Power-Style[™]

QED-2 Switchboards

Instruction Bulletin

80043-055-16 Release date 06/2024







Legal Information

The information provided in this document contains general descriptions, technical characteristics and/or recommendations related to products/solutions.

This document is not intended as a substitute for a detailed study or operational and site-specific development or schematic plan. It is not to be used for determining suitability or reliability of the products/solutions for specific user applications. It is the duty of any such user to perform or have any professional expert of its choice (integrator, specifier or the like) perform the appropriate and comprehensive risk analysis, evaluation and testing of the products/solutions with respect to the relevant specific application or use thereof.

The Schneider Electric brand and any trademarks of Schneider Electric SE and its subsidiaries referred to in this document are the property of Schneider Electric SE or its subsidiaries. All other brands may be trademarks of their respective owner.

This document and its content are protected under applicable copyright laws and provided for informative use only. No part of this document may be reproduced or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), for any purpose, without the prior written permission of Schneider Electric.

Schneider Electric does not grant any right or license for commercial use of the document or its content, except for a non-exclusive and personal license to consult it on an "as is" basis.

Schneider Electric reserves the right to make changes or updates with respect to or in the content of this document or the format thereof, at any time without notice.

To the extent permitted by applicable law, no responsibility or liability is assumed by Schneider Electric and its subsidiaries for any errors or omissions in the informational content of this document, as well as any non-intended use or misuse of the content thereof.

Table of Contents

Safety Information	5
Please Note	5
Introduction	6
Inspection and Packaging	6
Document Replacement	6
Safety Precautions	7
Moisture Contamination Avoidance and Mitigation	8
Shipping, Receiving, and Storage Requirements	8
Installation, Operation, and Maintenance Requirements	9
Exposure to Moisture, Chemicals, and Condensation	9
Additional Receiving, Handling, and Storing Information	10
Receiving	10
Handling	10
Handling with Lifting Straps	11
Handling Without Lifting Straps	11
Storing	14
Installation	15
Location	15
Foundation Preparation	15
Switchboard Preparation	16
General Installation	16
Joining Shipping Sections-Outdoor Switchboards	17
Joining Shipping Sections-Indoor Switchboards	18
Anchoring for Seismic Qualifications	19
Responsibility for Mitigation of Seismic Damage	19
Maintaining Seismic Certification	19
Anchoring QED–2 Equipment for Seismic Applications	19
Base Anchoring	21
Top Anchoring/Restraint	23
Anchoring the Switchboard	24
Through Bus Splice Connections	25
Ground Bus Splice Connections	26
Grounding and Bonding	27
Service Equipment-Grounded System	27
Service Equipment-Ungrounded System	29
Non-Service Equipment	29
High-impedance Grounded Neutral Systems	29
Busway Connections	29
Busway Connection-NEMA Type 1 (Indoor) Only (Qwik Flange)	30
Busway Connections–NEMA Type 1 (Non-Qwik Flange) and NEMA Type	
3R	31
Conduit Area	32
Cable Pulling	33
Cable Terminations	33

Cable Restraint for Short-circuit Current Rating (SCCR)	34
Pre-energizing Checkout Procedure	37
Ground Fault Protection Systems	
Energizing the Switchboard	40
Maintaining the Switchboard	41
General Inspection and Cleaning	41
Bus Bar Joints, Lug Terminations, and Insulating Materials	42
General Lubrication Information	42
Automatic Transfer Switches	42
Bolt-Loc Bolted Pressure Contact Switch Maintenance, 800-4000 A	43
Circuit Breakers	45
QMB/QMJ/QMQB Fusible Switches	46
Switch Maintenance	47
Fuse Replacement (Fusible Switches Only)	47
Installing QMB/QMJ/QMQB Fusible Switches	47
Removing QMB/QMJ/QMQB Fusible Switches	48
Ground Fault Protection Systems	49
Continuous Thermal Monitoring (CTM) Sensors	49
Sensor Maintenance	49
Adverse Circumstances	50
Inspection Following a Short Circuit	50
Clean-up Following a Short Circuit	50
Water-soaked Switchboards	50
Water-sprayed or Splashed Switchboards (Clean Water Only)	51
Inspection and Clean-up of Clean Water Sprayed or Splashed	
Switchboards	51
Torque Values for Electrical Connections	53
Switchboard Insulation Resistance Chart	55
Reference Publications	56
Installation and Maintenance Log	57
Appendix A-Instructions for ArcBlok Main Section	58
Switchboard Preparation - Bottom Fed ArcBlok Main Section	58
Anchoring Access for the Bottom Fed ArcBlok Main Section	59
Grounding and Bonding-Bottom Fed ArcBlok Main Section	60
Conduit Area-Bottom Fed ArcBlok Main Section	60
Cable Pulling and Termination in the ArcBlok Main Section	60
Cable Restraint Instructions–ArcBlok Main Section	71
Pre-energizing Checkout Procedure-ArcBlok Main	73
Maintenance on ArcBlok Main Section If Internal Arc Interruption Occurs	74

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.

A A DANGER

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

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

ACAUTION

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 manual contains instructions for the proper installation, operation, and maintenance of Power-Style QED-2 switchboard equipment manufactured by Schneider Electric. Engineering, installation, and operating staff supervisors should familiarize themselves with this manual and become acquainted with the appearance and characteristics of each piece of equipment mounted or contained in the switchboard.

These instructions and procedures apply to Power-Style QED-2 switchboard installations by Schneider Electric. When special features or non-standard components are incorporated in the switchboard, detailed instructions for these components are included in the instruction material holder.

NOTE:

- Series 2: There are references to Series 2 switchboards in several places in this instruction bulletin. To determine if the QED-2 switchboard is a Series 2 model, check the rating nameplate located on the front cover. If the switchboard is a Series 2 model, the nameplate indicates that. If it is not a Series 2 model, there is no Series designation.
- QED-2 with Vented Roofs: Some QED-2 designs are roof vented, with an option for roof hoods in lieu of drip pans. If roof hoods are selected, they are shipped separately and are installed on top of the vented roof using four (4) self-threading, 0.25 in. (6 mm) fasteners (included). They require 6 in. (152 mm) of additional height clearance. See Typical QED-2 Roof Hood Construction, page 6 for typical roof hood construction.

Figure 1 - Typical QED-2 Roof Hood Construction



Inspection and Packaging

Every Power-Style QED-2 switchboard is carefully inspected and packaged at the assembly plant. Construction of the switchboard is checked, both structurally and electrically, for compliance with all specifications, codes, and standards. After a complete inspection, the switchboard is prepared for shipment. Each section is shipped separately for easier handling before installation. The factory order number, an identification number, and the shipping weights are plainly marked on each shipping section.

Document Replacement

Contact your local Schneider Electric representative to replace lost or damaged wiring diagrams and instruction sheets. Use the factory order number as a reference.

Safety Precautions

A A 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 CSA Z462.
- This equipment must be installed and serviced only by qualified personnel.
- Perform 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.
- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power. Assume all circuits are live until they are de-energized, tested, and tagged. Particularly consider the power system design and all sources of power, including the possibility of backfeeding.
- Always use a properly rated voltage sensing device to confirm power is off.
- Practice lock-out/tag-out procedures according to OSHA requirements.
- Handle this equipment carefully and install, operate, and maintain it correctly in order for it to function properly.
- Carefully inspect your work area and remove any tools and objects left inside the equipment.
- Replace all devices, doors, and covers before turning on power to this equipment.
- All instructions in this manual assume that the customer has taken all the measures above before performing maintenance or testing.

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

AWARNING

POTENTIAL COMPROMISE OF SYSTEM AVAILABILITY, INTEGRITY, AND CONFIDENTIALITY

- Change default passwords to minimize instances of 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 minimize chances of unauthorized exposure, loss, modification of data and logs, interruption of services, or unintended operation.

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



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

A A 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 minimum of 200 W 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.

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, 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.

- Treat the equipment as if it is in storage until it is installed and operational. The storage area must be clean, dry (75% or less relative humidity), and climatecontrolled with proper ventilation.
- To keep the equipment dry, use of heaters is required in some cases (for example, during seasonal or low periods of electrical loading and equipment deenergization).
 - Consult the engineer of record for the appropriate environmental control settings or means to mitigate environmental influences.
 - If so equipped, set the thermostats and/or humidistats to mitigate condensation. A minimum of 200 W of heat per section is recommended.
 - If heaters are 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 (no tarp) over-the-road transportation that risks exposing the equipment to the elements. Leave the factory shipping wrap around the equipment on the equipment until the equipment is ready for inspection 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 your 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 help prevent condensation and alternate heat sources are required. If environmental controls such as a thermostat or humidistat are used, their settings must be sufficient to mitigate condensation and always remain operational. 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.

Additional Receiving, Handling, and Storing Information

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- If signs of moisture contamination are present, do not follow the instructions in this section.
- If signs of moisture contamination are present, proceed to Moisture Contamination Avoidance and Mitigation, page 8.

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

Receiving

On receipt:

- Check the packing list against the equipment received to ensure the order and shipment are complete.
- Immediately inspect switchboard sections for any damage that occurred in transit. If damage is found or suspected, file a claim with the carrier immediately and notify the nearest Schneider Electric representative.

Handling

SPECIAL HANDLING REQUIREMENTS

- Do not lay the equipment on its front or sides.
- · Lay equipment only on its back when special handling is required.
- Do not ship the equipment lying down.

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

Proper equipment, such as an overhead crane, must be available at the installation site to handle the switchboard. This equipment helps avoid injury to personnel and damage to the switchboard.

The shipping weight of each shipping section is marked on the packing list. Verify the lifting capacity of the equipment used to handle the switchboard is in accordance with the shipping weight of each shipping section. Keep the switchboard upright during handling.

Schneider Electric recommends using an overhead crane, lifting straps, and cables or chains to handle the switchboard. This method and alternative handling methods are discussed in this section.

Handling with Lifting Straps

Schneider Electric provides lifting straps as standard equipment for NEMA Type 1 switchboard shipping sections rated 3,000 A or less. Instruction labels on each shipping section include drawings and written instructions outlining the proper use of the lifting straps (see Lifting with an Overhead Crane, Lifting Straps, and Cables or Chains, page 11). Use rigid spreaders or a spanner bar to provide vertical lift on the lifting straps. This helps avoid damage to the frame or finish.



Figure 2 - Lifting with an Overhead Crane, Lifting Straps, and Cables or Chains

To handle the switchboard:

- 1. Use load-rated cables or chains with safety hooks or shackles. Do not pass cables or chains through holes in lifting straps.
- 2. Use a load-rated spreader beam to minimize chance of structure damage. Rig so that the minimum angle between the lifting cables or chains and equipment top is 45°.

To lay the equipment on its back:

- 1. Remove shipping skid and equipment back covers.
- 2. Use overhead cranes, lifting straps, and cables or chains to lay equipment on its back. Rate of drop or pickup for laying equipment on its back is four feet (1.2 m) per minute or less.
- 3. Reverse the procedure to stand the equipment in its upright position.
- 4. Reinstall back covers.

