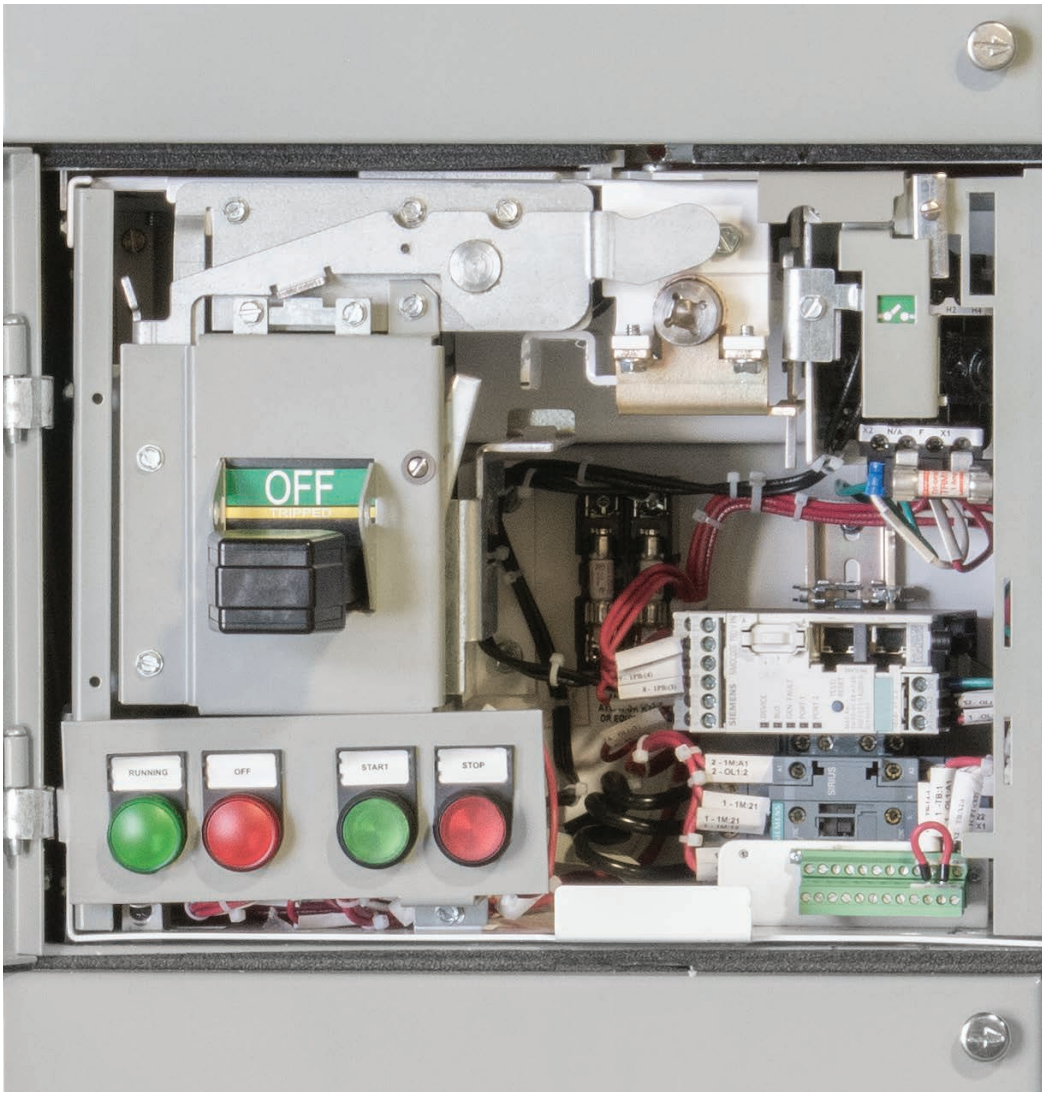
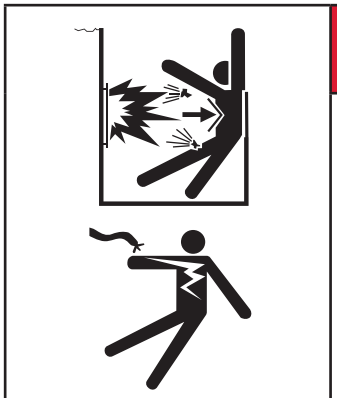


INSTRUCTION MANUAL

SIERS retractable stabs

tiastar™ low-voltage motor control centers instruction manual
77617000061

SIEMENS



⚠ DANGER

Hazardous voltages and high-speed moving parts.

Will cause death, serious injury, or property damage.

Always de-energize and ground the equipment before maintenance. Read and understand this instruction manual before using equipment. Maintenance should be performed only by qualified personnel. The use of unauthorized parts in the repair of the equipment or tampering by unqualified personnel will result in dangerous conditions which will cause death, severe injury, or equipment damage. Follow all safety instructions contained herein.

Important

The information contained herein is general in nature and not intended for specific application purposes. It does not relieve the user of responsibility to use sound practices in application, installation, operation, and maintenance of the equipment purchased. Siemens reserves the right to make changes in the specifications shown herein or to make improvements at any time without notice or obligation. Should a conflict arise between the general information contained in this publication and the contents of drawings or supplementary material or both, the latter shall take precedence.

Qualified person

For the purpose of this instruction manual a **qualified person** is one who has demonstrated skills and knowledge related to the construction and operation of electrical equipment and installations and has received hazard safety training to identify the hazards and reduce the associated risk. In addition, this person has the following qualifications:

- **Is trained and authorized** to de-energize, clear, ground and tag circuits and equipment in accordance with established safety procedures.
- **Is trained** in the proper care and use of protective equipment, such as: rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc. in accordance with established safety practices.
- **Is trained** in rendering first aid.
- **Is trained** in the methods of safe release of victims from contact with energized electrical conductors or circuit parts.

Further, a qualified person shall also be familiar with the proper use of special precautionary techniques, personal protective equipment, insulation and shielding materials, and insulated tools and test equipment. Such persons are permitted to work within limited approach boundary, and shall, at a minimum, be additionally trained in all of the following:

- The skills and techniques necessary to distinguish exposed energized parts from other parts of electric equipment.
- The skills and techniques necessary to determine the nominal voltage of exposed live parts.
- The approach distances specified in NFPA 70E® and the corresponding voltages to which the qualified person will be exposed.
- The decision-making process necessary to perform the job safety planning, identify the electrical hazards, assess the associated risks, and select the appropriate risk control methods including personal protective equipment

Note:

These instructions do not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise that are not covered sufficiently for the purchaser's purposes, the matter should be referred to the local sales office.

The contents of this instruction manual shall not become part of or modify any prior or existing agreement, commitment or relationship. The sales contract contains the entire obligation of Siemens Industry, Inc. The warranty contained in the contract between the parties is the sole warranty of Siemens Industry, Inc. Any statements contained herein do not create new warranties or modify the existing warranty.

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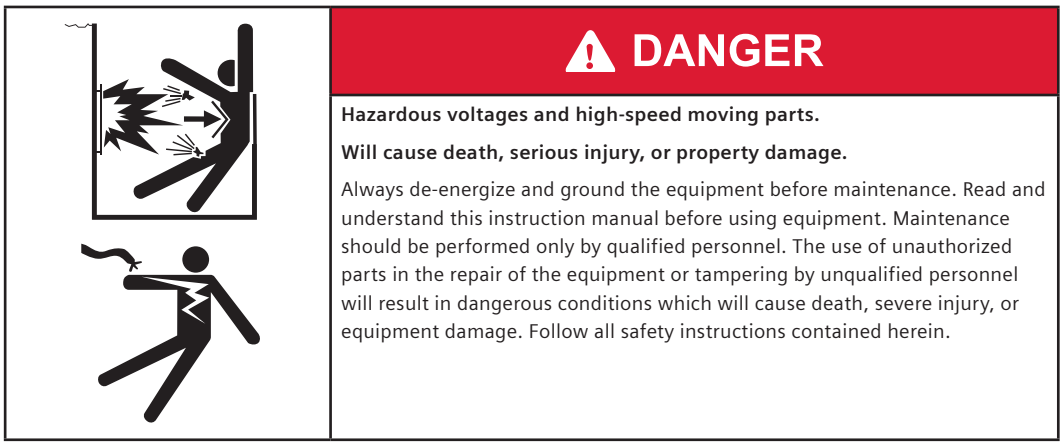
Introduction



⚠ DANGER

Hazardous voltages and high-speed moving parts.

Will cause death, serious injury, or property damage.

Always de-energize and ground the equipment before maintenance. Read and understand this instruction manual before using equipment. Maintenance should be performed only by qualified personnel. The use of unauthorized parts in the repair of the equipment or tampering by unqualified personnel will result in dangerous conditions which will cause death, severe injury, or equipment damage. Follow all safety instructions contained herein.

