REHAU®
Unlimited Polymer Solutions


# DUAL SENSING DIGITAL THERMOSTAT

## PRODUCT INSTRUCTIONS

## SCOPE

This guide gives instruction regarding REHAU Programmable Digital Thermostat installation and operation. Thermostats may only be installed, calibrated and maintained by an appropriately trained installer of radiant systems. The installer should also have a basic understanding of electrical wiring and electronic controls.

Throughout this document, the signal word NOTICE is used to help you avoid property damage. We cannot warn of all hazards; you must also use your own good judgment.

## ABOUT PROGRAMMABLE DIGITAL THERMOSTATS

This 3-wire thermostat offers powerful capabilities with simple, easy to use menus. There is a “reduced” operating mode which may be used for nighttime and vacation periods. With the optional floor sensor, this thermostat can regulate either the floor or the room temperature or both, in which case the floor sensor is used as a temperature limiter, set to either high or low limit.

This thermostat offers numerous programming options including the ability to:

- Exercise the system pump daily for 1 minute
- Define the thermostat to be operated as a simple on/off switch
- Use proportional integral regulation (PWM) anticipation logic
- Select a night reduction which automatically reduces the temperature by 7°F (4°C)

### Components

Each thermostat (Art. No. 236487-001) comes complete with:

- Installation instructions
- Mounting template

### In addition, you will need:

- 10k floor sensor, where applicable
- No.1 Phillips head screw driver
- 1/8 in. flat head screw driver
- Mounting screws (typical for drywall installation)
- Drill
- Pencil
- Level

**Table 1: Thermostat Technical Specifications**

| | |
|---|---|
| Control | Microprocessor control |
| Material | White PVC plastic |
| Dimensions (H x W x D) | 3 1/4 x 3 1/4 x 1 in (80 x 80 x 27 mm) |
| Measured temperature precision | 0.2°F (0.1°C) |
| Packaged weight | 0.26 lb (97 g) |
| Floor limiting temperature range | 50 to 104°F (10 to 40°C) |
| Temperature regulation | Proportional integral regulation (adjustable – see installation menu)<br>Cycle: 15 min. or static differential 1.8°F (1°C) |
| Ambient conditions (indoor use only) | 32 to 122°F (0 to 50°C), < 90% |
| Electrical protection class | Class II – IP30 |
| Power supply | 24 V ±10% 60 Hz 15 W max |
| Output | TRIAC output 24 VC, 15W max (typical – 4 actuators) |
| Optional floor sensor | NTC thermistor, 10 kΩ; 10 ft (3 m) cable (Art. No. 236497-001) |
| Wire type | Minimum of three conductor thermostat wires (18-24 AWG);<br>four or eight conductor thermostat wires are recommended |

