CHORUS

KNX Thermo ICE thermostat (surface-mounting)

GW16976CB

GW16976CN

GW16976CT

Programming manual

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2 Aim of this publication

The aim of this manual is to explain to both the installer and the end user how the thermostat works and how its various operating parameters (setpoint, control type, operating type, operating mode, etc.) can be set and regulated.

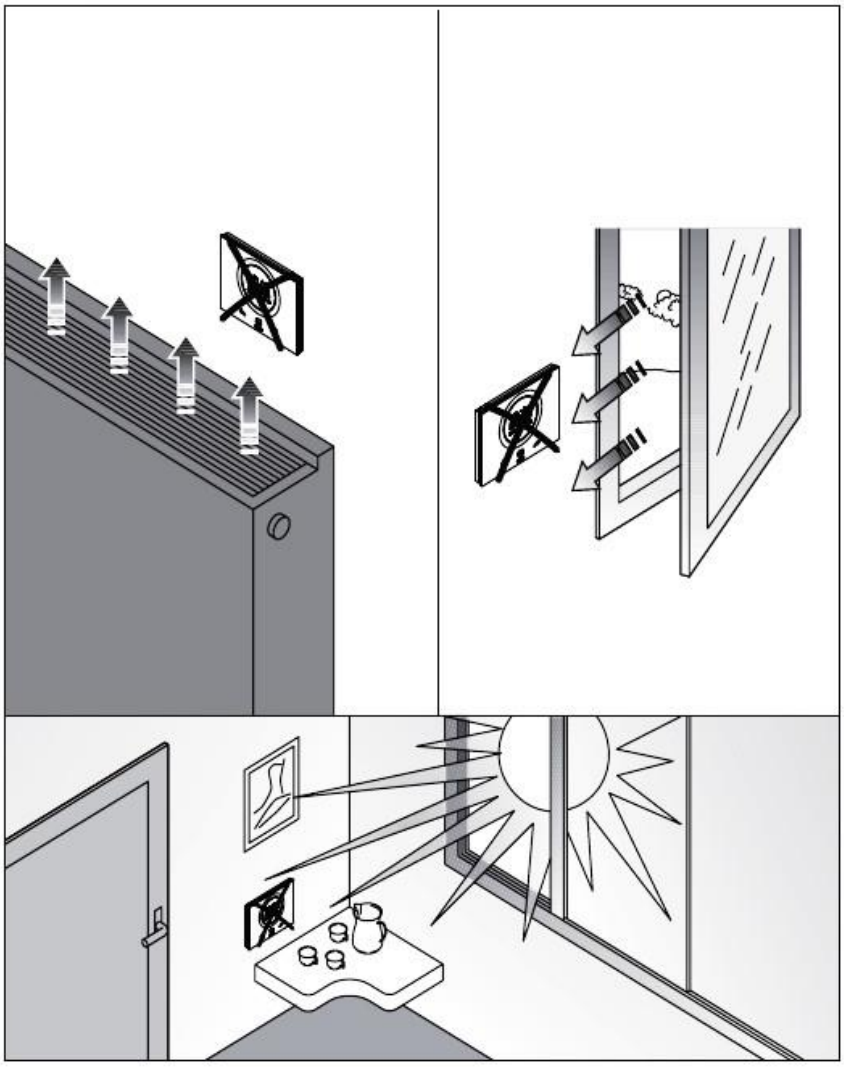
All the information concerning the connection diagrams, command descriptions and assembly instructions are contained in the installation manual which is supplied with the product and can be downloaded from the website www.gewiss.com.

3 Technical datasheet

Communication	KNX BUS, 29V DC SELV
Current absorbed by the BUS	10 mA
External power supply	110-230V AC, 50/60 Hz
External power supply absorption	< 3W (in standby < 1W)
BUS cable	KNX TP1
Command elements	3 touch commands 1 circular touch slider
Inputs	1 input for an external temperature sensor (e.g. GWA10800) (type NTC 10K)
Visualisation elements	1 backlit LED display
Measuring elements	**Temperature sensor** Measurement range: 0°C ÷ +45°C Resolution: 0.1°C Accuracy: ±0.5°C (between +10°C and +30°C)
	Relative humidity sensor Measurement range: 10-95% Resolution: 1% Measurement accuracy: ±5% (between 20% and 90%)
Temperature regulation intervals	Tanti-freeze: 5 ÷ 10°C Thigh temperature protection: 35 ÷ 40°C Other setpoints: 10 ÷ 35°C
Usage environment	Dry indoor places
Operating temperature	-5 to +45°C
Storage temperature	-25 to +70°C
Relative humidity	Max 93% (non-condensative)
Humidity regulation field	20 - 90%
Connection to the BUS	Coupling terminal, 2 pins Ø 1mm
Electric connections	Screw terminals, max. cable section: 1.5 mm2
Degree of protection	IP20
Dimensions (L x H x D)	123.3 x 95.5 x 20.6 mm
Reference Standards	Low Voltage Directive 2014/35/EU (LVD) Electromagnetic Compatibility Directive 2014/30/EU (EMC) RoHS Directive 2011/65/EU ERP Directive 2009/125/EU
Certification	KNX

4 Installation requisites: CORRECT POSITIONING

To correctly measure the controlled ambient temperature, the thermostat must not be installed in niches, near doors or windows, or next to radiators or air-conditioning units, and it must not be in the line of draughts or direct sunlight.



If necessary, the temperature measurement can be corrected via the advanced parameter P42 (with an interval of ± 5°C). This parameter can be regulated both directly (local) or via the configurator.

5 Useful terms

HVAC:	Heating / Ventilation / Air-conditioning
Local:	Action implemented directly on the thermostat
Setpoint:	The required temperature, or the operating mode in which the user can freely define the setpoint (target temperature) required
Hotel:	Type of thermostat control that gives no access to parameter modification and greatly limits the regulations that can be made locally. Aimed at accommodation facilities
Slave:	Type of thermostat control that provides some limit to thermostat use and regulation, depending on the settings defined via the configurator
Autonomous:	Type of thermostat control that gives access to all the parameters - both standard and advanced - if access has been enabled via the configurator

THE THERMOSTAT

6 The thermostat

This device is formed of two main elements: a base that must be fixed to the wall or to a 3-gang rectangular box (e.g.: GW24403), and the front part that is connected to the base and held in place by means of a screw.

It's a backlit touch LED device.

There are 3 main commands on the screen, along with the circular slider (as shown in the figure below).

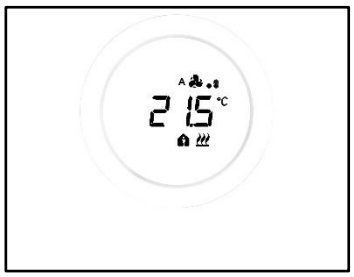
LOGO	NAME	FUNCTIONS
	MODE / Enter	*Slave* or *Autonomous* operation • MODE: to select the operating mode • MODE: to confirm the values • MODE: to select the pages (in normal operation) or parameters (in parameter setting mode) *Hotel* operation • MODE: shows the next page
	NEXT	*Slave* or *Autonomous* operation • NEXT: shows the next page • NEXT: shows the next parameter to be modified • NEXT: shows the next parameter value *Hotel* operation • Not used
	SET	*Slave* or *Autonomous* operation • SET: parameter setting mode input *Hotel* operation • Not used
	Circular slider	Backlit circular slider • Shows the previous and next value of the parameter to be modified • temporary setpoint variation • temporary fan speed variation The circular light guide that illuminates the slide area changes colour during the heating (red) and cooling/ humidity management (pink) activation phases.
8888	**Display for visualisation**	• Temperature/Relative humidity/Time • Parameter name and value • Fan speed % • Cleaning function countdown
°F	**Temperature range**	Indication of the value in degrees Fahrenheit
°C	**Temperature range**	Indication of the value in degrees Centigrade
%	**Percentage**	• Percentage of relative humidity in the atmosphere • Speed of the fan coil with continuous control algorithm 0% ÷ 100%
A 	**Fan speed**	Fan coil speed: automatic operation enabled (A) Fan coil speed: manual forcing
OFF	**Operating mode**	OFF mode: thermostat switched off and Building protection active
		Economy mode active
		Pre-comfort mode active
		Comfort mode active
	Forcing	Temporary setpoint forcing active
	Type of operation	Heating
	Type of operation	Cooling

NORMAL OPERATION

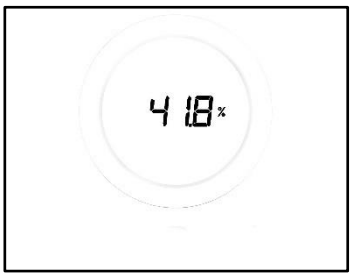
7 Normal operation

Once the thermostat has been installed, correctly programmed and integrated in the KNX system, there are three possible situations:

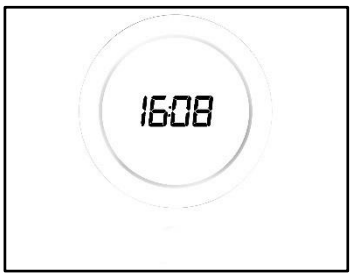
1. In standby, the plate cyclically displays the pages indicating:
   A. the temperature measured, the active operating type, the active operating mode, and the fan coil speed (if active)
   B. the relative humidity
   C. the current time



A

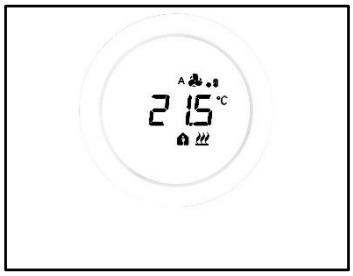


B



C

2. In standby, the plate always displays the last page visualised when the thermostat was active (e.g.: if the last page visualised was the one showing the temperature measured, this will remain visible when the thermostat goes into standby)

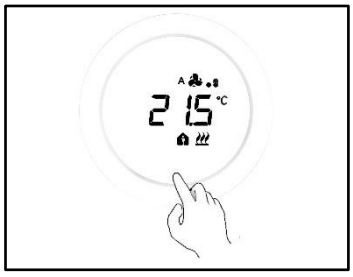


3. The standby page is deactivated and no information is displayed until the screen is activated (either by direct contact or, if the proximity sensor is enabled, by simply bringing your hand close to the screen)

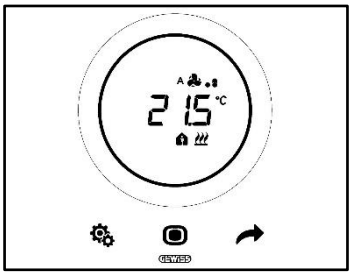
7.1 Activating the thermostat screen

The screen can always be activated by touching it with your finger:

1



2



3

If this function is enabled, the screen can be activated by just bringing your hand close to it (Enabling of the proximity sensor). When the screen is activated, the three SET ⚙, MODE ▣ and NEXT ➦ button keys are illuminated, along with the circular slider.