Introduction

This instruction manual supplements the instruction manual for the type tiastar low-voltage motor control centers and describes the SIERS for tiastar optional feature.

Refer to the instruction manuals for specific low-voltage motor control center components.

Read, understand, and follow all of the safety advisories, instructions, and procedures contained in the reference manuals. For convenience, these instruction manuals will hereafter be referred to as the basic equipment manuals.

The retractable stab option allows the operator to connect and disconnect the unit stabs from the vertical bus in a low-voltage motor control section without opening the door. The optional remote operator can be used to operate the system from a distance.

Signal words

The signal words “danger,” “warning”, and “caution” used in this instruction manual indicate the degree of hazard that may be encountered by the user. These words are defined as:

Danger - Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

Warning - Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

Caution - Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.

Notice - Indicates a potentially hazardous situation that, if not avoided, may result in property damage.

Field service operation and warranty issues

Siemens can provide competent, well-trained field service representatives to provide technical guidance and advisory assistance for the installation, overhaul, repair, and maintenance of Siemens equipment, processes and systems. Contact regional service centers, sales offices or the factory for details, or telephone Siemens field service at +1 (800) 333-7421 or +1 (423) 262-5700 outside the U.S.

For customer service issues, contact Siemens at +1 (800) 333-7421 or +1 (423) 262-5700 outside the U.S.

Receiving, handling, and storage

⚠ WARNING

Heavy weight.

Can result in death, serious injury or property damage.

Observe all handling instructions in this instruction manual to prevent tipping or dropping of equipment.

Receiving

Each shipping split of tiastar low-voltage motor control center is securely blocked and braced for shipment. It is wrapped, boxed, or covered as required by shipping conditions. If special handling is required, it is so indicated. As relatively delicate instruments, relays, and other devices may be included, the assembly must be handled carefully when unloading.

Identification

When the shipment includes more than one unit/shipping group or equipment for more than one location, marking tags are attached to each package for identification. The sales order number on the tag is also on the shipping list. The shipping list identifies the contents with the unit numbers included in the shipping group. Refer to the general arrangement drawing for the location of each unit within the group lineup. Use this information to simplify the assembly operation and save unnecessary handling.

Inspection and unpacking

Inspect the equipment as soon as possible after receipt for any damage that may have occurred in transit. Before unpacking, examine the package itself, as a damaged package may indicate damage to the contents of the package. Be careful when unpacking equipment.

The use of sledge hammers and crowbars may damage the finish or the equipment itself and may void the warranty. Use nail pullers. After unpacking, examine equipment for any possible damage. Check the shipping manifest to be certain that all items have been received.

Note: If there is a shortage, make certain it is noted on the freight bill and contact the carrier immediately. Notify Siemens customer service +1 (800) 333-7421 (+1 (423) 262-5700 outside the U.S.) of any shortage or damage.

Shipping damage claims

Important: The manner in which visible shipping damage is identified by consignee prior to signing the delivery receipt can determine the outcome of any damage claim to be filed.

Notification to carrier within 15 days for concealed damage is essential if loss resulting from unsettled claims is to be eliminated or minimized.

1. When shipment arrives, note whether equipment is properly protected from the elements. Note trailer number on which the equipment arrived. Note blocking of equipment. During unloading, make sure to count the actual items unloaded to verify the contents as shown on the delivery receipt.

2. Make immediate inspection for visible damage upon arrival and prior to disturbing or removing packaging or wrapping material. This should be done prior to unloading when possible. When total inspection cannot be made on vehicle prior to unloading, close inspection during unloading must be performed and visible damage noted on the delivery receipt. Take pictures if possible.

3. Any visible damage must be noted on the delivery receipt and acknowledged with the driver's signature. The damage should be detailed as much as possible. It is essential that a notation "possible internal damage, subject to inspection" be included on delivery receipt. If the driver will not sign the delivery receipt with damage noted, the shipment should not be signed for by the consignee or their agent.

4. Notify Siemens immediately of any damage, at +1 (800) 333-7421 or +1 (423) 262-5700 outside the U.S.

5. Arrange for a carrier inspection of damage immediately.

Important: Do not move equipment from the place it was set when unloading. Also, do not remove or disturb packaging or wrapping material prior to carrier damage inspection. Equipment must be inspected by carrier prior to handling after receipt. This eliminates loss due to claims by carrier that equipment was damaged or further damaged on site after unloading.

6. Be sure equipment is properly protected from any further damage by covering it properly after unloading.

7. If practical, make further inspection for possible concealed damage while the carrier's inspector is on site. If inspection for concealed damage is not practical at the time the carrier's inspector is present, it must be done within 15 days of receipt of equipment. If concealed damage is found, the carrier must again be notified and inspection made prior to taking any corrective action to repair. Also notify Siemens immediately at +1 (800) 333-7421 or +1 (423) 262-5700 outside the U.S.

8. Obtain the original of the carrier inspection report and forward it along with a copy of the noted delivery receipt to Siemens at +1 (800) 333-7421 or +1 (423) 262-5700 outside the U.S. Approval must be obtained by Siemens from the carrier before any repair work can be performed. Before approval can be obtained, Siemens must have the above referenced documents. The carrier inspection report and/or driver's signature on the delivery receipt does not constitute approval to repair.

Note: Shipments are not released from the factory without a clear bill of lading. Approved methods are employed for preparation, loading, blocking, and tarping of the equipment before it leaves the Siemens factory. Any determination as to whether the equipment was properly loaded or properly prepared by shipper for over-the-road travel cannot be made at the destination. If the equipment is received in a damaged condition, this damage to the equipment must have occurred while en route due to conditions beyond Siemens' control. If the procedure outlined above is not followed by the consignee, purchaser, or their agent, Siemens is not liable for repairs. Siemens is not liable for repairs in any case where repair work was performed prior to authorization from Siemens.

Indoor equipment handling

There are a number of methods that properly trained employees can use in handling tiastar low-voltage motor control centers that will not damage the equipment. The handling method used will be determined by conditions and available equipment at the installation site.

Before removing the protective packing materials, the low-voltage motor control sections may be moved by crane with lift cables attached through the packaging to the lifting plates on the top of the equipment.

Lifting with a crane is the preferred method of handling; however, overhead obstructions or low ceilings often dictate that other methods must be used. If crane facilities are unavailable, or if tight spaces prevent the use of a crane, rollers, jacks or forklift trucks under the wooden shipping skids may be used. tiastar low-voltage motor control centers are shipped in groups of one to four vertical sections mounted on wooden shipping skids and wrapped, boxed, or covered. Individual units are shipped either in boxes or crates depending on unit size. Remove protective packing in shipping container to access unit.

Each group has provisions for attaching lifting equipment to the top of the sections.

Receiving and inspection

Become familiar with the unit and unit support components. Carefully remove all packaging material from the unit. Read the entire unit installation guide. And inspect the unit for damage. Become familiar with the unit and unit support components described in the images below. Refer to Figures 1 and 2.

Item	Description
1	Door interlock
2	Pilot device panel (used when mounting directly to unit)
3	Operating handle
4	Racking lever
5	Racking lever lock plate
6	Top barrier plate
7	Terminal block

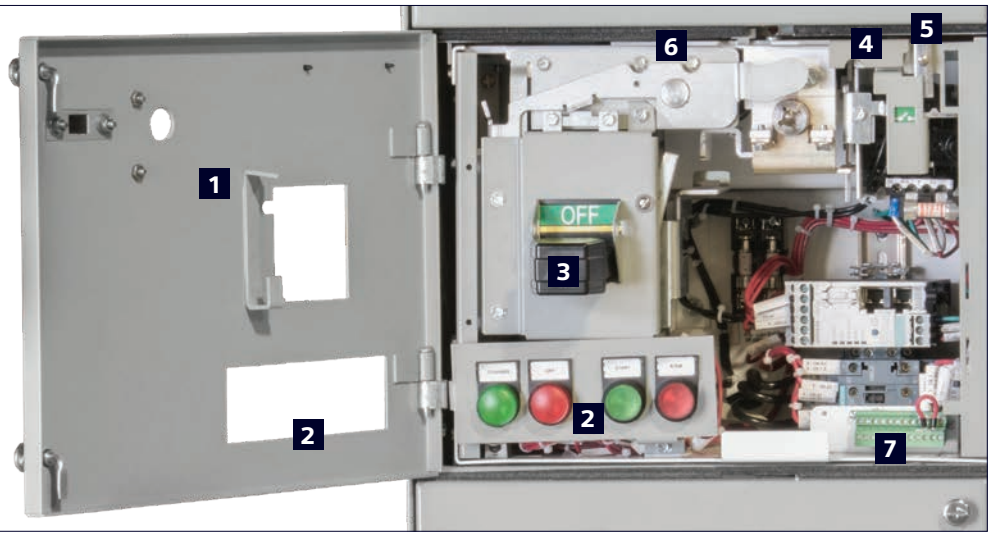


Figure 1: Unit components

Item	Description
1	Pin-type door hinge
2	Shelf bracket
3	Separator angle
4	Intermediate angle