**Thermostat Display Features**

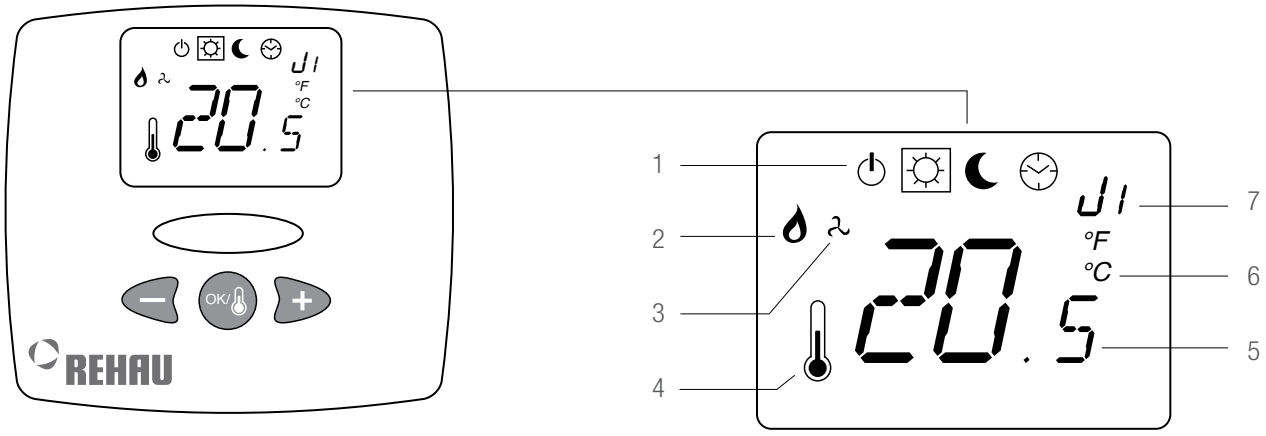



*Fig. 1: Thermostat display features*

1. Operating mode menu
2. Heating indication
3. Cooling indication
4. If symbol is displayed, the measured temperature is shown (position 5)
5. Measured temperature or set temperature
6. °C or °F indication
7. Title for installation parameters (J0,CLr…)

