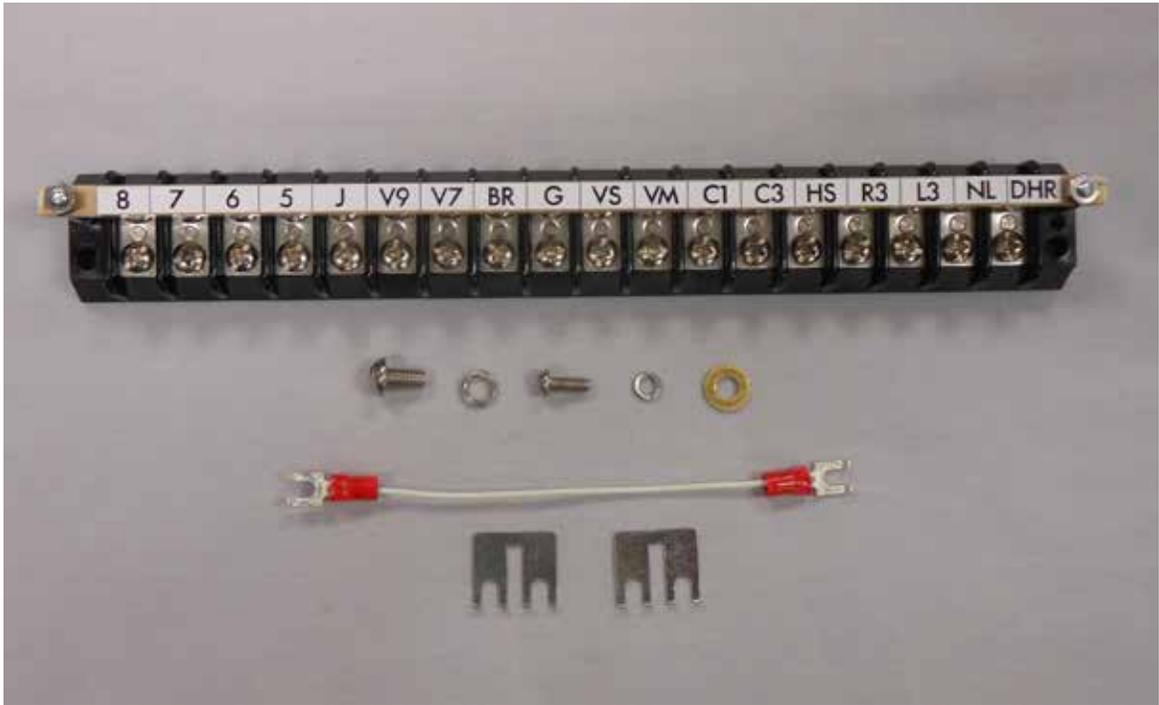


Back panel upgrade 10- to 18-position terminal strip installation instructions for CL-7 regulator control



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Safety for life



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.

CAUTION: 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.

G103.3

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.

G101.0

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.

G102.1

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.

G122.3

Product information

Introduction

Service Information MN225019EN contains instructions for upgrading voltage regulator back panels from a 10-position to 18-position terminal strip. This upgrade is necessary to accommodate an Eaton's Cooper Power™ series CL-7 voltage regulator control replacing an Eaton's Cooper Power series CL-1, CL-2, or CL-2A control.

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.

Additional information

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

Acceptance and initial inspection

Each 18-position terminal strip assembly is in good condition when accepted by the carrier for shipment. Upon receipt, inspect the shipping container for signs of damage. Unpack the 18-position terminal strip assembly and inspect it thoroughly for damage incurred during shipment. If damaged is discovered, file a claim with the carrier immediately.

Handling and storage

Be careful during handling and storage of the 18-position terminal strip assembly to minimize the possibility of damage. If the assembly is to be stored for any length of time prior to installation, provide a clean, dry storage area.

Standards

ISO 9001 Certified Quality Management System

Parts supplied

Item Number	Description	Qty
1	18-Position Terminal Strip Assembly	1
2	10-32x3/8 Stainless Steel Machine Screw	1
3	#10 Split Lock Washer	1
4	6-32x3/8 Stainless Steel Machine Screw	1
5	#6 Split Lock Washer	1
6	.203x.437 Round Br. Washer	1
7*	Wire Jumper	1
8*	2-Position Metal Jumper	2

* Parts included in PRA parts kit.

