

Uponor

RADIANT HEATING SYSTEMS

HEAT AND COOL THERMOSTAT

INSTRUCTION SHEET

Technical Data

Operating Voltage	24VAC +/- 10%
Maximum Load	1.3 Amps at 24VAC 4 x MVA (part number A3020522) 6 x TVA (part number A3010522)
Display Range	38°F to 99°F (2°C to 37°C)
Setting Range	38°F to 99°F (2°C to 37°C) 68°F (20°C) heating default setting 75°F (24°C) cooling default setting
Minimum Limit	38°F (2°C) to maximum limit 50°F (10°C) default minimum setting
Maximum Limit	Minimum limit to 99°F (37°C) 86°F (30°C) default maximum setting
Units	User-configurable Fahrenheit or Celsius
Memory	Permanent settings and mode without power
Freeze Protection	Activation at 38°F (3.3°C) De-activation at 39°F (3.8°C)
Overheat Protection	Activation at 100.4°F (38°C) De-activation at 98.6°F (37°C)
Resolution	1° displayed 0.25° calculated
Temperature Ranges	Shipping and storage: 14°F to 158°F, (-10°C to 70°C) Operation: 32°F to 104°F, (0°C to 40°C)
Humidity	20 to 90% non-condensing
Size	5" H x 2.72" W x 0.91" D

Overview

The Uponor Heat and Cool Thermostat (A3030102) controls hydronic heating, air conditioning and a fan. The six-wire thermostat receives power from the Rh (radiant heating) and C (cooling) terminals.

These thermostats are power-sharing, meaning they receive power for operation by sharing voltage with the connected wiring. This eliminates any need for a third wire or batteries, making them simple to install, wire and service.

Note: Uponor thermostats work effortlessly with other Uponor components. However, some commonly used third-party devices (e.g., relays, zone valves, etc.) may have compatibility issues with these thermostats. If connecting the Uponor thermostat to a third-party control device, refer to that device's installation instructions for specific information regarding operation with power-sharing thermostats. The Typical Wiring Schematics section on **page 5** features the most common wiring applications. For additional help, contact Technical Services.

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Uponor Canada: (888) 994-7726

Tools Required

- Small, flat-head screwdriver
- Phillips screwdriver (for mounting hardware)
- Wire stripper and cutter

Installation

To properly install the thermostat, refer to the following instructions.

1. Thoroughly read this instruction sheet to understand the proper procedures for installation and operation. Failure to do so could result in damage to the thermostat or its connected equipment, and can also create a safety hazard.
2. Ensure the function and rating of the thermostat is suitable for the application.
3. Only experienced and trained professionals familiar with low-voltage wiring should attempt to install the thermostat.
4. Uponor recommends using 18AWG LVT wiring for all low-voltage connections (as regulated by local building codes).

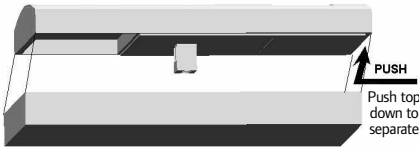
Placing the Thermostat

Thermostat placement is extremely important. Install the thermostat approximately five feet (1.75 meters) above the floor on a smooth, flat surface. Avoid mounting the thermostat in the following locations.

- Near or around windows
- On outside walls
- Near fireplaces
- In the corner of a room
- Behind doors
- On interior walls susceptible to solar gains
- Near stoves, lamps, televisions, etc.
- Damp areas

Mounting the Wall Plate

The thermostat case can mount to a standard electrical wall box or most wall surfaces using suitable hardware. To properly mount the wall plate, refer to the following instructions.



1. Separate the front and back plates of the thermostat by gently applying downward pressure on the front plate to separate the front plate from the back plate.
2. Pull the thermostat wire through the round opening in the back plate.
3. Place the back plate against the wall at the desired location to cover the opening or electrical wall box.
4. Align the holes of the back plate to the holes in the wall or electrical wall box, and attach the plate with screws. If mounting the plate to drywall, use wall anchors and screws.
5. If the wall cavity behind the thermostat is susceptible to drafts (e.g., from a return-air plenum or an uninsulated wall), plug and seal any openings to prevent them from affecting temperature readings.

Wiring the Thermostat

To properly wire the thermostat, refer to the following instructions.

Note: All wiring must comply with local electrical codes and standards.