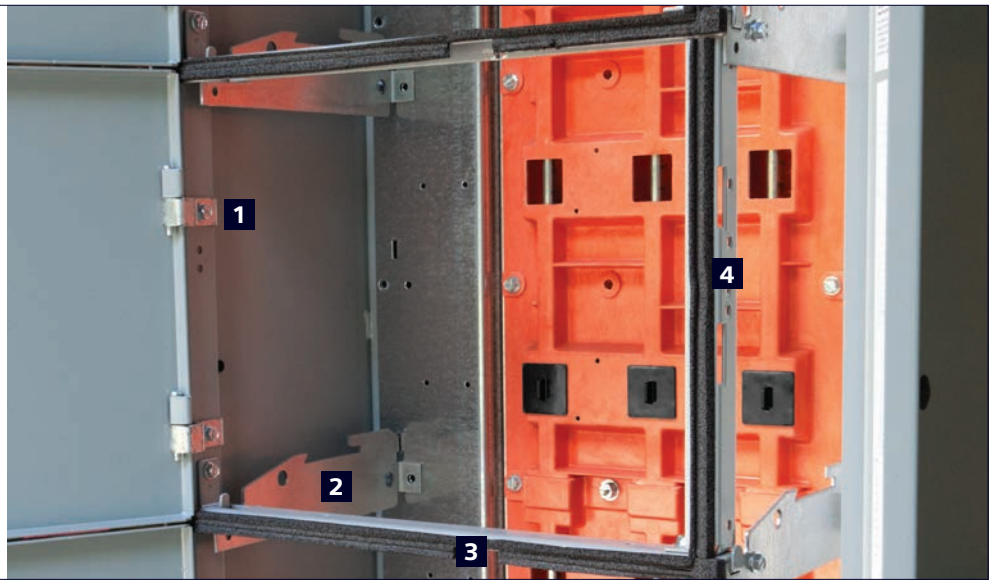


Figure 2: Unit support components

SIERS system overview

⚠ DANGER

Hazardous voltages.

Will cause death, serious injury, or property damage.

The door interlock should be defeated only by authorized personnel in the event of a malfunction in the equipment.

⚠ DANGER

Hazardous voltages.

Will cause death, serious injury, or property damage.

Do not attempt to use excessive force or leverage to overpower any mechanical interlock systems. Malfunctions must be serviced by qualified personnel only.

Do not attempt to modify, override, or uninstall any mechanical interlock systems.

Important: These instructions do not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the local Siemens sales office. The contents of this instruction manual shall not become part of or modify any prior or existing agreement, commitment or relationship. The sales contract contains the entire obligation of Siemens. The warranty contained in the contract between the parties is the sole warranty of Siemens. Any statements contained herein do not create new warranties or modify the existing warranty.

SIERS system overview

Plug-in units equipped with the tiastar retractable stabs mechanism (SIERS) provide additional levels of functionality to the customer. The system allows an operator to disconnect the stabs of the plug-in unit from the vertical bus of a tiastar section without accessing the inside of either the section or the bucket.

The SIERS system utilizes a series of integrated interlocking systems to protect both the operator and the mechanism. These interlock systems are included to guard against unintended use of the mechanism.

Item	Description	Item	Description	Item	Description
1	Racking lever lock plate	5	SIERS drive socket	8	Mechanism-to-section interlock
2	Pilot device panel	6	Access interlock	9	Handle-to-section interlock
3	Operating handle	7	Door interlock	10	Mid-position interlock
4	Racking lever				

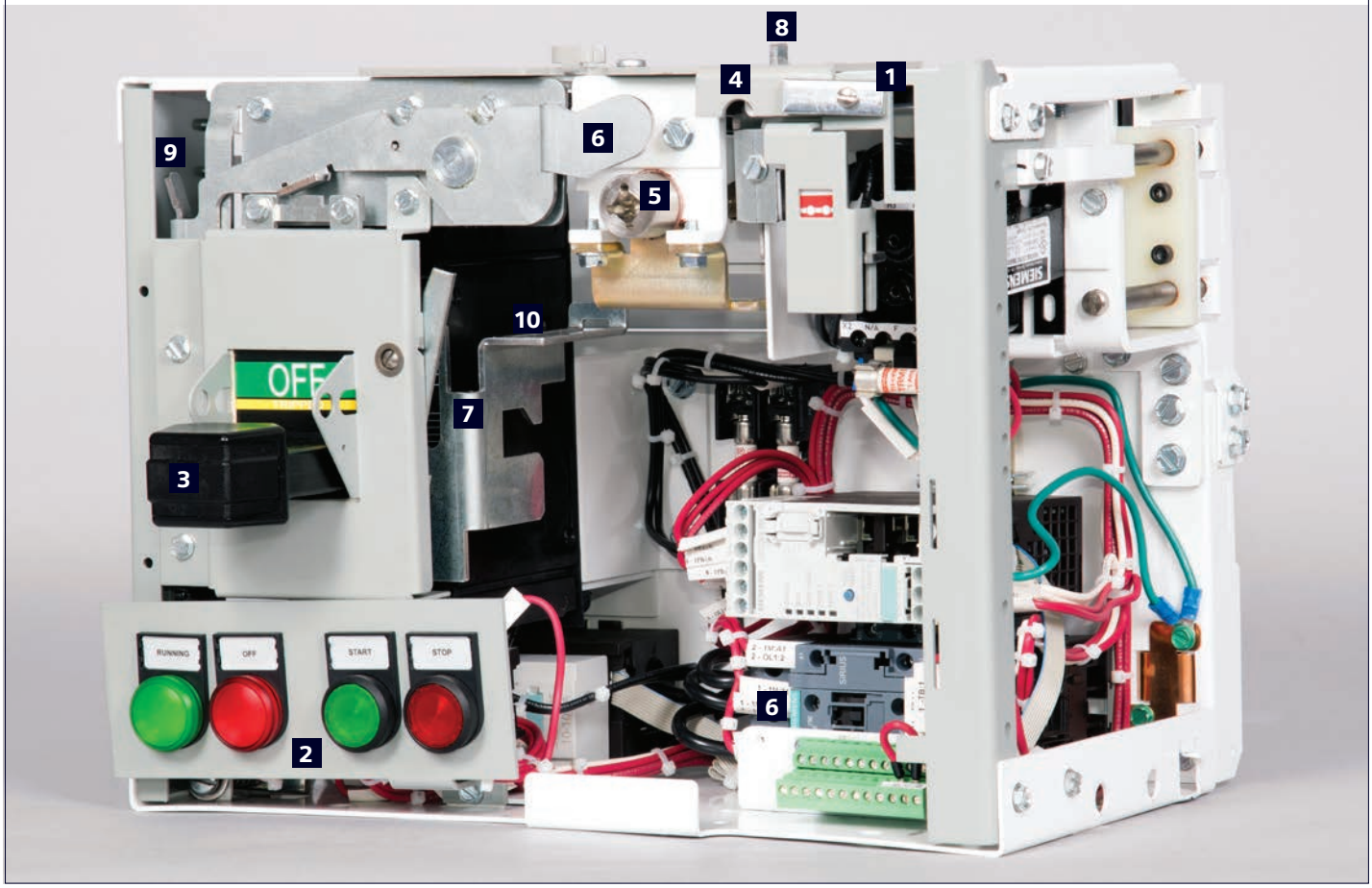


Figure 3: SIERS unit components

It is important to become familiar with the features of the retractable stabs system.

1. Racking lever lock plate.
2. Pilot device panel (if equipped).
3. Operating handle.
4. Racking lever.
5. SIERS drive socket.
6. Access interlock: Prevents users from operating the mechanism when the circuit breaker or disconnect switch is in the ON position. With the handle in the ON position, the access port to operate the mechanism is shielded.
7. Door interlock: When the door is open, the circuit breaker handle cannot be operated to the ON position. Additionally, when the circuit breaker is in the ON position, the door cannot be opened without defeating the interlock.
8. SIERS mechanism-to-section interlock: When the mechanism is in the extended position, the bucket cannot be removed from the section.
9. Handle bucket-to-section interlock: When the handle is in the ON position, the bucket cannot be removed from the section.
10. Mid-position interlock: Prevents the user from operating the circuit breaker into the ON position while the mechanism is in an intermediate state.

Removing an existing unit without SIERS system

1. Move disconnect operating handle to the OFF position.
2. Open the unit door; transfer any attached pilot devices from door to slot on unit.
3. Unscrew latch located at the bottom of the unit. Rotate the latch until it disengages from the separator angle (refer to Figure 8).
4. Open the vertical wireway.
5. Loosen the lock bar in the top right and rotate it out of the way of the racking lever.
6. Rotate the racking lever out of the unit.
7. Disconnect control and load wiring from the unit.
8. Remove unit by pulling forward and slightly tilting the front of the unit downward and sliding it out of the structure.

