Electronic thermal control system for radiators

210 series

CALEFFI

01263/15 GB

ISO 9001 FM 21654

RADIO WAVE system

Function

The radio wave thermal control system is composed of:
- multi-zone thermal controller code 210100
- electronic control head for radiator valve code 210510
- ambient temperature sensor (optional) code 210001

The thermal controller manages the temperature in the various rooms by controlling the electronic actuators installed on the valves of the individual heating bodies. The actual temperature is measured by the sensors positioned in the room and/or integrated in the control heads. Depending on the set temperature parameters and the comfort or set back cycles, the controller sends a modulating opening or closing signal to the actuators and turns the boiler on and off. The actuators are controlled by means of radio wave transmission.
Quick-coupling installation with adaptor.

Product range

Code 210100 Radio wave multi-zone thermal controller, with power supply unit.
Code 210510 Radio wave electronic control head. For thermostatic and convertible radiator valves.
Code 210001 Radio wave ambient temperature sensor. For temperature control of the individual zone or room.
Code 210004 Power supply unit for thermal controller.
Code 210005 Tamper-proof kit.
Code 210011 Wireless radio signal repeater with plug for power outlet.
Code 210010 Wireless radio signal repeater for wall recess or false ceiling.
Code 210006 Click switch.

STAND ALONE system

Function

The stand alone chrono-thermostatic control head allows control of ambient temperature on the basis of a series of programmed settings, both by time band and by temperature level. It can be installed both on thermostatic and convertible radiator valves. Operation is assured by touch buttons and an integrated temperature sensor. Programmable directly, with display of temperatures and comfort-set back cycles. The unit is battery operated.
Quick-coupling installation with adaptor.

Product range

Code 210500 Stand alone chrono-thermostatic control head, with backlit display. For thermostatic and convertible radiator valves.

Technical specifications

Radio wave multi-zone thermal controller code 210100 to manage electronic control heads code 210510 (with power supply unit)

Radio communication:	RF 868 MHz - EnOcean Standard
Transmission range:	up to 30 m indoors
Display:	Colour graphic TFT
Operativity:	touch buttons
Thermal control possibilities:	up to 8 zones / 32 radiators
Weekly programming:	Auto - Holiday - Eco – Comfort functions
Electric supply:	24 V (dc)
Auxiliary contact (NO) maximum contact rating for heating demand:	5 A
Protection class:	IP 30
Power consumption:	0,6 W (0,1 W in stand-by)
Ambient temperature:	0–50°C
Storage temperature:	-20–70°C
Relative humidity:	10–90%
Clock data storage without electric supply:	2 hours

Power supply

Electric supply:	230 V (ac)
Output voltage:	24 V (dc)
Output current:	180 mA
Output power:	4,2 W
Dimensions:	42,5 x 40 x 22 mm

Radio wave electronic control head code 210510

Performance

Can be coupled to multi-zone thermal controller code 210100

Radio communication:	RF 868 MHz - EnOcean Standard
Electric supply:	2 AA / LR6 / 1,5 V alkaline/lithium batteries
Average battery life:	2 years
Temperature sensor:	integrated
Operation:	touch buttons
Radiator valve connection threading:	M30 x 1,5
Actuator stroke:	up to 4 mm
Max. differential pressure with control head installed on valve:	1 bar
Protection class:	IP 30
Colour:	white RAL 9010

Ambient conditions (valve + control head)

Medium working temperature range:	5–75°C
Working temperature:	0–50°C
Storage temperature:	-20–70°C
Relative humidity:	10–90% non condensing.

Radio wave ambient temperature sensor code 210001 for temperature control of the individual zone or room

Can be connected to multi-zone thermal controller code 210100

Mounting:	with double-sided adhesive or flat-head screw
Ambient temperature:	0–40°C
Storage temperature:	-20–60°C
Relative humidity:	10–100%
Transmission range:	up to 30 m indoors
Radio communication:	RF 868 MHz - EnOcean Standard
Electric supply:	photovoltaic cell and backup battery
Battery life:	approx 7 years in absence of light
Protection class:	IP 30

