

L7224U Oil and Electric Boiler Electronic Aquastat® Controller

INSTALLATION INSTRUCTIONS

APPLICATION

The EnviraCOM™ enabled L7224U Electronic Aquastat® Controller provides electronic temperature sensing in a UL limit-rated controller with a single sensing probe. The L7224U controls the circulator, oil or electric burner or contactor, and boiler temperature.

The L7224U is "Outdoor Temperature Reset" ready, which is enabled when connected to the W8735Y1000 wireless or W8735S1000 wired Outdoor Reset Kits. This option is intended for all applications except for tankless coil systems for domestic hot water.

The L7224U replaces the L8124A, L8124C, L7124U, L7148A, L7248A,C, L7224A,C, and L8148A controllers and is intended for residential applications.

The L7224U also complies with 2012 DOE regulations to ensure efficiency is maximized without interfering with domestic hot water demands.

IMPORTANT:

Use of Outdoor Temperature Reset on a tankless coil application requiring a Low Limit setting may result in limited system effectiveness and reduced efficiency.

The L7224U provides status and diagnostic information through an LED display combined with LED lights as well as EnviraCOM communications enabled thermostats and diagnostic tools to enhance the diagnostic process.

SPECIFICATIONS

Electrical Ratings:

Voltage: 120 Vac, 60 Hz.
 Power: 7 VA maximum at 120 Vac plus external loads.
 Thermostat current: 100 mA nominal at 24 Vac.
 Burner Relay:

7.4 A at 120 Vac Full Load Amperage (FLA);
 44.4 A inrush Locked Rotor Amperage (LRA);
 Less Ignition Load: 360 VA.

Circulator Relay:

7.4 A at 120 Vac FLA; 44.4 A inrush LRA.
 Zone Controller (ZC): 7.4 A at 120 Vac FLA;
 44.4 A inrush LRA.

NOTE: All loads combined cannot exceed 2000 VA.

Environmental Ratings:

Temperature: -30 °F to +150 °F (-34 °C to +66 °C).
 Humidity: 0 to 95% relative humidity, noncondensing.

Approvals:

Underwriters Laboratories Inc. Component Recognized.
 Canadian Underwriters Laboratories Inc. Component Recognized.

2012 DOE Compliance and Operation

Operation of this control may delay the burner operation while the residual heat is circulated out of the boiler.

NOTE: This operation may be different than earlier electronic Aquastat® revisions which did not implement thermal purge.



Accessories (Ordered Separately):

- W8735Y1000 Wireless Outdoor Reset Kit
- W8735ER1000 Wireless Outdoor Reset Module
- C7089R1013 Wireless Outdoor Temperature Sensor (requires W8735ER1000)
- W8735S1000 AquaReset™ Outdoor Reset Kit (includes 50022037-002 Outdoor Reset Module and C7089U1006 Outdoor Temperature Sensor)
- W8735S1008 AquaReset™ Domestic Hot Water Kit (includes 50022037-005 Domestic Hot Water Module and 32003971-003 Sensor)
- C7089U1006 Outdoor Temperature Sensor (used with the 50022037-002)
- 32003971-003 Temperature Sensor (used with 50022037-005)
- Sensor (See Table 2).
- Sensor Well Clamp 121371AA.
- 120650 Heat Conductive Compound.

Table 1. Wells for L7224U Controller.

Part Number	Spud Size in. (mm)	Insertion in. (mm)	Insulation in. (mm)
123869A	1/2 (12.7) NPT	3 (76.2)	1-1/2 (38.1)
123870A	3/4 (19.05) NPT	3 (76.2)	1-1/2 (38.1)

Table 2. Sensors for L7224U Controller.

Part Number	Length in. (mm)	Application
50001464-001	12 (304.8)	Well-mounted controls
50001464-003	24 (609.6)	Flush-mounted controls
50001464-004	36 (914.4)	
50001464-005	48 (1219.2)	

