# Instructions for Use

Touchscreen chronothermostat - battery power supplied

## CRONOTC1B / CRONOTC2B / CRONOTC3B

# Index

## Introduction

Chronothermostat CRONOTC...B is suitable to measure the ambient temperature and to control the heating and air conditioning system to which it is connected. The operating mode can be chosen between the preset ones or can be customized according to user's needs.

The wide display shows the temperature profile - i.e.: the relationship between the time table and the temperature to be kept -, as well as the measured temperature, relative humidity, calculated perceived temperature, time and day of the week.

**NOTE** Temperature perceived is calculated according to the following formula:

$$H = T + \frac{5}{9}\left(6,11\frac{RH}{100}10^{\frac{7,5\,T}{237,7+T}}-10\right)$$

Where "H" is the perceived temperature, "T" is the effective air temperature. Values in brackets represent the empirical calculation of the air steam partial pressure (according to the relative humidity).

The chronothermostat is battery powered. Both settings and data are stored in a non-volatile memory capable of retaining them even when batteries are down.
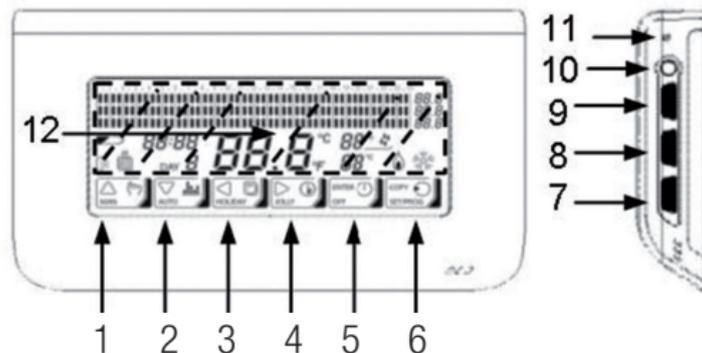
It it possible to connect the chronothermostat to an external floor temperature probe (AVE p.n 53GA91-T).

Chronothermostat is available in the following colours:

- "Domus RAL 9010" white (p.n. CRONOTC1B)
- "Life" black (p.n. CRONOTC2B)
- "Allumia" grey (p.n. CRONOTC3B)

## Controls and indications

**Controls**



1. Button used to select the "Manual" operating mode or increase a value (▲) *

2. Button used to select the "Automatic" operating mode or decrease a value (▼) *

3. Button used to select the "Holiday" operating mode or go back to the previous data item (◄) *

4. Button used to select the "Jolly" operating mode or go to the next data item (►) *

5. Button used for the "OFF" or "Enter" functions *

6. Button used for the "Programming" or "Copy" or "Statistical data displaying" functions *

7. Rotary selector for temperature correction: T1, Manual temperature, Jolly temperature, and antifreeze temperature *

8. Rotary selector for correcting temperature T2 or the Jolly duration * operating mode

9. Rotary selector for correcting temperature T3 or the Jolly duration * operating mode

10. Summer/Winter switching key and keyboard lock

11. Chronothermostat reset button

12. Backlighted area

* The function associated with the button or selector depends on the current operating mode. It is highlighted by the icon placed above.

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**Indications**
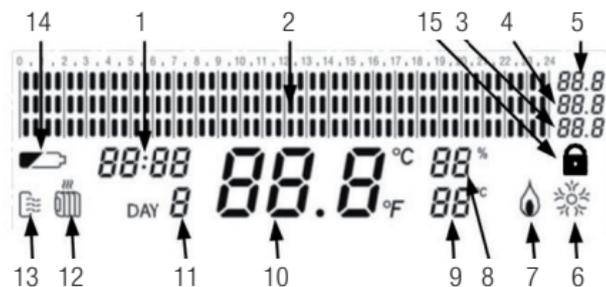


1. Time
2. Temperature profile
3. Temperature value T1 or "Jolly" operating mode duration (days)
4. Temperature value T2 or "Jolly" operating mode duration (hours)
5. Temperature value T3
6. System ON in Summer operation
7. System ON in Winter operation
8. Relative humidity percentage
9. Perceived temperature (displayed by the degree)

10. Ambient/external temperature
11. Current day (1 = Monday … 7 = Sunday; 8 = Holiday)
12. Winter operation
13. Summer operation
14. Battery charge level
15. keyboard lock

**Note**: pressing of a key is signalled by a short acoustic signal.
When ON blue backlighting will stay on for about three seconds after pressing a key

## User manual

In order to start the chronothermostat after it has been installed, proceed as follows:
1. Set the date and time.
2. Select the Summer/Winter operation.
3. Select the operating mode.

