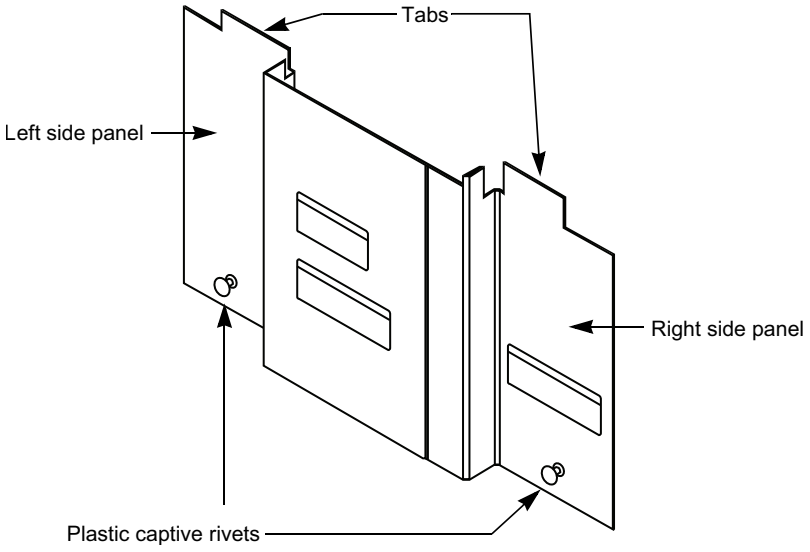
NOTE: The horizontal bus barrier contains two identical panels with arrows at the top. The “handle” on the left panel faces the front of the MCC section. The “handle cavity” on the right panel faces the front of the MCC section.

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. Align the arrows on the right panel and top track.
3. Lift the panel up into the rear groove of the top track.
4. Lower the panel into the rear groove of the bottom track.
5. Slide the panel to the far right.
6. Align the arrows on the left panel and top track.
7. Repeat steps 3 and 4 using the left panel and front groove.
8. Slide the panel to the left until it locks (snaps) into place.
9. Verify that the barrier is completely closed by making sure that the wiring compartment is isolated from the bus compartment.

Fixed Barrier Removal

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. A captive rivet at the bottom of each bus barrier panel secures the panels to mounting brackets on the MCC (see Fixed Horizontal Bus Barrier, page 90, Horizontal Bus Barrier Installation and Removal, page 91, and Barrier Installed and Removed, page 91).

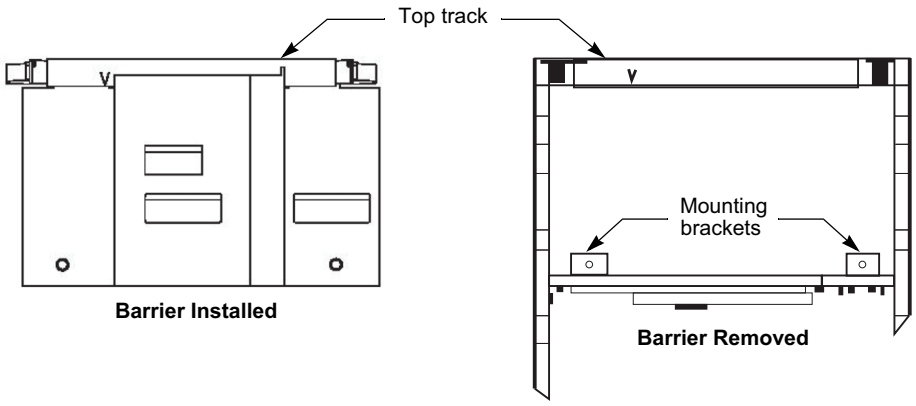
Figure 57 - Fixed Horizontal Bus Barrier



3. Firmly grasp the head of the left side rivet and pull until the rivet releases from the mounting bracket.
4. Pull out on the bottom of the left side panel until the tab at the top of the panel is clear of the top track (see Horizontal Bus Barrier Installation and Removal, page 91).

5. Remove the panel from the MCC.
6. Repeat steps 3–5 for the right side panel.

Figure 58 - Horizontal Bus Barrier Installation and Removal



Fixed Barrier Installation

1. Turn off all power supplying this equipment before working on or inside the equipment, and follow lockout/tagout procedures. Always use a properly rated voltage sensing device to confirm the power is off.
2. Insert the tab on the right side panel into the top track on the right side of the MCC and set it into place (see Horizontal Bus Barrier Installation and Removal, page 91 and Barrier Installed and Removed, page 91).

Figure 59 - Barrier Installed and Removed

Installed **Removed**

3. Secure the right side panel by pushing the rivet firmly into the hole of the mounting bracket.
4. Repeat steps 2 and 3 for the left side panel.

Technical Support

Technical support is available Monday-Friday, 8:00 a.m. to 8:00 p.m. ET, by calling 888-778-2733.

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