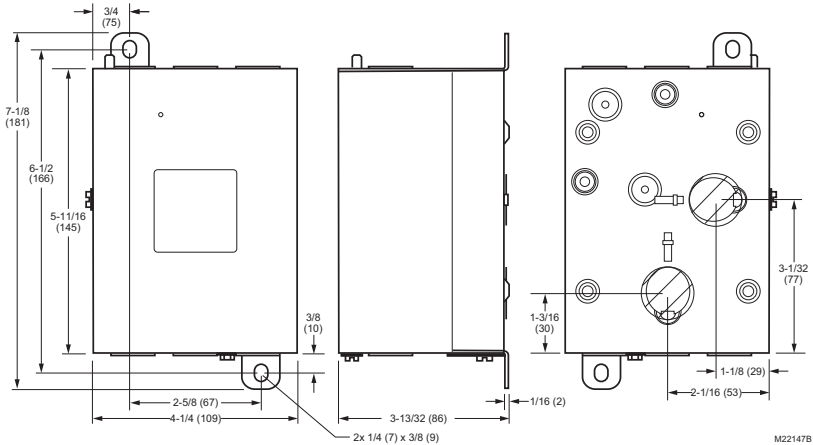


Fig. 1. L7224U mounting dimensions in inches (mm).

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. The installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.
5. Set High Limit, Low Limit and Differential to the settings recommended by the boiler OEM.
6. Record the maximum High Limit setting from the replaced controller in the text box provided on the cover insert label.

7. Record the High Limit setting at the time of installation in the text box provided on the cover insert label.



WARNING

Electrical Shock Hazard.
Can cause severe injury, death or property damage.

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

Mounting

The L7224U can be mounted in a well mount, horizontal or vertical position, or flush mounted remote from the well.

IMPORTANT

Immersion well must fit sensing element and sensor must rest against bottom of well.

New Installation

Order well assemblies separately; refer to Table 1 and form no. 68-0040, Immersion Wells and Compression Fittings for Temperature Controllers. Boilers usually have tappings that allow the well to be mounted horizontally so boiler water of average temperature can circulate freely over the well. See Fig. 1 for mounting dimensions.

1. Turn off all power and drain the boiler, if applicable.
2. If no tapping is provided, prepare properly sized and threaded tapping near the top of the boiler.
3. Sparingly coat the well threads with pipe dope.

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

4. Install the well in the boiler tapping and tighten securely.
5. Refill boiler and check for water leakage.
6. Identify if installation requires vertical or horizontal mounting.
7. Remove the well knockout, for either vertical or horizontal mounting, by carefully prying the knockout from the back of the case, using a flat-bladed screw driver. Refer to Fig. 2.
8. Loosen but do not remove the well clamp screw.
9. Fit the case into the well so the clamp on the case slides over the flange on the well.
10. Securely tighten the clamp screw.
11. Insert the sensor element into the well until it bottoms. (If necessary, slightly bend the wire inside the case to hold the sensor against the bottom of the well.)
12. Turn power ON.
13. Set High Limit, Low Limit and Differentials to the settings recommended by the boiler OEM. (See OPERATION section, also refer to INSTALLATION steps 6 and 7.)

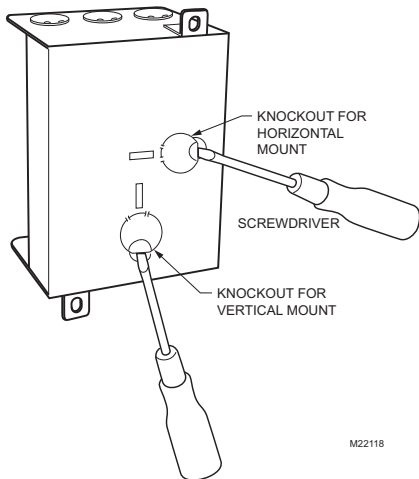


Fig. 2. Removing horizontal or vertical mounting knockout.

IMPORTANT

Best thermal response is obtained with a well that snugly fits the sensor. Insert the sensor until it rests against the bottom of the well. Use a well of correct length and bend the wiring, if necessary, to hold the bulb against the bottom of the well.

If the well is not a snug fit on the sensor, use the heat-conductive compound (furnished with TRADELINE® models) as follows: Fold the plastic bag of compound lengthwise and twist it gently. Then snip off end of bag and work the open end of the bag all the way into the well. Slowly pull out the bag while squeezing it firmly to distribute compound evenly in the well. Bend the wiring, if necessary, to hold the sensor against the bottom of the well and to hold outer end of the sensor in firm contact with the side of the well. See Fig. 3. Wipe excess compound from the outer end of the well.

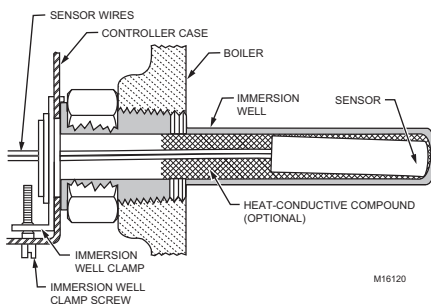


Fig. 3. Position of sensor in immersion well.

