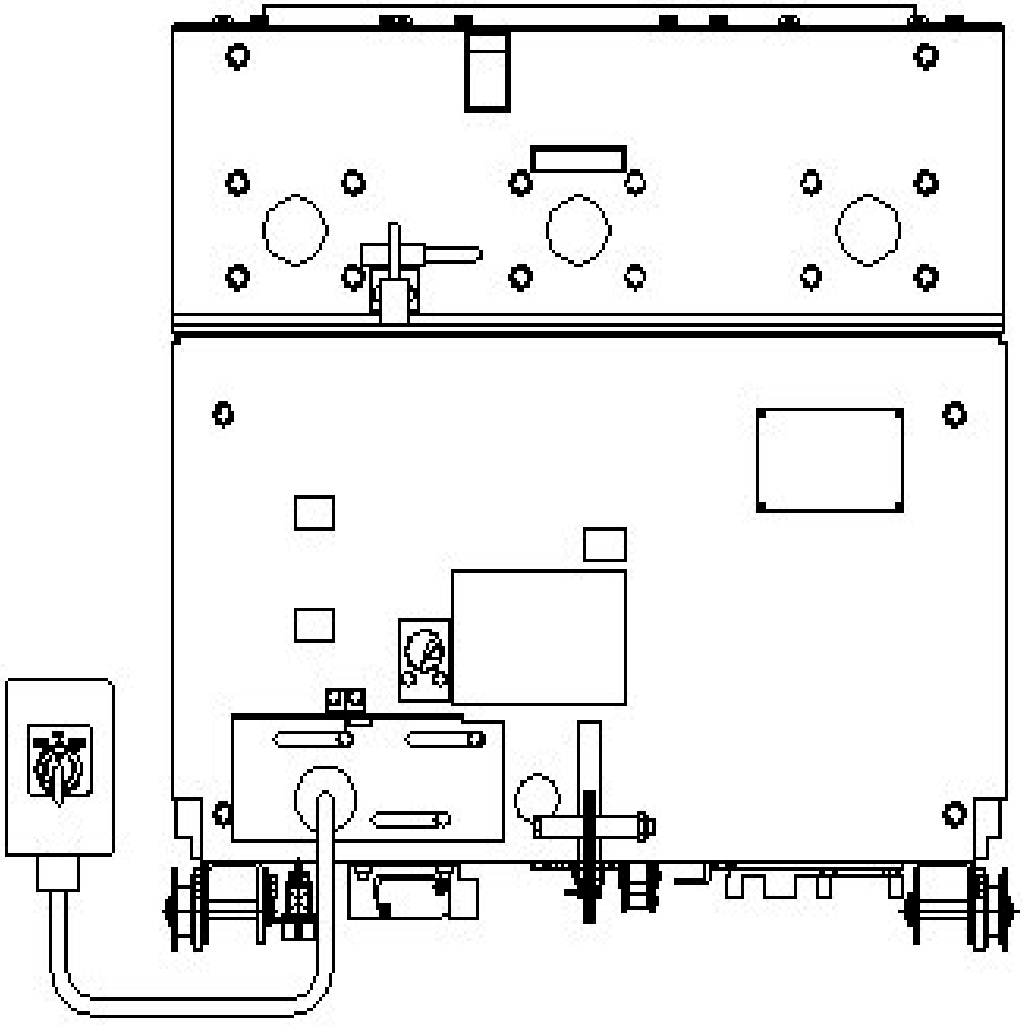

Cutler-Hammer, Inc.
1000 Cherrington Parkway
Moon Twp., PA 15108

Effective April 1, 1999

Type VCP-W

ELECTRICAL GROUND AND TEST DEVICE (Simple)

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TYPE VCP-W ELECTRICAL GROUND & TEST DEVICE (SIMPLE)

PURPOSE

The VCP-W Electrical Ground and Test Device is designed for insertion into a Vac Clad-W switchgear compartment to provide a safe and convenient means to:

1. Ground the circuit for maintenance work
2. Apply potential for cable testing
3. Provide access to line circuits for “Phasing Out” tests.

CAUTION: Because of the unique application and vast variety of system/user requirements, specific operating procedures must be developed by the user.

