



RADIO FREQUENCY AMBIENT THERMOSTAT  
FOR FAN-COILS (AUTO VERSION WITH ACTUATOR)



CH130ARFR

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## Introduction

This fan-coil thermostat control kit CH130ARFR is made up of a CH130ARF thermostat and a DIN bar CH172DRF actuator.

The CH130ARF model is a fan-coil 4- or 2-pipe thermostat that allows you to control the ambient temperature both in the heating and cooling mode. These controls are sent to a CH172DRF actuator that communicates with the CH130ARF through radio frequencies.

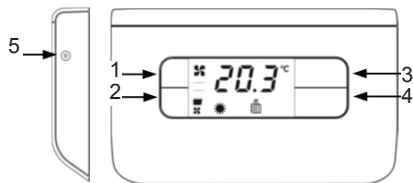
The CH130ARF is powered by two AA-size batteries (1.5 V). It is able to drive two valves and control a 3-speed fan-coil motor, either in manual or automatic mode. The thermostat measures the ambient temperature either through an internal probe or an external sensor. It keeps the set-point by acting on the ventilation speed.

The wide display shows the measured temperature, the fan speed, the program being run and the selected season.

The settings and data are stored in a permanent memory capable of keeping the same even when the batteries are not inserted.

## Controls and signals

### Controls



1. Fan speed increase button
2. Fan speed decrease button
3. Selected program temperature value increase button
4. Selected program temperature value decrease button
5. Thermostat reset button

### Button combinations (press simultan.)

- 1+2 Summer/Winter switch
- 3+4 Comfort/Economy switch
- 2+4 Celsius/Fahrenheit switch

### Signals



1. Measured temperature
2. "Comfort" symbol
3. "Economy" symbol
4. "Summer" symbol
5. "Winter" symbol
6. Fan speed symbols
7. "Automatic" symbol
8. System "ON" in summer operation
9. System "ON" in winter operation
10. Low battery charge

## User's manual

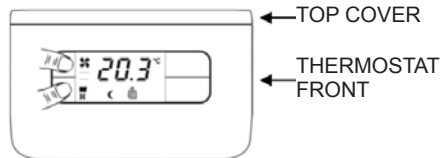
First of all, make sure that the self-learning procedure has already been performed (page 8); moreover, verify that both the CH130 and the CH172D are 30 metres far from each other at the most. In fact, this distance represents the free air maximum range for the radio frequency modules used by the thermostat and the actuator. Please note that the range will decrease if obstacles are found between the CH130ARF and the CH172DRF.

To start the thermostat after the same has been installed, proceed as follows:

1. Select the Summer / Winter operation;
2. Select the operating mode;
3. Select the fan speed.

### “Summer / Winter” selection

To switch from the “Winter” operation (i.e. heating system) to the “Summer” operation (i.e. cooling system), and vice versa, press the 1+2 button combination. The selected operation will be indicated on the display by the “Winter” or “Summer” icons.

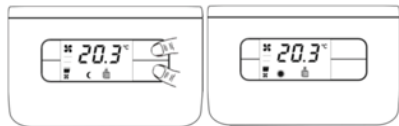


## Operating modes

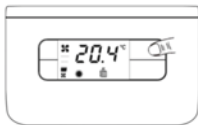
The CH130ARF thermostat features three different manual operating modes: “Comfort”, “Economy”, and the “OFF” function (OFF).

### “Comfort” operating mode

With the “Comfort” operating mode, the thermostat regulates the heating or cooling system operation in order to always keep the same comfort temperature set. To switch from “Economy” to “Comfort”, press buttons “3” and “4” simultaneously.

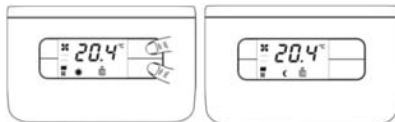


The temperature level can be modified during operation by means of buttons “3” and “4”. The temperature can be changed from 2°C to 40°C by 0.1°C steps.



### “Economy” operating mode

With the “Economy” operating mode, the thermostat regulates the heating or cooling system operation in order to always keep the same economy temperature set. To switch from “Comfort” to “Economy”, press buttons “3” and “4” simultaneously.



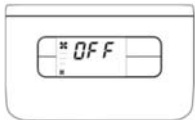
The temperature level can be modified during operation by means of buttons “3” and “4”. The temperature can be changed from 2°C to 40°C by 0.1°C steps.



