

SunStat® Relay C3

Installation and Operation Manual



Features:

- Extend the area controlled by a SunStat Connect, Command or Core thermostat
- Control up to 15 Amps of electric floor heating
- Use with 120 or 240 VAC electric heating systems
- Built-in GFCI
- Status Lights
- Up to 10 Relay C3's per thermostat
- Three-Year warranty

Model# 108101

WARNING

Please be aware local codes may require this control to be installed or connected by an electrician.

This device complies with Part 15 of the FCC Rules and with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

WARNING



Read this manual BEFORE using this equipment.

Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment.



Keep this manual for future reference.

Important Safety Information



This is a safety-alert symbol. The safety-alert symbol is shown alone or used with a signal word (DANGER, WARNING, or CAUTION), a pictorial and/or a safety message to identify hazards.

When you see this symbol alone or with a signal word on your equipment or in this manual, be alert to the potential for death or serious personal injury.



This pictorial alerts you to electricity, electrocution, and shock hazards.

WARNING

This symbol identifies hazards which, if not avoided, could result in death or serious injury.

CAUTION

This symbol identifies hazards which, if not avoided, could result in minor or moderate injury.

NOTICE

This symbol identifies practices, actions, or failure to act, which could result in property damage or damage to the equipment.

Box Contents

- SunStat Relay C3
- Screwdriver
- Installation manual
- 2 machine screws
- 5 wire nuts



Items Needed

- Electrical box (must be UL Listed and proper size)
- Wire nuts (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

- SunStat Relay C3 is designed for indoor dry location only.
- 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.

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
GFCI	Class A (5 milliamp trip)
Approvals	UL 943, UL 873, UL 991, FCC Meets Class B: ICES-003 & FCC Part 15B



Ambient conditions 32°F to 86°F (0 to 30°C), <90% RH non-condensing

NOTICE

The Relay C3 is only compatible with the SunStat Connect, Command and Core models. Do not connect to older model SunStat thermostats or relays.

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 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 relay. 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 relay location.

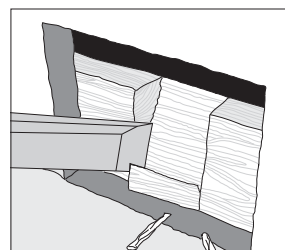
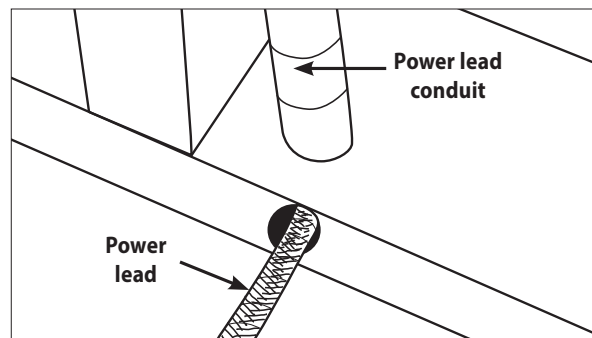
- Leave about 6 to 8" (15 to 20 cm) of wire for connections.
- This wiring should be size 12 or 14 AWG, in compliance with local code requirements.
- A qualified person should run a dedicated circuit from the main circuit breaker panel to the control location. If a dedicated circuit is not possible, 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 hole for routing the power lead conduit at the bottom plate as indicated. This hole should be directly below the electrical box.



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

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.

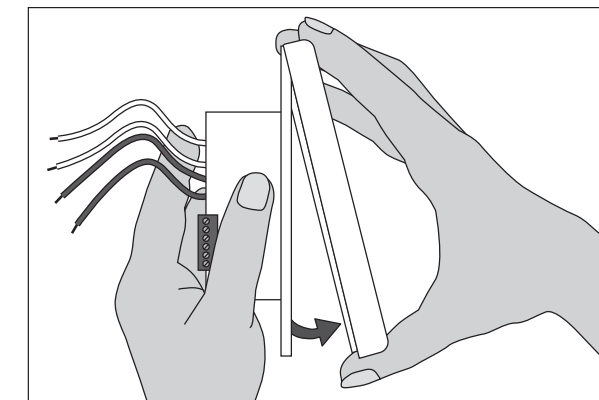
Rough-in Communication Wiring

- Pull 18 AWG to 24 AWG 2-conductor shielded wire from the thermostat location to this relay location. The wire may be up to 100' (30 m) long.
- If additional Relay C3's are required, pull 18 AWG to 24 AWG 2-conductor shielded wire between relay locations.
- Up to 10 Relay C3's can be controlled by a single SunStat Connect, Command or Core thermostat.
- Strip the wire ends to 1/8" long.

