Instructions manual

Thermostat 02905
Installer Manual

VIMAR

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1. Thermostat 02905

Wall-mounting, battery-powered thermostat with interface with capacitive keys. Equipped with user-friendly functions to facilitate energy saving. Designed to control heating and air-conditioning via C, NC, NO relay output. Equipped with multi-function input for remote control.

2. Field of application

This device is designed to control room temperature by acting on the control circuit of the burner or circulation pump (heating) or on the control circuit of the air conditioner (air conditioning), ensuring an ideal temperature. The graphical user interface, thanks to special views, facilitates system management helping the user to operate while maintaining a state of energy saving.

3. Installation

The appliance must be installed on a wall at a height of 1.5 m off the floor in a suitable position for correctly detecting the ambient temperature. It must not be installed in niches, behind doors and curtains or in areas affected by sources of heat or atmospheric factors.
It can be installed directly on a wall or on 2 and 3 module back boxes.
It should be used in dry, dust-free places at a temperature between 0°C and +40°C.
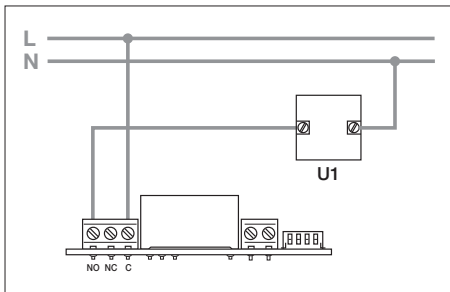
4. Connections

4.1 Relay connection

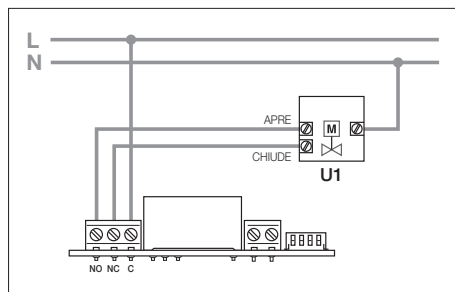Fig. 1 - Connections with circulation pumps, burners and solenoid valves

Fig. 2 - Connections with motorized valves

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4.2 Multi-function input

Depending on how it is configured, the multi-function input can be used to activate various functions of the timer-thermostat (see par. 7.8 and 7.9).

It is on when the two terminals of the figure are closed by a dry contact; vice versa if they are open, the input is off. The contact must be SELV and free of potential.

The typical wiring diagram is the following:

FUNCTIONS
- Remote nighttime reduction
- Remote ON
- Summer/Winter switching

NO NC C
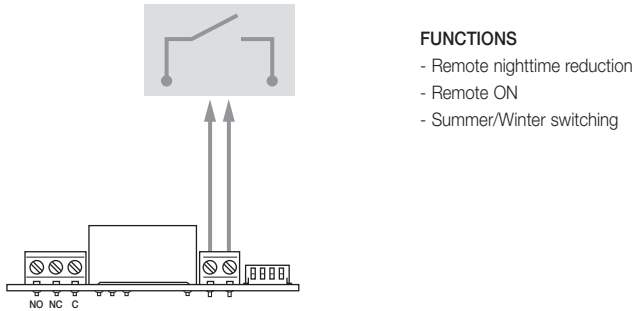
Fig. 3: Connecting the multi-function input

Activation type	dry contact
Type of conductor	1 single wire or 1 multi-wire cable conductor MAX. 1.5 mm^2
Length of the conductor	max. 100 m between the 2 terminals