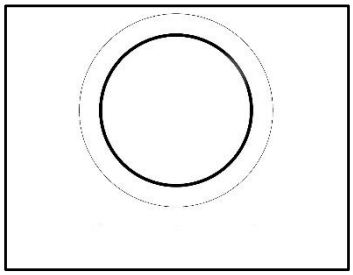
7.2 Functions of the three button keys: SET, MODE and NEXT

Once the screen has been activated, the three thermostat operation button keys light up. Their main functions are explained below:

	SET	The SET button key gives access to the Standard and Advanced Parameters menus (if enabled). The settings in this menu can be altered to change the behaviour of the thermostat. This button key cannot be used if the control type selected is "Hotel". (see ch. 8.1)
	MODE	The MODE button key is used to: • Modify the current HVAC mode (Comfort, Pre-Comfort, Economy, OFF – Autonomous control type, HVAC operating mode) • Switch from the predefined HVAC mode to OFF mode and vice versa (Slave control type, HVAC operating mode) • Confirm a new value entered in one of the thermostat menus With Hotel control type: • Used to move between the screen pages (the one showing the temperature and the one showing the fan coil speed. The pages showing humidity and the current time will only be displayed if cyclical page visualisation has been enabled via the configurator)
	NEXT	The NEXT button key is used to: • change the page displayed on the screen, moving from one to the other • change the value displayed on the screen, moving on to the next one This button key cannot be used if the control type selected is "Hotel" (see ch. 8.1)

7.3 The circular slider

In the middle of the thermostat plate there is a circular element showing all the values and logos of the thermostat. This tool is called a "circular slider".



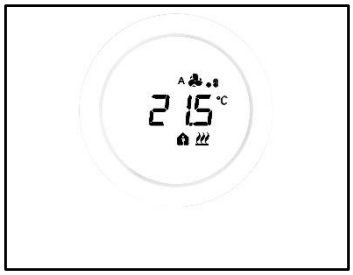
The circular slider is used to:

- change (increase or decrease) the values displayed on the screen
- force the setpoints directly from the temperature page (if enabled)
- regulate the HVAC mode setpoints (if enabled)
- force the fan coil speed directly from the relative page (if enabled)
- move between the various pages of the standard and advanced parameters (if enabled)

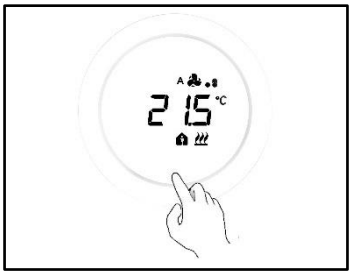
7.4 Choosing which info page to display on the screen

Once the screen has been activated, you can choose which page to visualise. Bear in mind that accessing the standard or advanced SET menu directly from the relative info page is, in practice, a short cut that takes you straight to the parameters (standard or advanced) for that particular function or topic (e.g.: if the SET menu is accessed from the page showing the humidity level, the first parameter displayed will be the first one relating to humidity management, rather than parameter P1).

1. Activating the thermostat by touching it

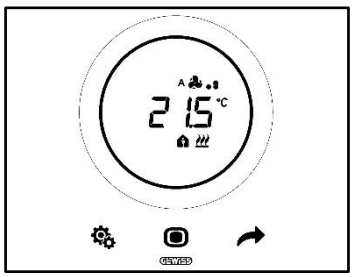


1

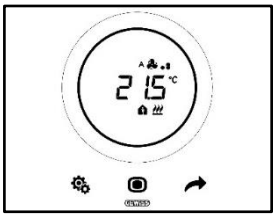


2

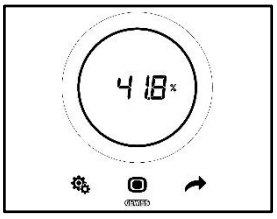
2. The first page displayed is the one showing the temperature measured, the operating type, the operating mode, and the fan coil speed (if active)



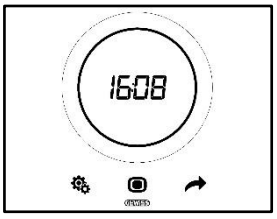
3. Using the NEXT button key, you can move from one info page to another (from the one showing the temperature, to the one showing humidity or the one showing the time and the one showing the fan coil speed, if active)



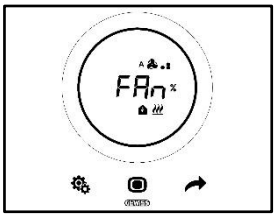
Temperature



Humidity



Hours

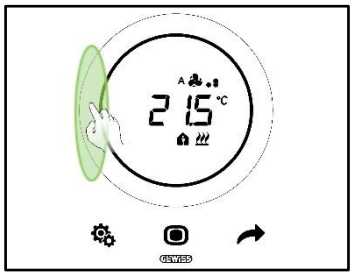


Fan coil

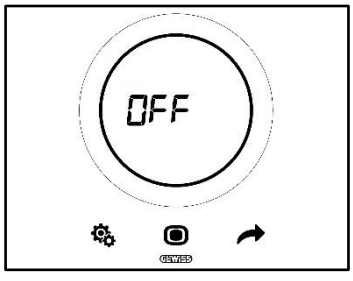
7.5 Deactivating standby

If you want to deactivate the standby pages and keep the thermostat screen OFF while it's not being used, proceed as follows:

1. Activate the thermostat screen
2. Press the left-hand part of the circular slider for at least 3 seconds



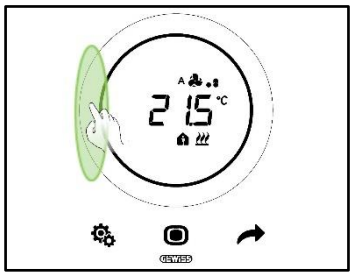
3. The word OFF will appear on the screen



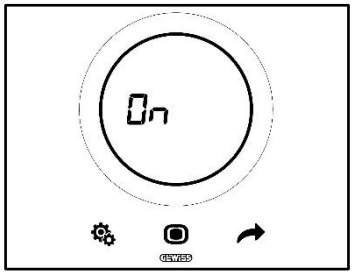
7.6 Reactivating standby

If you want to reactivate the standby pages after having deactivated them, proceed as follows:

1. Activate the screen
2. Press the left-hand part of the circular slider for at least 3 seconds



3. The word ON will appear on the screen



7.7 Modifying the pre-defined setpoint

The pre-defined setpoint can be modified (from both HVAC operating mode and Setpoint operating mode) if this option has been enabled via the configurator (see ch. 9.3.5.)

7.8 Increasing or reducing the fan coil speed

If the system is fitted with a fan coil, its speed can be increased or reduced if this option has been duly enabled via the configurator.

For the detailed explanation, refer to ch. 9.4.1.

7.9 Changing the HVAC operating mode

If the thermostat has been set to work in HVAC mode and the control type selected is Autonomous, you can switch locally between the three different HVAC operating modes (Comfort, Pre-Comfort, Economy). See ch. 8.3.

For the detailed explanation, refer to ch. 9.3.1.

7.10 Switching off the thermostat

If you want to switch off the thermostat, just turn the operating mode to OFF OFF, as explained in chapters 9.3.1 and 9.3.2.

7.11 Reactivating the thermostat

If the OFF OFF operating mode has been selected but you now want to reactivate the system, just switch the mode again, choosing an option other than OFF OFF. See chapters 9.3.1 and 9.3.3.

CONTROL TYPE, OPERATING TYPE, OPERATING MODE AND ALGORITHMS

8 Structure and operation

When using and setting the thermostat, it's necessary to choose from a series of operating types and modes.

The settings made will affect how the user interacts with the thermostat, and the flexibility of the local functions.

1 – Control type

First of all, the thermostat has three control types:

- Autonomous
- Slave
- Hotel

The "Autonomous" control type allows complete local control of the thermostat. The "Slave" type allows more limited control. And finally the "Hotel" type imposes even stricter limitations on the modifications that can be made locally. The latter type of control is aimed in particular at accommodation facilities.

CONTROL TYPE		
AUTONOMOUS	SLAVE	HOTEL

2 – Operating type

The thermostat can be used in two different functions:

TYPE OF OPERATION	
HEATING	COOLING

3 – Operating mode

The thermostat can then be set to work in six different operating modes. There are four HVAC operating modes: Comfort, Pre-Comfort, Economy, OFF. There are two Setpoint modes: Manual and OFF.

Each mode has different operating characteristics and parameters.

OPERATING MODE					
COMFORT	PRE-COMFORT	ECONOMY	OFF	MANUALLY	OFF
HVAC				SETPOINT	

4 – Control algorithms

The thermostat can autonomously manage temperature control thanks to the definition of specific algorithms. The choice of algorithm depends first of all on the type of system created (2-way or 4-way). Generally speaking, the parameters that can be selected for heating and/or cooling are:

CONTROL ALGORITHMS
TWO POINTS ON-OFF
TWO POINTS 0% - 100%
PROPORTIONAL-INTEGRAL WITH PWM CONTROL
CONTINUOUS PROPORTIONAL INTEGRAL
FAN COIL WITH 3-SPEED REGULATION (ON-OFF)
FAN COIL WITH CONTINUOUS SPEED REGULATION (0% - 100%)

8.1 Control type: Autonomous – Slave – Hotel

The thermostat has three different control types:

- **Autonomous**
- **Slave**
- **Hotel**

The specific characteristics of each type are listed below:

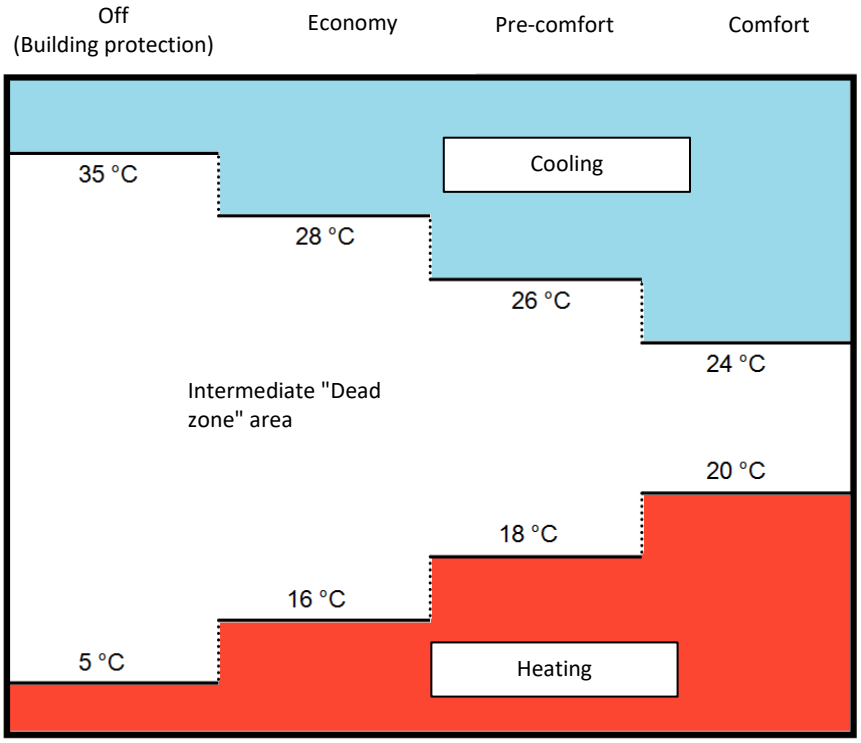
CONTROL TYPE:	CHARACTERISTICS:
Autonomous:	The device autonomously manages the temperature adjustment system (or part of it) without the aid of the timed thermostats connected to it, that control parts of the system. This configuration provides a single control centre for the ambient temperature.
Slave:	The device is configured so it can manage the temperature adjustment system with the aid of a Master device such as a timed thermostat. With this configuration, the device does not control the entire system but only a part of it (a "zone"); there is a Master device in the system that controls its operating mode and type. In this case, the thermostat controls the temperature in the room where it is located, whereas it is the Master device that defines the operation set by the user. The HVAC mode of the device cannot be modified locally.
Hotel:	The device has the same characteristics as the *slave* control type, plus further graphic interface simplifications and thermostat usage limitations appropriate for the hotel context in particular. Use the central button key (MODE) to switch between the thermostat pages in order to: • Personalise the setpoint of the temperature and fan speed (only if the control algorithm selected is the fan coil type) • Switch the thermostat off or enable automatic control mode It is not possible to access the menus to configure the parameters (whether standard or advanced).