Relay C3 Wiring

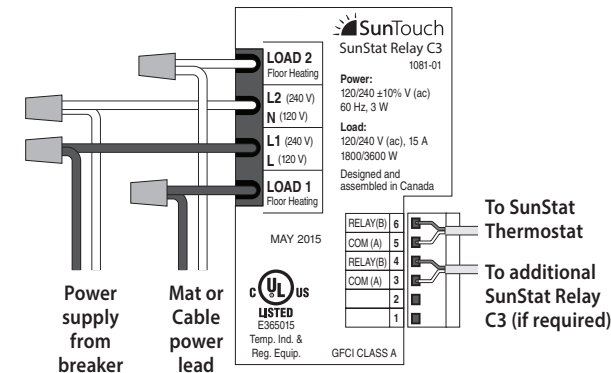
Before connecting the wires to the back of the relay, detach the front from the base.

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



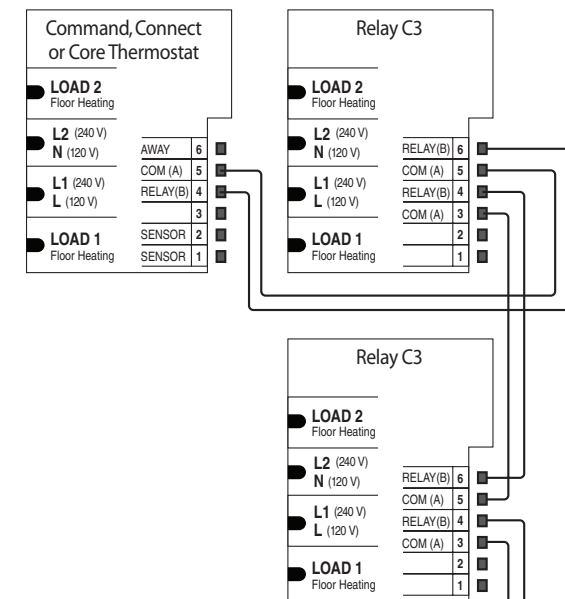
Using the wire nuts included with the relay:

- 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 relay 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 relay 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.



Connection to the SunStat thermostat and additional relays are made by inserting the wires into the square openings in the terminal block and tightening the screws on the side.

- Connect 2 wires from the Com and Relay terminals on the thermostat to the Com and Relay terminals on the Relay C3. Ensure the Com wire at the relay is the same conductor connected to the Com terminal on the thermostat.
- For systems requiring additional relays, connect the lower set of Relay and Com terminals from one relay to the upper set of Com and Relay terminals on the additional Relay C3.



Additional Relay C3's (Up to 10 Relay C3's controlled by 1 SunStat 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 Relay 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 relay base to the electrical box. Do not overtighten.
- When re-attaching the front, line up the top edge with the base, then rotate the bottom towards the base. Ensure the pins are not bent when connecting.