5. Inserting new / replacement batteries

When replacing batteries, remove the front panel by raising it with a screwdriver. Replace the batteries with Alkaline 1.5V "AA" batteries.
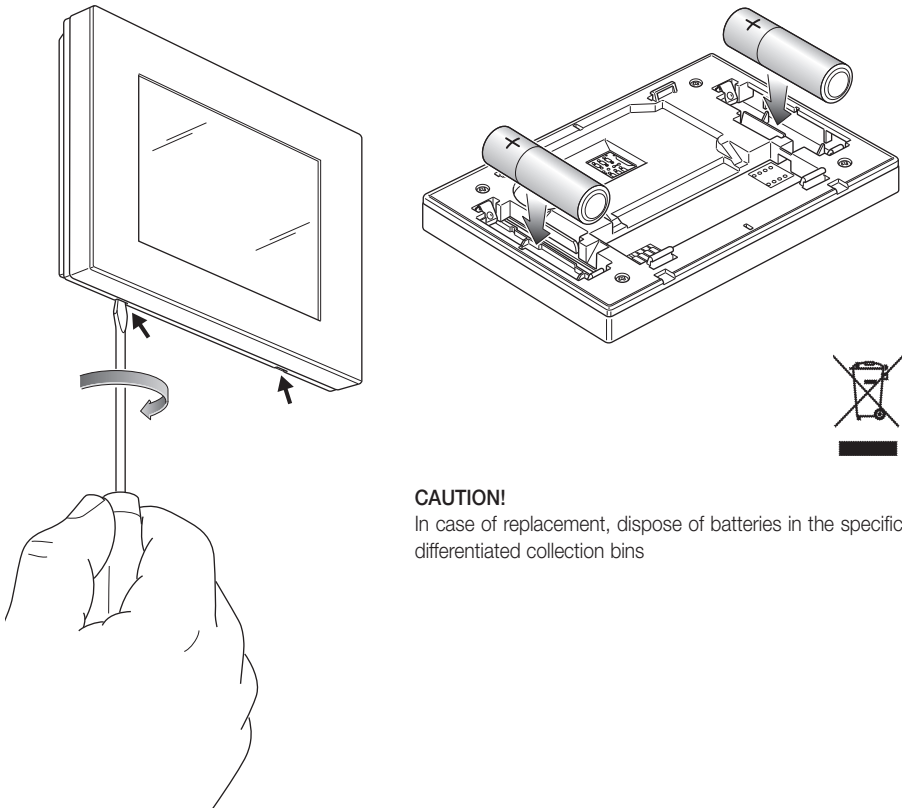
CAUTION!
In case of replacement, dispose of batteries in the specific differentiated collection bins

Fig. 4: Changing batteries

The battery charge status is shown as follows:
• no ▭ icon ➔ battery charged
• flashing ▭ icon ➔ battery almost flat (replace it)
• fixed on ▭ icon ➔ battery flat (the device will go OFF and it is no longer possible to switch to operation).

6. Display

The touchscreen display allows you to control the system using the following buttons and icons:
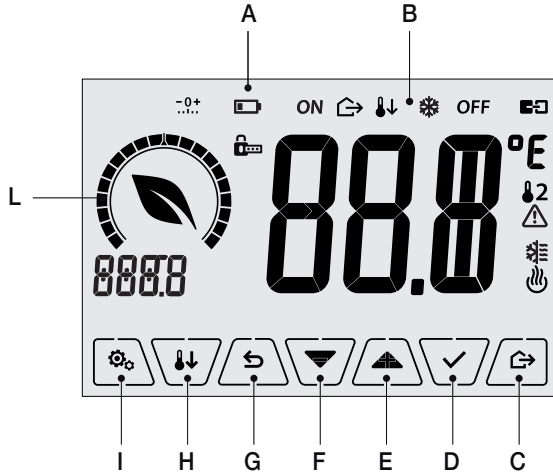

Fig. 5: Graphical interface and buttons

A: Battery charge status

B: Operating mode

C: Away

D: Confirm

E-F: Menu navigation and setting parameters

G: Back

H: Nighttime reduction

I: Settings menu

L: Ring indicating consumption level and energy savings indicator

6.1 Functions of the buttons

+ : **increases** the numerical values. When it "disappears" from the display it means that the value cannot be increased any more.

– : **decreases** the numerical values. When it "disappears" from the display it means that the value cannot be decreased any more.

: during navigation, it **scrolls to the next item** through the available menus. If it "disappears" then you have arrived at the last of the items that can be scrolled.

: during navigation, it **scrolls to the previous item** through the available menus. If it "disappears" then you have arrived at the last of the items that can be scrolled.