Handling Without Lifting Straps

Lifting straps are not furnished on shipping sections rated more than 3,000 A, or on rainproof switchboards. Use rollers, slings, or other means to handle the shipping sections. The handling label (Handling Instruction Label, Switchboards without Lifting Straps, page 12) is affixed to each of these sections.

🛦 WARNING / ADVERTENCIA / AVERTISSEMENT Do not pass cables or chains through lift 45° Min. angle Ángulo de 45° mín. holes. Use only load rated cables or chains with safety hooks or shackles. Angle de 45° min. No haga pasar cables ni cadenas por los agujeros de levantamiento. Utilice sólo cables o cadenas adecuados para la carga con argollas o ganchos de seguridad. Ne faites pas passer de câbles ou chaînes 1/2 A or more. par les trous de levage. Utilisez uniqument 1/2 de A o más. 1/2 A ou davantage. des câbles ou chaînes classés poursuporter la charge, munis de crochets ou manilles de sécurité Load rated spreader bar. Blocks Barra separadora adecuada Equipment (front or rear) Bloques para la carga. Equipo de distribución tipo Blocs Entretoise classée pour autosoportado (parte frontal o posterio supporter la charge. Stringer Cadena L'appareil de commutation Sling rigging. Traverse (avant ou arrière) Montaje de eslinga. Arrimage de élingues. HANDLING AND LIFTING HAZARD · This equipment must be moved by a sling, chain or rollers. · Stabilize the shipping section to prevent tipping. · Do not work under, around or on this equipment while elevated or moving. · Consult with a certified rigging and lifting expert for any situation not covered in these instructions. · Do not lay the equipment on its front or sides. Doing so will damage unit. • Lay equipment only on its back when special handling is required. See Instruction Bulletin for special handling instructions for laying equipment on its back. · Equipment is NOT to be shipped lying down. Failure to follow these instructions can result in death, serious injury or equipment damage. PELIGRO AL LEVANTAR O MANEJAR EL EQUIPO · Este equipo debe moverse con una eslinga, cadena o rodillos. • Estabilice la sección de embarque para evitar voltearla. • No trabaje debajo, alrededor o sobre el equipo mientras se está elevando o moviendo · Consulte con un experto certificado en elevación y montaje para cualquiersituación que no se incluye en estas instrucciones. • No coloque el equipo sobre su frente o lados ya que podría dañarse la unidad. · Coloque el equipo sobre su parte posterior solamente cuando sea necesario manejarlo de manera especial · Consulte el boletín para obtener las instrucciones especiales de manejo para colocar el equipo sobre su parte posterior. · El equipo NO deberá transportarse acostado. El incumplimiento de estas instrucciones puede causar la muerte, lesiones serias o daño al equipo. **RISQUE EN COURS DE LEVAGE ET DE MANUTENTION** · Cet appareil doit être déplacé à l'aide d'une élingue, d'une chaîne ou de roulettes. Stabilisez la section de transport afin d'éviter qu'il ne bascule. • Ne travaillez pas en dessous, autour ou sur cet appareil pendant qu'il est soulevé ou déplacé. · Consulter un spécialiste de l'arrimage et du levage pour toute situation non couverte dans ces directives. · Ne couchez pas l'appareil sur sa face avant ou sur las cotés. Faire ainsi l'endommagerait. · Couchez l'appareil sur le dos uniquement lorsqu'une manutention spéciale est nécessaire. · Consultez les directives d'utilisation pour les instructions de manutention spéciales pour caucher l'appareil sur le dos. · N'expédiez PAS l'appareil sur son dos. Si ces directives ne sont pas respectées, cela peut entraîner la mort, des blessures graves ou des dommages matériels.

Figure 3 - Handling Instruction Label, Switchboards without Lifting Straps

The warning label shown in Rear Warning Label, Rainproof Switchboards, page 13 is attached to the rear of rainproof switchboards.





The warning label shown in Front Warning Label, Rainproof Switchboards, page 13 is attached to the front of rainproof switchboards.





AWARNING

TOP HEAVY LOAD—HAZARD OF TIPPING

- · Stabilize the shipping section to reduce the possibility of tipping.
- Consult with a certified rigging and lifting expert for any situation not covered in these instructions.

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

When elevating a shipping section not equipped with lifting straps, use an overhead crane equipped with either of the following:

- A chain coupled to a sling rigging
- A wire cable with safety hooks and shackles

Wrap the sling completely around the switchboard and shipping stringers.

NOTE: A forklift is an alternative method of handling the switchboard. Always check that the fork lengths extend under the entire switchboard. Carefully balance the load, and always use a safety strap when handling or moving a switchboard with a forklift (Rear Warning Label, Rainproof Switchboards, page 13).

Storing

When storing the switchboard before installation, cover the top and openings of the equipment during the construction period to protect the switchboard from dust and debris.

If a switchboard is not installed and energized immediately, store it in a clean, dry space with a consistent temperature to avoid condensation. Store the switchboard indoors in a heated building with adequate air circulation and protect it from dirt, fumes, water, and physical damage. Storing the switchboard outdoors can cause harmful condensation inside the switchboard.

NOTE: Install portable electric heaters of approximately 200 Watts per vertical section in both indoor-type and rainproof-type switchboard enclosures for adequate protection during storage.

Before energizing the space heaters, remove all loose packing or flammable materials inside the switchboard. Outdoor switchboards are not weather-resistant until completely and properly installed; treat them the same as indoor switchboards until after installation.

Installation

Correct installation of Power-Style QED-2 switchboards is essential for proper operation of all switchboard components. Study the associated instruction books and all drawings carefully. In most cases, all drawings are sent to the purchaser before a switchboard is shipped to enable adequate planning.

A A DANGER

ROOF COLLAPSE

Do not stand, lie, place heavy objects, or place a large load on the roof. The top of the switchboard is not designed to support the weight of an installer.

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

Location

Find the designated area on the building floor plan for the switchboard installation. The location chosen for installation must provide working clearances complying with Section 110.26 of the National Electrical Code[®] (NEC[®]) or Section 2308 of the Canadian Electrical Code (CEC) Part 1.

- Front-accessible switchboards require field connections, including mains, branches, ground bus, and neutral bus, that are accessible and maintainable from the front.
- For switchboards having rear ventilation, allow a minimum 1/2-in. (13 mm) clearance between the rear of the switchboard and the wall for proper ventilation. Equipment drawings identify switchboards requiring rear or side access.
- Switchboards that require rear access for installation, field connections, or maintenance (such as filter replacement), require 30 in. (762 mm) of working space per NEC 110.26.
- If the switchboard is in a wet location or outside of the building, enclose it in an outdoor enclosure or equipment to prevent moisture or water from entering and accumulating within the enclosure. Outdoor-rated switchboards drain to the rear, so there must be at least a 1/2-in. (13 mm) clearance between the rear of the switchboard and a wall or other obstruction for proper drainage.
- Choose a location for installation that is well ventilated. The temperature of the area should not exceed 40°C (104°F).

Foundation Preparation

The floor or foundation must be strong enough to support the weight of the switchboard without sagging. The surrounding floor area must gently slope away from equipment and toward a drain.

NOTE: For seismic qualifications, read Anchoring for Seismic Qualifications, page 19 before pouring the floor or foundation.

Power-Style QED-2 switchboards are assembled on true and level floors at the assembly plant. To ensure correct bus bar alignment, the mounting pad or final installation site must be smooth and level. If parallel steel floor channels are imbedded for mounting the switchboard, the floor channels must be level over their entire length to avoid distortion of the switchboard structure. Each channel must be level with the finished floor.

When pouring the foundation, make provisions for conduits entering the switchboard from below and carrying the incoming and/or outgoing cables, control wiring, and ground cable. The bottom view in the equipment drawing shows the available conduit area for correct layout.

Conduits must project above the finished floor by two (2) in. (51 mm). However, to simplify moving the shipping sections into place, install the conduits flush with the concrete and, after the sections are in their final position, add the appropriate extension sleeves. Otherwise, raising the shipping section on timbers or lifting it by a crane to clear the conduit hubs becomes necessary. Before pouring the foundation, consider installing additional conduits for future circuits.

Switchboard Preparation

- 1. Remove dirt and debris from the foundation and surrounding area before moving the switchboard into final position.
- 2. Move the switchboard to its final installation site and take each shipping section off its shipping stringers. For switchboards greater than 24 in. (610 mm) deep, remove the center base channel.
- 3. Remove all packing materials. If the switchboard is equipped with a bottom closure plate in each vertical section, remove and retain the plates for reuse. When bottom closure plates are furnished, the customer must create any holes necessary for conduit entering the bottom of the switchboard. After creating the holes, reinstall the closure plate.

For ArcBlok Main section, refer to Switchboard Preparation - Bottom Fed ArcBlok Main Section, page 58.

General Installation

NOTICE

IMPROPER STRESS ON BUS

Level and align adjacent shipping sections with one another. Ensure proper alignment of horizontal main through bus and proper splice bus connections.

Failure to follow these instructions can result in equipment damage.

Install the switchboard into its final position by leveling progressively each section and bolting the frames together, if separated. Position shipping sections as follows:

- 1. Maneuver each shipping section into the desired position using the procedures under Handling, page 10.
- 2. Carefully lower the section over the conduit stubs to comply with the "available conduit area" as shown in the bottom view of the equipment drawings. Otherwise, there might not be sufficient cable bending space.
- 3. Level the shipping section.
- 4. After installation of each section is complete, make the through bus splice connection to the preceding section before installing the next section.

Joining Shipping Sections-Outdoor Switchboards

 Remove the center top cap (see Joining Adjacent Sections—Outdoor Switchboards, page 17) from the left-hand section, and retain all hardware for reuse.

Figure 6 - Joining Adjacent Sections—Outdoor Switchboards



- 2. When possible, open or remove the front and rear doors and panels, providing access to bolt adjacent shipping sections together.
- 3. Remove three 0.5 in. (13 mm) diameter knockouts from the front vertical corner channel and three from the rear vertical corner channel (a total of six per frame side) as indicated by the arrows in Joining Adjacent Sections—Outdoor Switchboards, page 17.
- 4. Position each adjacent section, carefully leveling it and aligning it with the previous section. If lifting straps are provided, completely remove them from the sides being bolted together so the sections are joined flush. The only gasket required between sections is provided on the roof flange.

NOTE: If lifting strap removal is not required to join sections, leave the lifting strap on the switchboard. Verify that the bolt is tight to maintain NEMA Type 3R integrity.

- 5. Place the six bolts (3/8-16 x 1 in.) provided through the holes created in step 3 to join adjacent sections.
- 6. Make the through bus splice connections to the preceding section.
- 7. Replace the center top cap removed in step 1.
- 8. Replace and secure the front and rear doors and panels removed in step 2.

Joining Shipping Sections-Indoor Switchboards

1. Position each adjacent section, carefully leveling and aligning it with the previous section. If lifting straps are provided, completely remove them from the sides being bolted together so the sections can be joined flush.

NOTE: Leave the other lifting straps on the switchboard if their removal is not required to join adjacent sections flush.