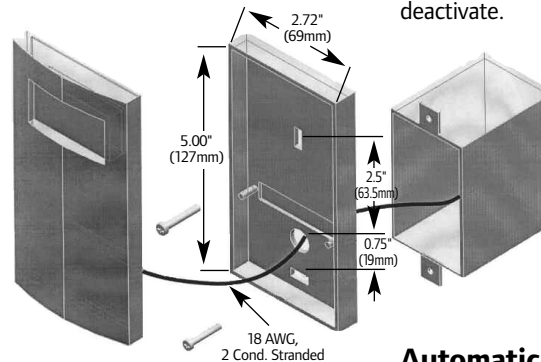
Caution: Disconnect electrical power to the system to prevent electrical shock and damage.

1. Remove $\frac{1}{4}$ " of wire insulation from the wire ends. Ensure the bare wires are clean and free of corrosion.
2. Route the wires to the terminal blocks and place the end of the wires in the correct wiring locations.

Note: The heat terminals (Rh and W) are not polarity sensitive.

Mounting the Thermostat to the Wall Plate

To mount the thermostat to the wall plate, refer to the following instructions.



1. Place the tabs at the bottom of the front enclosure into the grooves at the back of the wall plate.
2. Check the alignment between the two components.
3. Apply pressure to the top of the thermostat until it snaps into place.

Operation

The dynamics of a radiant heating system differ from a typical baseboard or forced-air heating system. This is because radiant systems heat the mass and the objects in the room. The Uponor thermostat uses optimized control logic to control radiant systems. Refer to the following information for the different modes of operation.

Heating Mode

When the room temperature falls 0.5°F (0.25°C) below the desired room setting, the control devices wired to the thermostat activate. When the room temperature rises 0.5°F (0.25°C) above the desired room setting, the control devices wired to the thermostat deactivate.

Cooling Mode

When the room temperature rises to 1°F (0.5°C) above the desired room setting, the control devices wired to the thermostat activate. When the room temperature falls 1°F (0.5°C) below the desired room setting, the control devices wired to the thermostat deactivate.

Automatic Mode

The thermostat automatically switches between heating and cooling modes based on the heating and cooling setpoints. (The cooling setpoint must be greater than or equal to the heating setpoint.) When the thermostat is in automatic mode, the cooling mode icon (snowflake) flashes when the cooling system is active; the heating mode icon (floor with tubing) flashes when the heating system is active.

Pulse Width Modulation (PWM) Mode

When the room temperature is between 1 to 3°F (0.5 to 1.5°C) below the desired room setting, the thermostat manages the application of heat by varying the on-and-off cycles, or what is known as pulse width modulation (PWM). The on-and-off times vary depending on the difference between room and desired temperatures — the further away, the greater the on time. This prevents the room temperature from rising above the desired temperature. The heating system will run continuously at temperature differences greater than 3°F (1.5°C).

Note: In PWM mode, the heating equipment may temporarily turn off even when the heating icon is flashing (indicating a call for heat).

Note: Operating forced-air heat disables PWM mode. Refer to the Differential Setting section on page 4 for further details.

Digital Filtering

The thermostats also feature digital filtering, meaning the thermostat continuously measures the room temperature and employs a digital filter to create a stable reading and consistent operation. If each room temperature reading displayed as it is sensed, the temperature shown would appear erratic and inconsistent. The filtering technique throws out sensor readings with large differences from the displayed temperature and then limits the amount any individual reading can affect the overall displayed reading. This results in a smooth display and operation.

Note: Due to filtering, the displayed room temperature can take up to a minute to change 1°F (0.5°C).

Important: Uponor thermostats conform to universal industry standards. Uponor is not responsible for damages resulting from misapplication or misuse of its products. To avoid damage to the thermostat, install the thermostat with the power disconnected.

Setting and Adjusting the Thermostat

All user functions operate via two buttons (+ and -) located on the front of the thermostat case.

Power Up and Power Interruption

After completing all electrical connections and properly mounting the thermostat, apply power to the system. The thermostat reading automatically starts at 68°F (20°C) in heating mode, which is the default temperature setting and mode.

The Uponor thermostat can recall the previous temperature setting and mode if power is interrupted. When power is restored, the

thermostat's reading will start at the previous temperature setting and the previous mode (Heat, Cool or Off).

Normal Operation

The thermostat displays the current room temperature measured by the thermostat along with the mode of operation. The following icons indicate the mode of operation.



- **None** — Thermostat is turned off.
- **Floor with tubing** — Heating mode is active with no call for heat.
- **Floor with tubing and lines flashing above** — Heating mode is active with a call for heat.
- **Snowflake** — Cooling mode is active with no call for cooling.
- **Flashing snowflake** — Cooling mode is active with a call for cooling.
- **Snowflake and radiant panel** — Automatic mode is active.
- **Fan** — The fan is on.