: **confirms** the selected option (activates the submenu if there is one or displays the next parameter/digit).
After each confirmation, the display shows the ✓ icon for approximately 1 s. In addition, if the timer-thermostat is connected to the probe 02960 via the circuit board 02915, it will also be possible to enable its acoustic signal.

: **back (or cancel)** exits the current screen/menu and returns to the previous one without saving any changes. In menus with changes to multiple digits it lets you go back to change the previous digit.

N.B. The field/value being edited is highlighted by the field/value itself flashing.

IMPORTANT: In order to avoid any accidental modifications, first press and hold down the required icon displayed to enable the function.

6.2 Symbols

Depending on the different operating modes, the following icons could also be displayed:

−0+ : Calibration

: Entering the PIN

: Away

ON : Manual (ON)

: Nighttime reduction

❄ : Antifreeze

OFF : Switched off (OFF)

: Multi-function input ON

: Air conditioning

: Heating

✓ : Confirm

: Eco (saving)

6.3 Ecometer

Ring for the level of consumption
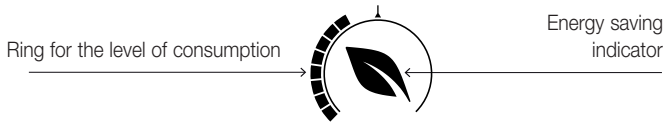
Energy saving
indicator

Fig. 6: Set of ECOMETER icons

On the left-hand side of the display there is a set of icons called the "ECOMETER" that provide an overview of the expected consumption as an aid to energy saving.

The information displayed is based on a consumption forecast obtained by comparing the currently set temperature setpoint and the estimated average consumption (which therefore has nothing to do with the current room temperature).

• The **consumption level ring** graphically indicates the expected level of consumption.
 If this level is less than half, it means that there will be a saving compared to the conventional average consumption; vice versa, if the level exceeds half, the expected consumption will be higher than the conventional average.

• T**he energy saving indicator** indicates whether the currently set setpoint will allow obtaining savings with respect to the conventional average consumption.

6.4 Locking the interface via PIN

The thermostat lets you set a password (see par. 8.9) which inhibits any change to the operating mode (eg switching from Manual to OFF), limits setting the temperature values and, more generally, blocks access to the configuration menu.

This feature is useful to prevent the thermostat being used by unauthorized persons: the device prompts you to enter the PIN, indicating a shutdown with the ⬛ icon
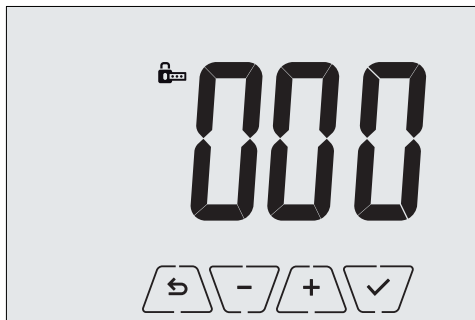

Fig. 7: Locking with PIN

7. Operating mode

The thermostat 02905 is able to adjust the temperature according to the following operating modes:

- **Switched off (OFF)**: switches the system off without making any adjustments
- **Manual (ON)**: lets you set the required temperature set-point manually
- **Away**: is a mode that lets you set the set-point in order to achieve significant energy savings during periods when the user is away
- **Nighttime reduction:** this mode, which can be activated locally, is useful for changing the manual adjustment set point in the hours of nighttime operation.
- **Antifreeze**: used to set a minimum temperature level to avoid damage to pipework or prevent the temperature from falling below a safety level.

In addition, if the multi-function input of the thermostat has been suitably configured, you can remotely activate the following modes:

- **Remote reduction**: conceptually similar to nighttime reduction, it acts on the comfort set point instead of the one set locally in manual mode.
- **Remote activation**: lets you activate the system remotely by setting the comfort set point
- **Summer/Winter switching**: the multi-function input automatically switches the thermostat onto air-conditioning mode (when on) or heating mode (when off).

The operating mode is selected via the SETTINGS menu (see chap. 9) or by using the shortcut buttons (see par. 7.3 and 7.4).