Stand alone chrono-thermostatic control head code 210500

Performance

Electric supply:	2 AA / LR6 / 1,5 V alkaline/lithium batteries
Average battery life:	2 years
Temperature sensor:	integrated
Operation:	touch buttons, integrated temperature sensor
Radiator valve connection threading:	M30 x 1,5
Actuator stroke:	up to 4 mm
Max. differential pressure with control head installed on valve:	1 bar
Anti-frost function:	always active with non user-editable 8°C fixed value

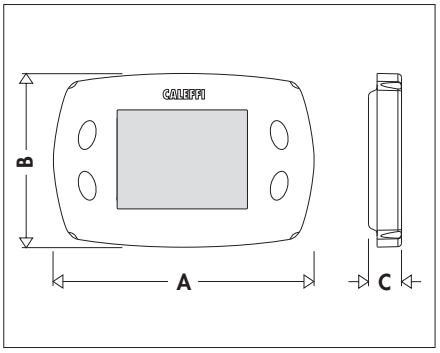
Automatic window opening detection

Protection class:	IP 30
Colour:	white RAL 9010

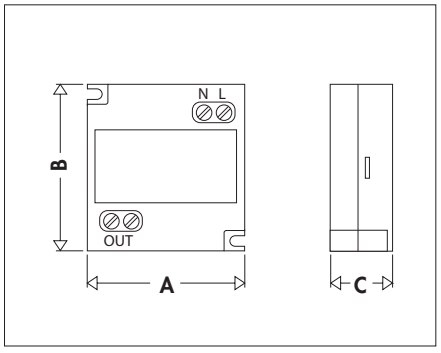
Ambient conditions (valve + control head)

Medium working temperature range:	5–75°C
Working temperature:	0–50°C
Storage temperature:	-20–70°C
Relative humidity:	10–90% non condensing

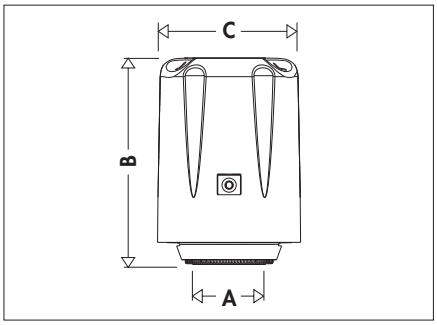
Dimensions



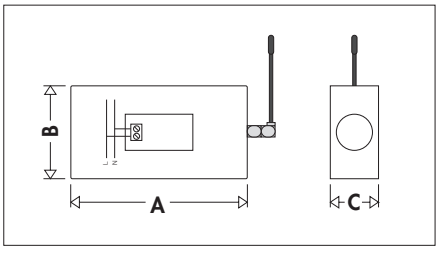
Code	A	B	C
210100	142	100	27



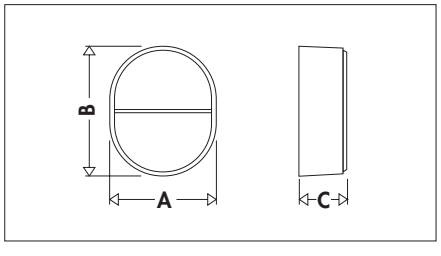
Code	A	B	C
210004	40	42,5	22



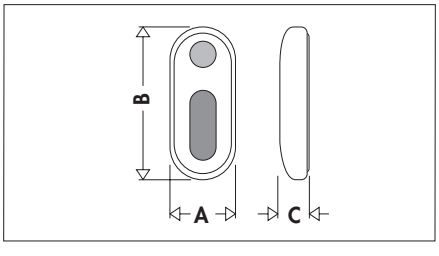
Code	A	B	C
210500	30 p.1,5	80	55
210510	30 p.1,5	80	55



