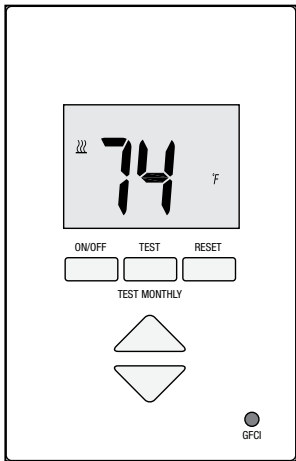


SunStat® Core

Installation and Operation Manual



Features:

- Floor temperature control
- Thin profile
- Easy to use
- Three-Year warranty

Model# 108201, 108202, 108203

Box Contents

- SunStat Core Thermostat
- Floor sensor
- Screwdriver
- Installation manual
- 2 machine screws
- 5 wire nuts



Items Needed

- Electrical box (must be UL Listed and proper size)
- Flexible or rigid conduit (if required, must be UL Listed and proper size)
- 12-gauge or 14-gauge electrical wiring cable (UL Listed)
- Nail plate
- Hot glue gun and hot glue

Location

- Thermostat is designed for indoor dry location only.
- Do not install where there is a draft, direct sun, hot-water piping, ducting or other cause for inaccurate temperature readings.
- Do not install where there is electrical interference from equipment, appliances, or other sources.
- Install away from all water sources such as sinks and at least 4' (1.2 m) away from showers and bathtubs.
- Consider easy access for wiring, viewing, and adjusting.
- Install at a suitable height, normally about 4-1/2' to 5' (1.4 m to 1.5 m) from the floor.

Specifications:

- Power supply** 120/240 V (ac), 60 Hz, 3 watts
Maximum load 15 amps, resistive
Maximum power 1800 watts at 120 VAC
 3600 watts at 240 VAC
 Class A (5 milliamp trip)
- GFCI**
Approvals UL 943, UL 873, UL 991, FCC
 Meets Class B: ICES-003 & FCC Part 15B



- Ambient conditions** 32 to 86°F (0 to 30°C), <90% RH non-condensing
Floor Sensor Thermistor, 10k NTC type, 300 V jacketed cable, 15' long

Installation

⚠ WARNING

Installation must be performed by qualified persons, in accordance with local codes, ANSI/NFPA 70 (NEC Article 424) and CEC Part 1 Section 62 where applicable. Prior to installation, please consult the local codes in order to understand what is acceptable. To the extent this information is not consistent with local codes, the local codes should be followed. Regardless, electrical wiring is required from a circuit breaker or other electrical circuit to the control. It is recommended that an electrician perform these installation steps. Please be aware local codes may require this product to be installed by an electrician.

The following cautions must be observed:

- NEVER** forget to install the floor sensor included with the thermostat.
- NEVER** put the system into full operation until the tile or flooring installer verifies all cement materials are fully cured (typically two to four weeks after installation).
- ALWAYS** use copper supply conductors to the thermostat. Do not use aluminum.
- ALWAYS** wire all circuits as Class 1, electric light & power circuits.
- ALWAYS** wire all circuits with insulation rated 600V minimum.
- ALWAYS** mount this control to a grounded electrical box.
- ALWAYS** use power supply wires suitable for at least (194°F) 90°C.
- ALWAYS** seek help if a problem arises. If ever in doubt about the correct installation procedure to follow, or if the product appears to be damaged, the factory must be called before proceeding with the installation.

⚠ WARNING



To prevent the risk of personal injury and/or death, make sure power is not applied to the product until it is fully installed and ready for final testing. All work must be done with power turned off to the circuit being worked on.

To reduce the risk of electric shock, do not connect to a circuit operating at more than 150 V to ground.

Power Supply

Pull power supply wiring to the control location.