### “OFF” function (OFF)

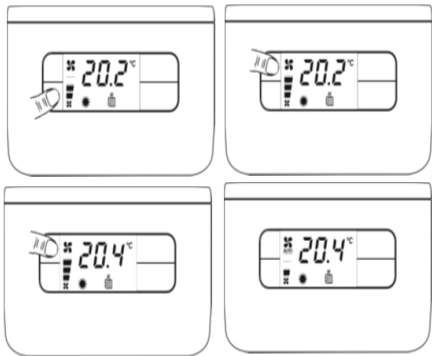
The “OFF” function can be achieved by setting the fan speed to zero: in this case, the thermostat will carry out no heat regulation, not even the antifreeze one.

The system will switch off automatically, and the “OFF” message will appear on the display.



### Fan speed selection

The fan speed can be set either to three fixed levels (minimum, medium, maximum) or automatically, by pressing buttons “1” and “2”. The “Auto” mode allows you to automatically change the fan speed depending on the ambient temperature.



## Maintenance

The thermostat should be cleaned by using a soft cotton cloth. No detergent should be used.

## Installation

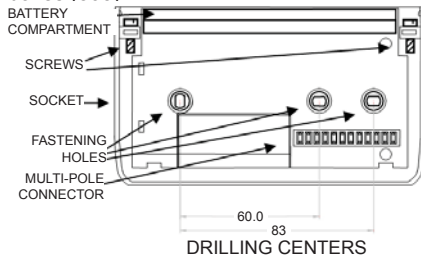
**Warning!** The thermostat shall be installed only by qualified personnel, in strict compliance with the law regulations in force.

The thermostat installation involves carrying out the following operations:

- Fastening the socket;
- Making the electric connections;
- Fastening the thermostat onto the socket;
- Inserting and replacing the batteries;
- Configuring the thermostat parameters.

## Fastening the socket

The thermostat is supplied complete with a socket suitable for mounting both on the wall and to rectangular or round built-in 3-seat boxes (503).



Remove the thermostat top cover.

Separate the thermostat socket and front by removing the screw by means of a suitable tool and taking the front part off.

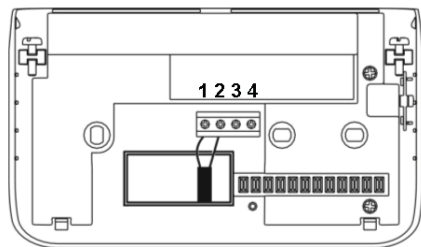
Fasten the socket to the desired surface by means of the special fastening holes; make sure that the socket is properly engaged, with no deformation, and that the connecting multi-pole connector is located in the right bottom corner.



To ensure correct operation, the socket shall be placed at a height of approximately 1.5 metres from the floor, far from heat sources (direct sunlight, etc.) and doors/windows.

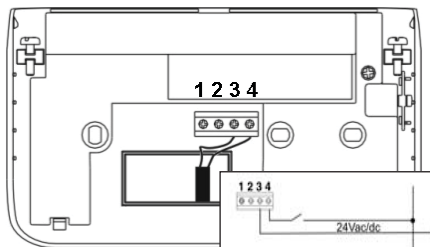
## Electric connections

### External probe connection



Connect the two wires of the EC19 external probe with screwed terminals “1” and “2”, as illustrated in the figure. Such probe can be configured as external probe, changeover or minimum temperature contact. See the CH130 instruction manual, “Thermostat configuration” paragraph, “P02” parameter.

### Auxiliary input connection



Connect the two auxiliary input wires with screwed terminals “3” and “4”, as illustrated in the figure. Such auxiliary input can be configured as “Remote ON/OFF” or “Remote summer/winter”. See the CH130 instruction manual, “Thermostat configuration” paragraph, “P06” parameter

**Fastening the thermostat onto the socket**  
Insert and screw the thermostat down to the socket (make sure that the multi-pole connector is engaged correctly).

### Inserting and replacing the batteries

Insert two “AA” batteries (1.5 V) into the battery compartment, according to the correct polarity: the negative pole shall press the metal spring (located on the right, when viewing the thermostat from the front). Fit the battery top cover

back into place.

A pair of new batteries will normally last one year at least. WHEN THE “low battery charge” SYMBOL APPEARS ON THE DISPLAY, BOTH BATTERIES SHALL BE REPLACED.

### CH172DRF self-learning procedure

In order for the CH130ARF and the CH-172DRF to be able to communicate correctly, a “self-learning” procedure shall be performed. During this procedure, the remote actuator will recognize and store the CH130ARF identity: from now on, it will be able to perform all of its controls while leaving out the controls from other transmitters that might be found in the area (please note that the CH130ARF/CH-172DRF system range is approximately 30 metres in the free air).