Figure 7 - Indoor Switchboards



- 2. Open or remove the front and rear doors and panels, providing access to bolt adjacent shipping sections together.
- 3. Place the six bolts (3/8-16 x 1 in.) provided through the existing holes in the front and rear vertical corner channels to join adjacent sections (see Indoor Switchboards, page 18).
- 4. Make the through bus splice connections to the preceding section.
- 5. Replace and secure all front and rear doors and panels removed in step 2.

Anchoring for Seismic Qualifications

QED-2 equipment that is seismically certified has been qualified to the site-specific seismic requirements of the listed model building codes and/or standards. Optional construction features may be required, depending on the location of the installation and the particular code and/or standard of interest. Seismic certificates of compliance are provided with all seismically-certified QED-2 equipment. To maintain the validity of this certification, equipment anchorage to the primary building structure is required.

Responsibility for Mitigation of Seismic Damage

For the purposes of the model building codes, QED-2 equipment is considered nonstructural building components. Equipment capacity was determined from triaxial seismic shake table test results as defined in the International Code Counsel Evaluation Service (ICCES) Acceptance Criteria for Seismic Qualification Testing of Nonstructural Components (AC156). Unless otherwise indicated, an equipment importance factor of 1.5 (Ip = 1.5) was used, indicating that equipment functionality was verified before and after shaker table seismic simulation testing. This importance factor is indicative of critical facilities where maximizing the probability of post event functionality is a priority. ASCE/SEI 7 recognizes AC 156 as an appropriate methodology for qualifying equipment to its requirements.

Consider incoming and outgoing cable and conduit as related but independent systems. They must be designed and restrained to withstand the forces generated by the seismic event without increasing the load transferred to the equipment. This system must be able to transfer the loads created by a seismic event to the load-bearing path of the building structural system.

Maintaining Seismic Certification

Seismic qualification of non-structural components by Schneider Electric is just one link in the total chain of responsibility required to maximize the probability that the equipment remains intact and functional after a seismic event. During a seismic event, the equipment must be able to transfer the loads that are created through the mounting pad and anchorage to the load-bearing path of the building structural system. The design Engineer of Record is responsible for detailing the equipment connection and anchorage requirements for the given installation. The installer and manufacturers of the anchorage restraint system are responsible for assuring that the mounting requirements are met. Schneider Electric is not responsible for the specification and performance of these systems.

Anchoring QED-2 Equipment for Seismic Applications

Formed base channels run the width of the section. The channels and connecting braces provide a minimum 0.75 in. (19 mm) diameter hole for fastening the section to the floor. To anchor the QED-2 switchboard to the floor properly, use all four mounting locations for NEMA Type 1 enclosures less than 36 in. (914 mm) deep, all six mounting locations for 36–70 in. (914-1778 mm) deep enclosures, and six of the eight mounting locations for enclosures greater than 70 in. (1778 mm) deep (see Base Channel Floor Anchor Bolt Locations, page 21).

Use one 1.25 in. (32 mm) outer diameter Belleville washer (not provided; see Belleville Washer, page 20) under the head of each bolt or anchor nut.

Figure 8 - Belleville Washer



Additionally, each NEMA Type 1 enclosed section includes four top-located hard points for attaching two upper lateral braces (braces and hardware are not supplied) to the QED-2 structure for top structural restraint (see Top Anchor Hard-Point Locations, page 23 and Top Anchor Mounting Hardware, page 24).

Top structural restraint is required for QED-2 equipment installed:

- · when indicated by the seismic qualification certificate, or
- when displacement at the top of the equipment cannot be tolerated.

NOTE: Anchoring hardware is not furnished with the QED-2 equipment.

After the QED-2 switchboard and adjacent equipment are properly joined and the entire structure is bolted to the floor, install the incoming service conductors and load side cables. During an earthquake, the top of the QED-2 switchboard can move in any direction. Any top incoming cables must accommodate this motion. Do not use the QED-2 enclosure (particularly the top) to mount exterior equipment.

Base Anchoring

 To anchor the switchboard to the floor properly, use all of the designated 0.75 in. (19 mm) diameter mounting hole locations as illustrated in Base Channel Mounting Hardware, page 22. The enclosure dimensions corresponding to Base Channel Floor Anchor Bolt Locations, page 21 are listed in Enclosure X,Y, Z Dimensions in Inches (mm), page 21.

Table 1 - Enclosure X,Y, Z Dimensions in Inches (mm)

$\begin{array}{l} \text{Enclosure} \\ \text{Width} \rightarrow \end{array}$	12 in.	24 in.	30 in.	36 in.	42 in.	48 in.	54 in.
↓Enclosure Depth	(305 mm)	(610 mm)	(762 mm)	(914 mm)	(1067 mm)	(1219 mm)	(1372 mm)
24 in. (610 mm)	X = 6 (152) Y = 21 (533)	X = 18 (457) Y = 21 (533)	X = 24 (610) Y = 21 (533)	X = 30 (762) Y = 21 (533)	X = 36 (914) Y = 21 (533)	X = 42 (1067) Y = 21 (533)	X = 48 (1219) Y = 21 (533)
36 in. (914 mm)	X = 6 (152) Z = 16.5 (419) Y = 33 (838)	X = 18 (457) Z = 16.5 (419) Y = 33 (838)	X = 24 (610) Z = 16.5 (419) Y = 33 (838)	X = 30 (762) Z = 16.5 (419) Y = 33 (838)	X = 36 (914) Z = 16.5 (419) Y = 33 (838)	X = 42 (1067) Z = 16.5 (419) Y = 33 (838)	X = 48 (1219) Z = 16.5 (419) Y = 33 (838)
48 in. (1219 mm)	X = 6 (152) Z = 22.5 (572) Y = 45 (1143)	X = 18 (457) Z = 22.5 (572) Y = 45 (1143)	X = 24 (610) Z = 22.5 (572) Y = 45 (1143)	X = 30 (762) Z = 22.5 (572) Y = 45 (1143)	X = 36 (914) Z = 22.5 (572) Y = 45 (1143)	X = 42 (1067) Z = 22.5 (572) Y = 45 (1143)	X = 48 (1219) Z = 22.5 (572) Y = 45 (1143)
54 in. (1372 mm)	X = 6 (152) Z = 25.5 (648) Y = 51 (1295)	X = 18 (457) Z = 25.5 (648) Y = 51 (1295)	X = 24 (610) Z = 25.5 (648) Y = 51 (1295)	X = 30 (762) Z = 25.5 (648) Y = 51 (1295)	X = 36 (914) Z = 25.5 (648) Y = 51 (1295)	X = 42 (1067) Z = 25.5 (648) Y = 51 (1295)	X = 48 (1219) Z = 25.5 (648) Y = 51 (1295)
60 in. (1524 mm)	X = 6 (152) Z = 28.5 (724) Y = 57 (1448)	X = 18 (457) Z = 28.5 (724) Y = 57 (1448)	X = 24 (610) Z = 28.5 (724) Y = 57 (1448)	X = 30 (762) Z = 28.5 (724) Y = 57 (1448)	X = 36 (914) Z = 28.5 (724) Y = 57 (1448)	X = 42 (1067) Z = 28.5 (724) Y = 57 (1448)	X = 48 (1219) Z = 28.5 (724) Y = 57 (1448)
72 in. (1829 mm)	$\begin{array}{c} X = 6 \ (152) \\ Z_1 = 28.5 \\ Z_2 = 40.5 \\ (1029) \\ Y = 69 \ (1753) \end{array}$	$\begin{array}{c} X = 18 \; (457) \\ Z_1 = 28.5 \; (724) \\ Z_2 = 40.5 \\ (1029) \\ Y = 69 \; (1753) \end{array}$	$\begin{array}{c} X = 24 \ (610) \\ Z_1 = 28.5 \ (724) \\ Z_2 = 40.5 \\ (1029) \\ Y = 69 \ (1753) \end{array}$	$\begin{array}{c} X = 30 \ (762) \\ Z_1 = 28.5 \ (724) \\ Z_2 = 40.5 \\ (1029) \\ Y = 69 \ (1753) \end{array}$	$\begin{array}{c} X = 36 \ (914) \\ Z_1 = 28.5 \ (724) \\ Z_2 = 40.5 \\ (1029) \\ Y = 69 \ (1753) \end{array}$	$\begin{array}{c} X = 42 \ (1067) \\ Z_1 = 28.5 \ (724) \\ Z_2 = 40.5 \\ (1029) \\ Y = 69 \ (1753) \end{array}$	

Figure 9 - Base Channel Floor Anchor Bolt Locations



Enclosures < 36 in. Deep

NOTE: See Enclosure X,Y, Z Dimensions in Inches (mm), page 21 for X, Y, Z dimensional values.



2. Depending on the frame size (see Base Channel Floor Anchor Bolt Locations, page 21), use either four or six anchorage points in the locations shown in Base Channel Mounting Hardware, page 22.





NOTE: Base channel mounting hardware detail shown for reference purposes only. Anchoring hardware is not furnished with the switchboard. Covers and internal hardware shown removed for illustration purposes.

3. Once the switchboard is in place, secure the base channels. The hardware used at each anchorage point must include a 1.25 in. (32 mm) diameter Belleville washer, as illustrated in Base Channel Mounting Hardware, page 22.

NOTE: The "TOP" side of the Belleville washer must be facing up.

Top Anchoring/Restraint

For installation at locations indicated by the seismic qualification certificate, or where displacement cannot be tolerated at the top of the switchboard during a seismic event, use top restraints attached to the equipment hard points.

NOTE: Anchoring hardware is not furnished with the switchboard.

 The four 0.88 in. (22 mm) diameter mechanical knock-outs shown in Top Anchor Hard-Point Locations, page 23 serve as hard points for application of a top restraint system.

NOTE: By code, it is the responsibility of the design Engineer of Record to determine the top restraint methodology for the intended building application.



Figure 11 - Top Anchor Hard-Point Locations

- 2. Detach the top plate from the main switchboard enclosure; retain the screws.
- 3. Remove the four 0.88 in. (22 mm) diameter mechanical knock-outs as directed by the design Engineer of Record.
- 4. With the knock-outs removed, reattach and re-secure the top plate to the enclosure using the screws removed in step 2.

5. Attach the top restraint system using a 1/2-13, Grade 5 bolt, a 1 in. (25 mm) diameter steel washer, a 1.25 in. (32 mm) diameter Belleville washer, and a hardened 1/2-13 nut as shown in Top Anchor Mounting Hardware, page 24.

Figure 12 - Top Anchor Mounting Hardware



6. After all switchboard sections are properly joined and the entire structure is properly anchored, install the incoming service conductors and load side cables.

NOTE: Do not use the switchboard enclosure (particularly the top) to mount exterior equipment, except for conduit.

Anchoring the Switchboard

Although sections are freestanding, a hard bump or shifting movement can result in damage to the splice joints between sections and conduit hubs connected to the sections. Therefore, each individual section must be anchored to the floor.

Formed base channels run the width of the shipping section. The channels have 0.75 in. (19 mm) diameter clearance holes for fastening the section to the floor (see Switchboard Base Channels, page 25).

