

ProBasic Thermostat 450009

- Dual Sensing



- Superior comfort control
 - Ultimate floor protection features
 - Maximum Energy Efficiency
 - Simplest Installation
 - Direct System Control
 - Modern, small, compact design

Key Features

- Electronic 24v Thermostat With Silent Triac Operation
- Easy Single Dial Temperature Regulation
- Superior Comfort Control Through Accurate Temperature Sensitivity Reading In 0.5°F Steps
- Set-back/night Reduction Modes
- External Timer Programmable
- Included External Sensor
- Switchable Dual Sensor Operation
- High Temperature Limiter
- Low Temperature Limiter
- Direct Control Of Up To Four Manifold And Zone Actuators
- Small, Compact Design

Description

Its many state-of-the-art features make AquaHeat® 450009 ProBasic dual sensing thermostats the most versatile and best performing room control in its value range. Organized components and switches allow for easy setup and installation.

The ProBasic dual sensing thermostat provides accurate reading of room and floor conditions and with our +/- 0.9°F temperature accuracy, your customers will be comfortable and protect their HVAC systems. Target temperature is being adjusted through a proportional integration function which guarantees maximum regulation efficiency. The thermostat works in either heating, Set back (Night Reduction), or timer compatible modes.

It is a single device that can directly operate up to four manifold or zone actuators on 24V_{AC} power. The thermostat further features a direct connection possibility for pump relays and auxiliary circuit components through the on-board TRIAC.

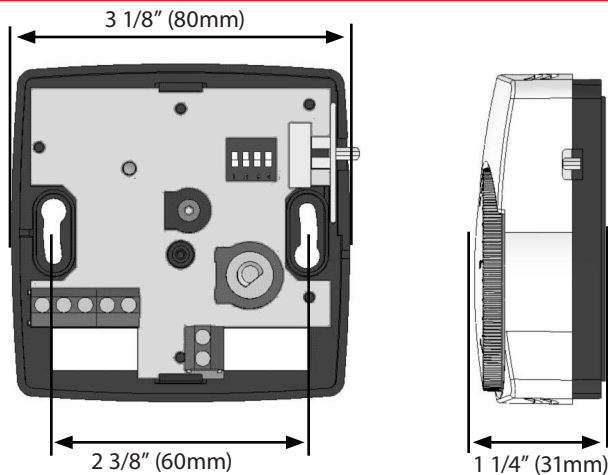
The dual sensing thermostat with its external probe included allows for the integration in heat/freeze-sensitive flooring applications (wood, marble) either through its maximum temperature limiting function or through its minimum temperature setting to maintain a specific slab temperature in the event the home is un-occupied during cold months.

Setback and timer modes can achieve an energy savings of up to 30% over conventional thermostats. Timer function is achieved through an optional timer control module in a central location like the AquaHeat Pro Clock Timer.

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Dimensions



Specifications

Measured Temperature Precision	0.2°F
Operating temperature	32°F – 122°F
Temperature Setting Range	41°F – 86°F in 0.5°F increments
Regulation Characteristics	Proportional Integral regulation Cycle: 10 minutes for 3.6°F or Static differential: 0.9°F
Electrical Protection	Class II - IP30
Power Supply	24 V _{AC} +/- 10%
Output	TRIAC output 24 V _{AC} , 15 VA max. (4 actuators CPS #450002)
External Floor Sensor	NTC (10K Ohms) 9ft
SW Version	V 1.4x
Dimensions	3 1/8" L x 3 1/8" H x 1 1/4" W

LED Indicator

The indicator consists of a color changing LED with the following characteristics:

LED Color	Signal	Description
Red	solid	Heating
Green	solid	Night Reduction/Setback (Clock)
Orange	solid	Heating during Setback mode (clock)
Green Blinking	0.5 sec. cycle	Internal & External sensor failure
Green Blinking	1 second cycle	Internal sensor failure
Green Blinking	2 second cycle	External sensor failure

Modes Of Operations

Operational modes are selected via the Mode Switch on the right side of the thermostat. Comfort Setting describes desired normal day time temperature settings. Night Reduction/Efficiency Mode reduces the Comfort temperature to the Reduced temperature. With an external clock timer/controller module Comfort and Night Reduction/Efficiency modes can be overridden and timer programmed.

☀️ COMFORT operating mode

Forces Comfort temperature operation indefinitely by setting mode switch to Comfort temperature setting symbol.

🌙 Night Reduction/Setback operating mode

Forces Reduced temperature operation indefinitely by setting mode switch to Reduced temperature setting symbol.

🕒 Timer or External Control mode

Thermostat will follow the external control signal (Pilot Wire).