7.1 Switched off (OFF)

With this mode on, the thermostat is turned off and you cannot make any adjustments; in this case, the **OFF** icon is displayed above the temperature indicator.
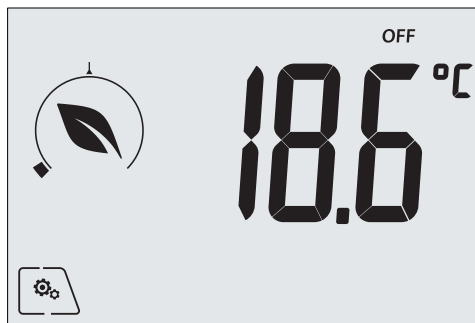When the thermostat is OFF, you cannot perform any operations other than accessing the configuration menu.

Fig. 8: Typical screen for OFF mode

For heating-only systems this mode is typically used in the summer.

7.2 Manual (ON)

This is the "traditional" operating mode. The thermostat controls the room temperature and takes it to the value set by the user (manual adjustment setpoint).
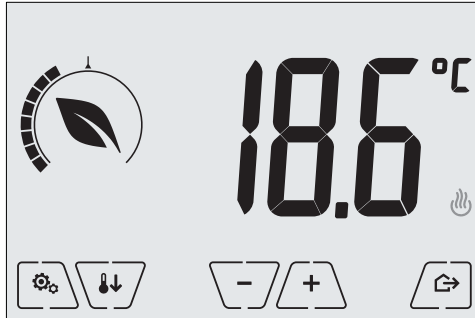
Fig. 9: Typical screen for Manual mode

The set point can always be changed via ⊞ or ⊟.

In the course of setting, the set point flashes and the circular ring fills up accordingly; this gives an indication of the expected consumption as a function of the set point you are setting:
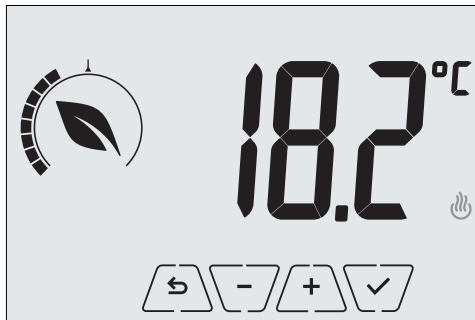
Fig. 10: Manual set point setting

The selection is confirmed by touching ✓.

The 🔥 and ❄ icons in the lower right corner indicate whether the system is operating in heating or air-conditioning mode respectively (icon illuminated = system on).

7.3 Away

This mode is useful to achieve energy savings quickly and effectively whenever the user leaves the regulated room.
In "Away" mode the system makes the adjustment according to the "away temperature" setpoint $T0$ (see para. 9.4.2).

The Away mode can only be activated in manual mode by touching $\boxed{\hookrightarrow}$.

The display will show the "away temperature" setpoint for approximately 2 seconds:

Fig. 11: Input in away mode showing the away temperature

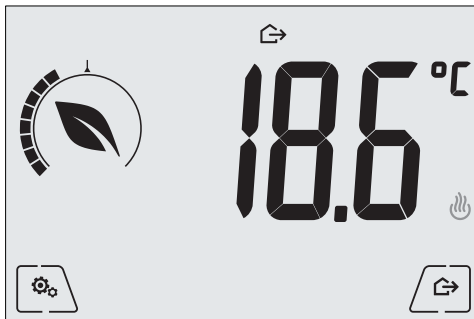Activation of this mode is identified by the $\hookrightarrow$ icon above the temperature indicator:

Fig. 12: Away Mode

To exit and return to Manual mode touch the $\boxed{\hookrightarrow}$ button again:

7.4 Nighttime reduction

This is the typical mode to use at night to reduce system consumption significantly.
In "Nighttime reduction" mode the device reduces the consumption of the system, taking the room temperature to a lower value (or higher, if on air-conditioning) than the Manual mode by ⬚⬚⬚ degrees (see par. 9.4.4).

"Nighttime reduction" is activated starting from Manual mode by touching ⬚ or remotely via the multi-function input (if enabled).