8.2 *Type of operation: Heating / Cooling*

The KNX Thermo Ice has two different and alternative types of operation: heating and cooling.

Type of operation	
Heating	Cooling

The switch from one type of operation to the other can be implemented by the thermostat itself. In this case, the switch is automatic. The thermostat defines which of the two types of operation to be used on the basis of the principle of the intermediate area or “dead zone”. The user must define the setpoints (temperature thresholds) of the heating and cooling HVAC modes. When one of the two external setpoints is exceeded, the switch is made from one type of operation to the other (see the figure below).



Alternatively, the user can switch from one type to the other manually, using the relative standard parameter (see ch. 11.2.4).

8.3 Operating mode: HVAC - Setpoint

The KNX Thermo Ice can be used with various operating modes. They can be divided into two groups: HVAC modes and SETPOINT modes.

These are the HVAC modes:

HVAC
Comfort
Pre-comfort
Economy
OFF (Anti-freeze / High temperature protection)

There are only two SETPOINT modes:

SETPOINT
Manually
OFF

In the HVAC modes, an HVAC setpoint must be pre-defined for each of the first three HVAC modes (Comfort, Pre-comfort and Economy). If enabled, the user can modify the pre-defined setpoint manually by means of local forcing (or by directly altering the pre-defined setpoint if the circular slider is enabled for this function).

Comfort mode is designed to ensure the greatest comfort possible in a room where the temperature is controlled by the KNX Thermo Ice. The setpoint defined will therefore be the highest of the various HVAC modes when the system is in Heating operation, and the lowest when in Cooling. This is the most costly operating mode.

Pre-Comfort is designed to be used when there is nobody currently in the room where the temperature is controlled by the KNX Thermo Ice, but it is expected that someone will enter the room shortly. This mode therefore brings the room temperature to the setpoint of Comfort mode. The aim is to begin reducing the gap between the real temperature and the Comfort mode setpoint.

Economy mode is designed to be used when there is nobody in the room where the temperature is controlled by the KNX Thermo Ice, and it is not expected that someone will enter the room in the short term. This is the least comfortable operating mode, but also the least expensive.

OFF mode merely safeguards the systems, protecting them from low and high temperatures. The systems remain OFF, and are only activated if the temperature reaches the danger thresholds that have been set.

In any case, the user can switch from one HVAC mode to another locally if the thermostat is set with the Autonomous control type.

There are two SETPOINT modes - **Manual** and **OFF**. **Manual** mode leaves the user free to define the value of the setpoint to be reached. This is done locally, via the circular slider. **OFF** mode, on the other hand, works the same as the HVAC **OFF** mode.

8.4 Control algorithms

The device implements an autonomous control logic by using various control algorithms.

These are the same for both operating types - Heating and Cooling.

CONTROL ALGORITHMS
TWO POINTS ON-OFF
TWO POINTS 0% - 100%
PROPORTIONAL-INTEGRAL WITH PWM CONTROL
CONTINUOUS PROPORTIONAL INTEGRAL
FAN COIL WITH 3-SPEED REGULATION (ON-OFF)
FAN COIL WITH CONTINUOUS SPEED REGULATION (0% - 100%)

For more details about the characteristics of each of these parameters, refer to the relative chapter (see the Annex).

USING AND REGULATING THE THERMOSTAT (AUTONOMOUS AND SLAVE)

9 Using and regulating the thermostat

9.1 Introduction

As indicated in the previous chapter, three different control types can be selected for the KNX Thermo Ice. This chapter explains how the thermostat works with the Autonomous and Slave control types. If a certain function changes in Slave mode compared with Autonomous mode, or is limited or cannot be accessed at all, an explanation will be provided separately for the Slave control type. If there is no separate explanation, this means there is no difference between Autonomous and Slave.

The Hotel control type will be described further on.

9.2 Switching from Heating to Cooling and vice versa

As explained in ch. 8.2, the switch from one operating type to the other can be made:

- Automatically
- Manually

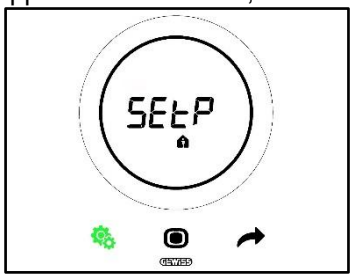
The automatic switch is made on the principle of the so-called “dead zone”. Using the parameters set, the thermostat switches from one type of operation to the other when one of the two thresholds is exceeded.

The manual switch requires the direct physical intervention of the user. It can be commanded from the local standard SET menu (if this has been enabled via ETS).

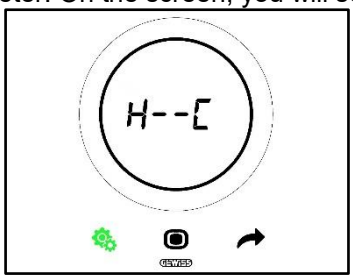
9.2.1. How to change the type of operation (Heating-Cooling)

Prerequisites for the installer: 1. Local parameter modification: enabled 2. Operating type setting: only via the local menu or the BUS

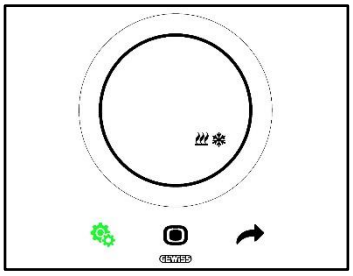
1. Activate the thermostat screen
2. Keep the SET button key pressed until it turns green . You can now access the standard parameters. The letters “SEtP” will appear on the screen, indicating access to the standard parameters



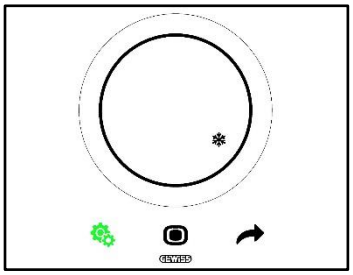
3. Use the NEXT button key to scroll through the pages until you reach the “Heating/Cooling/Automatic” parameter. On the screen, you will see “H - - C” (Heating/Cooling)



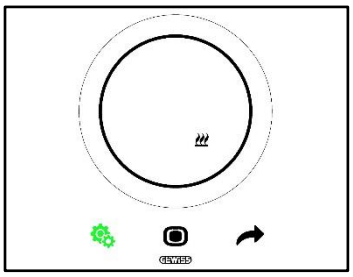
4. Press the MODE button key to access the “Heating/Cooling/Automatic” parameter
5. The Heating and Cooling logos will flash on the screen



Dead Zone – The switch between Cooling and Heating is made automatically (see ch. 8.2)



Cooling active



Heating active

6. Use the circular slider or the NEXT button key to move from one icon to the other. Once the operating type has been selected, the MODE button key will begin flashing
7. Confirm your choice by pressing the MODE button key
8. The thermostat will return to the “H - - C” page
9. Use the SET button key to bring the thermostat back to the Homepage

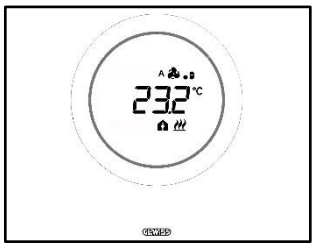
9.3 Operating mode: HVAC vs. Setpoint

9.3.1. Changing the HVAC mode (control type: Autonomous)

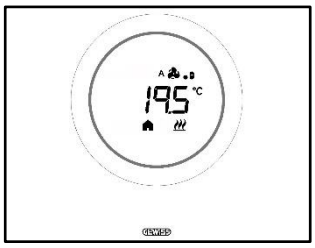
Prerequisites for the installer:

- Control type: Autonomous
- Operating mode: HVAC

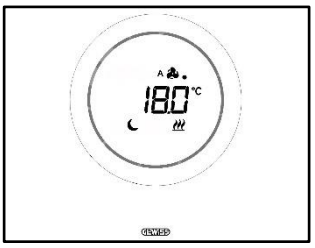
1. Activate the thermostat screen
2. Use the MODE button key to switch from one operating mode to another



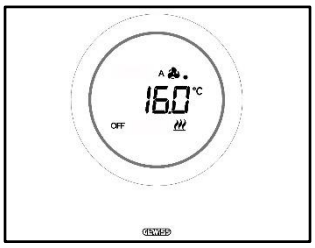
HVAC – Comfort Heating



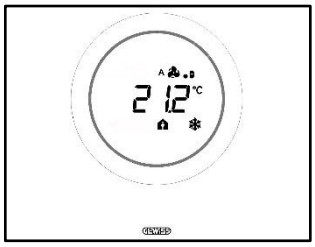
HVAC – Pre-comfort Heating



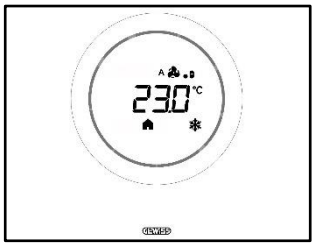
HVAC – Economy Heating



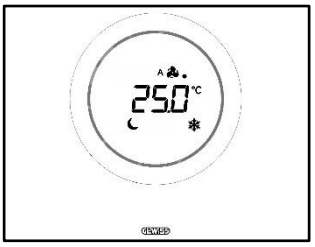
HVAC – OFF Heating



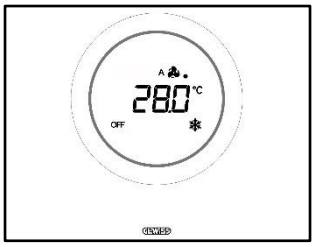
HVAC – Comfort Cooling



HVAC – Pre-comfort Cooling



HVAC – Economy Cooling



HVAC – OFF Cooling

3. Every time the MODE button key is pressed, you will see the reference temperature of the HVAC mode visualised

4. The mode is confirmed automatically after 2 seconds, returning to the visualisation of the measured temperature

9.3.3. Defining which HVAC mode should be used with Slave control

Prerequisites for the installer:

- Control type: Slave
- Operating mode: HVAC

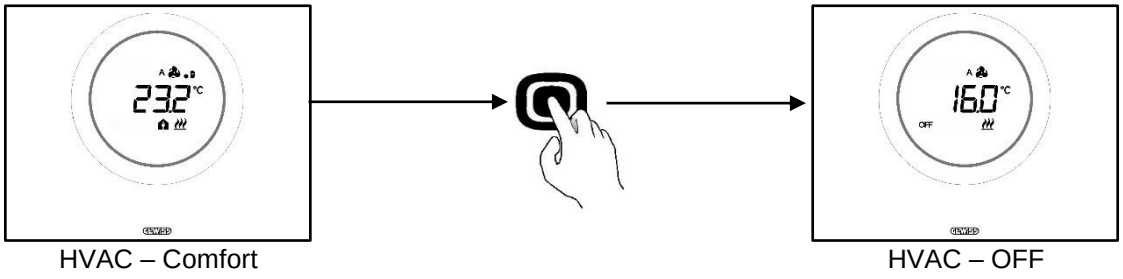
The HVAC operating mode that the thermostat uses when the Slave control type is selected is defined by the Master device (supervisor or thermostat).

