CL-7 Control Panel Retrofit Installation Instructions
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Eaton meets or exceeds all applicable industry standards relating to product safety in its Cooper Power™ series products. We actively promote safe practices in the use and maintenance of our products through our service literature, instructional training programs, and the continuous efforts of all Eaton employees involved in product design, manufacture, marketing, and service.

We strongly urge that you always follow all locally-approved safety procedures and safety instructions when working around high-voltage lines and equipment, and support our “Safety For Life” mission.

Safety information

The instructions in this manual are not intended as a substitute for proper training or adequate experience in the safe operation of the equipment described. Only competent technicians who are familiar with this equipment should install, operate, and service it.

A competent technician has these qualifications:

- Is thoroughly familiar with these instructions.
- Is trained in industry-accepted high- and low-voltage safe operating practices and procedures.
- Is trained and authorized to energize, de-energize, clear, and ground power distribution equipment.
- Is trained in the care and use of protective equipment such as arc flash clothing, safety glasses, face shield, hard hat, rubber gloves, clampstick, hotstick, etc.

Following is important safety information. For safe installation and operation of this equipment, be sure to read and understand all cautions and warnings.

Hazard Statement Definitions

This manual may contain four types of hazard statements:

DANGER
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

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

CAUTION
Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE
Indicates a potentially hazardous situation which, if not avoided, may result in equipment damage only.

Safety instructions

Following are general caution and warning statements that apply to this equipment. Additional statements, related to specific tasks and procedures, are located throughout the manual.

DANGER
Hazardous voltage. Contact with hazardous voltage will cause death or severe personal injury. Follow all locally-approved safety procedures when working around high- and low-voltage lines and equipment.

WARNING
Before installing, operating, maintaining, or testing this equipment, carefully read and understand the contents of this manual. Improper operation, handling, or maintenance can result in death, severe personal injury, and equipment damage.

WARNING
This equipment is not intended to protect human life. Follow all locally-approved procedures and safety practices when installing or operating this equipment. Failure to comply can result in death, severe personal injury, and equipment damage.

WARNING
Power distribution and transmission equipment must be properly selected for the intended application. It must be installed and serviced by competent personnel who have been trained and understand proper safety procedures. These instructions are written for such personnel and are not a substitute for adequate training and experience in safety procedures. Failure to properly select, install, or maintain power distribution and transmission equipment can result in death, severe personal injury, and equipment damage.
Product information

Introduction
This document provides the instructions for retrofitting an Eaton’s Cooper Power™ series CL-7 control panel on an Eaton, Siemens Corporation, General Electric, or Howard Industries, Inc. 32-step voltage regulator.

Read this manual first
Read and understand the contents of this manual and follow all locally approved procedures and safety practices before installing or operating this equipment. Read and understand the manuals detailing the installation and operation of the regulator and the regulator control used with the regulator. Refer to document MN225003EN, CL-7 Voltage Regulator Control Installation, Operation, and Maintenance Instructions for information on the CL-7 voltage regulator control. Refer to document MN225008EN, VR-32 Voltage Regulator with Quik-Drive™ Tap-Changer Installation, Operation, and Maintenance Instructions for information on Eaton’s voltage regulator with Quik-Drive tap-changer.

Additional information
These instructions cannot cover all details or variations in the equipment, procedures, or process described nor provide directions for meeting every possible contingency during installation, operation, or maintenance. For additional information, please contact your Eaton representative.

Acceptance and initial inspection
This kit is thoroughly inspected at the factory. It is in good condition when accepted by the carrier for shipment.

Upon receipt of the regulator kit, a thorough inspection should be made for damage, evidence of rough handling, or shortages. Should this initial inspection reveal evidence of rough handling, damage, or shortages, it should be noted on the bill of lading and a claim should immediately be made with the carrier. Also, notify your Eaton representative.

Handling and storage
Be careful during handling and storage of equipment to minimize the possibility of damage. If the regulator kit is not to be placed into immediate use, store the kit where the possibility of damage is minimized.

