resideo

L8148A,E Aquastat® Relays

INSTALLATION INSTRUCTIONS

APPLICATION

L8148A,E Aquastat® Relays are immersion type controllers for use with forced hydronic heating systems. The combination high limit and intermediate switching relay works with a low voltage (24V) thermostat to control burner and circulator circuits. A call for heat by the thermostat starts both the burner and the circulator. If boiler water temperature exceeds the high-limit setting, the burner circuit is broken; the circulator continues to operate during thermostat call for heat.

L8148A controls line voltage burner circuits; L8148E controls low voltage burner circuits. All models control line voltage circulator circuits.

L8148A,E have provisions for adding low limit controllers; L8148E can power valves in multizone systems.

L8148E available with plug and 50 VA transformer for use with the SV9500/SV9600 SmartValve® System Control.

Scale Range:
180°F to 240°F (82°C to 116°C).

Differential:
Nonadjustable.

High Limit Dial Stop:
Adjustable (optional).

Electrical Ratings:
Circulator Control Circuit (A):

Type	120 Vac	240 Vac
Full Load	7.4	3.7
Locked Rotor	44.4	22.7

Burner Control Circuit:

Model No.	Voltage	Electrical Rating
L8148A	Line	Same as circulator control circuit.
L8148E	Low	0.8A maximum at 24 Vac.

Maximum Pressure on Immersion Well:
255 psi (1758 kPa).

Maximum Ambient Temperature:
150°F (66°C) with 1.2A 24V load.
77°F (25°C) with 1.4A 24V load.

Maximum Bulb Temperature:
40°F over setpoint, up to 265°F (4°C over setpoint, up to 129°C).

Thermostat Heat Anticipator Setting:
0.2A.

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.

⚠ WARNING
Can cause property damage, severe injury or death.
This product is intended for use only in systems with a pressure relief valve.

⚠ CAUTION

1. Disconnect the power supply before beginning installation to prevent electrical shock or equipment damage.
2. Never apply a jumper across (or short) terminals B1 and B2. This will burn out the transformer.

Mounting

Boilers usually have tappings to allow the immersion well (ordered separately) to be mounted horizontally where boiler water of average temperature can circulate freely around it.

1. Turn off all power and drain the boiler.
2. If no tapping is provided, prepare properly sized and threaded tapping near the top of the boiler.

3. Coat the well threads sparingly with pipe dope, install the well in the boiler tapping, and tighten securely.

   NOTE: Do not attempt to tighten using the case as a handle.

4. Refill the boiler and check for water leakage.
5. Insert the bulb element into the well until it bottoms. If necessary, slightly bend the tube inside the case to hold the bulb against the bottom of the well.
6. Center the loop of excess tubing in front of the immersion well so it cannot touch any electrical parts.

   NOTE: Some models have an adjustable tubing length to 3 in. (76 mm). In these models, extra tubing inside the case can be pulled out, if needed. See Fig. 1.

7. Fit case onto well so clamp on case slides over flange on well. Tighten clamp screw securely.

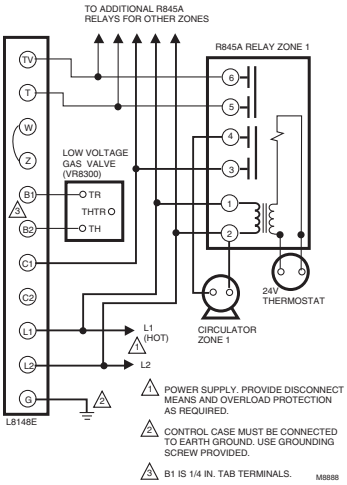

Fig. 1. Adjusting capillary length.

WIRING

IMPORTANT

The terminals of these Aquastat® Relays are approved for use only with copper wire.

Disconnect power supply before making wiring connections to prevent electrical shock or equipment damage. All wiring must comply with local electrical codes and ordinances. The specifications given in the Application section must not be exceeded when applying this control.