Adjusting the Temperature

To adjust the temperature setting, refer to the following instructions. Pressing the + (increase or top button) or - (decrease or bottom button) changes the desired room temperature setting.

1. Press either button to enter the setting program mode.
2. When adjusting the heating setpoint, the Heating icon will flash; when adjusting the cooling setpoint, the Cooling icon will flash.

3. Press the + (top button) to increase the room setting and the - (bottom button) to decrease the room setting. Press and hold the button to rapidly change the temperature setting.
4. The thermostat accepts the new setting five seconds after pressing the last button; then the thermostat reverts to displaying the current room temperature.

Note: When the mode is set to Off, temperature settings cannot be changed or adjusted.

Note: If the thermostat is in Automatic mode, changing the setting will change the setpoint that is currently active. When the thermostat is set for Automatic mode, and Cooling mode is active, changing the setting will affect the cooling setpoint. When the thermostat is set for Automatic mode, and Heating mode is active, changing the setting will affect the heating setpoint. The mode icon will flash to indicate which mode is active when changing the setpoint in Automatic mode. To change a setpoint, that mode must be active (e.g., if the Cooling mode is active and the user wants to change the heating setpoint, the user must activate the Heating mode to change the heating setpoint).

Changing Modes (Heating, Cooling and Off)

This thermostat does not use a switch to change the mode from Heat to Off. To change the modes, refer to the following instructions.


1. Press both (+ and -) buttons simultaneously to change the mode.
2. Ensure the program bar is flashing to indicate the thermostat is in the programming mode.
3. Press the + or - button to change the mode of operation. Using the + (top) button or the - (bottom) button changes the rotation sequence of the icons or modes.



The following icons indicate the mode.

- **None** — Thermostat is off
- **Floor icon** — Heating mode with automatic fan
- **Floor and fan icons** — Heating mode with fan turned on
- **Snowflake icon** — Cooling mode with automatic fan
- **Snowflake and fan icons** — Cooling mode with fan turned on
- **Snowflake and floor icons** — Automatic mode with automatic fan
- **Snowflake, floor and fan icons** — Automatic mode with fan turned on
- **Fan icon** — Fan operates, but heating and cooling devices will not activate

Note: The thermostat accepts changes five seconds after pressing the last button, and then the thermostat returns to normal operation.

 **Important:** The thermostat remembers the previous operating mode and settings after it is powered off.

Advanced Settings

The Uponor thermostat features extra settings, which are accessed via the Special Setting button on the inside of the thermostat case. When using this button, the thermostat must be wired and have power, but needs to be separate from the wall mounting plate.

Note: Uponor recommends only qualified installers change these settings. Improper adjustment of these settings can result in damage to the thermostat.

Units

The Uponor thermostat is capable of operating in either Fahrenheit or Celsius. To change the units setting, refer to the following instructions.

1. Press the Special Setting button once.
2. The display shows the units icon (°F or °C).
3. Press the + (top) or – (bottom) button to change the units.
4. The thermostat accepts the change five seconds after pressing the last button, and then the thermostat returns to normal operation.

Upper Setting Limit

To set the upper limit of the allowable temperature setting range, refer to the following instructions.

1. Press the Special Setting button twice.
2. The number 1 will appear in the lower left of the display along with the temperature setting.
3. Press the + (top) or – (bottom) button to increase or decrease the upper setting limit of the thermostat.
4. The thermostat accepts the change five seconds after pressing the last button, and then the thermostat returns to normal operation.

Lower Setting Limit

To set the lower limit of the allowable temperature setting range, refer to the following instructions.


1. Press the Special Setting button three times.
2. The number 2 will appear in the lower left of the display along with the temperature setting.
3. Press the + (top) or – (bottom) button to increase or decrease the lower setting limit of the thermostat.
4. The thermostat accepts the change five seconds after pressing the last button, and then the thermostat returns to normal operation.

Note: Use the upper and lower limit for public thermostat operation. By setting these limits to the same value, a user cannot change the thermostat setting.

Sensor Reading Calibration

This setting varies the reading of the thermostat to overcome installation-related issues.


1. Press the Special Setting button and the + (top) button at the same time.
2. The display shows a single digit number and the set operating units.
3. Press the + (top) or – (bottom) button to increase or decrease the sensor reading offset. Positive numbers increase the sensor reading; negative numbers decrease the sensor reading.
4. The thermostat accepts the change five seconds after pressing the last button, and then the thermostat returns to normal operation.