Quality standards
ISO 9001 Certified Quality Management System
CL-7 control in Eaton control box, dead front

Table 1. Kit parts identification

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part Number</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jumper, 7 terminals width</td>
<td>A613078004</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Backpanel tool, plastic*</td>
<td>A613098002</td>
<td>1</td>
</tr>
</tbody>
</table>

*Retain for future use.

Note: Eaton’s Universal PRA kit may include parts not required for every installation. Only parts required for this installation are included in this list.

Required tools
- Screwdriver (Phillips)
- Backpanel tool (included in kit)

Note: Verify all kit items are present before beginning installation procedure.

Installation procedure
Follow these instructions to install the CL-7 control in a control box on an Eaton’s Cooper Power series voltage regulator with a dead-front backpanel.

1. Remove the existing control:
   - Refer to the appropriate voltage regulator control manual for complete instructions on removing a control.
   - Refer to document MN225016EN, VR-32 Voltage Regulators CL6 Series Control Installation, Operation, and Maintenance Instructions for information on the Eaton’s Cooper Power series CL6 series voltage regulator control.

2. For control boxes with an existing CL6B regulator control, use a screwdriver to remove the latching bracket from the control box mounting tabs. Refer to Figure 1.

3. In control boxes with a full back panel, locate the TB8 terminal board and use the back panel tool to remove the jumper between terminal 4 and 5. Refer to Figure 2. This step is not required for the short back panel.

4. Identify the terminal board containing the control plug receptacle on the lower back panel. Peel back the strip containing the terminal markings in the center of this terminal board using the back-panel tool to reveal the terminal board jumpers. See Figure 3.
5. Remove the jumper between terminals 5 and 6, if present. Refer to Figure 4.

6. If not present, install the 7-position jumper between terminal 6 and G. Refer to Figure 5 and Figure 6.

7. Reinstall the terminal marking strip over the jumpers.

8. Slide the CL7 control panel onto the existing hinge pins.

9. Connect the green ground cable to the back panel. Refer to Figure 7.

10. Plug the wiring harness connector into terminal board receptacle on the backpanel. Make sure to face the plug in the correct direction so that the terminal marking match those on the top of the plug. Refer to Figure 7.

11. Secure the CL7 control panel to the latch tab using the latching screw.

12. Complete the control programming and testing as required. Refer to document MN225003EN, CL-7 Control Installation, Operation, and Maintenance Instructions for proper control configuration and start up procedures.
CL-7 control in Eaton control box, not dead front

Table 2. Kit parts identification

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part Number</th>
<th>Qty</th>
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<tbody>
<tr>
<td>1</td>
<td>Wiring harness assembly, fanning strip style</td>
<td>A64316200E</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>18-position terminal board kit</td>
<td>A64289100B</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Terminal jumper</td>
<td>TAA114731001</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Jumper wire</td>
<td>102A008HEHE043</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Eaton’s Universal PRA kit may include parts not required for every installation. Only parts required for this installation are included in this list.

Required tools
- Screwdriver (Standard)
- Screwdriver (Phillips)

Note: Verify all kit items are present before beginning installation procedure.

Installation procedure
Follow these instructions to install the CL-7 PRA into a control box on an Eaton voltage regulator with a fanning strip terminal board connection.

1. Remove the existing control. Refer to the appropriate voltage regulator control manual for complete instructions on removing a control.

   For example, refer to Service Information S225-10-10, McGraw-Edison® VR-32 Regulator and CL-5 Series Control Installation, Operation and Maintenance Instructions for information on the CL-5 series voltage regulator control.

2. If the control box contains a 10-position TB1 terminal board (see Figure 8), it must be upgraded to an 18-position board. See document MN225019EN, Back Panel Upgrade 10- to 18-Position Terminal Strip Installation Instructions for instruction on installing the 18-position terminal board.