1. Anchor each section to the floor with hardware suitable for installation of electrical equipment (not furnished).

Figure 13 - Switchboard Base Channels



2. Install the incoming service conductors and load side cables.

NOTE: If the switchboard consists of only one shipping section, proceed to Grounding and Bonding, page 27.

Through Bus Splice Connections

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not install through bus splice connectors with the switchboard energized.

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

Through bus splice connectors and/or hardware, along with installation instructions, are provided with each shipping split. Follow the installation instructions, and torque splice bolts to the value given in Torque Values for Electrical Connections, page 53.

If through bus bars are wrapped with an insulative material, cover the splice connections with the material provided.

For splice connections with bus on the front and rear of an insulating tube, the Ushaped, copper connector must be centered around the tube. Proper Orientation of Ushaped Splice Connector, page 26 shows the proper orientation of the connector.

NOTE: The U-shaped connector fits snugly against the insulating tube when installed correctly. It is pulled away from the insulating tube in Proper Orientation of U-shaped Splice Connector, page 26 to show the orientation of the connector slot.

Figure 14 - Proper Orientation of U-shaped Splice Connector



U-shaped splice connector

Ground Bus Splice Connections

 Align and secure the ground bus splice connection between shipping sections. Torque connections to 100 lb-in. (11 N•m) (Ground Bus Splice Connection, page 26 or Series 2 Ground Bus Splice Connection, page 26).

NOTE: Proper installation is essential for equipment ground fault systems.

Figure 15 - Ground Bus Splice Connection



Figure 16 - Series 2 Ground Bus Splice Connection



Grounding and Bonding

A system is "grounded" if it is grounded at any point ahead of the switchboard, whether the grounded conductor (neutral) is carried through to the loads, or not.

Service Equipment-Grounded System

For solidly-grounded systems used as either service equipment or as a main switchboard on a separately derived system:

 Run a grounding electrode conductor from the grounding electrode at the installation site to the grounding electrode conductor connector (ground lug) located on the switchboard ground bus (or on the neutral bus, if so indicated on the equipment drawing) (see Grounding Electrode Connector, page 27). Select the material and size of this grounding electrode conductor to comply with Sections 250.62 and 250.66 of the NEC or Sections 10-204 and 10-206 of the 1998 CEC, and install it as specified in Section 250.64 of the NEC or Section 10-908 of the 1998 CEC.

Figure 17 - Grounding Electrode Connector



2. Install the main bonding jumper between the neutral bus and the ground bus (see Main Bonding Jumper, page 28 or Series 2 Main Bonding Jumper, page 28). For torque values, refer to Torque Values for Electrical Connections, page 53.

NOTE: If the switchboard is fed from multiple sources (for example, doubleended systems), there may be two or more main bonding jumpers to install.



Figure 18 - Main Bonding Jumper

Figure 19 - Series 2 Main Bonding Jumper



In Canada, a main bonding jumper bus or cable is provided between the neutral bus and ground bus. When the bonding jumper must be disconnected (for example, for a Megger[®] test):

- 1. Remove the main bonding jumper bus or cable lug with cable from the neutral bus. This is normally located near the line neutral lugs.
- 2. Secure the main bonding jumper bus or cable and lug to maintain the required distance from phases and neutral.

NOTE: If the switchboard is fed from multiple sources (for example, a doubleended system like a main-tie-main), there may be two or more main bonding jumpers installed.

For grounding and bonding in ArcBlok Main section, see Grounding and Bonding-Bottom Fed ArcBlok Main Section, page 60.

Service Equipment-Ungrounded System

For ungrounded systems used as either service equipment, or as a main switchboard on a separately derived system:

- 1. Run a grounding electrode conductor from the grounding electrode at the installation site to the grounding electrode conductor connector (ground lug) located on the switchboard ground bus.
- Select the material and size of this grounding electrode conductor to comply with Sections 250.62 and 250.66 of the NEC or Sections 10-700 and 10-702 of the 1998 CEC, and install it as specified in Section 250.64 of the NEC or Section 10-204 of the 1998 CEC.

Non-Service Equipment

For either grounded or ungrounded systems, when a switchboard is not used as service equipment nor as a main switchboard on a separately derived system:

Use equipment grounding conductors sized according to Section 250.122 of the NEC or Section 10-206 of the 1998 CEC to connect the switchboard frame and ground bus to the service ground.

High-impedance Grounded Neutral Systems

For high-impedance grounded neutral systems:

Ground the system following the instructions provided with the system grounding equipment and in compliance with Section 250.36 of the NEC. Confirm that the switchboard frame and ground bus are bonded in accordance with Section 250.102 of the NEC.

Busway Connections

Schneider Electric switchboards are manufactured with two different styles of busway connections:

- Qwik Flange[™] is used on indoor switchboards only.
- "Dummy" flanged end. This type is used on some indoor switchboards, but primarily on outdoor units. The dummy flanged end must be removed to allow actual busway flanged end installation. Either the dummy or actual busway flanged end must be in place before energizing the switchboard.

NOTE: Do not use the switchboard to support the weight of the busway connection. Support the busway independently. When the busway is installed, make sure no areas of the roof are bowed downward. This minimizes the chance of water pooling.

Busway Connection-NEMA Type 1 (Indoor) Only (Qwik Flange)

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power supplying the switchboard and busway before installing connections.

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

Follow the instructions in this section to make Qwik Flange busway connections (see Qwik Flange Installation, page 30 and Qwik Flange, page 30):

- 1. Remove any protective covering from the opening in the switchboard.
- 2. Slip the busway joint into the switchboard connectors.
- 3. Check the joint bolt alignment; the center line (C/L) of the joint bolt to the switchboard surface must be 0.95 in. (24 mm) (see Qwik Flange Installation, page 30).

Figure 20 - Qwik Flange Installation



Figure 21 - Qwik Flange



- 4. Attach the side closing plates using two 5/16 in. bolts (provided). When installed properly, the holes in the side closing plates align with the holes in both the switchboard and busway.
- 5. Use an 18 in. (457 mm) or longer wrench to torque the joint bolt until the outer break-away head twists off. Do not allow the break-away bolt head or red warning disc to drop into the switchboard.

- 6. Slip the remaining two small closing plates into position by aligning with the holes in the switchboard. Use the four 1/4-20 screws provided to secure the equipment.
- 7. Confirm proper phasing of the installed busway before energizing.

Busway Connections–NEMA Type 1 (Non-Qwik Flange) and NEMA Type 3R

If this style of connection for busway is furnished, the busway "dummy" flanged end must be removed before installing the busway (see Cable Restraint Example, page 35).

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power supplying the switchboard and busway before installing connections.

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

- 1. From inside the switchboard, remove the 1/2 in. (13 mm). bolts that fasten the switchboard bus to the busway dummy nonmetallic flanges. Retain all hardware for reuse.
- 2. Remove all screws securing the busway dummy flanged end to the switchboard enclosure.
- 3. Remove the busway dummy flanged end (see Removing the Busway Dummy Flanged End, page 31).

Dummy Flanged End

Figure 22 - Removing the Busway



4. Install the actual busway flanged end to the switchboard bus connectors provided in the switchboard (see Flanged-End Connections, page 32). Insert the flanges between the switchboard bus connectors so that the mounting holes in the collar of the flanged end align with the pre-drilled holes in the switchboard enclosure.

Figure 23 - Flanged-End Connections



5. Line up the holes in the bus bar flanges, and reinstall the 1/2 in. (13 mm) hardware that was removed in step 1 as shown in Reinstalling the 1/2 in. (13 mm) Hardware, page 32.





NOTE: The convex side (marked "Top") of one conical washer must be against the bolt head, and the convex side of the second conical washer must be against the hex nut.

- 6. Torque the bolts inserted in step 5 as indicated in Torque Values for Electrical Connections, page 53.
- 7. Assemble the busway collar to the switchboard enclosure with the screws provided.
- 8. Ensure that the busway integral ground is connected to the switchboard ground bus.
- 9. Confirm busway phasing before energizing.

Conduit Area

1. Locate and terminate all conduit in the switchboard enclosure in the "available conduit area" designated on the equipment drawing.

NOTE: On switchboards greater than 24 in. (610 mm) deep, the center base channel can be removed for additional conduit area. **Exception:** Do not remove any base channels when seismic restraint is required.

2. Install the conduit properly. Use hubs, locknuts, and bushings to protect the cables and prevent condensation on the conduit from entering the switchboard.

NOTE: If top entry, do not use the top of the switchboard to support the weight of the conduit. Support the conduit independently. When the conduit is installed, make sure no areas of the roof are bowed downward. This minimizes the chance of water pooling.

If bottom closure plates are furnished, the customer must remove the plates, create holes in them for any conduit entering the bottom of the switchboard, and then reinstall the plates.

Under seismic conditions, consider using top restraints if movement of the top of the switchboard is an issue.

3. Bond all conduit hubs to the switchboard enclosure with approved electrical connections.

Cable Pulling

Power-Style QED-2 switchboards are constructed to customer specifications for the cable entrance arrangement (for example, top or bottom feed). Switchboard components are arranged to give proper cable clearance and bending space for cables entering or exiting the switchboard as specified on the equipment drawing.

- 1. Use only cable sizes suitable for a proper fit with the corresponding lugs.
- 2. Pull the proper number of line side and load side cables according to the load served and the NEC or CEC.
- 3. Position the cables inside the switchboard so that they are not subject to physical damage.
- 4. Maintain the largest possible bending radii and proper clearance to bus bars and grounded parts. If any cables are lying or bearing on structural members, support them to relieve this condition or place suitable protective material at the bearing point to protect the cable insulation.
- 5. Be certain to run all phase conductors, including the neutral, through the same opening where cables enter or leave the switchboard, or pass through any metal that has magnetic properties. Otherwise, overheating can result. See Section 300.20(A) of NEC.
- 6. When instructed, brace or cable-lace the conductors.

Cable Terminations

- 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.
- 2. Thoroughly clean aluminum cable contact surfaces with a wire brush, or scrub them with an abrasive cloth to remove oxides and foreign matter.
- 3. Immediately apply an acceptable joint compound to the bare aluminum surfaces.

- 4. If compression-type lugs are furnished on any switch or circuit breaker, or as the main incoming power lugs, unbolt and remove them to create sufficient room for crimping the lugs to the cables with the crimping tool.
 - a. Insert the cable into the lug barrel and, using the crimping tool, make the specified number of crimps per the recommendations of the manufacturer.
 - b. Wipe excess joint compound from the connector and insulation.
 - c. Remount the lugs onto the bus bars, switches, or circuit breakers. Torque the bolts to the values given in Torque Values for Electrical Connections, page 53.

Set screw-type lugs may be furnished as main incoming lugs and are standard on molded case circuit breakers and QMB/QMJ/QMQB¹ fusible switches.

 Torque these lugs to, but do not exceed, the specified values. Torque values for circuit breaker and switch lugs are marked on these units. Torque values for other switchboard lugs are marked on the switchboard (Multiple Conductor Neutral and/or Ground Bar, page 53).

Cable Restraint for Short-circuit Current Rating (SCCR)

For ArcBlok Main Section, refer to Appendix A-Instructions for ArcBlok Main Section, page 58.