9.3.4. From the predefined HVAC mode to OFF mode (control type: Slave)

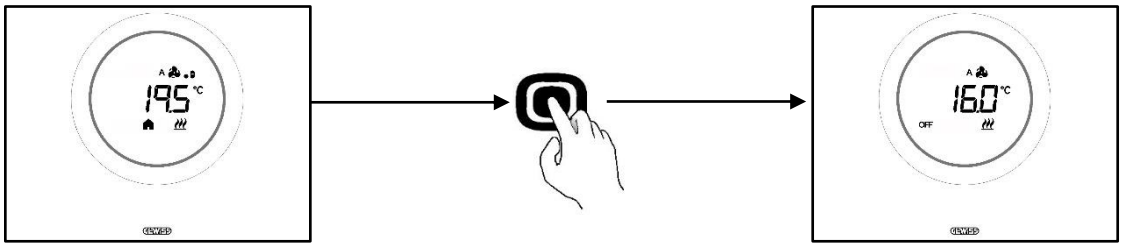
Prerequisites for the installer:

- Control type: Slave
- Operating mode: HVAC
- Local switch-off is permitted

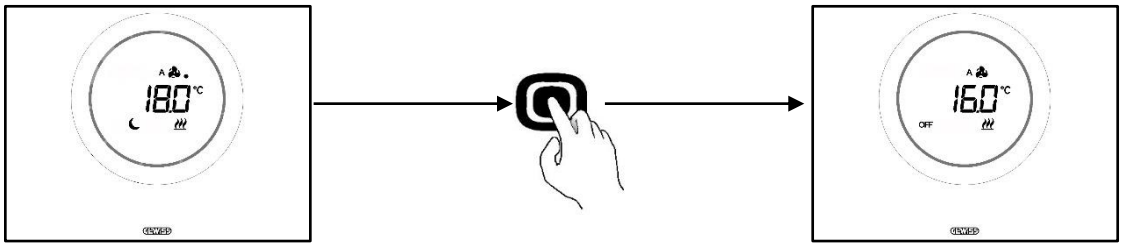
1. Activate the thermostat screen
2. Use the MODE button key to switch the operating mode from the predefined HVAC one to OFF



HVAC – Comfort HVAC – OFF



HVAC – Pre-comfort HVAC – OFF



HVAC – Economy HVAC – OFF

9.3.5. Reactivate the HVAC mode after switching off the thermostat (control type: Slave)

Prerequisites for the installer:

- Control type: Slave
- Operating mode: HVAC
- Local switch-off must be permitted

If the user has switched the thermostat off locally, passing from the predefined HVAC mode to OFF mode, the HVAC mode can be reactivated locally.

1. Activate the thermostat screen
2. Press the MODE button key. The thermostat will return to the predefined HVAC operating mode

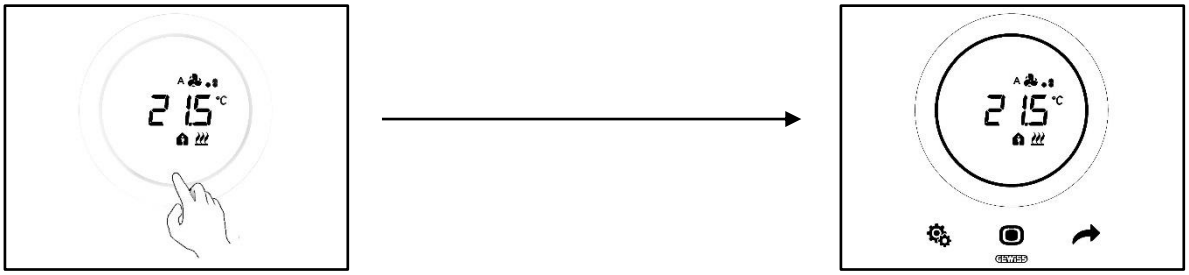
9.3.6. Forcing the setpoint

Prerequisites for the installer:

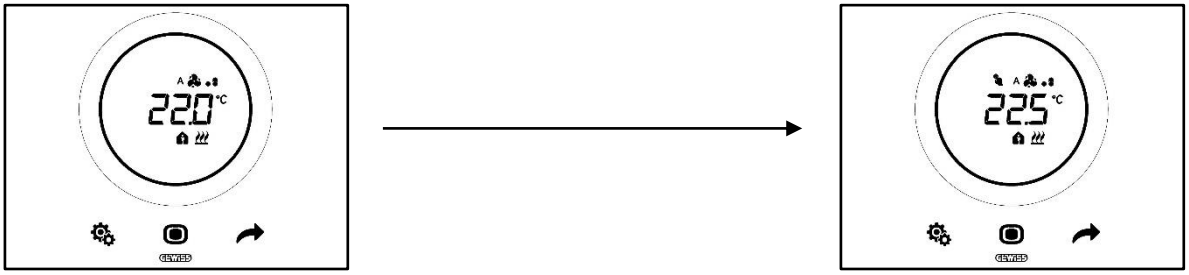
- Setpoint variation gap for manual forcing ≠ ±0

The user can force the pre-defined setpoint with both the Autonomous and Slave control types and in both HVAC and Setpoint operating mode (if the pre-condition indicated above is respected).

1. Activate the thermostat screen



2. Use the circular slider. The pre-defined setpoint will appear on the screen. Use the slider to change this value



3. Once the new setpoint has been selected, it will be confirmed when the thermostat has been left untouched for 2 seconds

This procedure is valid for the HVAC modes (apart from OFF) and Setpoint modes as well: in the latter case, the setpoint is entirely free and can be managed by the user.

Note 1:

If the selected operating mode is Setpoint mode, bear in mind that the following rules must be respected when defining the setpoint:

$10°C < T_{operation} < 35°C$ (in both heating and cooling)

* "T" indicates the general value of the setpoint

Furthermore, if the dead zone is active, the following constraint must also be respected:

$T_{heating\ operation} < T_{cooling\ operation} - 1°C$

* "T" indicates the general value of the setpoint

Note 2:

If the function of the circular slider (for temperature regulation) is set for direct setpoint modification, the user does not make a temporary forcing when modifying the setpoint; in this case, he/she modifies the predefined setpoint directly.

9.3.7. Defining the setpoint values of the HVAC modes

The various predefined setpoints for the HVAC modes can be modified via the standard SET menu for the Comfort, Pre-comfort and Economy operating modes (see chapters 11.2.1, 11.2.2, 11.2.3), whereas the advanced parameter P1 must be accessed to modify the setpoints for the OFF mode.

The following rules must be respected when defining these setpoints:

	Operating mode: Comfort/Pre-comfort/Economy/OFF
HEATING	$T_{anti\text{-}freeze} < T_{economy} < T_{pre\text{-}comfort} < T_{comfort}$
COOLING	$T_{comfort} < T_{pre\text{-}comfort} < T_{economy} < T_{high\ temperature\ protection}$

	Operating mode: Comfort/Pre-comfort/Economy
HEATING	$10°C < T_{economy} < T_{pre\text{-}comfort} < T_{comfort} < 35°C$
COOLING	$10°C < T_{comfort} < T_{pre\text{-}comfort} < T_{economy} < 35°C$

Furthermore, if the dead zone is active, the following constraint must also be respected:

$$T_{heating\ comfort} < T_{cooling\ comfort} - 1°C$$

* “T” indicates the general value of the setpoint of the mode

The various setpoints must always respect the order shown above. The setpoint of an operating mode cannot therefore change position. The Tanti-freeze and Thigh temperature protection parameters are the ones set to safeguard the domestic systems when the thermostat is set to the OFF operating mode. If the room reaches one of the two critical temperature values, the thermostat activates the system to avoid any damage to it.

9.3.8. Regulating the setpoint forcing gap

The setpoint regulation gap can be limited via the configurator. Contact your installer.

9.4 Managing the fan coil

The KNX Thermo Ice can be used to manage the speed of the system fan coil.

Prerequisites for the installer:

- Control algorithm:
  - Fan coil with 3-speed regulation (ON-OFF)
  - Fan coil with continuous speed regulation (0% -100%)

9.4.1. Forcing the fan coil speed locally

If the algorithm selected for fan coil control is “Fan coil with 3-speed regulation”, the fan speed can be adjusted on a scale with three stages:

Speed 1 (V1):

Speed 2 (V2):

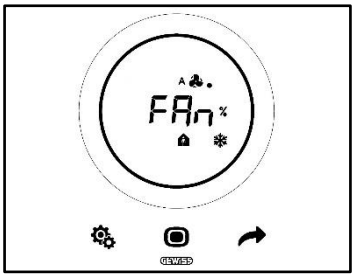
Speed 3 (V3):

If, on the other hand, the algorithm is “Fan coil with continuous speed regulation (0-100%)”, the fan speed can be adjusted on a continuous scale ranging from 0% to 100%. This scale is split into three different speed thresholds (merely to make it simpler to represent in graphic form), as indicated below:

Speed x%:	0-32%	
Speed x%:	33-65%	
Speed x%:	66-100%	

9.4.1.1. FORCING THE FAN SPEED WITH 3-SPEED REGULATION

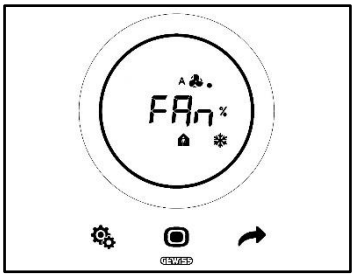
1. Activate the thermostat
2. Scroll through the pages shown on the screen using the NEXT button key, until you find the page relating to fan coil management. The word Fan will appear on the screen



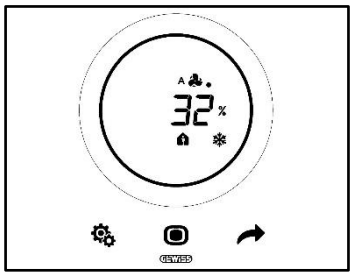
3. Use the circular slider or the NEXT button key to change the speed threshold
4. The logo indicating the fan speed will begin flashing
5. Confirm your choice by pressing the MODE button key

9.4.1.2. FORCING THE FAN SPEED WITH CONTINUOUS SPEED REGULATION

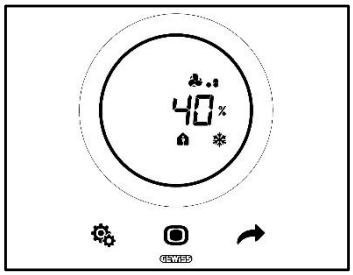
1. Activate the thermostat
2. Scroll through the pages shown on the screen using the NEXT button key, until you find the page relating to fan coil management. The word Fan will appear on the screen



3. The next page is the one showing the fan speed



4. Use the circular slider or the NEXT button key to change the fan speed
5. Depending on the percentage defined, the value will fall into one of the three speed thresholds indicated above. If it's in the first (0-32%), a single spot will appear next to the fan symbol; three spots if it's in the second (33-65%); six spots if it's in the third (66-100%).