Recommended hand tools
• Flat-head screwdriver
• Phillips-head screwdriver
• ⅜" drive rachet
• ⅜" drive extension bar.

9. If rearranging different size units, perform the following tasks:

   9a. Remove all unit support assemblies by unfastening the screws for each assembly, tilting upward, and sliding out of their holes.

   9b. Realign support assemblies as needed.

   9c. Include intermediate angles in all spaces where a plug-in unit will not be installed.

   9d. Remove stab-hole covers at appropriate heights and replace covers on unused stab holes. Stab-hole covers should be arranged so that the only uncovered openings are those to which a unit will be connected (refer to Figure 5).

      9d1. Motor control centers with automatic shutters; tiastar shutter mechanism kit 8PG1191-2MA00 can be ordered if additional shutters are needed.

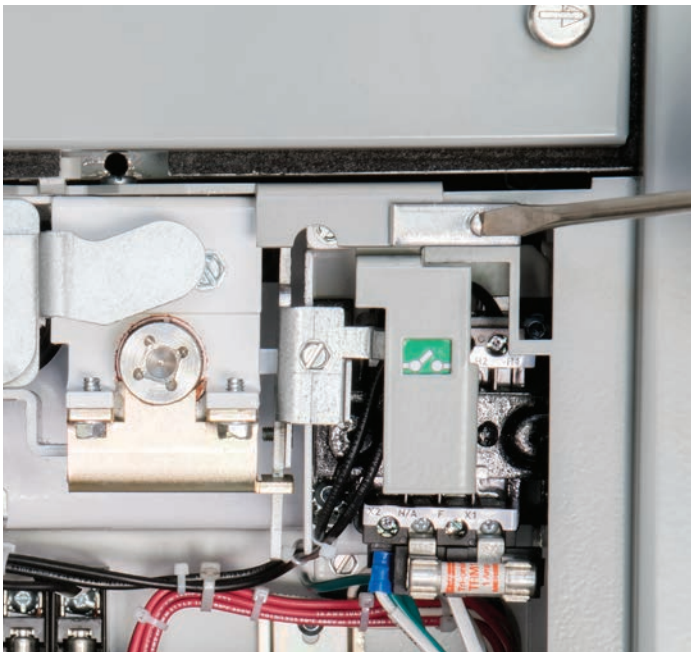


Figure 4: Tightening racking lever lock bar

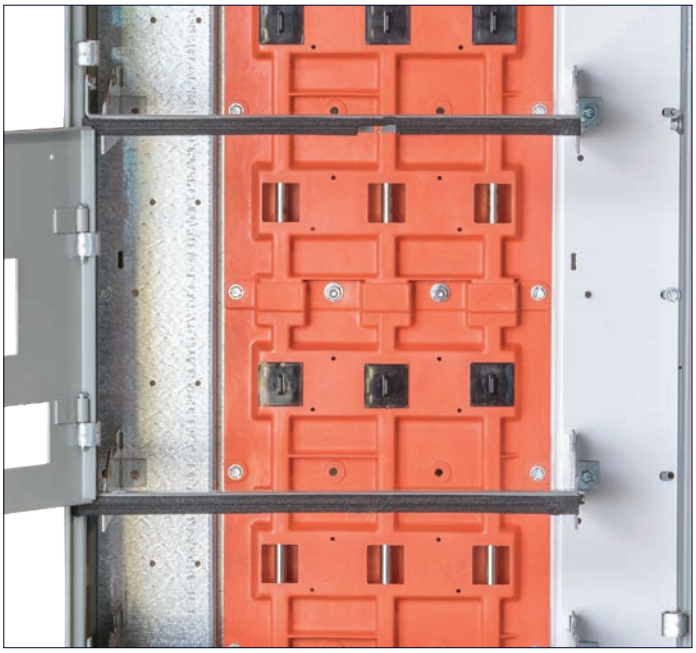


Figure 5: Uncovered stab holes

Installing a unit with the SIERS system

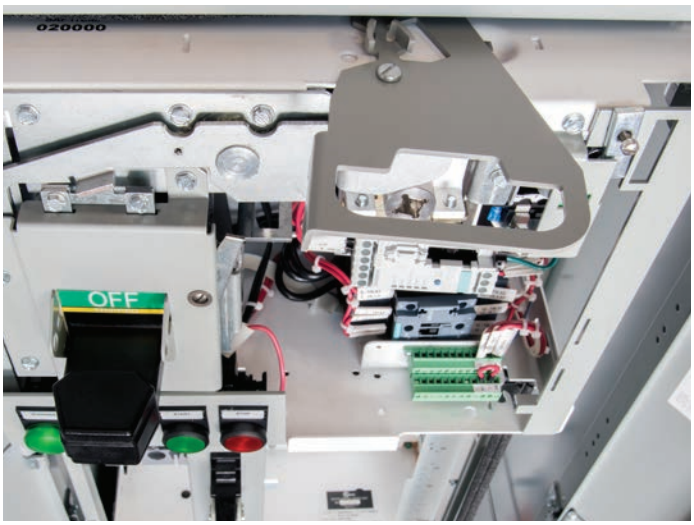


Figure 6: Placing unit on support assembly and in TEST position

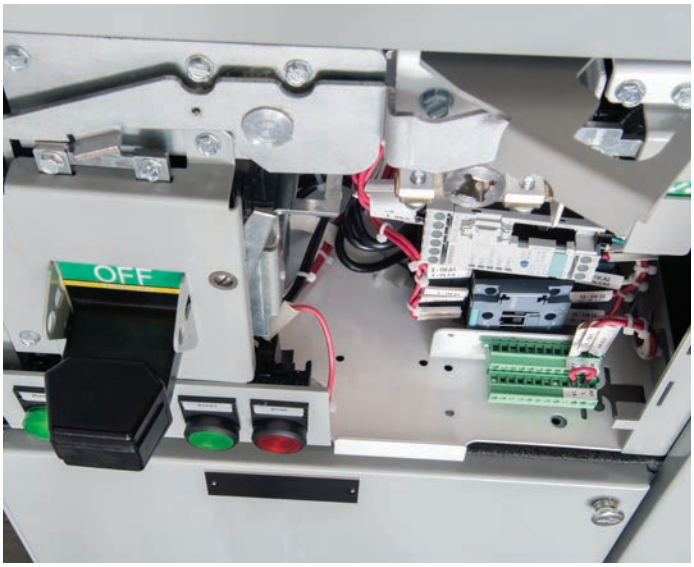


Figure 7: Closing racking lever

1. If present, remove existing door by first withdrawing its hinge pins and then closing the door halfway before sliding it off its hinges.
2. If installing the plug-in unit in a previously blank location, the intermediate angle will need to be removed. Do so by removing the screw that fastens it to the separator angle and tipping slightly to remove the formed tab at the top from slot on shelf bracket above.
3. If necessary, install unit-support assembly by inserting shelf brackets at a slight angle into the appropriate holes in the vertical bus-support angle and snapping into place (refer to Figure 2). Secure support assembly with the two screws provided. One screw fastens the right-hand shelf bracket to the vertical bus-support angle. The second screw fastens the separator angle to the left side of the structure.
4. If necessary, remove appropriate unit stab-hole covers.
5. Install unit door by sliding it onto the hinges while half open. Once on the hinges, open the door completely and insert hinge pins.
6. Any plug-in unit equipped with the SIERS system must be in the DISCONNECTED position before installing it into a tiastar section. In the DISCONNECTED position, the stabs are retracted into the unit and the position indicator will show a disconnect symbol and green background.

   6a. If the SIERS system is not in the DISCONNECTED position, the system must be placed in the DISCONNECTED position. First verify that the power handle is in the OFF position. For more information on this process, refer to “Handle operation and maintenance” on page 22 and to Figure 10.

   6b. Next, place the SIERS system in the DISCONNECTED position. Refer to section “Disconnecting the SIERS system” on page 14 and execute steps two through four.

7. Place plug-in unit inside of the enclosure (refer to Figure 6).

   7a. With the handle in the OFF position, slide unit into place on support assembly.

   7b. Slightly tilt the front of the unit downwards in order to slide the back of the unit over the shelf brackets.

   7c. Once the unit has been pushed in as far as it can go, close the racking lever in top barrier plate (refer to Figure 7).

   7d. Engage locking latch at lower left of the unit to the separator angle and tighten it using a flat-head screwdriver (refer to Figure 8)

   7e. Engage the racking lever lock bar in the upper right corner of the unit. Adjust it so that it locks the racking lever in the RACKED position and tighten down with a flat-head screwdriver (latch shown in correctly installed position in Figure 9).