Tools required

Description	Qty
Screwdriver (Standard)	1
Phillips-Head Screwdriver	1
1/4 inch Nut-Driver	1
Wire Cutter	1

WARNING

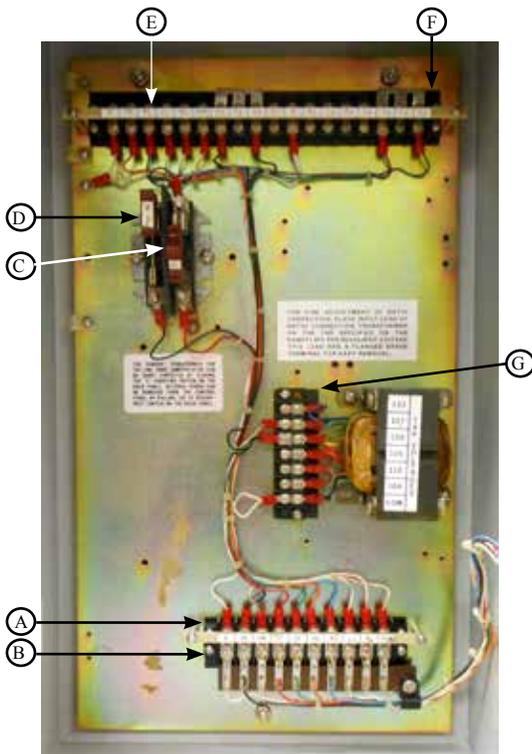
Hazardous voltage. Electric power must be off to the control panel and back panel below the knife switches before performing the installation operations. Failure to do so may result in death or serious injury.

VR-T249.0

Installation procedures

Removing the existing control

- If the regulator and/or control is energized perform the following steps to isolate the TB2 terminal board before installing the upgrade. See Figure 1.
 - Open the **V1** and **V6** (if present) knife-blade switches on the back panel.
 - Close the **C** knife-blade switch to short the CT. In some of the earlier regulators, the **C** shorting switch must be pulled open in order to short the CT.
 - Locate the orange **HS** lead. Remove the **HS** lead terminal from the lower row of screws on **TB1**.
- Disconnect the fanning strip from the existing control by loosening the ten screws and pulling the trip downwards.



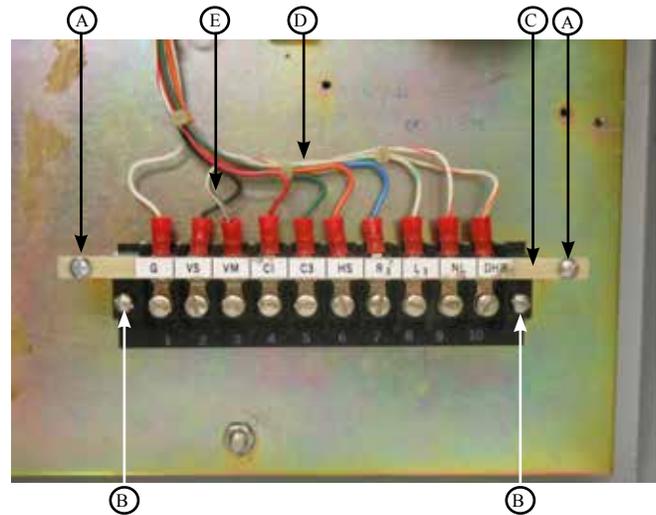
Code	Description
A	TB2 Terminal Board to be replaced
B	Fanning Strip
C	CT Shorting Switch
D	V1 Switch
E	HS Terminal
F	TB1 Terminal Board
G	RCT1 Terminal Board

Figure 1. Back panel with 10-position terminal board.

- Remove the existing control from the hinges.

Removing 10-position terminal strip

- Remove the label bar screws and spacers and remove the label bar. See Figure 2.
- Remove the white/black wire connected between the terminal **VM** and the **RCT1** terminal board (Figure 2). Do this by removing both ends of the wire from the terminal boards, cutting off the top terminal and pulling the wire out of the harness from below. See Note 2 for more information on the **VM** connection.
- Remove the remaining control wiring harness terminals from the top of **TB2**.
- Use a screwdriver to remove the **TB2** terminal board mounting screws, there could be as many as four screws. See Figure 2.



Code	Description
A	Label Bar Mounting Screw
B	Terminal Board Mounting Screw
C	Label Bar
D	Control Wiring Harness
E	White/Black Wire to remove

Figure 2. 10-position terminal board.

Installation of 18-position terminal strip

8. After removing the old terminal board, thoroughly clean the area where the new board will be installed.
9. Remove the adhesive backing from the new terminal board and press it firmly in place. Locate the new board at the same height as the old board and center on the back panel. See Figure 3.
10. Using a 1/4 inch nut-driver remove the nuts and lock-washers securing the label bar and remove the label bar from the terminal board stud.