Cable restraint is recommended for lugs mounted on bus when the following conditions are met:

- Unsupported cable lengths are greater than 3.5 ft. (1 m)²
 AND
- Cables meet the Yes criteria shown in Cable Restraint Criteria, page 34.

Table 2 - Cable Restraint Criteria

Cable Amnacity	Available Short Circuit Trip Current (RMS)					
Cubic Ampuolity	< 65 kA	65 to < 85 kA	85 to < 150 kA	150 to 200 kA		
≤ 800 A	No	Yes	Yes	Yes		
1200 A	No	No	Yes	Yes		
1600 A	No	No	Yes	Yes		
2000 A	No	No	Yes	Yes		
2500 A	No	No	No	Yes		
3000 A	No	No	No	Yes		
≥ 4000 A	No	No	No	No		

OR

• When otherwise specified.

NOTE: For I-Line[™] circuit breakers, or if the lugs are in the circuit breaker, refer to the instruction bulletin for the specific circuit breaker.

^{1.} QMQB switches are available in Canada only.

^{2.} Cable length is measured from the end of the lug to the conduit fitting through which the cable exits.

Figure 25 - Cable Restraint Example



NOTICE

CABLE MOVEMENT UNDER SHORT-CIRCUIT CONDITIONS

Restrain all cables, including neutral cables, in the switchboard installation when the conditions stated in Cable Restraint Example, page 35 are met.

Failure to follow these instructions can result in equipment damage.

When cable restraints are required, perform the following steps.

NOTE: Wrap cables using 1/2 in. (13 mm) diameter sisal rope, 3/8 in. (9.5 mm) diameter nylon rope, or equivalent.

- Begin wrapping the cables (see Wrapping Cables (neutral cables not shown), page 35) a maximum distance of 11 in. (279 mm) from the end of the lugs. Continue to wrap the cables on 11 in. (279 mm) center (s) up to the point where the cables leave the enclosure.
 - a. Wrap the cables four times as shown, leaving three ft. (1 m) of excess rope at the first end (A).
 - b. Pull the rope (B) taut.

Figure 26 - Wrapping Cables (neutral cables not shown)



- 2. Wrap the rope several times (see Wrapping the Space Between Cables, page 36) until the space between the cables is completely filled.
 - a. Weave the final rope loop underneath the previous loop (C).
 - b. Bring the rope through the right-hand space.
 - c. Pull the rope taut.





- 3. Wrap the rope several times until the space between the cables (see Finish Wrapping the Space Between Cables, page 36) is completely filled.
 - a. Weave the final rope loop underneath the previous rope loop (D).
 - b. Pull the rope taut.



Figure 28 - Finish Wrapping the Space Between Cables

4. Tie the rope ends (1) and (2) together (see Tying Rope Ends Together, page 36) until they are taut. Cut off excess rope, and tape ends to prevent fraying.





5. Recheck torques of wire binding screws after securing the cables.

NOTE: Refer to the torque label supplied with the switchboard for torque values.
Pre-energizing Checkout Procedure

Conduct a complete inspection **before** the switchboard is energized to ensure that all components function and operate properly. **Complete every step of the checkout procedure listed before energizing the switchboard.** Additional steps are required for ArcBlok Main Section. Refer to Appendix A-Instructions for ArcBlok Main Section, page 58.

- 1. Check all field-installed bus bar connections. Torque values are listed in Torque Values for Electrical Connections, page 53.
- 2. Check all accessible connections for tightness.
- 3. Check all factory- and field-installed lug terminations for tightness.
- 4. Check the rigidity of all bus bar supports.
- 5. Check the switchboard enclosure for dents or other damage that reduces electrical clearances inside the switchboard.
- 6. Remove all foam blocks, or other temporary cushioning or retaining material, from the electrical devices.
- 7. Manually open and close all switches, circuit breakers, and other operating mechanisms, checking for correct alignment and free operation.
- 8. Operate all electrically operated switches, circuit breakers, and other devices equipped with remote operators (not under load). An auxiliary source of control power may be necessary to accomplish this.
- 9. Check all relays, meters, and instrumentation to verify that all field-installed wiring connections are made properly and that the devices function properly.
- Current transformers (CTs) supplied for customer use require connection to a metering device load before energizing. Verify that the metering device load is properly connected, including main switchboard connections to remote equipment.
- 11. Some CT circuits supplied by Schneider Electric for customer metering use are shorted for shipment. Remove shorting terminal screws on shorting terminal blocks or jumpers and store in the block.
- 12. Factory-installed circuit breakers may have an adjustable magnetic or electronic trip which is factory set to the lowest setting. To provide coordinated operation during an event, adjust the trip as outlined in the instruction manual provided with the circuit breaker. All poles are adjusted simultaneously, using a screwdriver, by the single setting.
- 13. If ground fault protection is furnished on type BP switch, adjust the relay to the desired ground current pickup setting. The relay is shipped from the factory at the lowest setting of 120 A for the relay. Relay pickup range is from 120–1,200 A for the relay.

NOTE: For molded case circuit breakers, refer to Reference Publications, page 56 for circuit breaker information.

14. Check the torque on all bolts of the fuses mounted in Bolt-Loc[™] switches, 21–30 lb-ft. (28–41 N•m), and in QMB/QMJ/QMQB³ switches (as marked on the device).



FUSE CLIP OVERHEATING

Do not pry open or spread the fuse mounting clips. Doing so can cause a loose connection, resulting in overheating.

Failure to follow these instructions can result in equipment damage.

^{3.} QMQB switches are available in Canada only.

- Examine fuse clip contact pressure and contact means (QMB/QMJ/QMQB⁴ fusible switches). If there is any sign of looseness, contact Schneider Electric Services at 1-888-778-2733 (US) or 1-800-565-6699 (Canada). Loose fuse clips can result in overheating.
- 16. Check all QMB/QMJ/QMQB⁴ fusible switches, verifying that the proper fuses with the required interrupting rating and continuous current rating are installed. Do not use renewable link fuses in Square D brand fusible switches.
- 17. Verify that all grounding connections are correctly made. If the switchboard is used as a service entrance, double check to see that the main bonding jumper is connected (Main Bonding Jumper, page 28).For ArcBlok Main section bonding, refer to Grounding and Bonding-Bottom Fed ArcBlok Main Section, page 60.

ACAUTION

OVERVOLTAGE TO CONTROL AND PROTECTION COMPONENTS

- Remove the long-time rating plug before electrical insulation testing a circuit breaker that has a label stating "Caution: Disconnect Plug Before Dielectric Test."
- For MasterPacT MTZ circuit breakers, remove the voltage power supply (VPS) module if it is present.
- Some MicroLogic trip units are not rated for voltages that would occur during electrical resistance insulation testing.
- Open all control and metering disconnects from the control circuits.

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

- 18. Conduct an electrical insulation resistance (Megger) test to ensure that the switchboard is free from short circuits and undesirable grounds.
 - a. Open all control power and metering disconnects or remove the fuses from the control circuits.
 - b. Disconnect the neutral connection at any surge protective device or other electronic device before performing the electrical insulation resistance test; reconnect to the device after the test.
 - c. With the neutral isolated from the ground and the power switches and circuit breakers open, conduct electrical insulation tests from phase-to-phase, phase-to-ground, phase-to-neutral, and neutral-to-ground.
 - d. If the resistance reads less than one megohm while testing with the branch circuit devices in the open position, the system may be unsafe and must be investigated.
 - e. Consult Schneider Electric Services at 1-888-778-2733 (US) or 1-800-565-6699 (Canada) to help correct any problems.
- 19. After completing the electrical insulation resistance test, replace all control power fuses that were removed and close power disconnects that were opened.
- 20. Check all field-installed wiring. Make certain it is clear of all live parts, and when instructed, secured to withstand trip-inducing currents.
- 21. Verify that all control wiring between sections is connected.

^{4.} QMQB switches are available in Canada only.

22. Vacuum to remove any dust, scrap wire, or other debris.

NOTICE

CONTAMINATION HAZARD

Do not use an air hose to blow out the switchboard. Dust can settle inside relays and overcurrent devices, causing overheating and improper operation.

Failure to follow these instructions can result in equipment damage.

23. Replace all covers and barriers; check for any pinched wires, and close doors. Make certain all enclosure parts are aligned properly and securely fastened.

Refer to Pre-energizing Checkout Procedure-ArcBlok Main, page 73 for additional steps for the ArcBlok Main Section

Ground Fault Protection Systems

Paragraph 230.95(C) of the National Electrical Code requires that all equipment ground fault protection systems be tested when first installed. If the circuit breaker has equipment ground fault protection installed, test it at this time.

- 1. Make sure the trip unit is powered. The trip unit is powered if any of the following conditions exist:
 - The circuit breaker is closed or bottom fed and has more than 100 V of load voltage on two phases (P or H trip unit only), or more than 208 V of load voltage on two phases (MasterPacT[™] MTZ circuit breaker).
 - The full-function or hand-held test kit is connected and on.
 - A 24 Vdc external power supply is connected (MasterPacT NW or NT circuit breakers), or a 5 Vdc power supply is connected to the power port or a PC is connected to the USB port (MasterPacT MTZ circuit breakers).
 - An external voltage tap is installed and voltage of more than 100 V is present on two phases (P or H trip unit only), or more than 208 V is present on two phases (MasterPacT MTZ circuit breaker).
- 2. If the system is a radial (single-ended) system, press the ground fault Push-to-Test button. The circuit breaker trips, and the trip unit ground fault indicator light comes on.
- 3. Record results on the ground fault system test log.

NOTE: If a complete check of the ground fault protection system is necessary, use primary injection testing. If the system is multiple source and/or requires field connections at the job site, use primary injection testing.

NOTE: Some ground fault protection systems require field connections at the job site. Consult the switchboard interconnection wiring drawing for details.

Energizing the Switchboard

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Correct short-circuit conditions detected during the checkout procedures described in Pre-energizing Checkout Procedure, page 37.
- Qualified electrical personnel must be present when energizing this equipment for the first time.
- · Follow the instructions in this section to energize the switchboard properly.

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

- 1. Make sure there is not a load on the switchboard when it is energized. Turn off all downstream loads.
- 2. Energize the switchboard in the following sequence:
 - a. Turn on all control power disconnects before energizing the switchboard. Refer to the record drawings supplied with equipment to see if control power disconnects are supplied.
 - b. Close any open doors and/or covers.
 - c. Close all main devices.
 - d. Close each branch circuit breaker or branch fusible switch.
 - e. Proceed to each panelboard and other downstream load.
- 3. After all overcurrent protective devices are closed, turn on all loads (for example, lighting circuits, contactors, heaters, and motors).

Maintaining the Switchboard

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Inspect and perform preventive maintenance only on switchboards and equipment that has been de-energized and electrically isolated (unless otherwise specified). This minimizes the chance that accidental contact cannot be made with energized parts.
- Follow safety-related work practices as described in NFPA 70E, Part II at all times.