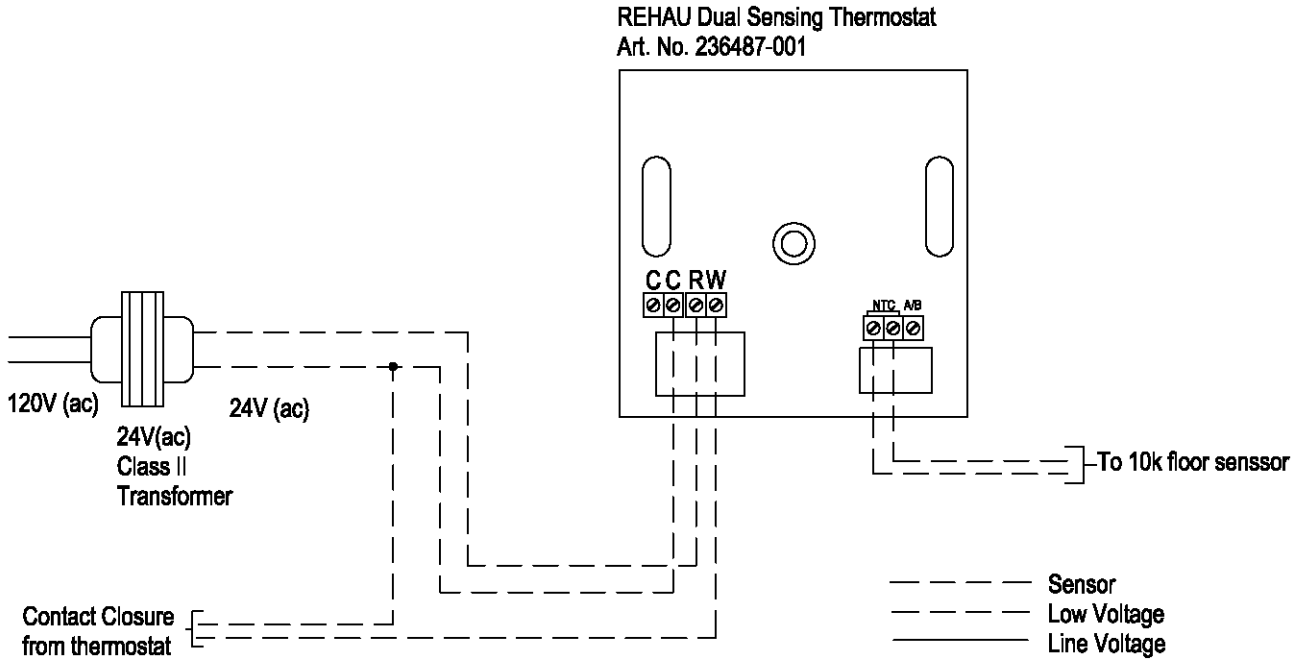



*Fig. 2: Wiring diagram for operation without actuator*

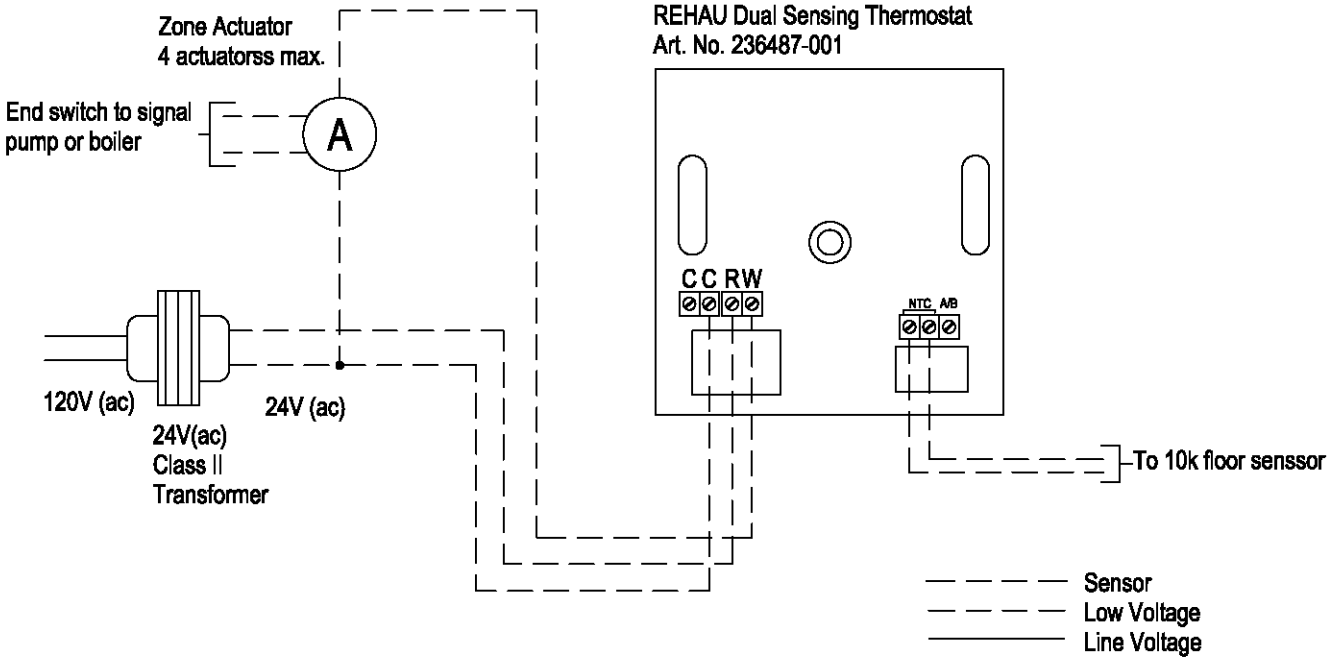



*Fig. 3: Wiring diagram for operation with actuator*

# MOUNTING THE THERMOSTAT

Note: Thermostat must be mounted in the correct location to work properly.

1. Thermostat should be located 1.5 m (5 ft) above the finished floor. The thermostat must be installed on an interior wall. Avoid locations in drafts (e.g., staircases, air outlets), behind doors, in direct sunlight or near other heat sources.

