Cronotermostato Digitale
TUO

Manuale d'Uso

User Manual
DIGITAL CHRONOTHERMOSTAT

Index

English

Wall-mounting chronothermostat powered by mains (230 V~), suitable for the control of heating and air-conditioning systems.

The device, through the bistable relay, acts on the control circuit of the burner or the circulation pump (heating), or on the control circuit of the air conditioner (conditioning), in order to guarantee the desired temperature.

The device also displays the relative humidity value thanks to the built-in probe.

The colour of the display backlighting can be chosen by the user among the 48 selectable shades. You can even set the backlighting to be variable according to the difference between the measured temperature and the set one.
The backlighting can be always switched off if the device is installed for example in bedrooms.

Code	Model	Description
VE771600	Tuo Bianco	Weekly chronothermostat white colour
VE771700	Tuo Nero	Weekly chronothermostat black colour

SAFETY WARNINGS

■ **During installation and operation of the product, it is necessary to comply with the following instructions:**

1) The device must be installed by a skilled person, in strict compliance with the connection diagrams.
2) Do not power on or connect the device if any part of it is damaged.
3) After installation, inaccessibility to the connection terminals without appropriate tools must be guaranteed.
4) The device must be installed and activated in compliance with current electric systems standards.
5) Before accessing the connection terminals, verify that the leads are not live.
6) In the electrical system of the building where the chronothermostat must be installed, a protection device from the overcurrents must be present.
7) The device performs actions of 1B type and is suitable for environments with pollution degree 2 and overvoltage category III (EN 60730-1).

DIMENSIONS
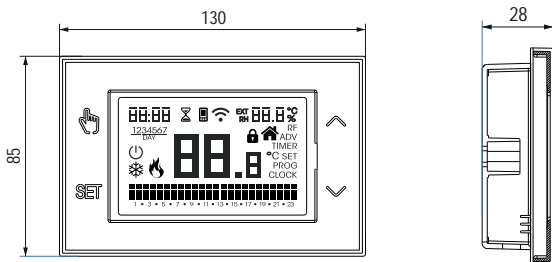
DEVICE DESCRIPTION
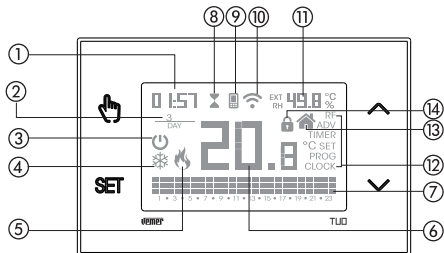
① Clock
② Day of the week
③ Off operation
④ Active load (conditioning mode)
⑤ Active load (heating mode)
⑥ Measured temperature
⑦ Running daily program divided into 24 histograms, one for each hour of the day.
   Each hour is associated with one of the 3 temperatures:

   ■ Temperature **T1**   ■ Temperature **T2**   ■ Temperature **T3**

⑧ Active timed operation
⑨ (not used)
⑩ (not used)
⑪ Measured relative humidity
⑫ Configuration menu:
   RF   (not used)
   ADV   advanced parameters of the device
   TIMER timings
   SET   automatic operating temperatures T1, T2, T3
   PROG   automatic operating programs
   CLOCK date and time

⑬ (not used)
⑭ Active keypad lock

English
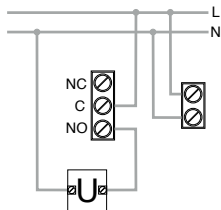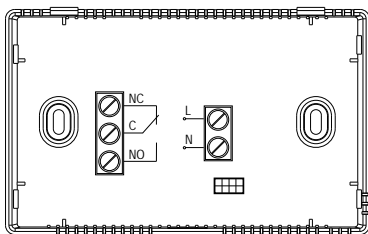
Connection diagram for the supply of circulation pumps, solenoid valves, etc. at 230V ~
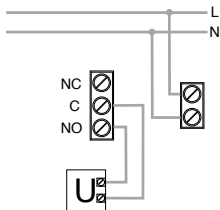
Connection diagram for the control of the boiler, heat pumps, etc.