To perform self-learning, proceed as follows: keep the CH172DRF button depressed for at least 5 seconds, until the multicolour LED comes on by switching among green, yellow, red and OFF. Then press the CH130ARF reset button: after a few instants, the LED will be blinking fast and then illuminate green steadily, to indicate that the self-learning has occurred (this procedure is also described in the CH172-

DRF instruction sheet).

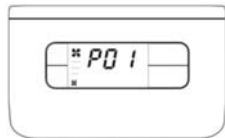
N.B. You can also control two or several CH-172DRF actuators by means of one single CH130ARF: of course, the self-learning procedure shall be performed on all the CH172DRFs (it shall not necessarily be performed at the same time, see page 19).

### Thermostat configuration

**Warning!** The configuration shall be performed only by qualified personnel.

The thermostat configuration allows you to customize the device operation parameters. To access the configuration program, proceed as follows:

1. Press the “Reset” button and also button “3” (with the thermostat ON);
2. Release the “Reset” button, then keep button “3” depressed for at least 3 seconds;
3. Release button “3”.



The configuration parameters are represented by an index (P01, P02...) on the display; by pressing buttons “1” and “2”, the parameter indexes will be scrolled through. Press button “3” to enter the displayed parameter.

To modify the current parameter, press buttons “1” and “2”. To exit the parameter, press button “3”.

Once all parameters have been set, press button “1” until the “END” message appears, then press button “3”. Now the thermostat will save the modified parameters into the internal memory and will automatically exit the parameter menu.

On the contrary, if buttons “1” and “4” are pressed simultaneously when the “END” message is displayed, the CH130ARF’s RF address will be reset and the self-learning procedure shall be performed again.

**N.B.** The thermostat will send the switch-on/-off controls for the three fans and the two valves to the actuator to a fixed rate of 1 minute.

Index	Parameter	Values	Preset
P01	Type of system	1-2	1
P02	External probe	1-2-3-4-5	5
P03	Display visualization	1-2	1
P04	“Summer” valve type	1-2	2
P05	“Winter” valve type	1-2	2
P06	Auxiliary input	1-2-3	3
P07	Ambient temperature correction	-4°C – + 4°C (step 0.1° C)	0
P08	“Winter” lower limit set-point temperature	2 °C – 40 °C (step 1°C)	2,0 °C
P09	“Winter” upper limit set-point temperature	2 °C – 40 °C (step 1°C)	40,0 °C

Index	Parameter	Values	Preset
P10	“Summer” lower limit set-point temperature	2 °C – 40 °C (step 1°C)	5,0 °C
P11	“Summer” upper limit set-point temperature	2 °C – 40 °C (step 1°C)	30,0 °C
P12	Changeover lower threshold	0-24 °C	24,0 °C
P13	Changeover upper threshold	26-48 °C	48,0 °C
P14	Differential adjustment	±0.3 - ±2°C	±0.3 °C
END	Thermostat saving and reset		

### **P01: Type of system**

**1** two-tube system: the thermostat will drive only the valve (ON/OFF type) used for heating both during the heating and the cooling: in fact, the valve will control both hot water and cold water.

**2** four-tube system: the thermostat will drive one valve (ON/OFF type) used for heating, plus one additional valve (ON/OFF type) used for cooling, depending on the needs of the environment.

### **P02: External probe**

**1** resumption: instead of the probe incorporated into the thermostat, an external probe can be used to read the ambient temperature and carry out heat regulation. Typically, this probe will be positioned under the fan-coil where air is sucked.

**2** changeover: the external temperature probe can be placed on the fan-coil delivery tube of a 2-tube system to perform automatic changeover between the “Summer” operation and the “Winter” operation. To achieve this, you will have to set the two actuation thresholds P12 and P13. Please note that either the ambient temperature (P03 set to 1) or the set-point (P03 set to 2) will be shown on the display, yet the changeover temperature will not be shown.

**3** minimum window/thermostat contact: when

the contact is open, the thermostat will carry out heat regulation; when it is closed, the heat regulation will not be carried out.

**4** inverted minimum window/thermostat contact: the window contact will operate with an inverted logic with respect to the statements made in previous step 3.

