

**Available Options:**

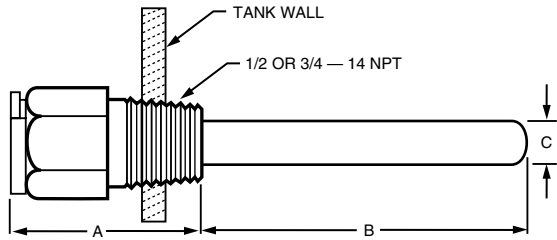
External adjustment screw and visible control point scale.  
 Factory set stop at 140°F (60°C).

**Approvals:**

Underwriters Laboratories Inc. Component Recognized:  
 File No. MP466, Guide Number MBPR2.  
 American Gas Association Design Certified: Report  
 Number 23-11B.

**Part Available:**

110641 Jumper to convert four-terminal L8100 to three-terminal L8100.



	CONTROLLER WELL		REMOTE WELL	
	IN.	MM	IN.	MM
A INSULATION DEPTH	2-1/4	57	1-1/2 OR 2-1/2	38 OR 64
B INSERTION DEPTH	5	127	3	76
C WELL DIAMETER	7/16	11	7/16	11

M4746

**Fig. 2. Approximate dimensions for the controller immersion well and remote immersion well in in. (mm).**

**INSTALLATION**

**When Installing this Product...**

- ❶ Read instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
- ❷ Check ratings and descriptions given in the specifications to make sure the product is suitable for your application.
- ❸ Installer must be a trained, experienced service technician.
- ❹ After installation is complete, check out product operation as provided in these instructions.

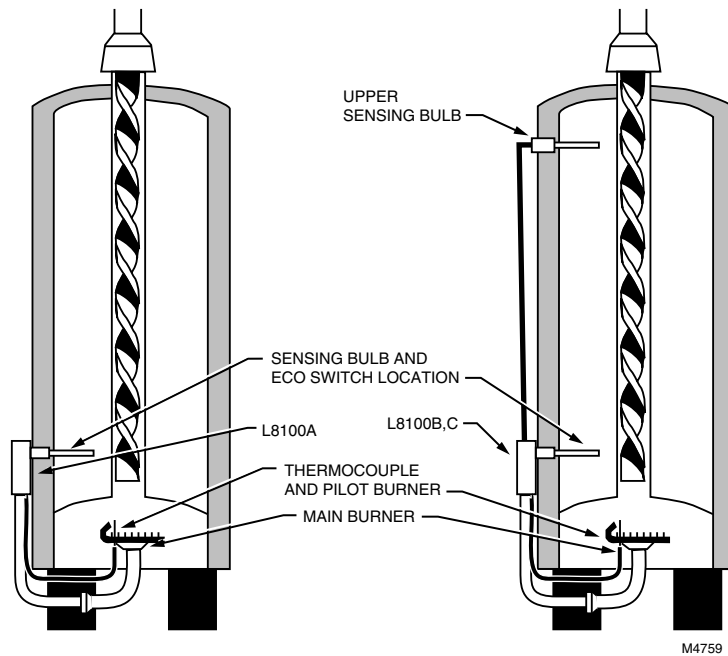


**CAUTION**

Disconnect power before installation to prevent electrical shock or equipment damage.

**Mounting Direct Immersion Well**

The manufacturer usually provides a tapping for insertion of the controller sensing element. This tapping is located at a point where typical water temperature can be measured. Follow the instructions furnished by the system manufacturer, if available, or use the procedure below. See Fig. 3.



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**Fig. 3. Location of L8100A,B,C Aquastat® Controllers.**

**IMPORTANT**

The controller immersion well is factory-installed to the controller. Do not remove the immersion well, this could damage the ECO switch.

- ❶ If system is filled, drain to a point below the tapping.
- ❷ Remove plug from tapping.
- ❸ If tapping is suitable, carefully screw immersion well into tapping. Do not tighten or apply force to the controller case.
- ❹ Fill tank. Make sure that well is screwed in tightly enough to prevent leakage.

**Mounting Remote Bulb (L8100B and L8100C)**

The remote temperature sensing bulb is installed in an immersion well (Fig. 4) or located near a capillary compression fitting (Fig. 5) that extends into the upper portion of the tank to prevent stacking.