3. If the control box is already equipped with the 18-position terminal board, it must be reconfigured to the correct jumper configuration. A metal jumper is required between terminal 3 and 4 and a wire jumper is required between terminals 2 and G (see Figure 9).

4. If a jumper is present between terminals 4 and 5 of TB8 (see Figure 10), remove the jumper. If this jumper remains in place, the CL-7 control will display an Auto Tap Blocked indication.

Figure 8. Obsolete 10-position terminal board to be replaced

Figure 9. Proper jumper arrangement on 18-position terminal board for the CL-7 voltage regulator control

Figure 10. Remove metal jumper between terminals 4 and 5
5. On some older units, a wire connection between the VM terminal and terminal 127 on an RCT may be present. In these cases, it is best to remove the connection and reconnect the VM and VS terminals with a metal jumper as shown in Figure 9.

![Figure 9](image)

**NOTICE**

If the jumper between VS and VM is in place and the connection to the RCT terminal 127 is not removed, wire damage will occur.

*Note:* If the fanning strip style wiring harness (Figure 11) has already been installed on the control, proceed to Step 9.

![Figure 11](image)

**Figure 11.** Item 1, Eaton fanning strip wiring harness for the CL-7 control

6. Remove the strain relief screw (retain the strain relief device) and disconnect the white connector from the side of the CL-7 control panel. See Figure 12. Reinstall the screw that had been holding the strain relief device in place.

![Figure 12](image)

**Figure 12.** Removal of standard wiring harness

7. Install the new wiring harness assembly (Item 1) in the connector located on the side of the CL-7 control panel. Refer to Figure 13.

8. Remove a screw and install the strain relief device under the screw as shown in Figure 13.

![Figure 13](image)

**Figure 13.** Wiring harness installed with repositioned strain relief device

9. If the new control is being installed on an Eaton/McGraw-Edison voltage regulator built in 1988 or earlier, the neutral light configuration switch must be set. Locate the switch on the left side of the control near the bottom. Using a small screw driver, flip the switch down. See Figure 14.

![Figure 14](image)

**Figure 14.** Setting neutral light configuration switch

10. Slide the CL-7 control panel onto the existing hinge pins.

11. Connect the green ground lead to the ground connection located on the back panel of the control encloser. Refer to Figure 15.

12. Install the wiring harness fanning strip into TB2 on the backpanel. Refer to Figure 15.
13. Secure the CL-7 control panel to the latch tab using the latching screw.

14. Complete the control programming and testing as required. Refer to document MN225003EN, CL-7 Control Installation, Operation, and Maintenance Instructions for proper control configuration and startup procedures.
Table 3. Kit parts identification

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part Number</th>
<th>Qty</th>
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<tbody>
<tr>
<td>1</td>
<td>CL-7 PRA wiring harness, Siemens/Howard control</td>
<td>A64316200F</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Faceplate, Right</td>
<td>E0003X00G29</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Left Hinge Bracket</td>
<td>E0003X00G32</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Siemens Retro Kit Magnet Assembly</td>
<td>57A6432B2002</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Hinge</td>
<td>0800071097Z</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Machine Screw: 6-32x0.38</td>
<td>0800071090Z</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Lock Washer: #6 SS</td>
<td>0800070916Z</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Lock Nut: 6-32</td>
<td>0800071115Z</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Ground Lead</td>
<td>E0003X00G160</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Adhesive cable-tie anchors</td>
<td>0800069825Z</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>Cable tie</td>
<td>0800011079Z</td>
<td>2</td>
</tr>
</tbody>
</table>

Required tools
- Screwdriver (standard)
- Screwdriver (Phillips head)
- 5/16-Inch nut driver or combination wrench
- 3/8-Inch nut driver or combination wrench

Note: Verify all kit items are present before beginning installation procedure.

Installation procedure
Follow these instructions to install the CL7 PRA on a voltage regulator manufactured by Siemens Corporation.