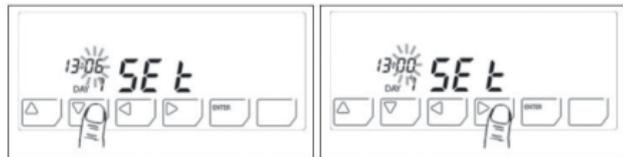### Setting the date and time

To set the current time and date, proceed as follows:

1. Enter the programming menu main page. The operating mode currently used will be interrupted temporarily.

   Choose the time setting function.

   

2. Modify the hour setting by means of the ▲ and ▼ buttons, then go to the minute setting by means of the ► button.

   

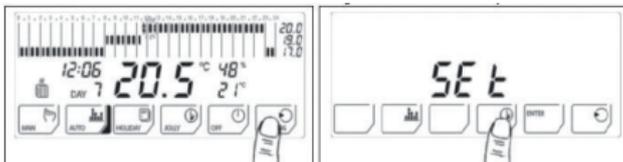3. Modify the minute setting by means of the ▲ and ▼ buttons, then go to the day setting by means of the ► button.
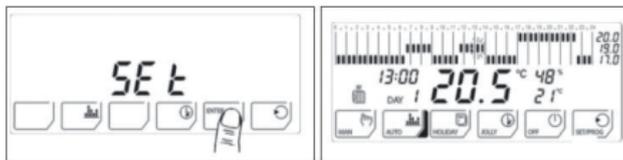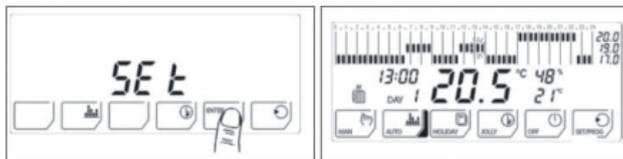
   

4. Modify the day setting by means of the ▲ button, then press ENTER to go back to the main page of the programming menu.

   

5. Press ENTER again to exit the programming menu.

   The chronothermostat operating mode previously interrupted will be resumed.

## Summer/Winter selection
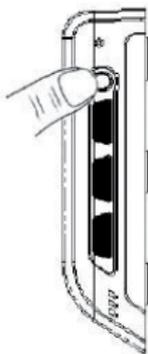


To shift from the Winter operation (heating system) to the Summer operation (cooling system), and vice versa, keep the Summer/Winter button pressed for at least 4 seconds. The selected operation will be shown on the display by means of the "Winter" or "Summer" icons.



Winter



Summer

## Operating modes

The CRONOTC...B chronothermostat features four different operating modes: Manual, Automatic, Holiday and Jolly (in addition to the OFF function).

## "Manual" operating mode

With the Manual operating mode, the chronothermostat adjusts the operation of the heating or cooling system in order to always keep the same temperature. To select "Manual", press MAN.
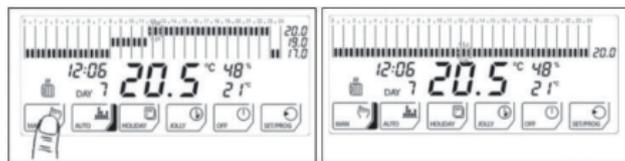


The temperature level can be modified during operation by means of the lower using either one of the three rotary switches on the right side of the chronothermostat. The temperature can be changed from 2°C to 40 °C by 0.1°C increments.
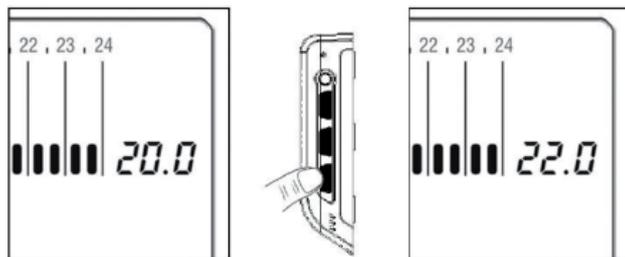
## "Automatic" operating mode

With the "Automatic" operating mode, the chronothermostat adjusts the operation of the heating or cooling system by following the profiles defined for the various days of the week. To select "Automatic", press AUTO.
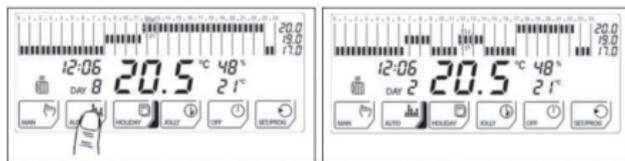


The three temperature levels used can be modified during operation by means of the rotary selectors located on the right side of the chronothermostat.

**Temperature T3** cannot be lower than temperature T2 or higher than 40 °C.

**In Summer operation mode**, the upper limit of temperature T3 is 30°C. When this value is exceeded, T3 will take the OFF value, which will involve switching the system off.



