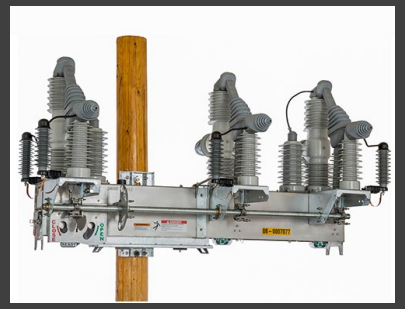
EVERSOURCE ENERGY



Common Device Guide

Cooper Nova Recloser

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common operations.

- The manufacturer's instructions and/or Eversource Engineering Specifications/Work Methods for the device that is to be operated are to be reviewed for specific information.

- All Appropriate Personal Protective Equipment (PPE) identified in the Eversource Safety Manual and Work Rules shall be complied with.

- Rev 1, 01/11/2024
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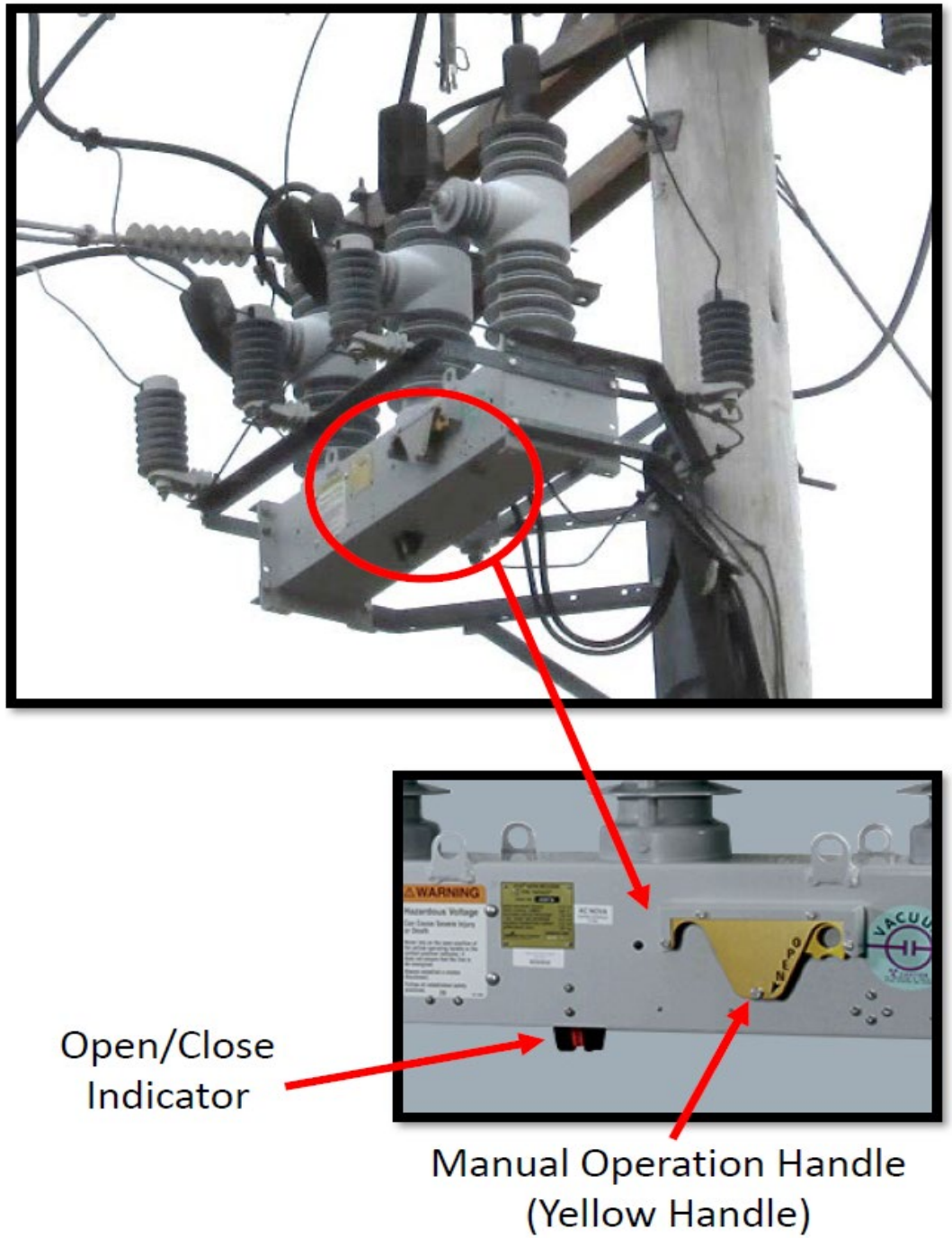
Recloser Description

- To manually open the recloser, pull down on the yellow lock out handle on the front side of the steel base.
  - When the yellow operating handle is pulled down, the recloser is locked out and is mechanically disabled; this means any method of closing will not work until the handle is pushed back up in normal position.
  - Pushing the yellow operating handle to the CLOSE position will not close the recloser; it will only enable the recloser to be operated by the control.
- OPEN/CLOSE (green/red) is indicated either by:
  - The control's front panel display
  - The visual indicator located on the bottom of the base
- The most common controls used with this recloser is the Cooper Form 6 and SEL 351R. Older versions of the Cooper Form Control (3A & 4C) are still on the system.
- Although Cooper NOVA Recloser unit has gone through 2 redesigns, the manual operation of the unit remains the same. The differences between the designs consist mostly of size of the mounting frame and animal guard protection.



Cooper NOVA Recloser

S&C IntelliRupter

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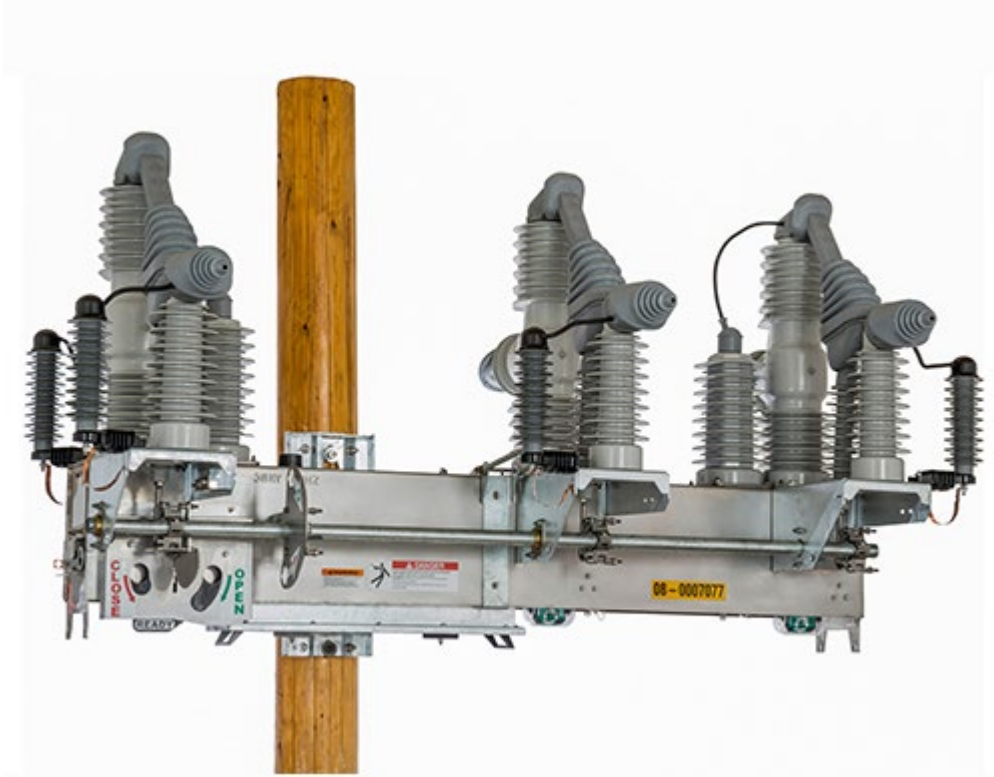
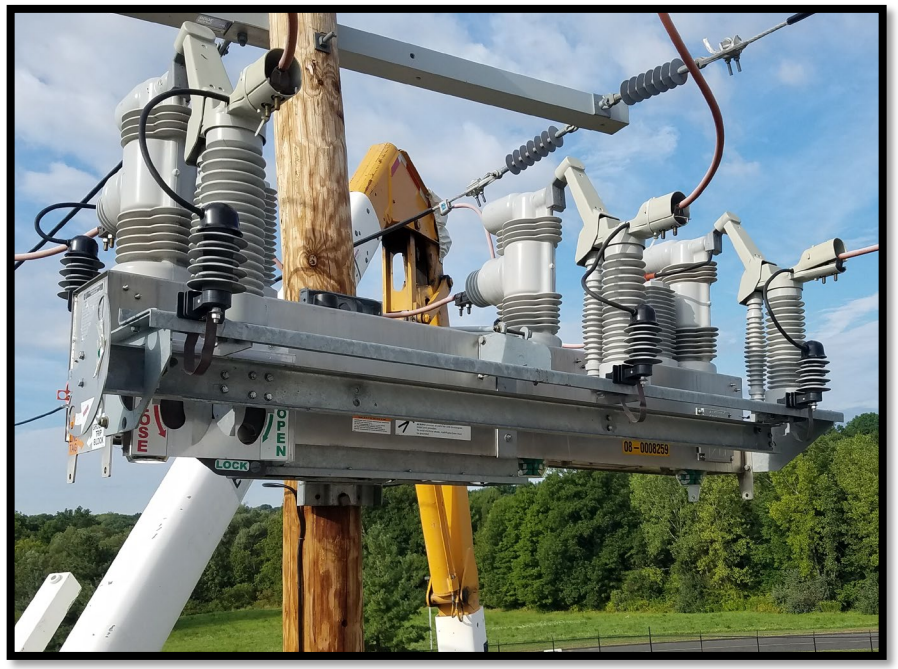
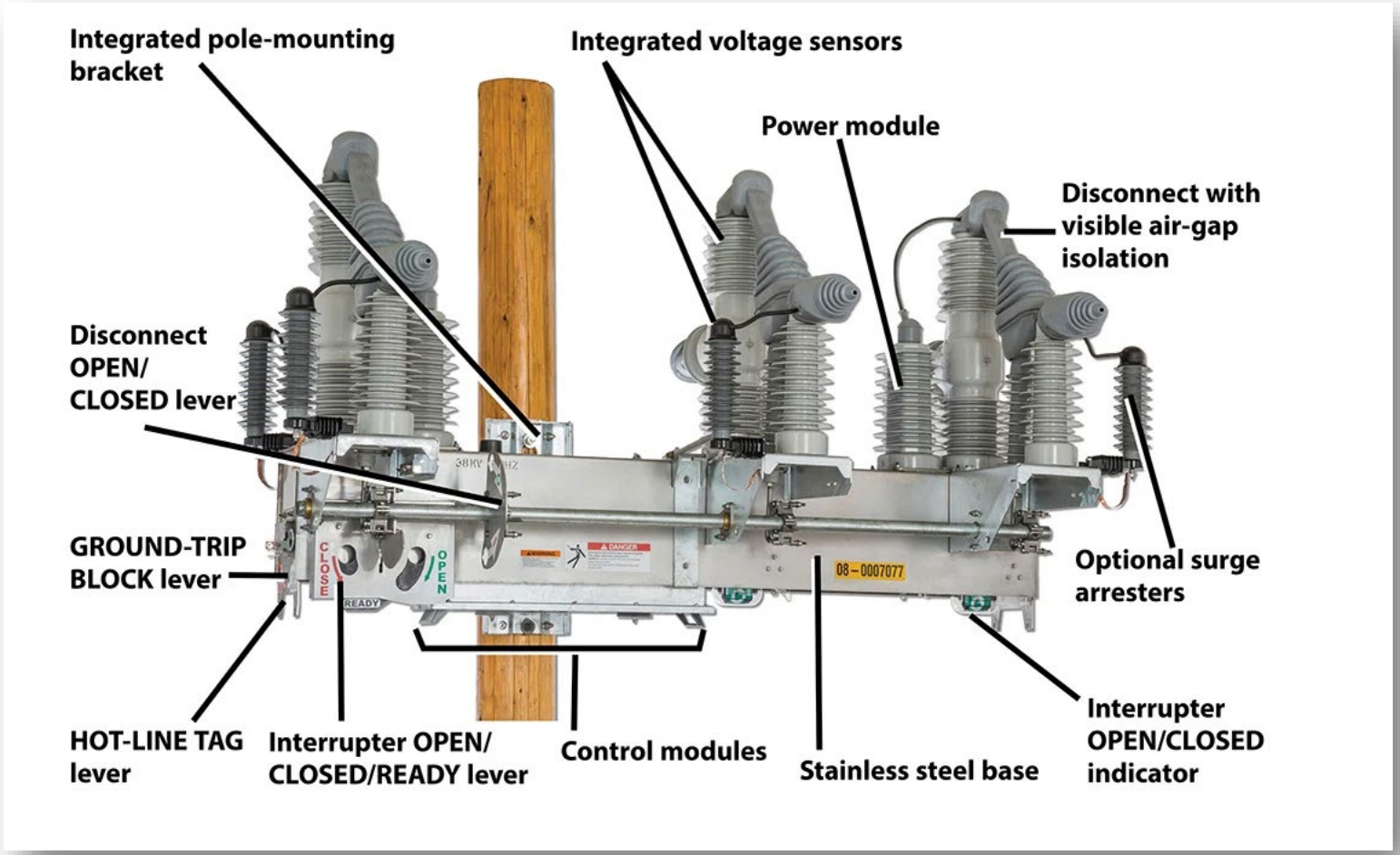


S&C IntelliRupter

- The S&C IntelliRupter is programmed as a three-phase Gang-Operated Recloser.
- It does not have a standard control box at the bottom of the pole; all controls are housed in the base of the unit.
- All manual field operations must be done with a hotstick.

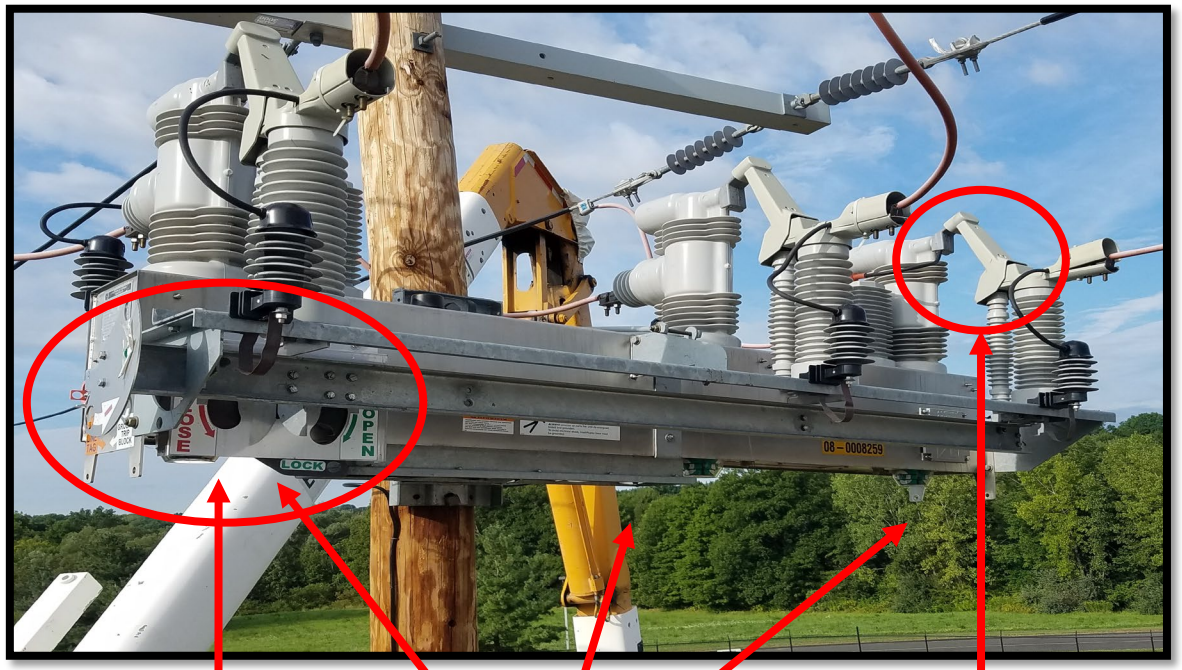




S&C IntelliRupter

- The IntelliRupter is used to protect overhead distribution lines from overcurrent.
- The IntelliRupter has reclose capabilities. It sends a low current pulse down the line to determine if the fault has cleared.
- The IntelliRupter uses vacuum interrupters to break current (nominal/fault). The interrupters are encased in solid dielectric.
- The IntelliRupter has a control module that plugs into the bottom of the unit.
- The source bushings and the load bushings are the same size.
- Integrated disconnect switches can be opened to provide a visible open; they can only be opened if the interrupters are open.

S&C IntelliRupter



Manual Operations here

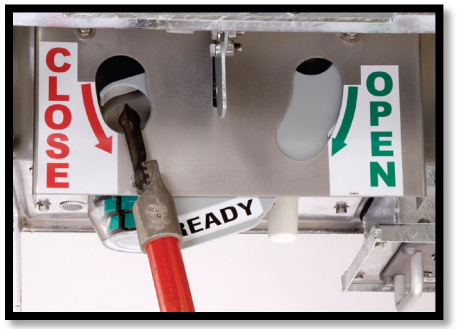
Disconnects provide a visual open

Indicators

OPEN/CLOSE/READY Lever

In the Ready state, OPEN & CLOSE are in the up position and the READY tab is visible.

To open, insert the hotstick into the OPEN lever and pull down; the LOCK tab appears. Closing is blocked in this position.



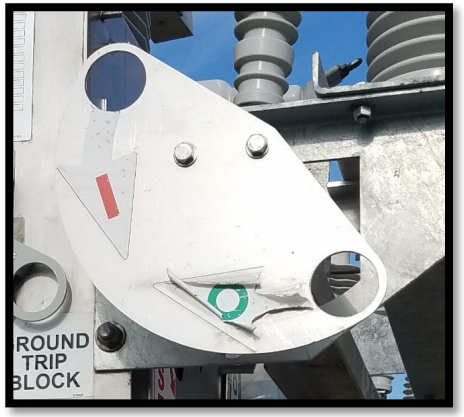
To close, push the OPEN lever up to the READY position; pull the CLOSE lever down and release. The CLOSE lever will return to the up position and the unit will close.

S&C IntelliRupter

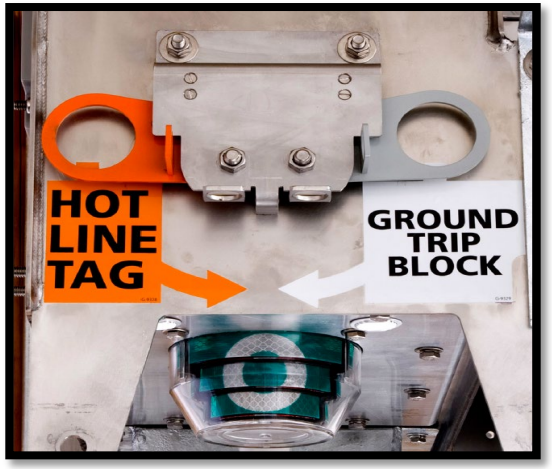
The Disconnects are shown here in the closed position.

To open/close the disconnects, the interrupters must be in the Lock OPEN position as indicated on page 4 by the OPEN/CLOSE/READY lever.

To Open the disconnects, insert the hotstick at the Green 0 opening and pull downward.
To Close the disconnects, insert the hot stick at the Red I and pull downward



Hot Line Tag



To enable Hot Line Tag, insert hotstick in the orange ring and pull downward to the vertical position.

At the base of the recloser, the Hot Line Tag amber light will flash every 2 seconds.
To disable Hot Line Tag, push the orange ring back to it's original position. The amber light will stop flashing.

Device Capabilities

- This device will provide visible opening capabilities.
- This device is able to break load. Refer to the manufacturer's instruction for specific capabilities.
- Follow the ESOP 100 Link to get the most up to date Switching and tagging info.

Cooper Triple Single

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common operations.

- The manufacturer's instructions and/or Eversource Engineering Specifications/Work Methods for the device that is to be operated are to be reviewed for specific information.

- All Appropriate Personal Protective Equipment (PPE) identified in the Eversource Safety Manual and Work Rules shall be complied with.