DESCRIPTION:

Vac Clad-W switchgear is a two-high arrangement. In the lower compartment the top terminals normally connect to the main bus and the bottom terminals normally connect to the incoming line or feeders. In an upper compartment, the opposite normally holds true., the top terminals connect to the incoming line or feeders and the bottom terminals connect to the main bus. This must be verified for each application. Because of this two-high arrangement, there are two styles of the Electrical Ground and Test Device. In the lower compartment, the Electrical Ground and Test Device would normally provide connections to the bottom terminals, see Figure 1. In the upper compartment, the Electrical Ground and Test Device would normally provide connections to the top terminals, see Figure 2. Again, the bus arrangement must be verified for each application.

This device is longer than the standard VCP-W breaker. Therefore:

1. Electrical Ground and Test Device must be handled with extreme care while loading it on or removing it from the extension rails.

2. The extension rails cannot be engaged or disengaged with the device in the "Test" position – the device must be either removed or in the "Connected" position.

3. The device cannot be stored in a Vac Clad-W breaker compartment. It can only be stored in a storage compartment.

The stored energy closing mechanism for the power grounding switch is the same as used in the Type VCP-W breakers. It is capable of applying the ground against a "Live" circuit if operational errors have not cleared the circuit. However, in such a case, the relaying at the source of power is expected to cause the source interrupter to clear the **as THIS DEVICE HAS NO INTERRUPTING CAPABILITY.**

POWER GROUNDING SWITCH OPERATION:

CLOSING

The power grounding switch is closed by a control switch at the end of a 50ft. long cable (supplied with the device). The control switch is a spring-return type to the neutral (unlabeled) position. Upon turning the control switch to "Close" position (note that the control switch does not have to be held in the "Close" position):

1. The closing springs start to charge

2. After the springs are fully charged, they automatically discharge to close the switch contacts.

Once the ground switch is closed, it can be locked in the “Closed” position by removing the cable from the receptacle on the device and locking the sliding cover that permits access to the receptacle and manual “Push to Open” button.

OPENING

The grounding switch can be opened by manual operation of the “Push to Open” button, located behind the sliding cover on the device front panel, Figure 3. If electrical trip is provided at the control switch (not recommended), for safety reasons the switch is prevented from opening in less than 20 seconds after closing.

INTERLOCKS AND SAFETY FEATURES

The device is designed to provide as many interlocks and safety features as practical for the personnel performing any of the operations described earlier.

The device cannot be levered into or out of the “Connected” position unless the ground switch is open:

- Upon levering a device with a closed grounding switch into or out of the “Test” position, the switch is tripped open by the floor tripper in the compartment.

- In the “Connected” position, the levering crank is prevented from being engaged with the levering screw unless the grounding switch is tripped first.

- An indicator on the front panel shows the status of the ground switch contacts – “Open” or “Closed”, Figure 3.

- The grounding switch can be locked **closed** with a key interlock or padlock. This is accomplished by locking the sliding cover on the device panel to prevent access to the manual “Push to Open” button cable receptacle, Figure 3.

- The grounding switch cannot be manually closed. The spring charging socket and manual close button are both covered by the device front panel, Figure 3.

- The grounding switch can be closed only electrically by a control switch at the end of a 50ft. cable supplied with the device. Access to the manual close button is blocked by the device front panel.

- The power to operate the grounding switch in this device is obtained through the secondary disconnect in the breaker compartment.

- When electrical tripping is provided, (not recommend) the ground switch cannot be opened electrically in less than 20 seconds after closing, Figure 4. This feature permits the source interrupter to clear a fault if the grounding switch is inadvertently closed on an energized circuit **as THIS DEVICE HAS NO INTERRUPTING CAPABILITY.**

- The control switch cable is connected to the device with a twist lock connector.

- The test ports are always available for voltage checking.

- The test port shutter can be padlocked in the “Closed” position.

OPERATION

SAFE PRACTICES

Ground and test device is a safety-related device. It must be recognized that **IMPROPER USE CAN RESULT IN DEATH, SERIOUS PERSONAL INJURY, OR PROPERTY DAMAGE.** That is why it is most important that the user developed specific and safe operating procedures for its use.

The following general safe practices are recommended:

- THE DEVICE CANNOT BE STORED IN A VAC CLAD-W BREAKER COMPARTMENT. IT CAN ONLY BE STORED IN A STORAGE COMPARTMENT.

- Store the device in a clean, dry area free from dust, dirt, moisture, etc.

- Keep all insulating surfaces, which include primary support insulation and insulation barriers, clean and dry.