**Immersion Well Fitting**

The immersion well must snugly fit the sensing bulb for good thermal response. Install as follows:

- ❶ Use tapping provided by tank manufacturer, if possible, or select an area where typical water temperature is best measured.
- ❷ If tank is filled, drain to below point where bulb will be installed.
- ❸ Screw well into tank.
- ❹ Insert bulb into well, pushing tubing until bulb bottoms in well.
- ❺ Attach mounting clamp end of well spud. Loosen draw nut and spread jaws of clamp with screwdriver if necessary.
- ❻ With mounting clamp attached to well spud (make sure jaws of clamp hook over ridge at end of spud, as shown at points A in Fig. 4), adjust tubing to fit through mounting clamp groove, as shown at point B in Fig. 4.
- ❼ Tighten draw nut until mounting clamp is firmly attached to well spud and tubing is held securely in place.

**CAUTION**

Do not secure draw nut so tightly that mounting clamp collapses tubing.

**Capillary Compression Fitting**

- ❶ Use tapping provided by manufacturer, if possible, or select an area where typical water temperature is best measured.
- ❷ If tank is filled, drain to below point where bulb will be installed.
- ❸ Screw fitting into boiler tank tapping.
- ❹ Place packing nut on tubing.
- ❺ Slide bulb completely through fitting.
- ❻ Place composition disk and four slotted brass washers on tubing in order shown in Fig. 5. Turn brass washers so slots are 180 degrees apart.
- ❼ Slide seal assembly into fitting and tighten packing nut.

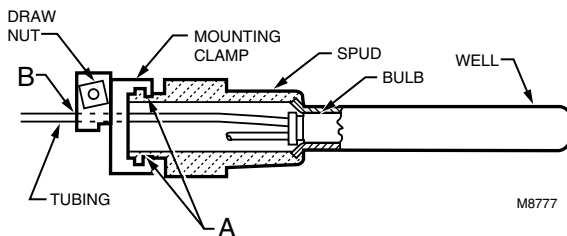
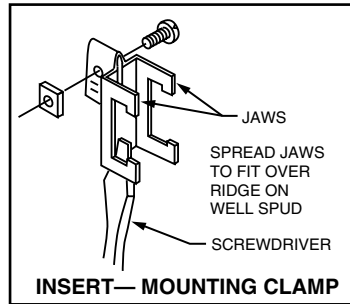


Fig. 4. Immersion well fitting for L8100 remote bulb.

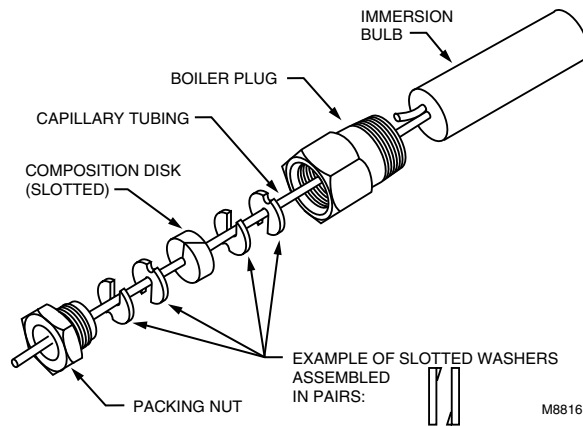
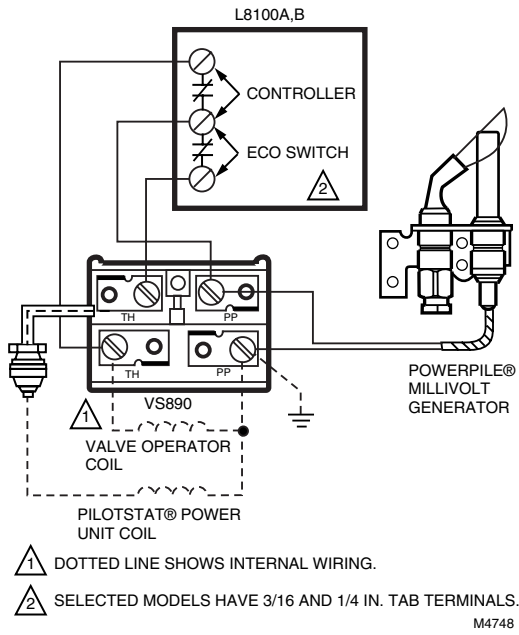


Fig. 5. Capillary compression fitting for L8100 remote bulb.