1. Remove existing control per manufacturer’s requirements. Retain the terminal block wing-nuts.

Note: If the Siemens Corporation style wiring harness (Figure 16), hinge and magnet assemblies (Figure 18) have already been installed on the control, proceed to Step 14.

Note: The Siemens harness may be equipped with two wires colored white and white/blue with two-terminal connectors as shown in Figure 16. The wires are for connection to the CL7 control general purpose inputs (GPIs). The wires can be used for analog voltage reduction or other programmable functionality. See document MN225003EN, CL7 Voltage Regulator Control Installation, Operation, and Maintenance Instructions for more information on the GPIs.
5. Remove the strain relief screw (retain the screw and strain relief device) and disconnect the white connector from the side of the CL-7 control panel. See Figure 19.

6. Using a 3/8-inch wrench, remove the green ground wire from the side of the panel; retain the washer and nut. See Figure 19.

7. Remove the remaining four screws holding on the hinged side panel; retain the screws. See Figure 20.

8. Install the right face plate to the side of the control using the screws retained from Step 5 and the last step. See Figure 18.

9. Install the Siemens Corporation wiring harness (Item 1). See Figure 21.

10. Install the extended green ground wire (Item 9) using the washer and nut retained from Step 6. See Figure 21.

11. Route the wiring harness and ground wire through the strain relief device and secure using the screw and strain relief device retained in Step 5 as shown in Figure 21.
12. Install the adhesive cable tie anchors (Item 10) as shown in Figure 22 and secure the wiring harness and ground wire using the provided cable ties (Item 11). Trim back the cable ties as necessary.

Figure 22. Installing ground wire and harness cable ties

13. Install the Siemens Corporation retrofit kit magnet assembly (Item 4) as shown in Figure 18 using the provided hardware (Items 6 and 8).

14. Slide the CL-7 control panel onto the existing hinge pins.

15. Connect the green ground wire to the enclosure ground. The best spot to make the ground connection usually is under the screws holding the enclosure terminal block into the control cabinet. See Figure 24.

16. Using a screwdriver, adjust the magnet depth of the magnet bracket as needed so that the CL-7 control panel remains in a closed position.

17. Install the terminal connector (Figure 23) into the existing enclosure terminal block (Figure 24), securing with the wing-nuts retained from Step 1.

Figure 23. Siemens Corporation-style terminal connector

18. Review the Siemens Corporation nameplate to determine correct overall Potential Transformer (PT) ratio entered at FC 44 on control. Divide the Load Volts shown by the corresponding Control Volts to obtain the Overall PT Ratio.

19. If a source-side PT will be used, on the terminal connector (Figure 25), move the white/brown wire from terminal P2 and place it on terminal U2. If this is not done, the control will use a calculation to determine the source-side voltage. If utilizing a source-side PT, make sure to enter the Internal PT Ratio into the control at FC 441. The Internal PT Ratio can be determined by dividing the Source Volts shown on the nameplate for reverse power flow by the corresponding Control Volts. Also, when using a source-side PT, the Vin PT Configuration (FC 146) must be set for Vin Mode.

Figure 24. Siemens Corporation enclosure terminal block

20. Complete the control programming and testing as required. Refer to document MN225003EN, CL-7 Control Installation, Operation, and Maintenance Instructions for proper control configuration and start up procedures.

IMPORTANT

If the neutral light does not illuminate when the regulator is in neutral, try flipping the neutral light switch to the opposite position. See Figure 14.
CL-7 Control Panel Retrofit

CL-7 control in General Electric control box with fork-type terminal

Table 4. Kit parts identification

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part Number</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CL-7 PRA wiring harness, General Electric fork-type terminal</td>
<td>A64316200G</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Hinge bracket assembly</td>
<td>E0003X00G22</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Left side bracket</td>
<td>E0003X00G25</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Self adjusting latch</td>
<td>E0003X00G158</td>
<td>1</td>
</tr>
</tbody>
</table>

Required tools

- Screwdriver (standard)
- Screwdriver (Phillips head)
- 3/8-Inch nut driver or combination wrench

Note: Verify all kit items are present before beginning installation procedure.