Flush-Mounted Aquastat Replacement

Turn off all power and remove the old controller. Refer to the cover insert of the old controller to identify and tag each external lead as it is disconnected. If the old well is unsuitable for the new installation, remove it and replace it with a suitable new well. If the old well is suitable, use it. See Fig. 1 and 4 for mounting tab location.

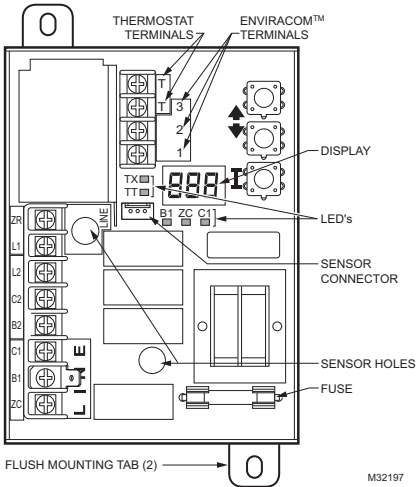


Fig. 4. Location of L7224U flush-mounting tabs and LEDs.

Well-Mounted Aquastat Replacement

Turn off all power and remove the old controller. Refer to the cover insert of the old controller to identify and tag each external lead as it is disconnected. If the old well is unsuitable for the new installation, remove it and proceed with instructions for new installation. If the old well is suitable, use it.

1. Loosen, but do not remove, the well clamp screw on the side of the controller case.
2. Position immersion well clamp snugly over the flange of the adapter and tighten the clamp screw.
3. Insert the sensor into the well as shown in Fig. 5. (If desired, distribute the heat-conductive compound in the tube prior to sensor insertion, as described in New Installation.)
4. Make sure sensor is fully seated to bottom of well (Fig. 5). Use a small pencil to measure depth of sensor in well, if necessary.

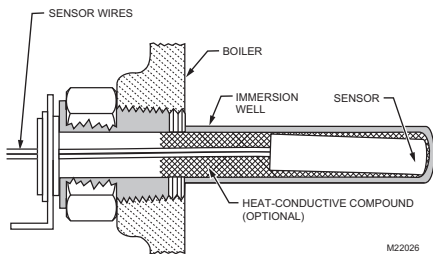


Fig. 5. Replacement sensor installation.

Replacement Sensor Installation

Turn off all power and carefully disconnect sensor from circuit board by pulling gently on the connector.

1. Gently pull sensor from thermo well and through circuit board by pulling on leadwires.
2. Carefully align replacement sensor with hole in circuit board and guide through Aquastat case and into well. Refer to Fig. 5.
3. Make sure sensor is fully seated to bottom of well (see Fig. 5). Use a small pencil to measure depth of sensor in well, if necessary.
4. Connect sensor to circuit board by pressing connector on sensor unit into mating connector on circuit board (refer to Fig. 6).
5. For remote sensors (flush mounted Aquastat) be sure to use the 121371AA clamp to securely hold sensor in place. See Accessories.

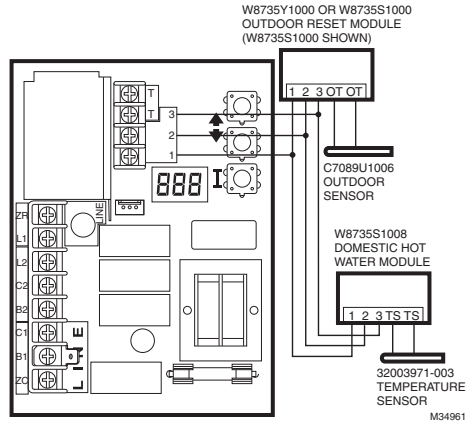


Fig. 6. Wiring the Outdoor Reset Module and the Domestic Hot Water Module.

Fuse

The 1 Amp fuse located near the transformer is intended to protect the EnviraCOM circuit from incorrect wiring. The Aquastat will continue to function should the fuse blow or be removed though no EnviraCOM communication will be possible on the bus and Err 6 will be displayed. See Table 9.

WIRING



WARNING

Electrical Shock Hazard.
Can cause serious injury or death.
Disconnect power supply before making wiring connections to prevent electrical shock or equipment damage.

All wiring must comply with local electrical codes and ordinances. Do not exceed the specifications in the Application section when wiring this controller.

IMPORTANT

The terminals on these Aquastat Controllers are approved for use with copper wire only.