INSTALLATION

Device installation

The device can be installed on the wall or to cover the 3-module flush-mounting box (type 503).

We recommend positioning at a height of 1.5 meters from the floor, in an area that respects as much as possible the average temperature conditions of the entire environment.

Avoid installation near doors or windows, in niches, behind doors and curtains or in positions with excess or total lack of ventilation, to avoid that the reading of the temperature measured by the probe is in some way offset.
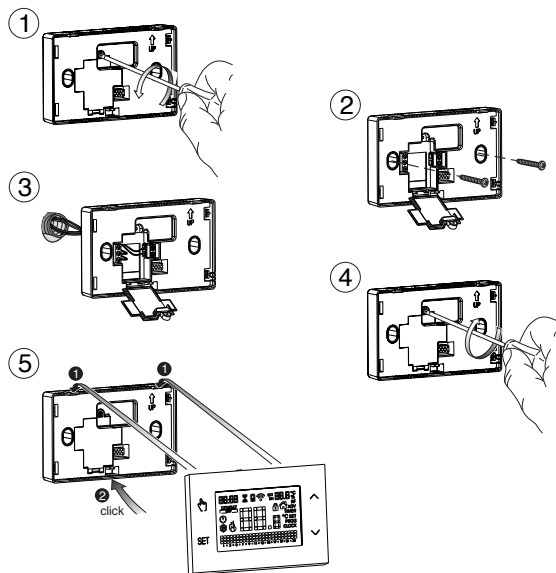
OPERATING MODE

The device can operate according to the following 3 modes:

Automatic mode

It allows you to use the device as a
chronothermostat and the temperature regulation
follows the "profile" of the set program.
The program profile assigns one of the 3
temperatures T1, T2 or T3 to each hour of the day.
It is possible to assign a different program to each day of the week.
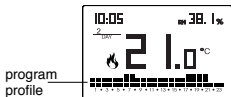
In the example, the device adjusts the temperature based on the value of:
T2 from 00:00 to 6:00 and from 8:00 to 17:00
T3 from 6:00 to 8:00 and from 17:00 to 21:00
T1 from 21:00 to 24:00
The values of T1, T2 and T3 can be set by the user.

Manual mode

It allows you to use the device as
a thermostat and the regulation is according
to the temperature Tm.

Off mode

It is suitable when long periods of absence are expected.
In this mode the device does not perform any regulation
however, if it works in heating mode, it maintains a
minimum temperature (antifreeze temperature) to prevent
possible freezing of the system.
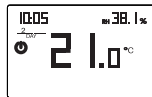
To switch from automatic to manual operation

Automatic operation → Tm operation → Manual operation
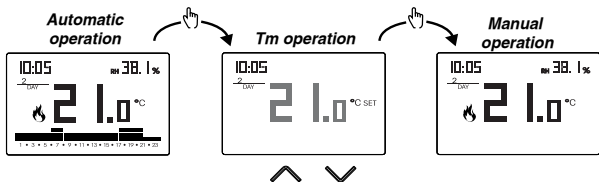
To switch from manual to automatic operation

Manual operation → Tm operation → Automatic operation
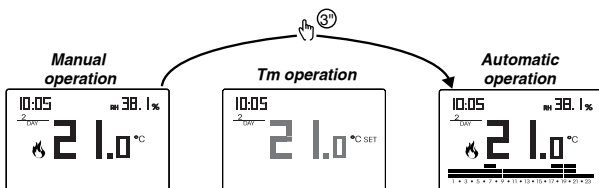
To switch from automatic operation (or manual) to the one switched off and vice versa

Automatic operation → Off operation
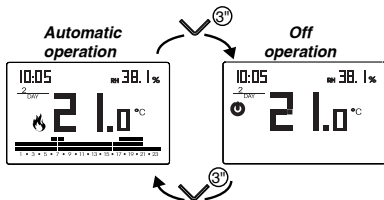
CONFIGURATION MENU DESCRIPTION

SET (3s)

SET → The CLOCK menu allows you to set date and time. It also allows the configuration of the daylight saving time change.