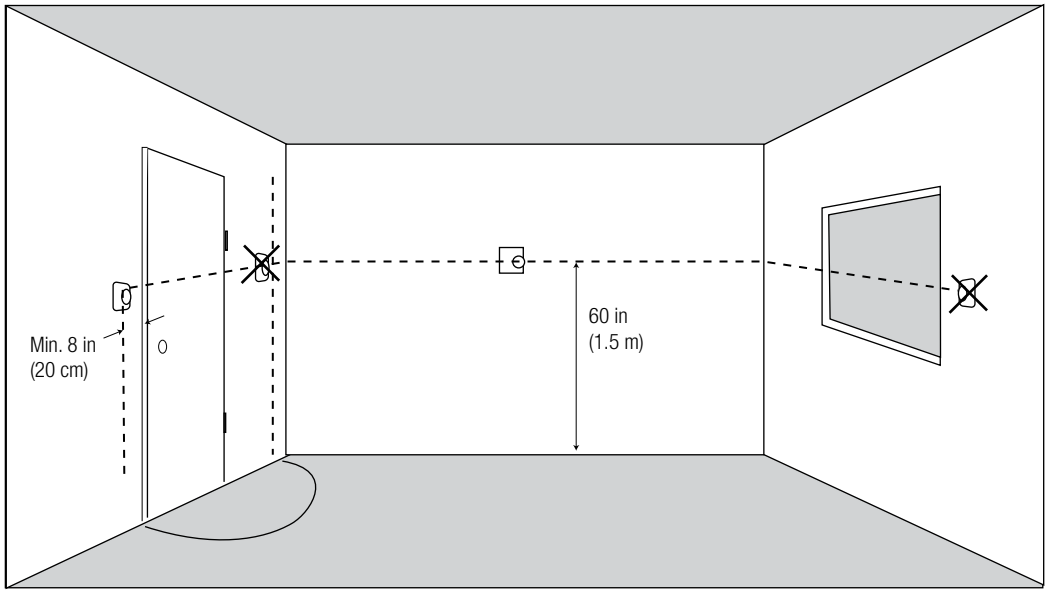



*Fig. 4: Locating the thermostat*

2. Make sure that wire is installed from control location to the desired thermostat location.

3. Use the mounting template (see Fig. 5) to help position the thermostat and drill the mounting holes.

4. Pull wires through access holes for thermostat wiring and floor sensor wiring (if applicable). Fasten the screws, but do not completely tighten the screws.

⚠ **WARNING:** Turn off all power to the wires before connecting wires to terminals. Failure to turn off power can cause electrocution.

5. Adjust thermostat with a level and tighten the screws.

6. Put the cover on the thermostat and secure with Phillips head screw, using a No. 1 Phillips head screw driver.

7. Apply 24V power.

# PROGRAMMING THE THERMOSTAT

1. When power is initially applied, the thermostat automatically turns on and displays the current room temperature.

If there is no display shown when power is applied to the thermostat, press OK/ until the box is around the sun symbol.