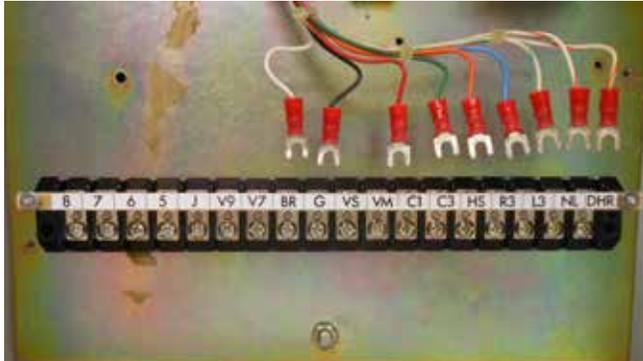


Figure 3. 18-position terminal board placement.

Table 1. Wire Connections to New Terminal Board

Color Code	Terminal Label
White	G
Black	VS
Red	C1
Green	C3
Orange	HS
Blue	R3
White/Green	L3
White/Red	NL
White/Orange	DHR

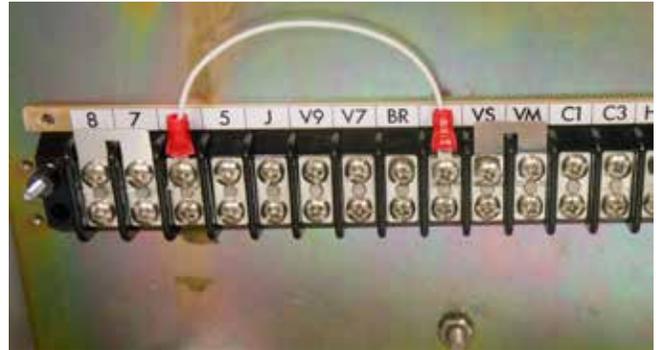


Figure 4. Jumper installation locations.

11. Install a 2-position jumper between terminals **7** and **8**. See Figure 4 and Note 1.
12. Install another 2-position jumper between terminals **VS** and **VM**. See Figure 4 and Note 2.
13. Install the jumper wire between terminals **6** and **G**. See Figure 4 and Note 1.
14. Wire the back panel wiring harness to the new TB2 terminal strip. Table 1 shows the wiring color code and label location for each lead.
15. Replace the label bar back onto the terminal board studs. Replace the lockwashers and nuts and tighten the 1/4 inch nuts on both ends of the terminal board using a nut-driver.
16. Select the appropriate screw and washer to fit into a hole to the right of and above the terminal board. Loosely screw the hardware into the hole for later grounding of the new regulator control.
17. Reconnect the orange **HS** lead back on to the terminal labeled **HS** on **TB1**. See Figure 1.
18. After installing the new regulator control, to energize the front panel, the V knife-blade switches must be closed and the C knife-blade switch placed in the open operating position.

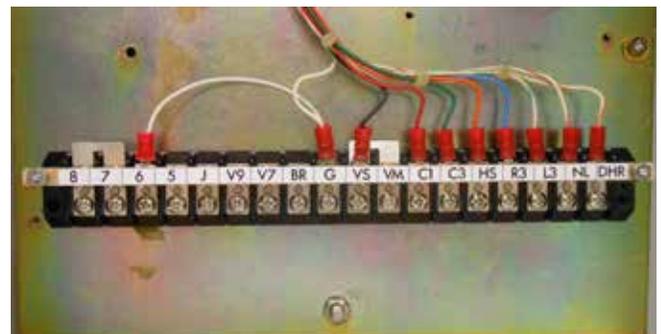


Figure 5. Terminal board and grounding screw installation complete.

Information notes

1. In order to power the control externally, the white wire jumper must be in place between terminals 6 and G and a metal jumper between terminals 7 and 8.
2. In a CL-1 series control the **VM** on **TB2** may be connected to an additional ratio correction transformer (**RCT2**) to supply power to the motor. This connection can be eliminated and the jumper installed between **VS** and **VM**.
3. **For CL-1 controls on regulators with a differential PT for reverse power flow:** To use the differential PT for reverse power, connect a lead from the 120 position on the **RCT3** terminal board to **TB2-V7** and remove the auxiliary reverse power flow panel.
4. **For CL-2 and CL-2A controls on regulators with a differential PT for reverse power flow:** To use the differential PT for reverse power, connect a lead from the 120 position on the **RCT2** terminal board to **TB2-V7** and remove the auxiliary reverse power flow panel.



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