**Temperature T2** cannot be higher than temperature T3 or lower than temperature T1.
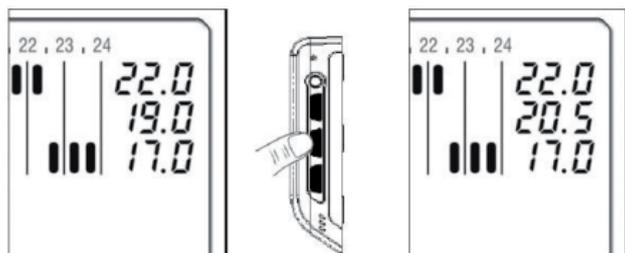


**Temperature T1** cannot be higher than temperature T2 or lower than 2 °C.
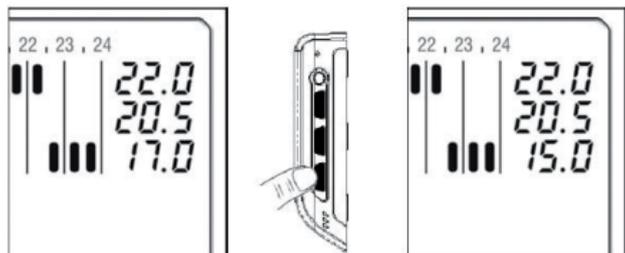


If no customization has been made, the automatic operating mode will function with the stored temperature profiles, i.e. the preset ones (refer to «Preset programs» pag. 35). To customize the profiles, refer to «Chronothermostat programming» pag. 35.

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## "Holiday" operating mode

With the "Holiday" operating mode, the chronothermostat adjusts the operation of the heating or cooling system by following one single temperature profile, which is valid for all days.

To select "Holiday", press HOLIDAY.
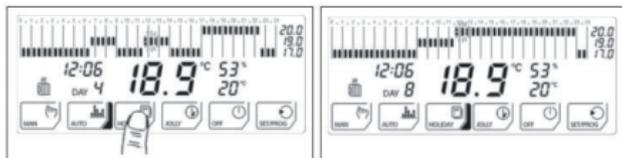


To modify the temperature levels, refer to the description of the "Automatic" operating mode (pag. 31).

When the preset programs are used (refer to «Preset programs» pag. 35), the "Holiday" mode will follow the profile set for Saturdays and Sundays. To create a customized "Holiday" program, refer to «Chronothermostat programming» (pag. 35).

## "Jolly" operating mode

With the "Jolly" operating mode, the chronothermostat interrupts the current operating mode and adjusts the operation of the heating or cooling system to keep the "Jolly" temperature during the entire time set (from 1 hour to 99 days and 23 hours, by 1 hour increments). After this time – which is displayed like a countdown – has elapsed, the previous operation of the chronothermostat will be resumed. To select "Jolly", press JOLLY.
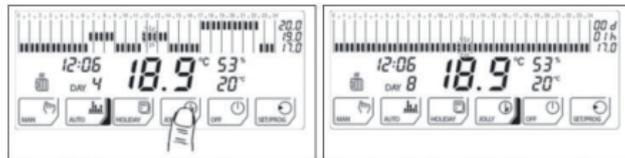


The "Jolly" temperature value and the operating mode duration can be modified by means of the rotary selectors located on the right side of the chronothermostat.

Use the lower rotary selector to modify the temperature level.

The temperature can be modified from 2°C to 40 °C, by 0.1 °C increments.
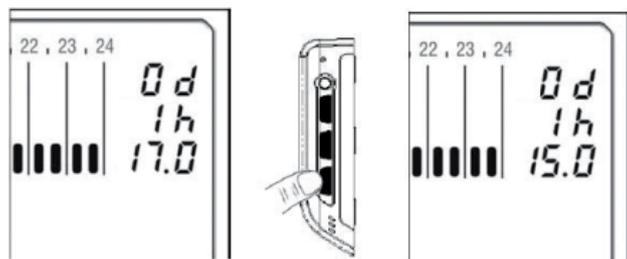


To set the "Jolly" operating mode duration, i.e. hours («h»), use the central rotary selector. The hours can range from 0 to 23.
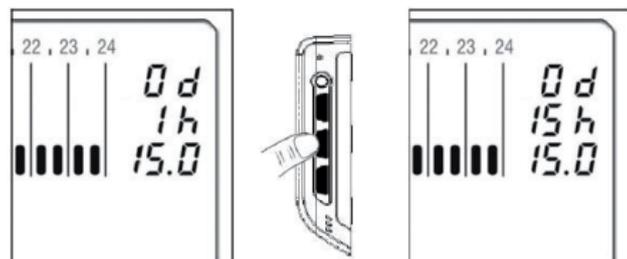


To set the "Jolly" operating mode duration, i.e. days («d»), use the upper rotary selector.