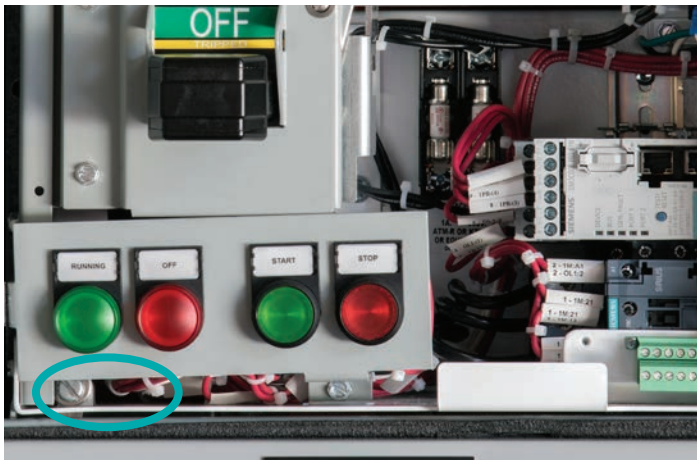


Figure 8: Lower locking latch

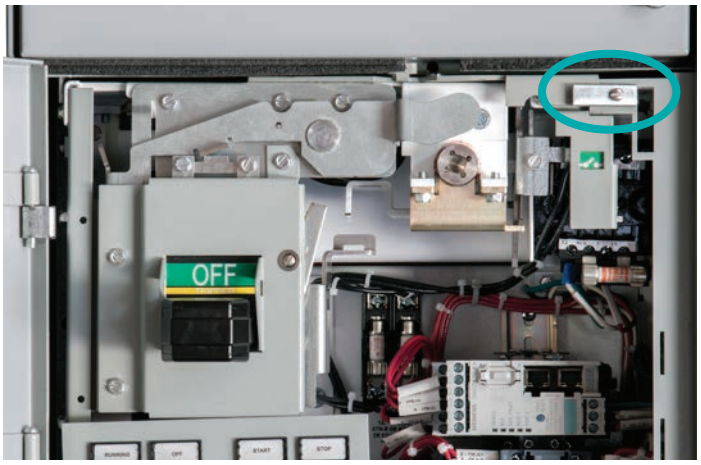


Figure 9: Racking lever lock bar in correctly installed position

Operating the SIERS system

⚠ DANGER

Hazardous voltages and high-speed moving parts.

Will cause death, serious injury, or property damage.

Do not attempt to use excessive force or leverage to overpower any mechanical interlock systems. Malfunctions must be serviced by qualified personnel only.

Do not attempt to modify, override, or uninstall any mechanical interlock systems.

Connecting the SIERS system

1. With the door closed, verify that the unit's power handle is in the OFF position (refer to Figure 12). (When the handle is in the ON position, it is not possible to access to the SIERS system's drive socket.) More information on handle operation can be found in "Handle operation and maintenance" on page 22.
2. If the door has a cover plate, lift it up to expose the SIERS drive socket. With the cover plate lifted insert the ⅜" square drive into the SIERS drive socket (refer to Figure 13).
3. Rotate the tool clockwise approximately 22 turns (refer to Figure 14). The mechanism should rotate smoothly with minor resistance when engaging the stabs onto the vertical bus. When the stabs reach the fully extended position, the mechanism will hit the rear bump stop and an increase in resistance will be felt by the operator. Do not apply more than 125 in-lb (14 Nm) of torque to the SIERS drive socket.
4. Check the position indicator on front of unit to verify that the mechanism is in the CONNECTED position. The CONNECTED position is represented by a red color background and closed circuit symbol (refer to Figure 15).
5. At this time, the system is fully installed onto the vertical bus and the unit's power handle can now be operated to the ON position.

Figure 13: Inserting ⅜" drive extension into SIERS drive socket

Figure 10: Operating handle position: ON

Figure 11: Operating handle position: TRIPPED

Figure 12: Operating handle position: OFF

Disconnecting the SIERS system

1. With the door closed, verify that the unit's power handle is in the OFF position. (When the handle is in the ON position, it is not possible to access to the retractable SIERS drive socket.) More information on handle operation can be found in "Handle operation and maintenance" on page 22.
2. Insert the ⅜" square drive into the SIERS drive socket (refer to Figure 13).
3. Rotate the tool counter-clockwise approximately 22 turns (refer to Figure 16). The mechanism should rotate smoothly with minor resistance when disengaging the stabs from the vertical bus. When the stabs reach the fully retracted position, the mechanism will hit the front bump stop and an increase in resistance will be felt by the operator. Do not apply more than 125 in-lb (14 Nm) of torque to the SIERS drive socket.
4. Check the position indicator on front of unit to verify that the mechanism is in the DISCONNECTED position. The DISCONNECTED position is represented by a green color background and open circuit symbol (refer to Figure 17).
5. At this time, the system is disconnected from the vertical bus.

Figure 14: Rotate tool clockwise to extend stabs and place the SIERS' system in the CONNECTED position

Figure 15: SIERS system position indicator in CONNECTED position

Figure 16: Rotate tool counter-clockwise to retract stabs and place the SIERS' system in the DISCONNECTED position

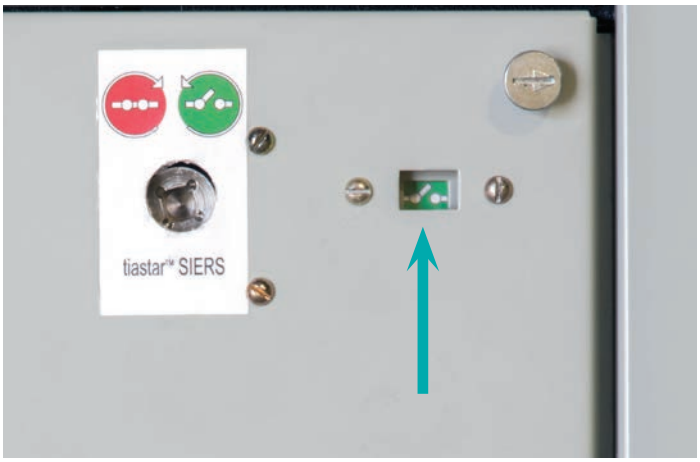


Figure 17: SIERS system position indicator in DISCONNECTED position

Uninstalling a unit with SIERS system

1. Any plug-in unit equipped with the SIERS system must be in the DISCONNECTED position before uninstalling it from a tiastar section. In the DISCONNECTED position, the stabs are retracted into the unit and the position indicator will show a disconnect symbol and green background.

   1a. If the SIERS system is not in the DISCONNECTED position, the system must be placed in the DISCONNECTED position. To place the retractable stabs system in the DISCONNECTED position, review the section titled “Disconnecting the SIERS system” on page 14 inside of section “Operating the SIERS system” and execute steps one through five.