- Check all primary circuit connectors to make certain that they are clean and tight.

- Permit only authorized trained personnel to use this device.

- Take extreme care while using this device to avoid contacting “Live” or “Hot” (energized) terminals.

- Always close the grounding switch electrically from the farthest distance with the remote control switch.

- Do not remove the device front panel while using this device.

- Beofre inserting the device into the breaker compartment, **CORRECTLY IDENTIFY LINE AND BUS TERMINALS FOR THE BREAKER COMPARTMENT** and visually make certain that the correct Electrical Ground and Test Device is being used. The device should connect to the Line Terminals.

- Check the dielectric integrity at 27kV AC across terminals to ground with grounding switch open.

Typical procedures for use of this device are as follows:

(A) For Grounding

1. With the device out of the breaker compartment, **correctly identify Line and Bus Terminals for the Breaker Compartment** and visually make certain that the connections will be made to the Line Terminals.

2. Life the device and load it on to the extension rails of the breaker compartment with extreme care.

3. Push the device to the “Test” position as indicated by the crisp clicking sound of the levering latch engaging the levering nut.

4. Using the breaker levering crank, lever the device to the “Connected” position as indicated by the red flag appearing in front of and under the levering crank.

5. Unlock and open the test ports and test for “dead” circuit using correctly rated neon test stick or equivalent.

6. After the circuit is checked “dead” and made certain that it is maintained “dead”, connect the remote switch cable and close the grounding switch from the safest distance.

7. Padlock the ground switch closed by disconnecting the control switch cable and sliding the cover to the left. It may also be locked by an optional key lock K3, if provided, Figure 3).

(B) For Cable Testing

1. With the device out of the breaker compartment, **correctly identify Line and Bus Terminals for the Breaker Compartment** and visually make certain that the connections will be made to the Line Terminals.

2. Lift the device and load it on the extension rails of the switchgear compartment with extreme care.

3. Push the device to the “Test” position as indicated by the crisp clicking sound of the levering latch engaging the levering nut.

4. Using the breaker levering crank, lever the device to the “Connected” position as indicated by the red flag appearing in front of and under the levering crank.

5. Unlock and open the test ports and test for “dead” circuit using correctly rated neon test stick or equivalent.

6. After the circuit is checked “dead” and made certain that it is maintained “dead”, insert the insulated test probes into the Test ports. With the grounding switch open, apply the test voltage to the cables via the insulated test probes.

(C) For Phasing-Out

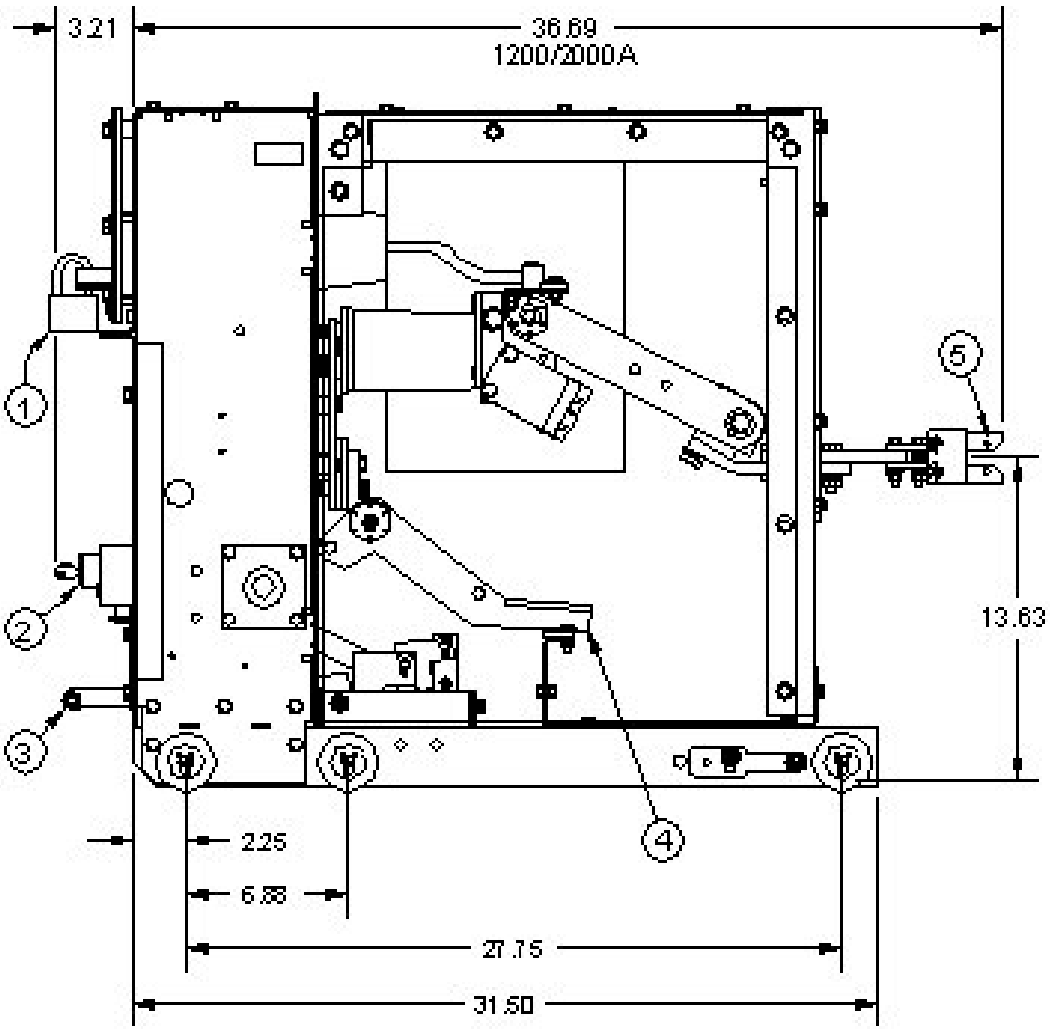
1. With the device out of the breaker compartment, **correctly identify Line and Bus Terminals for the Breaker Compartment** and visually make certain that the connections will be made to the Terminals.