The display will show the "nighttime reduction" setpoint for approximately 2 seconds:

Fig. 13: Input in Nighttime Reduction mode showing the reduction set point

Activation of this mode is identified by the ⬚ icon above the temperature indicator:

Fig. 14: Nighttime reduction mode

To exit and return to Manual mode touch ⬚ again:

7.5 Antifreeze

This mode, which can only be activated when the system is operating in heating mode, lets you set a minimum temperature value (T_0 setpoint) to avoid damage to the pipework or to keep it from falling below a certain safety level when you are away for lengthy periods in the winter.

The "antifreeze" mode is activated directly from the Settings menu (see par. 9.1).
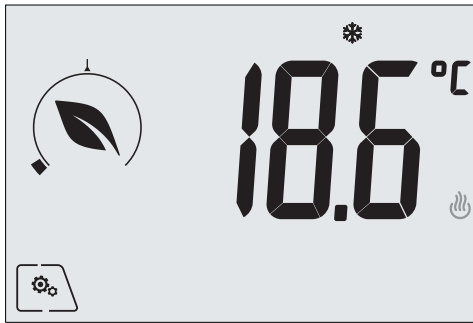Once activated, antifreeze mode is identified by the ❄ icon above the temperature indicator.

Fig. 15: Antifreeze mode

7.6 Remote reduction

Remote reduction is a useful way to "centralize" energy saving if there are multiple 02905 thermostats in different rooms of the same house.

It is similar to Nighttime reduction mode with the only difference being that activation is by remote control.

Example: Before going to bed, using a simple switch, all the thermostats in the house are set onto "reduction" at the same time.

This mode comes into operation when the multi-function input is activated (see par. 4.1) only if it has been properly configured; the activation of the configured multifunction input is considered solely when the thermostat is in Manual mode.

In "remote reduction" mode, the device sets the temperature to a value equal to Tcomfort - dTr (see para. 9.4).

In this condition the display and its buttons have limited functions; access to the settings menu is disabled and you can only change the temperature setpoint within a limited range, if configured.

The "Remote reduction" mode is identified by the ⊞ and ↓ icons located simultaneously above the temperature indicator.

The ⊕ and ⊖ buttons let the user change the temperature in the range dTu.

Fig. 16: Input in Remote reduction mode

On disabling the multi-function input, the thermostat returns to manual mode and the user can again manage the device completely.

7.7 Remote activation

This mode is typically used in applications where you want to remotely enable or disable temperature control of a room and limit the functions that can be performed by the user.

For example, this is a typical mode in hotel room management.

This mode comes into operation when the multi-function input is activated (see par. 4.2) only if it has been suitably configured by the installer (see par. 9.6).

In "remote activation" mode, the device sets the temperature to a value equal to Tcomfort (see para. 9.4).

In this condition the display and its buttons have limited functions; access to the settings menu is disabled and you can only change the temperature setpoint within a limited range, if configured.

The "Remote activation" mode is identified by the ▣◧ icon located above the temperature indicator.

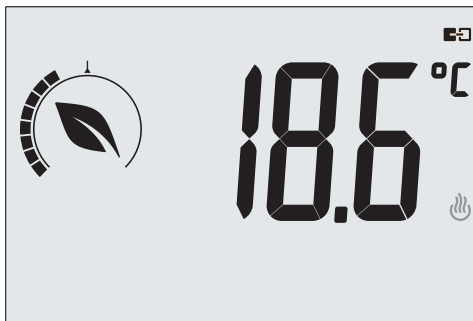The ⟋+⟍ and ⟍−⟋ buttons let the user change the temperature in the range d Tu.


Fig. 17: Input in Remote manual mode

8. Selecting user menu type and resetting default parameters

Switch off the thermostat by removing the batteries and switch back on by replacing them; for approximately 3 s, the display will show the firmware version and the icon [⚙].

• Easy Menu

Within 3 secs, touch [⚙] and, using [▲] and [▼] , select **EASY** and then **YES** confirming with [✓] both choices. The thermostat will restart, showing the easy operating mode for which, using [+] and [−] , only the desired temperature set point can be set without the need to confirm the entered value.

• Normal menu

Within 3 secs, touch [⚙] and, using [▲] and [▼] , select **EASY** and then **NO** confirming with [✓] both choices. The thermostat will restart, showing the normal operating mode.