- Rev 1, 02/19/2021
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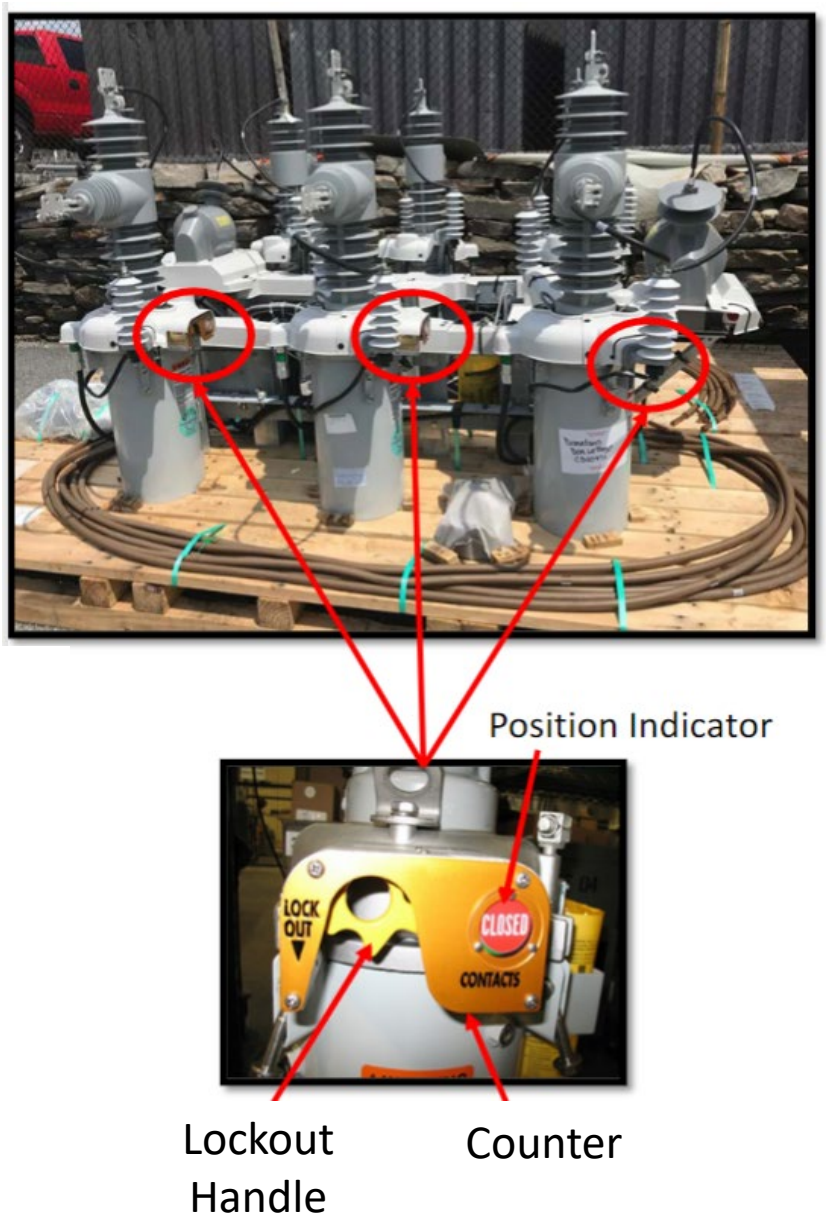
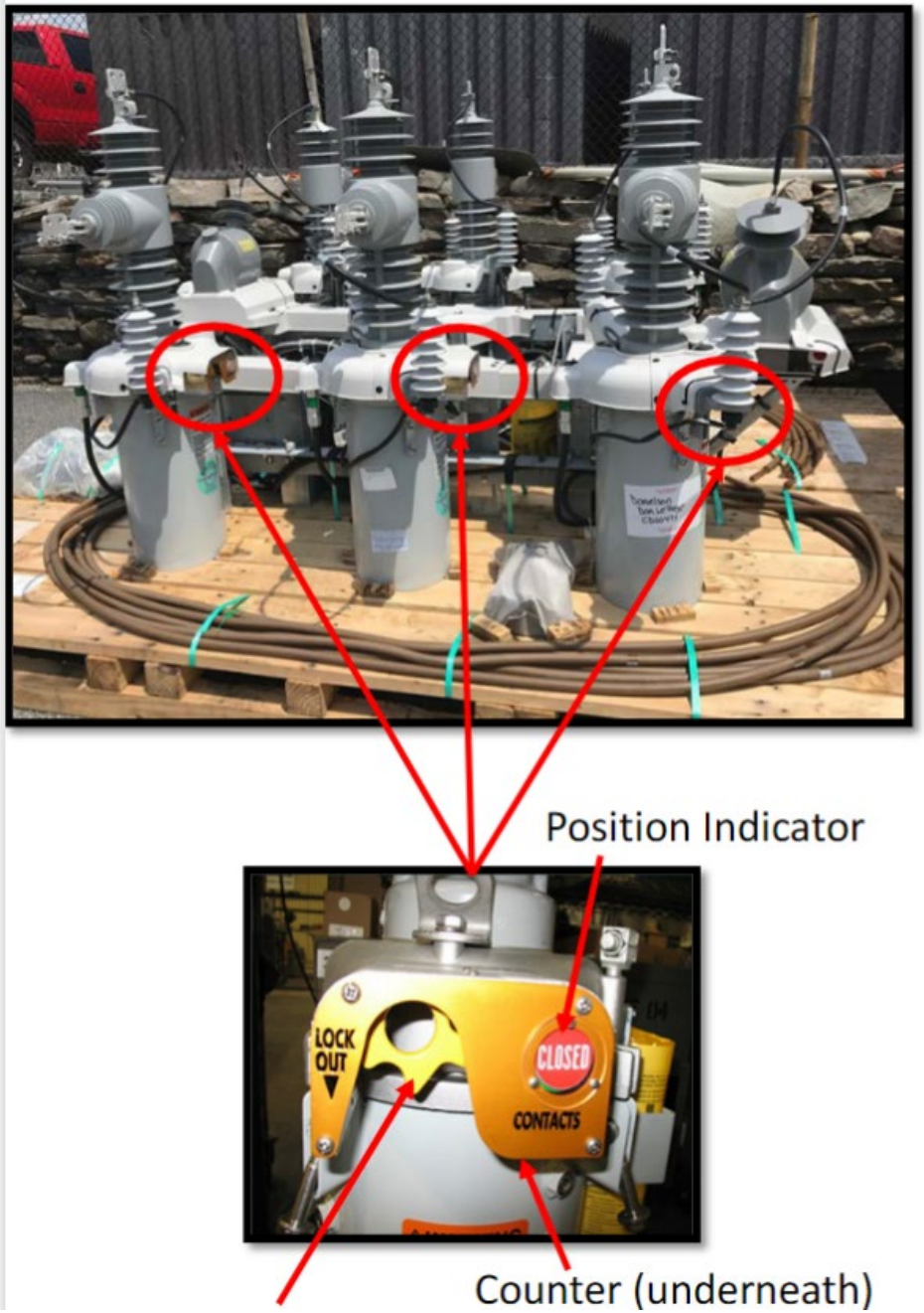
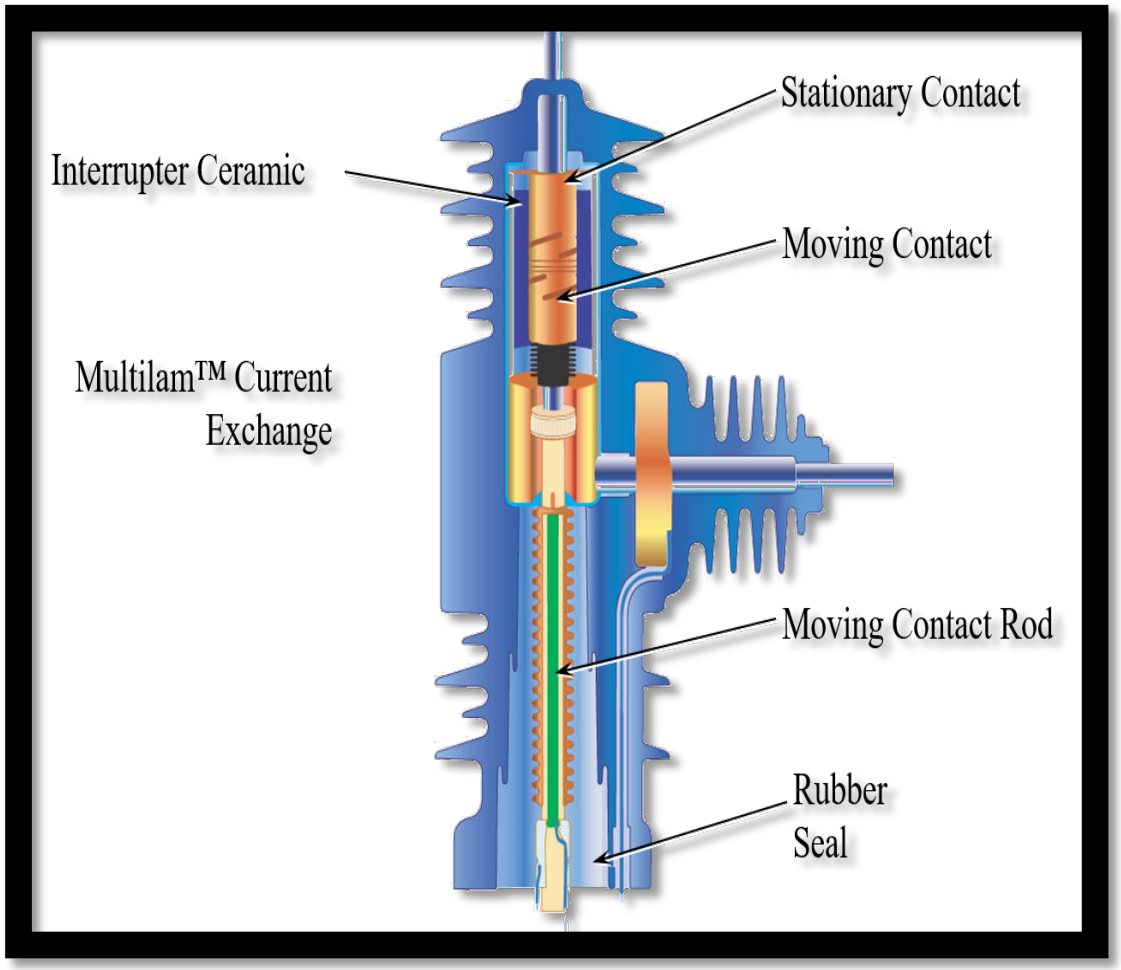


Cooper Triple-Single Recloser

- When manually opening the recloser, note that each recloser unit has their own (yellow) lock out handle. Only the unit with the handle pulled down to the OPEN position will lock out. The other two units will not be affected, and their yellow operating handles will remain in the CLOSE position.
- Pushing the yellow operating handle to the CLOSE position will not close the recloser; it will only enable the (individual) recloser to be operated by the control. All close operations are initiated by the Form 6-TS control.
- OPEN/CLOSE is indicated either by:
  - The Triple-Single control's front panel display,
  - The visual indicator on each recloser unit, located on the outboard side of the sleet hood



Cooper Triple-Single Recloser



Device Capabilities

- This device does not provide visible opening capabilities.
- This device is able to break load. Refer to the manufacturer's instruction for specific capabilities.
- Need to achieve visible break for clearance through the use of other work practices.
- Follow the ESOP 100 Link to get the most up to date Switching and tagging info.

Thomas & Betts Triple-Single Recloser

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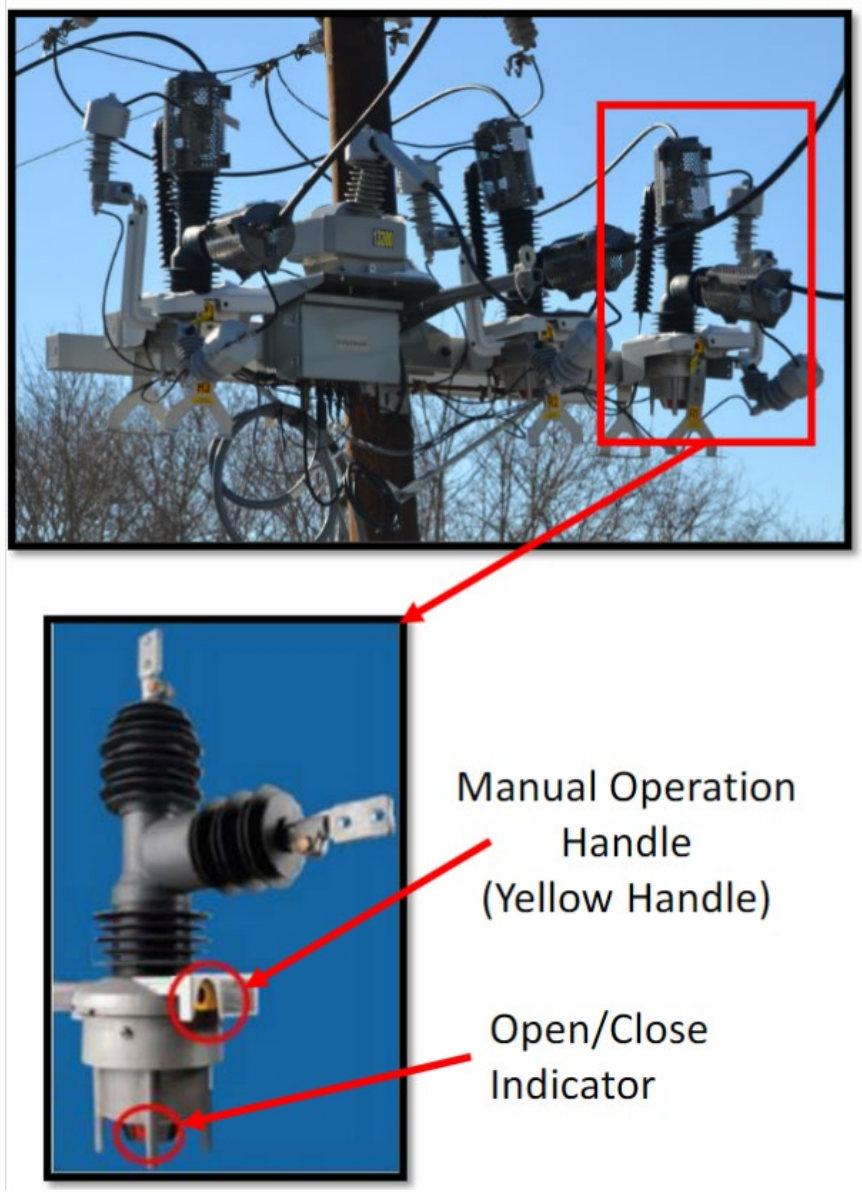

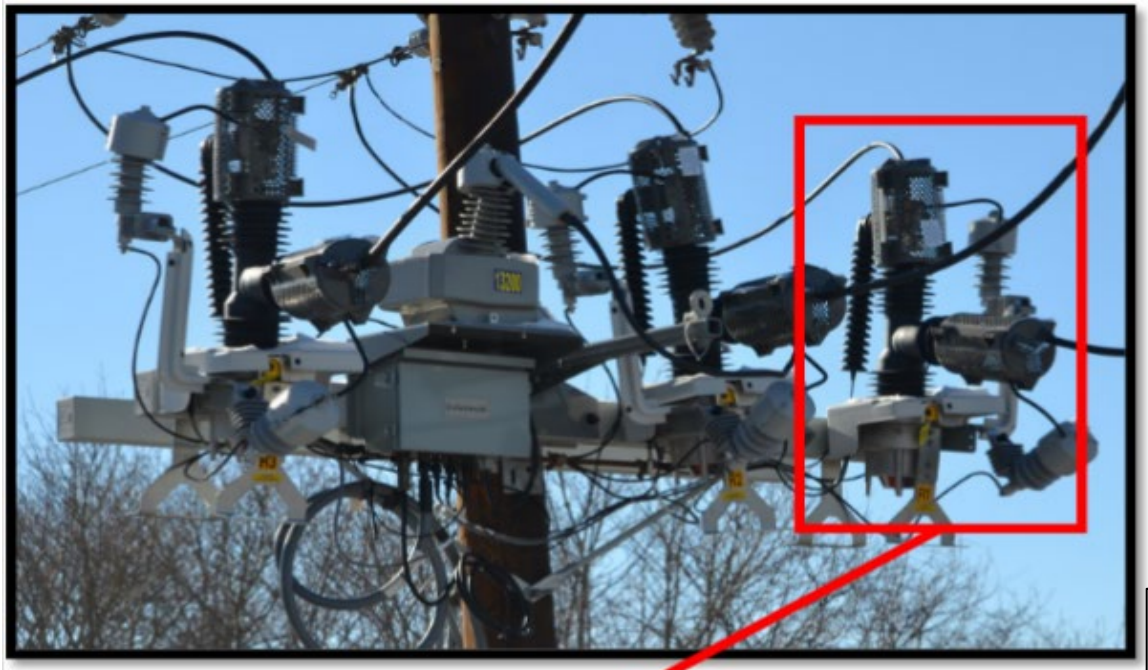

- Each recloser unit has its own (yellow) lock out handle. Only the unit with the handle pulled down to the OPEN position will lock out. The other two units will not be affected, and their yellow operating handles will remain in the CLOSE position.
- Pushing the yellow operating handle to the CLOSE position will not close the recloser; it will only enable the (individual) recloser to be operated by the control. All close operations are initiated by the SEL 651R Control.
- OPEN/CLOSE is indicated either by:
  - The control's front panel display,
  - The visual indicator on each recloser unit, located on the outboard side of the sleet hood

Device Capabilities

- This device does not provide visible opening capabilities.
- This device is able to break load. Refer to the manufacturer's instruction for specific capabilities.
- Need to achieve visible break for clearance through the use of other work practices.
- Follow the ESOP 100 Link to get the most up to date Switching and tagging info.

Siemens Triple-Single Recloser

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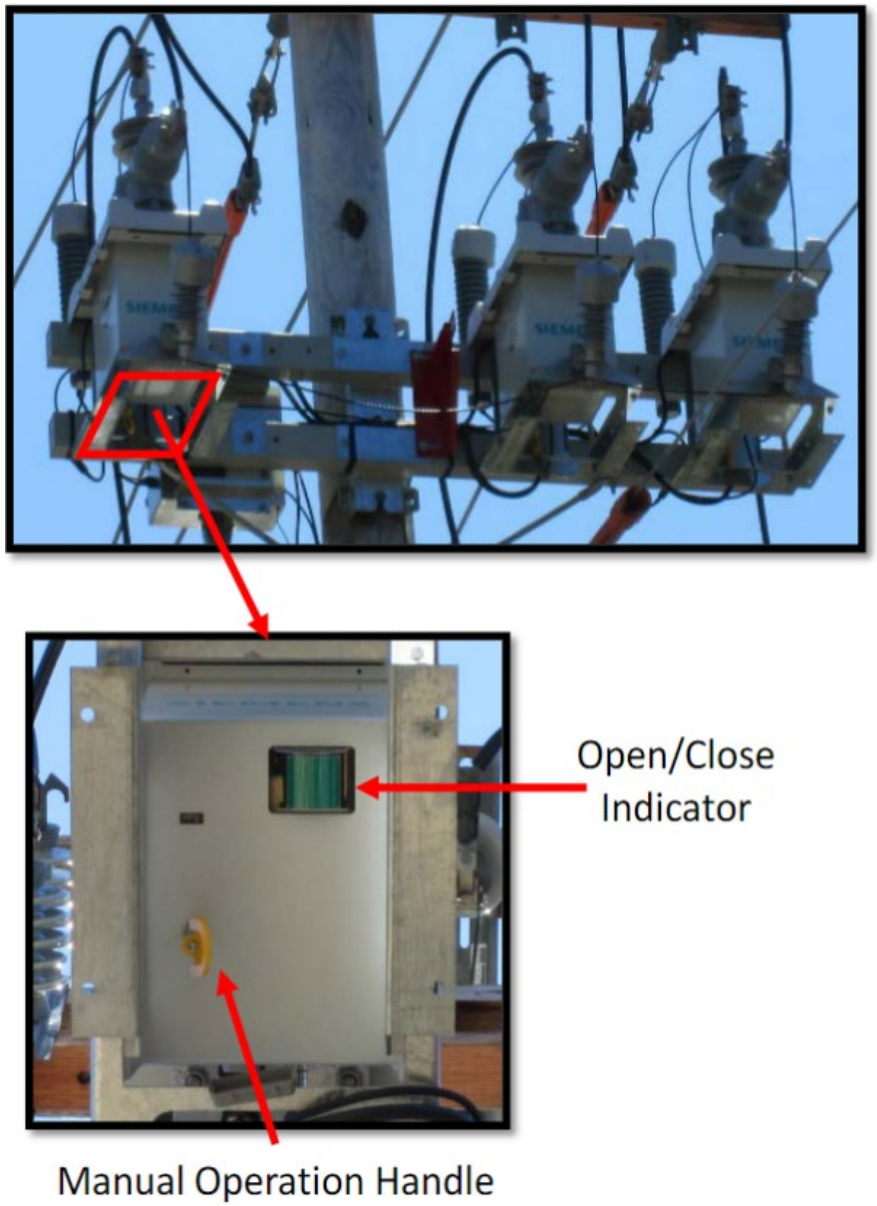
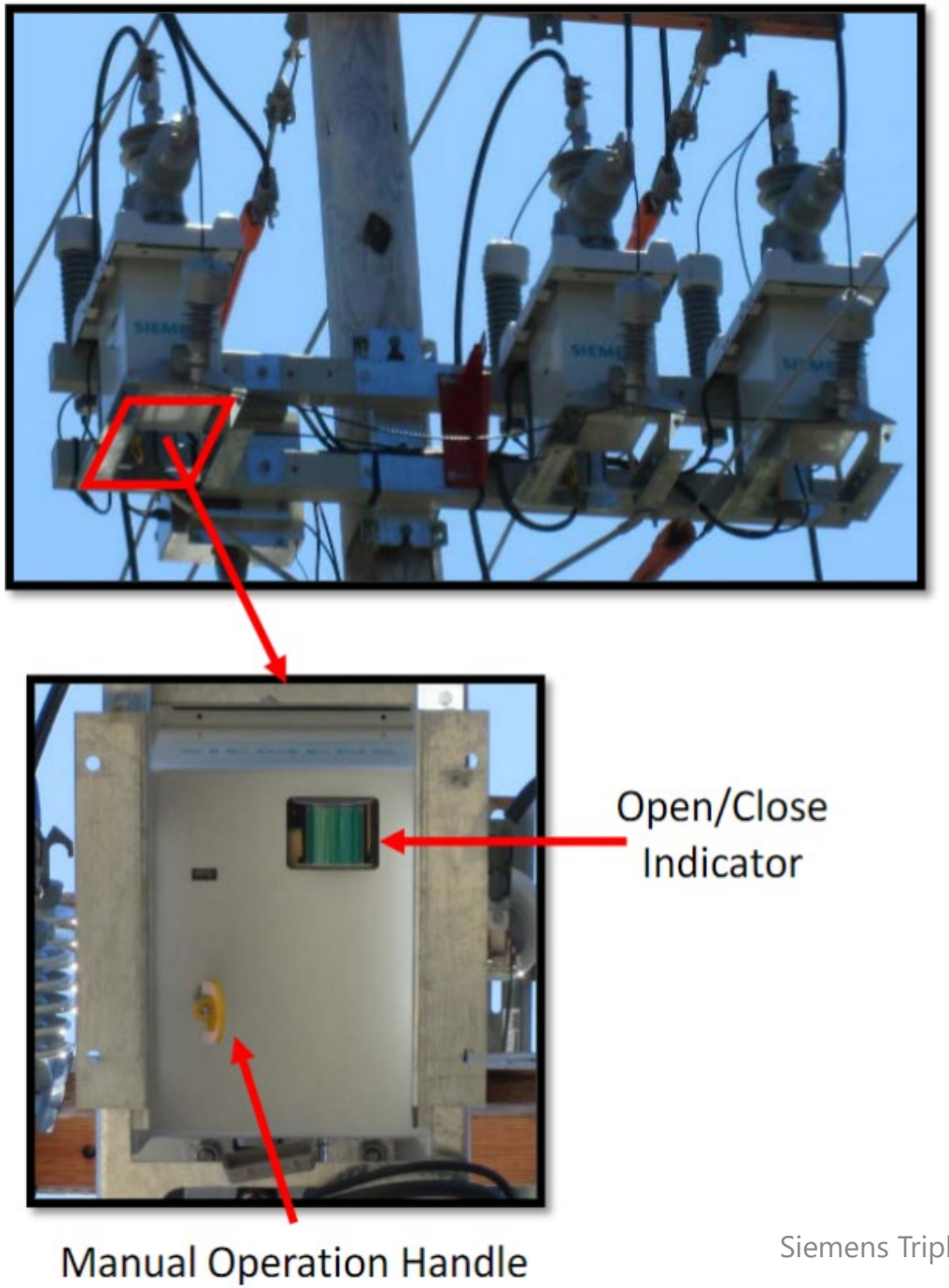


Siemens Triple-Single Recloser



- Each recloser unit has its own (yellow) lock out handle. Only the unit with the handle pulled down to the OPEN position will lock out. The other two units will not be affected, and their yellow operating handles will remain in the CLOSE position.
- Pushing the yellow operating handle to the CLOSE position will not close the recloser; it will only enable the (individual) recloser to be operated by the control. All close operations are initiated by the SEL 651R Control.
- OPEN/CLOSE is indicated either by:
  - The control's front panel display,
  - The visual indicator on each recloser unit, located on the outboard side of the sleet hood

G&W Viper Recloser

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common operations.