The days can range from 0 to 99.
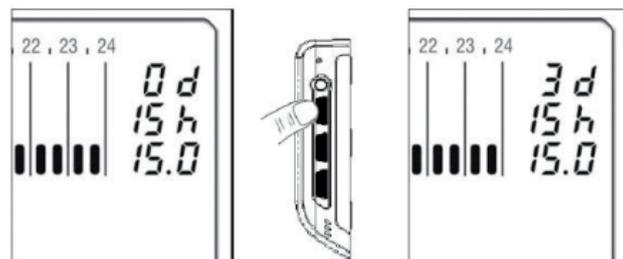


You can interrupt the "Jolly" mode at any time, by selecting any other operating mode.

The "Jolly" operating mode can be used, for instance, to:

- save energy by lowering the temperature when the house is not inhabited at the weekends or winter vacation, while being sure that a comfortable temperature will exist when the house is inhabited again);

- extend the night heating or cooling beyond the usual time, i.e. when you stay up in the company of your guests.

## "OFF" function

The "OFF" function can be activated by pressing OFF.

**ENGLISH**

## Winter operation
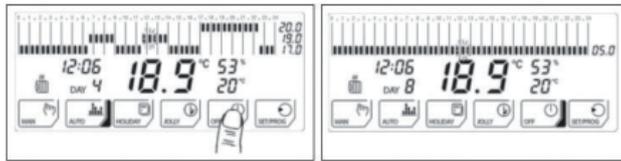


The chronothermostat adjusts the operation of the heating system to keep the "Antifreeze" temperature, in order to reduce the energy consumption and, at the same time, avoid any damage caused by extremely low temperatures.

The "Antifreeze" temperature can be modified from 2°C to 7°C (by 0.1°C increments), by using either one of the three rotary switches on the right side of the chronothermostat.

If a temperature of less than 2°C is set, the system will be fully turned off and the antifreeze protection will be lost.
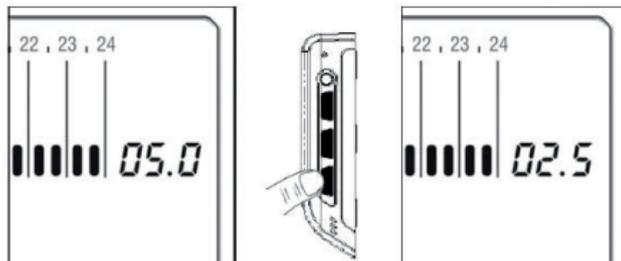


## Summer operation
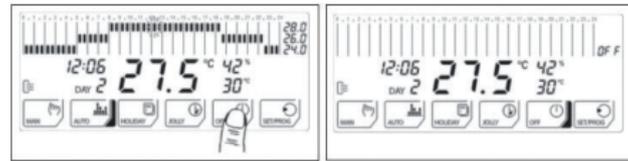


The system will be fully turned off and the "OFF" message will appear on the display, without any temperature profile.

## Preset programs

The chronothermostat has two preset programs (i.e. "Winter" and Summer") for quicker start-up.

**"Winter" program – working days**
**(from Monday to Friday)**



**"Winter" program – public holidays**
**(Saturdays, Sundays and "Holiday" program)**
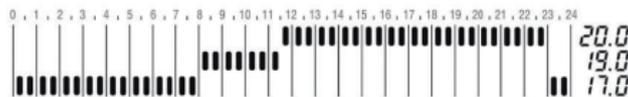


**"Summer" program**
**(All days of the week, plus "Holiday" program)**
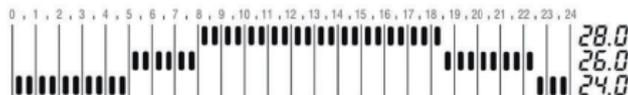


## Chronothermostat programming

You can customize the temperature profiles for the "Automatic" and "Holiday" operating modes, so as to adapt them to your own needs. To set new temperature profiles, proceed as follows:

1. Enter the programming menu main page. The operating mode currently used will be interrupted temporarily.

   Choose the temperature profile customization function.
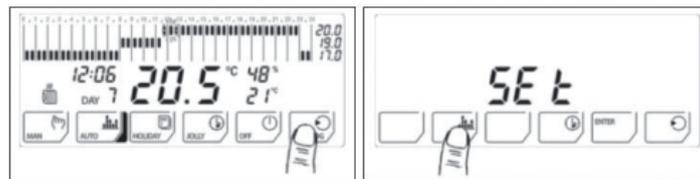
   

2. The Monday profile (DAY 1) for "Winter" operation (icon 🖐) will be displayed. Use the ◄ and ► buttons to move the bar chart blinking segment to the time at which the temperature is to be modified. Each segment equals half an hour. To modify the "Summer" operation profile (icon 🖐), press the "Summer/Winter" button on the left side of the chronothermostat.
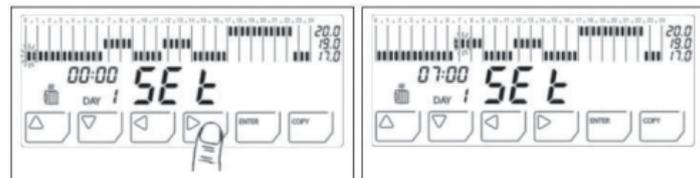
3. Use the ▲ and ▼ buttons to modify the temperature level (T1, T2 or T3).
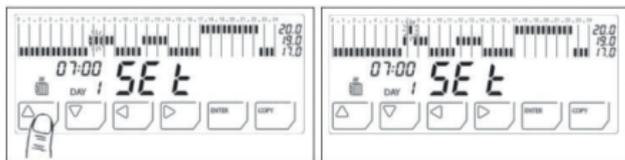