Installation procedure

Follow these instructions to install the CL-7 PRA on a voltage regulator manufactured by General Electric with fork-type terminal connections.

1. Remove existing control per the manufacturer’s requirements. Retain the hinge pins.

Note: If the General Electric wiring harness (Figure 26), hinge bracket and latch bracket (Figure 28) have already been installed on the new CL-7 control, proceed to Step 11.

Note: The GE harness may be equipped with two wires colored white and white/blue with two-terminal connectors as shown in Figure 26. The wires are for connection to the CL-7 control general purpose inputs (GPIs). The wires can be used for analog voltage reduction or other programmable functionality. See document MN225003EN, CL-7 Voltage Regulator Control Installation, Operation, and Maintenance Instructions for more information on the GPIs.

2. Using a screwdriver, remove the four screws to uninstall the existing latch bracket from the left side of the CL-7 control; retain the screws. See Figure 27.

3. Install the General Electric latch bracket (Item 3) on the left side of the control using the screws retained from the last step. See Figure 28.
4. Remove the strain relief screw (retain the screw and strain relief device) and disconnect the white connector from the side of the CL-7 control panel. See Figure 29.

5. Using a 3/8-inch wrench, remove the green ground wire from the side of the panel; retain the wire, washer, and nut. See Figure 29.

6. Remove the remaining four screws holding on the hinged side panel; retain the screws. See Figure 30.

7. Install the General Electric hinge bracket on the right side of the control using the screws retained from Step 4 and the last step. See Figure 28.

8. Install the General Electric fork-style wiring harness (Item 1). See Figure 31.

9. Reinstall the green ground wire using the washer and nut retained from Step 6. See Figure 31.

10. Route the wiring harness through the strain relief device retained from Step 5 and secure under a screw as shown in Figure 31.

11. Install the CL-7 control panel into the control box by mounting it onto the existing hinges using the hinge pins retained from Step 1.

12. Connect the green ground wire to the enclosure ground.

13. Install the fork-terminal connectors into the existing NN terminal blocks (Figure 32 and Table 5).
14. Close and secure the CL-7 control panel using the self-adjusting latch.

15. Review the General Electric nameplate to determine correct overall Potential Transformer (PT) ratio entered at FC 44 on control.

16. If a source-side PT will be used, move the white/brown wire from terminal 9 and place it on terminal 32 as shown in Figure 33. If this is not done, the control will use a calculation to determine the source-side voltage. If utilizing a source-side PT, make sure to enter the internal PT Ratio into the control at FC 441. Also, when using a source-side PT, the Vin PT Configuration (FC 146) must be set for Vin Mode.

17. Complete the control programming and testing as required. Refer to document MN225003EN, CL-7 Control Installation, Operation, and Maintenance Instructions for proper control configuration and start up procedures.

**IMPORTANT**

If the neutral light does not illuminate when the regulator is in neutral, try flipping the neutral light switch to the opposite position. See Figure 14.
CL-7 control in General Electric control box with pin-type terminal

Table 6. Kit parts identification

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part Number</th>
<th>Qty</th>
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<tr>
<td>1</td>
<td>CL-6B PRA wiring harness, General Electric, pin-type</td>
<td>A64316200H</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Hinge bracket assembly</td>
<td>E0003X00G22</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Left side bracket</td>
<td>E0003X00G25</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Self adjusting latch</td>
<td>E0003X00G158</td>
<td>1</td>
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</table>

Required tools
- Screwdriver (Phillips head)
- 3/8-Inch nut driver or combination wrench

Note: Verify all kit items are present before beginning installation procedure.

Installation procedure
Follow these instructions to install the CL-7 PRA on a voltage regulator manufactured by General Electric with pin-type terminal connections.