Code	A	B	C
210010	100	50	25



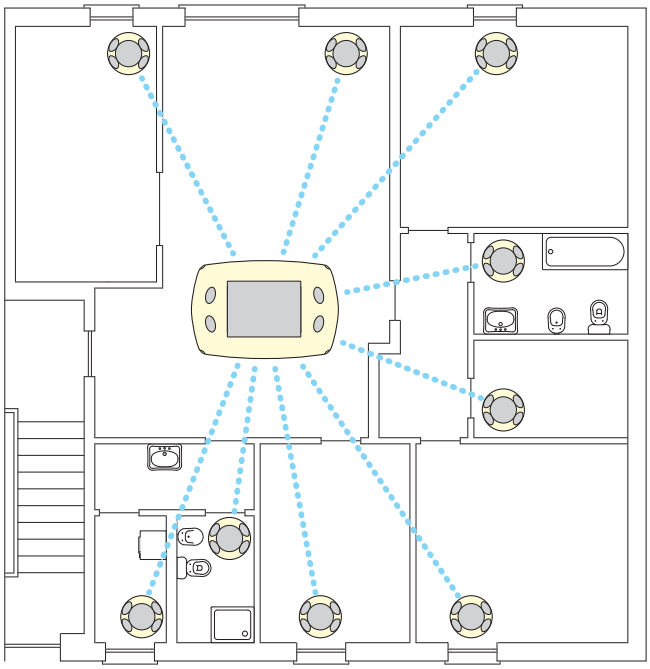
Code	A	B	C
210006	63	81	16,5



Code	A	B	C
210001	32	80	18

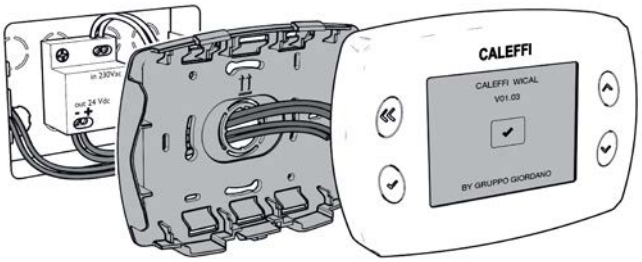
Operating principle of the radio wave thermal control system

The controller manages the temperature in different rooms by controlling the electronic actuators installed on the valves on each radiator. The temperature sensor inside the electronic control head communicates the temperature reading of the zone to the controller so that it can regulate the opening of the radiator valves of the zone. The temperature measured is an average of all temperature readings of all electronic control heads in the zone. The controller is equipped with its own temperature sensor, which is used in the absence of other sensors or in the event of a fault. The maximum indoor transmission range without significant obstacles (such as thick concrete walls, doors or metallic shields, etc.) is approximately 30 m. In the presence of transmission difficulties, install one or more signal repeaters code 210010 or code 210011. The controller can manage up to 8 zones which are in turn able to control up to a maximum of 4 actuators (hence up to 32 actuators can be managed in total).



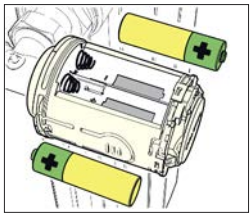
The electric supply is 24 V (dc).

The power supply must be connected in accordance with the diagram in instruction sheet code 28238.



Avoid signal transmission problems by positioning the controller in accordance with the instructions given in the installation and commissioning manual.

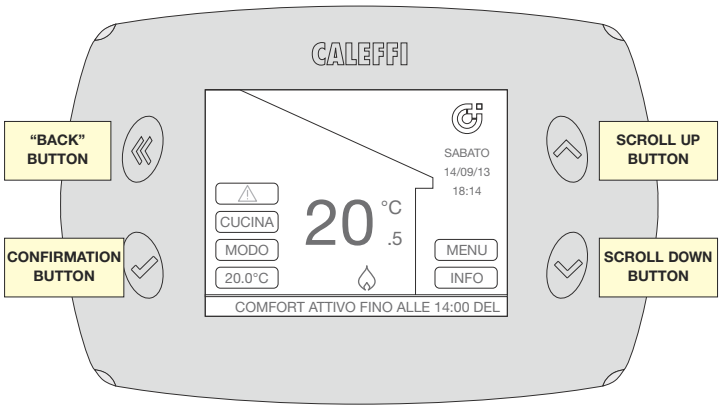
Electronic control heads code 210510 mounted to the valve of each radiator are indispensable to manage heating system zones. Modulating the flow rate of the thermal medium the control heads regulate the ambient temperature in accordance with the selected comfort level. The controller and electronic control head communicate every 10 minutes (20 minutes in summer mode) to maximise battery life.
The operation for binding control heads to the controller is easy thanks to the display indications to guide the user through the procedure. The actuator is equipped with touch buttons that are used during the binding procedure and also during normal operation. You can perform several operations such as manual opening or closing of the valve, checking the radio communication level, control head factory reset, etc. The LED on the front of the device lights in accordance with the various operating states of the electronic control head.