6. To directly duplicate the temperature profile by going to the next day, press COPY (to customize every single day separately, refer to step 5 below).
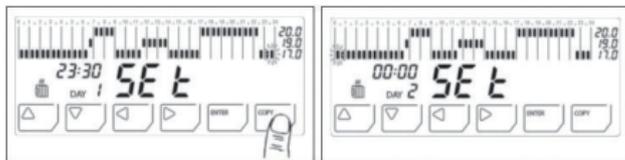


7. Press ENTER to go to the next day, then repeat the operations described starting from step 2 for the other days of the week (the "Holiday" profile will be indicated as DAY 8). To go back to the programming menu main page, use the ENTER button to scroll through the eight days or keep the ENTER button pressed for 3 seconds.

   If no button is pressed within the next three minutes, the chronothermostat operating mode previously used will be resumed.

## Reset default parameters

To resume the preset temperature profiles and values (T1-T2-T3-Temperature used with the Manual mode, Temperature used with the Jolly mode, Antifreeze temperature, OFF function), keep the ▲ and ▼ buttons pressed simultaneously when you are in the temperature profile programming mode.

**Displaying the temperature detected by the separate probe**

To display the temperature detected by the external floor temperature probe the chronothermostat must be configured (refer to «chronothermostat configuration» pag. 41) and the probe must be connected.

To display the temperature value read by the external probe, press the button of the operating mode currently used (the temperature will blink).

To display again the temperature detected by the chronothermostat, press again the button of the operating mode currently used (the temperature will not blink any longer).

## Statistical data

The chronothermostat provides a set of statistical data concerning the system operation. To access this data, proceed as follows:

1. Enter the programming menu main page. The operating mode currently used will be interrupted temporarily.

   Choose the statistical data function.
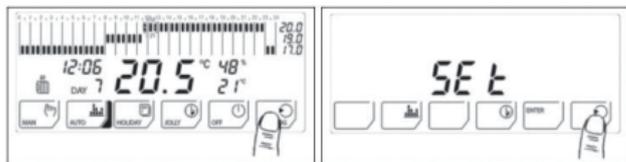
   

2. Page 1: number of hours during which the system was switched on the previous day (6 hours in the image).

   Use the ► button to go to the next page.

   

3. Page 2: total number of hours during which the system has been switched on and operating since its first start-up (16 hours in the image).

   Use the ► button to go to the next page.

   Press the ▲ and ▼ buttons simultaneously to reset the total system switch-on hours.

   

4. Page 3: minimum temperature reached on the current day, and time at which such minimum temperature was reached (15.8°C at 03.15 a.m. in the image). Use the ► button to go to the next page.

5. Page 4: maximum temperature reached on the current day, and time at which such maximum temperature was reached (22.5°C at 09.08 p.m. in the image).

   

6. Press the ENTER button twice to go back to the operating mode previously used.

   

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## Maintenance

To clean the chronothermostat use a soft cotton cloth and no detergent. Do not use paper handkerchiefs to clean the touch screen.

## Keyboard lock

To clean the chronothermostat without changing accidentally its settings, press the Summer/Winter key in order to activate the keyboard lock. When the keyboard lock is ON, symbol 🔒 on the display will turn on. The display can now be cleaned, each time a key is pressed symbol 🔒 will flash. To restore keyboard operation, press again the Summer/Winter key, symbol 🔒 will turn off.

## Touch Screen

The touch screen surface is highly scratchable. Only use your fingers to touch the screen. Never use pens, pencils or other pointed objects.

## Replacing the batteries

When the battery charge starts to lower, symbol ▱ on the display will start flashing.

If the "bAtt" parameter is set to "On" or to "Off" (see paragraph «configuring the chronothermostat» pag. 41) and batteries are not replaced within 15 days, the chronothermostat will turn off automatically and the display will show the message "OFF" or "On" instead of the temperature value.

Settings and data are however stored in the non-volatile memory.