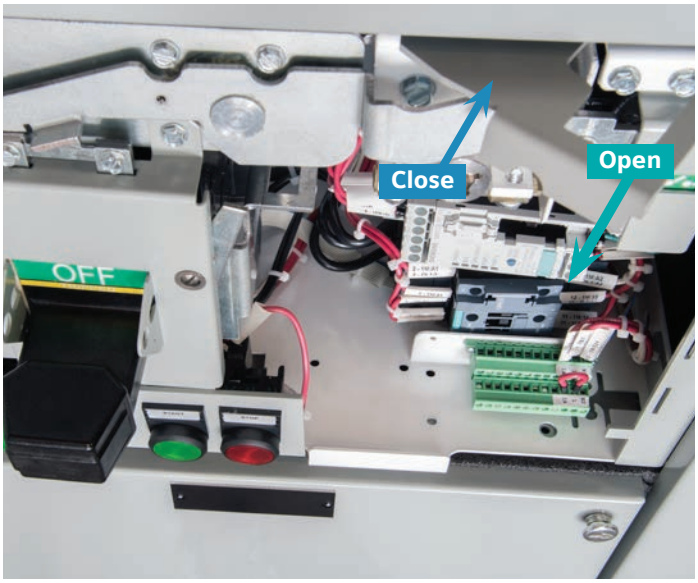
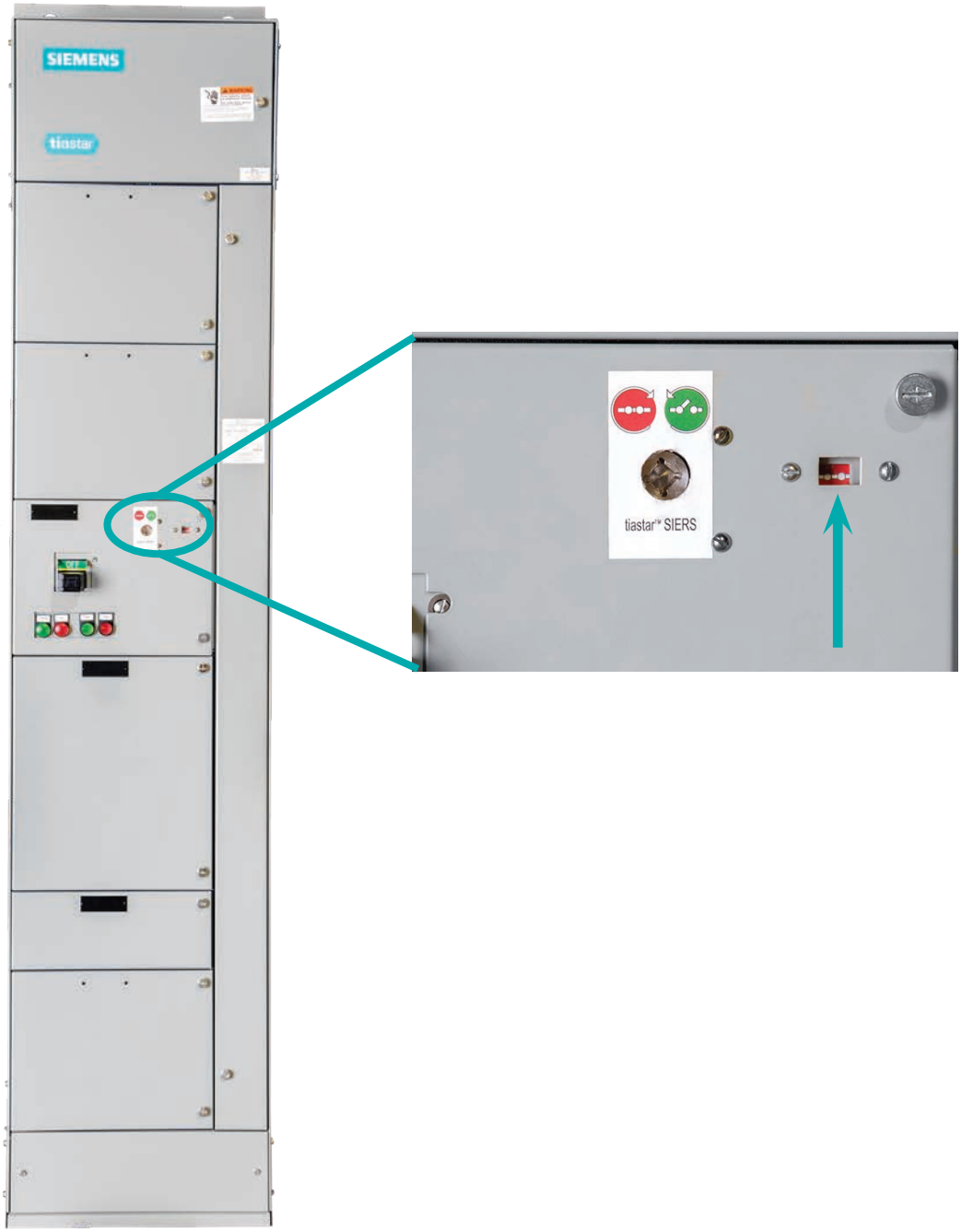


Figure 18: Closing or opening racking lever

2. Open the unit door; transfer any attached pilot devices from door to slot on unit.
3. Unscrew latch located at the bottom of the unit. Rotate the latch until it disengages from the separator angle (refer to Figure 8).
4. Open the vertical wireway.
5. Disconnect control and load wiring from the unit.
6. Loosen the lock bar in the top right and rotate it out of the way of the racking lever.
7. Rotate the racking lever out of the unit.
8. Remove unit by pulling forward and slightly tilting the front of the unit downward and sliding it out of the structure.

Figure 19: SIERS system position indicator in CONNECTED position



Operating the SIERS system with the remote operator

The remote operator for the SIERS system allows the user to remotely connect and disconnect the unit stabs from the vertical bus in a low-voltage motor control section without opening the door.

The remote operator kit consists of a remote operator and pendant connected to the remote operator with a 30 ft (9.1 m) control cord.

Remote operator kit:

- One remote operator
- Hand-held control pendant with 30 ft (9.1 m) of control cable
- One ac power cord.

Installing the remote operator for use

1. Verify that the plug-in unit's power handle is in the OFF position and that the door is securely closed and latched. More information about handle operation can be found in "Handle operation and maintenance" on page 22.
2. If the door has a cover plate, lift it up to expose the mechanism drive socket. With the cover plate lifted, slide the motor's drive bar into the mechanism drive socket. Insert the remote operator drive shaft into the mechanism drive socket. After insertion, rotate the remote operator so that the remote operator handle points upwards (refer to Figure 20).
3. While holding remote operator in place, push and twist the magnet handles on the left and right of the remote operator 180° clockwise to the ON position to secure the remote operator to the unit door (refer to Figure 21).
4. With the remote operator fully secured to the door and aligned properly, connect the control pendant plug and ac power cord to the remote operator. After they are installed, connect the power cord to a standard 120 Vac power outlet (refer to Figure 22).
5. The remote operator is now ready for use.

Using the remote operator

Connecting the SIERS system

1. Ensure that the unit being operated is in the DISCONNECTED position by examining the position indicator window and verifying that the power handle is in the OFF position.
2. While holding the control pendant press and hold the connect button (refer to Figure 23).
3. The yellow active light will illuminate indicating power is being delivered to the motor and it is operating (refer to Figure 24). Simultaneously, the remote operator will begin to operate the mechanism.
4. Watch the control pendant. When the red operation complete light illuminates, the motor has finished connecting the stabs and the connect button should be released (refer to Figure 25).
5. To confirm a successful connect operation, visually inspect the position indicator window. If successful, it will show a connected electrical symbol with a red background (refer to Figure 26).
6. Uninstall the remote operator from the unit door per "Uninstalling the remote operator" on page 19.

Disconnecting the SIERS system

1. Verify that the unit being operated is in the CONNECTED position by examining the position indicator window and verifying that the power handle is in the OFF position. Install the remote operator per steps two through five of "Installing the remote operator for use."
2. While holding the pendant, press and hold the disconnect button (refer to Figure 27).
3. The yellow active light will illuminate indicating power is being delivered to the motor and it is operating (refer to Figure 24). Simultaneously, the remote operator will begin to operate the mechanism.

4. Watch the pendant. When the red operation complete light illuminates, the motor has finished disconnecting the stabs and the disconnect button should be released (refer to Figure 25).
5. To confirm a successful disconnect operation, visually inspect the position indicator window. If successful, it will show a disconnected electrical symbol with a green background (refer to Figure 17).
6. Uninstall the remote operator from the unit door per “Uninstalling the remote operator”.

Uninstalling the remote operator

1. With the remote operator fully secured to the door, disconnect the control pendant plug and ac power cord from the remote operator.
2. Support the weight of the remote operator. Then, push and twist the magnet handles on the left and right of the remote operator 180° counterclockwise to the OFF position to disconnect the magnets from the door.
3. With the magnets disconnected, pull the remote operator off the door and out of the mechanism drive socket. If the door has a cover plate, lower the cover plate so that it covers the mechanism drive socket.

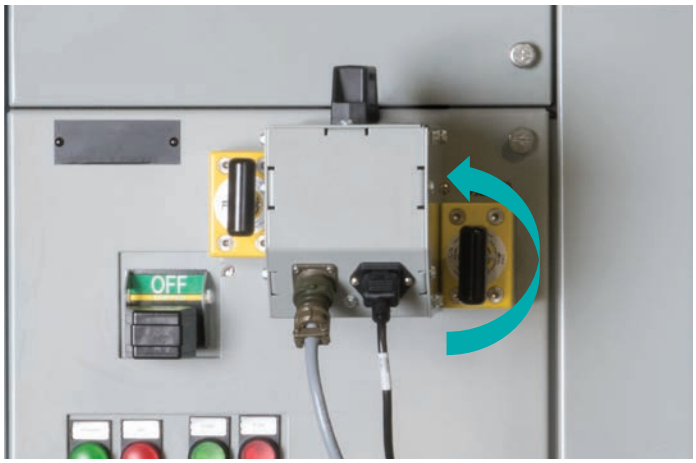


Figure 20: Rotate remote operator to adjust so that both magnets are on the door and lifting handle on top of the motor enclosure faces upwards

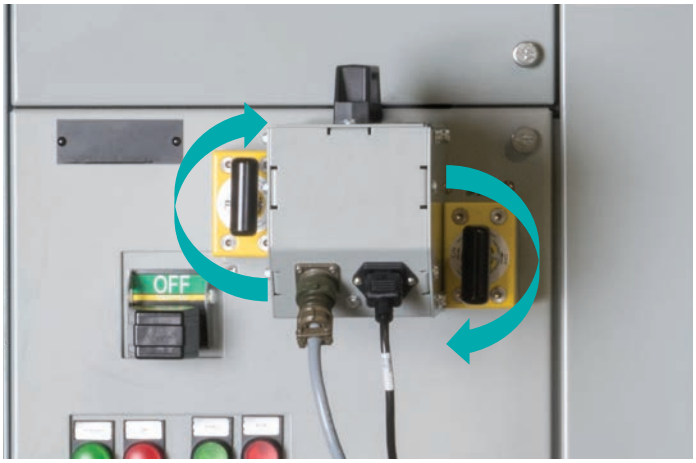


Figure 21: Push and twist magnet handles 180° clockwise to activate magnets and secure remote operator to door