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

Periodic maintenance of the switchboard includes cleaning, lubrication, and exercising component parts. The interval between maintenance checks varies depending upon the amount of usage and environmental conditions of each installation. The maximum recommended inspection interval is one year. This definition for periodic maintenance applies throughout this manual, unless otherwise noted.

Always inspect the switchboard after a trip occurs. (Refer to Adverse Circumstances, page 50). Service bulletins for the various disconnecting and overcurrent devices mounted in the switchboard are available through your local Schneider Electric representative.

General Inspection and Cleaning

- 1. Vacuum the switchboard interior to remove any dirt or dust deposits. Wipe all bus bars, insulators, cables, and other items with a clean, dry, lint-free cloth.
- Please refer to Moisture Contamination Avoidance and Mitigation, page 8 if moisture, condensation build-up, or signs of any previous wetness are discovered.

NOTICE

CONTAMINATION HAZARD

- Do not use an air hose to blow out the switchboard. Dust can settle inside relays and overcurrent devices, causing overheating and improper operation.
- Do not allow paint, chemicals, or petroleum-based solvents to contact plastics or insulating materials.

Failure to follow these instructions can result in equipment damage.

3. Inspect the switchboard for any signs of overheating. Discoloration and flaking of insulation or metal parts are indications of overheating.

NOTE: If overheating occurs, be sure that all conditions that caused the overheating have been corrected. Loose or contaminated connections can cause overheating.

4. Check for signs of rodent nesting in the switchboard. If required, use a good exterminating technique in the general area of the switchboard.

NOTE: Do not place or use exterminating substances and chemicals inside the switchboard. Some products attract rodents.

5. Carefully inspect all devices for any visibly worn-out, cracked, or missing parts.

- 6. Manually open and close switches and circuit breakers several times to verify they are working properly.
- 7. Verify that all key interlocks and door interlocking provisions are working properly.

Bus Bar Joints, Lug Terminations, and Insulating Materials

NOTE: Bus bar joints are maintenance-free. Do not retighten them after the preenergizing checkout procedure is complete.

NOTICE

PLATING DAMAGE

- Do not sand or remove plating on any bus bar, splice bar, or terminal lug.
- Damage to plating can result in overheating. Replace damaged part. Contact Schneider Electric Services at 1-888-778-2733 (US) or 1-800-565-6699 (Canada).

Failure to follow these instructions can result in equipment damage.

 Check all bus bar joints and terminal lugs for any pitting, corrosion, or discoloration resulting from high temperatures or subjection to high trip conditions. If any damage has occurred, replace the bus bars or lugs. If cleaning is required, use Lectra-Clean[®], or similar type of cleaner.

NOTE: Do not to apply chemicals while the bus bar joints or terminal lugs are inside the switchboard.

2. Inspect all insulating materials. Before re-energizing the switchboard, replace insulators with any visible damage (such as cracks).

General Lubrication Information

For field maintenance re-lubrication of blade/jaw components in switches 600 V and below, use BG20 High Performance Synthetic Grease from Dow Corning (Schneider Electric catalog number SWLUB). This grease is applicable for the following switches:

- Bolt-Loc
- QMB Main and Branch
- QMJ Branch
- QMQB⁵ Main and Branch

For bus/plug-on connections, use electric joint compound, Schneider Electric catalog number PJC7201.

For MasterPacT drawout connections, use only Schneider Electric catalog number S48899 Electric Joint Compound.

Automatic Transfer Switches

Consult the documentation provided by the manufacturer for all installation, operation, and maintenance instructions for these devices.

^{5.} QMQB switches are available in Canada only.

Bolt-Loc Bolted Pressure Contact Switch Maintenance, 800-4000 A

Refer to the Bolt-Loc switch installation and maintenance manual for complete information (manual is shipped with the switchboard). If the manual is not available, refer to Reference Publications, page 56, and contact your local Schneider Electric representative to obtain the appropriate manuals.

- 1. Exercise the operating mechanism at least once a year to validate proper operation.
- 2. The Bolt-Loc switch is shipped from the factory properly lubricated. Periodic cleaning and lubrication of the switch is required. The maintenance interval between lubrications depends on factors such as usage and ambient conditions. The maximum recommended maintenance interval is one year for current-carrying parts and five years for operating mechanisms.

A A D A N G E R

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Always check line and load ends of the fuses for voltage before starting the replacement procedure. The Bolt-Loc switch can be part of a multiple source system in which the fuses can be energized when the Bolt-Loc switch is in the "open" position.

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

- 3. To replace the fuse:
 - a. Open the switch before opening the fuse door (see Type BP Bolt-Loc Fusible Switch, page 44).



Figure 30 - Type BP Bolt-Loc Fusible Switch

- b. Open the fuse door, releasing the interlock as described in the instructions on the door.
- c. Observe the switch blades to confirm the switch is "open."
- d. Check the line and load ends of fuses for voltage using a properly rated voltage sensing device. No voltage should be present.
- e. Remove all fuses. Retain the hardware for reuse.
- f. Using a non-abrasive cleaner such as Lectra-Clean, made by CRC, wipe clean the fuse mounting pads on the switch and the terminals of each new fuse. Check the alignment of fuse terminals before installing new fuses.

NOTE: Take care when using the Lectra-Clean so that it does not inadvertently contact other part.

- g. Install new fuses using the same hardware removed in Step e. Tighten to 21–30 lb-ft. (28–41 N•m).
- 4. Close the fuse door, and check the fuse door interlock with the switch in the **ON** position. The fuse doors should not open using normal force.

Circuit Breakers

Schneider Electric circuit breakers are designed and manufactured as sealed units requiring minimal periodic maintenance.

Exercise circuit breakers at least once a year to validate proper operation. For general maintenance:

- 1. Trip the circuit breaker by pushing the Push-To-Trip or "Open" button located on the face of the circuit breaker. Refer to the appropriate circuit breaker manual for the specific location of this button (see PowerPacT R-Frame Circuit Breaker, page 45).
- 2. Manually open and close the circuit breaker two to three times.



Figure 31 - PowerPacT R-Frame Circuit Breaker

NOTE: Schneider Electric instruction bulletin 0600IB1201, Field Testing and Maintenance Guide for Thermal-Magnetic and MicroLogic[™] Electronic Trip Molded Case Circuit Breakers, provides more in-depth information.

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- If adjusting circuit breaker settings, do not set the long-time trip rating at a higher ampacity than the rating of the bus bar or load cables it supplies; overheating can occur.
- Before energizing the switchboard, fill all unused I-Line circuit breaker mounting spaces with blank fillers and/or extensions as listed in I-Line Blank Fillers and Extensions, page 46.

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

Refer to individual circuit breaker instruction manuals shipped with the switchboard for additional maintenance information, such as changing rating plugs, sensor plugs, or adjustable settings and removing circuit breakers. If the instruction manual is not available, refer to Reference Publications, page 56 for the appropriate number, or contact your local Schneider Electric representative.

ltem	Height	Catalog No.	Branch Circuit Side	Circuit Breaker Frame	
Blank Fillers	1.50 in. (38 mm)HNM1BLBoth Side4.50 in. (114 mm)HNM4BLBoth Side		Both Sides Both Sides	Not applicable	
Blank Extensions	1.50 in. (38 mm) 4.50 in. (114 mm) 1.50 in. (38 mm) 4.50 in. (114 mm)	HLW1BL HLW4BL HLN1BL HLN4BL	Wide Side Wide Side Narrow Side Narrow Side	All applications except PowerPacT H/J circuit breakers with MicroLogic trip unit 5/6.	
	4.50 in. (114 mm) 4.50 in. (114 mm)	HLN4EBL HLW4EBL	Narrow Side Wide Side	Only PowerPacT H/J circuit breakers with MicroLogic trip unit 5/6.	

NOTICE

PLUG-ON CONNECTOR DAMAGE

- Do not remove the protective lubricant on the plug-on connectors.
- If additional lubrication is required, apply a coating of electrical joint compound, catalog number PJC7201, to the contact surfaces of the plug-on connector.

Failure to follow these instructions can result in equipment damage.

3. A full function test kit, catalog number FFTK, is available from Schneider Electric to test PowerPacT M, P, and R circuit breakers equipped with MicroLogic trip units. It runs trip unit tests automatically, with prompts to the user for initial information. Test modules for each circuit breaker frame are used to store data necessary for automatic tests. Series B MicroLogic trip units require test module CBTMB, which is included in UTS3.

A pocket tester, catalog number S434206, or UTA tester, catalog number STRV00910, are available from Schneider Electric to test PowerPacT H-, J-, and L-frame circuit breakers with MicroLogic trip units. These testers supply power to the MicroLogic trip units and allow for settings to be adjusted through the keypad located on the circuit breaker or through a PC using the USB interface.

To test MasterPacT NW circuit breakers with MicroLogic trip units, use the fullfunction test set, catalog number S33595, or the hand-held test set, catalog number S33594, which are available from Schneider Electric.

To test MasterPacT MTZ circuit breakers and control units, use EcoStruxure, which is available from Schneider Electric.

NOTE: Tests can be conducted with a circuit breaker installed in the switchboard; circuit breaker removal is not required. **The switchboard must be de-energized.**

QMB/QMJ/QMQB Fusible Switches

NOTE: QMQB switches are available in Canada only.

Refer to the QMB/QMJ/QMQB instruction manual for complete maintenance information. If the instruction manual is not available, refer to Reference Publications, page 56 of this manual for the appropriate number. Contact your local Schneider Electric representative to obtain the manual.

Switch Maintenance

- 1. Periodically exercise the switch to validate proper operation. This period should not exceed one year.
- 2. Check the cover interlock with the switch in the **ON** position. The cover should not open using normal hand force.
- 3. Inspect the switch interior for any damaged or cracked parts, and replace as necessary.
- 4. For fusible switch units, check the fuse mounting clips or bolted contact area for corrosion or discoloration (indicating overheating). Replace them if necessary.
- 5. For additional maintenance instructions, see the label on the inside of the door.

Fuse Replacement (Fusible Switches Only)

1. Turn the switch to the OFF position before opening the door.

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Always check line and load ends of the fuses for voltage before starting the fuse replacement procedure with a properly rated voltage sensing device.

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

- 2. Observe the switch blades to confirm that the switch is in the **OFF** position.
- 3. Using a properly rated voltage sensing device, verify that line and load ends of the fuse are not energized.
- 4. Observe all hazard labels specifying the type of fuse to use. Do not substitute a non-current limiting fuse, or attempt in any way to defeat the rejection feature of the fuse clips furnished with the switch. Do not use renewable link fuses in Schneider Electric fusible switches.

NOTICE

FUSE CLIP OVERHEATING

Do not pry open or spread the fuse mounting clips. Doing so can cause a loose connection, resulting in overheating and nuisance fuse opening.

Failure to follow these instructions can result in equipment damage.

Installing QMB/QMJ/QMQB Fusible Switches

NOTE: QMQB switches are available in Canada only.

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Remove power for these sections before installing or removing QMB/QMJ/ QMQB⁶ switches.
- Do not use a main as a branch unit or a branch as a main.
- All unused spaces must be filled with blank fillers before energizing the switchboard. Refer to Table 4 and Table 5 for sizes and catalog numbers.