To remove the chronothermostat from the base pull the left and right sides of the chronothermostat, without applying force to selectors.
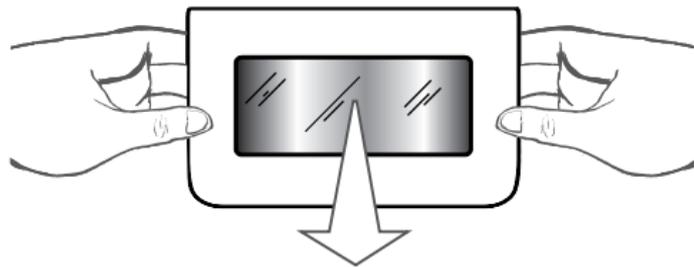


If after replacing the batteries, the display only shows the message OFF or On, press the icon key with ENTER after refitting the chronothermostat on the base.

With the "bAtt" parameter off (see paragraph «configuring the chronothermostat» pag. 41), and symbol ▱ flashing, batteries shall be changed as soon as possible to prevent that battery charge becomes insufficient for regular chronothermostat operation.

**IMPORTANT: Standard battery life is approx. 1 year. You are recommended to replace batteries at the beginning of system operating season to prevent batteries from running down when you are away from home, e.g. during Christmas holidays.**

**The batteries shall be properly disposed of in special containers.**

## Installation

**CAUTION: The chronothermostat shall be installed by qualified personnel only, in compliance with the current regulations in force.**

Chronothermostat installation involves the following operations:

• Fastening the base.

• Electric connections.

• Fitting the batteries.

• Fastening the chronothermostats onto the base.

• Configuring chronothermostat parameters.

## Fastening the base

The chronothermostat is supplied with a base suitable for wall mounting or for flush-mounting in three-module rectangular or round boxes.
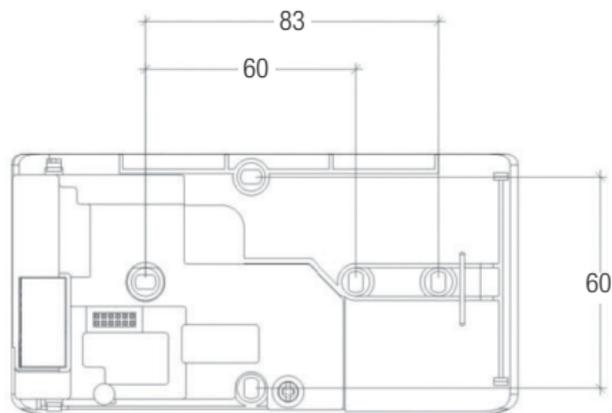


SPACING DIMENSIONS FOR FIXING THE BASE

Separate the base from the chronothermostat levering on the slot located at the bottom of the base by means of a proper tool.

Make sure that the base is properly secured and it is not deformed. Check that the chronothermostat multi-pole connector is placed at the bottom left corner.

To ensure correct operation the base shall be installed at about 1.5 metres above the floor level and far from heat sources (heating radiators, direct sunlight, etc.), doors and windows.

## Electric connections

Before making connections, remove the terminal protection guard (keep it together with the fastening cross-slotted screw).
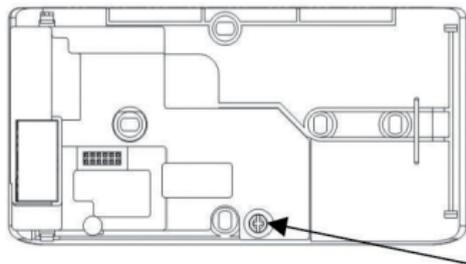


Protection guard fastening screw

**Connecting the heating or air-conditioning system**
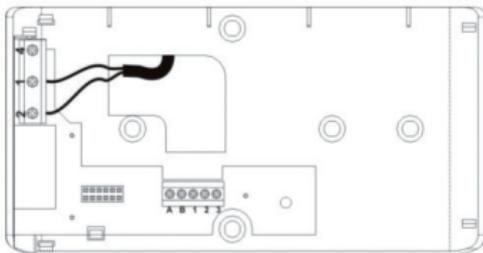


Connect the two wires of the heating or air-conditioning system to the terminals 1 and 2, as shown in the figure.

Terminals are suitable for flexible cables with screw 2.5 mm$^2$ max section.

Terminal 4 is free and may be used for signalling or other use, as necessary.
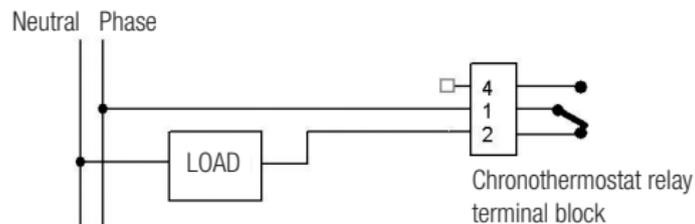


LOAD = burner - circulation pump

**Warning**: Make sure the relay load value is not exceeding the values specified in «Technical data».

**Connecting the external floor temperature probe**
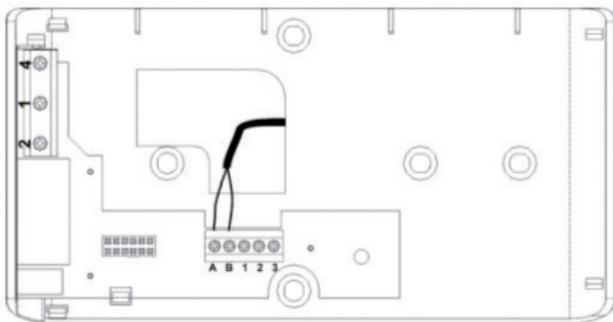


Connect the two wires of the external temperature probe to terminals A and B, as shown in the figure.

