

Raychem

Green Leaf

Programmable Thermostat for Electrical Floor Heating
Installation Instruction



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ATTENTION

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

1. DESCRIPTION

The Raychem Green Leaf Thermostat is a Programmable Thermostat designed for Electrical Floor Heating. The thermostat is designed to control your Electrical Floor Heating in order to give you the best possible comfort and the lowest possible energy usage.

The Thermostat can work in 3 different temperature sensing modes:

- Floor Sensing mode
- Room Sensing mode
- Room Sensing mode with floor temperature limiter

The Thermostat has 2 programmes to choose from:

- Manual ON/OFF (Constant Single temperature)
- Timer programme (4 timer events/day)

To change from one programme to the other, just touch the intelligent leaf button “”.

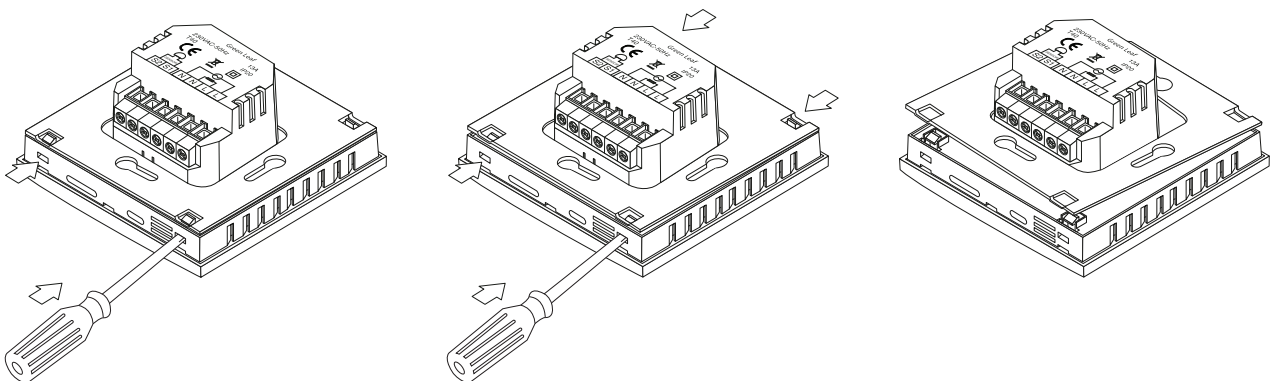
2. MOUNTING AND INSTALLATION

Mounting the Thermostat

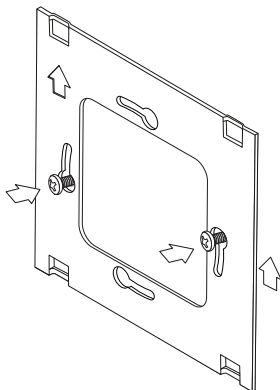
The installation of the Green Leaf must be performed by a qualified installer. The Green Leaf is a thermostat with protection class IP21, make sure to comply with all local regulations when installing the thermostat. Green Leaf is intended for flush mounting in a wall box. It should be positioned approximately 1.5 meters above the floor, protected from direct sunlight and draughts. All electrical conduits passing into the wall box that contain cables must also be sealed to protect the thermostat against draughts, e.g. with a piece of insulation in the conduit outlet.

Step 1: Switch off the power supply

Step 2: Detach the metallic support from the Thermostat using a screwdriver



Step 3: Screw the metallic support frame to the in-wall box



Step 4: Install the floor sensor (mandatory for floor sensing mode or room sensing mode with floor temperature limiter).

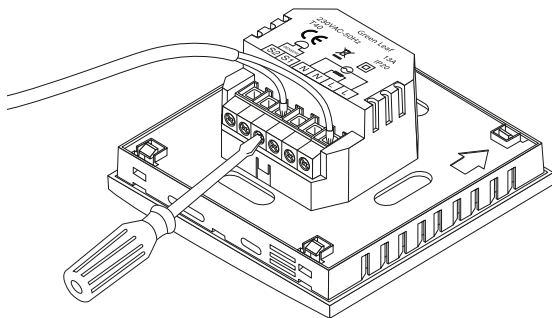
The floor sensor should be installed in a separate flexible conduit all the way to the end, covering the end of the sensor, for easy replacement and to avoid possible signal disturbance on the sensor. For best control performance, position the floor sensor between two heating cables as close as possible to the top floor surface.

