

## L4008A,B,E,L; L6008A,G,H Aquastat® Controllers

### INSTALLATION INSTRUCTIONS

#### APPLICATION

These remote bulb (see Fig. 7), immersion type (see Fig. 1) controllers operate in response to temperature changes in hydronic heating systems and other heated liquids.

##### Electrical Ratings:

Switch ratings are shown on the inside cover of each device. The electrical requirements on controlled equipment must not exceed this rating.

L4008A—breaks the burner circuit on a rise in water temperature. It is normally used as a limit controller. When used as an operating controller or low limit, a separate high limit control must be used.

L4008B—makes a control circuit on a rise in water temperature. It is normally used as a circulator controller to prevent circulator operation until boiler water temperature is at or above the control setting.

L4008E—breaks the burner circuit and locks out on a rise in water temperature. It is used as a high limit controller where manual reset is desirable.

L4008L—is used as a 2-stage Aquastat® controller.

L6008A—makes the burner circuit on a drop in water temperature. It is normally used as a circulator and low limit cooling controller.

L6008G—is used as a 2-stage Aquastat® controller to cycle 2-stage gas valve.

L6008H—is used as a low fire Aquastat® controller.

If immersion well or capillary compression fitting must be ordered, refer to form 68-0040, Wells and Fittings for Temperature Controllers, for part numbers and ordering information.

#### INSTALLATION

##### When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

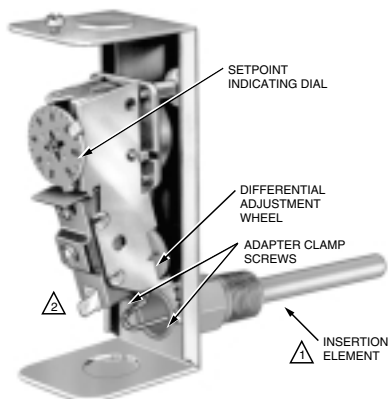


#### CAUTION

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

Depending on model and installation requirements, install the temperature sensing bulb either in an immersion well (see Fig. 2) that extends into the boiler or tank, or directly immerse the temperature sensing bulb in the liquid. For installations not using a well, secure the bulb with a bulb compression fitting (see Fig. 3), or a capillary compression fitting (see Fig. 4). Order the well or the fitting separately.

The boiler manufacturer generally provides a tapping for inserting the Aquastat® controller sensing element. Locate this tapping in a representative point where typical water temperature can be measured. Never locate the bulb or protecting immersion well close to a hot or cold water inlet or steam coil. Install the bulb in the supply line of an indirect water heater, in the indirect water heater itself, or in the feed riser about 6 in. (152 mm) above the boiler. If the riser is valved, install the bulb between the boiler and the valve.



⚠ WITH VERTICAL MOUNTING OF IMMERSION WELL, ELEMENT IS ATTACHED TO BOTTOM OF THE CASE.

⚠ SELECT MODELS HAVE SCREW TERMINAL, NOT TAP TERMINAL.

M8806

Fig. 1. Internal view.



The Aquastat® controller can be remotely mounted—either vertically on a wall or panel, or directly on the boiler, tank, or vessel.

If the system is filled, drain the system to a point below the boiler tapping, or to wherever the sensing bulb is to be installed.

## Mounting the Case

- 1 Remove the cover and fasten the case to the wall or panel using the three mounting holes in the back of the case.
- 2 When mounting the remote bulb, if desirable, route the tubing to run through any of the other three corner notches in the case. Be careful not to kink or bend tubing sharply. Be sure bends have at least 1 in. (25.4 mm) radius.

## Installing Remote Bulb with Immersion Well

Fit well, if used, to sensing bulb snugly for good thermal response. Insert bulb until it rests against the bottom of the well; then hold it there while tightening the tubing clamp.

