

**NEW WAVE**

**RICEVITORE RADIO 1 CANALE PER IMPIANTI DI  
RISCALDAMENTO/RAFFRESCAMENTO**

*1 RADIO CHANNEL RECEIVER FOR HEATING/COOLING SYSTEM*

**1-KANAL-RADIOEMPFÄNGER FÜR HEIZUNGS-/KÜHLUNGSANLAGEN**

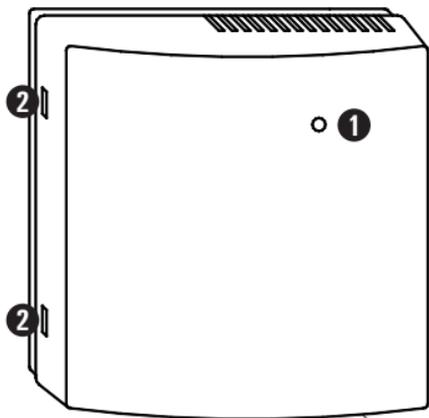
*RÉCEPTEUR RADIO 1 CANAL POUR SYSTÈMES DE  
CHAUFFAGE/REFROIDISSEMENT*

**RECEPTOR RADIO 1 CANAL PARA INSTALACIONES DE  
CALEFACCIÓN/REFRIGERACIÓN**

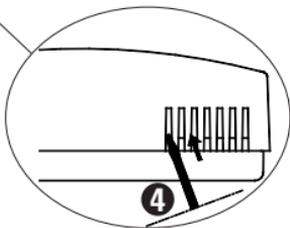
*RECEPTOR DE RÁDIO 1 CANAL PARA INSTALAÇÕES DE  
AQUECIMENTO/ARREFECIMENTO*



**CE**



**Fig. 1 - Abb. 1**



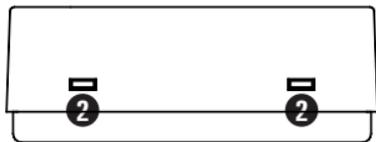


Fig. 2 - Abb. 2

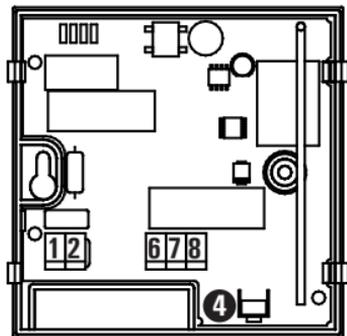


Fig. 4 - Abb. 4

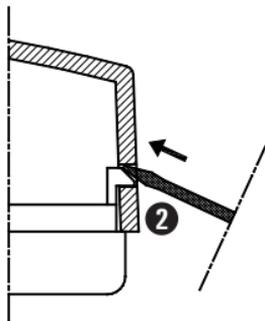
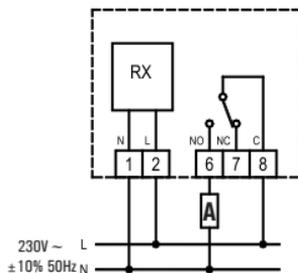


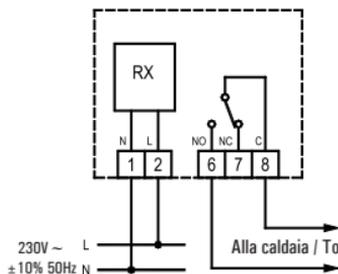
Fig. 3 - Abb. 3

**SCHEMA DI COLLEGAMENTO - WIRING DIAGRAM - SCHALTSCHEMA -  
SCHEMA DE BRANCHEMENT - ESQUEMA DE CONEXIÓN - ESQUEMA DE CONEXÃO**



**A:** Carico / Load / Ladung / Charge / Carga / Carga  
 230V ~ ± 10% 50Hz  
 MAX 6A

**Fig. 5 - Abb. 5**



Esempio di collegamento all'ingresso "termostato ambiente" di una caldaia.  
 Example of connection to the "ambient thermostat" of a boiler.  
 Beispiel von Anschluss an den "Raumthermostateingang" eines Kessels.  
 Exemple de connexion à l'entrée "Thermostat d'ambiance" d'une chaudière.  
 Ejemplo de conexión al ingreso "termostato ambiente" de una caldera.  
 Exemplo de conexão na entrada do "termostato ambiente" de uma caldeira.