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- Rev 1, 06/03/2021
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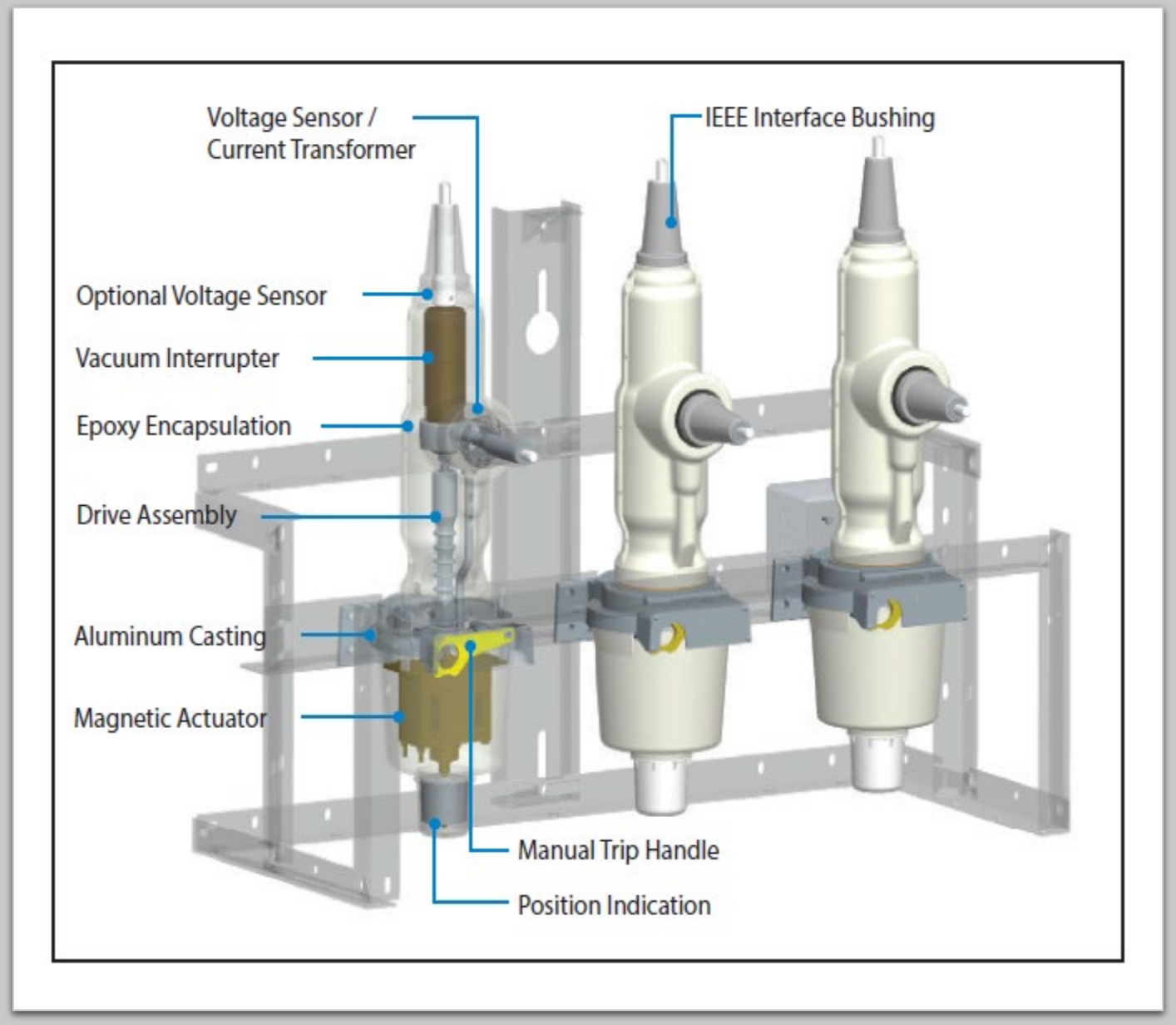
EVERSOURCE

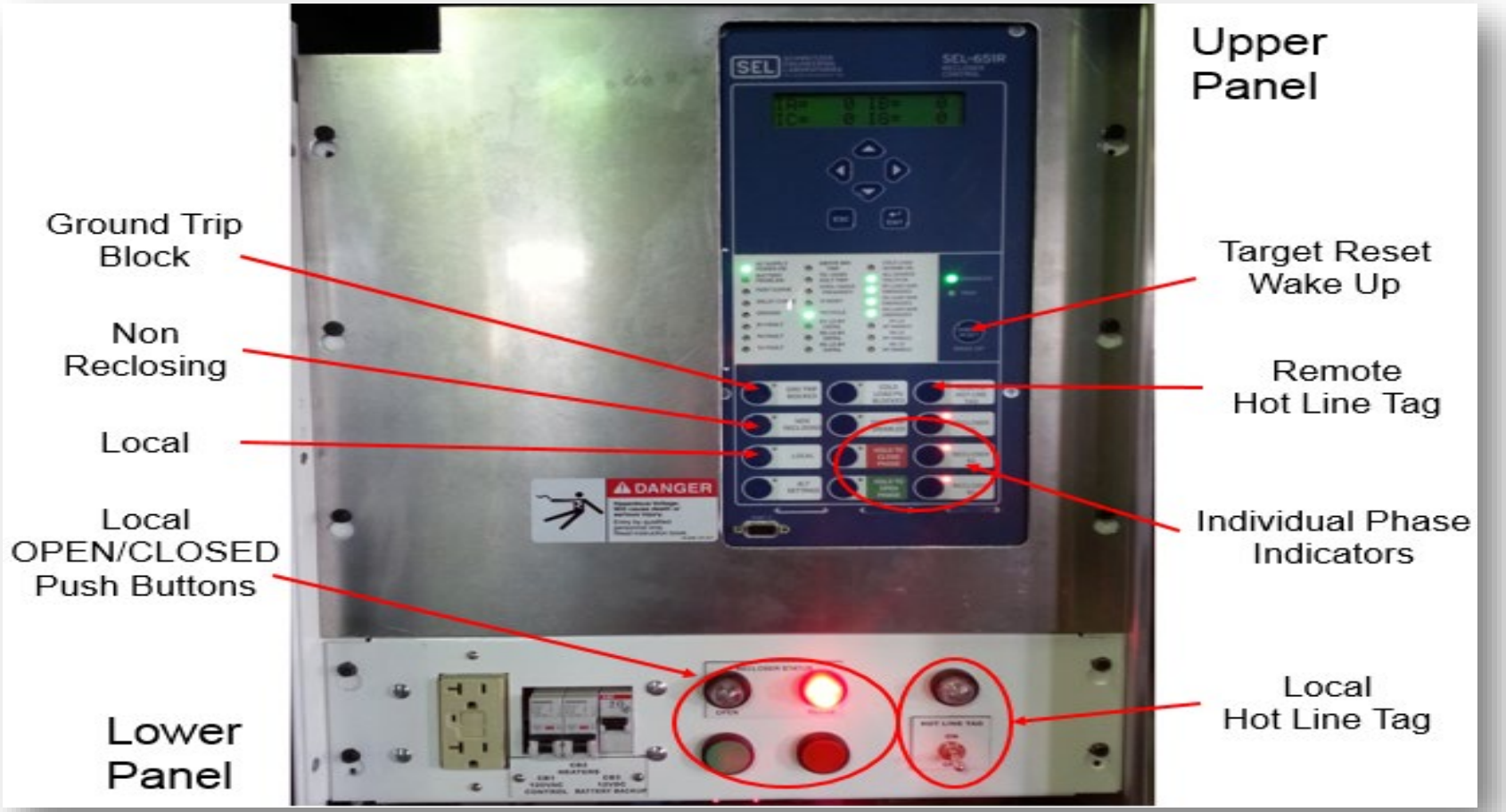
Recloser Description

- The Viper-ST is an independent pole operated (IPO) recloser which uses electronically controlled, vacuum fault interrupters to make a solid-dielectric insulated device.
- Viper-ST can come in various configurations such as center pole mounted, alley arm pole mounted, cluster pole mounted, substation mounted.
- The vacuum interrupter and all other energized parts are sealed within solid-dielectric insulation. The body of the modules are fully grounded to provide a dead-tank construction.
- The IPO feature offers three distinct mechanical operating modes.
  - 1 phase trip / 1 phase lockout
  - 1 phase trip / 3 phase lockout
  - 3 phase trip / 3 phase lockout
- The Viper-ST provides overcurrent protection for systems through 38kV maximum, 800A continuous current and 16kA symmetrical interrupting up to 27kV and 12.5kA symmetrical interrupting at 38kV.
- A hookstick operable, manual trip and lockout handle prohibits operation from either the control or remotely.
- A mechanical blocking device further assures against accidental close.
- An open and closed contact indicator verifies contact position. Contact status and lockout condition can also be verified at the control.
- The Viper-ST works directly with the SEL-651R control panel.



G&W Viper Recloser

SEL 651R



Any LED that is illuminated in the “Status and Trip Target” Display or “Operator Controls” Pushbutton Panel means that status point or function is enabled.

SEL 651R

- **To Open & Close the Recloser:**
  - Confirm that the yellow manual operating handle is in the UP position on the recloser.
    - If any of the three units are mechanically locked out, with the yellow handle down, the control box will not be able to close those units in
  - **Gang Opening/Closing:** Located on the lower panel there are two push buttons, one red and one green, and two corresponding bulb lights.
    - To open on three phases, press the green push button and the corresponding green light will illuminate.
    - To Close on three phases, press the red push button and the corresponding red light will illuminate.
    - Verify the desired operation with the OPEN/CLOSE indicators on the recloser unit.
  - **Individual Opening/Closing:** The SEL 651R Control has the capability to operate individual phases. This can be done by using the "HOLD TO CLOSE PHASE" and "HOLD TO OPEN PHASE" in conjunction with the three "RECLOSER R#" pushbuttons.
  - To operate an individual phase, press and hold the desired operation's "HOLD TO.." pushbutton and press the recloser phase to be operated.
  - Each "RECLOSER R#" pushbutton has a status LED that will illuminate green when open, red when closed.

G&W Viper Recloser

- **Enable/Disable Hotline tag:**
  - Move the Hotline Tag toggle switch, located on the lower panel, to the ON position to enable and OFF to disable.
  - When bulb above the toggle switch is illuminated it is indicating Hot Line Tag is active.
  - When active, this function enables a one-shot, fast-trip operation.
- **Enable/Disable Local/Remote (Supervisory):**
  - Press the "LOCAL" pushbutton located in the middle left of the pushbutton panel; Verify the "LOCAL" LED is illuminated.
  - When active, this function will block all remote commands via radio to the control. Repeat steps to disable.
  - Hotline Tag can be activated remotely via Distribution Supervisory Control And Data Acquisition (DSCADA). If activated, the "REMOTE HOTLINE TAG" LED on the top right of the pushbutton panel will illuminate.
  - Note that the method Hotline Tag is applied is the only way it can be removed.
- **Enable/Disable Non-Reclosing:**
  - Press the "NON-RECLOSING" pushbutton located in the top left of the pushbutton panel; Verify the "NON-RECLOSING" LED is illuminated.
  - When active, this function enables the one-shot operation. Repeat steps to disable.

Manual Operating

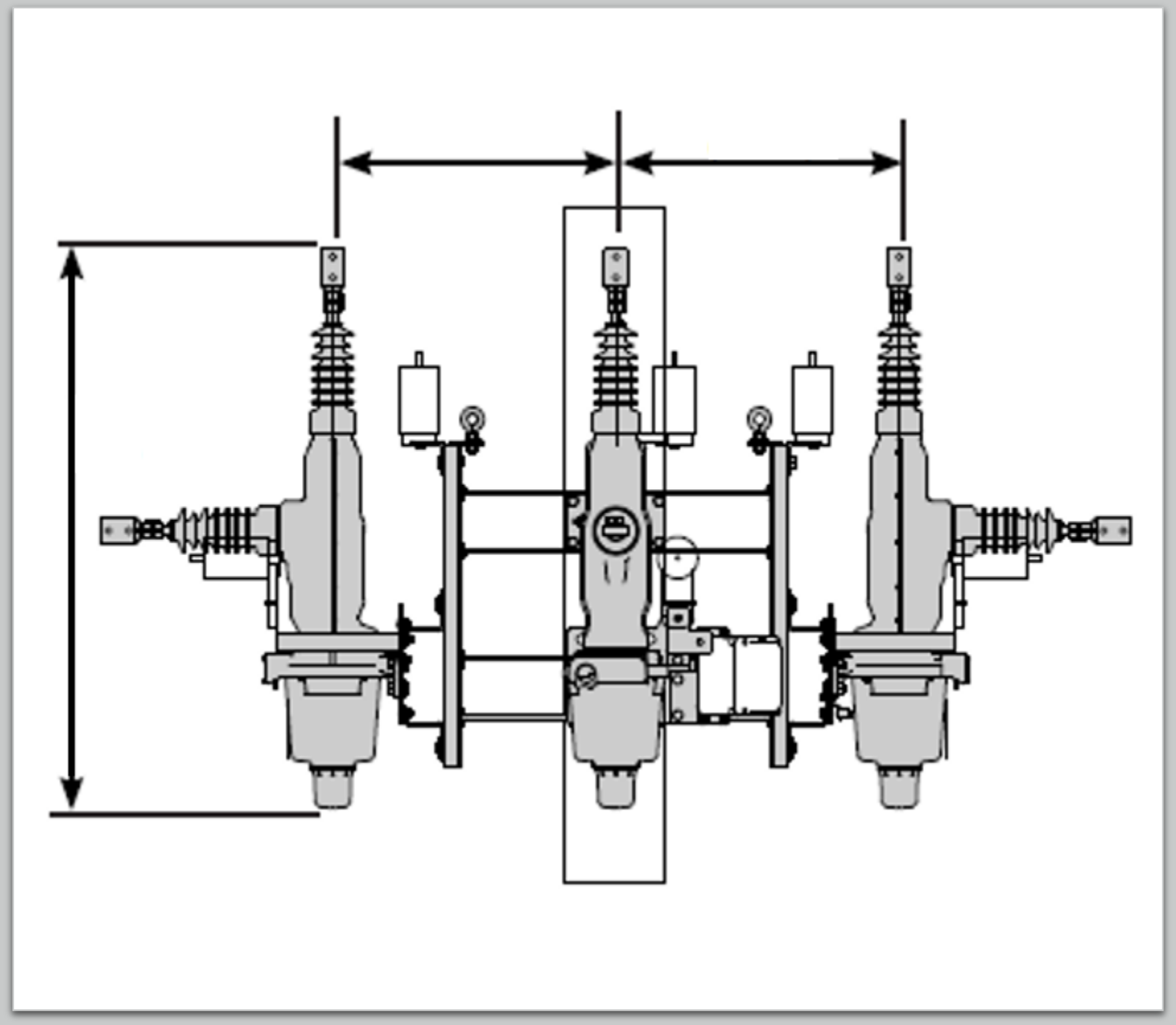
Manual Trip Operation

- Operation of the hookstick operable manual trip handle trips and locks out the recloser.
- Pulling the handle down trips and locks out the selected phase.
- A contact position indicator is provided, indicating open or closed status of the contacts for each phase.
- Module contact status is also displayed at the control.
- Operation of the manual trip handle disables any local or remote closing operation until the handle is reset. A mechanical blocking device further assures against accidental close.
- The handle is operable from ground level.
- Once reset, the recloser can be closed using the control.

G&W Viper Recloser

Device Capabilities

- This device does not provide visible opening capabilities.
- This device is an interruptible device capable of breaking fault current. Refer to the manufacturer's instruction for specific capabilities.
- Need to achieve visible break for clearance through the use of other work practices.
- Follow the ESOP 100 Link to get the most up to date Switching and tagging info.



G&W Viper Recloser

Single Phase Hydraulic Recloser (E, H, L)

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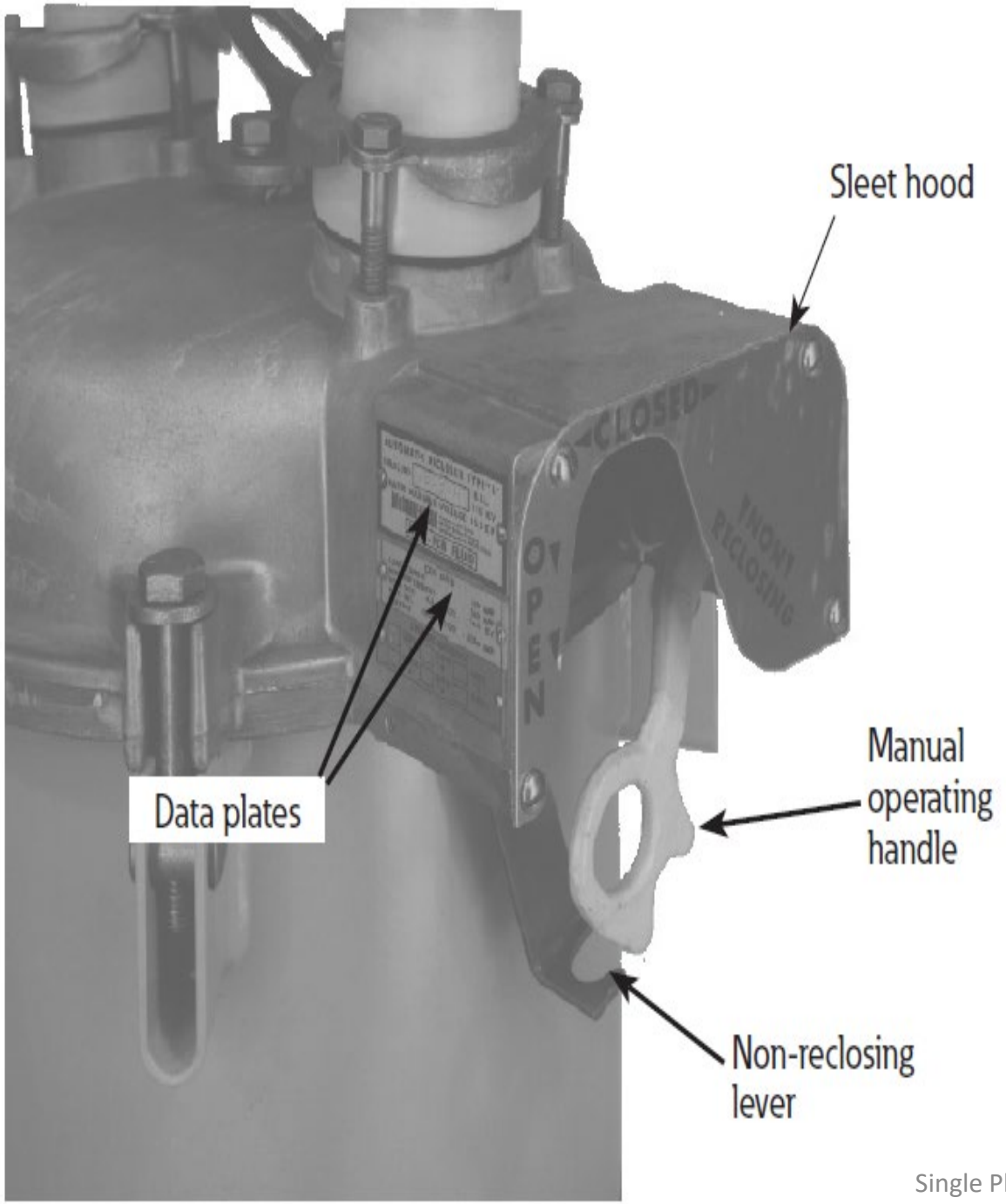
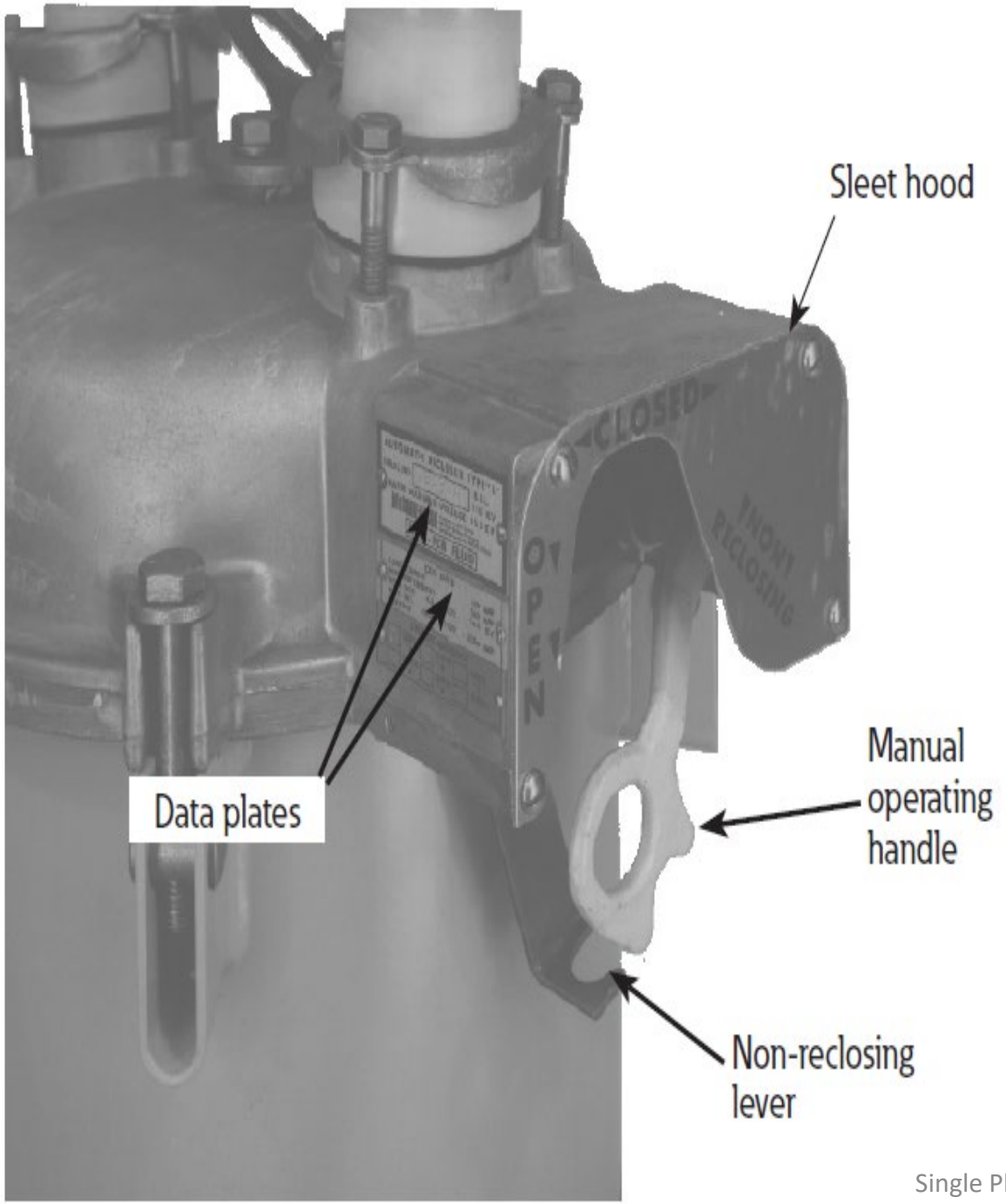


- Protect overhead distribution circuits from overcurrent.
- Can be configured to reclose up to four times before locking out. The speed of tripping can be configured to multiple time current curves.
- Configuration changes are done mechanically within the unit.
- Not tethered to a separate control box.
- Single phase devices.
- Normally used on radial lines.
- Filled with oil.
- Connected in series with load current.

Single Phase Hydraulic Recloser



Reclosers in the E, H, and L groups (see cover photo) are self-contained, hydraulically controlled devices that sense and interrupt fault currents on single-phase lines of an electrical power distribution system. If the fault is temporary, the recloser automatically recloses and restores service. If the fault is permanent, the recloser locks open after one to four operations, depending upon its setting.

Data Plates

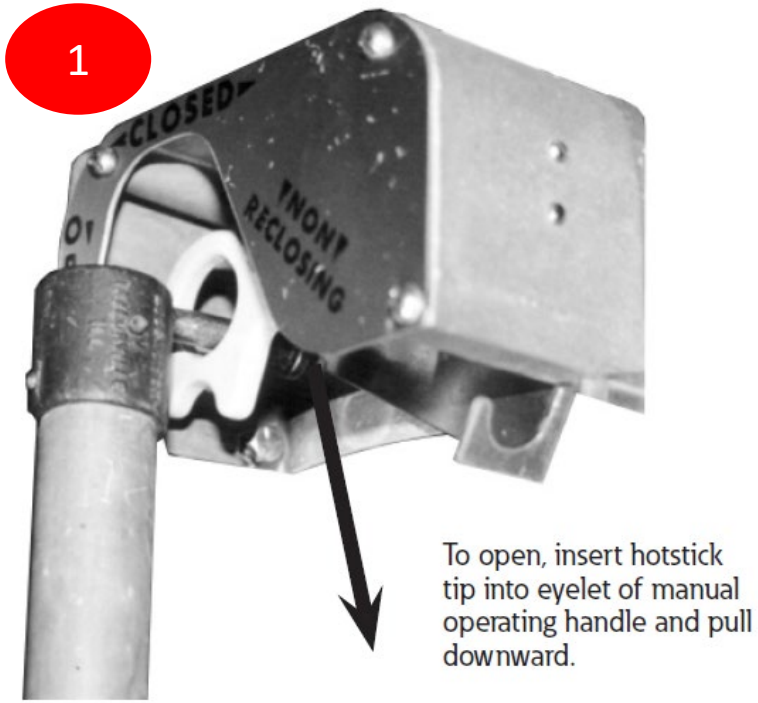
- The recloser data plates, located on the sleet hood, provide ratings information: product type and serial number, nominal operating voltage, maximum-interrupting current, trip coil rating, operating sequence, and number of operations to lockout.