SET → The PROG menu allows you to change the programming of the automatic operating mode.

SET → The SET menu allows you to modify the values of the 3 temperatures of the automatic operation (T1, T2, T3).

SET → The TIMER menu allows setting of one of the 3 timed operations.

SET → The ADV menu allows you to configure the general operating parameters of the device.

To set the date and time values, proceed as follows:
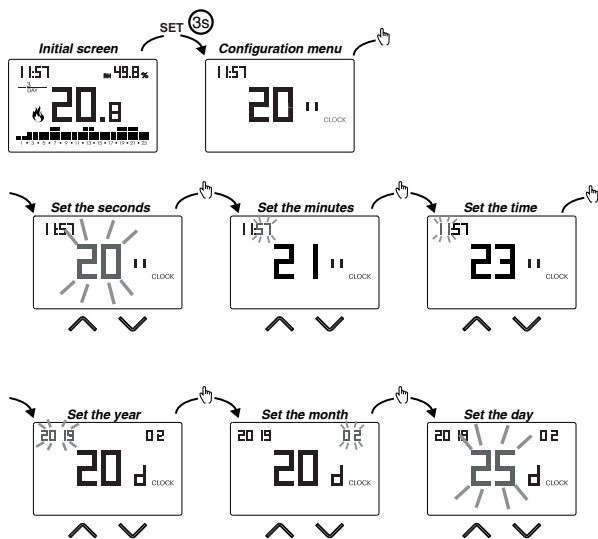
To exit the date and time setting:

- • press the key SET once to return to the configuration menu
- • press the key SET twice to exit the menu and return to the initial screen
- • to change the settings of the summer/winter time change, press and hold for a long time the key (see "Configuration of the summer/winter time change")

Configuration of the summer / winter time change

You can configure the device to independently manage the summer time update. The factory setting includes:
- the passage winter time → summer time (+1h) the last Sunday of March at 2:00 o'clock
- the passage summer time → winter time (-1h) the last Sunday of October at 3:00 o' clock

To change the configuration of the summer/winter time change:
- when changing any of the clock parameters (seconds, minutes, hour, year, month or day), keep the key 🖑 pressed for a long time until the display shows 𝐴𝑈𝑡𝑜

Changing the clock   *Automatic on/off time change*
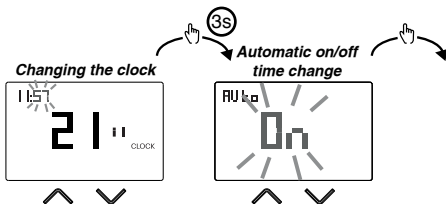
If the function is enabled (AUTO ON), it is necessary to set:
- the day of the week (1= Monday...,7= Sunday)
- the week of the month (1st= first, 2nd= second,...LSt= last)
- the month of the year
- time

using the keys 🔼 and 🔽 to set the value and the key 🖑 to confirm and move on to the next parameter.

hour — 02:00   LSt — week
day — 03   month
❄
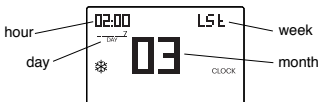
To exit the summer/winter time change configuration:
- press the key SET once to return to the configuration menu
- press the key SET twice to exit the menu

Note: the winter time change → summer time is identified by the symbol ❄.
the summer time change → winter time is identified by the symbol 🔥.

For example, in Italy the summer time starts the last (LST) Sunday (7) of March (03) at 2:00 o' clock and the last (LST) Sunday (7) of October (10) at 3:00 o' clock.