Once connections are over, refit the terminal protection guard removed previously.



TERMINAL NOT USED

3
2
1
B
A

EXTERNAL TEMPERATURE PROBE

TERMINAL BLOCK CRONOTC...B
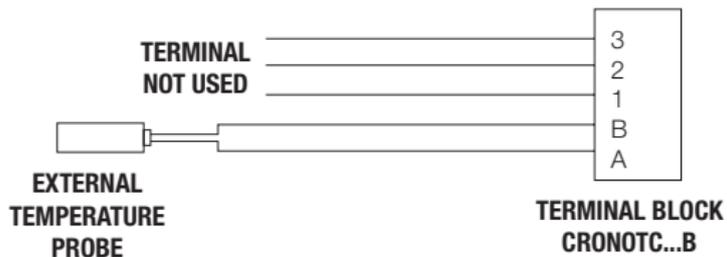
## Fitting the batteries

Fit two long-life 1.5 V AA alkaline batteries into the back of the chronothermostat, observe the specified polarity. After fitting the batteries the chronothermostat will turn on automatically.

## Fastening the chronothermostat onto the base

Press by hand the chronothermostat onto the base, make sure the multi-pole connector fits properly. The chronothermostat will click into position.

## Configuring the chronothermostat

**Warning: The chronothermostat shall be configured by qualified personnel only.**

Chronothermostat configuration enables to customize the operating parameters. To open the configuration program, proceed as follows:

1. Press the SET / PROG key [key 6]. The operating mode being currently used will be temporarily stopped and it will be resumed automatically at the end of programming.

2. Keep the SUMMER / WINTER switching key [key 10] pressed for about 5 seconds.



$CELS$ **20.7** °C

Every configuration parameter featuring preset settings is identified on the display by an index and a writing. To change parameter values use keys ▲ [key 1] and ▼ [key 2]; use key ► [key 4] to move across parameters.

To go back to the initial page of the programming menu, press the ENTER key [key 5] which will save changes.

If no key is pressed within 3 minutes, the chronothermostat will quit the configuration program and will resume the operating mode being used previously, without saving changed settings.

To cancel changed settings and to reset preset configuration parameter values, keep keys ▲ [key 1] and ▼ [key 2] pressed simultaneously for about 4 seconds.

| Index | Parameter | Writing | Values | Preset value |
|---|---|---|---|---|
| 1 | Type of connected card | COn | rEL / rAd / --- | none |
| 2 | Temperature scale | CELS o FHAr | °C / °F | °C |
| 3 | Type of regulation | Std o ProP | Std / ProP | Std |
| 3A | Thermal differential | DIFF | HI / LO | LO |
| 3A | Regulation band | BAnd | 1 °C – 4 °C (step 0.1°C) | 2 °C |
| 3B | Regulation period | Per | 5 / 10 / 20 minutes | 10 minutes |
| 4 | Separate temperature probe configuration | Sect | --- / FLO / In /Out | --- |
| 4A | Floor temperature limit | Tflo | 15 °C – 45 °C | 27.0 °C |
| 5 | Ambient temperature correction | Corr | -4.0 °C to +4.0 °C | 0.0 °C |
| 6 | Optimization | Opt | ON/OFF | OFF |
| 6A | Max. optimization duration (hours) | OPtH | 1h – 5h | 2h |
| 7 | Pump anti-seizure | Pu | ON/OFF | OFF |
| 8 | Low battery | bAtt | --- / On / OFF | OFF |
| 9 | Baud | baud | 0/1 | 0 |
| 10 | Software release | SOFt | xxx | xxx |

### Type of connected card

The chronothermostat can check whether the base is connected. If it is not connected dashes will be displayed whereas when it is connected the writing rEL is displayed.

### Temperature scale

To select the temperature scale to be displayed: Celsius (centigrade) or Fahrenheit. When choosing the Fahrenheit scale, temperatures may range between 0.0 and 99.9 °F.

### Type of regulation

To select the temperature regulation mode: differential (Std) or proportional (ProP). This parameter is used for heating only.

### Thermal differential

To set the thermal differential value to be used when choosing the differential temperature regulation mode. Continuous switching on and off can be avoided by choosing a proper differential value according to the thermal inertia of the heating system. It is recommended to set a low thermal differential (LO) in heating systems with radiators and high thermal differential (HI) in heating systems with fan-coils.