N.B. When replacing the batteries, the set menu will automatically start when the thermostat is switched back on, without having to repeat the above procedure.

• Reset to default parameters

Within 3 secs, touch [⚙] and, using [▲] and [▼] , select **rSEt** and then **YES** confirming with [✓] both choices. The thermostat will restart having restored the default parameters, including any PIN that has been set.

9. Settings of the normal menu

From the settings menu you can configure all the features of the thermostat.

On the main screen (see Fig. 3) tap the [⚙] icon.

From the main menu, using [▲] and [▼] will display the following (flashing) symbols in succession, which provide access to the corresponding submenus:

1. **ON ❄ OFF**   operating mode setting

2. **°C °F**   unit of measurement setting

3. [❄] and [♨]   air-conditioning/heating setting

4. **T▁**   temperature setpoint setting

5. **-0+**   calibration setting

6. **In** and [▣-◪] multi-function input setting

7. **Out**   OnOff/PID temperature control algorithm setting

8. **InF**   device info

9. [🔒]   lock/unlock PIN setting

Touching [✓] opens the submenu and then the flashing highlights the parameters of the submenu.

9.1 Operating mode setting

This menu is used to select the operating mode of the device:

- **ON**   Manual
- **OFF**   Off
- **❄**   Antifreeze (only if the thermostat is set on "heating")

Using [▲] and [▼] select the required mode and confirm with [✓].

9.2 Unit of measurement setting

- The menu lets you set the unit of measurement used for the temperature (°C or °F)

Using [▲] and [▼] select the required unit of measurement and confirm with [✓].

9.3 Heating/air-conditioning setting

This menu lets you set the operation of the device depending on the season (winter/summer):

- ⚒ heating
- ❄ air-conditioning

Using ⬆ and ⬇ select the required operation and confirm with ✓.

9.4 Temperature set point setting

This menu lets you set the temperatures and hystereses necessary for defining the temperature control set-point used in the different operating modes.
In particular, you can have setpoints for:

1. Tc temperature **Tcomfort** *
2. TO and ⬆ temperature of the **Away mode** *
3. TO and ❄ temperature of the **Antifreeze mode**
4. dTr and ⬇ thermal delta in **Nighttime reduction mode**
5. dTu thermal delta with thermostat controlled remotely or inhibited by PIN
6. dT temperature differential of the device (only if in OnOff adjustment mode)

* CAUTION: Depending on the mode the thermostat is in (heating or air-conditioning), setting this setpoint acts only on the value associated with the current mode highlighted by the ⚒ or ❄ icon (for example, T.comfort of heating mode).

After then changing the setpoints of the current mode in succession, change the mode and set all the setpoints corresponding to it.

9.4.1 Comfort temperature

This menu, via ＋ and －, lets you increase/decrease the value of the comfort temperature Tc.
The Tcomfort temperature is the "reference" temperature used in the remote settings and can be defined as the "comfort temperature" that you want to reach after remote activation. In addition, it can also be the temperature at which to apply the thermal delta for nighttime reduction when it is activated via the multi-function input.
The comfort temperature differs depending on whether you are in the heating or air-conditioning mode.

9.4.2 Away temperature

This menu, via $\boxed{+}$ and $\boxed{-}$, lets you increase/decrease the value of the away temperature ⊓⊓.
The away temperature, preset by the user, is an intermediate temperature geared to obtain sub-stantial energy savings during periods when the user is away.
The away temperature differs depending on whether you are in the heating or air-conditioning mode.

9.4.3 Antifreeze temperature

This menu, via $\boxed{+}$ and $\boxed{-}$, lets you increase/decrease the value of the antifreeze tem-perature ⌐□.
Antifreeze mode is used to set a minimum temperature level to avoid damage to the pipework or keep the room temperature from falling below a safety level (see par. 7.5).