**5** none: the external probe input will not be controlled by the thermostat.

### **P03: display visualization**

**1** ambient temperature: the ambient temperature will be shown on the display.

**2** set-point: the current set point will be shown on the display.

### **P04: “Summer” valve type**

**1** normally open: in this case, the water flow is normally open and will be closed when the valve is fed.

**2** normally closed: when the valve is energized, it will open the water flow.

### **P05: “Winter” valve type**

**1** normally open: in this case, the water flow is normally open and will be closed when the valve is fed.

**2** normally closed: when the valve is energized, it will open the water flow.

### **P06: auxiliary input configuration**

**1** ON/OFF: in the event that several thermostats have been installed, you may decide either to drive all of them in the normal operation condition (ON) or take advantage of the OFF function (see page 5) by making use of one single control through a central point. The thermostat will be configured to OFF (OFF function) when the input is powered with 24 V (d.c. with no polarity obligation or a.c.); on the contrary, it will remain active when the input is free from voltage.

**2** Summer/Winter: as with the previous case, the thermostat will be configured to “Summer” when the input is powered with 24 V (d.c. with no polarity obligation or a.c.); on the contrary, it will remain in the “Winter” mode active when the input is free from voltage.

**3** none: the thermostat will carry out no operation, whatever the input status.

### **P07: ambient temperature correction**

It can be adjusted from  $-4.0$  to  $4.0^{\circ}\text{C}$ . This parameter is used to correct the acquired ambient temperature. As a matter of fact, the ambient temperature reading may, on some installations, not be satisfying, owing to the probe location (i.e. internal or resumption). With this parameter, a constant value upon reading can be added to or subtracted from.

**P08: “Winter” lower limit set-point temperature**

It can be adjusted from 2.0 to 40.0°C. It represents the lower limit for all the set-points (“Comfort” and “Economy”) in the heating mode.

**P09: “Winter” upper limit set-point temperature**

It can be adjusted from 2.0 to 40.0°C. It represents the upper limit for all the set-points (“Comfort” and “Economy”) in the heating mode.

**P10: “Summer” lower limit set-point temperature**

It can be adjusted from 2.0 to 40.0°C. It represents the lower limit for all the set-points (“Comfort” and “Economy”) in the cooling mode.

**P11: “Summer” upper limit set-point temperature**

It can be adjusted from 2.0 to 40.0°C. It represents the upper limit for all the set-points (“Comfort” and “Economy”) in the cooling mode.

**P12: changeover lower threshold**

It can be adjusted from 0 to 24°C. It defines the changeover function lower threshold. Be-

low this temperature, the thermostat will be set to the cooling mode, if P02 is set to configuration 2.

**P13: changeover upper threshold**

It can be adjusted from 26 to 48°C. It defines the changeover function upper threshold. Above this temperature, the thermostat will be set to the heating mode, if P02 is set to configuration 2.

**P14: differential adjustment**

It can be set starting from  $\pm 0.3^{\circ}\text{C}$  (value suitable for slow-inertia systems) to  $\pm 2^{\circ}\text{C}$  (value suitable for very reactive systems).

## Technical features of the thermostat

Power supply	Two "AA" batteries (1.5 V)
Outputs	RF module
Inputs	Auxiliary input, external probe input
Electric connections	Screwed terminals
Protection degree	IP20 (pollution degree 2)
Setting memorization	Non-volatile memory
Software	Class A
Temperature adjustment range	2°C – 40°C
Max. temperature	T45
Local signalling	LCD display
Local controls	5 buttons
Dimensions (L x H x D)	135 x 83 x 21
External temperature probe distance	10 m max.
Reference temperature gradient	4 K/h
Radio signal features	868.350 MHz <= 15mW
Signal max. range (in free air)	30 m (indoors); 70 m (outdoors)
Conforming to the directives	2006/95/CE, 2004/108/CE , 1993/68/CE

Complying with the standards

R&TTE EN 300 220-3, CEI EN 60730-1, EN60730-2-9

ErP classification: ErP Class IV; 2% (EU Reg. 811/2013 - 813/2013)

## DIN bar CH172DRF actuator

### Application and use

An unlimited number of actuators can, if necessary, be controlled by one single thermostat, provided that such actuators are subjected to self-learning and are placed within the maximum communication distance (see below).



### Fastening and connecting

The unit has been designed to be built in (inside fan-coils, special panels or other suitable housings).


The unit shall be installed by qualified personnel in accordance with the EN regulations in force.

The maximum communication distance between the actuator and the transmitter shall be 30 m. in free air. Connect the wires to the socket terminal block in accordance with the diagrams illustrated below.

If a two-tube system is available, connect only valve "1" (contact between terminals "C" and "V1"). In case of a four-tube system, valve "1" is dedicated to heating, whereas valve "2" (between "C" and "V2") is dedicated to cooling.