2. Press and hold OK/ for 5 seconds until END is displayed.

3. Press + to toggle through the menu.

4. Press OK/ to edit each parameter. The parameters will be shown on the upper right corner of the display.

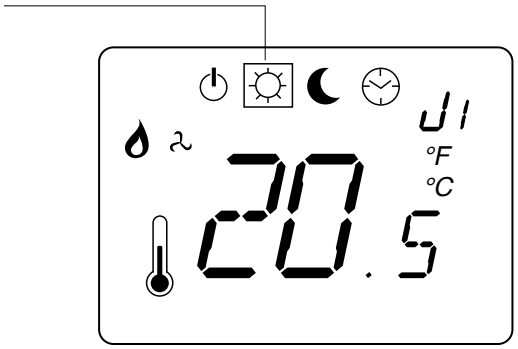


Table 2: Programming Parameters

| Parameter | Description of Parameter | Default Setting | Other Choices |
|---|---|---|---|
| U0 | Select temperature units | ºC | ºF |
| U1 | Mode of operation | << Hot >> Heating mode | << Cld >> Cooling mode |
| Cy | Proportional integral regulation (PWM) time cycle value in minutes | << 15 >> Slow system adapted to each heating type | Heating application:<br>Burner oil << 10 >><br>Burner gas << 10 >><br>Heat pump << 20 >> |
| bP | Value of the proportional band (PWM) in ºC | << 2.0ºC / 3.6ºF >> | Adjustable 1ºC to +7ºF:<br>Well insulated house << 1.5ºC >><br>Non-well insulated house << 4ºC >> |
| U4 | Type of output for contact closure | << NC >> Normally closed | << NO >> Normally opened |
| U5 | Pump exercising | << Pmp >> To exercise the pump if the pump has not worked on a particular day. Operation time of pump is one minute. | << NO >> No exercising |
| U6 | Select sensor for operation | << Air >> Room sensor only or room sensor with floor limitation if optional external 10K sensor is used. | << Flr >> External 10K sensor is used, without floor limitation |
| U8 | Selection of regulation type | << rEg >> Proportional band | << hys >> Static differential of 0.3ºC |
| CP | Value of the compensation in ºC. This value can be increased if the thermostat is perturbed by external perturbations i.e. near to the heating elements. | << 2.0ºC / 3.6ºF >> | Adjustable 1ºC to 8ºC |
| A0 | Calibration of the internal sensor. The calibration must be done after 15 minutes working with the same setting temperature. Check room temperature with a thermometer and enter the real value. | Air sensor +0ºC | From -5ºC to +5ºC |
| F0 | Calibration of external sensor (if connected). The calibration must be done same as above. | Floor sensor +0ºC | From -5ºC to +5ºC |
| FL | Lower limit of the floor temperature. Only effective if the external sensor is connected and selected. | << 28ºC / 82ºF >> | From << FL >> to 37ºC |
| FH | Upper limit of the floor temperature. Only effective if the external sensor is connected and selected. | << 28ºC / 82ºF >> | From << FL >> to 37°C |
| CTR | Reset the thermostat to factory settings | Press and hold <<< OK Key >>> for 5 seconds | |
| END | To exit installer menu | Press the << OK Key >> once. | |

**Table 3: Room Air and Floor Sensing Options**

| | |
|---|---|
| Room Air Sensing Only Operation (J6) | When operating without a floor sensor, only the internal thermostat air sensor controls the “call for heat.” |
| Room Air Sensing with Floor Lower Limit | When operating with the optional floor sensor (Art. 236497-001), the thermostat is “reading” both the room air temperature and the floor temperature. The floor sensor will ensure that the floor will never drop below a certain temperature. The range of this temperature is 50 to 104°F (10 to 40°C). |
| Room Air Sensing with Floor Upper Limit | When operating with the optional floor sensor (Art. 236497-001), the thermostat is “reading” both the room air temperature and the floor temperature. The floor sensor will ensure that the floor will never rise above a certain temperature. The range of this temperature is 50 to 104°F (10 to 40°C). |
| Floor Sensing Operation (J6), (FL) and (FH) | When operating with the optional floor sensor (Art. 236497-001), the floor sensor can completely control the “call for heat” with LOW (FL) and HIGH (FH) temperature limits. If (J6) is set to AIR, the thermostat continually monitors the room air temperature while also ensuring that the floor remains within the LOW and HIGH limits. |

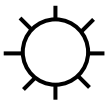
Note: Operating with only a slab sensor can lead to either overheating or under heating of the space.

# END USER INSTRUCTIONS

Push the  button on the thermostat to select the desired operating mode

**OFF Mode**

In this mode, the thermostat is off and the display goes blank. All program settings are saved.
NOTICE: In this mode, the system can freeze.



**COMFORT Mode**

In this mode, the thermostat will continually maintain the temperature entered.
When the sun is blinking, the desired heating temperature is set by pressing buttons and after a few seconds, the display switches back to the measured temperature, denoted by the  symbol.

**REDUCED Mode**

In this mode, the thermostat automatically reduces the “set temperature” to your adjusted setback temperature. After a few seconds, the display switches back to the measured temperature, denoted by the  symbol.