2. Lift the device and load it onto the extension rails of the breaker compartment with extreme care.

3. Push the device to the “Test” position as indicated by the crisp clicking sound of the levering latch engaging the levering nut.

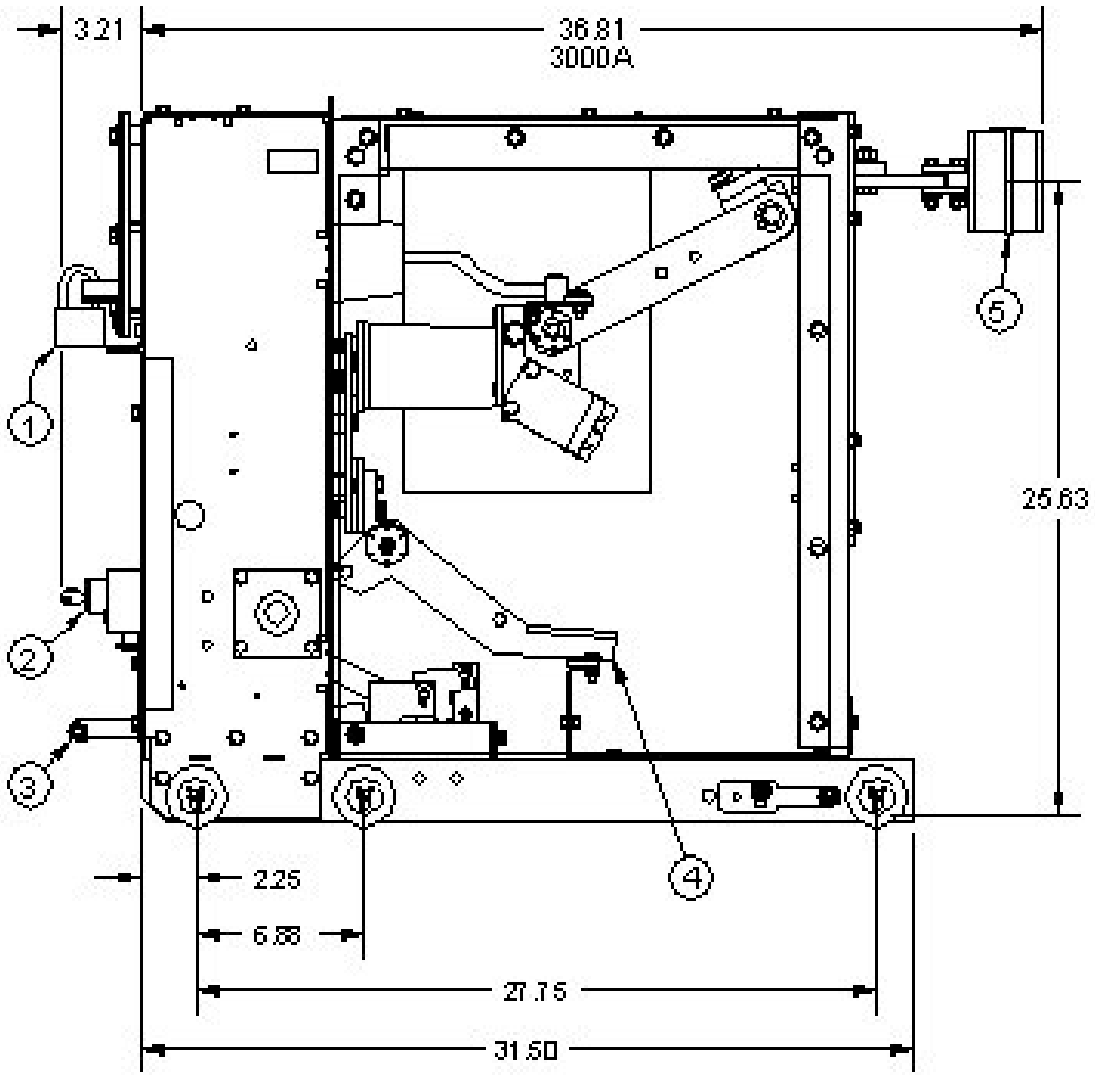
4. Using the breaker levering handle, lever the device to the “Connected” position as indicated by the red flag appearing in front of and under the levering crank.