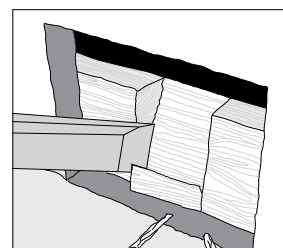
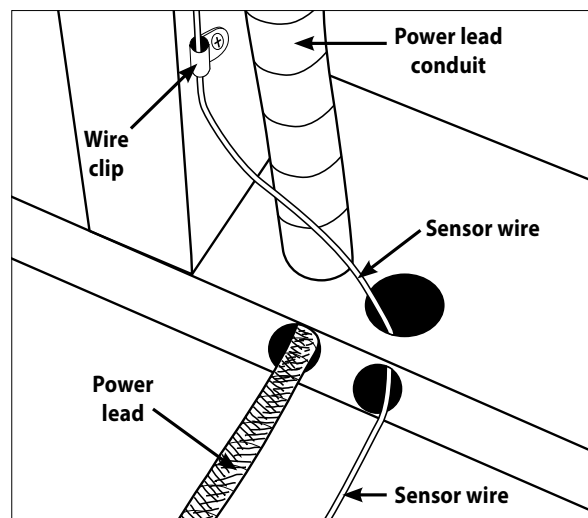
- Leave about 6 to 8" (15 to 20 cm) of wire for connections.
- This wiring should be size 12 or 14 AWG, in compliance with local code requirements.
- A qualified person should run a dedicated circuit from the main circuit breaker panel to the control location. If a dedicated circuit is not possible, it is acceptable to tap into an existing circuit. However, there must be enough capacity to handle the load (amps) of the floor heating system being installed, and any appliance likely to be used on the circuit such as a hair dryer or vacuum cleaner.
- Avoid circuits that have ballasted lighting, motors, exhaust fans, or hot tub pumps to reduce the likelihood of interference.
- The circuit breaker should be rated 20 amps for total circuit loads up to 15 amps. A 15-amp circuit breaker may be used for total circuit loads up to 12 amps.
- A GFCI (ground-fault circuit interrupter) or AFCI (arc-fault circuit interrupter) type circuit breaker may be used, but is not necessary.

⚠ WARNING

Make sure 120 VAC is supplied to 120 VAC cables and 240 VAC is supplied to 240 VAC cables. Otherwise, dangerous overheating and a fire hazard could result. Do not exceed 15-amps on this control.

Bottom Plate Work

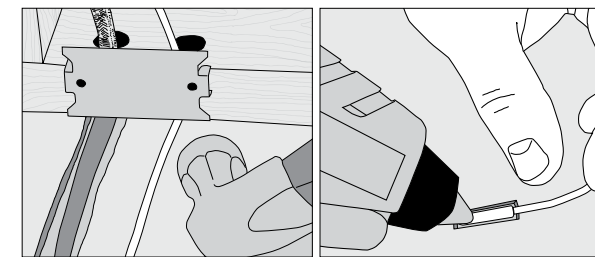
- Drill or chisel holes at the bottom plate as indicated. One hole is for routing the power lead conduit and the other is for the thermostat sensor. These holes should be directly below the electrical box(es).



For retrofit installations, cut out drywall and chisel out the bottom plate to route wires to control.

SunStat Sensor Installation

- The SunStat sensor can be installed with or without electrical conduit depending on code requirements. Conduit is recommended for added protection against nails and screws.
- Do not place the sensor in the same conduit as the power leads to avoid possible interference. Open a separate knock-out in the bottom of the thermostat box. Feed the sensor (and conduit, if used) through the knock-out, down through the cut-out in the bottom plate, and out into the floor where the heating cable will be installed.
- If the sensor wire needs to be secured to the wall stud, wait until after the wire or mat and sensor are completely installed on the floor.
- At the sensor location, measure at least 1' into the heated area. Mark the spot where the sensor will be attached to the floor. Be sure to place the sensor exactly between two of the heating wires. Ensure the sensor wire does not cross over any heating wires.
- Do not locate the sensor outside the heating area or in a gap between heating wires that is wider than the rest of the floor. Do not locate the sensor where direct sun, hot-water piping, heat duct, or lighting below will cause inaccurate temperature reading. Do not locate the sensor where an insulating item such as a rug is likely to be placed.
- To make sure the sensor tip does not create a high spot in the floor, it may be necessary to chisel a channel into the floor and lay the sensor tip into the channel. Hot glue the tip into place.
- Do not cut the sensor wire or remove the black cable protector. Strip the wire ends to 1/8" long.



Floor Heating Mat or Cable Power Lead Installation

- The shielded power lead can be installed with or without electrical conduit (recommended for added protection against nails or screws), depending on code requirements.
- Remove one of the knock-outs in the electrical box to route the power lead. If electrical conduit is not required by code, install a wire collar to secure the power leads where they enter the box. If conduit is required by code, install 1/2" (minimum) conduit from the bottom plate up to the electrical box. For multiple power leads (multiple cables), install 3/4" conduit.
- Secure a steel nail plate over the cutout in the bottom plate to protect the wires against baseboard nails later.

SunStat Relay Rough-in Wiring

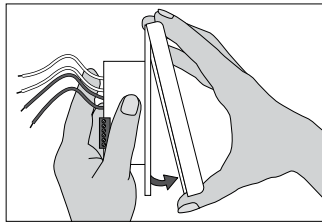
A SunStat Relay C3 is used when more than 15 amps must be controlled by one SunStat thermostat. The SunStat Core is only compatible with the SunStat Relay C3. Do not use other models.