Do not position the floor sensor tip closer than 3 cm to the heating cable.

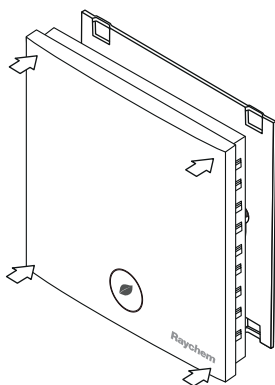
The floor sensor cable can be extended up to 100 m with a separate standard installation cable 2 x 1.5 mm² (230VAC).

Step 5: Connect the electrical power supply, the sensor and the cold lead of the electrical floor heating system to the Green Leaf according to the electrical diagram. If you connect heating cables exceeding 13A for constant wattage or 10A for self-regulating cables you must use a contactor with an integrated suppression device.

For the earth connection of the floor heating, you must use a separate earth terminal connection block.



Step 6: Click the Green Leaf into the metallic support frame.



Step 7: Switch on the power again

Product specific information

The thermostat is compatible with Raychem QuickNet, T2Blue, T2Green, T2Black and T2Red heating solutions.

T2Red

Self-regulating heating cables have an inrush current when the floor is cold. In order to guarantee the life time of the thermostat, the maximum load of the self-regulating application in nominal conditions is limited to 10A.

A 13A self-regulating load will reduce the life time of the relay contacts and the installation will not be covered by the Total Care Warranty.

3. USING THE THERMOSTAT

The Display

Display in manual on/off programme

The following icons are visible in the Manual ON/OFF:



Active sensor display

- Floor sensing mode (↓)
- Room Sensing mode (↑)
- Room Sensing mode with Floor temperature limiter (↑↓)

Heating display

The heating display is flashing when the heating is on.



Temperature

The temperature on the display depends on the selected sensing mode.

- Floor sensing mode => Actual floor temperature on the display
- Room sensing mode => Actual room temperature on the display
- Room sensing with floor temperature limiter mode => Actual room temperature on the display

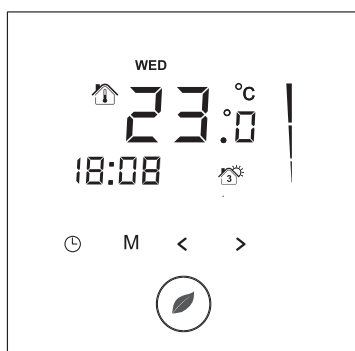
Remark: When touching on the “<” or “>” button, the set point temperature appears on the display blinking for 5 seconds

Installer Menu

- Touch the M button for 5 seconds to enter the Installer Menu

Display in timer programme

The following icons are visible in the Timer Programme:



Time and day

The actual day is displayed on the screen with the 3 letters (MON-TUE-WED-THU-FRI-SAT-SUN).

The time can be set in 24H or 12AM/PM mode (see INSTALLER MENU).

4 Event display

The 4 events are displayed with the symbols:



Event 1



Event 2



Event 3



Event 4

The manual on/off programme

When switching on the thermostat for the first time (touching the Green Leaf button for 2 seconds), it will start in MANUAL ON/OFF programme using the floor sensing mode as a standard (see INSTALLER MENU to change the sensing mode).

You will see the following screen:



Touch “◀” or “▶” to show the set point temperature. It will blink for 5 seconds.