5. Check the “Phasing Out” according to the specific customer’s operating procedure.



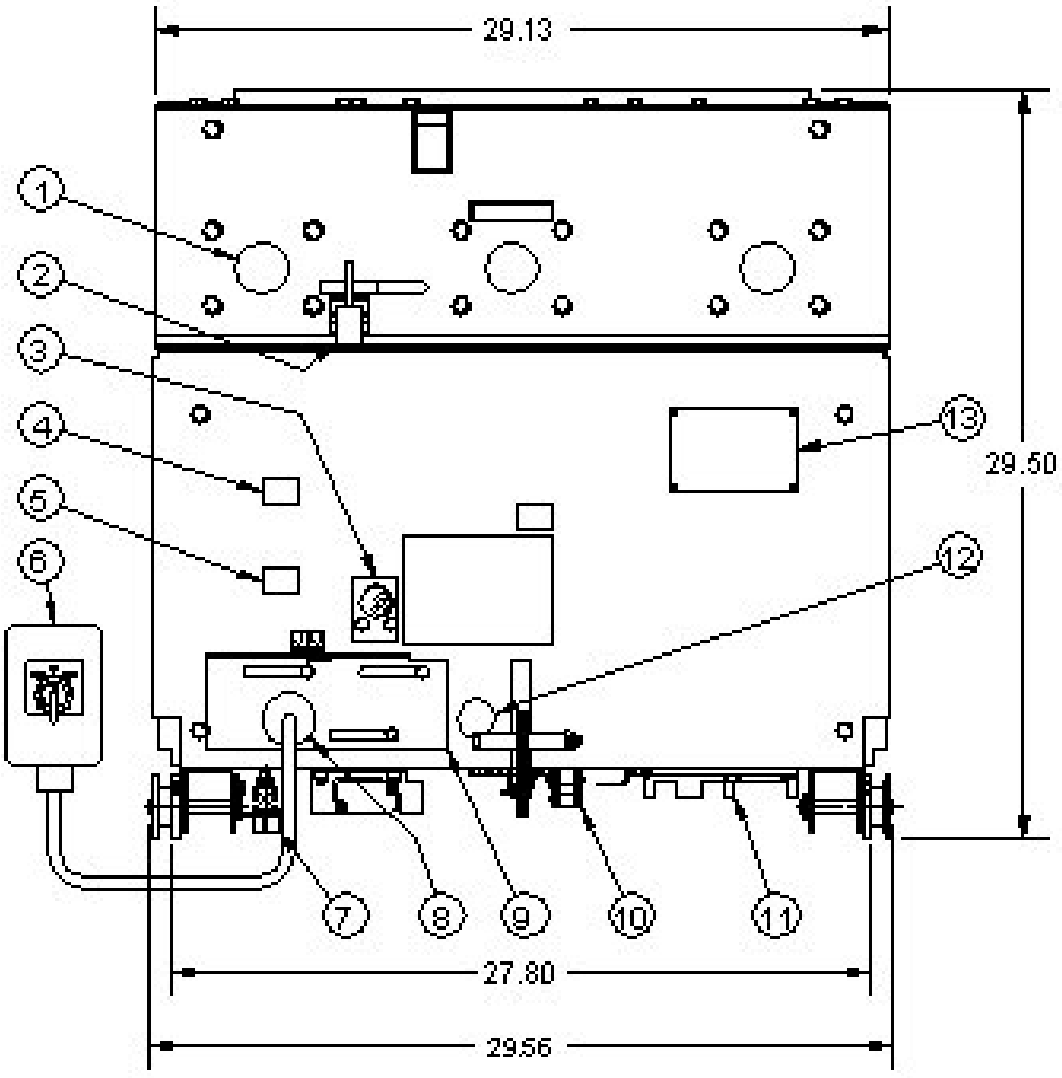
1. Terminal test ports padlock
2. Grounding switch operations key interlock
3. Lever latch handle
4. Grounding switch blade
5. Lower terminals (1200/2000A shown)