Operations Counter

- A four-digit mechanical counter, which records all trip operations, is located under the sleet hood.

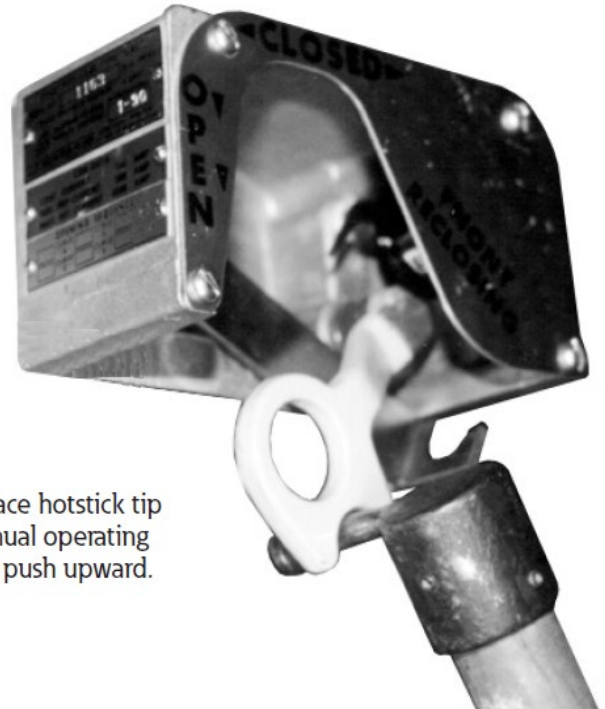
Single Phase Hydraulic Recloser

1



To open, insert hotstick tip into eyelet of manual operating handle and pull downward.

2



To close, place hotstick tip against manual operating handle and push upward.

Manual Operating Handle

- The manual operating handle (yellow handle) permits manual opening and closing of an energized recloser.
- It is not to be used as a substitute for a visible disconnect during line work.

Opening

- Pulling down the handle trips and locks open the main contacts of the recloser. Place the hotstick hook into the eyelet of the manual operating handle and pull downward.
- The correct placement of the hotstick to open the recloser is shown in Figure 1.

Closing

- Lifting up the handle closes the main contacts. The handle is operated with a hotstick.
- The correct placement of the hotstick to open the recloser is shown in Figure 2.

Non-Reclosing Lever

- The non-reclosing lever provides the recloser with the capability of locking out on the first trip operation for added safety during downline, hot-line work. This lever is also hotstick operated.

Device Capabilities

- This device does not provide visible opening capabilities.
- This device is an interruptible device capable of breaking fault current. Refer to the manufacturer's instruction for specific capabilities.
- Need to achieve visible break for clearance through the use of other work practices.
- Follow the ESOP 100 Link to get the most up to date Switching and tagging info.

Cooper Padmount Recloser

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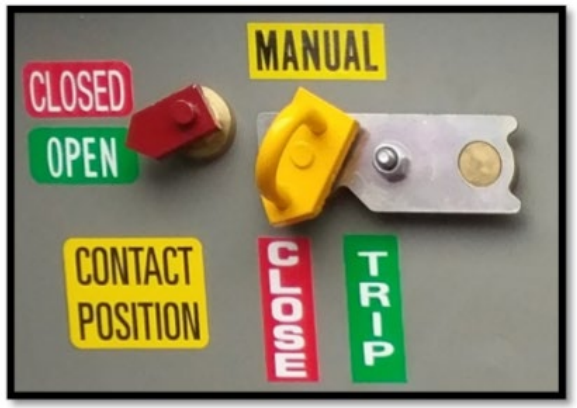
- Rev 1, 02/19/2021
  - Contact ESOP.100@eversource.com for document comments

Manual Operation

Cooper Padmount Recloser

- This red lever is not operable; it only indicates the current state of the recloser (OPEN/CLOSED).
- The yellow handle is operated with a hot stick by turning it clockwise/counter-clockwise to either the CLOSED or TRIP position.
  - TRIP position will open the recloser and mechanically disable the unit from any CLOSE operation. While in this position the recloser can not be closed.
  - The CLOSE position will not close the recloser; it will only enable the recloser to be operated. All close operations are initiated by the Form 6 control.



Cooper Padmount Recloser

- The Padmount Recloser will have a minimum of 3 elbow-voltage sensors installed on bushings. (always on source side)
- A voltage sensor elbow has characteristics of a 200 Amp loadbreak elbow. Install the voltage sensor elbow and operate it as you would a 200 Amp loadbreak elbow.
- Note that each sensor is grounded. (green wire).

- The Padmount recloser has a PT installed on the source side of the switch they be required to be shut off when doing troubleshooting.
- The black cap is removable and the back side of it is a keyed hex head that will fit over operable hex bolt used to OPEN and CLOSE the PT.

S&C SCADA-MATE

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common operations.

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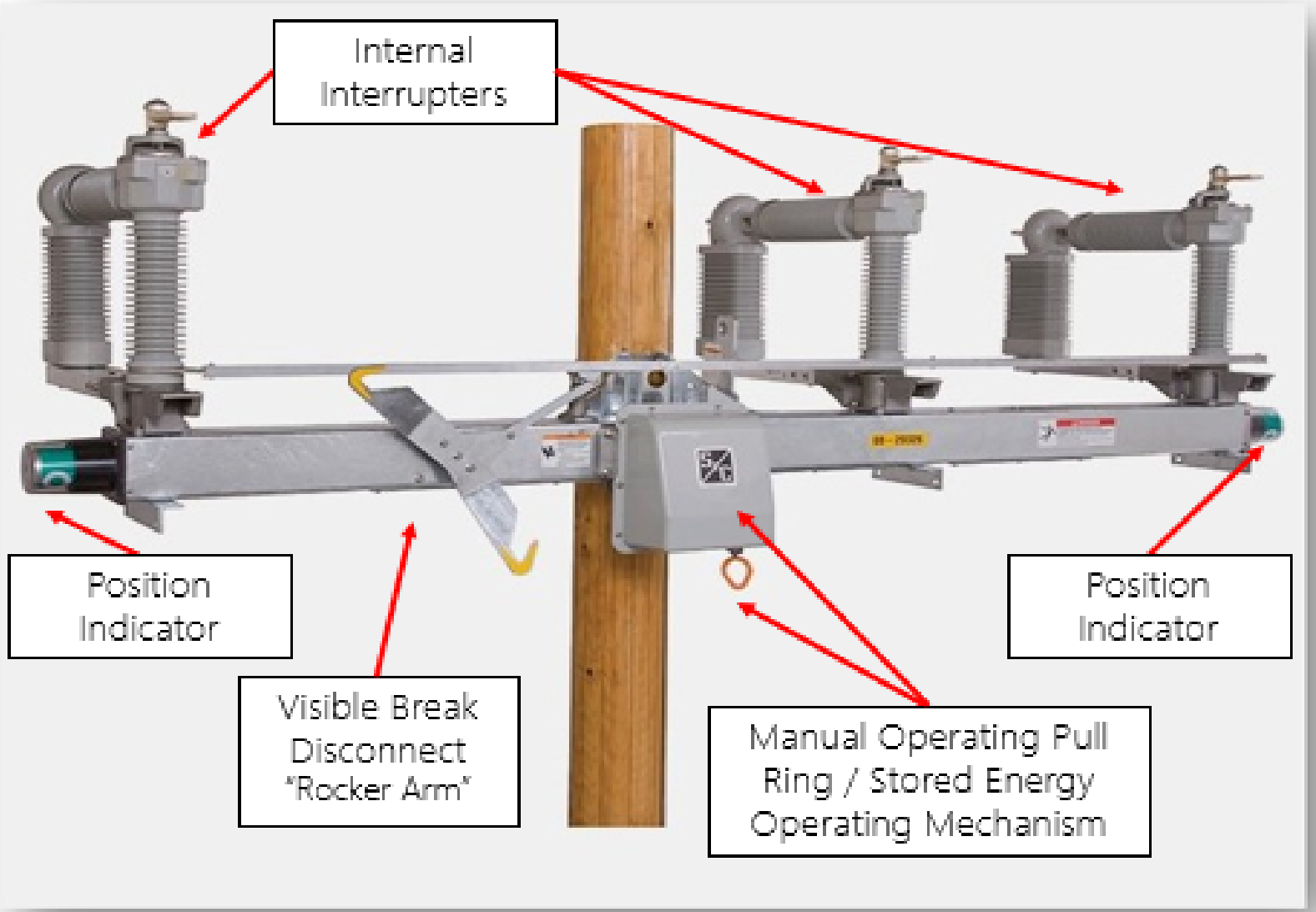
- Rev 1, 02/19/2021
  - Contact ESOP.100@eversource.com for document comments

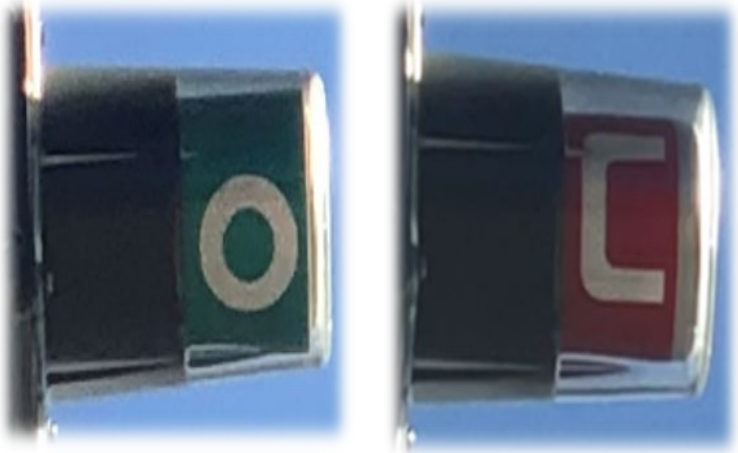
SCADA-MATE Switch Device Components



Position Indicator:

Green O – switch is open

Red C – switch is closed



SCADA-MATE Switch

There are three ways to operate the SCADA-MATE interrupters.

1. Interrupters can be operated via Distribution Supervisory Control And Data Acquisition (DSCADA) from a local Control Center if the local control box is in the “Remote” control position.
2. Interrupters can be operated locally via the control box in the field if the local control box is in the “Local” control position.
3. Interrupters can be operated locally (manually) via the pull-ring.

To open the SCADA-MATE Interrupters electrically from the local control box:

- In the local control box, press the Scada Control Remote/Local change button to “LOCAL”.
- Press and hold the “Open” pushbutton until the LED is illuminated
- The “Local” & “OPEN” LED on the display will illuminate
- Verify the interrupters are open by viewing the Open/Closed Indicator is in the “GREEN O” position

To close the SCADA-MATE Interrupters electrically from the local control box:

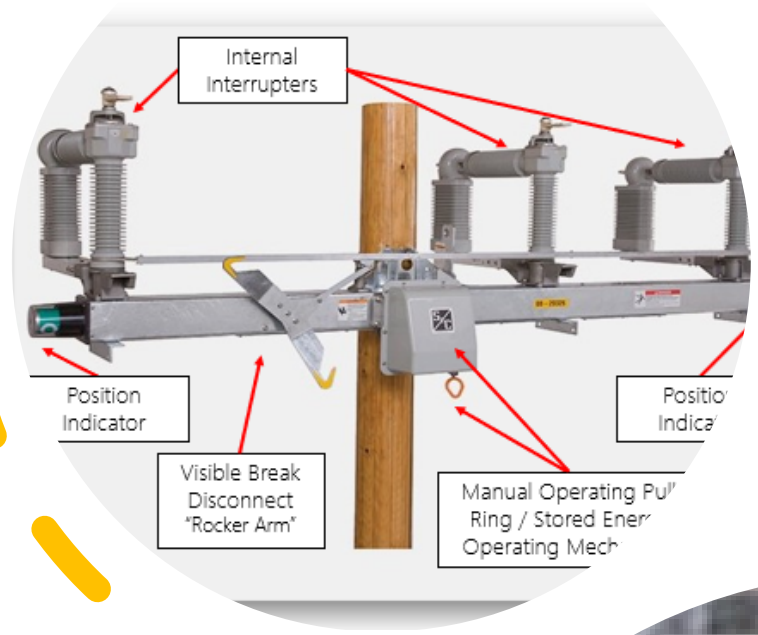
- In the local control box, check that the Scada Control Remote/Local button is set to “LOCAL”.
- Press and hold the “Close” pushbutton until the LED is illuminated
- Verify the interrupters are open by viewing the Open/Closed Indicator is in the “RED C” position
- Press the Scada Control Remote/Local Change button to “REMOTE” (as required by Control Center)
- If Visible Break Disconnect “Rocker Arm” is in the “Open” position, you will not be able to close the vacuum interrupters.

SCADA-MATE Switch

- The SCADA-MATE Interrupters can be operated locally (manually) via the pull-ring.

Pull-Ring:

- Make sure the switch is in the “LOCAL” position.
- Use the switch stick to pull the pull-ring down to its full extension and let the pull-ring return to its normal position.
- Repeat this until the switch changes to the desired position.
- This will take from 1 to 9 pulls depending on the charge the operating spring has.
- Operating the pull ring can open or close the device depending on current position.
- If the “Rocker Arm” is in the open position, the pull ring will not close the device electrically.



SCADA-MATE Switch

The Visible Break Disconnect “Rocker Arm” provides the ability to give the device a visible break. Once the “Rocker Arm” is opened, you can insert a Lockout Pin “eye-bolt” to lock the arm in the open position.

Opening Rocker Arm (Visible Break Disconnect):

- Using a switch stick, pull down on the visible break disconnect handle. The disconnects will open and pivot. Be sure to pull the handle all the way down.
  - If vacuum indicators show “closed”, you will not be able to “open” the Visible Break Disconnects via the Rocker Arm.
- Install Lockout pin after disconnects are fully opened.
- Tags may be installed after pin is installed.

Closing Rocker Arm (Visible Break Disconnect):

- After receiving authorization to remove any tags, remove the Lockout pin before trying to close the disconnects. Using a switch stick, pull down on the visible break disconnect handle. The disconnects will pivot and close. Be sure to pull the handle all the way down.
- Closing the disconnects will not close the interrupter contacts. You must close the interrupter contacts manually, using the switch control or via Scada.

Device Capabilities

- This device will provide visible opening capabilities.
- This device is able to break load. Refer to the manufacturer's instruction for specific capabilities.
- Follow the ESOP 100 Link to get the most up to date Switching and tagging info.

S&C SCADA-MATE CX

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common operations.

- The manufacturer's instructions and/or Eversource Engineering Specifications/Work Methods for the device that is to be operated are to be reviewed for specific information.

- All Appropriate Personal Protective Equipment (PPE) identified in the Eversource Safety Manual and Work Rules shall be complied with.

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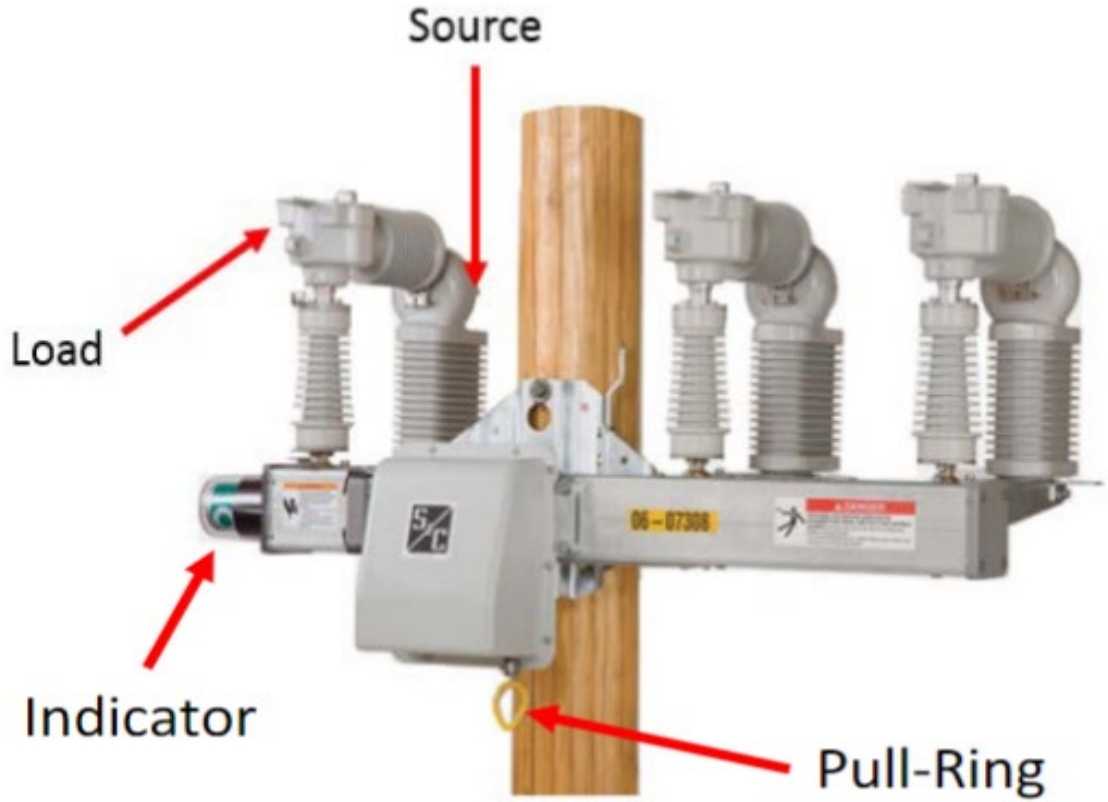
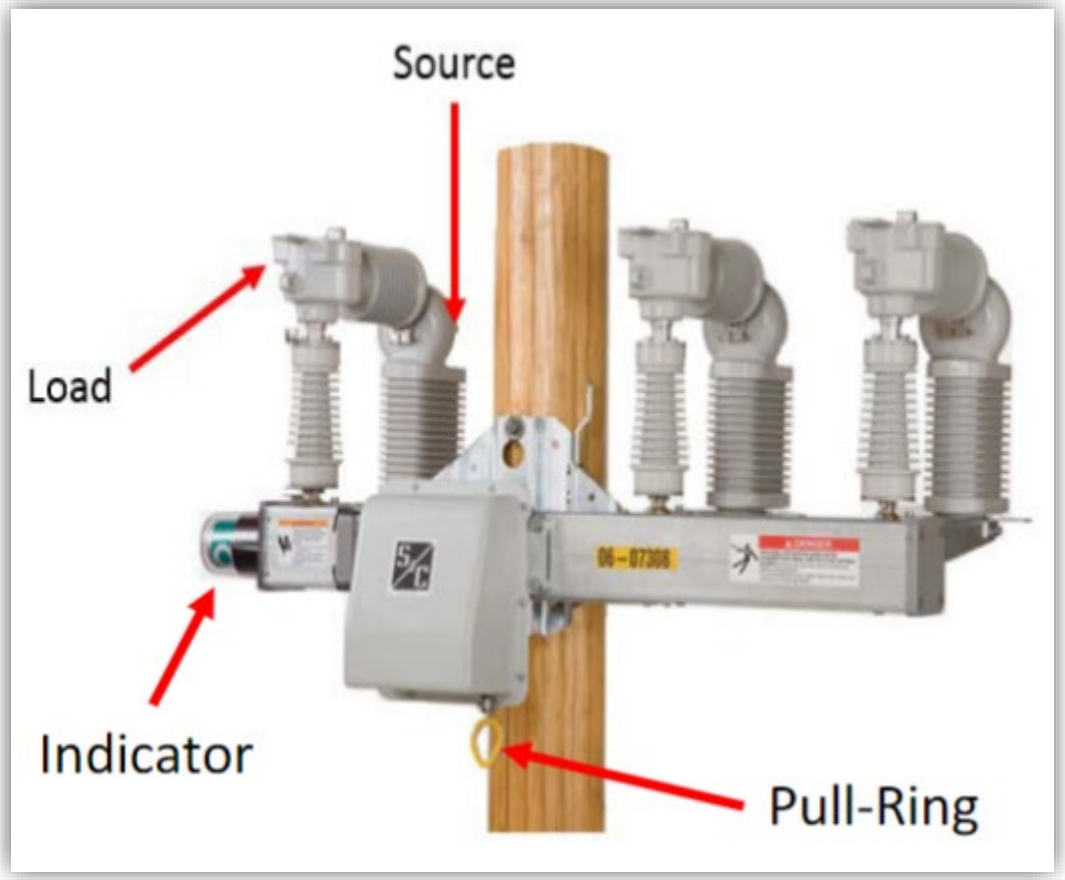


SCADA-MATE CX Switch



The CX Switches do not have a visual break feature built into the switch. A set of 1200A disconnects must be installed with every CX switch.

- Pull-Ring: Make sure the switch is in the "LOCAL" position. Use the switch stick to pull the pull-ring down to its full extension and let the pull-ring return to its normal position. Repeat this until the switch changes to the desired position. This will take from 1 to 9 pulls depending on the charge the operating spring has.
- Indicator:
  - Green O –switch is open
  - Red C – switch is closed
- Opening Visible Disconnect Break: The SCADA-MATE CX Switch Interrupters must be OPEN before opening the 1200 Amp disconnects. Check that the Indicator and the Control box indicates the switch is open. With dispatch approval open the 3 -1200 Amp disconnects.
- Closing Visible Disconnect Break: SCADA-MATE CX Switch Interrupters must be OPEN before closing the 1200 Amp disconnects. Check that the indicator and the SCADA-MATE CX Switch Interrupters must be OPEN before closing the 1200 Amp disconnects. Control box indicates the switch is open. With dispatch approval open the 3 -1200 Amp disconnects.

Alduti-Rupter Switch

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common operations.

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Alduti-Rupter Switch

The Alduti-Rupter can be opened manually via decoupling the switch. The visible break can only be operated manually like a loadbreak switch.

Opening/Closing Visual Break

- Make sure the switch is in the “LOCAL” position.
- If the Automatic Operation “ENABLED” LED is illuminated, hold the Automatic Operation switch in the “DISABLE” position until the “DISABLED” LED illuminates and the ENABLED” LED is no longer illuminated. Release the switch – it will return to the neutral position.
- Unlock the protective shroud, swing it to the right and lift it off its hinges.
- Remove the decoupler pin from the coupling mechanism and pull the Operating Handle Receptacle down.
- Insert the decoupler pin into the coupling mechanism to hold the latching wedge clear of the mechanism.
- Remove and insert the Operating Handle into the Operator Handle Receptacle and rotate it clockwise to lock it into place.
- To open the switch, push the handle from right to left.
- To close the switch, push the handle from left to right.

Visual Open

- Like the loadbreak switch, the blades of the switch will be in an open position, swinging parallel to the base of the switch.

S&C TripSaver II

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common operations.

- The manufacturer's instructions and/or Eversource Engineering Specifications/Work Methods for the device that is to be operated are to be reviewed for specific information.

- All Appropriate Personal Protective Equipment (PPE) identified in the Eversource Safety Manual and Work Rules shall be complied with.