- 1 Screw the well into the boiler, tank or pipe tapping.
- 2 Insert the bulb into the well, pushing the tubing until the bulb bottoms in the well.
- 3 Attach the retainer clamp to the end of the well spud. Loosen the draw nut and spread the jaws of the clamp with the screwdriver if necessary.
- 4 With the retainer clamp attached to the well spud (be sure jaws of clamp hook over ridge at end of the spud, as shown in Fig. 2, points A). Adjust tubing to fit through retainer clamp groove, as shown at point B.
- 5 Tighten the draw nut so the retainer clamp is firmly attached to the well spud and the tubing is held by the clamp.

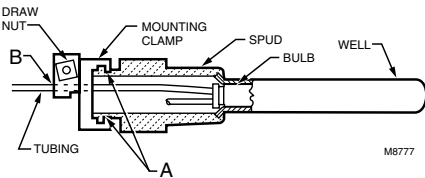
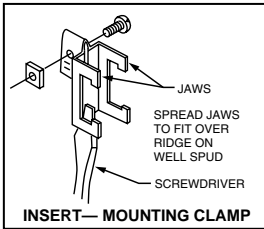


Fig. 2. Immersion well fitting.

### IMPORTANT

*Do not secure draw nut so tightly that retainer clamp could cut or collapse tubing.*

## Mounting with Bulb Compression Fitting

- 1 Screw the fitting into the boiler or pipe tapping.
- 2 Slide sealing washer onto the bulb.
- 3 Insert the bulb into the fitting until bulb bottoms.
- 4 Slide split sleeve into fitting.
- 5 Place clamps A and B on assembly so that sleeve is drawn into fitting when screws are tightened.

NOTE: Make sure that the nub on clamp A engages space between sleeve and clamp.

- 6 Tighten clamp screws evenly.

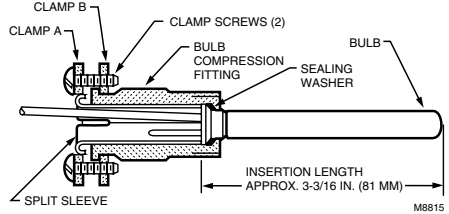


Fig. 3. Bulb compression fitting.

## Mounting with Capillary Compression Fitting

### Fitting

- 1 Screw fitting into the boiler or pipe tapping.
- 2 Place packing nut on tubing.
- 3 Slide bulb completely through fitting.
- 4 Place composition disc and 4 slotted brass washers on tubing in the order shown in Fig. 4. Turn brass washers so that slots are 180 degrees to each other.
- 5 Slide seal assembly into fitting and tighten packing nut.

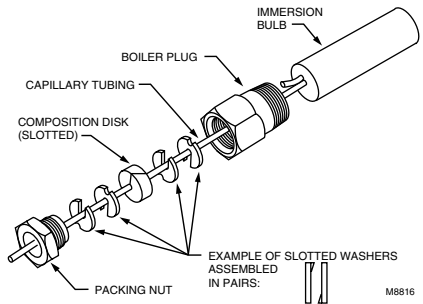


Fig. 4. Capillary compression fitting.

## WIRING

All wiring must agree with applicable codes and ordinances and regulations in such matters as wire size, type of insulation, and enclosure. The controllers are provided with conduit knockouts in the top and bottom of case.

Refer to Fig. 5 or 6 for a typical connection diagram.

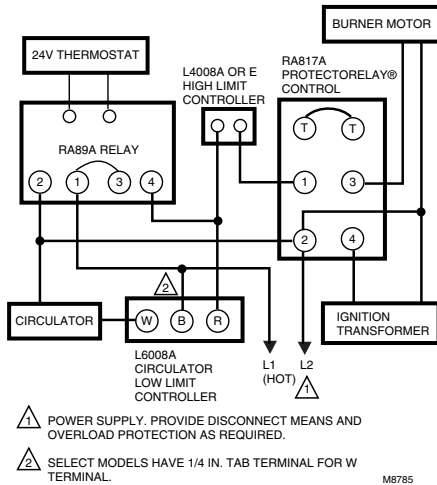


Fig. 5. Typical oil-fired hydronic heating system with domestic hot water.