**Fig. 6 - Abb. 6**

## MAIN FEATURES

- Operating frequency 868.150 MHz
- Power supply 230V ~
- Indication of the radio communication quality
- Controls NC and NO actuators

## TECHNICAL FEATURES

Power supply:	230V ~ ±10% 50Hz
Absorption:	11VA
Relay contacts capacity:	6A@250V ~
Hysteresis:	0,3°C
Frequency:	868,150 MHz
Sensitivity:	-105 dBm
Modulation:	GFSK
Bandwidth (-3 dB):	100 KHz
Type of antenna:	indoor style
Max. distance from transmitter:	> 300 m in free field > 50 m in buildings (depending on the building and environment)
Protection rating:	IP 30
Operating temperature:	0°C .. 40°C
Storage temperature:	-10°C .. +50°C
Humidity limits:	20% .. 80% RH RH non-condensing
Enclosure:      Material:	ABS V0 self-extinguishing

Colour:	Signal White (RAL 9003)
Dimensions:	85 x 85 x 31 mm (L x A x P)
Weight:	~ 126 gr.
Installation:	Wall mounted
EMC normative references:	ETSI EN 301 489-3 v1.4.1
LVD normative references:	EN 60730-1 (1996).
R&TTE normative references:	ETSI EN 300 220-2 v2.1.1

## OVERVIEW

This device is a one-channel receiver designed to switch on loads (more precisely, electro-thermal valves or circulators) via radio in home or office heating/cooling systems.

It has 1 channel that can be associated with an independent transmitter (wireless thermostat or chronostat). This system is an optimal solution for buildings in which wires cannot be laid between thermostats and the environment to be controlled. Operating on a frequency of 868.150 MHz (LPD) provides the user with all the advantages of this band, such as the greatest freedom from interference and greater efficiency in the transmission of the signal.

## OPERATION

Each thermostat or chronostat transmitter sends radio commands to the receiving unit based on the heating and cooling requirements of the room where it is located.

These radio commands are then received and decoded by the receiving unit, which is usually installed in the same room as the boiler or air conditioning equipment.

The relay output is turned on or off in the receiving unit depending on the requirements. This output can be connected to a valve that control in turn the flow of hot/cold water in the heating/cooling unit located in the room. While it is operating, the receiver continuously monitors the status of each channel in order to detect any transmitter malfunctions.

## MECHANICAL DESCRIPTION

### LED

On the front panel of the device, shown in Fig. 1, there is one LED ❶, which gives information regarding the correct power supply, the output channel status and its signal strength:

#### Power supply

When the receiving unit is powered, the LED ❶ lights up and performs a blinking sequence "green-red-green-red" to indicate the correct operation of the device. Then the LED becomes active depending on its normal operation and the receiver starts to perform its normal activity, decoding the signals sent by the transmitters.

#### Actuator output status

During normal operation, the LED ❶ may light up green, yellow or red. The LED provides information about the output and the wireless thermostat controlling it.

In general, the following rule should be borne in mind:

- When a LED is lit, irrespective of colour, it means that the corresponding

actuator output is ON.

- When a LED is either off or only faintly lit, it means that the corresponding actuator output is OFF.
- The colour of the LED provides information about the quality of radio communication. See paragraph on **“Checking the signal strength”**.
- A continuously blinking LED indicates the presence of a fault in the system which requires the user’s intervention. In this case the colour of the LED has the following meanings:
  - Green:** Error in the temperature probe of the wireless thermostat.
  - Yellow:** Wireless thermostat battery low
  - Red:** Absence of radio communication.

When the channel is in a fault status and the LED is blinking, it may blink in two different ways depending on the output relay status.