Figure 22: Install pendant cable and power cord to remote operator

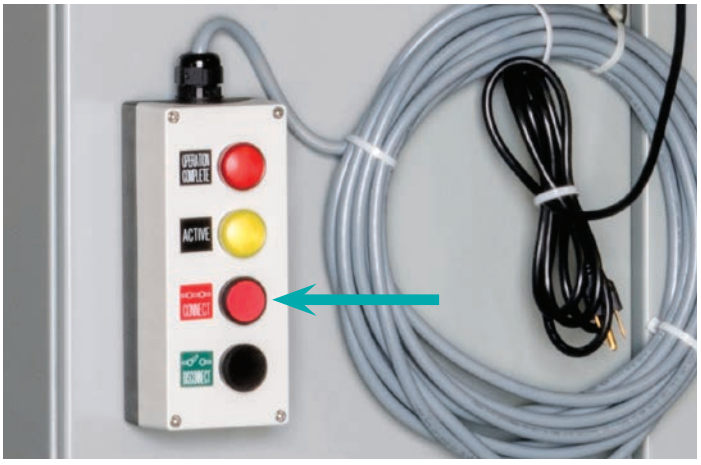


Figure 23: CONNECT button on pendant

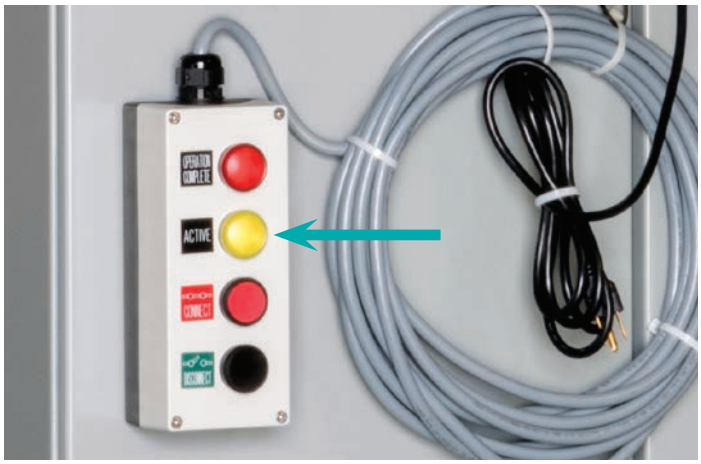


Figure 24: Active indicator light on pendant

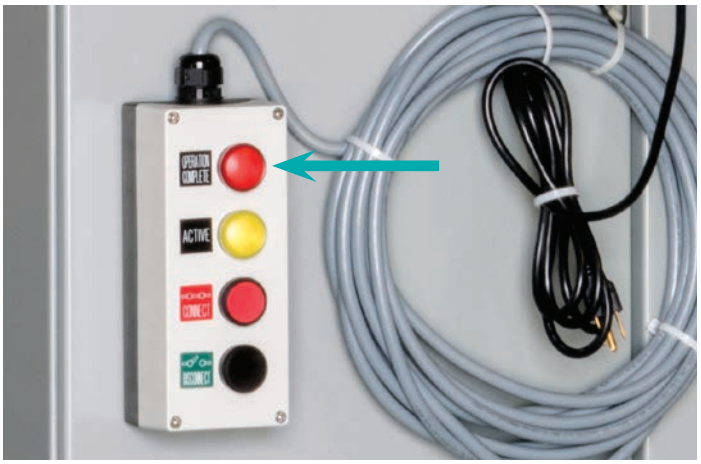


Figure 25: Operation complete indicator light on pendant

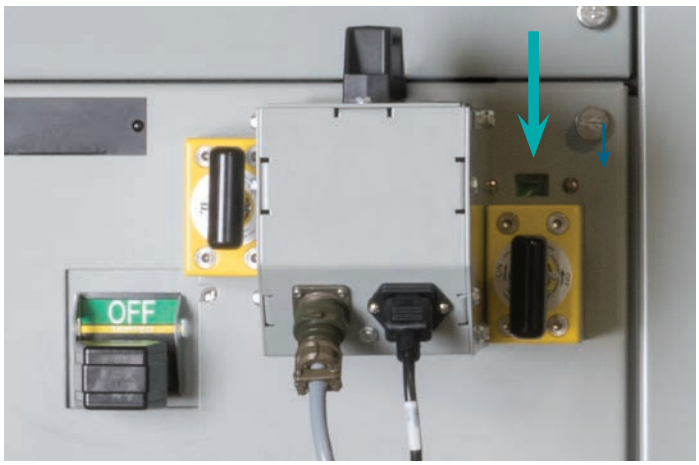


Figure 26: Position indicator window indicating DISCONNECTED position. If CONNECTED, this window will show red.

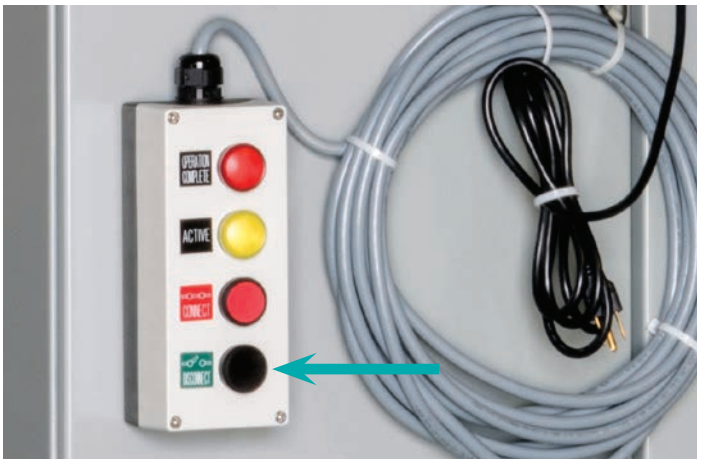


Figure 27: DISCONNECT button on pendant

Outgoing power and control wiring

1. Connect power and control wires for the unit with the unit stabs disengaged from the vertical bus.
2. Wiring between control units is pulled through the vertical wireway at the right side of the section. These wires can be fastened with the wireform wire ties provided. Route wiring to control units in other sections through the horizontal wireways.
3. When load cable conduit is in the bottom of a motor control center, additional room for pulling cable may be obtained by removing bottom plug-in units.

Handle operation and maintenance

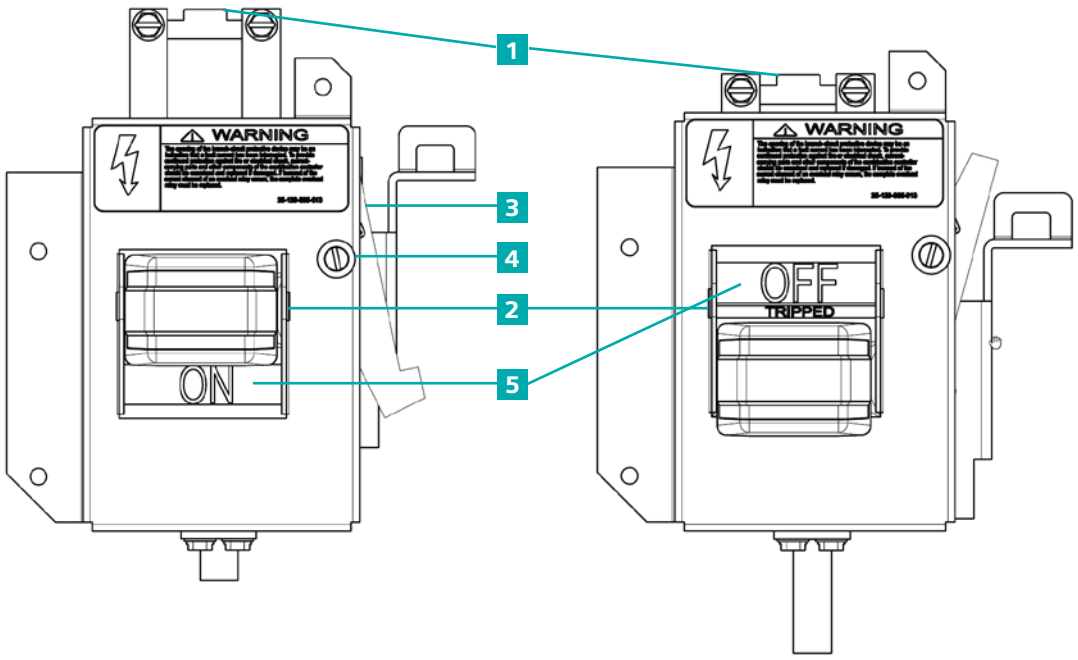
DANGER

Hazardous voltages and high-speed moving parts.

