



*We Manage Heat®*

# **FWT®- 3H Hydronic Thermostat**

**(Order Number 19090)**

## **Installation And Operating Instructions**

**Environmental Technology, Inc.**

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Before disposing of the packing material, verify the inclusion of items in the packing list. Immediately notify CUSTOMER SERVICE of any discrepancy or shipping damage.

### Packing List

Quantity	Part Number	Description
1	19092	Installation and Operation Instructions
1	19088	FWT-3H Electronic Assembly
2	18581	Wall Plate Screw, White
1	19272	Temperature Sensor/Extension Cable

## Installation

### Mounting

The FWT-3H Electronic Assembly mounts in a single-gang switch box (customer supplied). Choose a mounting location that is convenient and reasonably close to the temperature sensor. The Temperature Sensor comes with 20 feet (6.1m) of jacketed extension cable. The cable length can be shortened if the entire 20 feet is not needed for the chosen mounting location. Shortening the cable will not affect performance of the FWT-3H. Locate the temperature sensor within the heated space as shown in Figure 1. Do not allow the temperature sensor or extension cable to cross over or come in contact with any heating source such as a hydronic tubing run.

Though it is not required, it is highly recommended that the temperature sensor/extension cable be housed in conduit as shown. This will make replacing the temperature sensor much easier in the unlikely event it ever needs to be replaced. The *entire* length of the extension cable need not be housed in conduit; only the length traveling through the floor substrate and a short vertical section behind an adjacent wall (generally where the extension cable rises up out of the floor substrate). Use thin wall conduit with a minimum diameter of 1/2". Be sure the temperature sensor can pass through the conduit unobstructed when the extension cable is fed through. Cap the end of the conduit in the heated space prior to installation of the floor substrate. This avoids clogging the conduit and wedging the temperature sensor against the conduit wall. Also make sure that the temperature sensor reaches the cap at the end of the conduit.

### Wiring

Figure 2 shows the relay, Temperature Sensor and power source connections to the terminal block on the back of the FWT-3H Electronic Assembly. A label on the terminal block identifies these connections. The relay is a normally open isolated contact rated at 3 Amps resistive, or 1 Amp inductive. The FWT-3H requires an NEC Class 2, 24 volt AC power source (customer supplied), rated at 5VA or higher to operate. Many hydronic systems use 24 volts AC, which is suitable for powering the FWT-3H. If power cannot be derived from the hydronic system, a separate 24 volt AC Class 2 transformer must be used. If the controlled device (pump contactor, zone valve, boiler control, etc.) is being supplied from the same power source supplying the FWT-3H, make sure the source has sufficient VA capacity to supply both loads. When making the *relay* and *power source* connections, use #18 AWG stranded wires if the wire lengths needed are less than 50 feet. For lengths more than 50 feet, but less than 150 feet, use #16 AWG stranded wires. For lengths greater than 150 feet, contact CUSTOMER SERVICE. Connect the temperature sensor extension cable leads into to the terminal block as shown in Figure 2. Reversing these leads does not interfere with operation of the FWT-3H.