- Pull 18 AWG to 24 AWG 2-conductor shielded wire from the relay location to this control location. The wire may be up to 100' (30 m) long.
 - Strip the wire ends to 1/8" long.
- Refer to the instructions provided with the SunStat Relay C3 for additional details.

Thermostat Wiring

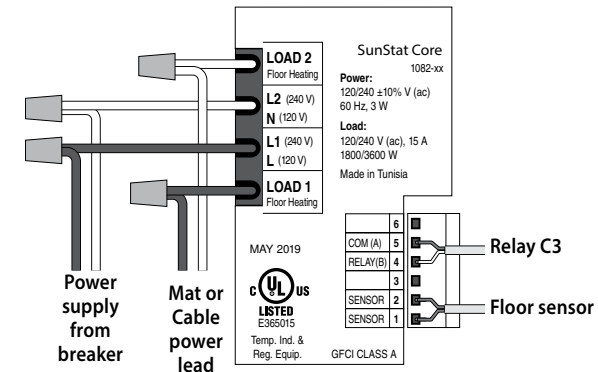
Before connecting the wires to the back of the thermostat, detach the display front from the base.

While holding the base section in one hand, pull the lower half of the display front towards you to pivot it away from the base.



Using the wire nuts included with the thermostat:

- Connect the ground wire from the power supply to the ground wire from the floor heating power lead. If the electrical box is metal, use a short length of wire to connect ground wires to the bonding screw.
- Connect the white wire labeled LOAD 2 on the thermostat to the white (or blue for 240 VAC) wire from the heating mat or cable power lead.
- Connect the black wire labeled LOAD 1 on the thermostat to the black wire from the heating mat or cable power lead.
- For 120 VAC connections, the L wire connects to the black (L) hot conductor from the breaker panel. The N wire connects to the white (N) neutral conductor.
- For 240 VAC connections, the L1 connects to one side of the 240 VAC supply from the breaker panel and the L2 to the other.



Sensor and relay connections are made to the terminal block by inserting the wires into the square openings and tightening the screws on the side.

- Connect the sensor wires to the SENSOR terminals on the thermostat. These connections are not polarity sensitive.
- For a SunStat Relay C3, connect 2 wires from the relay to the Com and Relay terminals on the thermostat. Ensure the Com wire at the relay is the same conductor connected to the Com terminal on the thermostat.

⚠ WARNING

Make sure the wire connections are secure by gently tugging on them. Otherwise, arcing could occur, causing dangerous overheating and a possible fire hazard. For added security, overwrap each wire nut connection with electrical tape.