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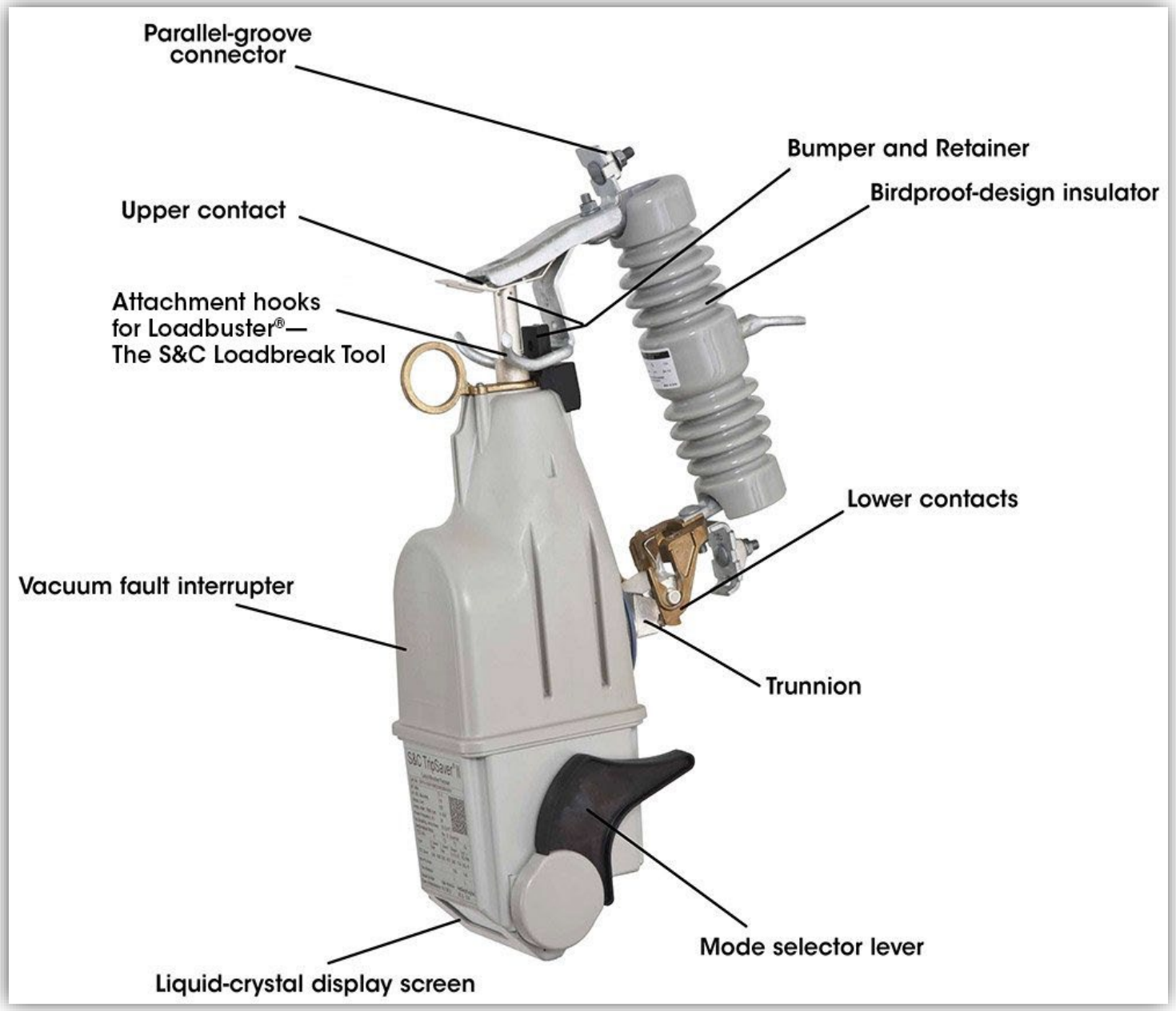
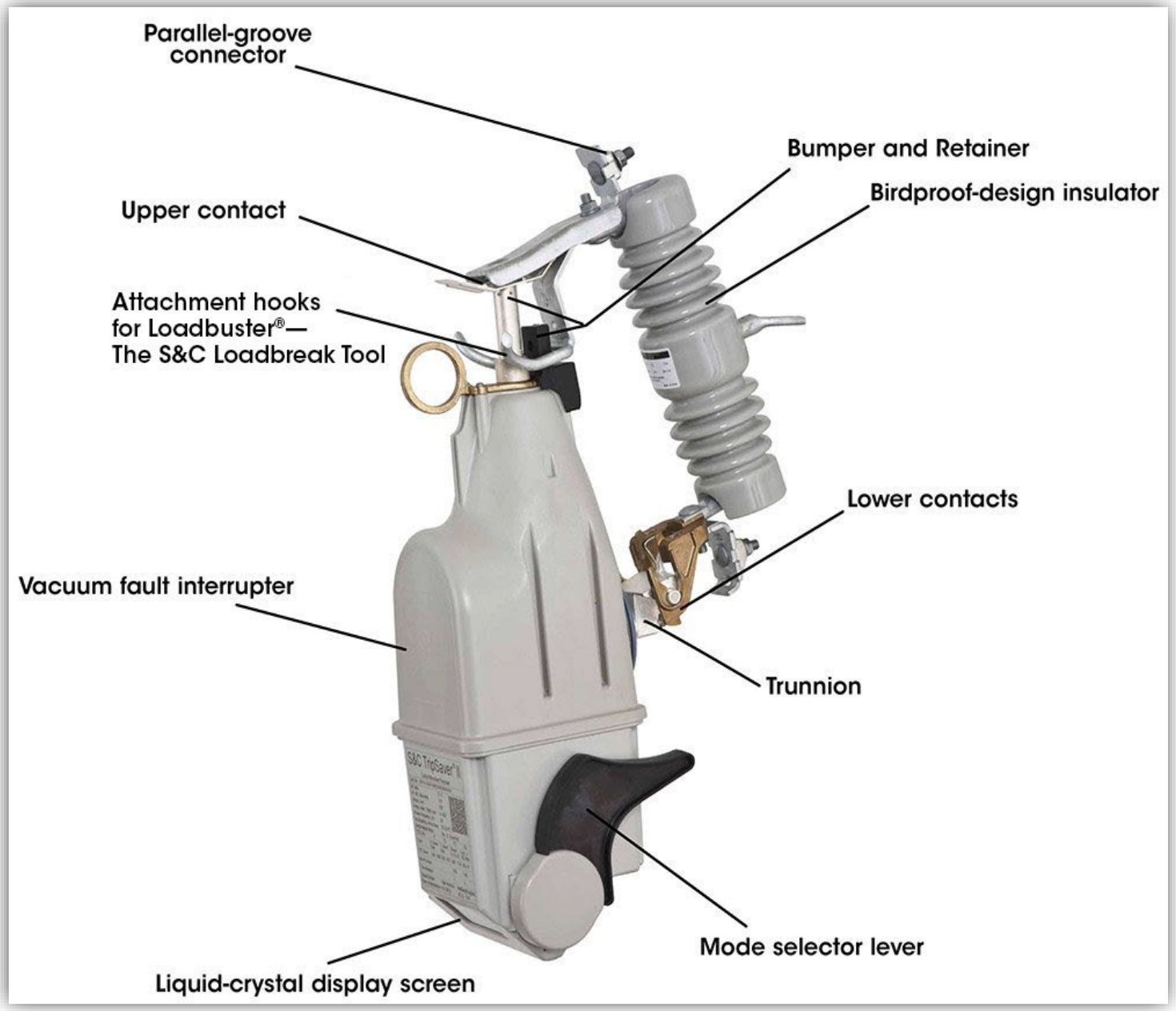


Tripsaver II

- The TripSaver protects overhead distribution circuits from overcurrent.
- The TripSaver is a single phase device that is inserted into a cutout body. When the unit trips to lock-out, it swings downward like a blown expulsion fuse.
- The TripSaver is an electronic device. Configuration changes can be made wirelessly using a laptop or tablet. The unit is not tethered to a control box.
- The TripSaver uses a vacuum interrupter to break current.



Open Recloser

- If a fault or overload condition occurs, the door will drop open like a fused cutout door. In the event the door does not drop open under a fault/overload condition (i.e. door is frozen), follow proper procedures utilizing the Loadbuster Tool to manually open the unit.

Close Recloser

- If unit has dropped Open, the vacuum interrupter would have closed automatically after it dropped open.
- Insert the hotstick end into the TripSaver pull-ring, swing unit to about 45°of fully closed position, then with firm grip, drive unit closed, applying force until it latches into the cutout mounting (like closing fused cutout door).
- Verify mode-selector lever is in desired position, i.e., Auto or Non-Reclose NR.
- If load is over 4amps, Display will show status of vacuum interrupter, verify this says CLOSED.
- If it says OPEN, refer to manual to remove unit and reset it.

To Remove from or place in Service

- The TripSaver hangs in the cutout bracket like a fuse holder.
- Remove the unit, or place into the cutout bracket in a similar fashion.

Non-Reclosing

- Using hotstick, rotate the mode-selector lever from the Auto position to the NR position, with the levers final position pointing downward.

Reclosing On

- Using hotstick, rotate the mode-selector lever from the NR position to the Auto position, with the levers final position in the horizontal direction.

Display

- In the normal screen mode, the display will indicate the vacuum interrupter, either OPEN or CLOSED, indicate mode, either AUTO or NR, indicate if tripped on overload, and indicates if service is required soon (Occurs when vacuum interrupter contact wear is 10% or less).

Display Screen Mode

- Unit will be in normal screen mode but can be switched into display mode by cycling the mode-selector lever down and then up again when the unit is energized.
- The display will now cycle through different items such as Load Current, Last Fault Magnitude, # of Operations/Counter.
- After a length of time the display returns to normal mode.

Device Capabilities

- This device will provide visible opening capabilities.
- This device is an interruptible device capable of breaking fault current. Refer to the manufacture's instruction for specific capabilities.
- Follow the ESOP 100 Link to get the most up to date Switching and tagging info.

Single Phase Spear Recloser

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common operations.

- The manufacturer's instructions and/or Eversource Engineering Specifications/Work Methods for the device that is to be operated are to be reviewed for specific information.

- All Appropriate Personal Protective Equipment (PPE) identified in the Eversource Safety Manual and Work Rules shall be complied with.

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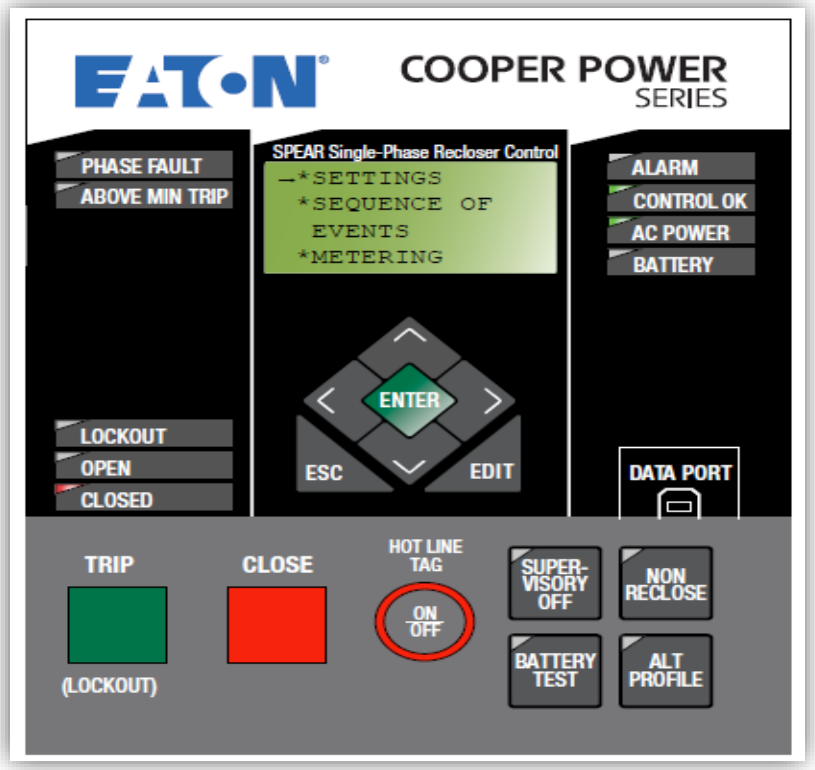
Recloser Description

- The SPEAR single-phase recloser consists of an interrupting module, with an embedded current transformer, and mechanism mounted to an aluminum head casting.
- Current sensing is provided by one current transformer located in the recloser and interfaced to the SPEAR single-phase recloser control via the control cable.
    - This cable also supplies Trip, Close, and Recloser status, and provides isolation for reliable operation.
    - Voltage for metering is connected to the control through the cabinet harness.
- The mechanism and interrupter assembly are mounted to a steel tank suitable for pole or substation mounting.
- The interrupter module utilizes an outdoor cycloaliphatic-epoxyencapsulated vacuum interrupter.
- The SPEAR single-phase recloser requires a SPEAR singlephase recloser control.
- Specifications of the SPEAR can be found on the data plate.

Single Phase Spear Recloser

Control Front Panel

- The front panel is separated into two clearly identified, color-coded sections:
  - **Programming Panel:** The top portion of the front panel is used for programming the control and providing LED status indication.
  - **Operating Panel:** The lower portion of the front operating panel is used for operating the control and recloser.



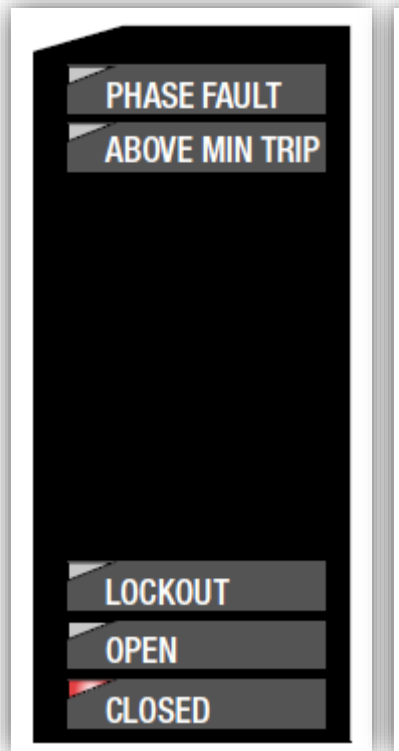
- The ▲ (up) key can be used for the following tasks:
  - Scroll to the next item up on the current Menu level
  - If already at the first item of the current Menu level, return to the last item of the current Menu
  - When editing a selectable option parameter, scroll up to the next available option
  - Decrement the value of a digit (example: from 6 to 5)

- The ▼ (down) key can be used to complete the following tasks:
  - Scroll to the next item down on current Menu level
  - If scrolled past the last line of the current Menu level, return to the first line of the current Menu
  - When editing a Selectable Option Parameter, scroll down to the next available option
  - Increment the value of a digit (example: from 3 to 4)

- The ◄ (left) key is used to go up one Menu level.
- The ◄ (left) key is used to move left when editing parameters.
- The ► (right) key is used to go down one Menu level.
- The ► (right) key is used to move right when editing parameters.

- The ESC (escape) key is used for the following tasks:
  - Go back one Menu level
  - Cancel Edit mode when editing settings without changing the value
- The ENTER key is used for the following tasks:
  - Go down one Menu level
  - Confirm settings change in the Edit mode
  - Confirm resetting the Resettable Parameters
  - Confirm passwords
- The EDIT key is used for the following tasks:
  - Enter the Edit mode to make a change.
  - Enter the Reset mode to reset the Resettable Parameter

Control Front Panel



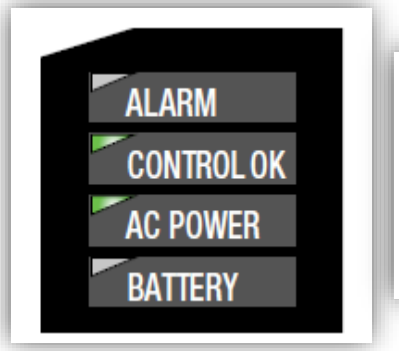
OPEN: This LED illuminates to indicate the recloser is in the open position.

CLOSED: This LED illuminates to indicate the recloser is in the closed position.

Note: There are several conditions that will cause the alternate blinking of the control LOCKOUT, recloser OPEN, and recloser CLOSED LEDs: Failure to Trip, Failure to Close, Interrupter Malfunction, and 52a/b Disagreement.

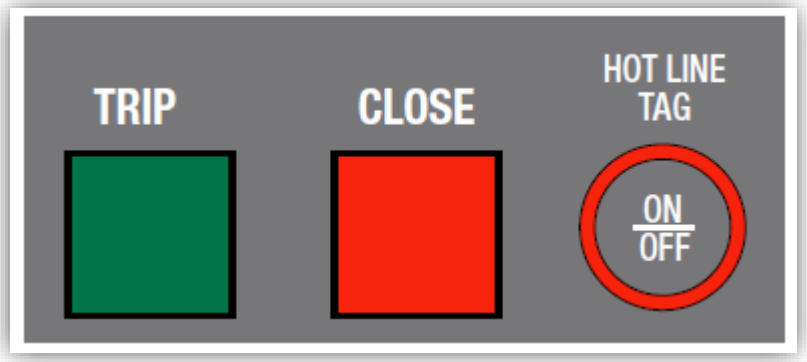
The LED blinking pattern for these conditions is the control LOCKOUT LED and recloser CLOSED LED alternating with the recloser OPEN LED.

Note: Reset Targets (under Counters menu) will clear the Interrupter Malfunction diagnostic. The alarm LED will remain illuminated as long as the alarm condition exists.



ALARM: This LED illuminates to indicate an alarm condition exists. The LED will flash for unacknowledged alarms, and will continuously illuminate for acknowledged alarms that are still active. Refer to *Service Information MN280012EN SPEAR Single-Phase Recloser Control Programming Guide* for alarm list.

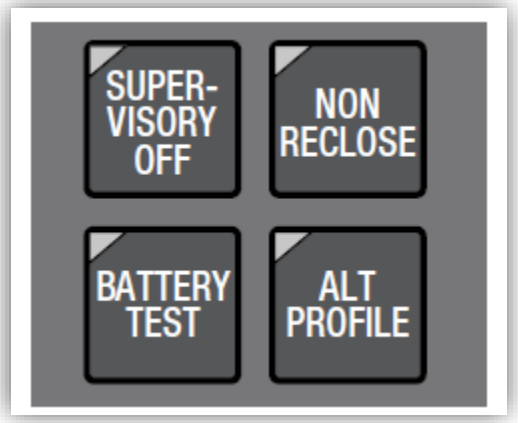
*The "52a/b Disagreement" alarm indicates the upper unit and lower control unit are not in sync. If the upper unit is opened via the control or by the local control center remotely, but the control cable is slightly bad and does not get the confirmation signal back to the lower control unit, the actual contacts in the upper unit will open, but the lower control will not change to OPEN status and will result in this "disagreement".



- ***TRIP (lockout) membrane pushbutton***
  - The TRIP pushbutton provides front-panel access to trip (lockout) the recloser. When pressed, the TRIP pushbutton opens the recloser and locks out the control. Control power is required for the TRIP button to issue a command to the recloser.
- ***CLOSE membrane pushbutton***
  - When pressed, the CLOSE pushbutton returns the control to the initial or home sequence position, closing the recloser. The control is ready for the start of a new trip/close sequence.

Control Front Panel

- ***One-touch function keys***
  - Quick access to frequently operated SPEAR single-phase recloser control features is provided with function key membrane pushbuttons on the control operator panel.
  - The SPEAR single-phase recloser control operator panel one-touch function keys are illustrated below.



  - LEDs located in the upper-left corner of each function key indicate the status of the function, regardless of local or remote activation. For example, if Non-Reclose is activated from a Distribution Supervisory Control And Data Acquisition (DSCADA) signal, the indicator will illuminate even though it was not activated from the operator panel.

SUPERVISORY OFF

- When the SUPERVISORY OFF red indicator is illuminated, supervisory commands are blocked; however, supervisory functions through the USB data port are not blocked.

NON-RECLOSE

- The control is operating in a non-reclosing mode when the NON-RECLOSE indicator is illuminated. Non-reclosing mode disables any automatic reclosing operations. Activation is possible via remote communications, the interface software, or locally (via the front panel).

BATTERY TEST

- This is a direct shortcut to run the battery test feature. The LCD screen will show the battery voltage and current. After the battery test is run, the battery test results are shown (battery voltage and current).

Manual Operating

Manual Operation of energized recloser

- The yellow manual operating handle on the SPEAR single-phase recloser is used to open and lock out the recloser and disable the electrical and supervisory closing.
- The manual operating handle is designed to be operated with a hotstick. Pulling down the handle trips and locks open the main contacts of the recloser.
- Contact position is indicated by the OPEN flag of the contact position indicator. The yellow operating handle will remain down in the OPEN position and not return upward under the sleet hood.
    - **Note:** When the recloser electronically operates to lockout, the yellow operating handle will not drop down from under the sleet hood. The yellow operating handle remains in the OPEN position only after manual operations are performed.
- The yellow operating handle must be returned up to the CLOSED position for the recloser to respond to a close signal from the SPEAR single-phase recloser control. All close operations are initiated by the control.

Single Phase Spear Recloser

Lockout Indication

- Lockout is indicated by the SPEAR single-phase recloser control.
    - **Note:** When the recloser is locked out, the yellow manual operating handle will not drop down from under the sleet hood.

Automatic Operation

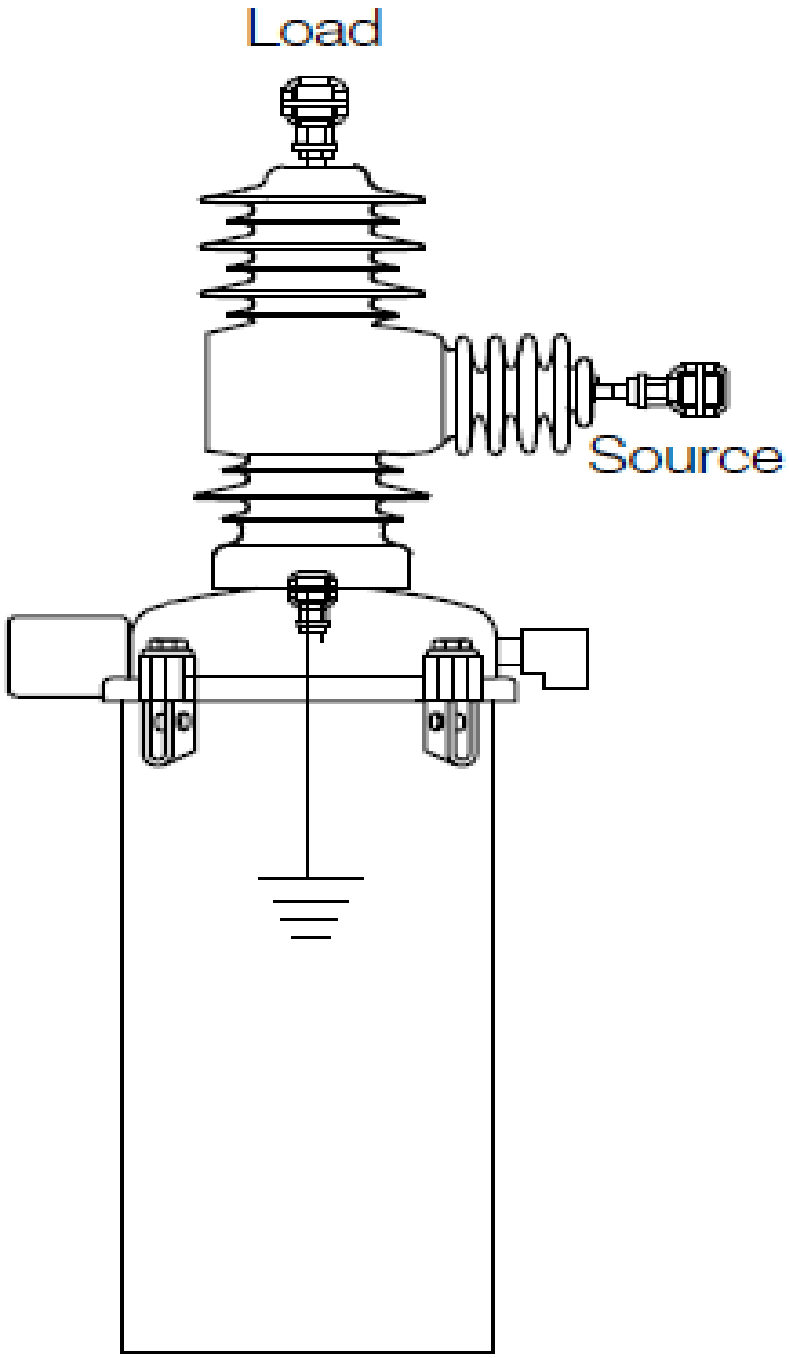
- The SPEAR single-phase recloser, in the CLOSED position, operates automatically per the control-programmed settings.