 **Important:** Adjust the sensor reading calibration as a last resort after first trying all other remedies.

Differential Setting

This setting allows the user to select a straight 2°F differential when operating a furnace or air handler, or the standard Uponor heat algorithm for radiant floor heating as described in the PWM Mode section on **page 2**.

1. Press the Special Setting button and the – (bottom) button at the same time.
2. The display indicates either AH (air handler/furnace) or FL (floor heating).
3. Press the + (top) or – (bottom) button to change the setting as required.
4. The thermostat accepts the change five seconds after pressing the last button and then returns to normal operation.

 **Important:** Uponor recommends using the FL or floor heating setting with radiant heating systems.

Freeze Protection

The thermostat features automatic low-temperature protection to prevent freezing. Regardless of the temperature setting and mode (Heating, Cooling or Off), the thermostat will activate the heating circuit at 38°F (3.3°C) until the room temperature reaches 38.8°F (3.8°C). Users cannot disable this feature.

Overheat Protection

The thermostat features an automatic high-temperature protection to prevent overheating. Regardless of the temperature setting and mode (Heating, Cooling or Off), the thermostat will activate the fan and cooling circuits at 104°F (38°C) until the room temperature reaches 98.6°F (37°C). Users cannot disable this feature.

Typical Wiring Schematics

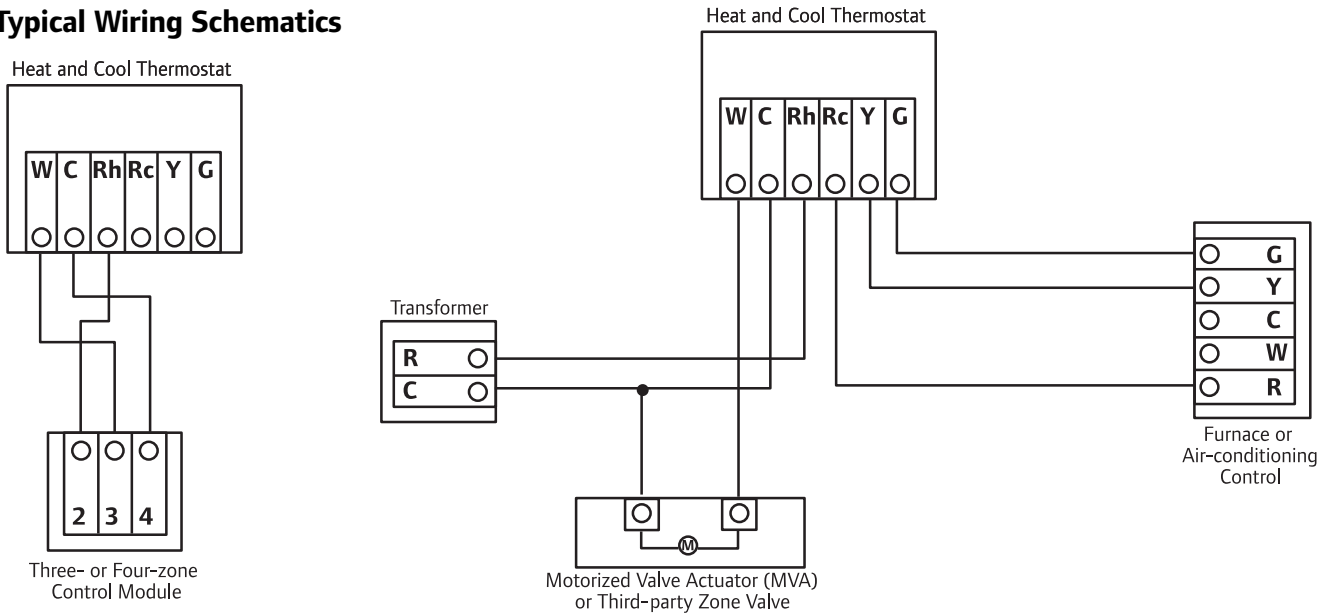


Figure 1: Typical Wiring for a Zone Control Module for Heating Only

Figure 2: Typical Wiring for Heating and Cooling

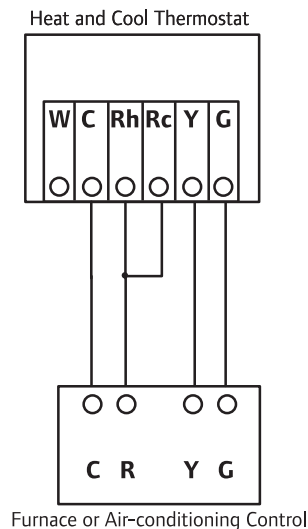


Figure 3: Typical Wiring Using Cooling Only

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