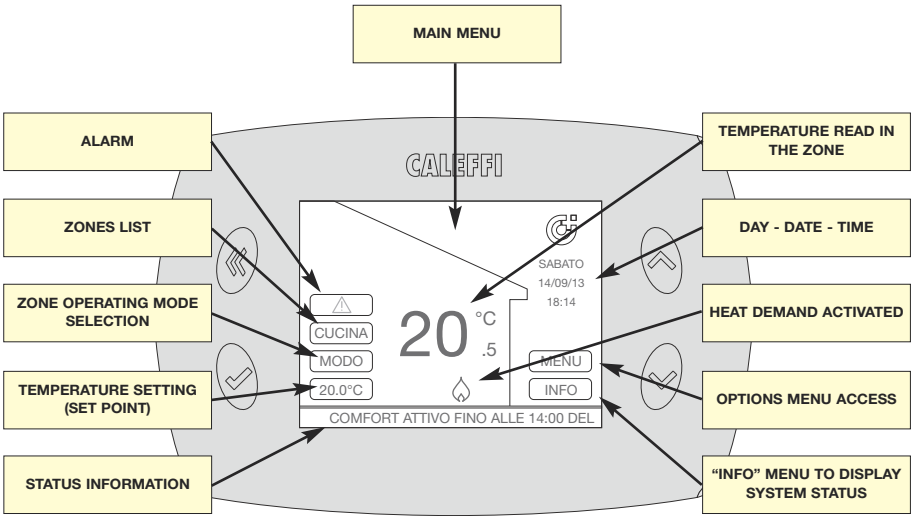
Electric supply is provided by two 1,5 V AA batteries with lifetime of up to 2 years depending on use.

The ambient temperature sensor code 210001 (optional) can be used if a more accurate ambient temperature reading is required or if the electronic control heads are located in a place in which it is impossible to read the temperature correctly. The optimal position is well clear of doors, windows, radiators and indirect sources of heat, ideally at a height of between 1,2 and 1,5 m.
The sensor does not require an external electric supply because it is equipped with a photovoltaic cell with backup battery that ensure continuous operation also in the absence of light for a minimum of approximately 7 years.

Thermal controller display

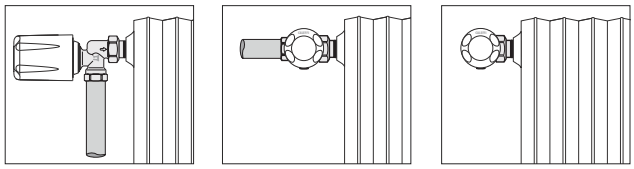


The controller is equipped with four buttons and an LCD illuminated display providing access to the various menus to consult the status of the system and its regulation. The menu contains all the information associated with the status of the zone selected as "main".

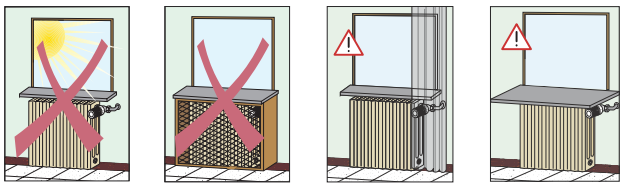


With the "MODE" function you can change the operating status of the various zones (AUTO-ECO-HOLIDAY-OFF) instantly.
You can temporarily change the temperature of each individual zone using the "SET POINT" function. The INFO menu allows you to view the status of the entire system continuously with the temperature readings and open/closed status of the radiator valves.
Any faults are shown in the "alarm" field.
For operating details refer to the installation and commissioning manual.