If the output is inactive the LED will normally remain off but then emit a short flash, whereas if the output is active, the LED will normally remain lit and then go off briefly.

### **Self-learning button**

The device is equipped with a self-learning button for setting up the wireless link between the thermostat (or chronostat) and the receiver, shown with **4** in Figure 1-4.

## **INSTALLATION**

Before installing the receiver, make sure that the radio signals transmitted by the thermostat are correctly received by the receiving unit.

- Make sure that the device is not powered (no mains power supply applied).
- Remove the cover using the screwdriver as a lever on the plastic tabs, shown with ② in Fig. 1-2-3, pressing down lightly between the tab and the hole in the plastic, without pushing down directly on it to avoid it breaking.
- Once the best place for installation has been identified (for signal reception), fix the bottom of the receiver to the wall using two screws and the two holes spaced 60 mm apart.

**While working with tools in proximity to electronic components, carefully check that the circuit is disconnected from the 230V ~ mains power supply and take care not to damage circuits or components.**

- Make the electrical connections as directed in the paragraph on “Electrical connections”.
- Close the device, placing the cover on the base, making sure that the hole is towards the LED, then press down lightly until the four plastic tabs click.
- Configure the device as explained in “Configuring the system”.

## **ELECTRICAL CONNECTIONS**

This section shows how to connect the receiver correctly: carefully read the directions below and refer to Fig. 5-6, which show the arrangement of the terminals and how they are connected internally.

Terminals 1 and 2 are the receiver's power inputs: connect them to the 230V ~ mains supply, making sure that terminal 1 is connected to neutral.

Terminals 6, 7 and 8 are SPDT type connectors of the output relay.

In Figure 5 is shown how to connect a valve, which will be powered once the

output is enabled and that is to say when the thermostat calls for heat (heating) using the NO connector of the relay.

In Figure 6 is shown how to connect the receiver to the “ambient thermostat” of a boiler. Follow this diagram when you need to replace the wired thermostat connected to a boiler with a wireless thermostat or chronostat.

## CONFIGURING THE SYSTEM

To be able to install several thermostats in the same area and to be able to use the multichannel systems, every thermostat is equipped with its own address code. Thermostats with different addresses can work at the same time without interfering each other and therefore controlling different areas.

In order to set up and store in the receiver the address of the thermostat from which want to receive the signals, it is necessary to perform the self-learning procedure described below.

### Self-learning procedure

- Make sure that the plastic enclosure of the receiver is closed before powering up the circuit, as all the internal parts are subject to high voltage 230V ~ .
- Switch on the receiver: the LED **1** blinks for a few seconds during the initialisation phase.
- Switch on a single thermostat or chronostat and set it in the “test” mode (this means that the transmitter will continuously emit an ON command followed by an OFF command after three seconds). It is advisable to keep the transmitter in the same room as the receiver.
- Press the self-learning button for a second by inserting a small screwdriver

in the slot visible in ④ of Fig.1. This is how the self-learning procedure is enabled: the receiver's LED will blink quickly yellow.

- As soon as a test command is received, the LED associated with the channel will remain steadily lit yellow for 7 seconds. During this time the module will continue to receive test commands and memorise only the signal received with the highest strength. This means that it will memorise the signal coming from the nearest transmitter and will thus avoid learning addresses from any transmitters in the test mode which are not meant to be connected to the system.
- After 7 seconds have elapsed the procedure will be terminated and the corresponding LED will blink red-green-red-green in sequence to indicate that the transmitter address has been saved.
- The module will resume normal operation and the output relay will immediately start to switch ON and OFF every three seconds following the commands emitted by the transmitter in the "test" mode.
- When using the "test" function it is advisable to check the strength of the signal received placing the transmitter in the desired position. To avoid wrong indications due to overlapping signals, do not test more than one transmitter at a time.
- After verifying that the signal strength is satisfactory, you may proceed with the final mechanical and electrical installation.

### **Checking the signal strength**

The device constantly indicates the strength of the radio signal received. This makes the whole system simpler to install and adjust and moreover allows the

user to carry out an instant check on the quality of the radio communications. The signal strength is indicated by the LED. It may light up green, yellow or red according to the quality of the radio signal received.