1. Remove existing control per manufacturer’s requirements. Retain the hinge pins.

2. Remove the circuit board from the control box back panel by pressing the white plastic levers out and sliding it down. Disconnect the existing wiring harness from the circuit board and save the board for reinstallation.

Note: If the General Electric pin-terminal wiring harness (Figure 34), hinge bracket and latch bracket (Figure 36) have already been installed on the new CL-7 control, proceed to Step 12.

Note: The GE harness may be equipped with two wires colored white and white/blue with two-terminal connectors as shown in Figure 34. The wires are for connection to the CL-7 control general purpose inputs (GPIs). The wires can be used for analog voltage reduction or other programmable functionality. See document MN225003EN, CL-7 Voltage Regulator Control Installation, Operation, and Maintenance Instructions for more information on the GPIs.

3. Using a screwdriver, remove the four screws to uninstall the existing latch bracket from the left side of the CL-7 control; retain the screws. See Figure 35.

Figure 34. Item 1, the General Electric pin-terminal wiring harness for the CL-7 control

4. Install the General Electric latch bracket (Item 3) using the screws retained from the last step. See Figure 36.

Figure 35. Removal of latch bracket from CL-7 control

Figure 36. Installing hinge and bracket assemblies
5. Remove the strain relief screw (retain the screw and strain relief device) and disconnect the white connector from the side of the CL-7 control panel. See Figure 37.

6. Using a 3/8-inch wrench, remove the green ground wire from the side of the panel; retain the wire, washer, and nut. See Figure 37.

7. Remove the remaining four screws holding on the hinged side panel; retain the screws. See Figure 38.

8. Install the General Electric hinge bracket on the right side of the control using the screws retained from Step 5 and the last step. See Figure 36.

9. Install the General Electric pin-style wiring harness (Item 1). See Figure 39.

10. Install the green ground wire using the washer and nut retained from Step 6. See Figure 39.

11. Route the wiring harness through the strain relief device retained in Step 5. Secure using a screw as shown in Figure 39.

12. Install the CL-7 control panel into the control box by mounting it onto the existing hinges using the hinge pins retained from Step 1.

13. Connect the green ground wire to the enclosure ground.

14. Install the wiring harness pin connector into the terminal plug on the circuit board removed in Step 2. See Figure 40.

15. Reinstall the circuit board into the back panel of the enclosure by lining up the circuit board and pressing up firmly. Refer to Figure 40.
16. Close and secure the CL-7 control panel using the self-adjusting latch.

17. Review the General Electric nameplate to determine correct overall Potential Transformer (PT) ratio entered at FC 44 on control.

18. Complete the control programming and testing as required. Refer to document MN225003EN, CL-7 Control Installation, Operation, and Maintenance Instructions for proper control configuration and start up procedures.

**IMPORTANT**

If the neutral light does not illuminate when the regulator is in neutral, try flipping the neutral light switch to the opposite position. See Figure 14.
CL-7 control in Howard Industries control box

Table 7. Kit Parts Identification

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Part Number</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CL-7 PRA wiring harness, Siemens/Howard control</td>
<td>A64316200F</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Right Faceplate</td>
<td>E0003X00G29</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Latch</td>
<td>E0003X00G31</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Shoulder screw</td>
<td>0800071110Z</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>SS flat washer, #6</td>
<td>0800019079Z</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Lock Nut, 6-32 hex</td>
<td>0800071115Z</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Left hinge bracket</td>
<td>E0003X00G32</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Hinge</td>
<td>E0003X00G47</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>SS machine screw, 6-32X0.38</td>
<td>0800071090Z</td>
<td>4</td>
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<tr>
<td>10</td>
<td>SS Lock washer, #6</td>
<td>0800070916Z</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>Ground lead</td>
<td>E0003X00G160</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Adhesive cable-tie anchors</td>
<td>0800069825Z</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>Cable tie</td>
<td>0800011079Z</td>
<td>2</td>
</tr>
</tbody>
</table>

Required tools
- Screwdriver (standard)
- Screwdriver (Phillips head)
- 3/8-Inch nut driver or combination wrench
- 5/16-Inch nut driver or combination wrench

Note: Verify all kit items are present before beginning installation procedure.