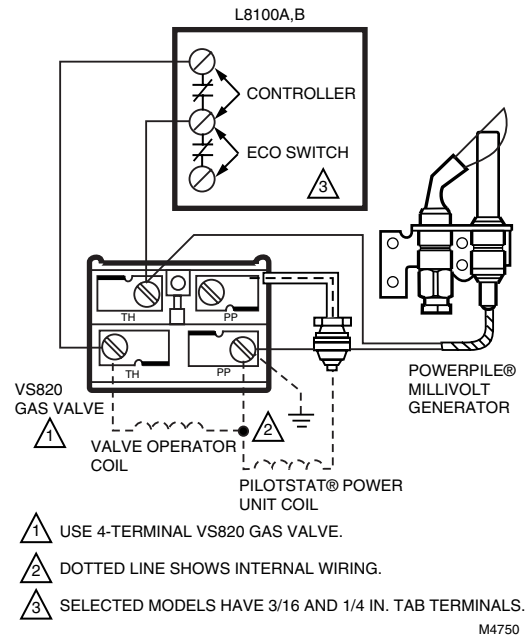
**Wiring**

Disconnect power supply before installation to prevent electrical shock or equipment damage. All wiring must comply with local codes and ordinances regarding wire size, type of insulation, enclosure, etc. Fig. 6 through 11 show typical Powerpile® (millivolt) gas control connections; Fig. 12 and 13 show typical connections for 24 Vac systems; Fig. 14 through 16 show an L8100 hookup with an S86E,F,G, or H Intermittent Pilot System.

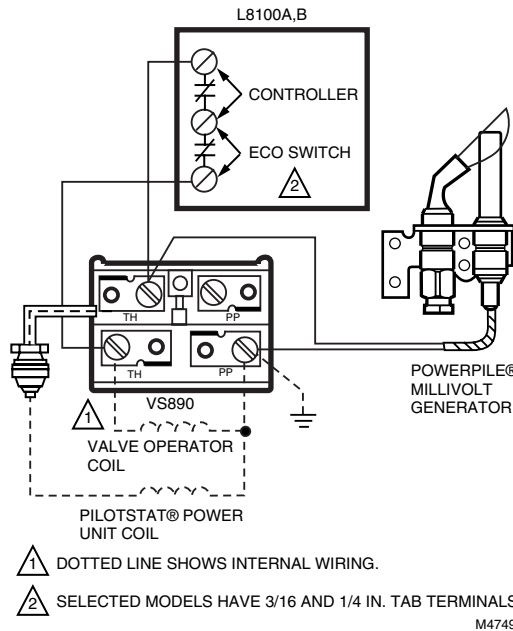
Some four-terminal models are shipped with jumper in place for use as three-terminal models. Remove jumper for four-terminal operation.



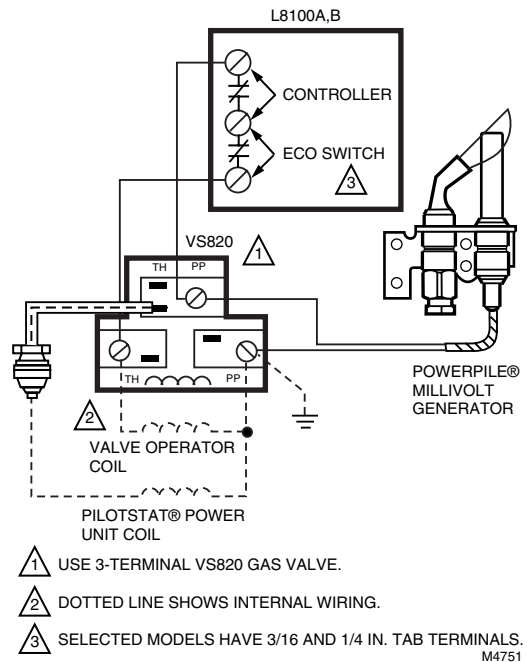
**Fig. 6. L8100A,B hookup with VS890 where controller cuts out main valve and ECO switch cuts out pilot safety valve.**



**Fig. 8. L8100A,B hookup with four-terminal VS820 where controller cuts out main valve and ECO switch cuts out pilot safety valve.**



**Fig. 7. L8100A,B hookup with VS890 where controller and ECO switch are placed in series to cut out main valve.**



**Fig. 9. L8100A,B hookup with three-terminal VS820 where controller and ECO switch are placed in series to cut out main valve.**