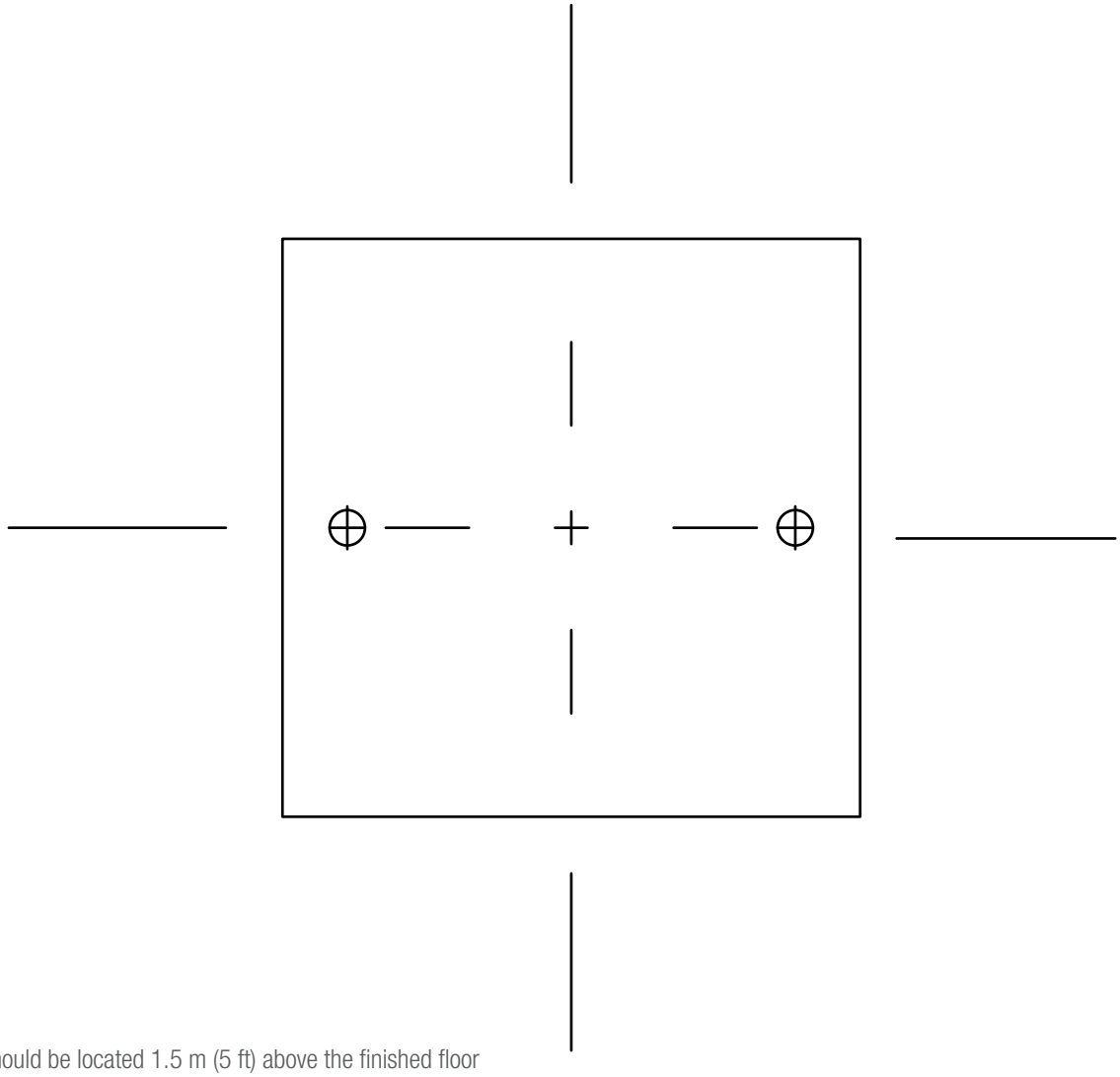
**EXTERNAL CLOCK Mode**

In this mode, the thermostat will work according to the “comfort mode.”
This mode is currently not available.

# APPENDIX

## MOUNTING TEMPLATE

Clip page and use as mounting template



Thermostat should be located 1.5 m (5 ft) above the finished floor

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