**WARNING!** Prior to carrying out any operation on the unit, make sure that you have disconnected the mains connecting cables.

### Operation

The unit operating status is indicated by the LED  represented by multicolour:

- GREEN: good RF signal level.
- YELLOW: poor RF signal level.
- RED: low or poor RF signal level, or signal not detected.
- Alternating GREEN/RED: relay switch-on manual mode.
- Alternating GREEN/YELLOW/RED/OFF: signal self-learning mode.
- Five more red LEDs indicate the switch-on of the corresponding relays.

To be able to use the CH172DRF with a CH130ARF, a self-learning procedure shall be performed: keep the CH172DRF button depressed for approximately 5 seconds until the multicolour LED comes on by switching among green, yellow, red and OFF.

Then press the CH130ARF reset button: after a few instants, the LED will be blinking fast and then illuminate green steadily.



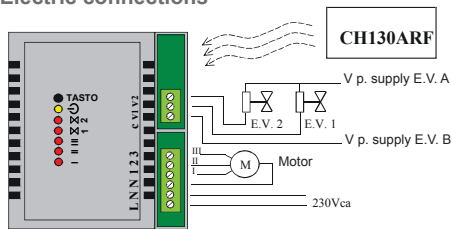
## Operation check

Refer to the preceding instruction manual for the use of the CH130ARF thermostat.

- Make sure that the actuator is close enough to the thermostat (30 m, in free air – or less, if obstacles are found).
- Power the actuator by connecting the same with the electric mains.
- Press the CH172DRF button: the LED will switch among the green and red light, to indicate the manual mode. Each time the button is pressed, one or several relays will turn on: this will be indicated by the switch-on of the corresponding red LEDs.
- Below is the switch-on sequence:
  - 1°- accessing the manual mode and valve “1” switch-on
  - 2°- valve “1” switch-on + engine speed 1
  - 3°- valve “1” switch-on + engine speed 2
  - 4°- valve “1” switch-on + engine speed 3
  - 5°- valve “2” switch-on
  - 6°- valve “2” switch-on + engine speed 1
  - 7°- valve “2” switch-on + engine speed 2
  - 8°- valve “2” switch-on + engine speed 3
  - 9°- exiting the manual mode.

- Perform a self-learning procedure, as described above. Now, the CH172DRF and the CH130ARF will be able to communicate.
- Switch over, on the thermostat, the fan motor speed (3 relays) and the valve control (2 relays), then verify that they have actually switched over.

## Electric connections



## Technical features of the actuator

Power supply	230 V, 50 Hz
Absorbed power	2 VA
Input	Thermostat controls
Relay output features	5(3) A250 V~
Voltage-free switching contacts	2 valve outputs
Network voltage switching contacts	3 motor contact outputs
Receiver	OOK 868.350 MHz
Container	IP00 (pollution degree 2)
Software class	A
Max. temperature	T45
Disconnection type	1B (micro-disconnection)
Pulse voltage	4000 V
Type of assembling	DIN bar

Dimensions	DIN bar 6 module container (106 x 93 x 42 mm)
Conforms with the directives	2006/95/CE, 2004/108/CE, 1993/68/CE
Complying with the standards	EN60730-1, R&TTE EN 300 220-3, EN 301 489-3

Fantini Cosmi S.p.A. reserve the right to make any necessary technical and construction modification without any obligation to give prior notice.

**WARNING:**  
SELF-LEARNING PROCEDURE SUPPLEMENT

In case of multiple kits (CH130-- plus CH172DRF) installation, proceed as follows:

- 1) Make sure that all CH130 are not powered (battery out).
- 2) Insert batteries in the first CH130--.
- 3) Start self-learning procedure between the CH130-- and relevant CH172DRF (as per manual instruction)
- 4) Remove batteries from the first CH130--.
- 5) Repeat the procedure from 1 to 4 for other kits
- 6) When all the self-learning procedure had been done with all kits, insert the batteries in each thermostat and test the heating/cooling system



**DISPOSAL OF PRODUCTS**

The crossed out wheeled dust bin symbol indicates that products must be collected and disposed of separately from household waste. Integrated batteries and accumulators can be disposed of with the product. They will be separated at the recycling centres. The black bar indicates that the product was placed on the market after August 13, 2005. By participating in separate collection of products and batteries, you will help to assure the proper disposal of products and batteries and thus help to prevent potential negative consequences for the environment and human health. For more detailed information about the collection and recycling programmes available in your country, please contact your local city office or the shop where you purchased the product.

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