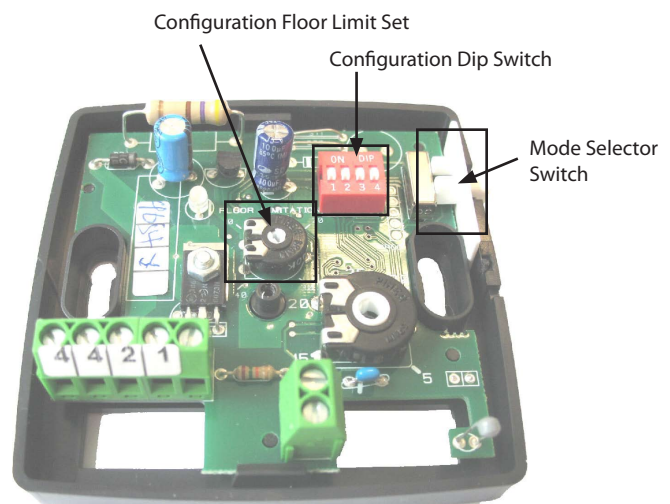
☀️ Green Solid Signal to indicate a Clock-operated Reduction Mode Signal (Pilot Wire).

🌙 Orange Solid Signal to indicate a Clock-operated Heating Mode Signal (Pilot Wire).

Configuring ProBasic Thermostats

Due to its versatile features, AquaHeat® 450009 ProBasic dual sensing thermostats can be configured for almost all applications in modern heating systems. To accomplish an adequate feature set for specific requirements, the thermostat has to be adjusted to the desired system setup through a set of dip switches and tune potentiometer.

Locate Adjustment Components

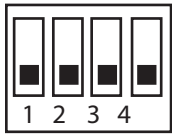


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Thermostat Configuration Switch



On
Off (default)

Configuration Dip Switch located on the upper right hand side of the circuit board.

Switch ID	Description	Default
J1	Actuator NC/NO	NC
J2	Static Differential or Proportional Integral Modes	SD
J3/J4	Double Switch Internal and External Sensor selector	Internal Sensor

J1 NC/NO Actuator Selector

Selects the actuator type of either "Normally Closed" (NC) or "Normally Open" (NO). In most manifold zone loops, NC actuators are being used. If a zone valve in front of a heating loop is being used, i.e. 1 zone systems a Normally Open (NO) might be used.

J2 Proportional Integral/Static Hysteresis Selector

Proportional Integral control mechanism builds the basis in modern HVAC control systems and particularly should be selected for floor heating applications. It is superior in the precision over regular static controls and eliminates the typical off-set problem in the system. It further minimizes circulator/pump time operation to regulate secondary circuit flow. Static Differential control method is set as default value.

J3 & J4 Sensor Selector

J3	J4	Sensor State
<input type="checkbox"/>	<input type="checkbox"/>	Internal Sensor only. Temperature regulation with internal sensor. (J3/J4 in off position).
<input type="checkbox"/>	<input checked="" type="checkbox"/>	External Sensor only. Temperature regulation with floor sensor. (J3 off/ J4 on)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature regulation with internal sensor and Low temp. limit through external probe
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Temperature regulation with internal sensor and High temp. limit through external probe

The AquaHeat® 450009 thermostat can measure air and/or floor temperatures through the internal or included external slab sensor (9ft cable). The slab sensor is installed by lowering through a conduit into the floor slab. Select whether to use the internal sensor only, external sensor only, or both. Default value set to Internal sensor only.

Note: If both floor and air sensor are being used, floor sensor works as a temperature limiter.

Configuration Floor Limiter

If the temperature regulation with both sensors is selected through a valid combination of switches J3 & J4 the floor or external sensor works as a temperature limiter. The limiting temperature must be pre-set in order to result in effective protection of the floor.

°C	°F
5	41
10	50
20	68
25	77
30	86
40	104

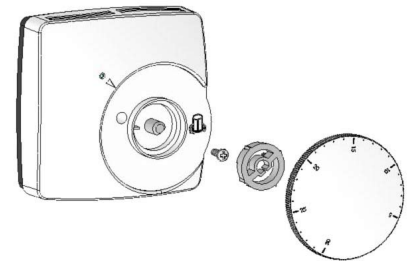
Setting the limiting temperature (high or low limit) can be adjusted between 41°F and 104°F. It is set by turning the arrow-like screw in the center of the limiter potentiometer located in the center of the thermostat circuit board. Please note that the printed numbers surrounding the limiter are scaling in degree centigrade. Use the conversion table on the right to

convert to the desired limiting temperature in degree Fahrenheit.