Installation notes for radio wave electronic control heads

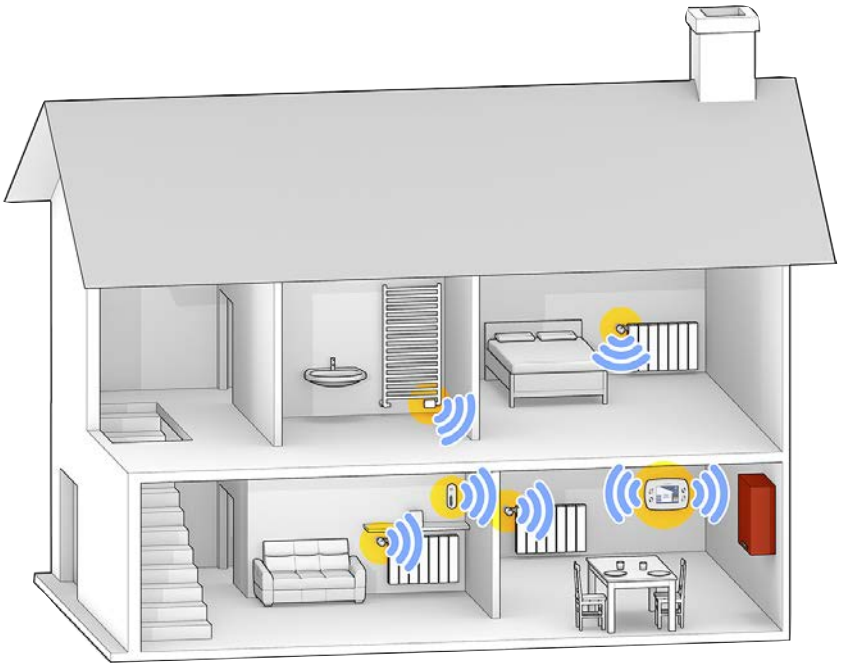


The electronic control heads **must be installed in a horizontal position** to allow a correct temperature reading to the internal sensor. If this proves impossible (e.g. a control head installed in a horizontal position would obstruct opening of a door) it becomes mandatory to use the ambient temperature sensor to replace the internal sensor in the control head. In this case the control head can be installed in a vertical position if necessary.



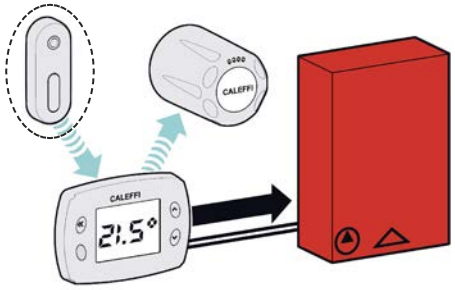
It is good practice to install an ambient temperature sensor in each zone if radiators are installed in recesses, in cabinets, behind curtains, under deep shelves, or exposed to direct sunlight thus creating conditions that could affect the accuracy of temperature readings.

Temperature regulation of zones with boiler control in independent systems



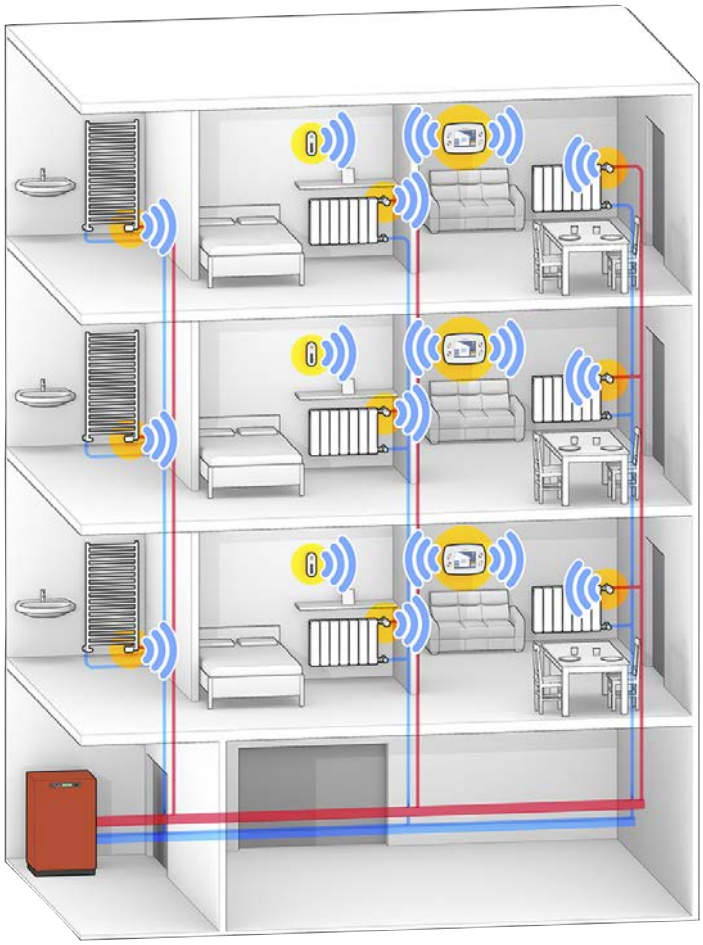
The controller receives the signal from the temperature sensor to establish the presence of heating demand in the zone in question on the basis of the programming. The valves located in the zone in question are adjusted accordingly. The boiler is started by means of the specific relay output in the presence of a heating demand from at least one of the zones.