PROG MENU - PROGRAMS SETTING

Access the PROG menu to change the programming of the automatic operation.
The factory setting includes:
- the P1 program from Monday to Friday
- the P2 program on Saturday and Sunday

If this program is not suitable for your needs, you can:
- assign a different program for one or more days of the week
- modify one or more existing programs by personalizing the profile, that is, assigning different temperature levels for one or more hours of the day.

How to choose a different program for the day Y

Initial screen — SET (3s) → *Configuration menu* — x1 time → *PROG. Menu*

Choose the day Y — *Choose the Px program* — SET
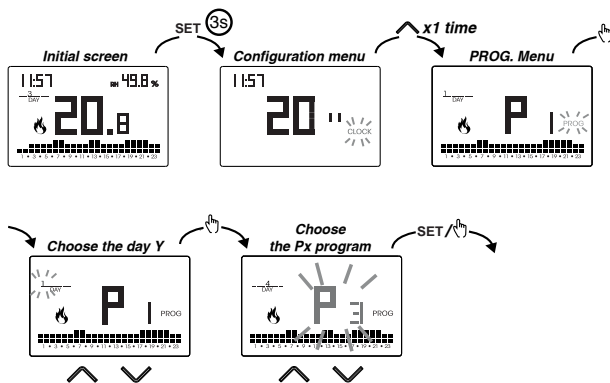
If the program meets the needs:

- press the key SET once to confirm and choose another day to which to assign a different program
- press the key SET twice to return to the configuration menu
- press the key SET three times to exit the menu and return to the initial screen

If no program meets the needs:

- choose the one that is closest to you and press the key 🖑 to customize the profile (see "How to customize the profile of a Px program")

English

How to customize the profile of a Px program

*Choose the
PX program*

*Choose the temperature
for the selected time*

*Choose the temperature
for the next hour*
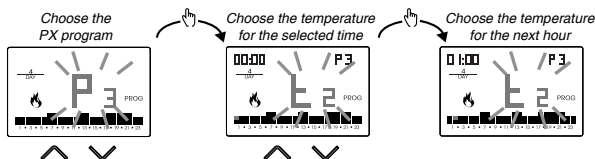
• starting from midnight 00:00, press the keys ⌃ and ⌄ to assign to each hour
  of the day one of the 3 possible temperatures (T1, T2, T3) and the key 👆
  to confirm and go to the next hour.

• to enter a switching delay for the selected hour, hold down the key 👆
  for a long time.
  For more information about switching delay, see "How the switching delay works"

When the profile program is suitable for your needs:
• press the key SET to exit the customization.

How the switching delay works

Set a switching delay for a specific hour
to maintain, for the duration of the delay, the temperature value
assigned to the previous hour.
For example, if the program includes:
  T2 from 12 to 13
  T3 from 13 to 14 pm with 30 minutes delay
the chronothermostat adjusts the temperature based on the value of
  T2 from 12 to 13.30 and
  T3 from 13.30 to 14.00
It is possible to set delays of 15, 30, 45 minutes,
independent for every hour of the day.

SET MENU - TEMPERATURES T1, T2, T3 SETTING

Access the SET menu to change the values of the 3 temperatures used in automatic operation. The factory setting includes:

- T1 = 5°C, T2 = 15°C, T3 = 18°C (heating/winter operation ♨)
- T1 = off, T2 = 23°C, T3 = 25°C (conditioning/summer operation ❄)

How to change the temperature values T1/ T2/ T3
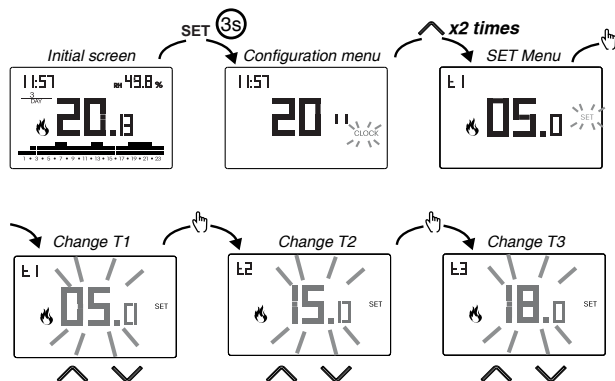
To exit the temperature change:
- press the key [SET] once to return to the configuration menu
- press the key [SET] twice to exit the menu and return to the initial screen

Note: temperature values between LO (minimum value)
and HI (maximum value) are allowed.
These factory values are: $LO = 2°C$, $HI = 50°C$ but can be modified through the ADV menu.