6. Confirm your choice by pressing the MODE button key
7. Press the NEXT button key to return to the Homepage

9.5 Managing humidity

The KNX Thermo Ice can be used to monitor and manage the percentage of humidity in the room where it's installed.

The thermostat has its own internal sensor. The system can also be equipped with an external KNX sensor. The installer can add an external sensor if required, and establish the weight to be attributed to the measurements taken with the external one and the internal one.

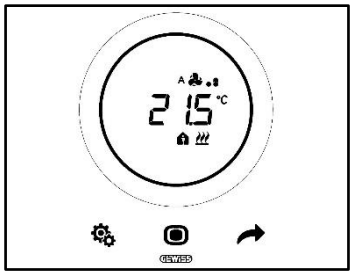
9.5.1. Visualising the level of humidity measured

Prerequisites for the installer:

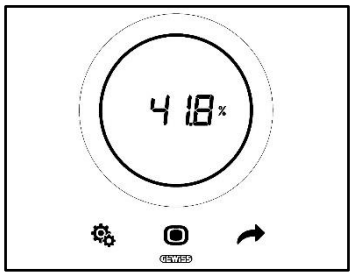
- Alternated display of the information in standby: enabled
- Display in standby: enabled

The thermostat cyclically shows the information regarding the temperature measured, the humidity level measured, and the current time.

Activate the screen and use the NEXT button key to manually select the page showing the humidity level measured.



1



2

9.5.2. Managing the humidity thresholds

The configurator can be used to enable up to five relative humidity thresholds that specific actions or system management changes can then be associated with. All these settings are managed via the configurator. If you want to modify the actions associated with the humidity thresholds, or activate/deactivate them, contact your installer.

If the advanced parameters are enabled, the humidity thresholds can be enabled and disabled locally (see P29-P30-P31-P32-P33).

9.6 Dew point

The dew point is the temperature that the air must reach in order to reach saturation point, where condensation occurs (100% relative humidity).

An alarm can be associated with this value threshold (via the configurator).

It is also possible to intervene locally to alter the three advanced parameters that affect the management of this alarm:

Prerequisites for the installer:

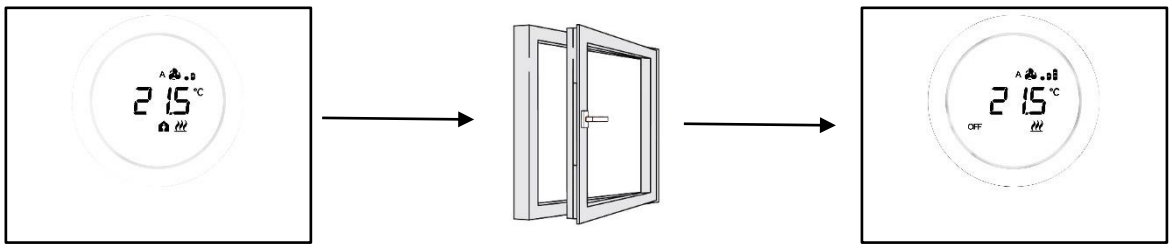
- Control type: Autonomous
- Local parameter modification: standard and advanced parameters

ADVANCED PARAMETERS FOR MANAGING THE DEW POINT	
P39	Dew point alarm enabling
P40	Dew point alarm signal limit
P41	Dew point alarm threshold hysteresis

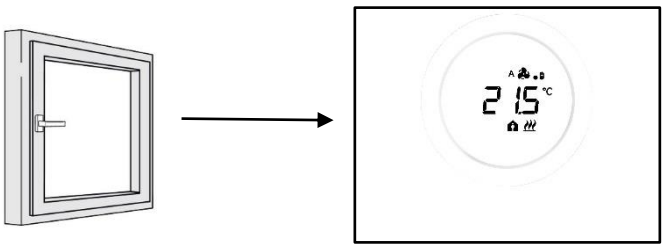
For a more detailed explanation of each of these advanced parameters, refer to the paragraph dedicated to the advanced parameters.

9.7 Window contact

To ensure greater energy efficiency, there is a function to detect the window contact status. If this function is correctly implemented, the thermostat will alter the system operating mode if the window contact is open. Regardless of the HVAC operating mode assumed by the device, the thermostat forces the current mode and switches it to OFF if the window contact is open. If the defined operating mode is Setpoint, the thermostat forces operation to OFF (BUILDING PROTECTION). The thermostat resumes the previous operating mode when the window contact is closed again.



1 2 3



4 5

MAINTENANCE

10 Maintenance

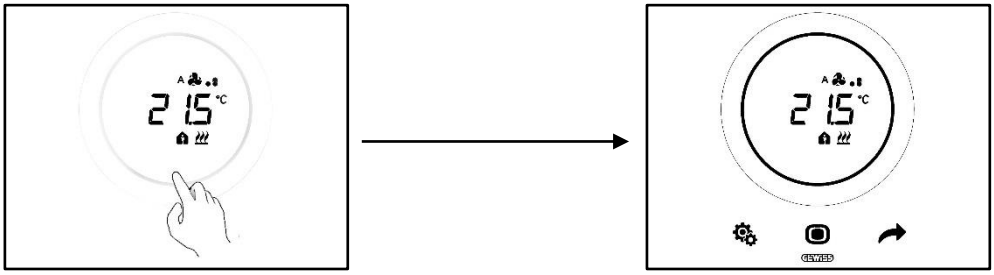
10.1 Plate cleaning

Prerequisites for the installer:
• Plate cleaning function: enabled

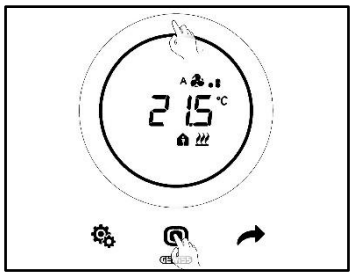
It may be necessary to clean the thermostat plate from time to time. For this task to be performed without activating the button keys, the specific “plate cleaning” function must be activated. When this function is activated, the screen sensors remain disabled for a certain time (the default setting is 30 seconds) so that the plate can be cleaned.

To activate this function, proceed as follows:

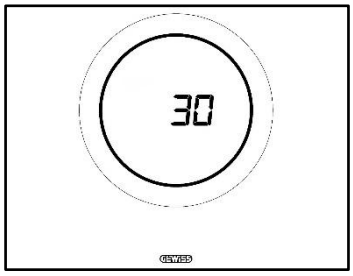
1. Activate the thermostat



2. Press the MODE button key and the upper part of the circular slider simultaneously



3. The enabling of the cleaning function is indicated by a beep. The countdown then begins, with the values shown on the screen (the predefined value is 30 seconds). Within this time, the plate can be touched without activating the thermostat



4. Another beep indicates the end of the countdown and the return to normal thermostat operation

PARAMETERS:

STANDARD AND ADVANCED

11 Parameters: standard and advanced

Some aspects of thermostat operation can be regulated locally, using the standard and advanced parameters. These parameters can only be accessed if they have been enabled via the configurator.

PREREQUISITES		
Control type:	Autonomous or Slave	
Accessing the standard parameters:	Local parameter modification:	"Standard parameters only"
		"Standard or advanced parameters"
Accessing the advanced parameters:	Local parameter modification: "Standard or advanced parameters"	

11.1 Standard parameters

The standard parameters are the ones used to:

- Regulate the HVAC setpoints
- Regulate the hour and minutes
- Choose between daylight saving time and standard time
- Switch between Heating, Cooling and AUTO

List of standard parameters:

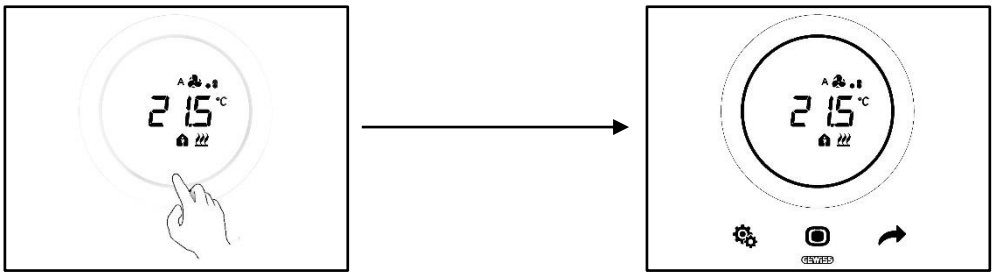
STANDARD PARAMETERS:

- SETPOINT/SETPOINT HVAC_COMFORT
- SETPOINT HVAC_PRE-COMFORT
- SETPOINT_HVAC_ECONOMY
- OPERATING MODE: HEAT – COOL
- REGULATION: HOURS
- REGULATION: MINUTES
- CHOICE OF DAYLIGHT SAVING TIME OR STANDARD TIME

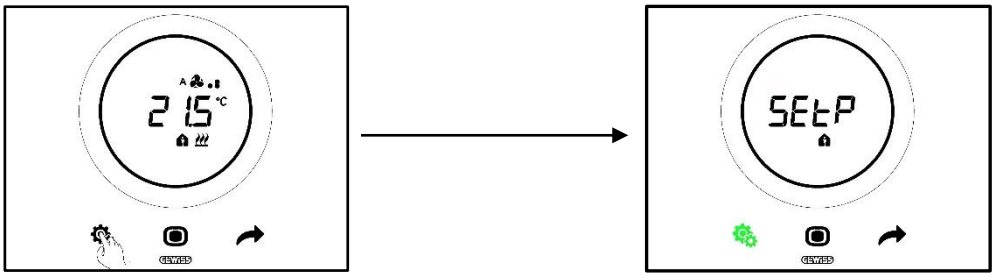
11.2 Accessing the standard SET menu

To access the standard SET menu, proceed as follows:

1. Activate the thermostat



2. Press the SET button key briefly to access the standard SET menu. The SET button key will turn green



There are now three possible scenarios, depending on how the thermostat has been set:

Situation A	CONTROL TYPE:	Autonomous or Slave
	OPERATING MODE:	HVAC
Situation B	CONTROL TYPE:	Autonomous
	OPERATING MODE:	Setpoint
Situation C	CONTROL TYPE:	Slave
	OPERATING MODE:	Setpoint

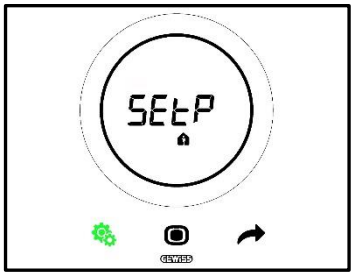
SITUATION A

If the thermostat is set with:

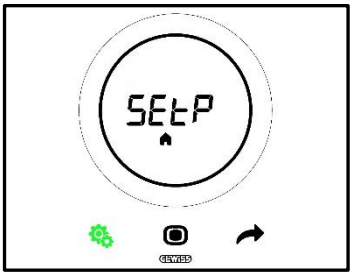
SITUATION A	
CONTROL TYPE:	Autonomous or Slave
OPERATING MODE:	HVAC

The standard SET menu will appear as follows:

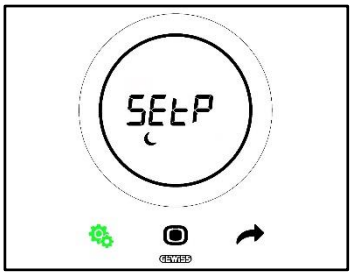
The first page to be displayed is the one for Setpoint regulation in HVAC Comfort operating mode. Use the NEXT button key to move between the various sub-menus of the page, and from one page to another. Once you have scrolled the HVAC sub-menus (Comfort, Pre-comfort, Economy), you will move on to the Operating Type menu (Heat – Cool), then the clock menu (hours, minutes) and finally the time convention menu (daylight saving time / standard time).