OPTIONAL



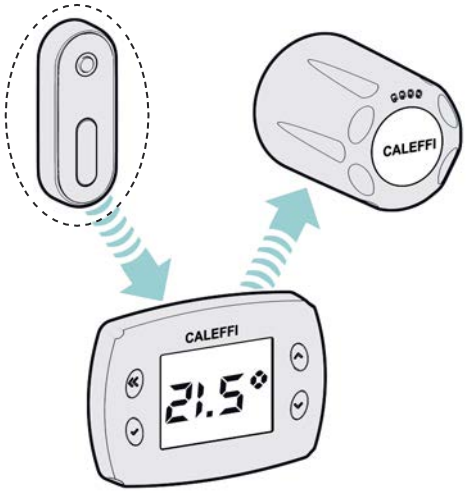
The temperature sensor is optional in that the electronic control head is already equipped with a built-in temperature sensor. Use of the sensor is recommended in the case of installation in conditions that could impair correct temperature readings. E.g., under deep shelves, as shown in the figure.

Room temperature regulation in centralised systems



The controller receives the signal from the temperature sensor to establish the presence of heating demand in the zone in question on the basis of the programming. The valves located in the zone in question are adjusted accordingly.

OPTIONAL



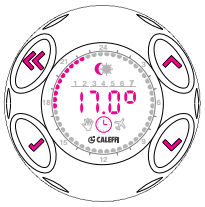
The temperature sensor is optional in that the electronic control head is already equipped with a built-in temperature sensor. Use of the sensor is recommended in the case of installation in conditions that could impair correct temperature readings. E.g., under deep shelves, as shown in the figure.

Operating principle of the thermal regulation system with stand alone chrono-thermostatic control head

Stand alone chrono-thermostatic control heads code 210500, installed on the valve of each radiator, regulate the room temperature depending on the selected comfort level and the set time bands. This function guarantees a significant increase in the benefits available with conventional thermostatic valves because it means heat can be used only where and when it is needed. For this purpose, simply set the required temperatures in the different time bands for the whole week in each room. With conventional thermostatic valves the only option is to maintain constant temperatures in each room. However, with programmable electronic thermostatic valves the room temperatures can be varied on the basis of the time and day of the week.

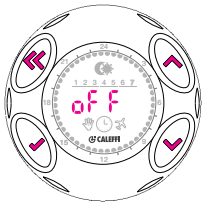
Display of the stand alone chrono-thermostatic control head

MANUAL



AUTOMATIC

HOLIDAY



OFF

Operating mode selection

The control has four operating modes: **MANUAL** (✋), **AUTOMATIC** (◷), **HOLIDAY** (✈), **OFF**.
You can change the operating mode at any time.

MANUAL mode (✋) — The control head modulates in such a way as to maintain the ambient temperature constantly at the set value.