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

Table 4 - QMB/QMJ Fusible Switch Blank Fillers

Height	Catalog No.
1.50 in. (38 mm)	QMB1BLW
3.00 in. (76 mm)	QMB3BLW
6.00 in. (152 mm)	QMB6BLW
15.00 in. (381 mm)	QMB15BLW

Table 5 - QMQB⁶ Fusible Switch Blank Fillers

Height	Catalog No.
2x: 1.375 in. (35 mm)	QFS1
8x: 5.50 in. (140 mm)	QFS5
10x: 6.875 in. (175 mm)	QFS6
14x: 9.625 in. (244 mm)	QFS9
24x: 16.50 in. (419 mm)	QFS16

NOTICE

PLUG-ON CONNECTOR DAMAGE

Do not remove the protective lubricant on the plug-on connectors.

Failure to follow these instructions can result in equipment damage.

- 1. Turn off the main power.
- 2. Turn the switch handle(s) to the **OFF** position. Align switch plug-on connectors with QMB panel vertical bus, and plug switch onto panel.
- 3. Place and partially tighten all unit mounting screws that mount to the QMB panel mounting rails.
- 4. Tighten all screws evenly. The unit mounting flange and plug-on connectors must be seated securely.

Removing QMB/QMJ/QMQB Fusible Switches

NOTE: QMQB switches are available in Canada only.

- 1. Turn off the main power.
- 2. Turn switch handle(s) to the **OFF** position.
- 3. Disconnect the load wires.

^{6.} QMQB switches are available in Canada only.

- For QMB and QMJ switches, remove mounting screws holding the switch to the mounting rail. For QMQB⁷ switches, remove the bolts holding the switch to the line terminal.
- 5. Unplug the switch.

Ground Fault Protection Systems

Check the terminal connections on the ground fault protection system at least once a year for tightness and corrosion. If the system can be tested without tripping the main or branch device, directions for testing the system are in the device manual. Otherwise, testing the ground fault protection system trips the main or branch device to which it is connected. If the ground fault sensor or relay is physically or electrically damaged, replace it.

If the ground fault protection system does not operate properly and additional equipment has been connected to the installation since the last maintenance test/ check, de-energize the entire system, and check for grounds on the neutral downstream from the main bonding jumper. If no downstream grounds are detected and the ground fault system is not operating properly, contact Schneider Electric Services at 1-888-778-2733 (US) or 1-800-565-6699 (Canada).

If no additions have been made to the installation and the ground fault protection system does not operate properly, contact Schneider Electric Services at 1-888-778-2733 (US) or 1-800-565-6699 (Canada).

Refer to the ground fault field test instruction manual for additional testing information. If the manual is not available, refer to Reference Publications, page 56 to obtain the appropriate number. Contact your local Schneider Electric representative to obtain this manual.

Continuous Thermal Monitoring (CTM) Sensors

Refer to the Schneider Electric thermal monitoring sensors instruction manuals shipped with the switchboard for complete installation and maintenance information. If the instruction manuals are not available, refer to Reference Publications, page 56 for the appropriate number, or contact your local Schneider Electric representative.

Sensor Maintenance

Only qualified electrical personnel can service Continuous Thermal Monitoring sensors.

^{7.} QMQB switches are available in Canada only.

Adverse Circumstances

This section includes, but is not limited to, all electrical components of the switchboard.

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Turn off all power supplying the switchboard before cleaning.
- Always use a properly rated voltage sensing device to confirm all power is off.
- Before energizing the switchboard, all unused circuit breaker mounting spaces must be filled.

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

NOTE: Before attempting to re-energize the switchboard following adverse circumstances, contact Schneider Electric Services at 1-888-778-2733 (US) or 1-800-565-6699 (Canada) for special instructions.

Inspection Following a Short Circuit

If a short circuit occurs, make a thorough inspection of the entire system, and verify that no damage to conductors or insulation has occurred. High mechanical and thermal stresses developed by short-circuit currents can damage conductors and insulation. Check the overcurrent-protection device that interrupted the short-circuit current for possible arcing damage.

Do not open sealed devices, such as molded case circuit breakers. Replace these devices if they are damaged. Before energizing the switchboard, all unused circuit breaker mounting spaces must be filled. For more information about these devices, refer to the appropriate instruction manual listed in Reference Publications, page 56.

Clean-up Following a Short Circuit

The insulating properties of some organic insulating materials can deteriorate during an electrical arc. If so:

- 1. Remove any soot or debris.
- 2. Replace carbon-tracked insulation.

NOTE: For more information see Damaged Low-Voltage Circuit Breakers.

Water-soaked Switchboards

Do not clean or repair a switchboard that has been exposed to large volumes of water or submerged at any time. Current-carrying parts, insulation systems, and electrical components may be damaged beyond repair. **Do not energize the switchboard.** Contact Schneider Electric Services at 1-888-778-2733 (US) or 1-800-565-6699 (Canada).

Water-sprayed or Splashed Switchboards (Clean Water Only)

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power supplying this equipment before working on it.

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

If the switchboard has been sprayed or splashed with small amounts of clean water, make a thorough inspection of the entire system, and verify that no damage to conductors or insulation has occurred or has contacted bus joints. Do not open devices such as molded case circuit breakers, control components, control devices, or fuses. Contact Schneider Electric if water has contacted these devices. For more information about these devices, refer to the appropriate instruction manual listed in Reference Publications, page 56.

NOTE: For more information see Damaged Low-Voltage Circuit Breakers.

Inspection and Clean-up of Clean Water Sprayed or Splashed Switchboards

Follow steps 1–10 only if:

- No signs of physical damage to the equipment are present.
- The switchboard has not been submerged or exposed to water for long periods of time.
- The water that has been in contact with the switchboard has not been contaminated with sewage, chemicals, or other substances that can negatively affect the integrity of the electrical equipment.
- The water that has been in contact with the switchboard has not entered any area of the enclosure that may contain wiring installed as intended, contacted any circuit breakers, any control components, any control devices, fuses, bus joints, or entered in a location above any live part. Specifically, inspect for water entering through conduits located above live parts.

If any one or more of these conditions have not been met, contact Schneider Electric Services at 1-888-778-2733 (US) or 1-800-565-6699 (Canada).

If ALL of the conditions listed have been met, proceed as follows:

- 1. Turn off all power supplying this equipment before working on or inside the equipment.
- 2. Always use a properly rated voltage sensing device to confirm all power is off.
- 3. Disconnect and electrically isolate the switchboard so that no contact can be made with energized parts.
- Wipe off all moisture from the bus bars, insulators, and insulating material with a clean, dry, lint-free cloth. Do **not** use cleaning agents or water displacement sprays.

5. Prepare the switchboard for insulation resistance (Megger) testing by disconnecting all line side supply connections and all load side cable connections to isolate the switchboard from the wiring system.

ACAUTION

OVERVOLTAGE TO CONTROL AND PROTECTION COMPONENTS

- Remove the long-time rating plug before electrical insulation testing a circuit breaker that has a label stating "Warning: Disconnect Plug Before Dielectric Test."
- For MasterPacT MTZ circuit breakers, remove the voltage power supply (VPS) module if it is present.
- Some MicroLogic trip units are not rated for voltages that would occur during electrical resistance insulation testing.
- Open all control and metering disconnects from the control circuits.

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

- 6. Turn all circuit breakers or switches to their **ON** position. The switchboard must remain de-energized.
- 7. Use a megohmmeter with a capacity of 500–1,000 Vdc and apply voltage from:
 - a. Each phase-to-ground with circuit breaker on.
 - b. Phase-to-phase with circuit breaker on.
- 8. Record resistance values. Refer to Switchboard Insulation Resistance Chart, page 55.
- 9. If resistance measurements are:
 - less than 0.5 megohm, call Schneider Electric Services at 1-888-778-2733 (US) or 1-800-565-6699 (Canada) for recommendations.
 - greater than 0.5 megohm, the equipment can be energized using the procedures listed in Energizing the Switchboard, page 40.

Torque Values for Electrical Connections

lable	6 -	Incoming,	Branch,	and	Neutral	Lug
-------	-----	-----------	---------	-----	---------	-----

Socket Size Across Flats	Torque Value
1/4 in.	180 lb-in. (20 N•m)
5/16 in.	250 lb-in. (28 N•m)
3/8 in.	340 lb-in. (38 N•m)
1/2 in.8	450 lb-in. (51 N•m)

Table 7 - Multiple Conductor Neutral and/or Ground Bar

Screw Type	Lug Wire Range	Conductor Size	Torque Value	
		14-10 Cu, 12-10 Al	20 lb-in. (2 N•m)	
	14–4	8 Cu-Al	25 lb-in. (3 N•m)	
Slotted Head		6-4 Cu-Al	35 lb-in. (4 N•m)	
	14 1/0	14-8 Cu-Al	36 lb-in. (4 N•m)	
	14-170	6-1/0 Cu-Al	45 lb-in. (5 N•m)	
Socket Head	14–1/0	All	100 lb-in. (11 N•m)	
Sockel Head	6–300 kcmil	All	275 lb-in. (31 N•m)	

Table 8 - Carriage Bolt Hex Nut Conical Washer



Table 9 - Carriage Bolt Conical Washer Assembly Keps Nut/Hex Head Bolt Conical Washer Assembly Keps Nut





Hardware Description	Torque Value		
1/4 in.	50–75 lb-in. (6–8 N•m)		
5/16 in.	80–125 lb-in. (9–14 N•m)		
3/8 in.	175–225 lb-in. (20–25 N•m)		
1/2 in.	250–350 lb-in. (28–40 N•m)		

^{8.} Certain lugs require 620 lb-in. (70 N•m) and are marked as such.

Table 10 - Square Head (Tee) Bolt Conical Washer Assembly Keps Nut



Hardware Description	Torque Value		
1/4 in.	50–75 lb-in. (6–8 N•m)		
3/8 in.	175–225 lb-in. (20–25 N•m)		
1/2 in.	250–350 lb-in. (28–40 N•m)		

Table 11 - Square Head (Tee) Bolt Conical Washer Assembly Keps Nut

	Hardware Description	Torque Value			
	Hardware Description	Conical Washer OD Square Head (Tee) Bolt Conical W			
Ē	2/8 in	0.87 in. (22 mm)	250–280 lb-in. (28–32 N•m)		
	5/6 11.	1.00 in. (25 mm)	130–150 lb-in. (15–17 N•m)		
	1/2 in.	1.25 in. (32 mm)	450,550 lb in (51,62 Nam)		
		2.25 in. (57 mm)			

Table 12 - Hex Head Bolt (2) Conical Washers

	Hardwara Description	Torque Value			
	naruware bescription	Conical Washer OD	Square Head (Tee) Bolt Conical Washer		
	5/16 in.	0.90 in. (23 mm)	145–160 lb-in. (16–18 N•m)		
	2/0 :=	0.87 in. (22 mm)	250–280 lb-in. (28–32 N•m)		
	3/8 IN.	1.00 in. (25 mm)	130–150 lb-in. (15–17 N•m)		
	1/2 in.	1.25 in. (32 mm)			
		2.25 in. (57 mm)	720–840 lb-in. (81–95 N•m)		
		3.00 in. (76 mm)			



Switchboard Insulation Resistance Chart

Always use a 500 or 1,000 Vdc megohmmeter when testing insulation resistance.