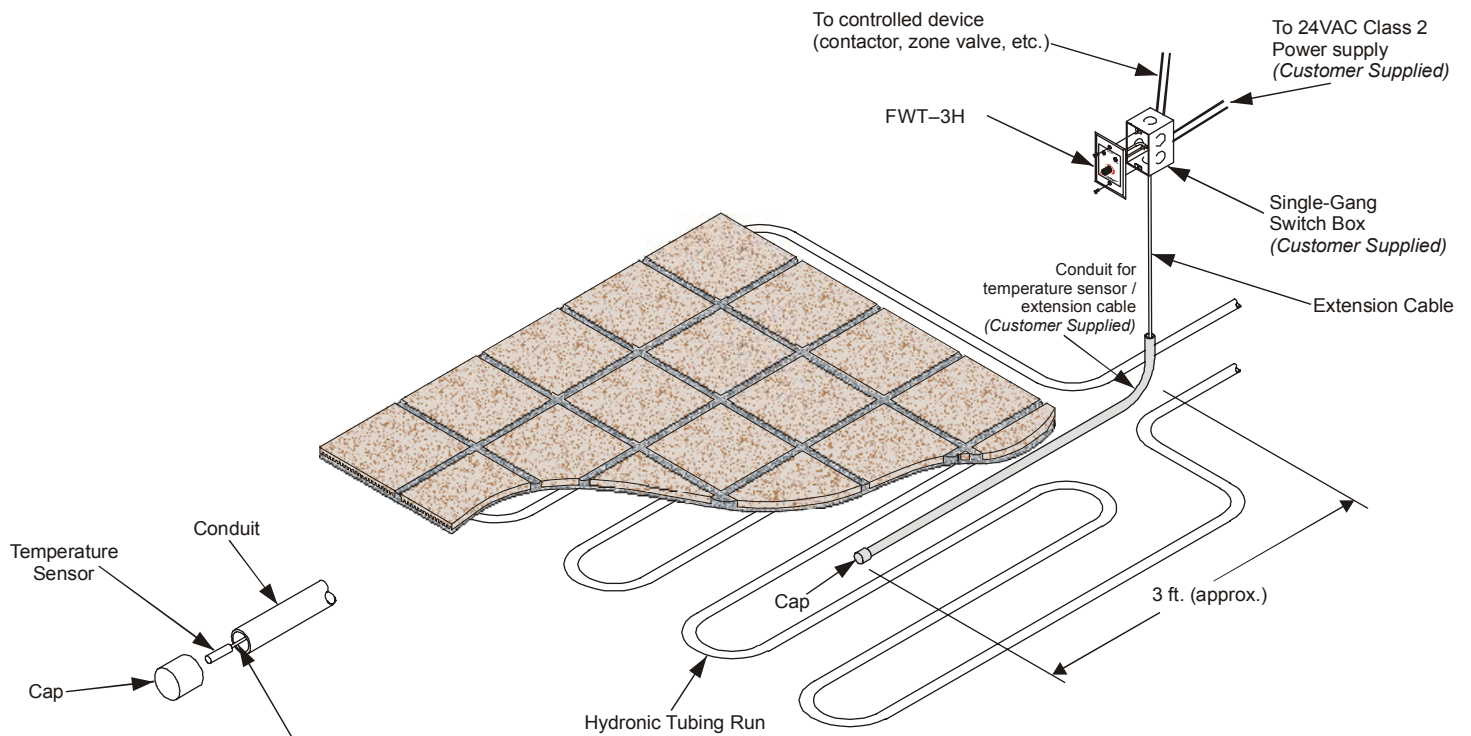


Figure 1

## FWT-3H Electronic Assembly/Temperature Sensor Mounting

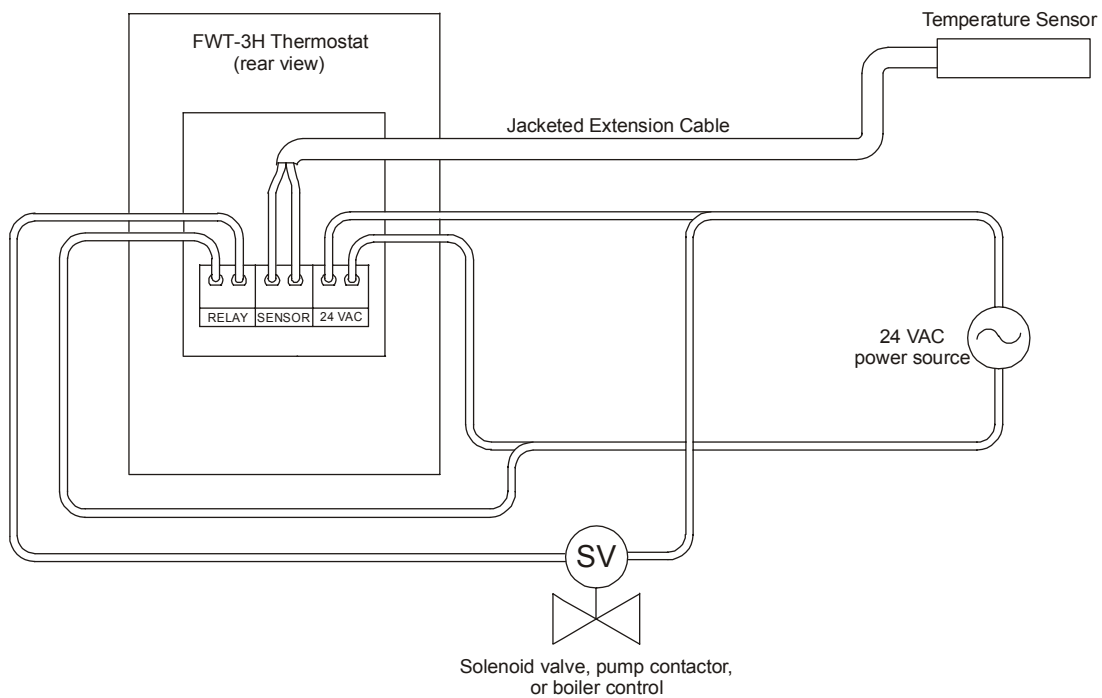


Figure 2

## FWT-3H Wiring Diagram

## Operation

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The green POWER indicator operates to show that power is available.

The yellow HEAT indicator operates and the relay contact closes during heating.

The knob sets the operating temperature. Clockwise rotation increases the temperature.

Full counterclockwise rotation puts the system or zone in IDLE mode which prevents heating. This feature saves energy by not heating unoccupied areas. The HEAT indicator blinks slowly when the IDLE mode has been selected.

## Troubleshooting

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Our experience shows that installation errors cause the majority of problems. Frequently encountered problems include wiring errors. Simple electrical tests and visual inspections usually identify these problems.

Neither indicator operates and there is no heat.

Power is probably not available - check the power source connection at the terminal block. If the problem persists with 24 volts AC available and power wires are properly connected, the FWT-3H Electronic Assembly is probably defective. Contact CUSTOMER SERVICE.

Both indicators operate continuously and there is no heat.

There may be an open circuit in the wiring between the RELAY connection and the controlled device (pump contactor, zone valve, boiler control, etc.). If this wiring is ok and the problem persists, a malfunction in the controlled device or the hydronic heating system is the likely source of the problem.

The yellow HEAT indicator blinks rapidly and there is no heat.

The FWT-3H is detecting an open circuit in the Temperature Sensor connection. When this happens, the relay remains de-energized (contacts open), regardless of the temperature setting. Make sure the wires in the Temperature Sensor extension cable are properly connected to the terminal block. If the wires are properly connected and the problem persists, the Temperature Sensor extension cable has probably been severed at some location along its length. A defective Temperature Sensor is possible, though unlikely.

There is continuous heat and the yellow HEAT indicator is off.

There may be a short circuit in the wiring between the RELAY connection and the controlled device. A short in this wiring can emulate a continuously closed relay contact without illuminating the HEAT indicator. If the wiring is ok and the problem persists, a malfunction in the controlled device or the hydronic heating system is the likely source of the problem.

### QUESTIONS AND COMMENTS

*For technical help, questions or comments concerning this product or any of Environmental Technology, Inc. products contact the Customer Service Department between 8:00am and 5:00pm EST at:*

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