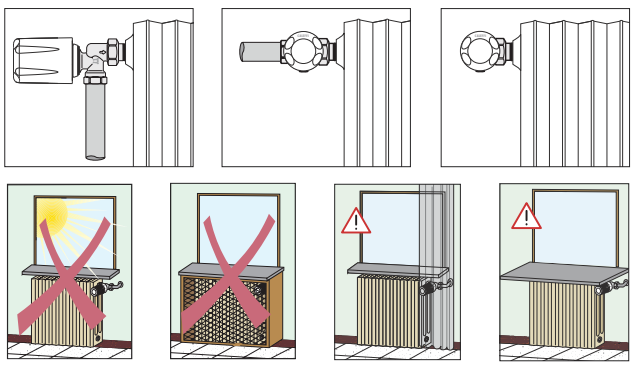
AUTOMATIC mode (◷) — The control head modulates in such a way as to control the temperature in accordance with the hourly programming and the two corresponding temperature levels (comfort / set back). The (◷) icon appears on the display together with the comfort icon (☼) or set back icon (☾). The set value is shown in the centre of the display: the programmed time bands are shown on the dial. The comfort (☼) and set back (☾) temperature values can be adjusted using the SetS function in the “configuration menu”. The factory settings are:
- comfort temperature: 20°C
- set back temperature: 17°C

A different hourly program can be selected or freely modified using the PrOG function in the “configuration menu”.

HOLIDAY mode (✈) — The temperature is kept constant at the set value until a specified date. After this date the system returns to the previous mode. The ✈ icon is shown on the display. The set value is shown in the centre of the display.

OFF mode (Off) — The control head assumes the valve fully closed position. The **OFF** icon is shown on the display.
The anti-frost function remains active.

Installation notes for stand alone chrono-thermostatic control heads



We recommend installing the chrono-thermostatic control heads in a horizontal position. Vertical positioning impairs correct temperature reading with consequent loss of accuracy in ambient temperature regulation.
Use of the control head in a position where it is directly exposed to sunlight for prolonged periods or inside radiator cabinets is strongly discouraged. In this latter case the temperature read by the sensor would be very close to the radiator temperature.

Correction with temperature offset

The stand alone control head is equipped with a temperature reading and management system that allows optimal temperature regulation in accordance with the various parameters. However, in certain cases, such as the use of a control head located behind thick curtains or shelves that are very exposed or very close to the control head, or if the control head is located very close to the floor or close to the ceiling, it is useful to apply a correction factor also called temperature “offset”, available in the “configuration” menu. This parameter is used to compensate for the difference between the actual ambient temperature and the temperature measured by the sensor. The chrono-thermostatic control head reads the temperature in the vicinity of the radiator so the value may be different from temperature readings in other parts of the room.

TABLE SHOWING COMBINATIONS WITH RADIATOR VALVES

Electronic and chrono-thermostatic control heads can be combined with the following valve series:

 338	 339	 401	 402	 425
 426	 421	 422	 220	 221
 222	 223	 224	 225	 226
 227	 4001	 4003	 4004	 455 F49671

Available on request specific adapter for thermostatic and convertible radiator valves not manufactured by CALEFFI.

Accessories

Wireless 1st and 2nd level signal repeater with plug for power output code 210011
Electric supply: 230 V (ac). CEE 7/4 M/F Schuko plug.
Radio communication: RF 868 MHz - EnOcean Standard.
Transmission range: up to 30 m indoors.
Stand-by power consumption: 0,9 W.

1st and 2nd level wireless signal repeater with antenna code 210010
Recessed or false ceiling version.
Electric supply: 230 V (ac).
Radio communication: RF 868 MHz - EnOcean Standard.
Transmission range: up to 30 m indoors.
Stand-by power consumption: 0,6 W.
Dimensions: 100 x 50 x 25 mm.

Click switch - Battery-free wireless interrupter remote control code 210006
The three buttons allow the system to be set to Automatic/Eco/OFF mode
without having to adjust the controller directly.
Radio communication: RF 868 MHz - EnOcean Standard.
Electric supply: without batteries.

Radio wave ambient temperature sensor code 210001
For controlling the temperature in each zone or room.
Installation: with double-sided adhesive tape or flat-head screw.
Transmission range: 30 m indoors.
Radio communication: RF 868 MHz - EnOcean Standard.
Can be connected to the 210 series multi-zone thermal controller.
Electric supply: photovoltaic cell and backup battery.
Battery life: approx. 7 years.
Protection class: IP 30.

Radio signals checking and validation tester code 210007
Radio communication: RF 868 MHz - EnOcean Standard.
Ambient temperature: 0–45°C.
Storage temperature: -15–65°C.
Relative humidity: IP 54.
Power supply: 2 AA/LR06 batteries.
Mass: 85 g.
Dimensions: 110 x 70 x 25 mm.