NOTE: The Neutral-Ground column is provided to record the results of the preenergizing checkout procedure only.

A A DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Turn off all power to the switchboard before testing.
- Always use a properly rated voltage sensing device to confirm power is off.

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

ACAUTION

OVERVOLTAGE TO CONTROL AND PROTECTION COMPONENTS

- Remove the long-time rating plug before electrical insulation testing a circuit breaker that has a label stating "Warning: Disconnect Plug Before Dielectric Test."
- For MasterPacT MTZ circuit breakers, remove the voltage power supply (VPS) module if it is present.
- Some MicroLogic trip units are not rated for voltages that would occur during electrical resistance insulation testing.
- · Open all control and metering disconnects from the control circuits.

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

Table 13 - Switchboard Insulation Resistance Chart

	Phase–Phase	hase-Phase Phase-Ground				Neutral–Ground	
Date	All Disconnects Open						
	a-b	b-c	c-a	a-ground	b-ground	c-ground	Neutral–Ground
Data	All Disconnects Closed						
Dale	a-b	b-c	c-a	a-ground	b-ground	c-ground	Neutral–Ground

Reference Publications

Schneider Electric publications are available through your local Schneider Electric representative. These publications include device replacement procedures and listings of spare parts to make ordering and servicing of replacement parts quick and convenient. Any maintenance procedure or device not listed, such as an I-Line interior, is not customer serviceable.

Contact your local Schneider Electric representative for information at 1-888-778-2733 in the US, or at 1-800-565-6699 in Canada. Or, refer to the Technical Library at http://www.schneider-electric.us/ to obtain the appropriate publications.

For information about obtaining NEMA documents, write to:

National Electrical Manufacturers Association (NEMA) Attention: Customer Service 1300 North 17th Street Suite 1847 Rosslyn, VA 22209

Table 14 - Reference Publications

Other Reference Publications	Publication Number	
General Instructions for Proper Installation, Operation, and Maintenance of Switchboards Rated 600 V or Less	NEMA Publication PB2.1	
Application Guide for Ground Fault Protective Devices for Equipment NEMA Publication PB2.2		
Circuit Breakers NEMA Publication AB-4		
Enclosed and Miscellaneous Distribution Switches	NEMA Publication KS-1	
Standard for Electrical Equipment Maintenance	NFPA 70B-2023	
Damaged Breakers Bulletin	0600DB1103	
Water Damaged Electrical Distribution and Control Equipment 0110DB0401R0711		
Evaluating-Water Damaged-Electrical-Equipment-Guide	NEMA Publication GD 1-2019	

Installation and Maintenance Log

Table 15 - Installation and Maintenance Log

Date	Initials	Maintenance Performed

Appendix A-Instructions for ArcBlok Main Section

Switchboard Preparation - Bottom Fed ArcBlok Main Section

Figure 32 - Conduit Closure Plate Label



Remove dirt and debris from the foundation and surrounding area before moving the switchboard into final position.

For the bottom-fed ArcBlok Main section:

- The bottom closure plate is installed at the bottom of the cable vault. For an ArcBlok Main switchboard greater than 24 in. (610 mm) deep, do not remove the center base channel as the cable conduit entry is inside the cable vault. The conduit closure plate is installed inside the cable vault.
- Remove and retain the conduit closure plate for reuse. The customer must create any holes necessary for conduit entering the bottom of the switchboard. After creating the holes, reinstall the conduit closure plate.(see Bottom-fed ArcBlok Main Bottom Closure and Conduit Closure Plate, page 58).



Figure 33 - Bottom-fed ArcBlok Main Bottom Closure and Conduit Closure Plate

Anchoring Access for the Bottom Fed ArcBlok Main Section

Figure 34 - Label for Rear Access Plate



The front cover and rear panel assembly of the ArcBlok bottom-fed cable vault is removable to allow access to anchor tie-down points (see Cable Vault Rear Access Panel, page 59).





- 1. Unplug the terminal block of ArcBlok Event Indicator and put it on the right side of the cable vault. Do not unplug any wires of 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.
- 6. Install the anchoring/seismic hardware at the location shown in Switchboard Base Channels, page 25).
- Reinstall the rear access panel using 1/4-20 hardware retained in steps 4 and 5. Torque cover 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 steps 2 and 3.
- 9. Re-plug the terminal block of ArcBlok Event Indicator removed in step 1.

Grounding and Bonding-Bottom Fed ArcBlok Main Section

For the ArcBlok Main Section, the ground extension bus and grounding electrode conductor connector (ground lug) are available inside the cable vault as indicated in Grounding Electrode Conductor Connector, page 60.

Main Bonding Jumper Cable Vault Ground Extension Bus Grounding Electrode Conductor Connector

Figure 36 - Grounding Electrode Conductor Connector

For the ground bus splice connections, follow instructions in Ground Bus Splice Connections, page 26.

Conduit Area-Bottom Fed ArcBlok Main Section

• Locate and terminate all conduit in the switchboard enclosure in the "available conduit area" designated on the equipment drawing.

NOTE: Do not remove any base channels when seismic restraint is required.

- The conduit area is available towards the front of the section inside the cable vault.
- Follow the instructions of cable conduit area access in Switchboard Preparation -Bottom Fed ArcBlok Main Section, page 58.

Cable Pulling and Termination in the ArcBlok Main Section

Refer to Cable Pulling, page 33. In addition, follow below steps for ArcBlok Main section:

1. Open the equipment breaker door and retain 1/4-20 size hardware.

2. Remove and retain 1/4-20 size hardware securing the equipment front covers available on the bottom of the circuit breaker door as shown in Removing Equipment Front Covers, page 61.





- 3. Remove and retain the equipment front covers.
- 4. Unplug the terminal block of the ArcBlok Event Indicator and put it on the right side of the cable vault. Do not unplug any wires of the terminal block.

5. Remove and retain 1/4-20 size hardware securing the cable vault front cover as shown in Removing Cable Vault Front Cover, page 62.





6. 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.

 Pull the cables inside the cable vault and terminate them on the ArcBlok lugs installed inside the ArcBlok module. Torque all the wire-binding screws at 842 lbin. (95 N•m) to install the cables as shown in Cross Section Showing Hole Placement, page 63).

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. (64 mm) 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 65 in step 9).

8. Cable entry into the cable vault must use conduit connection means installed on the conduit closure plate in the bottom fed applications. The conduits must be sealed using duct seal putty as shown in **Sealing Conduits with Duct Seal**, page 64.

Figure 40 - Sealing Conduits with Duct Seal



Conduits in the bottom removable conduit closure plate sealed with duct seal.

- 9. 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 65. 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 N•m).

NOTE: The TIM mounting screws are not completely removable.





Figure 42 - TIM Sleeve



10. 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 66. 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 N•m).

NOTICE

DAMAGE TO TAPE ON THERMAL INTERFACE MODULE (TIM)

Do not damage the tape on the TIM during installation of the ArcBlok front over 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.

Figure 43 - ArcBlok Front Cover Installation



 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 Heatsink Installation, page 67. Torque all six screws on the heatsink in a star pattern to 60 lb-in. (6.8 N•m).



Figure 44 - ArcBlok Heatsink Installation

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 or CSA Z462.

Failure to follow these instructions can result in injury.

12. 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 68.

NOTICE

DAMAGE TO SENSOR SPRING LOADED PROBE

Do not damage or let the sensor spring loaded probe tip out of place during the instillation 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 45 - Thermal Sensor Installation

- 13. 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 69).
 - b. Locate (5) 1/4-20, one 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 N•m) (see Reinstall Cable Vault Front Cover, page 69).





Figure 47 - Cable Vault Front Cover Labels



- 14. Re-plug the terminal block of the ArcBlok Event Indicator removed in step 4.
- 15. Make sure the ArcBlok Event Indicator plunger is pushed back as shown in **ArcBlok Event Indicator**, page 70.

Figure 48 - ArcBlok Event Indicator



Event indicator plunger pushed out



Event indicator plunger pushed back



Reinstall the equipment front covers using 1/4-20 size hardware retained in step 2.

17. Close the breaker door and secure it to the frame using 1/4-20 size hardware retained in step 1.

Cable Restraint Instructions–ArcBlok Main Section

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.

For non-ArcBlok applications, follow instructions in Cable Restraint for Short-circuit Current Rating (SCCR), page 34.

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, 3/8 in. (9.5 mm) diameter nylon 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 set and a second looping group nearer to the ArcBlok.

4. Attach one end of the rope to the cable bundle (see First Cable Lacing, page 72).

Figure 49 - First Cable Lacing



- 5. After attaching the rope to the cables, start the entry loop at about six in. (152 mm) from the floor. Make a loop in the rope and pull the loop around the 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. Continue to make a loop group of no more than two loops, wrapping the cable bundle eight times per loop.
7. Create the second loop group by pulling the rope around the cable bundle. Make a loop by pulling the loose end under the rope. Continue to pull the rope through the loop until it is tight around the cable bundle. Repeat the procedure until the cable bundle has no more than two loops, wrapping the cable bundle four times. The spacing between the upper and lower loop groups must be no more than 13 in. (330 mm) (see Upper and Lower Cable Lacing Groups, page 73).

Figure 50 - Upper and Lower Cable Lacing Groups



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

Pre-energizing Checkout Procedure-ArcBlok Main

Conduct a complete inspection before the switchboard is energized to validate that all components function and operate properly. Refer to Pre-energizing Checkout Procedure, page 37. Additional steps are required for ArcBlok Main Section. Complete every step of the checkout procedure listed before energizing the switchboard.

For ArcBlok Main Section:

- 1. Verify all incoming power cables are properly installed and secured:
 - a. Cables pulling and termination is complete per instructions in Cable Pulling and Termination in the ArcBlok Main Section, page 60.
 - b. The conduit closure plate is installed with conduits.
 - c. The space between conductors and conduits sealed with duct seal.
 - d. The Thermal Interface Module, ArcBlok Module Front Cover, Heatsinks, and Thermal Sensors are installed correctly as instructed in Cable Pulling and Termination in the ArcBlok Main Section, page 60.
- 2. Verify all 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 Cable Pulling and Termination in the ArcBlok Main Section, page 60.
- 4. Refer to deployment guide 7EN42-0247-00 for the Arcblok Event Indicator and CL110 thermal sensor commissioning procedure.

Maintenance on ArcBlok Main Section If Internal Arc Interruption Occurs

sensors commissioning procedure.

Normal Operation

ACAUTION **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 or CSA Z462. Failure to follow these instructions can result in injury. 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 of discoloration. See Inspection Point After an Event, page 75. 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

Figure 51 - Inspection Point After an Event



Schneider Electric

800 Federal Street Andover, MA 01810 USA

888-778-2733

www.se.com

As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

© 1988 – 2024 Schneider Electric. All rights reserved.

80043-055-16