9.4.4 Nighttime reduction thermal delta

This menu, via $\boxed{+}$ and $\boxed{-}$, lets you set the difference between the Nighttime reduction temperature and Tcomfort temperature (or the temperature set in Manual mode).
The hysteresis is an increase/decrease in temperature that is applied to the Manual setting (when nighttime reduction is activated by the display) or to Tcomfort (when nighttime reduction is acti-vated by the multi-function input); the thermal delta value is identical both in heating mode and in air-conditioning mode with the only difference being that in the former case it causes a decrease in the set point while in the latter one it determines an increase.
The nighttime reduction mode can be activated either locally or via the multi-function input (if configured appropriately).

9.4.5 User settable thermal delta

This menu, via $\boxed{+}$ and $\boxed{-}$, lets you set the range of values within which the user can adjust the temperature when the menus are inhibited following remote activation or entering the PIN.
When the thermostat is turned on remotely (via the multi-function input when suitably configured), the control temperature is fixed and therefore cannot be changed; with ⌐⊤⊔ not zero instead, the user can modify the temperature within a certain range.
For example: multi-function input set as remote activation, T. comfort set at 20.0°C. Setting the thermal delta to 0.8°C allows the user to change the temperature setting from 19.2°C (20.0°C - 0.8°C) to 20.8 (20.0°C + 0.8°C).

9.4.6 Hysteresis of the device

This menu, via $\boxed{+}$ and $\boxed{-}$, lets you set the temperature range of the heating/air-conditioning system between "ON" and "OFF".
This value can also be changed via the submenu for ON/OFF operation.
The parameter cannot be changed if the thermostat is set as PID operation.

For example: Heating, with setpoint on 20.0°C, dT : 0.5°C → → →   *20.5 (off), 19.9 (on)*

9.5 Calibration setting

This menu lets you "calibrate" the temperature read by the thermostat.

Using $\boxed{+}$ and $\boxed{-}$, you can add or subtract (at intervals of 0.1°) a fixed amount from the temperature detected by the thermostat to make it equal, for example, to that of a sample thermometer.

CAUTION: For correct calibration it is recommended to wait until the thermostat has been on for at least 1 hour in a room at constant temperature.

Tap $\boxed{\checkmark}$ to confirm your choice.

9.6 Multi-function input setting

This menu is used to set the operating mode of the multi-function input.

Using $\boxed{\blacktriangle}$ and $\boxed{\blacktriangledown}$ you can select the following options:

• **OFF**: the state of the multi-function input is ignored by the device.
• **ON (remote activation)**: the multi-function input (when enabled) automatically sets the "Tcomfort" temperature as the setpoint.
  In this context, the user can only change the temperature within a narrow range and cannot carry out any further operations on the device; with the multi-function input disabled, the default mode is "Antifreeze" (or OFF if on air-conditioning) and the user can manage the thermostat completely.
• **(remote nighttime reduction)**: the multi-function input (when enabled) forces a reduction in temperature (which can be set via the submenu associated with that selection) with respect to "Tcomfort".
  In this context, the user can change the temperature within a narrow range and cannot carry out any other operations on the thermostat; with the multi-function input disabled, the thermostat returns to the previously set operating mode and the user can manage the thermostat completely.
• **(summer/winter switching)**: the multi-function input automatically switches the thermostat onto air-conditioning mode (when on) or heating mode (when off).
  On enabling this selection, the submenu described in 8.3 is no longer displayed.
  This option is useful for centralized systems in which the air-conditioning or heating mode is performed at the level of the entire building and impacts on many sub-environments.

Tap $\boxed{\checkmark}$ to confirm your choice.

9.7 OnOff/PID setting

This menu lets you select the way in which the ambient temperature will be controlled.

Via $\boxed{+}$ and $\boxed{-}$ you can select the following options:

- **I-0** **(OnOff control)**: this is the traditional "threshold" control so that, on exceeding the set temperature increased by **dT** (vice versa for air-conditioning), the heating is switched off to then be turned back on when the room temperature drops below the set temperature.
  The **dT** value can be set directly via the submenu that follows this selection.

- **PID** **(P.I.D. control)**: this is an evolved algorithm that is able to keep the temperature in the environment more stable, increasing comfort; this algorithm switches the system on and off appropriately so there will be a gradual increase or decrease in the thermal (or refrigerating) power of the system itself.
  To take full advantage of its performance it needs to be suitably calibrated according to the type of environment and heating system; in the light of this, the following parameters must be set via the submenus that follow this selection:

  - **Tb** **(breadth of adjustment range)**: starting from the set temperature, Tb is the temperature range in which the heating power goes from 0% to 100%.