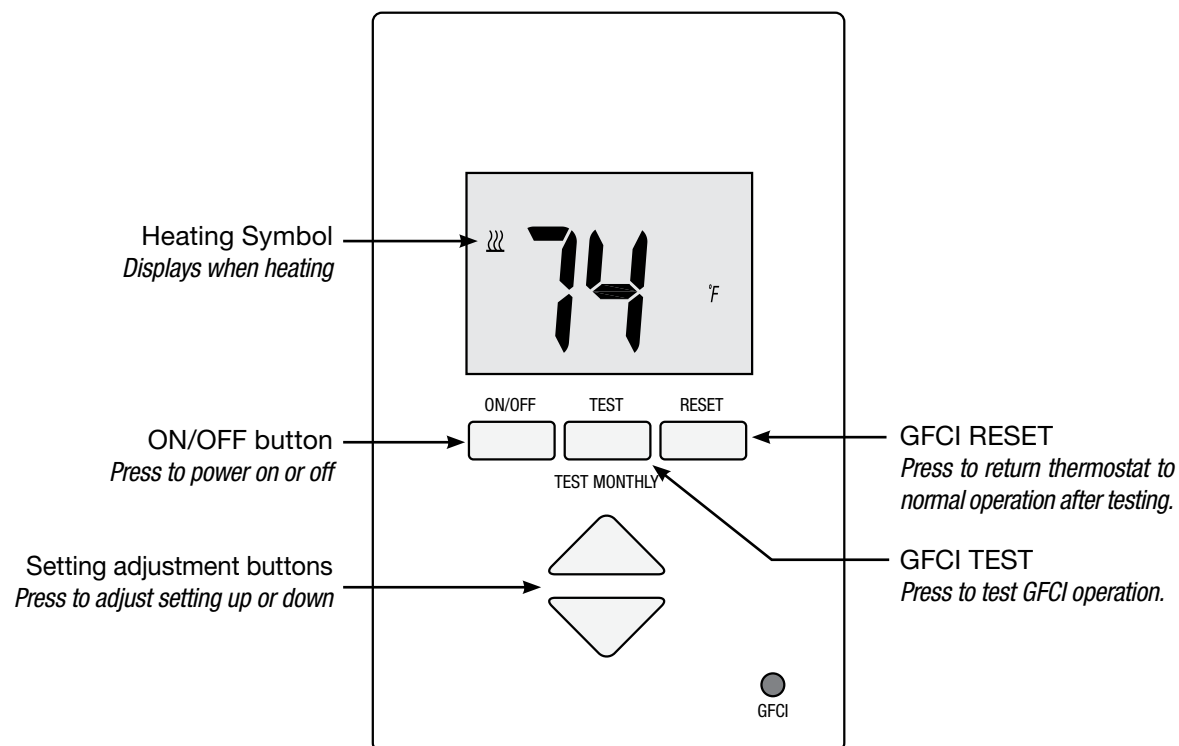
Finish Thermostat Installation

- Ensure all connections are secure.
- Carefully press the wires back into the electrical box. Do not use the control to push them.
- Use the included screws to attach the thermostat base to the electrical box. Do not overtighten.
- When re-attaching the display front, line up the top edge with the base, then rotate the bottom towards the base. Ensure the pins are not bent when connecting.

See over for operation details

NOTICE

Make sure the mortar has had time to fully cure before operating the system for more than a brief test.



Troubleshooting Guide

It is strongly recommended that a qualified, licensed electrician install the heating cables and related electrical components. If problems with the system arise, please consult the troubleshooting guide below.

⚠ WARNING

Any electrical troubleshooting work should be performed with the power removed from the circuit, unless otherwise noted.

Problem	Possible Cause	Solution
Heating symbol is displayed, but floors do not feel warm.	Set temperature is too low to feel warm to the touch.	Increase the temperature setting in small increments.
	Incorrect or faulty wiring.	Check the floor temperature displayed on the screen. If this temperature does not increase while the heating symbol is displayed, the sensor and power lead wiring will need to be checked by a certified electrician.
Increased the set temperature but heating symbol is not displayed on the screen.	Temperature at the floor or room sensor is already at the setting.	Heating symbol only displays when the sensed temperature is lower than the set temperature and heat is actively operating.
Display is not on.	Power from the breaker is off.	Check the breaker or fuse in the electrical panel supplying power to the SunStat.
	Incorrect or faulty wiring.	Have the power lead wiring checked by a certified electrician.
ERR	Floor sensor wiring is incorrect.	The floor sensor wires may be loose, inserted in the wrong terminals, or crossed. Have a certified electrician check the wiring and sensor resistance. Replace the sensor if necessary.

Operation

Power Up

- Switch on the circuit power supply at the breaker.
- Press the On/Off button and hold it for 1 second.

GFCI Testing and GFCI Light Operation

- Press the Test button on the GFCI monthly to verify that the GFCI function is operational. The GFCI light will flash red after pressing the Test button. To resume normal operation, press the Reset button.
- If pressing test does not display a flashing red GFCI light, protection is lost and the unit will need replacement.
- If the GFCI light continues to flash after pressing the reset button, protection is lost and the unit will need replacement.
- If the GFCI trips during normal operation, press the Reset button to resume operation. If it trips again, the electric floor heating system should be inspected and tested by a qualified technician.
- If the GFCI light alternates between hi and low brightness during normal operation, the unit has reached end of life and needs to be replaced.

Power Off

- To turn the thermostat off, press the On/Off button and hold it for 1 second.

Adjust the Temperature Setting

- Press the up or down button to turn on the display backlight.
- Press the button again to change the temperature setting. Setting Range: 40°F to 95°F (4.4°C to 35°C)

Change Units

- Press the up or down button briefly to turn on the display backlight. Press the up AND down buttons at the same time and hold them for 2 seconds.
- The display will show the current temperature units. Press the up or down button to select °F or °C.

Limited 3 Year Warranty

Watts Radiant warrants this control (the product) to be free from defect in material and workmanship for a period of (3) years from the date of original purchase from authorized dealers. During this period, Watts Radiant will replace the product or refund the original cost of the product at Watts Radiant's option, without charge, if the product is proven defective in normal use. Please return the control to your distributor to begin the warranty process.

This limited warranty does not cover shipping costs. Nor does it cover a product subjected to misuse or accidental damage. This warranty does not cover the cost of installation, diagnosis, removal or reinstallation, or any material costs or loss of use.

This limited warranty is in lieu of all other warranties, obligations, or liabilities expressed or implied by the company. In no event shall Watts Radiant be liable for consequential or incidental damages resulting from installation of this product. Some states or provinces do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above exclusions or limitations may not apply to you. This warranty gives you specific legal rights and you may also have other rights that vary from state to state.

Watts Radiant Customer Support

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