**Green:** The signal received is good or excellent, radio communication is reliable.

**Yellow:** The signal received is sufficient.

**Red:** The signal received is weak, communication is not reliable.

The status of the output of the actuator that is currently switched off is signalled with the corresponding LED faintly lit rather than off, so that the quality of the radio signal can always be seen.

The receiver indicates two types of signal quality via the LED:

- An immediate analysis of the last command received;
- A long-term analysis of the commands received.

The LED will normally indicate the “long-term” signal quality, based on the quantity of correct commands received over the previous 90 minutes of operation.

At the moment when it receives a radio command, the output LED goes off for a brief instant and then immediately back on again. For a brief instant the LED will provide an immediate indication of the last command received, proportional to the strength of the radio signal received.

If a transmitter is in the “test” mode, the LED on the receiver will always provide only an “immediate” indication so that you can instantly assess whether to go ahead with mechanical installation.

If the signal strength is not acceptable, try changing the position of the receiver or, if necessary, of the transmitter.

Remember that both the transmitter and receiver must be installed away from metal objects or metal-reinforced walls that could weaken the radio signals.

**NOTE:** The LED may blink to signal a system fault. In this case the colour of the LED has a different meaning, see the paragraph on “Actuator output status”.

## TROUBLESHOOTING

**SYMPTOM:**

The receiver appears completely “dead”.

**PROBABLE CAUSE:**

There's no 230V ~ mains power.

**REMEDY:**

Check the mains power connection. Usually led ❶ may remain off, but it performs a blinking sequence “green-red-green-red” when it is switched on to indicate correct operation.

**SYMPTOM:**

The led ❶ Fig. 1 on the front panel of the receiver blinks green continuously.

**PROBABLE CAUSE:**

The device is signalling a fault because it has detected an error in the temperature probe of the wireless thermostat or chronostat.

**REMEDY:**

Check the temperature probe of the transmitter and, if present, the jumper for selecting between the internal and external probe. Carefully read the instructions of the transmitters for further information.

**SYMPTOM:**

The led ❶ Fig. 1 on the front panel of the receiver blinks yellow continuously.

**PROBABLE CAUSE:** The device is signalling a fault because it has detected the wireless thermostat or chronostat batteries to be running low.

**REMEDY:** Replace the batteries of the transmitters concerned. Carefully read the instructions of the transmitters for further information.

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**SYMPTOM:** The led **1** Fig. 1 on the front panel of the receiver blinks red continuously.

**PROBABLE CAUSE:** The channels in question are in an "alarm status" due to the absence of radio communication.

**REMEDY:** Check the radio communication again using the "test" function on the transmitter. Assess whether the devices need to be moved away from metal shields or a "repeater" needs to be installed.

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**SYMPTOM:** The transmitter is in the "test" mode but the module fails to switch on any relay.

**PROBABLE CAUSE:** The address sent by the transmitter does not correspond to the address memorised in the receiver.

**REMEDY:** Carry out the "self-learning" procedure as directed in the section "Configuring the System".

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**SYMPTOM:** The transmitter is in the "test" mode but the receiver fails to switch on any relay. The LED does not

**PROBABLE CAUSE:**

indicate any reception of commands via radio.  
The signals received are too weak to enable correct decoding of the commands.

**REMEDY:**

Assess whether the devices need to be moved away from metal shields or a “repeater” needs to be installed.

**WARNING**

- **When deciding on a correct position, make sure that the radio signals transmitted are received correctly by the receiving unit.**
- **Device installation and electrical connections must be carried out by qualified personnel and must comply with the laws in force.**
- **Before making any connections, make sure the mains power is disconnected.**

In the view of a constant development of their products, the manufacturer reserves the right for changing technical data and features without prior notice.

The consumer is guaranteed against any lack of conformity according to the European Directive 1999/44/EC as well as to the manufacturer's document about the warranty policy. The full text of warranty is available on request from the seller.

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