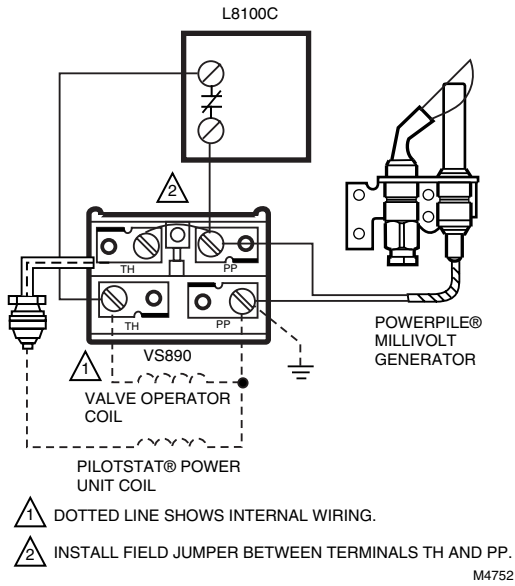


Fig. 10. L8100C hookup with VS890 to cut out main valve.

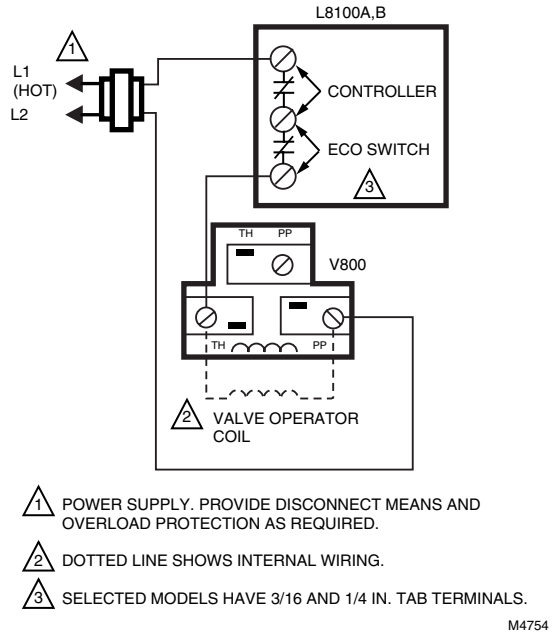


Fig. 12. L8100A, B hookup with V800 to cut out main valve.

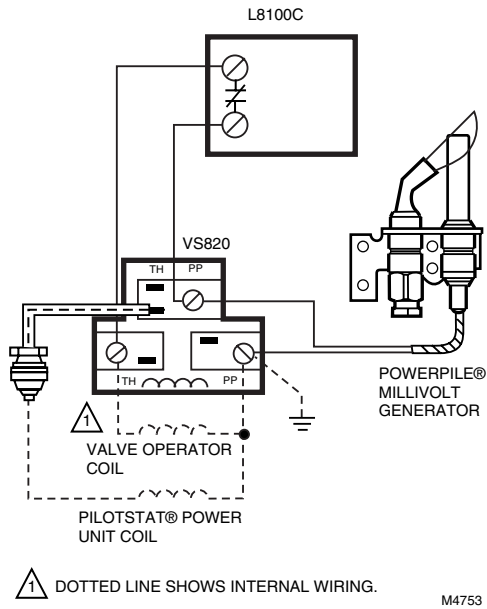


Fig. 11. L8100C hookup with three-terminal VS820 to cut out main valve.