Contact Position Indicator

- Pushing the yellow operating handle to the CLOSED position will not close the recloser. All close operations are initiated by the SPEAR single-phase recloser control.
- Located on the outboard side of the sleet hood, this indicator displays the word OPEN (Green) when the recloser contacts are open and CLOSED (Red) when the recloser contacts are closed.

Operations Counter

- A four-digit mechanical counter, located under the sleet hood, cumulatively records each time the recloser operates.



Device Capabilities

- This device does not provide visible opening capabilities.
- This device is an interruptible device capable of breaking fault current. Refer to the manufacturer's instruction for specific capabilities.
- Need to achieve visible break for clearance through the use of other work practices.
- Follow the ESOP 100 Link to get the most up to date Switching and tagging info.

G&W Trident 3-Phase Vacuum Fault Interrupter (VFI) Switch

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common operations.

- The manufacturer's instructions and/or Eversource Engineering Specifications/Work Methods for the device that is to be operated are to be reviewed for specific information.

- All Appropriate Personal Protective Equipment (PPE) identified in the Eversource Safety Manual and Work Rules shall be complied with.

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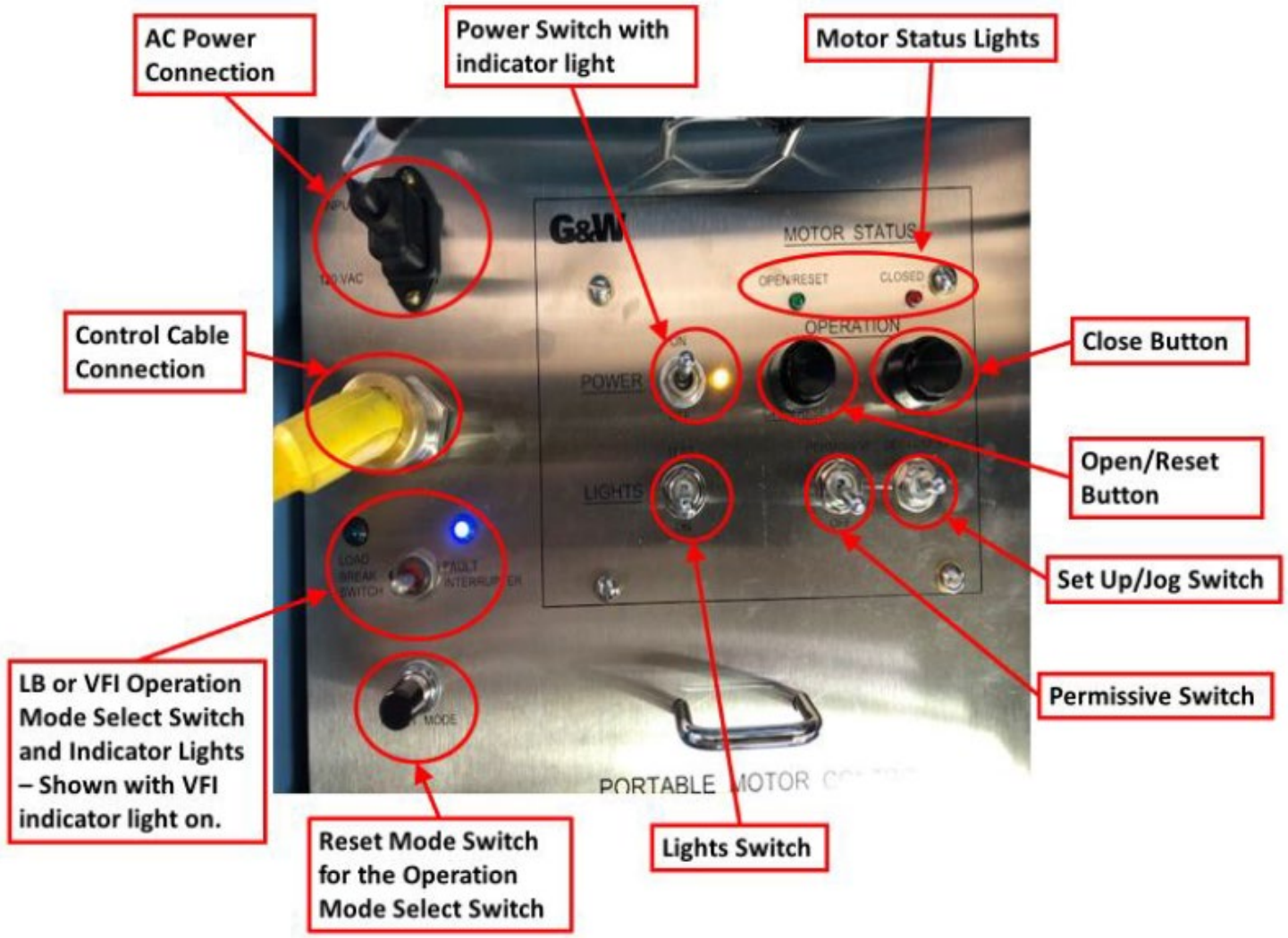
G&W TRIDENT VFI

Portable “Blue Box” Motor Controller



- **AC Power Connection:** Unit needs to be plugged into a live AC source for power.
- **Power Switch with Indicating Light:** Turns unit ON and OFF, light indicates power.
- **Motor Status Lights:** Status lights indicate whether motor is OPEN/RESET or CLOSED.
- **Switch Operation Buttons:** Used to OPEN/RESET or CLOSE the switch.
- **Set Up/Jog Switch:** Jog switch moves the motor in clockwise or counterclockwise direction.
- **Permissive Switch:** Permissive must be held up in permitting position simultaneously with either Operation button to perform switch operation.
- **Lights Switch:** Used to test that all indicating LED lights on the portable “blue box” motor controller are functioning.
- **Reset Mode Selection Switch:** To reset toggle Mode Select Switch back to neutral position from LB or VFI selection.
- **Loadbreak/Fault Interrupter Switch:** Toggle switch shall be placed to Loadbreak or Fault Interrupter based on type of switch.
- **Control Cable Connection:** Connects to motor on the switch.

NOTE: An Indicating light has been added for the Loadbreak/Fault Interrupter Operation Mode Selector Switch to clearly identify the operation mode the portable switch controller has been set to (Loadbreak/Fault Interrupter).

G&W TRIDENT VFI

Opening Trident VFI:

- To OPEN the switch (if CLOSED), push and hold the PERMISSIVE switch up into the “PERMISSIVE” position.
- While holding the PERMISSIVE switch in the “PERMISSIVE” position push and hold the “OPEN/RESET” pushbutton.
- Once the MOTOR TRAVEL light comes on (to the right of the PERMISSIVE switch), release both switches.
- The portable “Blue Box” switch controller will automatically stop the switch motor after the switch has fully opened.

Closing Trident VFI:

- To CLOSE the switch, (if OPEN), push and hold the PERMISSIVE switch up into the “PERMISSIVE” position.
- While holding the PERMISSIVE switch in the “PERMISSIVE” position push and hold the “CLOSE” pushbutton.
- Once the MOTOR TRAVEL light comes on (to the right of the PERMISSIVE switch), release both switches.
- The portable switch controller will automatically stop the switch motor after the switch has fully closed.
- The switch will make an audible noise when it latches into the closed position.

Device Capabilities

- This device does not provide visible opening – only indication.
- This device is able to fault interrupt. Refer to the manufacturer’s instruction for specific capabilities.
- Follow the ESOP 100 Link to get the most up to date Switching and tagging info.

Controls

Cooper Form 6/ Form 6 TS Recloser Control

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common Operations.

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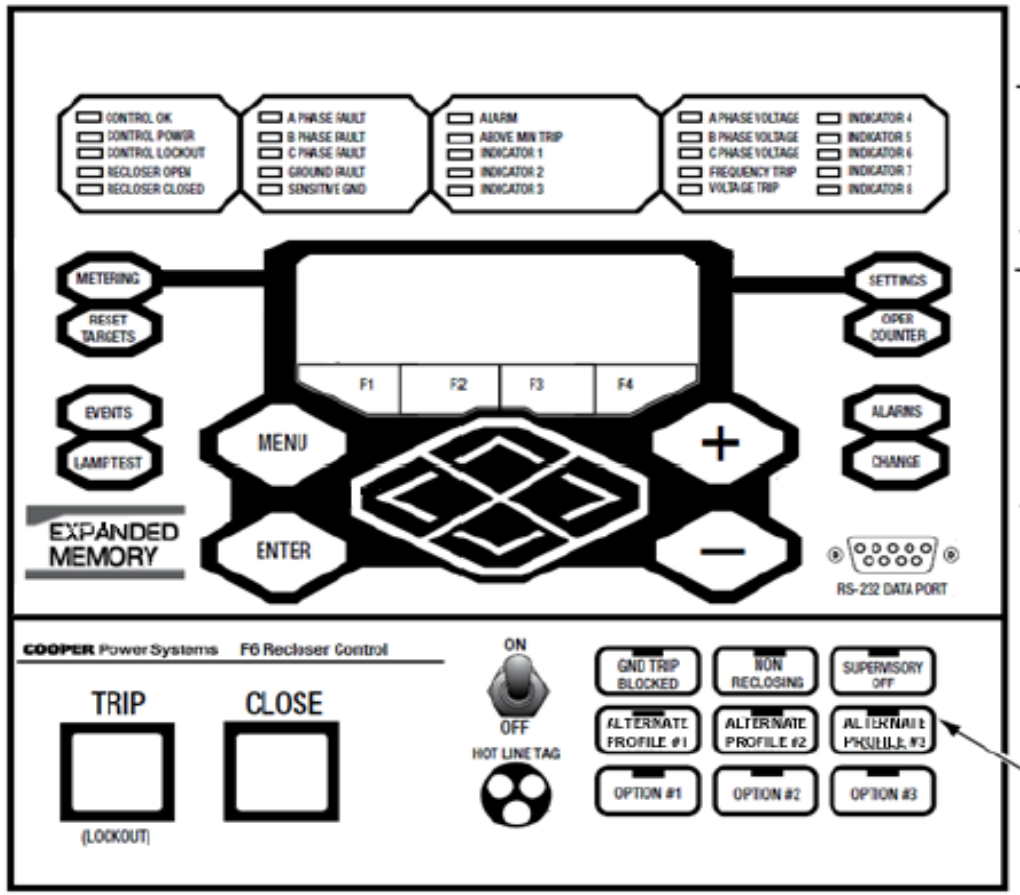
FORM 6 CONTROL



Any LED that is illuminated in the “LED Indicators” Display or on the “One-Touch Function Keys” Panel means that status point or function is enabled.

Note there is a 10 second window with any features that first requires pressing the “CHANGE” button, located in the right side of the middle section of the control panel, and the desired function button, located in the bottom right.

Enable/Disable Local/Remote (Supervisory):

- Press the “CHANGE” key, then press the “SUPERVISORY OFF” key.
- The “SUPERVISORY OFF” LED on the key will illuminate, indicating that this function is enabled.
- When active, this function will block all remote commands via radio to the control. Repeat steps to disable.

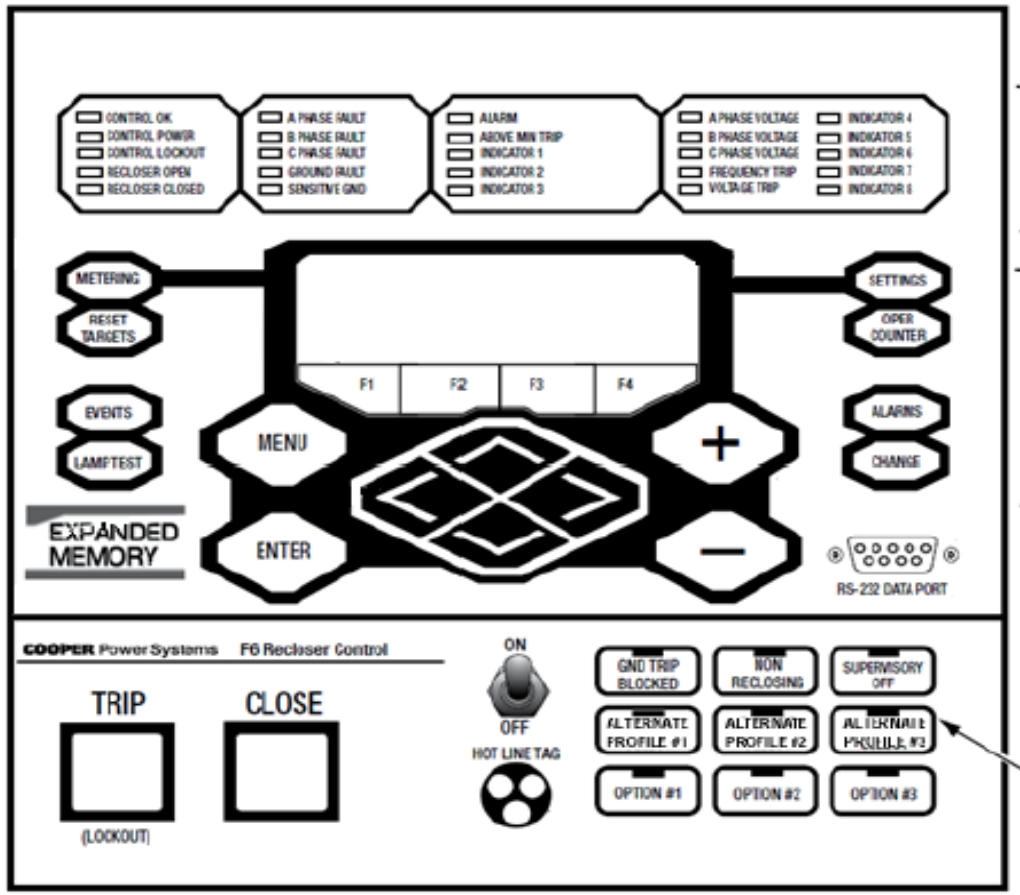
Open Recloser

- Press the Green pushbutton labeled “TRIP” located in the bottom left of the control panel.
- The “RECLOSER OPEN” & “LOCKOUT” LED on the upper display illuminate; the “RECLOSER CLOSED” LED will extinguish.

Close Recloser

- Confirm the manual operating handle is in the UP position on the recloser head and Hotline Tag is disabled in the control.
- Press the Red pushbutton labeled “CLOSE” located in the bottom left of the control panel.
- The “RECLOSER CLOSED” LED on the upper display illuminate; the “RECLOSER OPEN” & “LOCKOUT” LED will extinguish.

FORM 6 CONTROL



Any LED that is illuminated in the “LED Indicators” Display or on the “One-Touch Function Keys” Panel means that status point or function is enabled.

Enable/Disable Hotline Tag:

- Move the Hotline Tag toggle switch to the ON position to enable and OFF to disable.
- When LED under the toggle switch is illuminated it is indicating Hot Line Tag is active.
- When active, this function enables a one-shot, fast-trip operation.

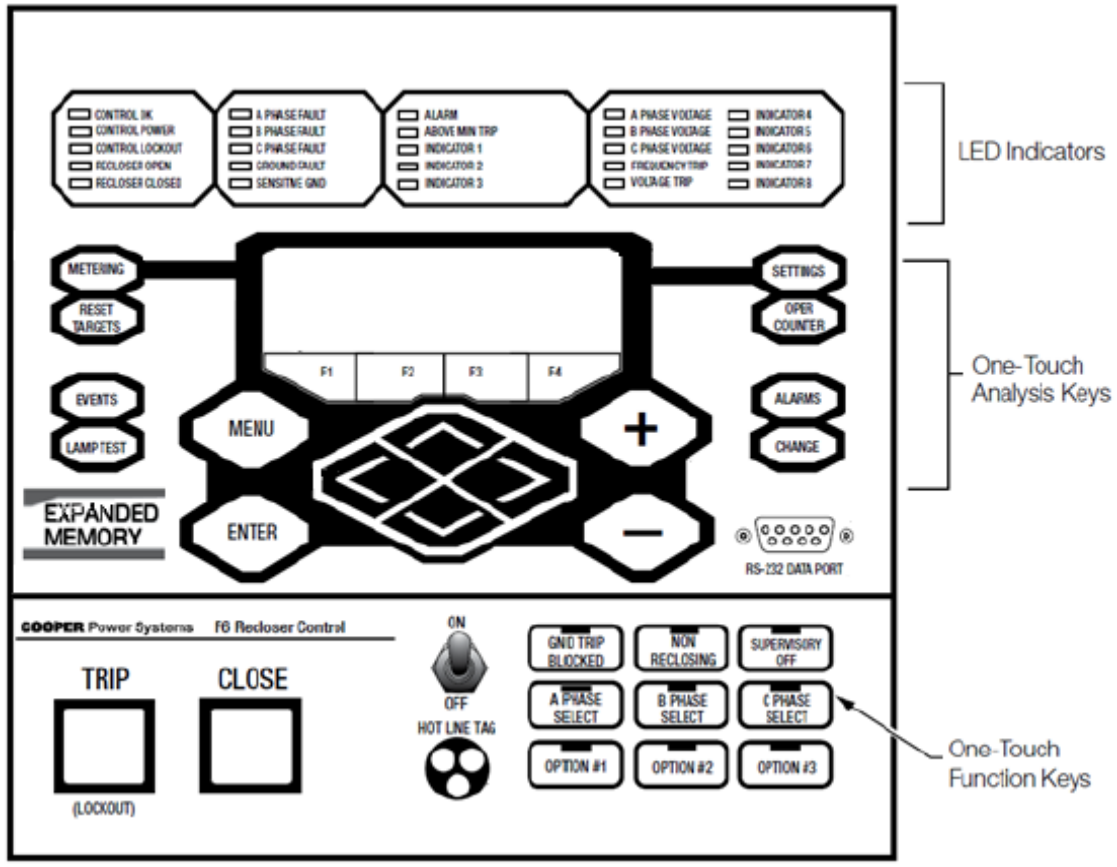
Enable/Disable Non-Reclosing:

- Press the “CHANGE” key, then press the “NON-RECLOSING” key.
- The “NON-RECLOSING” LED on the key will illuminate, indicating that non reclosing is enabled.
- When active, this function sets the recloser to one shot to lock out. Repeat steps to disable.

Enable/Disable Ground Trip Block:

- Press the “CHANGE” key, then press the “GND TRP BLOCKED” key.
- The “GND TRP BLOCKED” LED on the key will illuminate, indicating that this function is enabled.
- When active, this function blocks ground trip fault operations. Repeat steps to disable.

FORM 6-TS CONTROL



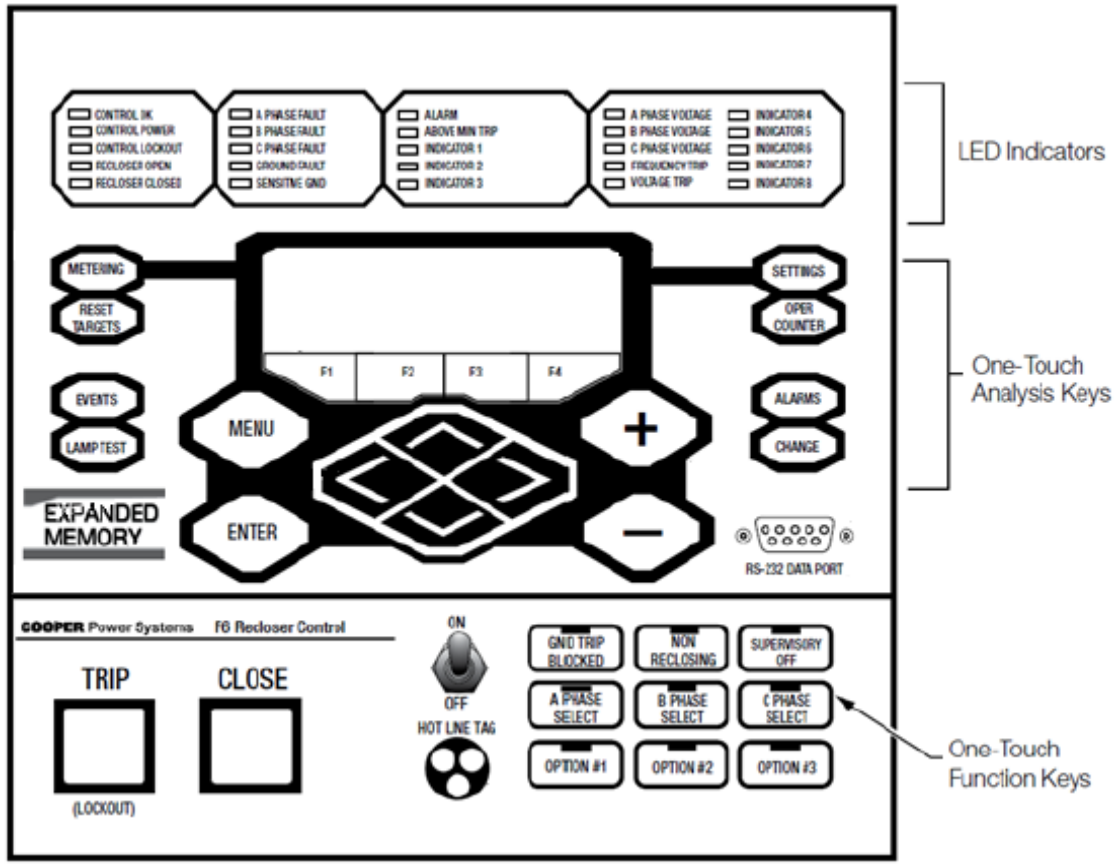
Any LED that is illuminated in the "LED Indicators" Display or on the "One-Touch Function Keys" Panel means that status point or function is enabled.

Note there is a 10 second window with any features that first requires pressing the "CHANGE" button, located in the right side of the middle section of the control panel, as well as the desired function button, located in the bottom right.

Open & Close Recloser

- At the bottom section of the front control panel, there are two push buttons used to open and close the recloser; the Green button labeled, TRIP, will open the unit and the Red button, CLOSE, will close it.
- The Form 6-TS control has the capability to operate individual phases. This is done so by using the A, B & C PHASE SELECT buttons in conjunction with the TRIP and CLOSE button.
- The control phase selection keys indicate to the operator which phase(s) of the triple-single recloser will operate when the manual TRIP or CLOSE pushbuttons are pressed; only the phases that are selected will operate.
- The selected phases are identified by the corresponding illuminated LED on each PHASE SELECT button.
- To select (or unselect) a phase(s), Press the "CHANGE" key, then press the "PHASE SELECT" key of the phase to be enabled or disabled.

FORM 6-TS CONTROL



Any LED that is illuminated in the “LED Indicators” Display or on the “One-Touch Function Keys” Panel means that status point or function is enabled.

Enable/Disable Hotline Tag:

- Move the Hotline Tag toggle switch to the ON position to enable and OFF to disable.
- When LED under the toggle switch is illuminated it is indicating Hot Line Tag is active.
- When active, this function enables a one-shot, fast-trip operation.

Enable/Disable Non-Reclosing:

- Press the “CHANGE” key, then press the “NON-RECLOSING” key.
- The “NON-RECLOSING” LED on the key will illuminate, indicating that non reclosing is enabled.
- When active, this function sets the recloser to one shot to lock out. Repeat steps to disable.

Enable/Disable Ground Trip Block:

- Press the “CHANGE” key, then press the “GND TRP BLOCKED” key.
- The “GND TRP BLOCKED” LED on the key will illuminate, indicating that this function is enabled.
- When active, this function blocks ground trip fault operations.
- Repeat steps to disable.

Enable/Disable Local/Remote (Supervisory):

- Press the “CHANGE” key, then press the “SUPERVISORY OFF” key.
- The “SUPERVISORY OFF” LED on the key will illuminate, indicating that this function is enabled.
- When active, this function will block all remote commands via radio to the control.
- Repeat steps to disable.