Note: the condition $T1 \leq T2 \leq T3$ must be respected.

TIMER MENU - TIMING SETTING

Set a timing to prolong the current operation for the duration of the timing itself. There are 3 timings available:

- **Timed manual:** set a timing during manual operation to maintain this operation until timing has elapsed.
  At the end of the timing, the device activates the automatic operation.
- **Timed automatic:** set a timing during the automatic operation to maintain this operation until the timing has elapsed.
  At the end of the timing, the device activates the off operation
- **Off timed:** set a timing during off operation to maintain this operation until timing has elapsed. At the end of the timing, the device activates automatic or manual operation, depending on which operation was active before switching off.

How to set a timing
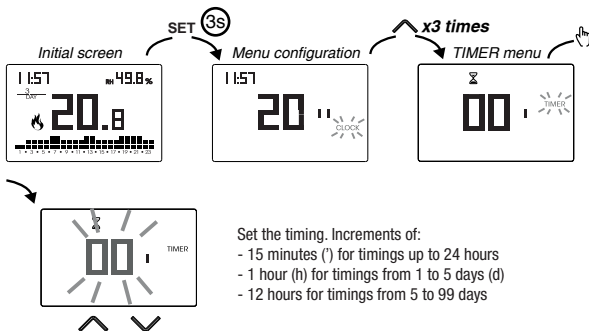
Set the timing. Increments of:
- 15 minutes (') for timings up to 24 hours
- 1 hour (h) for timings from 1 to 5 days (d)
- 12 hours for timings from 5 to 99 days

To exit the timing change:
- press the key SET once to return to the configuration menu
- press the key SET twice to exit the menu and return to the initial screen

When a timing is in progress, the symbol ⧖ is lit.

Note: to cancel a timing in progress or to exit without activating the timer, set 00'.
Note: the timing ends in the case of changes to the operating mode.

ADV MENU - ADVANCED PARAMETERS SETTING

SET (3s) ∧ x4 times

Initial screen   *Configuration menu*   *ADV menu*
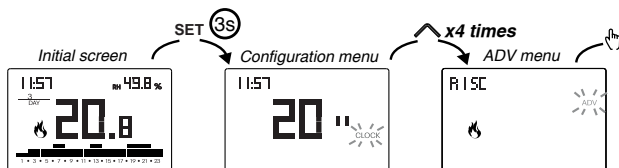
In the ADV menu, the parameters related to the advanced configuration of the device are proposed in sequence. Press:

- the keys ∧ and ∨ to change the value of the selected parameter
- the key 🖑 to go to the next parameter
- the key SET to exit and confirm the changes

Note: the device exits the menu after about 40 seconds without any key being pressed.

Operating mode

Setting up:
- r ISc if the device is connected to a heating system (winter operation)
- cond if the device is connected to an air conditioning system (summer operation)

Factory value: r ISc (heating).

English

Regulation type

(this menu is active only if operating mode = heating)

Setting up:
- $\square$ to choose on/off regulation.
- P to choose proportional regulation.

Factory value: $\square$ (on/off).
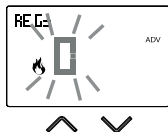
Parameters for the regulation type

(this menu varies depending on the chosen regulation type)

If the chosen regulation type is on/off, set the
differential d iF. Allowed values: 0.1°C ÷ 1°C.