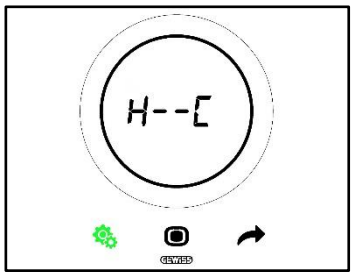
Comfort setpoint



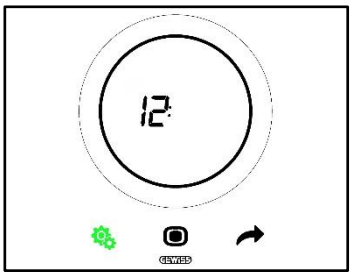
Pre-comfort setpoint



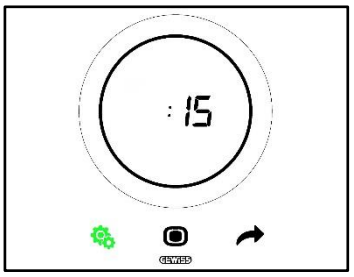
Economy setpoint



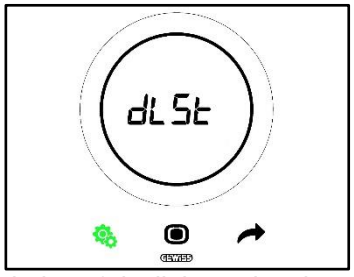
Operating type
(Heat - Cool)



Hour regulation



Minute regulation



Choice of daylight saving time /
standard time

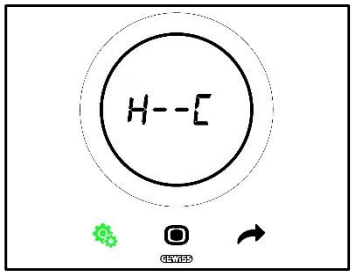
SITUATION B

If the thermostat is set with:

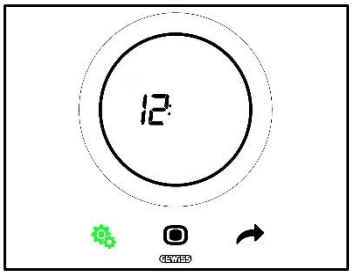
SITUATION B	
CONTROL TYPE:	Autonomous
OPERATING MODE:	Setpoint

The standard SET menu will appear as follows:

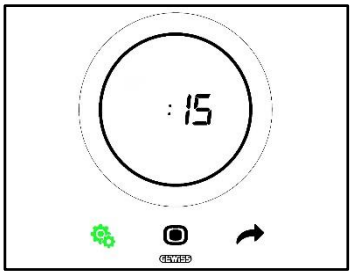
The first page displayed is the one showing Operating Type (Heat – Cool). Use the NEXT button key to move from one page to another. You will move from the Operating Type menu (Heat – Cool) to the clock menu (hours, minutes) and then the time convention menu (daylight saving time / standard time).



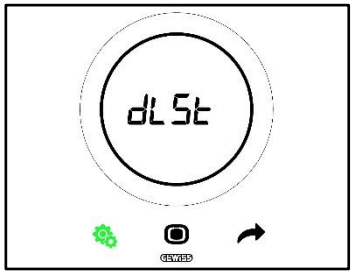
Operating type
(Heat - Cool)



Hour regulation



Minute regulation



Choice of daylight saving time /
standard time

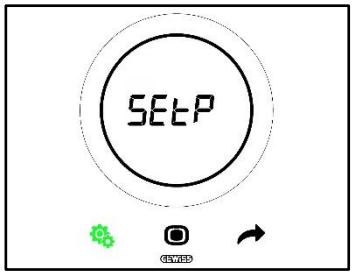
SITUATION C:

If the thermostat is set with:

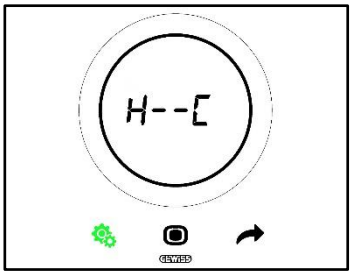
SITUATION C	
CONTROL TYPE:	Slave
OPERATING MODE:	Setpoint

The standard SET menu will appear as follows:

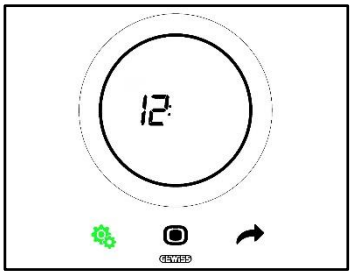
The first page displayed is the one for Setpoint regulation (SEtP). On the SEtP page, you can directly modify the thermostat setpoint rather than apply a forcing action (forcing is obtained via the page showing the measured temperature, using the circular slider if it has been enabled for forcing only). Use the NEXT button key to move from one page to another. You will move from the Setpoint (SEtP) menu to the Operating Type menu (Heat – Cool), the clock menu (hours, minutes) and finally to the time convention menu (daylight saving time / standard time).



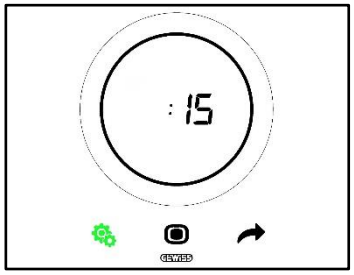
Setpoint regulation



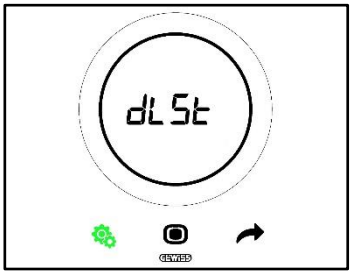
Operating type
(Heat - Cool)



Hour regulation



Minute regulation



Choice of daylight saving time /
standard time

11.2.1. Standard parameter: SETP_TComfort

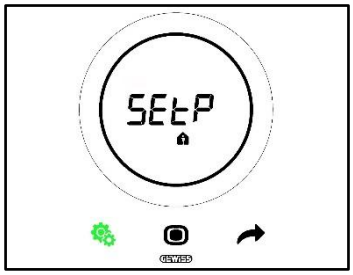
This standard parameter is used to modify the predefined setpoint of the HVAC Comfort mode or of the Setpoint operating mode (bear in mind that there are some general rules that must be respected when modifying the setpoints of the HVAC modes. See ch. 9.3.6.).

First situation:

- **Control type: Autonomous or Slave**
- **Operating mode: HVAC**

Procedure:

1. Once the standard SET menu has been activated, the screen will show the SEtP_TComfort page



2. Press the MODE button key to access the parameter in question
3. The setpoint of the Comfort mode will flash on the screen. Use the circular slider to regulate this value

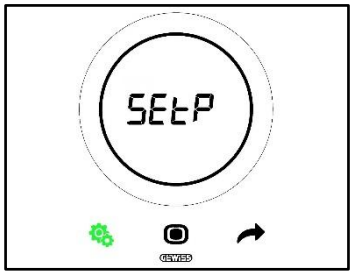
4. Once you have changed the setpoint, the MODE button key will start to flash
5. Press the MODE button key to confirm the new setpoint
6. The thermostat will now return to the SEtP page
7. Press the SET button key to return to the page showing the measured temperature

Second situation:

- **Control type: Slave**
- **Operating mode: Setpoint**

Procedure:

1. Once the standard SET menu has been activated, the screen will show the SEtP page



2. Press the MODE button key to access the parameter in question
3. The pre-defined setpoint will flash on the screen. Use the circular slider to regulate this value

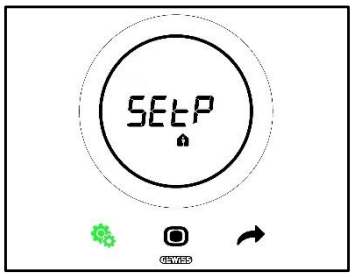
4. Once you have changed the setpoint, the MODE button key will start to flash
5. Press the MODE button key to confirm the new setpoint
6. The thermostat will now return to the SEtP page
7. Press the SET button key to return to the page showing the measured temperature

11.2.2. Standard parameter: SETP_TPre-comfort

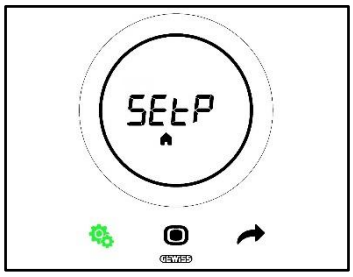
This standard parameter is used to modify the predefined setpoint of the HVAC Pre-comfort mode (bear in mind that there are some general rules that must be respected when modifying the setpoints of the HVAC modes. See ch. 9.3.6.).

Procedure:

1. Once the standard SET menu has been activated, the screen will show the SEtP_TComfort page



2. Use the NEXT button key to move to the SEtP_TPre-comfort page



3. Press the MODE button key to access the parameter in question
4. The setpoint of the Pre-comfort mode will flash on the screen. Use the circular slider to regulate this value

5. Once you have changed the setpoint, the MODE button key will start to flash
6. Press the MODE button key to confirm the new setpoint
7. The thermostat will now return to the SEtP page

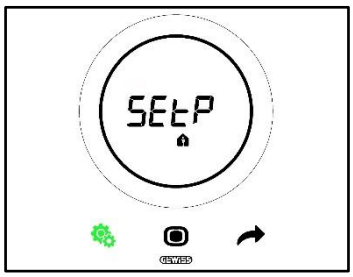
8. Press the SET button key to return to the page showing the measured temperature

11.2.3. Standard parameter: SETP_TEconomy

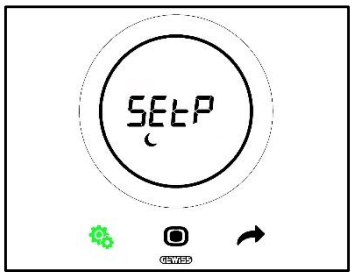
This standard parameter is used to modify the predefined setpoint of the HVAC Economy mode (bear in mind that there are some general rules that must be respected when modifying the setpoints of the HVAC modes. See ch. 9.3.7.).