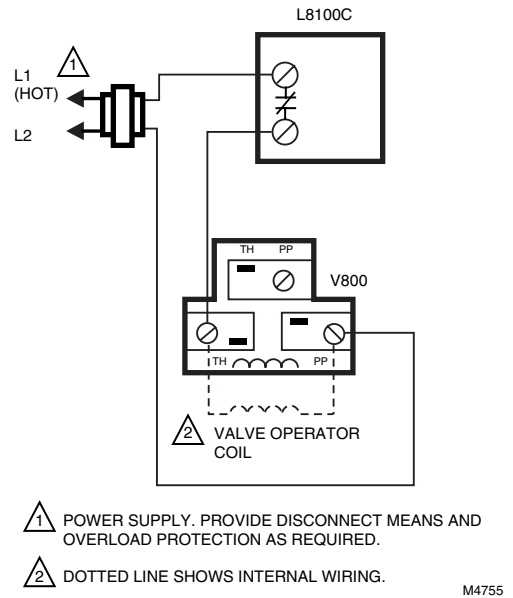
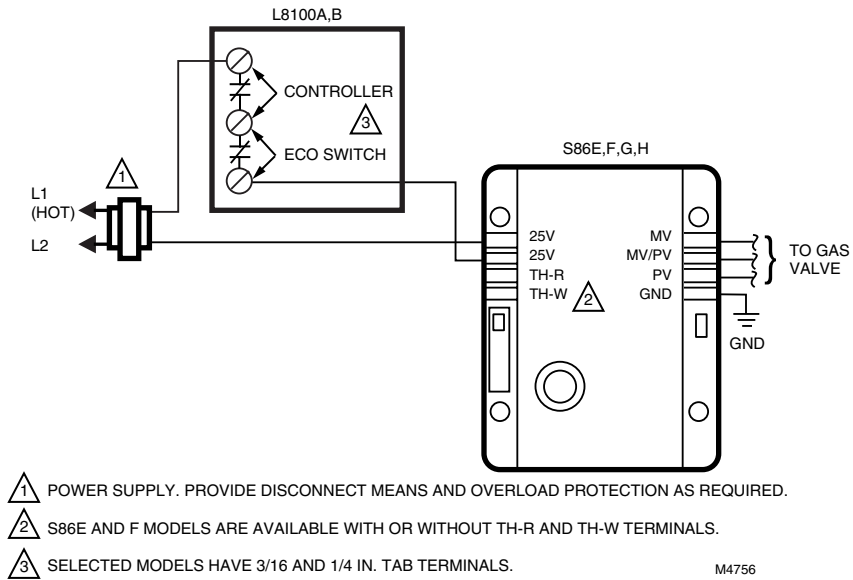
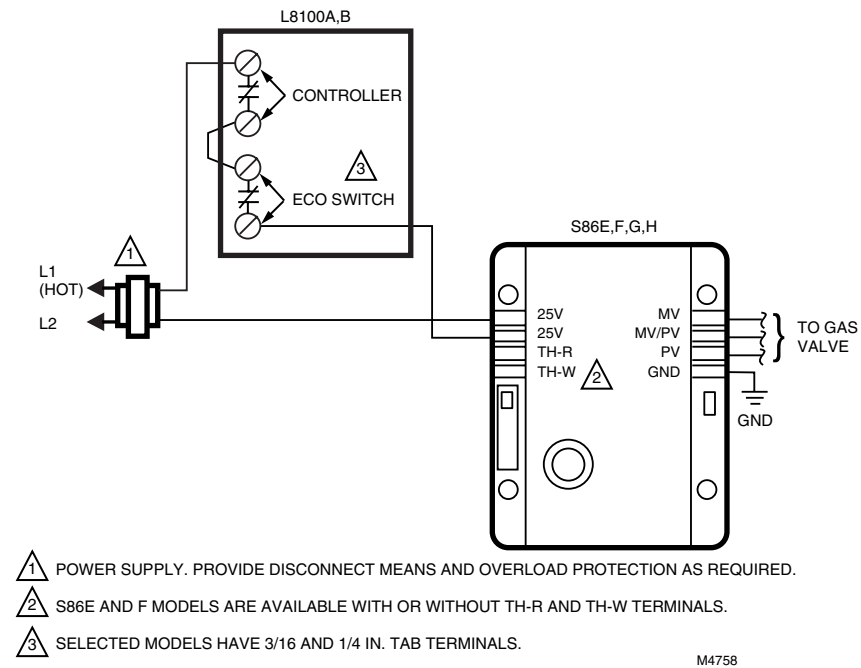


Fig. 13. L8100C hookup with V800 to cut out main valve.