L8148E can power up to three V8043 Zone Valves. Additional valves, in groups of three or less, require an additional transformer. Follow the appropriate wiring diagrams when using zone valves or a low limit controller. See Fig. 2 through 10.

NOTE: On systems requiring a vent damper, the vent damper can be connected directly to some L8148E Aquastat® Relay models (Fig. 9) or S8610 Ignition Modules (Fig. 8). With the vent damper plugged into the Aquastat® Relay, a fuse in the Aquastat® Relay blows when the thermostat first closes. Once the fuse is blown, the Aquastat® Relay does not operate unless the vent damper is connected. With the vent damper plugged into the S8610, a fuse in the ignition module blows when first powered. Once the fuse is blown, the ignition module does not operate unless the vent damper is connected.

If the B1 terminal on the device being replaced is a 1/4-inch tab terminal, use the existing wiring harness terminals to install the replacement device. If the B1 terminal on the device being replaced is a screw terminal, insert the provided tab terminal into the screw terminal adapter onto the 1/4-inch tab terminal of the replacement device. After the adapter is installed, reuse the existing wrap-around wire end to make an electrical connection to the B1 terminal.

⚠ CAUTION

If L8148E is used to power zone valves, low voltage (24V) load must not exceed 1.4A; a 1.2A load is the maximum permissible when ambient temperature exceeds 77°F (25°C). Use additional transformer(s) when load exceeds these ratings.

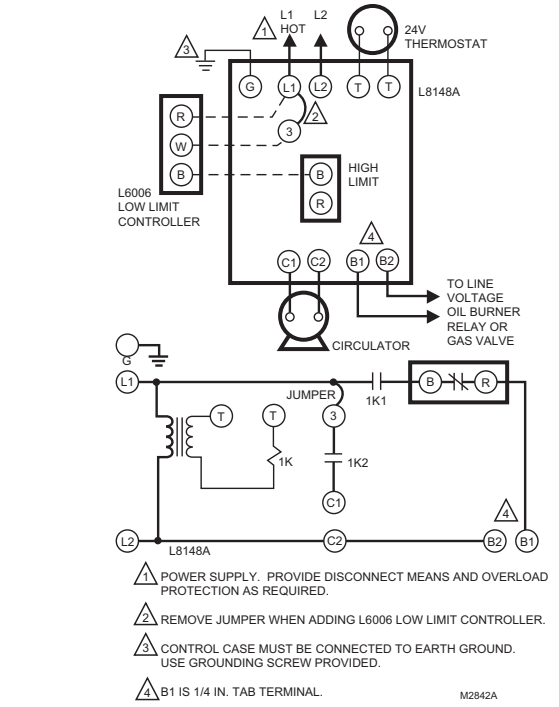

Fig. 2. External connections and internal schematic for L8148A.

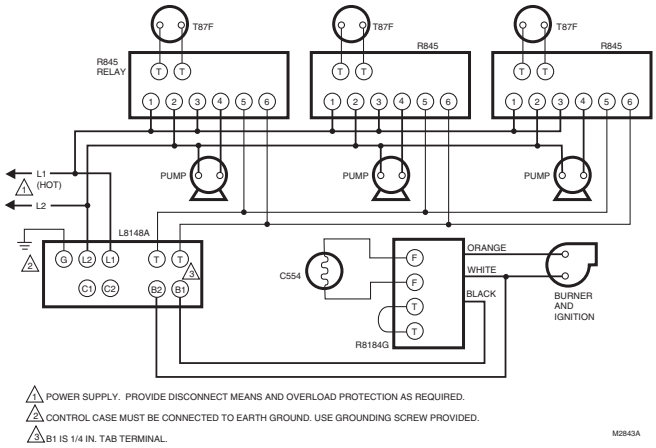

Fig. 3. Wiring L8148A in oil-fired, forced hot water, no tankless, zoned, pump system.