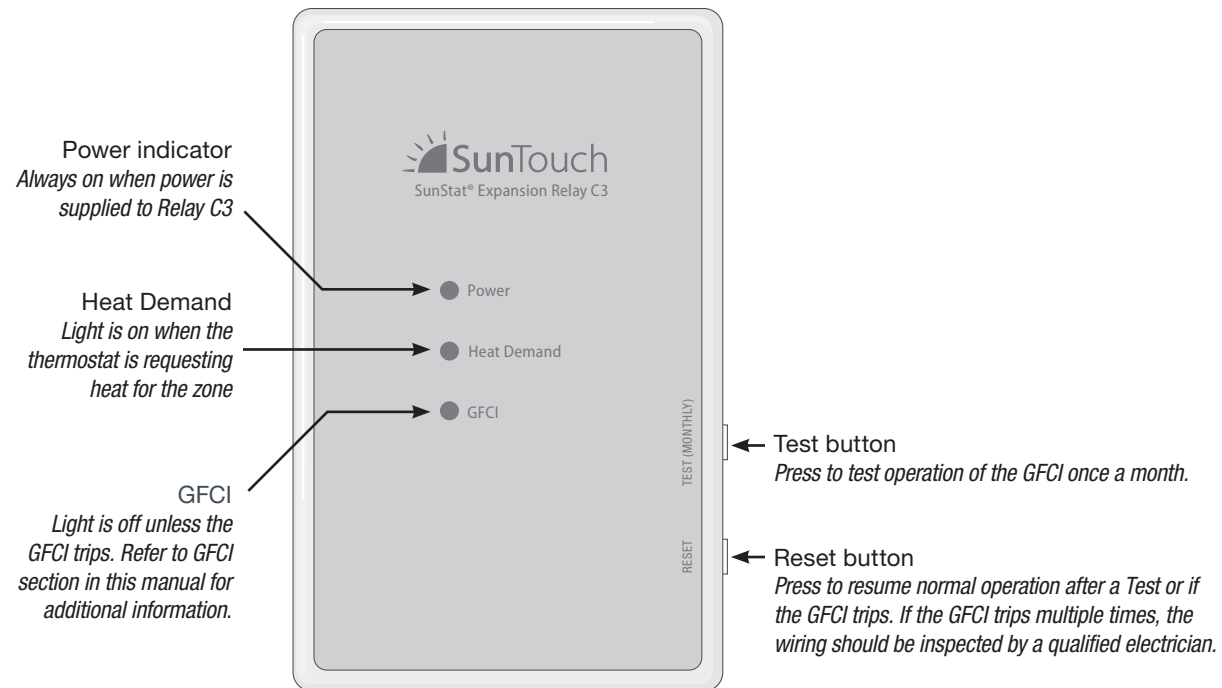
See over for operation details

NOTICE

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

LED Operation

LED lights on the SunStat Relay C3 indicate operational status.



Operation

Power Up

- Switch on the circuit power supply at the breaker.
- The Power light should display green.

Heating Operation

The SunStat Relay C3 provides additional capacity for spaces that are larger than a SunStat Connect, Command or Core thermostat can control. The SunStat Relay C3 energizes the connected heating cable any time the thermostat determines heat is required. When the thermostat signals the relay to operate, the Heat Demand light is on.

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 suspend operation of the SunStat Relay C3, turn off the connected SunStat by pressing the button on the thermostat touchscreen and select in the settings menu.

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
'Heat Demand' light is on but floors do not feel warm.	Set temperature is too low to feel warm to the touch.	Increase the temperature setting on the thermostat in small increments.
	Incorrect or faulty wiring.	Check the floor temperature displayed on the thermostat screen. If this temperature does not increase while 'Heating' is displayed, the sensor and power lead wiring will need to be checked by a certified electrician. If the voltage between relay terminals A and B is less than 0.5 V (dc), then the thermostat is calling for heat. Check the floor heating wiring. If the wiring has no faults, the relay will need to be replaced.
'Heat Demand' light is on but 'Heating' is not displayed on the thermostat.	Incorrect or faulty wiring, thermostat or relay.	The wiring should be checked by a certified electrician. If the voltage between Relay C3 terminals A & B is greater than 4.5 V (dc), then disconnect wire B from Relay C3. If the 'Heat Demand' light stays on, then Relay C3 is defective. If the light goes out, the wiring is defective. Disconnect wire B from the thermostat terminals. If the voltage between the thermostat terminals is less than 4.5 V (dc) the thermostat is defective.
'Heat Demand' light does not turn on when 'Heating' is displayed on the thermostat and power indicator is on.	Incorrect or faulty wiring or relay.	If the 'Heat Demand' light does not turn on within a few minutes of the thermostat displaying 'Heating', the communication wiring should be checked by a certified electrician. If the voltage between Relay C3 terminals A and B is less than 4.5V (dc), then Relay C3 is defective. If this voltage is greater than 8 V (dc), then disconnect wire B from the thermostat. If the voltage between the thermostat terminals A & B is less than 0.5 V (dc) the wiring is defective. If this voltage is greater than 8 V (dc), the thermostat is defective.
Power indicator light is not on.	Power from the breaker is off.	Check the breaker or fuse in the electrical panel supplying power to the SunStat Relay C3.
	Relay front is not securely attached to the base.	Turn the power to the circuit off and remove, then re-attach the front. Ensure pins are lined up when closing. Turn the power supply back on once the unit is properly connected.
	Incorrect or faulty wiring.	Have the supply power wiring checked by a certified electrician.
GFCI light alternates between high and low brightness during normal operation.	The relay is not functioning correctly.	The unit requires replacement. Turn off the power to the circuit and contact the manufacturer.
GFCI frequently trips during normal operation.	Loose wire connection, or short to ground.	Have a certified electrician check the supply wiring.
Pressing 'Test' button does not cause flashing red GFCI light.	The relay is not functioning correctly.	The unit requires replacement. Turn off the power to the circuit and contact the manufacturer.
Pressing 'Reset' does not cause GFCI light to turn off.	The relay is not functioning correctly.	The unit requires replacement. Turn off the power to the circuit and contact the manufacturer.

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. For more information: www.watts.com/prop65

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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