SEL 351R

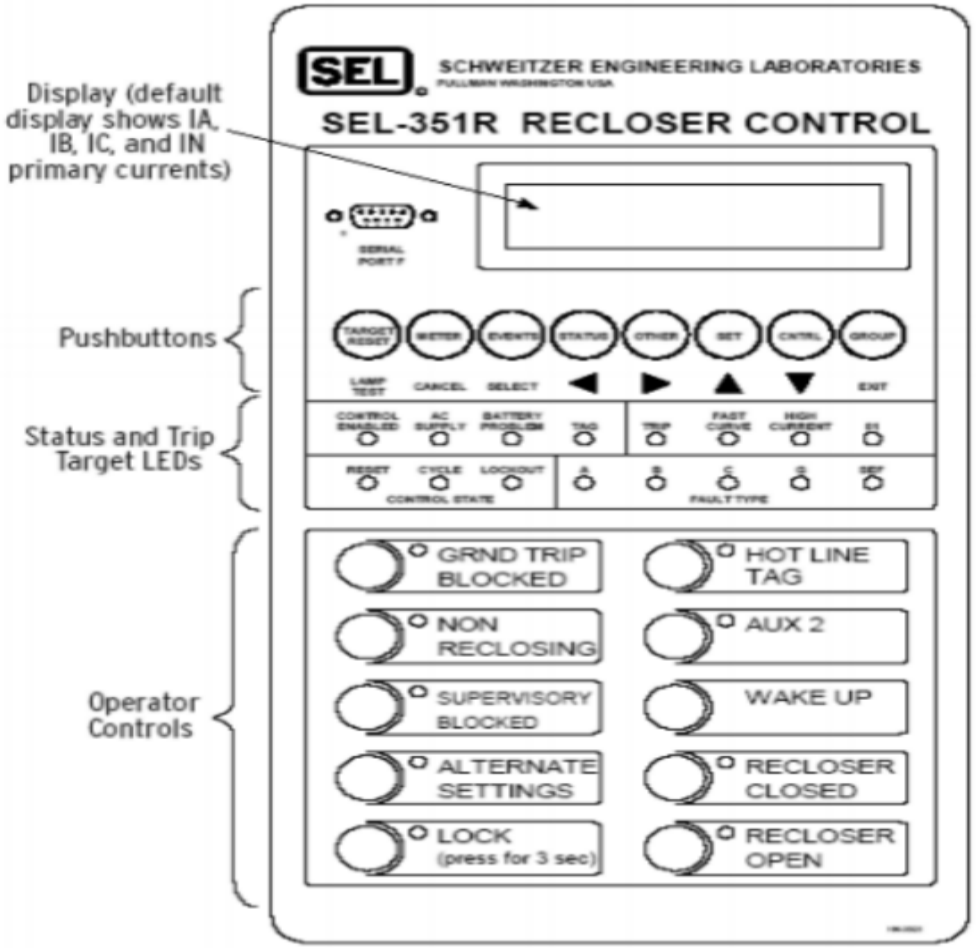
- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common Operations.

- The manufacturer's instructions and/or Eversource Engineering Specifications/Work Methods for the device that is to be operated are to be reviewed for specific information.

- All Appropriate Personal Protective Equipment identified in the Eversource Safety Manual and Work Rules shall be complied with.

- Rev 1, 02/24/2021
  - Contact ESOP.100@Eversource.com for document comments.

EVERSOURCE



SEL 351R

Any LED that is illuminated in the “Status and Trip Target” Display or “Operator Controls” Pushbutton Panel means that status point or function is enabled.

- To Open the Recloser:
  - Press the RECLOSER OPEN Pushbutton located in the bottom right of the Operator Controls pushbutton panel.
  - The “RECLOSER OPEN” & “LOCKOUT” LED will illuminate; the “RECLOSER CLOSED” LED will extinguish.
- To Close the Recloser:
  - Confirm the yellow manual operating handle is in the UP position on the recloser head and Hotline Tag is not enabled in the control.
  - Press the RECLOSER CLOSED Pushbutton located in the bottom right of the Operator Controls pushbutton panel.
  - The “RECLOSER CLOSED” LED will illuminate; the “RECLOSER OPEN” & “LOCKOUT” LED will extinguish.

Enable/Disable Hotline tag:

- Press the “HOT LINE TAG” Pushbutton located in the top right of the Operator Controls pushbutton panel; Verify the “HOT LINE TAG” LED is illuminated. When active, this function enables the one-shot, fast-trip operation.
- To remove, Press “HOT LINE TAG” Pushbutton and verify the “HOT LINE TAG” LED is extinguished.

Enable/Disable Local/Remote (Supervisory):

- Press the “SUPERVISORY BLOCKED” Pushbutton located in the middle left of the Operator Controls pushbutton panel; Verify the “SUPERVISORY BLOCKED” LED is illuminated. When active, this function will block all remote commands to the control.
- To remove, Press “SUPERVISORY BLOCKED” Pushbutton and verify the “SUPERVISORY BLOCKED” LED is extinguished.

Enable/Disable Non-Reclosing:

- Press the “NON-RECLOSING” Pushbutton located in the top left of the Operator Controls pushbutton panel; Verify the “NON-RECLOSING” LED is illuminated. When active, this function enables the one-shot operation.
- To remove, Press “HOT LINE TAG” Pushbutton and verify the “NON-RECLOSING” LED is extinguished.

SEL 651R

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common Operations.

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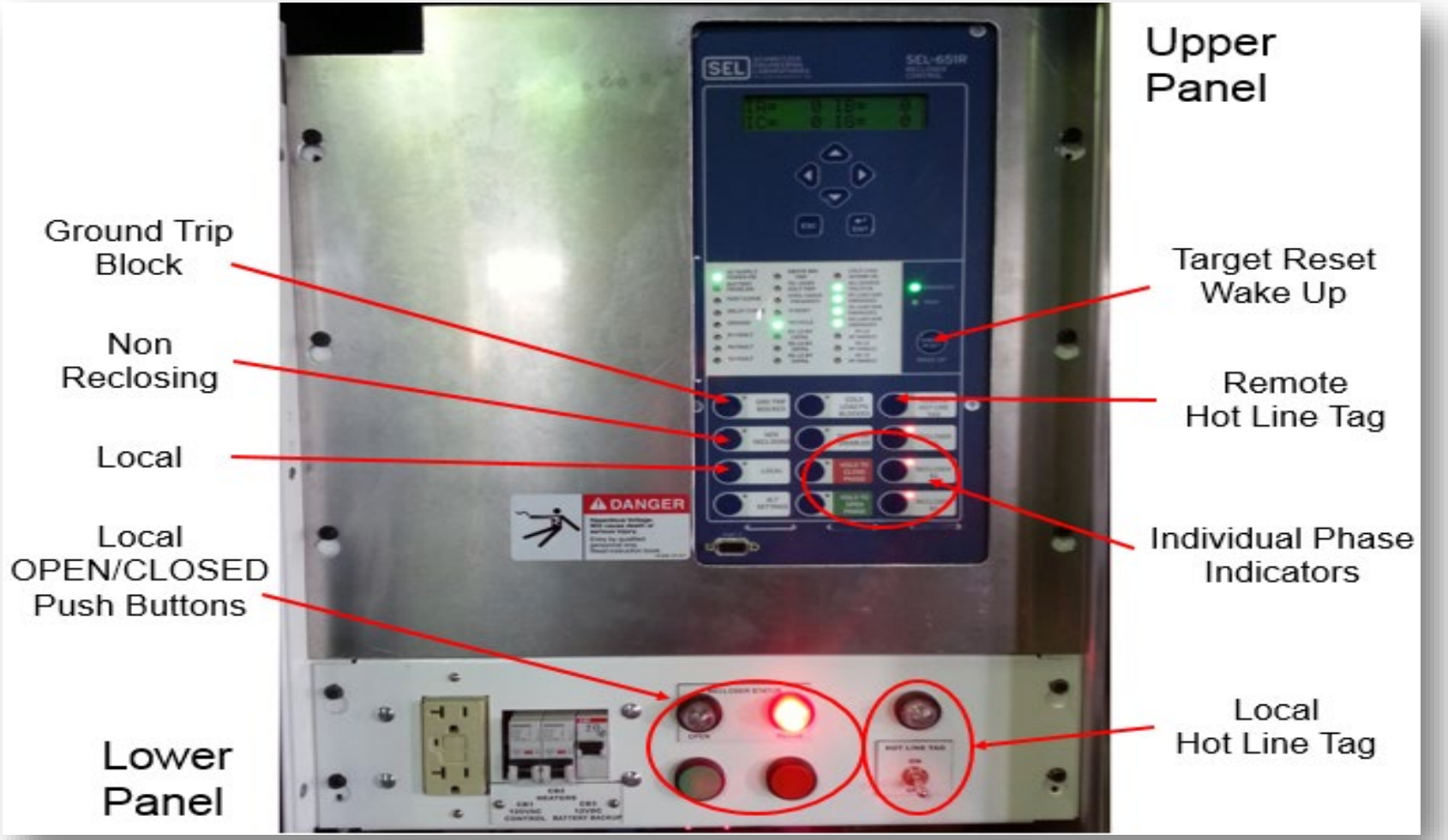
EVERSOURCE

SEL 651R



Any LED that is illuminated in the “Status and Trip Target” Display or “Operator Controls” Pushbutton Panel means that status point or function is enabled.

SEL 651R

To Open & Close the Recloser:

- Confirm that the yellow manual operating handle is in the UP position on the recloser.
  - If any of the three units are mechanically locked out, with the yellow handle down, the control box will not be able to close those units in
- **Gang Opening/Closing:** Located on the lower panel there are two push buttons, one red and one green, and two corresponding bulb lights.
  - To open on three phases, press the green push button and the corresponding green light will illuminate.
  - To Close on three phases, press the red push button and the corresponding red light will illuminate.
  - Verify the desired operation with the OPEN/CLOSE indicators on the recloser unit.
- **Individual Opening/Closing:** The SEL 651R Control has the capability to operate individual phases. This can be done by using the "HOLD TO CLOSE PHASE" and "HOLD TO OPEN PHASE" in conjunction with the three "RECLOSER R#" pushbuttons.
- To operate an individual phase, press and hold the desired operation's "HOLD TO.." pushbutton and press the recloser phase to be operated.
- Each "RECLOSER R#" pushbutton has a status LED that will illuminate green when open, red when closed.

Enable/Disable Hotline tag:

- Move the Hotline Tag toggle switch, located on the lower panel, to the ON position to enable and OFF to disable.
- When bulb above the toggle switch is illuminated it is indicating Hot Line Tag is active.
- When active, this function enables a one-shot, fast-trip operation.

Enable/Disable Local/Remote (Supervisory):

- Press the "LOCAL" pushbutton located in the middle left of the pushbutton panel; Verify the "LOCAL" LED is illuminated.
- When active, this function will block all remote commands via radio to the control. Repeat steps to disable.
- Hotline Tag can be activated remotely via Distribution Supervisory Control And Data Acquisition (DSCADA). If activated, the "REMOTE HOTLINE TAG" LED on the top right of the pushbutton panel will illuminate.
- Note that the method Hotline Tag is applied is the only way it can be removed.

Enable/Disable Non-Reclosing:

- Press the "NON-RECLOSING" pushbutton located in the top left of the pushbutton panel; Verify the "NON-RECLOSING" LED is illuminated.
- When active, this function enables the one-shot operation. Repeat steps to disable.

6801 Control

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common Operations.

- The manufacturer's instructions and/or Eversource Engineering Specifications/Work Methods for the device that is to be operated are to be reviewed for specific information.

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- Rev 1, 02/24/2021
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EVERSOURCE

6801 Control

Any LED that is illuminated in the “LED Indicators” Display or on the “One-Touch Function Keys” Panel means that status point or function is enabled.

Model 6801 switch controls can be programmed to operate as a sectionalizer. Controls programmed to operate as sectionalizers will have a label reading “ASU” on the outside of the control box door. The yellow “TRIP” LED will illuminate whenever the control automatically opens the switch. The LED will turn off when the switch is closed.

To Open the Switch:

- Press the Scada Control Remote/Local Change button to “LOCAL”.
- Press and hold the “OPEN” pushbutton until the LED is illuminated.
- The “LOCAL” & “OPEN” LED on the display will illuminate.

To Close the Switch:

- Verify the switch position indicators and position lights show the switch in the desired position.
- Press and hold the “CLOSE” pushbutton until the LED is illuminated.
- Press the Scada Control Remote/Local Change button to “REMOTE”.
- The “CLOSED” and “REMOTE” LED on the display illuminate.

For Boxes Labeled ASU – Enable/Disable Automatic Operation:

- Press the Scada Control Remote/Local Change button to “LOCAL”.
- Hold the Enable/Disable pushbutton to the desired position for 3 seconds. The desired LED will illuminate. When “ENABLED”, the control will operate like a sectionalizer and coordinate with the source side recloser/breaker should a load side fault occur. When “DISABLED” the control will take no action should a load side fault occur.
- Press the Scada Control Remote/Local Change button to “REMOTE”.

M Series Control

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common Operations.

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- Rev 1, 02/24/2021
  - Contact ESOP.100@Eversource.com for document comments.

M Series Control

M Series Switch Operators can be programmed to operate as a sectionalizer. Operators programmed to operate as sectionalizers will have a label reading “ASU” on the outside of the control box door. Any LED that is illuminated in the “LED Indicators” Display or on the “One-Touch Function Keys” Panel means that status point or function is enabled.

To Open the Switch:

- Toggle the Remote/Local switch to “LOCAL”.
- Hold the Close/Open switch to the OPEN position until the correct indicator LED is illuminated. This will occur in about 3 seconds.
- The “LOCAL” & “OPEN” LED on the display will illuminate.

To Close the Switch:

- Verify the switch position indicators and position lights show the switch in the desired position.
- Hold the Close/Open switch to the CLOSE position until the correct indicator LED is illuminated. This will occur in about 3 seconds.
- Toggle the Remote/Local switch to “REMOTE”.
- The “CLOSE” LED on the display will illuminate and the “LOCAL” LED will be extinguished.

For Boxes Labeled ASU – Enable/Disable Automatic Operation:

- Toggle the Remote/Local switch to “LOCAL”.
- Hold the Enable/Disable switch to the desired position for 3 seconds. The desired LED will illuminate. When “ENABLED”, the control will operate like a sectionalizer and coordinate with the source side recloser/breaker should a load side fault occur. When “DISABLED” the control will take no action should a load side fault occur.
- When complete Toggle the Remote/Local switch to “REMOTE”.

For Boxes Labeled ASU – Closing Switch with One Shot to Lockout:

- Confirm that Automatic Operation is Enabled – the “ENABLED” LED will be illuminated.
- Confirm the switch is Open.
- Toggle the Remote/Local switch to “LOCAL”.
- Hold the Enable/Disbaleswitch in the “ENABLE” position - the “ENABLED” LED will begin blinking. Continue holding the switch.
- Hold the Close/Open switch in the “CLOSE” position until the switch closes. Release both switches – both switches will return to the neutral position
- The “ENABLED” LED will be on and the “CLOSED” LED will be blinking. Should the source recloser/breaker operate while the “CLOSED” LED is blinking and the control sees fault current, the control will open the switch.
- The “CLOSED” LED will stop blinking and stay illuminated after a short period of time (seconds). The switch is now operating normally.

Cooper 4C

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common Operations.

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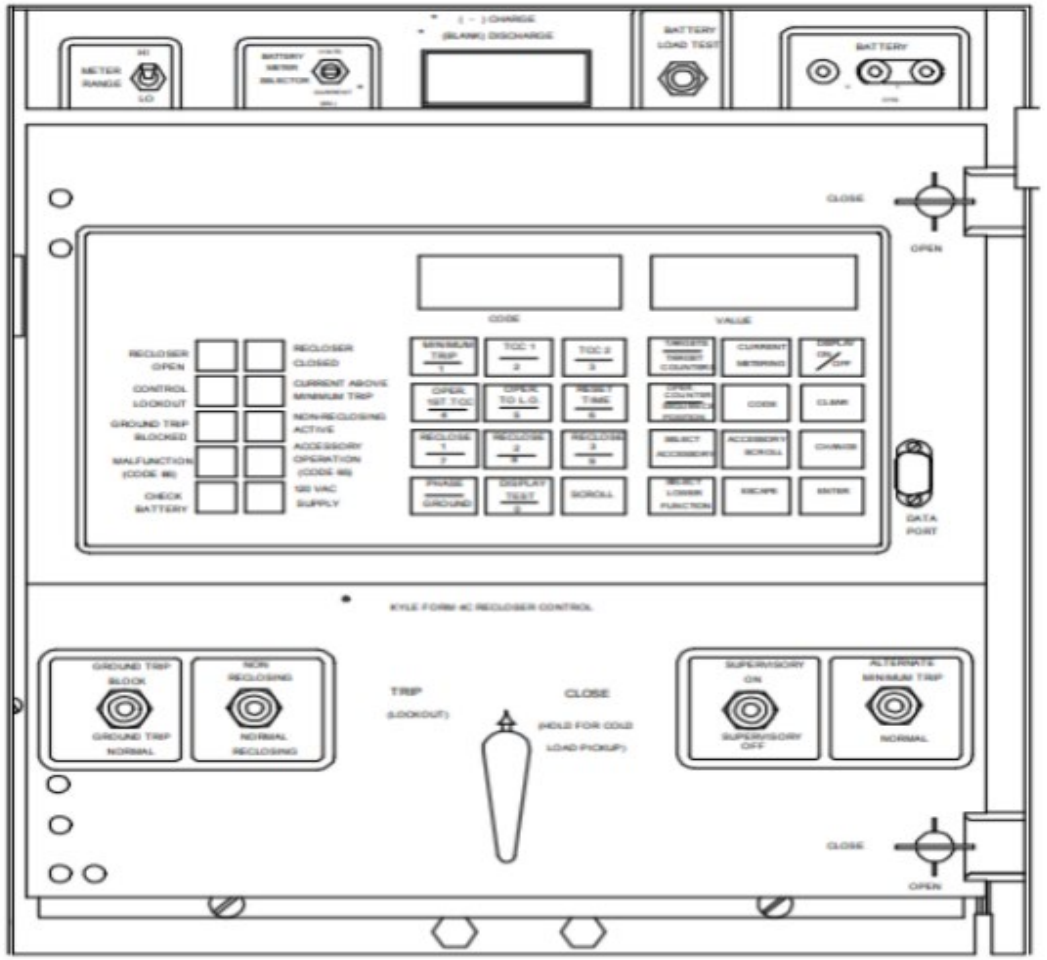


Cooper 4C

To Open the Recloser:

- Turn the main operating handle on the lower panel of the control to “TRIP”. The red position indicator, located under the sleet hood of the recloser, will move down to the “OPEN” position. Verify that the recloser flag/indicator agrees with the control.

To Close the Recloser:

- Confirm that the yellow manual operating handle, on the recloser, is in the “UP” position.
- Turn the main operating handle on the lower panel of the control to “CLOSE”. The red position indicator, located under the sleet hood of the recloser, will move up.

Enable/Disable Local/Remote (Supervisory):

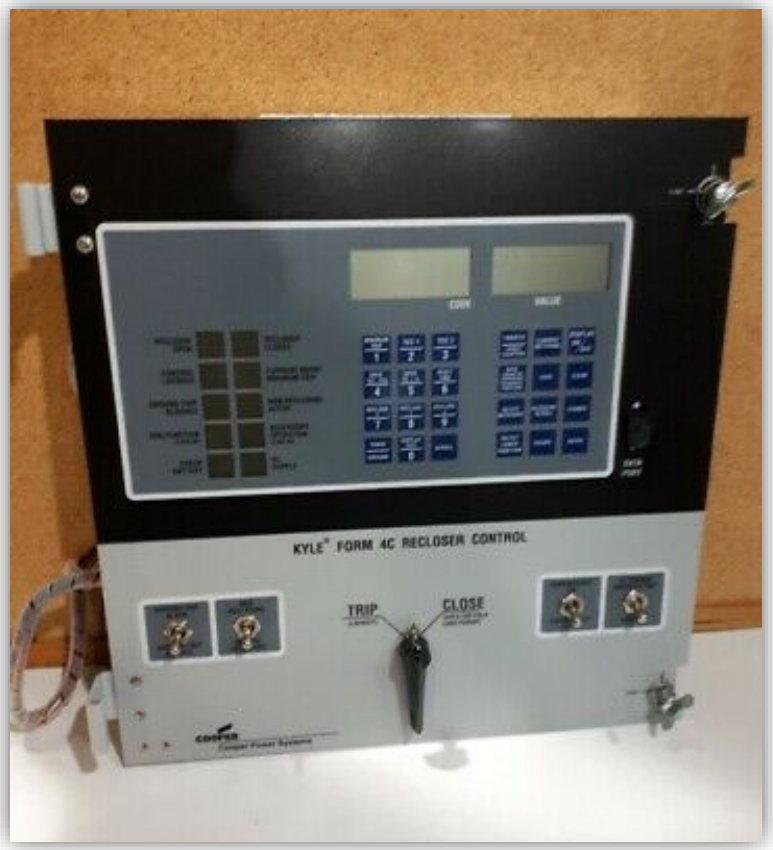
- Move the Supervisory toggle switch, located on the bottom, right panel of the control, to the “Down” position to turn supervisory off.
- To enable Supervisory, move the toggle switch to the “Up” Position.

Enable/Disable Non-Reclosing:

- Move the Non-Reclosing toggle switch, located on the bottom, left panel of the control, to the “Up” position to enable “NON RECLOSING”. When active, an indicator light will illuminate.
- To return the recloser to normal operation, move the toggle switch to the “Down” Position.

Enable/Disable Ground Trip Block:

- Move the Ground Trip toggle switch, located on the bottom, left panel of the control, to the “Up” position to enable ground trip block.
- To return the recloser to normal operation, move the toggle switch to the “Down” Position.



Cooper 3A

- This guide is to only be utilized by trained and authorized personnel. It is only intended to serve as a guide for common Operations.

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- All Appropriate Personal Protective Equipment identified in the Eversource Safety Manual and Work Rules shall be complied with.

- Rev 1, 02/24/2021
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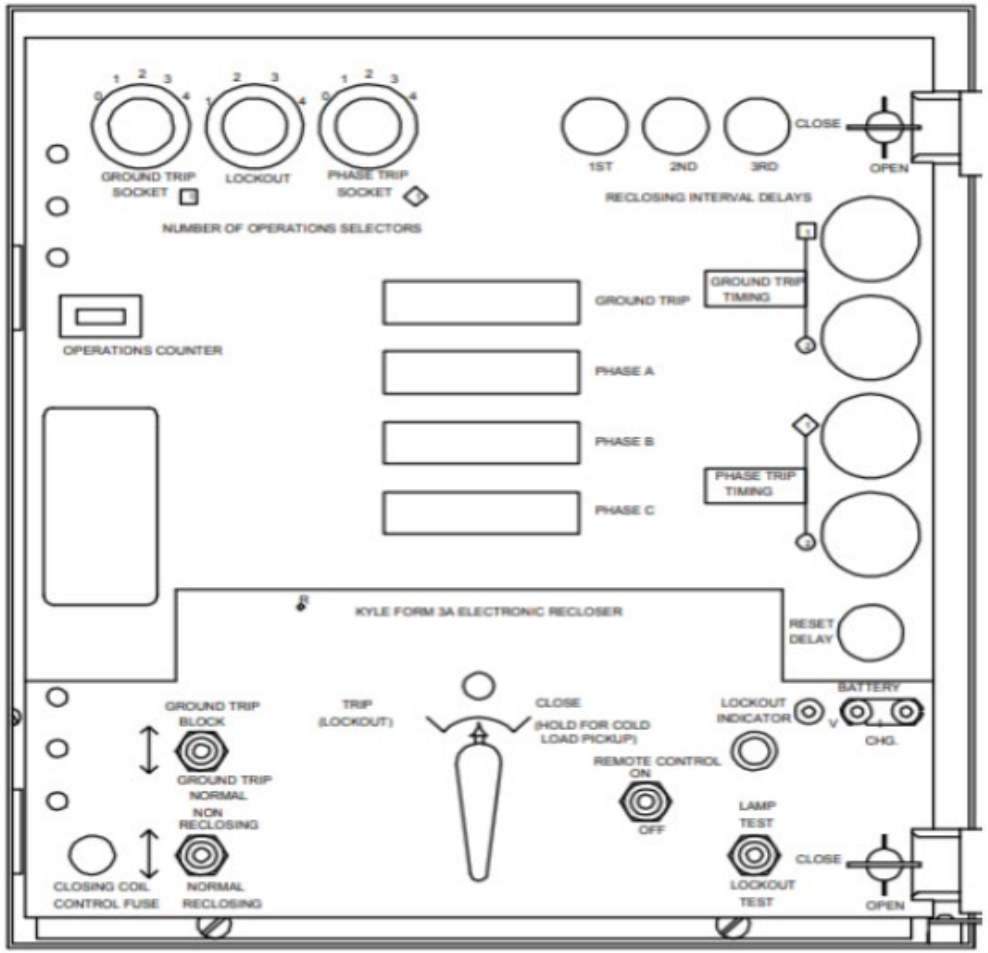
EVERSOURCE



Cooper 3A

To Open the Recloser:

- Turn the main operating handle on the lower panel of the control to “TRIP”. The red position indicator, located under the sleet hood of the recloser, will move down to the “OPEN” position. Verify that the recloser flag/indicator agrees with the control.