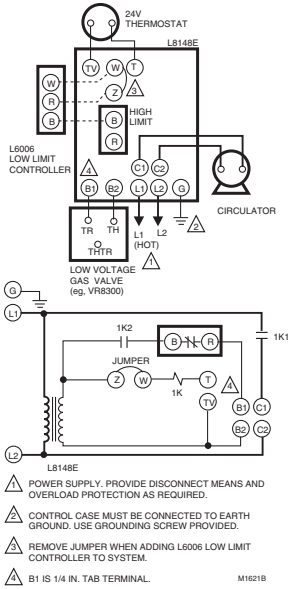

Fig. 4. External connections and internal schematic for L8148E.

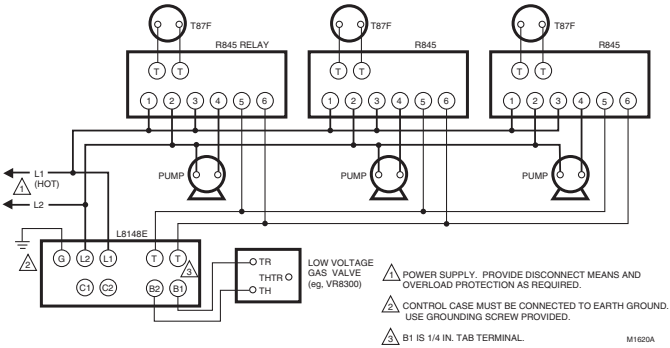

Fig. 5. Wiring L8148E in gas-fired, 24V, forced hot water, no tankless, zoned, pump system.

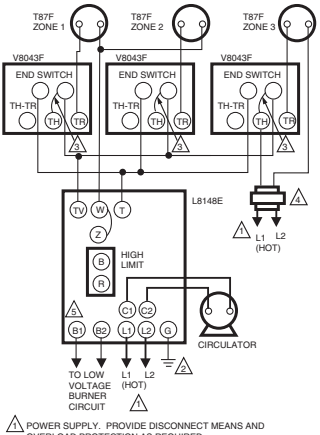

Fig. 6. Wiring L8148E with multizone valves.

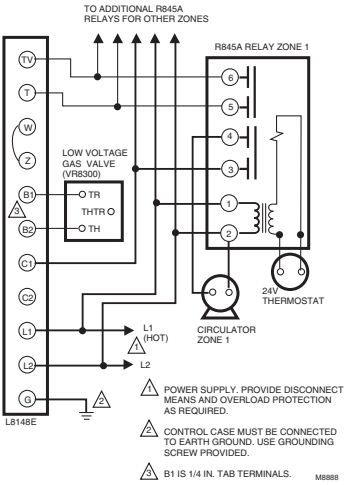

Fig. 7. Wiring L8148E in multizone system with R882C switched circulator.

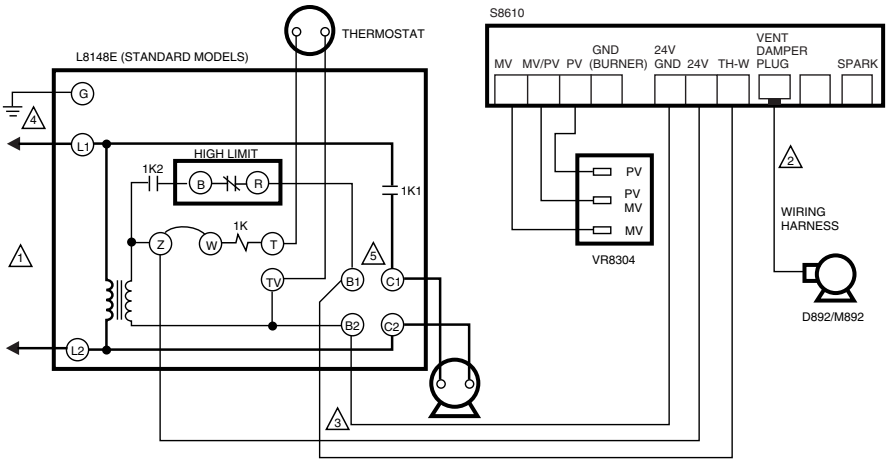

Fig. 8. Wiring L8148E with S8610 automatic vent damper plug and vent damper.