    For example: with the temperature (for heating) set to 20.0°C and Tb=4.0°C, the thermostat activates the heating system on 100% when T.ambient is <= 16.0°C; as this temperature increases, the system power is consequently lowered down to 0% when the ambient temperature reaches 20°C.

    The value of Tb must be set consistently with the thermal capacity of the system; in general, it is recommended to use small values of Tb for environments with a good level of thermal insulation and vice versa.

  - **t b** **(system cycle time)**: this is the time in which a cycle of regulation is completed; the shorter this time, the better the regulation but the temperature control system is under greater stress.
    This parameter setting is thus the result of a compromise between the accuracy of the regulator and the load on the system; in general, the rule is that Tb can be that much higher (and therefore put fewer demands on the system), the slower the system or the larger the environment to regulate.

Tap $\boxed{\checkmark}$ to confirm your choice.

9.8 Info

The menu lets you view information related to the thermostat.

Using ⌞+⌟ and ⌜−⌝ you can select:

• **h**: displays the number of hours that the thermostat relay has been on (the same as the number of hours of operation of the system).
The counter can be reset, for example at changes in season to differentiate between heating and air-conditioning, by pressing and holding the ⌜↰⌝ button.

• **UEr** displays the software version of the device.

9.9 Lock/unlock PIN setting

This menu lets you add/change the password to inhibit use of the thermostat.

Using ⌞+⌟ and ⌜−⌝ set the three digits of the PIN one at a time and then confirm each set digit with ⌞✓⌟.
If you wish to have free access to the thermostat (so without it prompting you for a password) it is sufficient to set the PIN to "000".

![VIMAR logo]

10. Summary table of thermostat parameters

Function	Parameters	Value range	Reso-lution	Default value
Multi-function input	IN selection	[Off, Nighttime Reduction, Activation, Heating/Air-Con.]	-	Off
Nighttime Reduction	δ_R (red. offset)	[1,..,6]°C	0.1°C	4°C
Temperature control mode	Selection TempCtrl	[Heat., Air-con.]	-	Heating
Control algorithm	Algorithm	[ON/OFF, PID]	-	ON/OFF
Hysteresis (ON/OFF)	δ_T (Differential)	[0.1,..,1]°C	0.1°C	0.2°C
Proportional band (PID)	Band	[0.5,..,5]°C	0.1°C	1°C
Adjustment period (PID)	Period	[10,..,30] minutes	1 min	20 min
Unit of measurement (temperature)	Temperature unit	[°C , °F]	-	°C
Temperature offset	T_E (Offset temp.)	[0,..,±3]°C	0.1°C	0°C
Adjustment limit range	Offset (δ_U)	[0,..,2]°C	0°C	0.5°C
PIN number	PIN	[000,..,999]	1	000
Temperature set-point	T_0 (Away-Heat.)	[TG, 10..35]°C	0.1°C	16°C
	T_2 (Comfort-Heat.)	[10,..,35]°C	0.1°C	20°C
	T_0 (Away-Aircon.)	[10,..,35,OFF]°C	0.1°C	29°C
	T_2 (Comfort-Aircon.)	[10,..,35]°C	0.1°C	25°C
	T_M (Manual-Heat.)	[10,..,35]°C	0.1°C	18°C
	T_M (Manual-Aircon.)	[10,..,35]°C	0.1°C	26°C
	T_G (Antifreeze)	[4,..,10]°C	0.1°C	5°C
Reset to default parameters	rSEt	–	–	–

Table 1: Device parameters

11. Cleaning the device

The device features a touchscreen display with capacitive buttons and therefore requires you to be gentle during the cleaning phase. Avoid using aggressive products. Clean the display with a special cloth for cleaning lenses.

12. Installation rules

Installation should be carried out in compliance with the current regulations regarding the installation of electrical systems in the country where the products are installed.

13. Regulatory compliance

LV directive.
EMC directive.
Standards EN 60730-2-9.