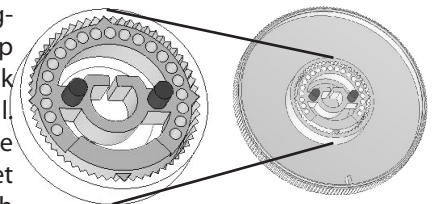
Min/Max Temperature Limitation

In order to set absolute (Max/Min) temperature limitation with the ProBasic Thermostat please follow the steps below.

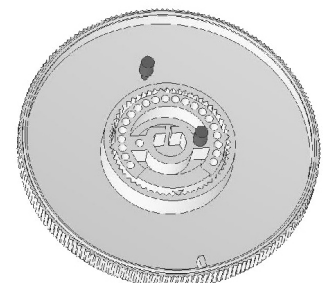
Step 1: Pull the temperature dial and the underlying regulation stop wheel from the regulator potentiometer



Step 2: Place the regulation stop wheel back into the dial. Make sure the wheel is set correctly with the dial scale.



Step 3: Remove one of the limiting pins located left and right of the center of the stop wheel (For illustration purposes shown in black)

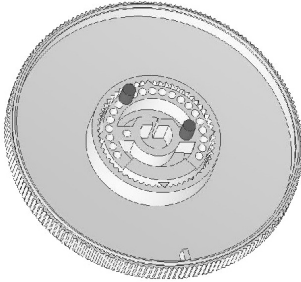


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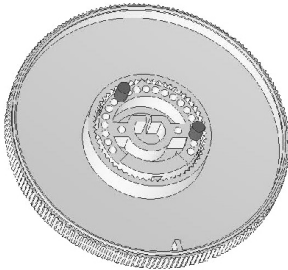
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Min/Max Temperature Limitation (cont.)

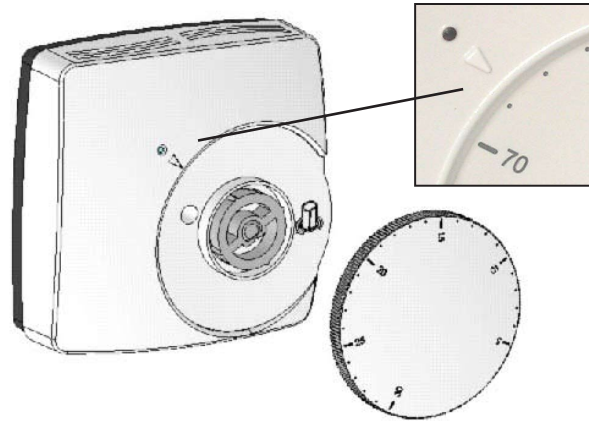
Step 4: Place the limitation pin into the adjustment wholes of the stop wheel at the whole corresponding to the desired min or max temperature.



Step 5: Repeat step three and four if both limits (min/max) need to be set

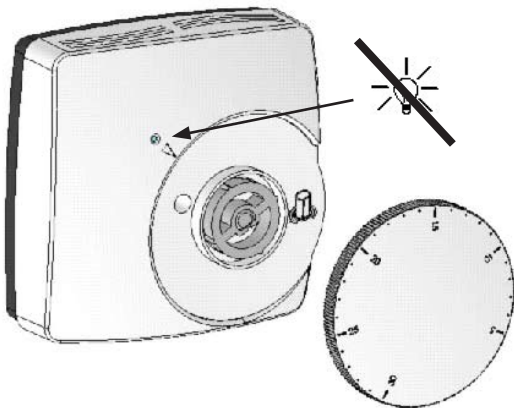


4. Push the dial back on the thermostat stop wheel and make sure to align the measured temperature identified on the scale in line with the LED indicator.

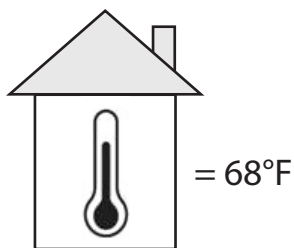


Calibrating the Temperature Dial

1. Prepare the system for thermostat calibration by heating the room or zone for min. 15 minutes to a desired temperature.
2. Check for the heating indicator LED to stop lighting, which shows that the desired temperature is reached. Then pull the dial from the stop wheel of the thermostat.



3. With an independent calibrated heat thermometer measure the room temperature around the thermostat.



Optional System Components

450014	ProZone Transformer 24V _{AC} , 60VA
450003/4	4/6 ProZone Multi-Zone Control Box
450007	Pro Clock Timer Control Box
450002	ProMix Zone Actuator, NC, 4-Wire
760002	ProLock Zone Actuator, NC, 4-Wire

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Representative