Factory value: 0.3 °C

If the chosen regulation type is proportional,
set the band bnd and the period PEr.
Allowed values: 0.5°C ÷ 5°C (band),
10, 20 or 30 minutes (period).

Factory value: 0.5 °C (band),
10 minutes (period).
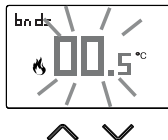
English
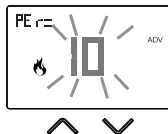
Antifreeze temperature

(this menu is active only if operating mode = heating)

The antifreeze temperature avoids the risk of freezing
of the system when on the chronothermostat is set
the off operation ⏻.

Allowed values: --- (excluded), 1°C ÷ 50°C .

Factory value: 6 °C.

Note: the "---" setting excludes the antifreeze function; in this case, when the device
is off, no minimum temperature is guaranteed

Adjustment of the measured temperature

In particular installation conditions, it can happen
that the temperature measured by the device deviates
from the average temperature present in the room.
In this case, introduce an adjustment of the temperature
with the $Rd\,J$ menu.

Allowed values: -5°C ÷ 5°C .

Factory value: 0 °C.

Note: the temperature value shown on the display during normal operation is inclusive
of any adjustment introduced.
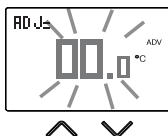
Minimum/Maximum settable temperature

Under particular installation conditions, for example in public buildings, hotels, etc., it may be useful to limit the range of values that the temperatures T1 / T2 / T3 and Tm can assume, in order to prevent incorrect settings by the user.

- LO is the lower limit

  Allowed values: 2°C ÷ HI
  Factory value: 2°C

- HI is the upper limit

  Allowed values: LO ÷ 50°C
  Factory value: 50°C
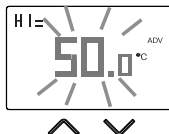
Password for key lock

Under particular installation conditions, for example in public buildings, hotels, etc., it may be necessary to lock the keypad to prevent changes to the settings by unauthorized persons.

To activate the keypad lock,
set a password between 001 and 999.

To deactivate the lock, keep the key ☑
pressed until you set "‑ ‑".
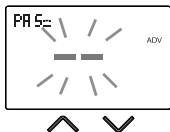
When the keypad lock is active, the symbol 🔒 appears on the display and, after pressing a key, the word bLOc appears.
To find out how to unlock the keypad, see page 47.

Hour meter of system operation

It displays the operating hours of the system (relay contacts on C-NA).

The device has two counters (5-digit)
independent for heating operation
and for the conditioning operation, but
is displayed only the counter of the
selected operation mode.
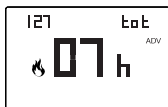
To reset the counter, keep the key 🖑 pressed for a long time during the display.
The maximum count is 65535h (about 7 years), when this digit is reached, the counter
resumes the count from 0h.

Display backlighting

The display backlighting can be:

• off (blue after pressing a key)

• fixed of a colour that can be chosen among
  48 variants

• variable based on the difference between the
  measured temperature and the set temperature:
  - blue when the measured temperature is lower than the set temperature of at least
    0.5°C (and after pressing a key)
  - green when the difference between the measured temperature and the set one
    is lower than 0.5°C (and in case of operation off)
  - red when the measured temperature is higher than the set temperature
    of at least 0.5 ° C

```
        ⌃           ⌃           ⌃           ⌃
   oFF    colour 1    .....    colour 48    rGb
        ⌄           ⌄           ⌄           ⌄
```
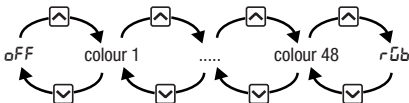
The backlighting can also be activated/deactivated from the initial screen by keeping
the key ⌃ pressed for a long time.

OTHER FUNCTIONS OF THE DEVICE

Display of minimum/maximum daily temperature

The device stores the values of the temperature and of the minimum and maximum humidity measured during the day.