Installation procedure
Follow these instructions to install the CL-7 PRA on a voltage regulator manufactured by Howard Industries.

1. Remove existing control per manufacturer’s requirements. Retain the hinge pins and terminal block wing-nuts.

Note: If the Howard Industries style wiring harness (Figure 41), hinge bracket and latch bracket (Figure 43) have already been installed on the control, proceed to Step 14.

Note: The Howard Industries harness may be equipped with two wires colored white and white/blue with two-terminal connectors as shown in Figure 41. The wires are for connection to the CL-7 control general purpose inputs (GPIs). The wires can be used for analog voltage reduction or other programmable functionality. See document MN225003EN, CL-7 Voltage Regulator Control Installation, Operation, and Maintenance Instructions for more information on the GPIs.

2. Using a screwdriver, remove the four screws to uninstall the existing latch bracket from the left side of the CL-7 control; retain the screws. See Figure 42.

3. Install the left hinge bracket (Item 7) using the screws retained from the last step. See Figure 43.

4. Install the hinges (Item 8) using the provided screws and washers, (Items 9 and 10). See Figure 43.
5. Remove the strain relief screw (retain the screw and strain relief device) and disconnect the white connector from the side of the CL-7 control panel. See Figure 44.

6. Using a 3/8-inch wrench, remove the green ground wire from the side of the panel; retain the washer and nut. See Figure 44.

7. Remove the remaining four screws holding on the hinged side panel; retain the screws. See Figure 45.

8. Install the right faceplate on the side of the control using the screws retained from Step 5 and the last step. See Figure 43.

9. Install the latch (Item 3) on the right faceplate using the shoulder screws (Item 4) and washers (Item 5) as shown in Figure 43.

10. Install the Howard Industries wiring harness (Item 1). See Figure 46.

11. Install the extended green ground wire (Item 11) using the washer and nut retained from Step 6. See Figure 46.

12. Route the wiring harness and ground wire through the strain relief device and secure using a screw as shown in Figure 46.

13. Install the adhesive cable-tie anchors (Item 12) as shown in Figure 47 and secure the wiring harness and ground wire using the cable ties (Item 13). Trim back the cable ties as necessary.
14. Slide the CL-7 control panel onto the existing hinge pins.

15. Connect the green ground wire to the enclosure ground. The best spot to make the ground connection usually is under the screws holding the enclosure terminal block into the control cabinet. See Figure 49.

16. Install the terminal connector (Figure 48) into the existing enclosure terminal block (Figure 49), securing with the wing-nuts retained from Step 1.

17. Review the Howard Industries nameplate to determine correct overall Potential Transformer (PT) ratio entered at FC 44 on control. On regulators manufactured by Howard Industries, divide the load volts by the corresponding control volts to obtain the overall PT ratio.

18. If a source-side PT will be used, move the white/brown wire from terminal PS and place it on terminal MS as shown in Figure 50. If this is not done, the control will use a calculation to determine the source-side voltage. If utilizing a source-side PT, make sure to enter the Internal PT Ratio into the control at FC 44. The Internal PT Ratio can be determined by dividing the Source Volts shown on the nameplate for reverse power flow by the corresponding Control Volts. Also, when using a source-side PT, the Vin PT Configuration (FC 146) must be set for Vin Mode.

19. Complete the control programming and testing as required. Refer to document MN225003EN, CL-7 Control Installation, Operation, and Maintenance Instructions for proper control configuration and start up procedures.

**IMPORTANT**

If the neutral light does not illuminate when the regulator is in neutral, try flipping the neutral light switch to the opposite position. See Figure 14.
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