Procedure:

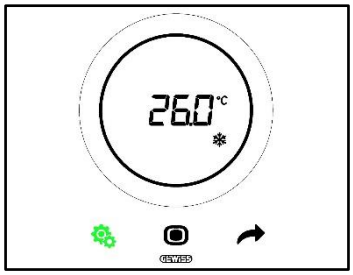
1. Once the standard SET menu has been activated, the screen will show the SEtP_TComfort page



2. Use the NEXT button key to move to the SEtP_TEconomy page



3. Press the MODE button key to access the parameter in question
4. The setpoint of the Economy mode will flash on the screen. Use the circular slider to regulate this value



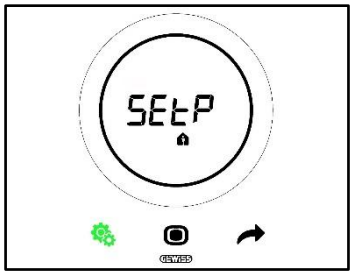
5. Once you have changed the setpoint, the MODE button key will start to flash
6. Press the MODE button key to confirm the new setpoint
7. The thermostat will now return to the SEtP page
8. Press the SET button key to return to the page showing the measured temperature

11.2.4. Standard parameter: Operating type (Auto – Heat – Cool)

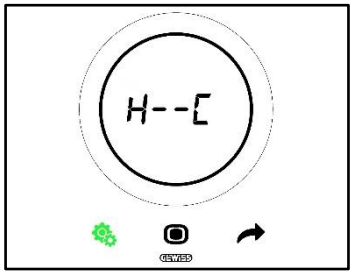
This parameter is used to select the required type of operation (Automatic – Dead zone, Heating, Cooling).

Procedure:

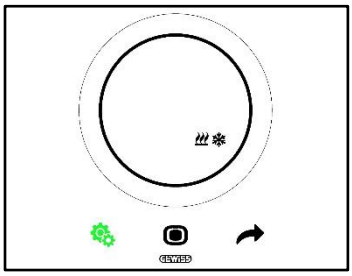
1. Once the standard SET menu has been activated, the screen will show the SEtP_TComfort page



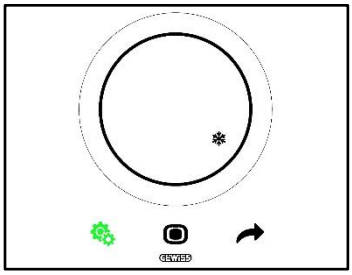
2. Use the NEXT button key to move to the Heat – Cool (H - - C) page



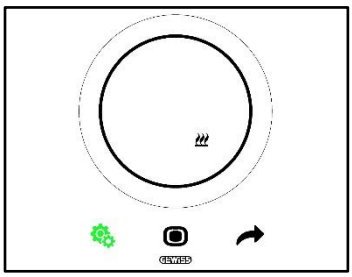
3. Press the MODE button key to access the parameter in question
4. The Heating and Cooling logos will flash on the page
5. Use the NEXT button key to move from one type of operation to the other. Three pages are displayed alternately:



Dead Zone – The switch between Cooling and Heating is made automatically (see ch. 8.2)



Cooling active



Heating active

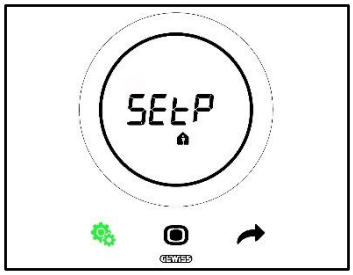
6. Confirm your choice by pressing the MODE button key
7. The thermostat will return to the Heat - Cool (H - - C) page
8. Press the SET button key to quit the standard SET menu

11.2.5. Standard parameter: Hour regulation

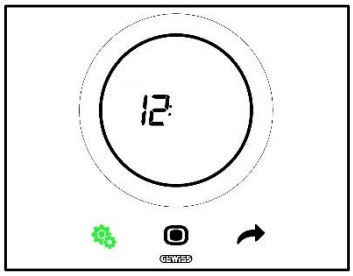
This parameter is used to regulate the hour displayed by the thermostat.

Procedure:

1. Once the standard SET menu has been activated, the screen will show the SET_TComfort page



2. Use the NEXT button key to move to the hour regulation page



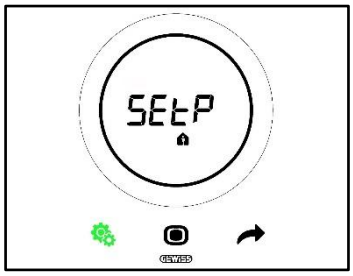
3. Press the MODE button key to access the menu. The value shown on the screen will begin flashing
4. Use the circular slider to change the hour
5. As soon as you stop using the circular slider, the value will be fixed and the MODE button key will begin flashing
6. Press the MODE button key to confirm the newly entered value
7. Press the SET button key to quit the standard SET menu

11.2.6. Standard parameter: Minute regulation

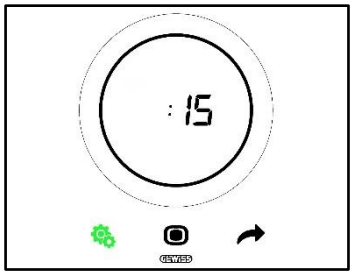
This parameter is used to regulate the minutes displayed by the thermostat.

Procedure:

1. Once the standard SET menu has been activated, the screen will show the SEtP_TComfort page



2. Use the NEXT button key to move to the minute regulation page



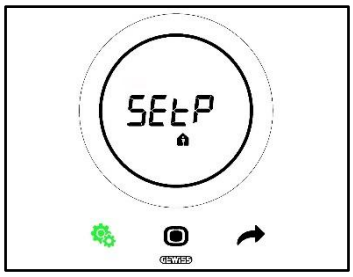
8. Press the MODE button key to access the menu. The value shown on the screen will begin flashing
9. Use the circular slider to change the minutes
10. As soon as you stop using the circular slider, the value will be fixed and the MODE button key will begin flashing
11. Press the MODE button key to confirm the newly entered value
12. Press the SET button key to quit the standard SET menu

11.2.7. Standard parameter: daylight saving time / standard time

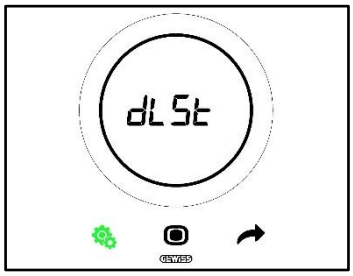
This parameter is used to choose whether to use daylight saving time or standard time.

Procedure:

1. Once the standard SET menu has been activated, the screen will show the SEtP_TComfort page



2. Use the NEXT button key to move to the "dlSt" page



3. Press the MODE button key to access the menu
4. The value "zero" will flash on the screen
5. The values that can be set are:

STANDARD PARAMETER: DLST	
0	Standard time
1	Daylight saving time

6. Use the circular slider or the NEXT button key to pass from one value to the other
7. Press the MODE button key to confirm the newly entered value
8. Press the SET button key to quit the standard SET menu

11.3 Advanced parameters

The advanced parameters are only visible if enabled via the configurator (see ch. 11).

The advanced parameters shown on the thermostat will depend on the settings made via the configurator: certain parameters will be visible, while others won't.

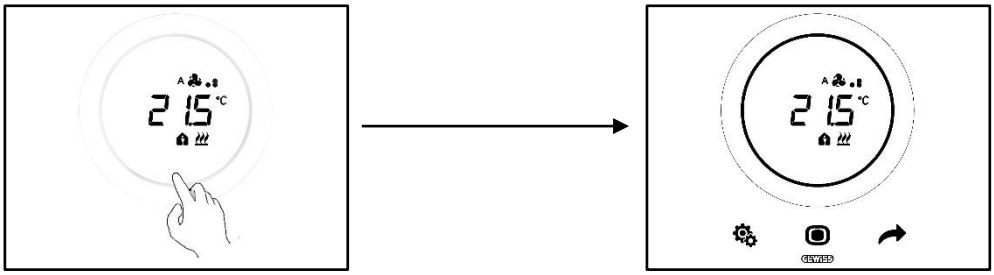
List of advanced parameters:

ADVANCED PARAMETERS	
P1	TOff
P2	°C/°F
P3	Backlight % value
P4	Touch acoustic signal
P5	Proximity sensor activation
P6	Alternated display of the information in standby
P7	Circular slider function for temperature regulation
P8	Proportional band (PI PWM)
P9	Integration time (minutes) (PI PWM)
P10	Cycle time (minutes) (PI PWM)
P11	Minimum % value for sending command (continuous PI)
P12	Hysteresis width (2 points)
P13	Hysteresis width (2 points – Fan coil)
P14	Proportional band (continuous PI – Fan coil)
P15	Integration time (minutes) (continuous PI – Fan coil)
P16	Minimum % value for sending command (continuous PI – Fan coil)
P17	V1 hysteresis (Fan coil)
P18	V2 hysteresis (Fan coil)
P19	V3 hysteresis (Fan coil)
P20	V1 inertia (Fan coil)
P21	V2 inertia (Fan coil)
P22	V3 inertia (Fan coil)
P23	Fan coil speed proportional band (fan speed PI)
P24	Fan coil speed integration time (minutes) (fan speed PI)
P25	Minimum % value for sending Fan coil speed command (fan speed PI)
P26	Limit threshold for fan coil intervention (fan speed PI)
P27	2nd stage hysteresis
P28	Slave/Autonomous
P29	Humidity threshold 1 enabling
P30	Humidity threshold 2 enabling
P31	Humidity threshold 3 enabling
P32	Humidity threshold 4 enabling
P33	Humidity threshold 5 enabling
P34	Humidity threshold 1
P35	Humidity threshold 2
P36	Humidity threshold 3
P37	Humidity threshold 4
P38	Humidity threshold 5
P39	Dew point alarm enabling
P40	Dew point alarm signal limit [tenths of °C]
P41	Dew point alarm threshold hysteresis [tenths of °C]
P42	Correction factor for internal temperature sensor (tenths of °C)
P43	Correction factor for internal humidity sensor (RH%)

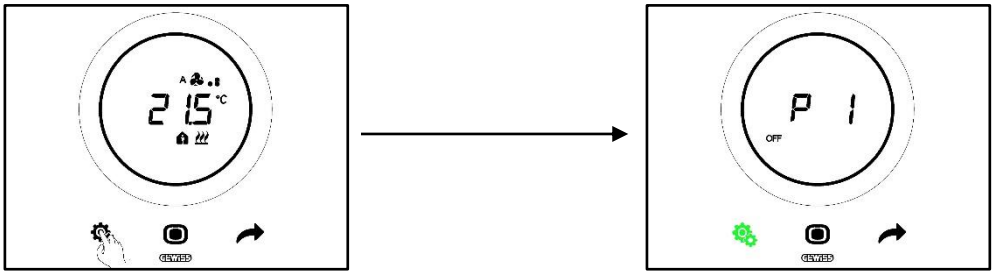
11.4 Accessing the advanced SET menu

To access the advanced SET menu, proceed as follows:

1. Activate the thermostat

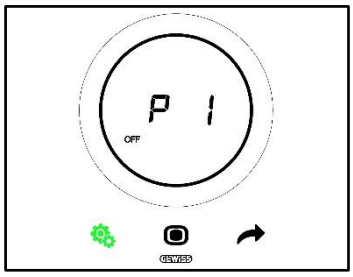


2. Press and hold the SET button key (≥ 30 sec) to access the advanced SET menu (if enabled, a beep indicated successful access). The SET button key will turn green . The first parameter that appears on the screen is P1



3. Use the circular slider or the NEXT button key to pass from one page to another. To access the individual advanced parameters, press the MODE button key

11.4.1. P1 – Setpoint OFF



This parameter is used to regulate high temperature protection and anti-freeze - setpoints that are activated when the HVAC OFF mode is selected, or OFF in Setpoint mode.