### Regulation band

To select the proper value according to the thermal gradient of the system (broadband for high gradients– narrow band for low gradients).

### Regulation period

To set the regulation cycle length (ON period + OFF period) when the proportional temperature regulation mode is chosen. Select 5 minutes for low-inertia systems (fan-coil type), 10 minutes for average-inertia systems (aluminium radiator type) and 20 minutes for high-inertia systems (cast-iron radiator type).

### External temperature probe configuration

The chronothermostat may be connected to a an external temperature probe. Probe operation is determined by this parameter.

- Probe off (---): the temperature value detected by the probe is not used (although the probe is connected).
- Floor probe (FLO): when the temperature detected by the probe reaches the value set in the Floor temperature limit parameter, the system will be turned off regardless of the temperature read by the chronothermostat.

### Floor temperature limit

To set the temperature limit value read by the external probe which turns the system off when the floor probe is used (for floor heating systems).

### Ambient temperature correction

To sum/subtract an offset value to/from the temperature value read by the chronothermostat.

**Optimization**

To calculate the advance switch-on time required to reach the desired temperature at the set time, considering the system thermal inertia. Optimization takes place only at the first switch-on of the day, i.e.: the first programmed passage from a temperature to a higher one.

**Max. optimization duration**

To set the max. duration (expressed in hours) of the advance switch-on time calculated by optimization.

**Pump anti-seizure**

To turn the system on for 1 minute a day (h 23.58), thereby operating the water circulation pump and preventing it from seizing. This takes place only if the system has never been turned on during the day.

**Low Battery**

To determine the relay status when batteries are flat for over 15 days. If this parameter is excluded (---), the chronothermostat will keep on controlling the relay as required by regulation until the remaining battery charge allows for it.

**Baud**

This parameter is not available

## Technical data

| | |
|---|---|
| Power supply | 2 AA alkaline batteries, 1.5 V |
| Battery life | about 1 year |
| Outputs | 1 single-pole relay voltage 250 Va.c. rating 5(3) A |
| Inputs | External temperature probe |
| Electric connections | Screw clamps 3.5 mm two-pole jack plug |
| Insulation | Double ▢ |
| Protection degree | IP20 |
| Setting storage | Non-volatile memory |
| Micro-disconnection | 1BU |
| Software | A Class |
| Temperature regulation range | 2 °C – 40 °C |
| Anti-freeze temperature regulation range | 2 °C – 7 °C |
| Max. temperature | T45 |
| Local indication | BLUE Backlighted LCD display |
| Local controls | 6 Touch screen icon keys 1 central backlighted area 3 rotary selectors |
| Dimensions (L x H x D) | 155 X 91 X 20 |
| External temperature probe distance | 10 m max |
| Reference thermal gradient | 4 K/h |
| Relative humidity displayed value | 20% - 90% |
| Pollution degree | 2 |
| Impulse Voltage | 4000V |

CRONOTC...B Chrnothermostat complies with CEI EN 60730-1 and second parts.
AVE S.p.A. reserves the right to make whatever technical and manufacturing modification without prior notice.

**Notes**

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**IMPORTANT NOTES:**

• Products should be sold in their original packaging. Otherwise, the retailer and/or installer is obliged to follow, as well as to communicate to the user, the instructions for use which are supplied with the product and/or are published on the website www.ave.it as well as in the current product catalog.

• AVE products are installation products

• Products must be installed by trained professionals in compliance with the installation regulations

• Once the product is unpacked, make sure that the appliance is undamaged. Do not use the appliance if there is any doubt, but contact a qualified technician

• Even before unpacking, the appliance should be handled with care and stored in a dry place at temperatures between −5°C and +40°C

• Before carrying out any maintenance on the appliance, cut off the mains power

• Special attention should be paid to the preparation of the cable terminals to be inserted into the appliance terminals so as to maintain sufficient isolation distance between contacts

• When tightening the terminal screws, special care should be taken to avoid overheating which could start a fire or damage the cables.

• The product must be used in dry, dust-free areas

• Suitable products must be used in any other conditions

• There is a risk of electric shock or malfunction of the device if not handled properly.

• Install products and accessories according to the prescriptions in the catalogue and the instructions sheet and in compliance with specific standards and rules

• Warranty certificate for a specific product, which specifies the warranty period and conditions in accordance with local regulations, is issued by the seller at the moment of sale of product.

**The manufacturer's warranty:** The 5 year warranty applies only to damaged or malfunctioning products caused by manufacturer's negligence, taking into account the rights and obligations prescribed by law (art. 1490, 1512 C.C., DL 24/2002, Directive 1999/44/CE, art. 1519 C.C.). The defect must be notified within 2 month from the date it was discovered. Five years are intended from the date of delivery of the product to the final customer.