Will cause death, serious injury, or property damage.

Do not attempt to use excessive force or leverage to overpower any mechanical interlock systems. Malfunctions must be serviced by qualified personnel only.

Do not attempt to modify, override, or uninstall any mechanical interlock systems.



Item	Description
1	Mechanism-access interlock driver
2	Padlocking provision
3	Door interlock mechanism
4	Door interlock defeat system
5	Handle position indicator

Figure 28: Linear motion operator handle

Circuit breaker disconnect operator

The operator mechanism for units up to 125 A is mounted to the unit structure by three screws. The operator mechanism for larger units, up to 400 A, is mounted directly to the disconnect device with four screws. In both cases, the screws and then the handle can be removed in order to access the protective device. Figure 28 shows the 125 A disconnect operator. This and the larger operator extend through the door to allow the device to be safely operated with the door closed. The operator is provided with three mechanical safety features to perform the following functions:

1. Mechanism access interlock: The mechanism access interlock performs two functions. First, the interlock denies access to the drive socket when the handle is in the ON position. Second, when the handle is in the ON position, the access interlock extends into the structure of the section and locking the unit so that it may neither be inserted nor withdrawn.

2. Padlocking. The handle may be locked in the OFF position by installing one to four padlocks in the locations shown. With one or more padlocks installed, the handle is prevented from moving to the ON position by interference between the padlock and the handle.

3. Door-interlock mechanism: The door interlock prohibits closing or opening the control unit door except when the handle is in the OFF position. As the handle moves to the ON position, the interlock (refer to Figure 28, item 3), pivots behind the door-mounted bracket thus preventing opening of the control unit door.

   A provision is made for qualified persons to defeat the door interlock when the handle is in the ON position. This is accomplished by turning the defeater screw (Figure 28, item 4) counterclockwise approximately ⅛ turn until the door is released.

   To reclose the door, gently hold the door closed while turning the defeater screw counterclockwise until the door is felt to close against the structure frame. Release the defeater screw and secure the ¼ turn door fasteners. This safety interlock also serves to prevent inadvertent closing of the circuit breaker or disconnect switch when the door is open.

   Authorized personnel may defeat the interlock in this situation by pushing and holding the exposed upper portion of the interlock arm to the left. This releases the interlock so that the protective device may be turned on.

Adjustment notes

No field adjustment to the door-interlock mechanism should be necessary under normal operating conditions. However, should adjustment become necessary as a result of mechanical damage or wear, the following procedure is recommended.

1. With the circuit breaker or disconnect switch in the OFF position, the latching mechanism fully extended, and the unit door open, defeat the interlock by pushing the top of the lever (Figure 28, item 3) to the left and turn the circuit breaker on and off several times. If the circuit breaker or disconnect switch fails to turn on or if excessive operating resistance is experienced, turn circuit breaker or disconnect switch off. Withdraw the unit and inspect for misalignment of the operator extension(s) or the driver (Figure 28, item 1) and the racking-handle assembly. Make necessary adjustments to correct any misalignment.

2. With the plug-in unit reinstalled in the motor control center, close and secure door. Turn circuit breaker or disconnect switch on. If operating difficulty persists and circuit breaker or disconnect switch fails to turn on, open the door. Inspect the door- mounted portion of the interlock assembly for damage or distortion. Inspect the interlock lever (Figure 28, item 3) mounted on the right side of the operator for damage, freedom of movement, and its ability to rest firmly against the boss on the plastic handle without assistance. If damage or unusual wear are detected, all affected parts must be replaced.

If operating difficulty persists, unlatch the ¼ turn fasteners and open the door, then slowly close it observing the point of contact between the interlock lever on the operator (Figure 28, item 3) and the door-mounted portion of the interlock. The ramp on the J-shaped bracket mounted on the door should first engage the moveable interlock lever on the operator at a point approximately 1/16" below the top right corner of the interlock lever. If the point of engagement does not occur at this point, gently bend the pointed extension of the door-mounted portion up or down slightly to the proper position. Before making this adjustment, verify the plastic handle is centered in the door cut out when the door is closed.

Recommended tightening torques

When making bolted assemblies, the following considerations should be generally followed:

1. Metal-to-metal (refer to Table 1)
2. Follow torque requirements of individual components for motor/load connections.
3. Retractable stab operator assembly maximum torque. Do not apply more than 125 in-lb (14 Nm) of torque to the SIERS system drive socket.

Table 1: Metal-to-metal fastener torque values

Thread size	Torque (in-lb)	Thread size	Torque (in-lb)
8-32	20	5/16-18	100
10-32	27-32	3/8-16	247
1/4-20	75	1/2-13	613

Recommended maintenance

Inspect the motor control center a minimum of once each year, or more often as deemed necessary. Look for any moisture or signs of previous wetness or dripping inside the motor control center. Look for any accumulation of dust or dirt. Clean as explained in the periodic cleaning and inspection section.

Periodic maintenance and lubrication should include all the tasks shown in Table 2: Maintenance tasks. This list does not represent an exhaustive survey of maintenance steps necessary to verify safe operation of the equipment. Particular applications may require further procedures. Accumulation of dust and foreign materials such as coal dust, cement dust, or lamp black must be removed from the low-voltage motor control center and all surfaces must be wiped clean at regular intervals. Dust can collect moisture, causing voltage breakdown. Do not use compressed air as it will only redistribute contaminants on other surfaces.

Should further information be desired or should particular problems arise not covered sufficiently for the Purchaser's purposes, the matter should be referred to Siemens at +1 (800) 333-7421 or +1 (423) 262-5700 outside the U.S.

Table 2: Maintenance tasks

Maintenance tasks
1. Before any maintenance work is performed within primary compartments, make certain that the equipment is completely de-energized, tested, grounded, tagged or locked out and released for work in an authorized manner.
2. Periodic cleaning and inspection: A. Check general condition of the plug-in unit. B. Inspect unit interior for accumulation of dust, dirt, or any foreign matter. Control equipment parts should be cleaned by vacuuming or wiping with a dry cloth or soft brush. Use care to avoid damaging delicate parts. Liquid cleaners, including spray cleaners, are not recommended due to the possibility of residues C. Check terminal block contacts for loose connections. D. Examine all safety interlocks for proper operation. E. Maintain other equipment in the unit in accordance with the respective instruction manual requirements. F. Lubricate mechanisms and other moving components.
3. Stab fingers and vertical bus A. Look for wear of the tin plating where the unit stab fingers engage the vertical bus. The plating is part of the environmental protection system. Oxide and/or other films can form on exposed bus resulting in a poor contact. B. Lubricate stab connection points with an approved lubricant. These parts must be replaced when the plating is worn to the point where copper can be seen because contact resistance becomes higher, increasing the heat generated at the contact point.

Pre-operation checks

Additional resources:

- Low-voltage motor control centers installation guide
- Unit-support assembly guides.

Before energizing and operating the motor control center, perform the following checks:

1. Operate all magnetic devices by hand to be sure that all parts operate freely. Check all interlocks for proper contact operation.
2. Current transformers for customer remote devices are shipped with their secondaries shorted out. Verify all such shunts are removed when the metering circuits are completed.
3. Verify that each motor is connected with the proper starter.
4. Check the overload setting or overload heater element against the full-load current shown on the nameplate of each motor.
5. Check all heater elements to verify they are properly installed.
6. Check all timers for proper time-interval setting and contact operations.
7. If instantaneous trip circuit breakers are used, adjust as follows:

   7a. Determine motor full-load current from the motor nameplate data. Use screwdriver to set indicator on adjustment screw to the appropriate position.

   7b. For maximum protection, the TRIP position should be set as low as possible. Turn the adjustment screw counterclockwise to successively lower positions until the circuit breaker trips on motor starting.
   After this position is determined, turn the adjustment screw clockwise to the next higher setting for normal operation. If the circuit breaker does not trip at the lowest setting, leave the indicator at this setting.

   7c. If tripping occurs at highest setting; re-check motor nameplate information, then check voltage and load with peak reading ammeter to locate problem.

8. If fusible disconnect type starters are used, check for proper fuse size. Fuse size should not exceed 150 percent FLA for RK5 and 300 percent FLA for Type J.
9. Clean the motor control center and verify that all extraneous material has been removed.
10. Check the torque value of each connection. Factory connections may loosen during shipment storage. It is of utmost importance to inspect all connections and bolted joints for tightness prior to energizing the equipment. Follow torque requirements of individual components for motor/load connections.
11. Close all access plates and doors before the motor control center is energized.
12. Jog motors to determine proper rotation.

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Siemens Industry, Inc.
7000 Siemens Road
Wendell, North Carolina 27591
United States of America

Telephone: +1 (800) 347-6659
www.usa.siemens.com/mcc

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