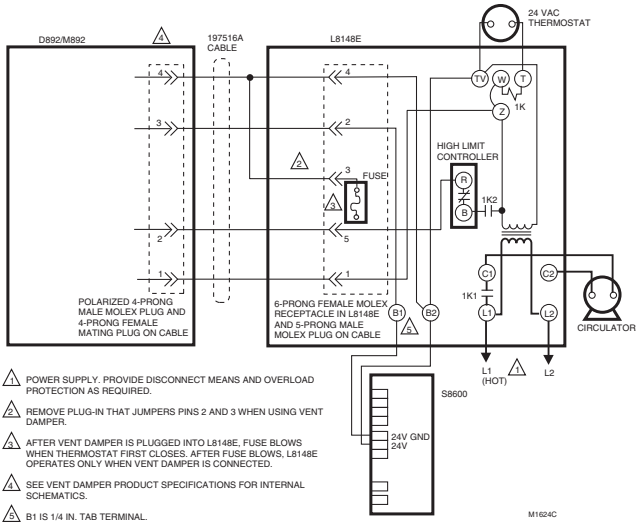

Fig. 9. Wiring L8148E with internal plug directly to D892/M892 Vent Damper in hydronic intermittent pilot system.

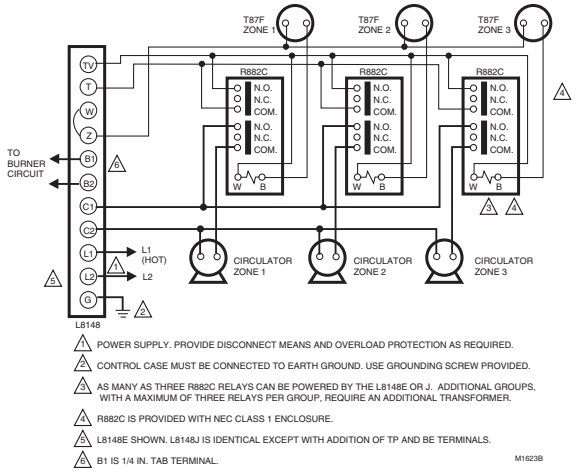

Fig. 10. Multizone system with R882C switched circulator.

OPERATION AND SETTING

High Limit

The high-limit switch shuts off the burner when the boiler water temperature exceeds the high-limit setting. Because heating systems differ, the correct temperature setting for each system can vary. Follow the boiler manufacturer recommendations for the proper setting. With the cover off, turn the dial until the desired setting is directly below the indicator. Adjusted models with an optional dial stop using a small screwdriver as shown in Fig. 11.

⚠ WARNING

Can cause property damage, severe injury or death.

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

Switching Relay

The switching relay is controlled by the low voltage room thermostat. On a call for heat, the relay contacts make to complete the line voltage circulator circuit and also make to complete the burner circuit when the boiler water temperature is below the high-limit setting.

CAUTION

Never apply a jumper across (or short) terminals B1 and B2. This burns out the transformer.

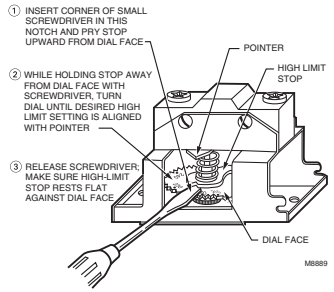

Fig. 11. Adjusting high-limit dial stop with small screwdriver.

CHECKOUT

Put the system in operation and observe each function through at least one complete cycle to be sure all equipment functions as described above.

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