1. Touch “◀” to decrease the temperature.
2. Touch “▶” to increase the temperature.

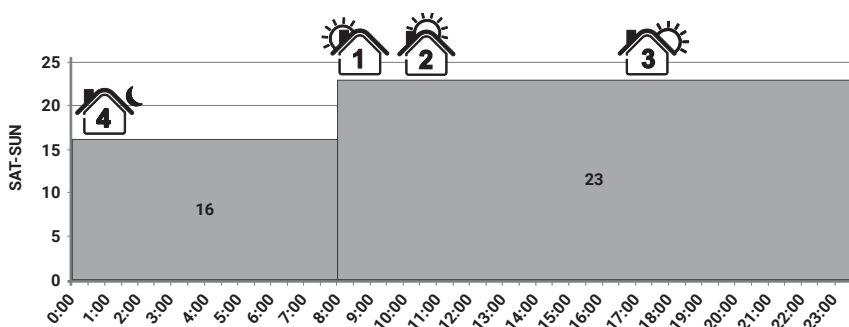
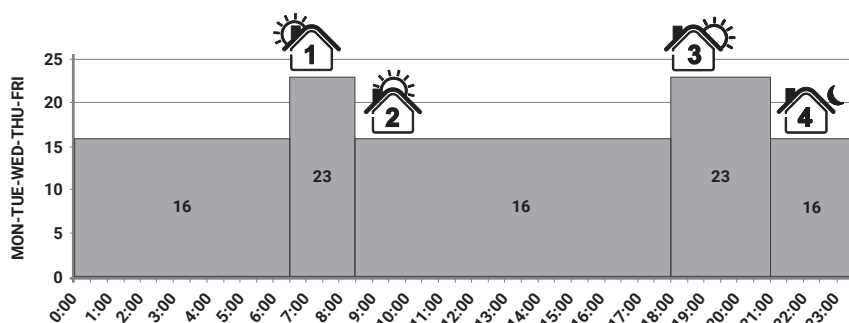
To switch from Manual ON/OFF to Timer Programme, touch the “🕒” button once.

To switch off the thermostat, touch the “🍃” button for 2 seconds.

The timer programme

The Green Leaf can be programmed with 4 events per day. Different temperatures can be maintained for each event of the day. The days can be programmed independently or per cluster of days.

The default Timer Programme is shown on the graph below. You can easily adapt the programme to your needs (see PROGRAMMING THE TIMER PROGRAMME)



- Touch the “🕒” button to set the clock and day of the week
- Touch the “🕒” button for 3 seconds to program the timer programme (see page 14 for more details).
- Touch the “M” button for 5 seconds to enter the Installer Menu
- Touch the “🍃” button to switch from Timer to Manual ON/OFF mode
- Touch the “🍃” button for 2 seconds to put the Thermostat into OFF (standby) mode
- Touch “◀” or “▶” to show the set point temperature. It will blink for 5 seconds
 1. Touch “◀” to decrease the temperature.
 2. Touch “▶” to increase the temperature.

Remark: The adapted temperature is valid until the next timer Event.

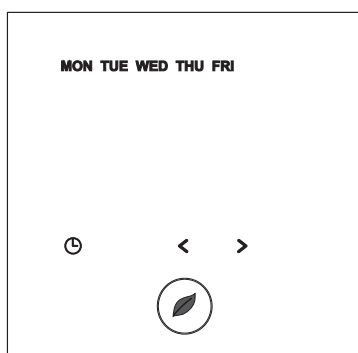
4. SETTING THE CLOCK

- Touch the "⌚" button to set the clock and day of the week
- Touch "◀" or "▶" to change the hours
- Touch the "⌚" button to validate
- Touch "◀" or "▶" to change the minutes
- Touch the "⌚" button to validate
- Touch "◀" or "▶" to change the day of the week
- Touch the "⌚" button to validate

Remark: In case of battery drainage after long period of power failure, you might have to re-programme the clock.

5. PROGRAMMING THE TIMER PROGRAMME

- Touch the "⌚" button for 3 seconds to program the Timer Programme
- Touch "◀" or "▶" to choose the day (or the sequence of days) you want to program
- Touch the "⌚" button to validate



Day Sequences are:

- ⌚ MON
- ⌚ TUE
- ⌚ WED
- ⌚ THU
- ⌚ FRI
- ⌚ SAT
- ⌚ SUN
- ⌚ MON TUE WED THU FRI
- ⌚ SAT SUN
- ⌚ MON TUE WED THU FRI SAT SUN

For Event 1

- Touch "◀" or "▶" to change hours of Event 1
- Touch the "⌚" button to validate
- Touch "◀" or "▶" to change the minutes of Event 1
- Touch the "⌚" button to validate
- Touch "◀" or "▶" to change the temperature for Event 1
- Touch the "⌚" button to validate

For Event 2, 3 and 4

- Repeat the actions for event 1 for the Events 2, 3 and 4

Touch the "⌚" button, at any time during the programming, to save your changes and return to the Timer Programme.

If needed, you can repeat the complete procedure to program other days or sequences of days.