**Fig. 14. Three-terminal L8100A,B hookup with S86E,F,G,H intermittent pilot system.**



**Fig. 15. Four-terminal L8100A,B hookup with S86E,F,G,H intermittent pilot system.**

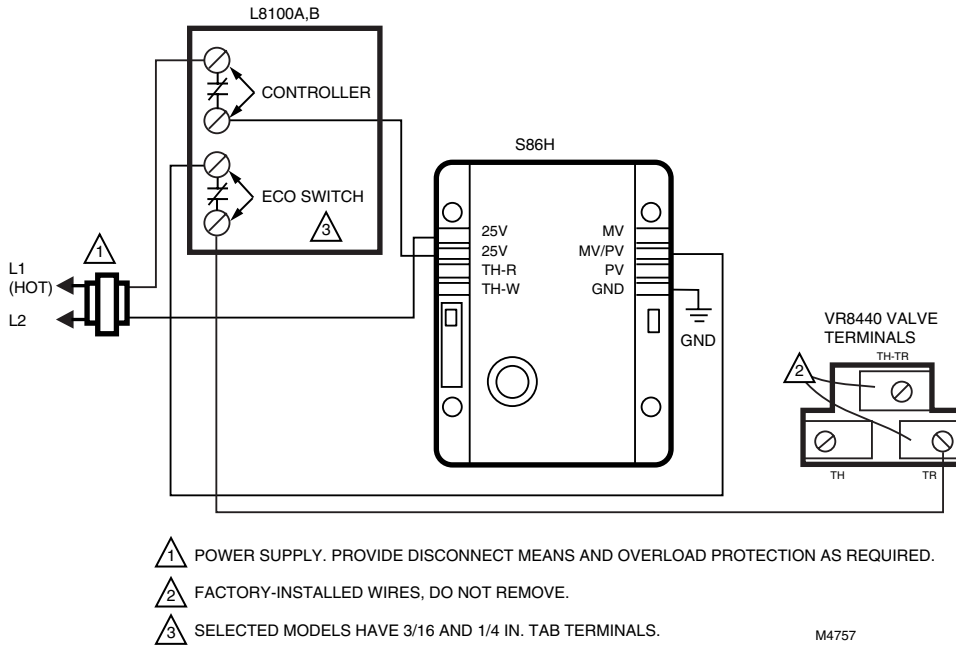


Fig. 16. Four-terminal L8100B manual reset hookup with S86H and VR8440.

## OPERATION AND CHECKOUT

### Operation

When tank temperature rises past the setpoint, the liquid fill in the sensing element expands and activates the snap-acting switch, closing the gas valve. When the water temperature drops below the differential, the switch opens the gas valve and the burner begins heating the water. The ECO switch will break the circuit to the Powerpile® millivolt generator or 24 Vac main valve before the water temperature rises to 210°F (99°C).

The second element of the L8100B,C is located at the top of the tank. These two elements sense the average temperature in the tank. If a stacking condition begins, the L8100B,C will close the valve before the top tank temperature becomes excessive.

### Adjusting

Adjust the control point to agree with the manufacturer's recommendations. To adjust, remove the cover and set the scale to the desired control point (see Fig. 17).

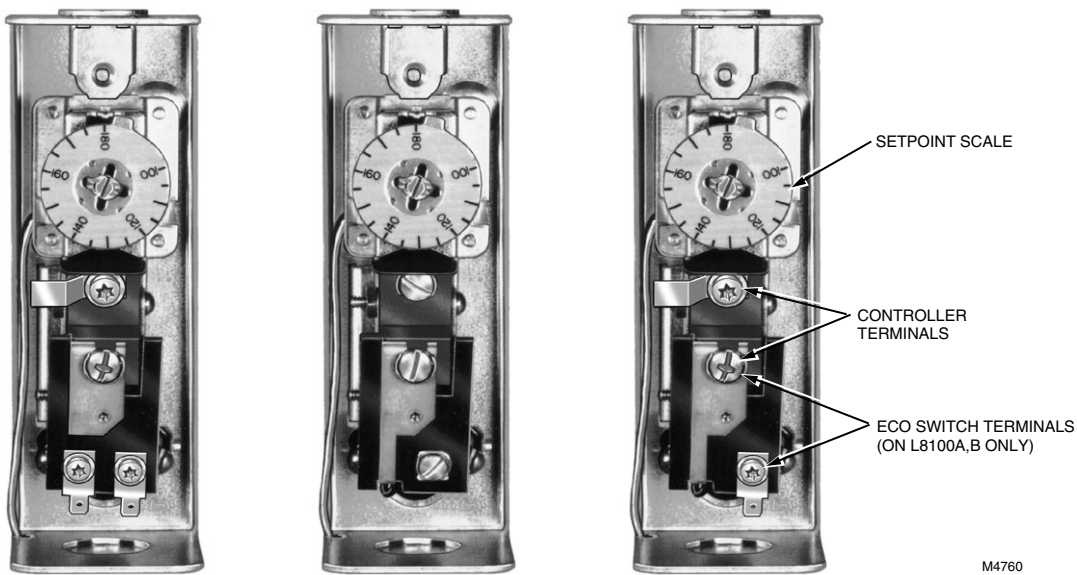


Fig. 17. Internal view of the L8100.

## **Checkout**

Check to verify the Aquastat® controller was installed and adjusted properly. Put the system into operation and observe the action of the device through several cycles to make certain that it provides proper control of the system. Further adjustments can then be made to meet more exact comfort requirements.