FIGURE 1 – SIDE VIEW – LOWER TERMINAL DEVICE



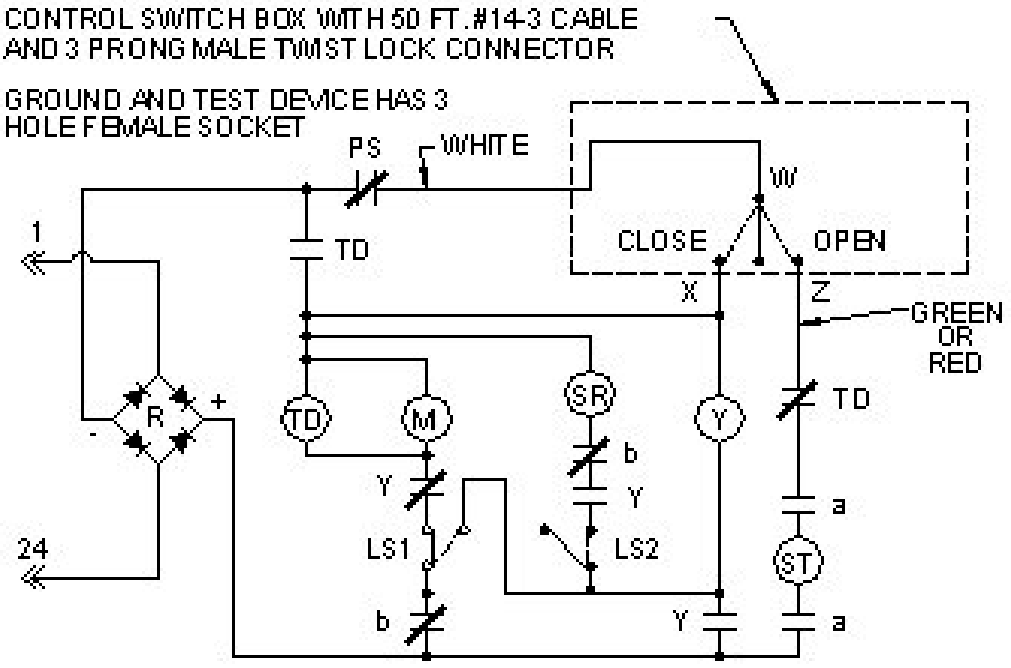
1. Terminal test ports padlock
2. Grounding switch operations key interlock
3. Lever latch handle
4. Grounding switch blade
5. Upper terminals (3000A shown)

FIGURE 2 – SIDE VIEW – UPPER TERMINAL DEVICE



1. Terminal Port
2. Terminal test ports padlock
3. Grounding switch operation interlock
4. Operations Counter
5. Grounding switch position indicator
6. Remote control switch
7. Ground contact
8. Remote control receptacle
9. Grounding switch access panel
10. Floor tripper
11. Code plate
12. Manual trip button
13. Rating plate