Tamper-proof kit for control head code 210005

SPECIFICATION SUMMARY

Code 210100
Radio wave multi-zone thermal controller for managing electronic control heads code 210510. Radio communication RF 868 MHz - EnOcean Standard. Transmission range up to 30 m indoors. Colour TFT graphic display. Touch button operation. Possibility to control heat settings for up to 8 different zones / 32 radiators. Weekly programmable clock. Auto - Holiday - Eco - Comfort Functions. Maximum contact rating of auxiliary contact (NO) for heating demand 5 A. Clock data retention without electric supply: 2 hours. Protection class IP 30. Power consumption 0,6 W (0,1 W in stand by). Electric supply 24 V (dc) by means of power supply (included), electric supply 230 V (ac), output voltage 24 V (dc), output current 180 mA, output power 4,2 W, dimensions 42,5 x 40 x 22 mm. Ambient temperature 0–50°C. Storage temperature -20–70°C. Relative humidity 10–90%.

Code 210510
Radio wave electronic control head for thermostatic or convertible radiator valves. Can be connected to multi-zone thermal controller code 210100. Radio communication RF 868 MHz - EnOcean Standard. White RAL 9010. Touch button operation, integrated temperature sensor. Electric supply by two AA/LR6/1,5 V alkaline/lithium batteries; average battery life 2 years. Radiator valve connection with M30 x 1,5 threading, actuator stroke up to 4 mm. Protection class IP 30, ambient conditions (valve + control head), thermal medium working temperature range 5–75°C, working temperature 0–50°C, storage temperature -20–70°C. Relative humidity 10–90%, non condensing.

Code 210500
Stand alone chrono-thermostatic control head with backlit display. White RAL 9010. Touch button operation, integrated temperature sensor. Electric supply by two AA/LR6/1,5 V alkaline/lithium batteries; average battery life 2 years. Radiator valve connection with M30 x 1,5 threading, actuator stroke up to 4 mm, constantly enabled anti-freeze function with non user-editable 8°C fixed value, anti-seizing function, automatic window opening detection. Protection class IP 30, ambient conditions (valve + control head), thermal medium working temperature range 5–75°C, working temperature 0–50°C, storage temperature -20–70°C. Relative humidity 10–90%, non condensing.

Code 210001
Radio wave ambient temperature sensor to control the temperature of each zone or room. Can be connected to multi-zone thermal controller code 210100. Transmission range up to 30 m indoors. Radio communication RF 868 MHz - EnOcean Standard. Installation with double-sided adhesive or flat-head screw. Ambient temperature 0–40°C. Storage temperature -20–60°C. Relative humidity 10–100%. Electric supply by photovoltaic cell and backup battery, approximately 7 years battery life. Protection class IP 30.

Code 210004
Power supply unit for thermal controller code 210100. Electric supply 230 V (ac). Output voltage 24 V (dc). Output current 180 mA. Output power 4,2 W. Dimensions 42,5 x 40 x 22 mm.

Code 210011
Wireless 1st and 2nd level signal repeater with plug for power outlet. Electric supply: 230 V (ac). Radio communication RF 868 MHz - EnOcean Standard. Transmission range up to 30 m indoors. Stand-by power consumption 0,9 W.

Code 210010
Wireless 1st and 2nd level signal repeater with antenna. Recessed or flase ceiling version. Electric supply 230V (ac). Radio communication RF 868 MHz - EnOcean Standard. Transmission range up to 30 m indoors. Power consumption in stand-by 0,6 W. Dimensions 100 x 50 x 25 mm.

Code 210006
Click switch - Battery-free wireless interrupter remote control. Operation in Automatic/Eco/OFF mode. Radio communication RF 868 MHz - EnOcean Standard.

Code 210007
Radio signals checking and validation tester. Radio communication RF 868 MHz - EnOcean Standard. Electric supply by two AA/LR6/1,5 V batteries. Protection class IP 54. Mass 85 g. Dimensions 110 x 70 x 25 mm.

CALEFFI Hydronic Solutions
Caleffi S.p.A.
S.R. 229 n. 25 · 28010 Fontaneto d'Agogna (NO) · Italy
Tel. +39 0322 8491 · Fax +39 0322 863723
info@caleffi.com · www.caleffi.com