Initial screen → *Maximum values display* → (3") *Maximum values resetting*

Initial screen → *Minimum values display* → (3") *Minimum values resetting*
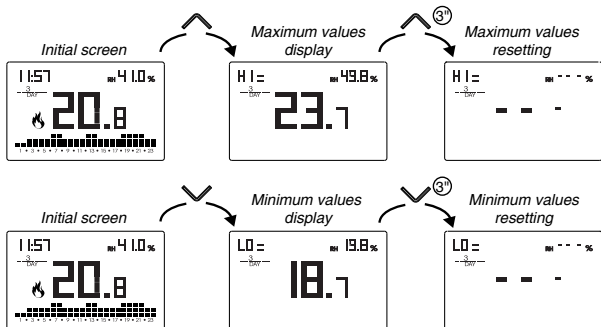
Display of relative humidity

The device displays the humidity value measured by the probe in the upper right corner, provided it is within the 20% ÷ 90% RH. Otherwise the device displays "- - -".

Humidity regulation is not possible.

Keypad unlock

When the key lock is active, the device adjusts the temperature using the set programming. In this condition, after pressing a key, the display shows the writing "bLOc"

To unlock the keypad:

1. While displaying the writing "bLOc" hold down any of the 4 keys for a long time until the display shows "- - -".
2. Enter the correct password using the keys ⌃ and ⌄ and confirm with the key 🖐.
   The keypad remains unlocked for about 45 seconds from the last press of a key, after which the keypad reactivates the lock. To remove the key lock, see page 45.

DEVICE RESET

Perform a reset to cancel the settings made and bring the device back to the conditions in which it appears as soon as it has been removed from the packaging.

To reset:

1. from the initial screen, press and hold the key [SET] to enter the configuration menu. The CLOCK indication flashes.
2. press and hold down the keys [⌃] and [⌄] simultaneously until "rES" appears on the display.
3. when the display shows all the segments, keep the key [SET] pressed until "dEF" appears

Initial screen **SET** (3s) *Configuration menu* (3")

SET (3s)
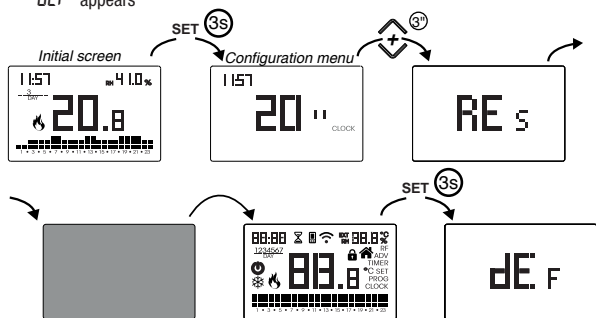
⚠ To reset if the key lock is active and you do not know the unlock password, you must remove and restore power and, when the display shows all the segments, keep the key [SET] pressed until "dEF" appears.

Operation mode	heating (winter)	Adj. ADJ temperature	0 °C
Regulation type	on/off	Min. settable temperature	2 °C
Differential (on/off)	0.3 °C	Max. adjustable temperature	50 °C
Band (proportional)	0.5 °C	Hour meter operation 🔥/❄	0 h
Period (proportional)	10 minutes	Automatic summer time change	active (according to EU rules)
Antifreeze temperature OFF	6 °C	Backlighting	active
		Key lock password	active

REGULATION TYPES

On/off regulation

With the on/off regulation, the device activates the heating (air conditioner) until the measured temperature is lower (higher) than the set one.

In order to avoid the oscillation straddling the set temperature which would cause the system to switch on and off continuously, a differential (or hysteresis) is introduced.
In this way the system is switched on:
- in heating, when the ambient temperature drops below the value
  "set temperature-differential" and remains on until the set temperature is reached.
- in conditioning, when the ambient temperature exceeds the value
  "set temperature+ differential" and remats on until the set temperature is reached.

The differential can be set from the ADV menu (see page 42).
Keep in mind that a low differential (0.1°C - 0.2°C) leads as a consequence more frequent ignitions of the system but the temperature will be more uniform than a high value (0.9°C - 1°C).