6. INSTALLER MENU

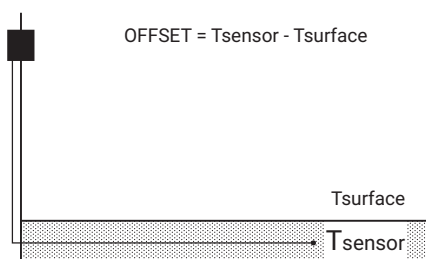
Touch the "M" button for 5 seconds to enter the installer Menu

#	Description	Range	Default setting
1	Sensing mode selection	Floor sensing mode Room sensing mode Room sensing mode with floor temperature limiter	Floor Sensing mode
2	12 vs 24 hours display	12 / 24	24
3	Motion sensor. When getting close to the thermostat (5cm range) the display lights up automatically	ON / OFF	ON
4	Offset for floor sensor calibration	Offset of 0 .. 10°C	4°C
5	Room sensor calibration	Measured sensor temperature +/- 5°C	Measured sensor temperature
6	Minimum temperature set point for the Floor Sensor	Floor sensing mode: 5 .. 15°C Room sensing mode: OFF Room sensing mode with floor temperature limiter: OFF	5°C OFF OFF
7	Maximum temperature set point for the Floor Sensor	Floor sensing mode: Minimum temperature set point floor sensor (installer menu 6) +5°C .. 35°C Room sensing mode: OFF Room sensing mode with floor temperature limiter: 10 .. 35°C	35°C OFF 27°C
8	Minimum temperature set point for the Room Sensor	Floor sensing mode: OFF Room sensing mode: 5 .. 15°C Room sensing mode with floor temperature limiter: 5 .. 15°C	OFF 5°C 5°C
9	Maximum temperature set point for the Room Sensor	Floor sensing mode: OFF Room sensing mode: Minimum temperature set point room sensor (installer menu 8) +5°C .. 40°C Room sensing mode with floor temperature limiter: Minimum temperature set point room sensor (installer menu 8) +5°C .. 40°C	OFF 40°C 40°C
10	Adjustable hysteresis	0.5 .. 2.0°C	1.0°C
11	Open window function	ON/OFF	ON

Floor sensor calibration

The temperature of the floor surface can differ from the temperature measured by the floor sensor due to the floor construction, the floor type and the position of the floor sensor. In order to calibrate your thermostat to this difference you can use the floor sensor calibration OFFSET in installer Menu 4.

After the temperature on the floor is stabilized, place a thermometer on the floor surface in order to sense the real temperature on the surface (T_{surface}). Read the floor sensor temperature (T_{sensor}) on the thermostat and adjust the OFFSET accordingly to the formula:



Room sensor calibration

If the value measured by the room sensor in the thermostat differs from the real room temperature, it is possible to calibrate the room sensor using the installer Menu 5.

After the temperature in the room is stabilized, place a thermometer close to the wall in order to sense the real room temperature. If this value differs from the one shown by the thermostat, adjust Menu 5 using the "<" or the ">" until the thermostat shows the same value as the reference thermometer.

7. TROUBLESHOOTING

In the event of damage or malfunction of one of the temperature sensors, the heating output cuts off (fail safe) and an error code is displayed.

Error Code	Description
ER1	Short circuit on floor sensor
ER2	Open circuit on floor sensor / Missing floor sensor
ER3	Short circuit on room sensor
ER4	Open circuit on room sensor
ER5	Check sensing mode

The floor sensor can be replaced by a new. In the event of malfunction of the room sensor, the entire thermostat must be replaced (Error 3 or Error 4).

Error 5 occurs if the thermostat is set in Room Sensing Mode and the floor sensor is installed.

To resolve the error change the sensing mode in Floor sensing or Room sensing with floor temperature limiter.

Otherwise, remove the floor sensor to work in room sensing mode. The floor sensor has got the following temperature/resistance values:

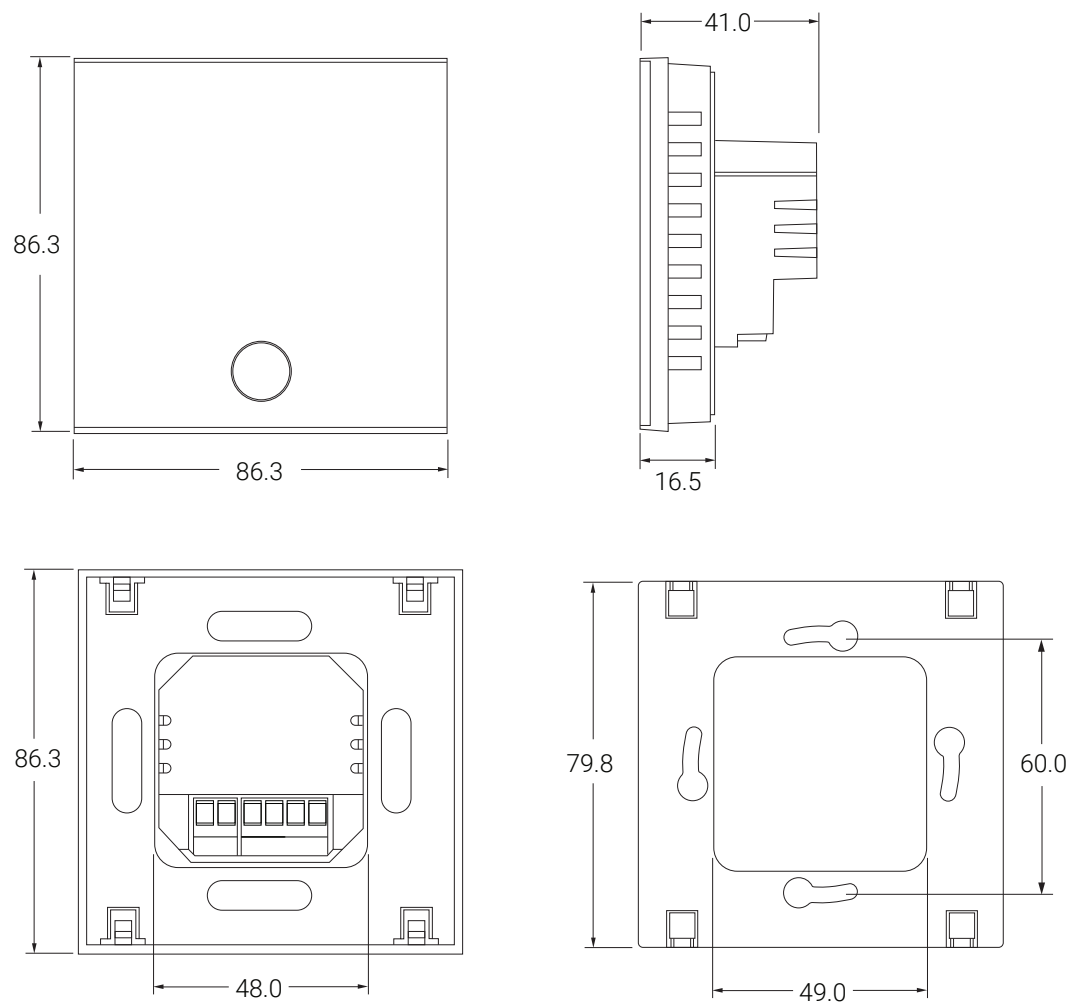
Temperature	Resistance
15°C	15.8 kΩ
20°C	12.5 kΩ
25°C	10.0 kΩ
30°C	8.0 kΩ
35°C	6.5 kΩ

8. TECHNICAL SPECIFICATION

Supply voltage	230VAC, +10%, -15%, 50Hz
Power consumption (Stand-by)	3 VA
Relay output	230V, maximum 13A resistive load (max. 3000W)
Ambient temperature – operation	0 .. 40°C, 5-95% RH (non condensing)
Ambient temperature – transport	-10 .. +60°C
Temperature range, floor sensor	+5 .. +35°C
Temperature range, room sensor	+5 .. +40°C
Switching hysteresis	1°C (Factory settings adjustable between 0.5-2.0°C)
Control modes	Floor sensing
	Room sensing
	Room sensing with floor temperature limiter
Temperature control	Manual ON/OFF Timer programme
Protection class	IP 21
Terminals	Max. 2,5 mm ²
Floor sensor with 3 m cable	NTC, 10KΩ / 25°C
Maximum length of floor sensor Cable	100 m, 2 x 1,5 mm ² (230VAC cable type)
Approvals	
Type of action	1.B. (39)*
Control pollution degree	2 (49)*
Rated impulse voltage	4kV (75)*
Temperature for the ball pressure test	125°C (77)*
SELV limits realized	22 VDC (86)*

* According to the EN 60730-1 table 1

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