To Close the Recloser:

- Confirm that the yellow manual operating handle, on the recloser, is in the “UP” position.
- Turn the main operating handle on the lower panel of the control to “CLOSE”. The red position indicator, located under the sleet hood of the recloser, will move up.

Enable/Disable Local/Remote (Supervisory):

- Move the Supervisory toggle switch, located on the bottom, right panel of the control, to the “Down” position to turn supervisory off.
- To enable Supervisory, move the toggle switch to the “Up” Position.

Enable/Disable Non-Reclosing:

- Move the Non Reclosing toggle switch, located on the bottom, left panel of the control, to the “Up” position to enable “NON RECLOSING”.
- To return the recloser to normal operation, move the toggle switch to the “Down” Position.

Enable/Disable Ground Trip Block:

- Move the Ground Trip toggle switch, located on the bottom, left panel of the control, to the “Up” position to enable ground trip block.
- To return the recloser to normal operation, move the toggle switch to the “Down” Position.

Eversource Fusing Guide

EMA North Fusing Guide

8.0/13.8 kV TRANSFORMER FUSING

SINGLE-PHASE

	Overhead Fused		BAY-O-NET	
1 PH kVA	Fuse	Item No.	Fuse	Item No.
15	6K	504268	3A D.S.	577189
25	6K	504268	6A D.E.	574177
37.5	6K	504268	12A D.E.	574182
50	10K	520739	15A D.E.	593582
75 - 100	15K	520740	25A D.E.	574178
167	30K	520742	50A D.E.	574179
250 - 333	-	-	65A C.S.	574279
500	-	-	100A C.S.	574181
667	-	-	140A C.S.	574180
833	-	-	125A H.A.O.	520607

THREE-PHASE

	Overhead Fused		BAY-O-NET	
3 PH kVA	Fuse	Item No.	Fuse	Item No.
45	6K	504268	3A D.S.	577189
75	-	-	6A D.E.	574177
112.5	6K	504268	12A D.E.	574182
150 - 225	10K	520739	15A D.E.	593582
300	15K	520740	25A D.E.	574178
500	20K	574076	50A D.E.	574179
750	30K	520742	65A C.S.	574279
1000	40K	520724	65A C.S.	574279
1500	65K	520745	100A C.S.	574181
2000	80K	520746	140A C.S.	574181
2500	100K	520747	125A H.A.O.	520607

NOTES
D.E. - Dual Element
D.S. - Dual Sensing
C.S. - Current Sensing
H.A.O. - High Amp Overload

2.4/4.0 kV TRANSFORMER FUSING

SINGLE-PHASE

	Overhead Fused		BAY-O-NET	
1 PH kVA	Fuse	Item No.	Fuse	Item No.
10	6K	504268	-	-
15	10K	520739	-	-
25	15K	520740	25A D.E.	574178
37.5	20K	574076	40A D.E.	591587
50	30K	520742	50A D.E.	574179
75	40K	520724	-	-
100	50K	520744	65A C.S.	574279
167	80K	520746	140A C.S.	574180

THREE-PHASE

	Overhead Fused		BAY-O-NET	
3 PH kVA	Fuse	Item No.	Fuse	Item No.
75	-	-	25A D.E.	574178
112.5	-	-	40A D.E.	591587
150	-	-	50A D.E.	574179
225	30K	520742	-	-
300	40K	520724	65A C.S.	574279
500	65K	520745	140A C.S.	574180
750	100K	520747	-	-
1000	140K	574082	-	-

NOTES
D.E. - Dual Element
D.S. - Dual Sensing
C.S. - Current Sensing
H.A.O. - High Ampere Overload

EMA North Fusing Guide

8.0/13.8 kV PADMOUNT/UG TRANSFORMER FUSING

SINGLE-PHASE

1 PH kVA	Externally Fused NX (Arc Strangled) Fuse	Item No.	Canister Fused Fuse	Item No.
25	-	-	6C	574033
50	-	-	18C	574034
75 - 100	25C	574122	30C	574035
167	35C	574123	40C	574036

THREE-PHASE

3 PH kVA	Externally Fused NX (Arc Strangled) Fuse	Item No.	Canister Fused Fuse	Item No.
112.5	10C	574071	10C	574037
150 - 225	12C	574125	12C	574133
300	25C	574122	25C	574038
500	30C	574126	40C	574039
750	50C*	574089	-	-
1000	60C*	574084	-	-
1500	80C*	574085	-	-
2000	130C**	574087	-	-
2500	160C**	574088	-	-

* = NX fuse rating achieved by mounting two smaller NX units in parallel hinge-style mounting

**= NX fuse rating achieved by mounting two smaller NX units in parallel clip mounted holders

600 Amp Switch
Fusing for 15.5 kV

Fuse	Item No.
30*	574092
50	574091
65	574087
80	574088

*: Use with fuse extender 573997

STEP-DOWN

1 PH kVA	Config.	High Side	Low Side
50	Y-Y	10K	-
100	Y-Y	15K	-
167	Y-Y	30K	-
250	Y-Y	30K	-
333	Δ-Y *	Three phase recloser	Three phase recloser
333	Y-Y	40K	-
500	Δ-Y *	Three phase recloser	Three phase recloser
500	Y-Y	65K	-

NOTE: Δ-Y units require three phase protection

Type "E" 15kV Power Fuses for PME-9

Fuse	Item No.
10E	577049
20E	577050
40E	577051
65E	577052
80E	577053
125E	577054
150E	577055
200E	577056

Capacitor Banks

Voltage	Size (KVAR)	Fuse	Item No.
4 kV	135	20K	574076
	150	30K	520742
	180	30K	520742
	300	50K	520744
	450	65K	520745
13.8 kV	450	30K	520742
	600	30K	520742
	900	50K	520744
	1200	50K	520744
	1350	65K	520745
	1500	80K	520746

Line Fusing K Link Fuses

Fuse	Item No.
6K	504268
10K	520739
15K	520740
20K	574076
30K	520742
40K	520724
50K	520744
65K	520745
80K	520746
100K	520747
140K	574082

2.4/4.0 kV PADMOUNT/UG TRANSFORMER FUSING

SINGLE-PHASE

1 PH kVA	Externally Fused NX (Arc Strangled) Fuse	Item No.	Canister Fused Fuse	Item No.
25	-	-	25C	574030
50	25C	574120	45C	574031
75	25C	574120	-	-
100	60C	574121	100C	574032
167	100C	574069	100C	574032
250	130C	574089	-	-

THREE-PHASE

3 PH kVA	Externally Fused NX (Arc Strangled) Fuse	Item No.	Canister Fused Fuse	Item No.
75	-	-	25C	574030
150	25C	574120	45C	574031
225	25C	574120	-	-
300	60C	574121	100C	574032
500	100C	574069	100C	574032
750	130C	574089	-	-

EMA South Fusing Guide

Grounded Y System - PADMOUNT TRANSFORMER FUSING

**3,740 Grd Y, 2,160 L-N
4,160 Grd Y, 2,400 L-N**

1 PH KVA	3 PH KVA	Fuse
25	75	25A D.E.
37.5	112.5	40A D.E.
50	150	50A D.E.
100	300	65A C.S.
167	500	140A C.S.
250	750	140A C.S.

**7,620 Grd Y, 4,400 L-N
8,320 Grd Y, 4,800 L-N**

1 PH KVA	3 PH KVA	Fuse
25	75	12A D.E.
50	150	25A D.E.
100	300	50A D.E.
167	500	65A C.S.
250	750	100A C.S.

600 Amp Switch Fusing for 25kV

Fuse	Item No.
15E	579611
25E	579612
40E	578999
65E	579000
80E	579001
125E	521157
100C	574032

13,200 Grd Y, 7,620 L-N

1 PH KVA	3 PH KVA	Fuse
25	75	6A D.E.
37.5	112.5	12A D.E.
50	150	15A D.E.
75	225	25A D.E.
100	300	25A D.E.
167	500	50A D.E.
250	750	65A C.S.
333	1000	65A C.S.
500	1500	100A C.S.
667	2000	140A C.S.
833	2500	125A H.A.O.

22,860 Grd Y, 13,200 L-N

1 PH KVA	3 PH KVA	Fuse
25	75	3A D.S.
37.5	112.5	6A D.E.
50	150	8A D.E.
75	225	12A D.E.
100	300	15A D.E.
167	500	25A D.E.
250	750	40A D.E.
333	1000	50A D.E.
500	1500	65A C.S.
667	2000	100A C.S.
833	2500	140A C.S.

Grounded Y System - OVERHEAD TRANSFORMER FUSING

**3,740, 4,160 Grd Y
2,160, 2,400 L-N**

1 PH kVA	3 PH kVA	Fuse	CLF
10	30	6T	12
15	45	10T	25
25	75	15T	25
37.5	112.5	25T	40
50	150	25T	40
75	225	40T	-
100	300	65T	-
167	500	100T	-
250	750	140T	-
333	1000	140T	-

**7,620, 8,320 Grd Y
4,400, 4,800 L-N**

1 PH kVA	3 PH kVA	Fuse	CLF
10	30	3T	12
15	45	6T	12
25	75	6T	12
37.5	112.5	10T	25
50	150	15T	25
75	225	15T	25
100	300	25T	40
167	500	40T	-
250	750	65T	-
333	1000	100T	-

**13,200 Grd Y
7,620 L-N**

1 PH kVA	3 PH kVA	Fuse	CLF
10	30	3T	12
15	45	3T	12
25	75	6T	12
37.5	112.5	6T	12
50	150	10T	12
75	225	15T	25
100	300	15T	25
167	500	25T	40
250	750	40T	-
333	1000	65T	-
500	1500	100T	-
667	2000	100T	-
833	2500	140T	-

**22,860 Grd Y
13,200 L-N**

1 PH kVA	3 PH kVA	Fuse	CLF
10	30	3T	12
15	45	3T	12
25	75	3T	12
37.5	112.5	6T	12
50	150	6T	12
75	225	6T	12
100	300	10T	12
167	500	15T	25
250	750	25T	40
333	1000	40T	-
500	1500	40T	-
667	2000	65T	-
833	2500	100T	-

Eastern MA South Fusing

CAPACITOR BANK FUSING			
KVAR	System Voltage (kV)	kVAR Per Phase	Fuse
150	4.16/2.4	1-50	30K
300	4.16/2.4	1-100	50K
450	4.16/2.4	1-150	65K
1800	13.2/7.62	3-200	80K
600	13.2/7.62	1-200	30K
1350	13.2/7.62	3-150	65K
600	22.8/13.2	1-200	20K
1800	22.8/13.2	3-200	50K

LINE FUSING	
Fuse	Item No.
3T	520718
6T	520730
10T	520748
15T	520749
25T	520750
40T	520751
65T	576386
100T	520753
140T	576387

CLF (K-Mate)	
15 kV K-Mate	
FUSE	Item No.
12K/8T	576133
25K/15T	576134
40K/25T	576135
25kV K-Mate	
FUSE	Item No.
12K/8T	576086
25K/15T	576087
40K/25T	536187

Bay-O-Net	
FUSE	Item No.
3A DS	577189
6A DE	574177
8A DS	577190
12A DE	574182
15A DE	593582
25A DE	574178
40A DE	591587
50A DE	574179
65A CS	574278
100A CS	574181
140A CS	574180
125A HAO	520607

DELTA SYSTEM TRANSFORMER FUSING

OVERHEAD			
Open Delta			
2 PH kVA	3 PH kVA	2,400 Fuse	4,800 Fuse
10	2-10	6T	3T
15	2-15	10T	6T
25	2-25	15T	6T
37.5	2-37.5	25T	10T
50	2-50	40T	15T
75	2-75	40T	25T
100	2-100	65T	40T
167	2-167	100T	65T

OVERHEAD			
Three Phase Closed Delta			
2 PH kVA	3 PH kVA	2,400 Fuse	4,800 Fuse
10	30	15T	6T
15	45	15T	10T
25	75	25T	15T
37.5	112.5	40T	25T
50	150	65T	25T
75	225	100T	40T
100	300	100T	40T
167	500	140T	100T

PADMOUNT			
(Bay-O-Net Fused)			
1 PH kVA	3 PH kVA	2,400 Fuse	4,800 Fuse
25	75	15A DE	6A DE
50	150	25A DE	15A DE
75	225	50A DE	25A DE
100	300	50A DE	25A DE
167	500	65A CS	50A DE

STEP-DOWN FUSING

Two to One (4,800/2,400 Step-Down)			
kVA	Primary Fuse	New Secondary Fuse	Old Secondary *See Note
25	6T	None	6T
50	15T	None	15T
75	25T	None	25T
100	25T	None	25T
167	40T	None	40T
Two and Three Quarters to One (13,200/4,800 Step-Down)			
kVA	Primary Fuse	New Secondary Fuse	Old Secondary *See Note
50	6T	None	10T
75	6T	None	10T
100	15T	None	25T
167	25T	None	40T
250	25T	None	65T
333	40T	None	-
Five and a Half to One (13,200/2,400 Step-Down)			
kVA	Primary Fuse	New Secondary Fuse	Old Secondary *See Note
50	6T	None	15T
75	10T	None	25T
100	10T	None	25T
167	15T	None	65T
250	25T	None	65T
333	40T	None	-

STEP-UP FUSING

Two to One (2,400/4,800 Step-Up)			
kVA	Primary Fuse	New Secondary Fuse	Old Secondary *See Note
25	15T	None	6T
50	40T	None	8T
75	40T	None	10T
100	65T	None	20T
167	100T	None	25T
Two and Three Quarters to One (4,800/13,200 Step-Up)			
kVA	Primary Fuse	New Secondary Fuse	Old Secondary *See Note
50	25T◄	None	3T
75	25T◄	None	6T
100	25T◄	None	10T
167	40T	None	10T
250	65T	None	15T
Five and a Half to One (2,400/13,200 Step-Up)			
kVA	Primary Fuse	New Secondary Fuse	Old Secondary *See Note
50	25T	None	3T
75	40T	None	6T
100	65T	None	6T
167	100T	None	10T
250	140T	None	15T

◄ - Denotes: Minimum fusing of a 40T link is mandatory on the Primary side of the Step-up when feeding a URD system.

Western MA Fusing Guide

MA **Fuse Sizes for Overhead Transformers Type T Fuse Links**

Single Phase				
Transformer Rating kVA	13200 V	7620 V 7970 V	4800 V	2400 V
1	6	6	6	6
10 – Note 4	6	6	6	15
15 – Note 4	6	6	6	15
25	6	6	6	15
37.5	6	10	15	30
50	6	10	15	30
75	10	15	30	50
100	15	30	30	65
167	30	50	50	80

Three Phase						
Transformer Rating kVA	23000 V	13200 V 13800 V	8320 V	4800 V	4160 V	2400 V
75	6	6	6	15	15	30
150	6	10	15	30	30	50
225	10	30	30	50	50	65
300	15	30	30	50	65	100
500	30	50	50	80	100	—

CT/WMA Stepdown Fusing Guide

Note: Cutouts should be installed one section away from the transformer.

Transformer Source Side Fuse						Transformer Load Side Fuse	
Circuit Voltage		13.2Y/7.6 or 13.8Y/7.9		22.9Y/13.2		4.16Y/2.4	
1Ø kVA	3Ø Bank kVA	K	T	K	T	K	T
50	150	15	25	10	15	30	40
100	300	30	40	30	25	65	65
167	500	65	65	30	40	100	100
250	750	100	100	65	65	140	140
333	1000	65	65	50/40**	40	400*	400*
500	1500	100	100	65	65	400*	400*
Circuit Voltage		13.2Y/7.6 or 13.8Y/7.9		22.9Y/13.2		4.8 Δ	
3Ø Bank kVA		K	T	K	T	K	T
150		15	15	10	10	30	40
300		30	40	30	25	65	65
500		65	65	65	65	100	100
750		100	100	65	65	140	140
1000		100	100	65	65	140	140
1500		100	100	65	65	400*	400*
Circuit Voltage		13.2Y/7.6 or 13.8Y/7.9		22.9Y/13.2		4.8 Δ 1Ø or 8.3Y/4.8	
1Ø kVA	3Ø Bank kVA	K	T	K	T	K	T
50	150	15	15	10	10	15	15
100	300	30	25	15	15	30	25
167	500	65	65	50/40**	40	65	65
250	750	65	65	50/40**	40	65	65
333	1000	100	100	65	65	100	100
500	1500	140	140	100	100	140	140
Circuit Voltage				22.9Y/13.2		13.2Y/7.6 or 13.8Y/7.9	
1Ø kVA		3Ø Bank kVA		K	T	K	T
50		150		10	10	10	10
100		300		30	25	30	25
167		500		30	40	30	40
250		750		50	40	50	40
333		1000		65	65	65	65
500		1500		100	100	100	100

Note: Cutouts should be installed one section away from the transformer.

Transformer Source Side Fuse								Transformer Load Side Indicator	
Circuit Voltage	4.16Y/2.4		8.3Y/4.8 or 4.8 Δ		13.2Y/7.6 or 13.8Y/7.9			13.2Y/7.6 or 13.8Y/7.9	22.9Y/13.2
1Ø kVA	K	T	K	T	K	T			
50	30	40	15	15	10	10		50	—
100	65	65	30	40	30	25		50	50
167	100	100	65	65	30	40		50	50
250	140	140	65	65	50	40		100	50
333	—	—	100	100	65	65		100	100
500	—	—	140	140	100	100		200	100
Circuit Voltage	4.16Y/2.4		4.8 Δ		8.3Y/4.8		13.2Y/7.6 or 13.8Y/7.9	13.2Y/7.6 or 13.8Y/7.9	22.9Y/13.2
3Ø Bank kVA	K	T	K	T	K	T	K T		
150	30	40	30	25	15	15	10 10	50	—
300	65	65	65	65	30	40	30 25	50	50
500	100	100	100	100	65	65	30 40	50	50
750	140	140	140	140	65	65	50 40	100	100
1000	—	—	140	140	100	100	65 65	100	100
1500	—	—	—	—	140	140	100 100	200	100

Connecticut Fusing Guide

Fuse Sizes for Overhead Transformers Type K Fuse Links

Single Phase				
Transformer Rating kVA	13200 V	7620 V 7970 V	4800 V	2400 V
1	6	6	6	6
10 – Note 4	6	6	6	6
15 – Note 4	6	6	6	10
25	6	6	6	15
37.5	6	6	15	30
50	6	10	15	30
75	10	15	30	50
100	15	30	30	65
167	30	50	50	80

CT **Fuse Sizes for Overhead Transformers Type K Fuse Links**

Three Phase					
Transformer Rating kVA	23000 V	13200 V 13800 V	8320 V	4800 V	4160 V
75	6	6	6	15	15
112.5	6	6	15	30	30
150	6	10	15	30	30
225	10	30	30	50	50
300	15	30	30	50	65
500	30	50	50	80	100

New Hampshire Fusing Guide

Overhead Conventional Transformer Type T-Fuse Links

NH												
Single Phase												
Transformer Rating kVA	2400 V		3300 V		4800 V		7200 V		12000 V 13200 V		19920 V See NOTE 2	
	Std	Alt	Std	Alt	Std	Alt	Std	Alt	Std	Alt	Std	Alt
10	6	6	6	6	3	6	3	6	3	6	3	6
15	8	10	6	6	6	6	3	6	3	6	3	6
25	15	15	10	10	6	6	6	6	3	6	3	6
37.5	20	25	15	15	10	10	6	6	6	6	3	6
50	30	40	20	25	15	15	10	10	6	6	3	6
75	40	40	30	25	20	25	15	15	8	6	6	6
100	50	65	40	40	30	25	20	15	10	10	6	6
167	—	—	—	—	—	—	30	25	15	15	10	10
250	—	—	—	—	—	—	50	40	25	25	15	15
333	—	—	—	—	—	—	65	65	30	40	20	25
500	—	—	—	—	—	—	100	100	50	40	30	40
Three Phase												
Phase to Phase System Volts	2400 V		3300 V		4160 V		7200 V		12470 V 13200 V		34500 V	
Transformer Rating kVA/ Connection	2400 Δ		3300 Δ		2400V Y		7200 Δ		7200Y 12000 Δ 13200 Δ		19920Y See NOTE 2	
	Std	Alt	Std	Alt	Std	Alt	Std	Alt	Std	Alt	Std	Alt
30	10	10	8	6	6	6	3	6	3	6	3	6
45	15	15	12	10	8	10	6	6	3	6	3	6
75	25	25	20	15	15	15	8	10	6	6	3	6
112.5	40	40	25	25	20	25	12	10	6	6	3	6
150	50	40	30	40	30	40	15	15	10	10	3	6
225	65	65	65	65	40	40	25	25	15	15	6	6
300	100	100	65	65	50	65	30	25	20	15	6	6
450	140	140	100	100	80	100	50	40	25	25	—	—
500	140	140	100	100	100	100	50	65	30	25	10	10
600	200	200	140	140	100	100	65	65	30	40	—	—
750	—	—	—	—	—	—	—	—	50	40	15	15
1000	—	—	—	—	—	—	—	—	65	65	20	25
1500	—	—	—	—	—	—	—	—	80	100	30	40
2000	—	—	—	—	—	—	—	—	100	100	50	40
2500	—	—	—	—	—	—	—	—	140	140	50	65

Conventional Transformers and Backup Partial Range Current Limiting Fuses–NH Only

System Voltage	Conventional Trans Max Fuse Size	CLF Voltage Rating	CLF Current Rating	Stock Code
7.2 / 12.47 kV	8 T	8.3 kV	12 A	520637
	15 T		25 A	520629
	25 T		40 A	520630
	30 T		65 A	520632
	50 T		80 A	520631
19.9 / 34.5 kV	8 T	23 kV	12 A	520633
	15 T		25 A	503701
	20 T		40 A	520635
	25 T		40 A	520635
	30 T		65 A	520634
	40 T		80 A	520638

CPS Transformers and Backup Partial Range Current Limiting Fuses–NH Only

System Voltage	CSP Transformer Rating kVA	CLF Voltage Rating	CLF Current Rating	Stock Code
19.9 / 34.5 kV	10 – 37.5	23 kV	12 A	520633
	50 – 100		25 A	503701
	167 – 250		40 A	520635

CPS Transformers and Backup Partial Range Current Limiting Fuses–NH Only

System Voltage	CSP Transformer Rating kVA	CLF Voltage Rating	CLF Current Rating	Stock Code
2.16 / 3.741 2.4 / 4.16 kV	10	8.3 kV	6 A	520681
	15		10 A	520672
	25 – 37.5		20 A	520673
	50		30 A	520674
	75		40 A	520675
	100		65 A	520676
4.8 / 8.3 kV	10 –15	8.3 kV	6 A	520681
	25		10 A	520672
	37.5 – 50		20 A	520673
	75		30 A	520674
	100		40 A	520675
7.2 / 12.47 kV	10 – 15	8.3 kV	3 A	520680
	25		6 A	520681
	37 – 50		10 A	520672
	75		20 A	520673
	100		30 A	520674
	167		40 A	520675