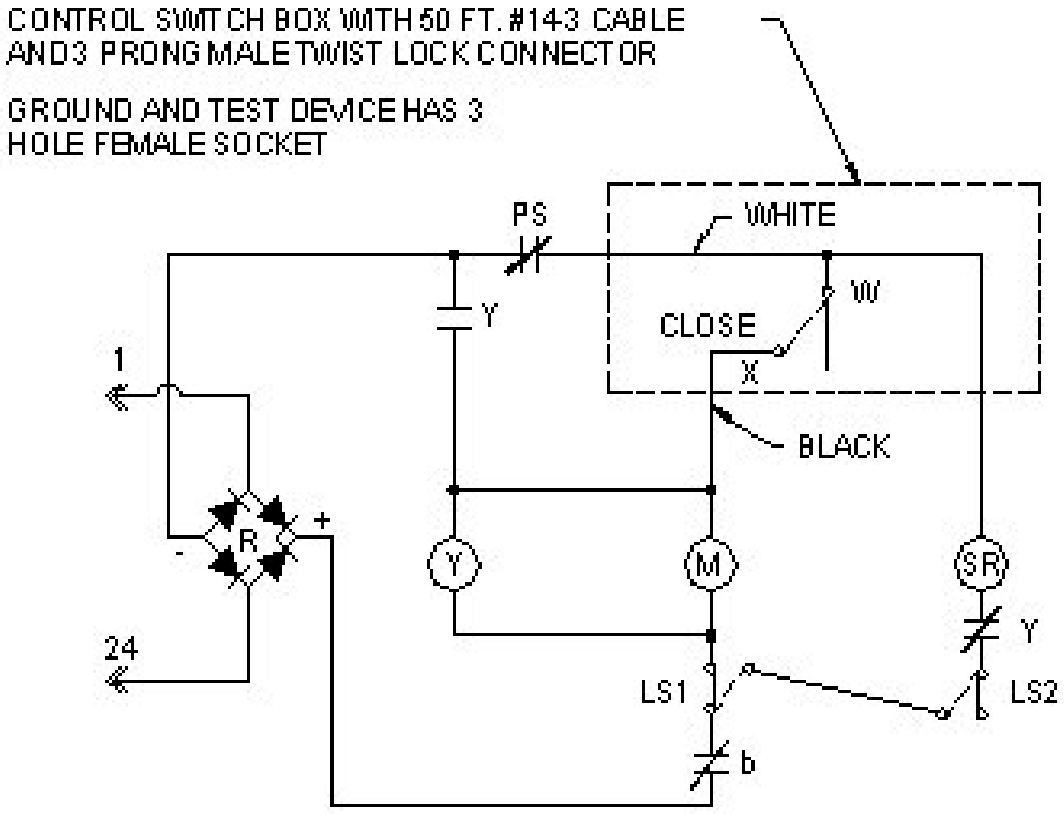
FIGURE 3 – FRONT VIEW



CS= CONTROL SWITCH
VERTICAL: NO CIRCUIT (SPRING RETURNE POSITION)
CW: CLOSE
CCW: TRIP

Y= ANTI PUMP RELAY
M= CHARGING MOTOR
LS= LIMIT SWITCH (SHOWN – SPRING DISCHARGED)
ST= SHUNT TRIP COIL
TD= TIME DELAY RELAY: SEALS IN TO COMPLETE CHARGING & CLOSING, 20 SECONDS DELAY ON DROPOUT, BLOCKS TRIPPING FOR 20 SECONDS AFTER CLOSING
a= AUXILIARY SWITCH CONTACT
b= AUXILIARY SWITCH CONTACT
SR= SPRING RELEASE COIL
R= BRIDGE RECTIFIER
PS= POSITION SWITCH (PREVENTS CHARGING BETWEEN “TEST: AND “CONNECTED” POSITIONS)

FIGURE 4 – CONTROL SCHEME – POWER TRIP



CS=	CONTROL SWITCH VERTICAL: NO CIRCUIT (SPRING RETURN POSITION) CCW: CHARGE & CLOSE
Y=	SEAL IN RELAY
M=	CHARGING MOTOR
LS=	LIMIT SWITCH (SHOWN – SPRING DISCHARGED)
SR=	SPRING RELEASE COIL
R=	BRIDGE RECTIFIER
PS=	POSITION SWITCH (PREVENTS CHARGING BETWEEN “TEST” AND “CONNECTED” POSITIONS
b=	AUXILIARY SWITCH CONTACT

FIGURE 5 – CONTROL SCHEME – MANUAL TRIP

NOTES

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