Proportional regulation (only for operation = heating)

The proportional regulation allows to keep the ambient temperature more constant and is based on the concept of band and period. The regulation band is the temperature range (centered on the setpoint) in which the proportional regulation is implemented The regulation period is the duration of the adjustment cycle (Switch-on time T_{on} + Switch-off time T_{off}). Operation is described by the following diagram:
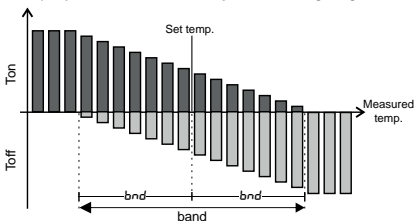
How to choose the period:
- 10 minutes for low thermal inertia systems (fancoil)
- 20 minutes for medium thermal inertia systems (aluminum radiators)
- 30 minutes for high thermal inertia systems (cast iron radiators)
How to choose the band:
- narrow band (0.5 °C) for systems with low thermal inertia
- narrow band (5 °C) for systems with high thermal inertia

TECHNICAL CHARACTERISTICS

- Power supply: 230V AC ± 15% 50/60 Hz
- Charge reserve (in case of blackout): about 12 hours
- Output: bistable relay with changeover contact 5A / 250V AC
- Weekly programming with 3 settable temperatures: T1, T2, T3
- Daily resolution: 1h
- Switch-on delay set between 15, 30 or 45 minutes (independent for each hour)
- Measured temperature scale: 0°C ÷ + 50°C
- Measured and displayed temperature resolution: 0.1°C
- Temperature regulation range: 2.0°C ÷ + 50°C
- Temperature update: every 20 seconds
- Measurement accuracy: ± 0.5 ° C
- Temperature regulation:
  – on/off with adjustable differential between 0.1°C and 1°C
  – proportional with settable band and regulation period
- Operating mode: heating (winter) or conditioning (summer)
- Configurable display backlighting
- Display of relative humidity (regulation is not allowed)
- Displayed ranges: 20% ÷ 90% RH
- Accuracy: 1% RH
- Automatic winter time/summer time
- Keypad lock with password for installation in public places
- Wall installation (or covering the box 503)
- Terminal block for cables with section of 1.5 mm^2
- Operating temperature: 0°C ÷ +50°C
- Operating humidity: 20% ÷ 90% non condensing
- Storage temperature: -20°C ÷ +65°C
- Degree of protection: IP: XXD

REFERENCE STANDARDS

Compliance with Community Directives
2014/35/EU (LVD)
2014/30/EU (EMCD)
is declared with reference to the following harmonized standards:
EN 60730-2-7, EN 60730-2-9

P1

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3							■	■										■	■	■	■	■		
T2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

P2

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3								■	■	■	■	■	■	■	■	■	■	■	■	■	■			
T2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

P3

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3							■	■				■	■					■	■	■	■	■		
T2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

P4

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3								■	■	■	■	■	■	■	■	■	■	■						
T2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

P5

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3							■	■							■	■	■	■	■	■	■	■		
T2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

P6

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3																								
T2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

P7

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3																								
T2																								
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

English

P1

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3	■	■	■	■	■	■			■	■	■	■	■	■	■	■							■	■
T2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

P2

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3	■	■	■	■	■	■	■																■	■
T2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

P3

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3	■	■	■	■	■	■		■	■	■	■			■	■	■							■	■
T2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

P4

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3	■	■	■	■	■	■											■	■	■	■	■	■	■	■
T2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

P5

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3	■	■	■	■	■	■			■	■	■	■	■	■									■	■
T2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

P6

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3																								
T2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

P7

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
T3																								
T2																								
T1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

English

Vemer S.p.A.
I - 32032 Feltre (BL)
Via Camp Lonc, 16
e-mail: info@vemer.it - web site: www.vemer.it