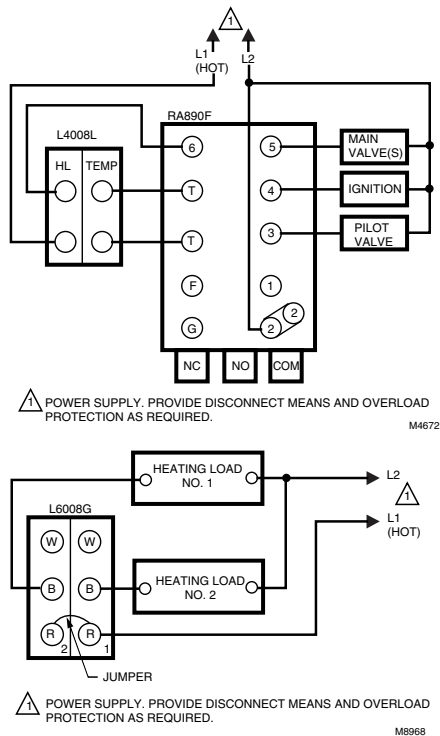


Fig. 6. Typical oil burner installation using L4008L or L6008G.

## SETTING

### Control Point:

Insert a screwdriver in the slotted head visible through the cover, and turn the indicating dial to the control point. Temperature settings should be according to boiler manufacturer's recommendations.

### Differential (on adjustable differential models):

Remove cover and move the differential adjustment wheel (Fig. 1 or 7) to a point on the scale corresponding to the desired differential. Replace cover.

### Manual Reset (L4008E):

After boiler water temperature has dropped to a point below the high limit setting, less differential, the reset button at the front of the case must be pushed before the burner can operate.

## ADJUSTMENTS

### Adjusting Differential

Set the differential to correspond with the boiler manufacturer recommendations. To adjust models with adjustable differential, rotate the wheel on the back of the snap switch, see Fig. 7, until the desired reading is aligned with the V notch in the frame. The wheel provides as adjustment from 5° to 30°F (3° to 17°C). Replace the cover on the Aquastat® controller.

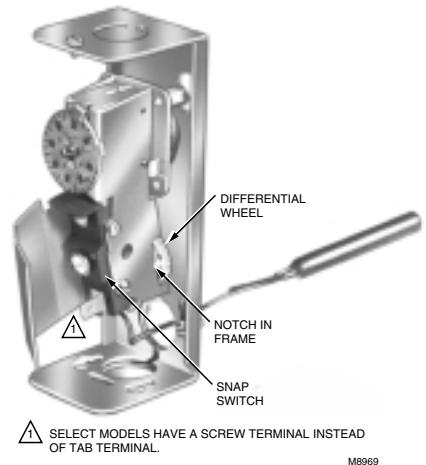


Fig. 7. Adjusting the differential.

Adjust the control point to correspond with the boiler manufacturer recommendations. To adjust, insert a screwdriver in the slotted screw type head located beneath the window in the cover. Turn the scale to the desired control point.

## Adjusting L6008G Interstage Differential

The L6008G Controller has an adjustable interstage differential. The setpoint adjustment knob determines the temperature at which the right switch operates. The left switch can be adjusted to operate from 3° to 10°F (1.7° to 5.6°C) above the point of operation of the right switch. The Interstage differential is adjusted by turning the star wheel with a narrow screwdriver inserted into the rectangular hole in the chassis. See Fig. 8

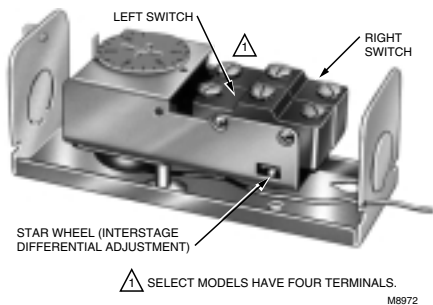


Fig. 8. Interstage differential adjustment on an L4008L or L6008G.

## CHECKOUT



### WARNING

**CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY OR DEATH.**

This product is intended for use only in systems with a pressure relief valve.

Check to be sure the Aquastat® controller is properly installed and adjusted. Put the system into operation and observe the action of the control through several cycles to make sure that it provides proper control of the system as described in the Operation section. Make any additional adjustments necessary to assure comfort requirements.

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