Depending on the active operating type (Heating – Cooling), you will gain access the high temperature protection parameter or the anti-freeze parameter.

Anti-freeze

High temperature protection

Procedure:

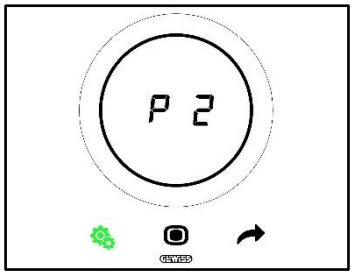
4. Once you have accessed the parameter, the defined setpoint will flash on the screen

5. Use the circular slider to increase or reduce this value
6. As soon as you stop using the circular slider, the value will stop flashing and the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

Bear in mind that these two setpoints must respect the following rules:

RESTRAINTS	
Anti-freeze	$2°C \leq T_{anti\text{-}freeze} \leq 10°C$
High temperature protection	$35°C \leq T_{high\ temperature} \leq 40°C$

11.4.2. P2 - °C/°F



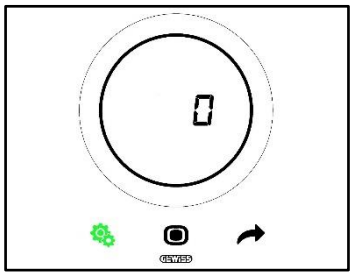
This parameter is used to define which measurement unit to use for measuring the temperature.

There are two options:

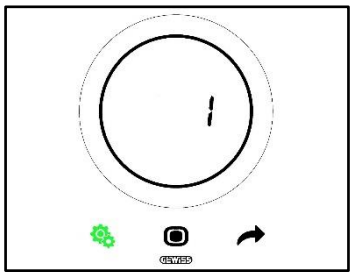
P2	
0	Celsius [°C]
1	Fahrenheit [°F]

Procedure:

4. Once the parameter has been accessed, the value for the set measurement unit will flash on the screen

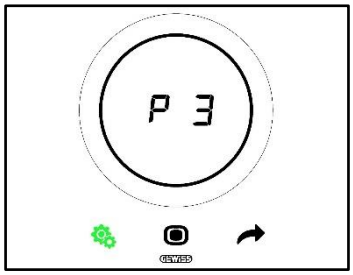


5. Use the circular slider or the NEXT button key to pass from one value to the other



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.3. P3 - Backlighting %

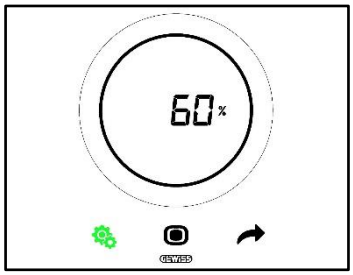


This parameter is used to regulate the intensity of the panel backlighting (both via the button keys and via the screen).

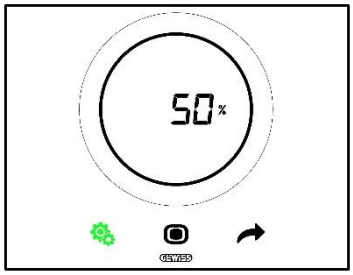
The light intensity can be regulated within a range that goes from minimum 30% to maximum 100%. The value can be increased or reduced in steps of 10%.

Procedure:

4. Once you have accessed the parameter, the defined light intensity value will flash on the screen

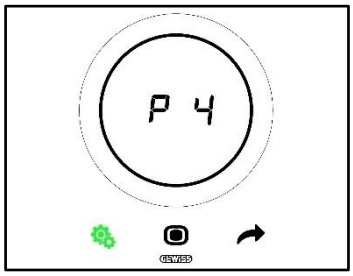


5. Use the circular slider or the NEXT button key to regulate this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.4. P4 – Touch acoustic signal

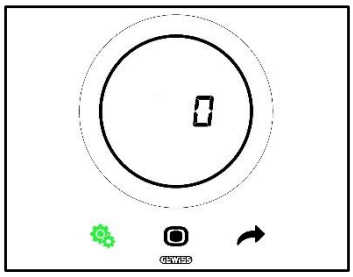


This parameter is used to activate and deactivate the acoustic signal associated with touch events on the screen. The possible values are:

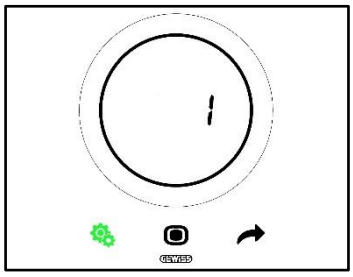
P4	
0	Acoustic signal disabled
1	Acoustic signal enabled

Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen

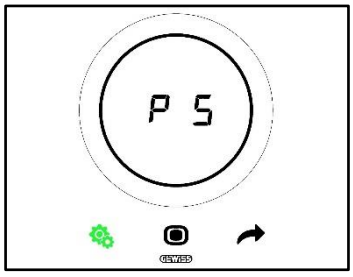


5. Use the circular slider or the NEXT button key to pass from one value to the other



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.5. P5 – Proximity sensor



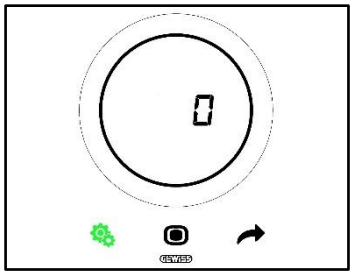
This parameter is used to activate and deactivate the proximity sensor that activates the screen when you simply bring your hand near it (without having to actually touch the screen).

The possible values are:

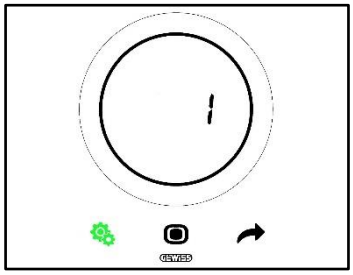
P5	
0	Sensor disabled
1	Sensor enabled

Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen

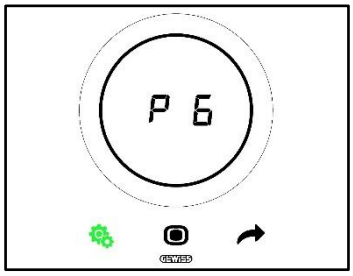


5. Use the circular slider or the NEXT button key to pass from one value to the other



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.6. P6 – Cyclical visualisation in standby



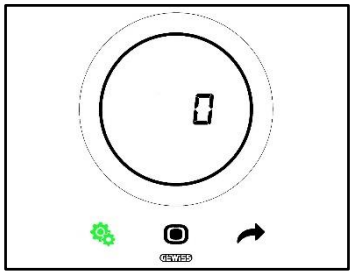
This parameter is used to activate or deactivate the cyclical visualisation of the standby screens (temperature, humidity, time and, if active, fan coil).

The possible values are:

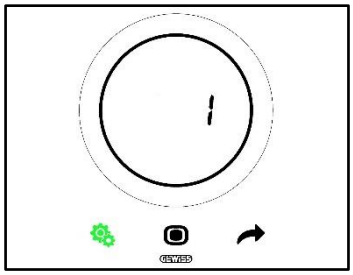
P6	
0	Cyclical visualisation disabled
1	Cyclical visualisation enabled

Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



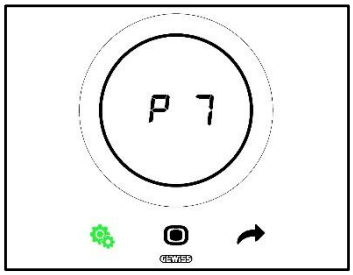
5. Use the circular slider or the NEXT button key to pass from one value to the other



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.7. P7 – Circular slider function

Prerequisites for the installer: This parameter is only visible if: • Control type: Autonomous



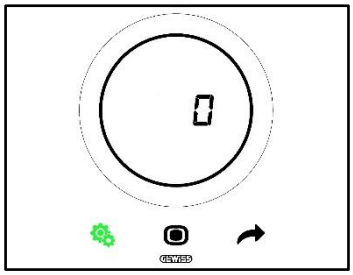
This parameter is used to define which function the circular slider fulfils in temperature regulation.

The possible values are:

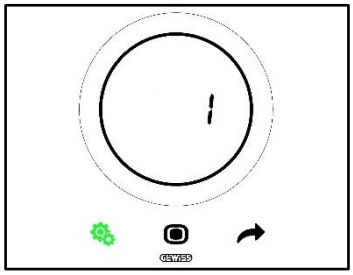
P7	
0	Temporary forcing of the current setpoint value
1	Modification of the current setpoint configuration value

Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to pass from one value to the other



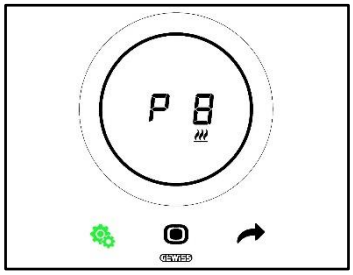
6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.8. P8 – PWM proportional band

Prerequisites for the installer:

This parameter is only visible if:

- Control algorithm: PWM proportional integral or Continuous proportional integral
- Select heating system: set the parameters manually

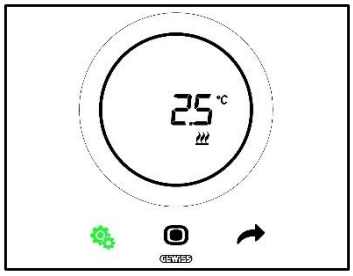


This parameter is used to modify the value of the proportional band of the proportional-integral control algorithm. The regulation range goes from 1°C to 10°C.

Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen

5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

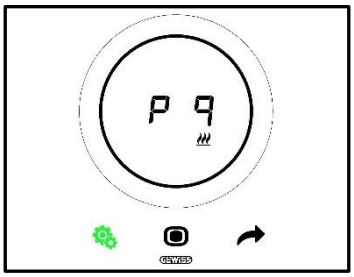
11.4.9. P9 – PWM integration time

Prerequisites for the installer:

This parameter is only visible if:

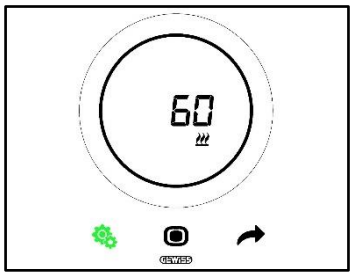
- Control algorithm: PWM proportional integral or Continuous proportional integral
- Select heating system: set the parameters manually

This parameter is used to modify the value of the integration time of the proportional-integral control algorithm. The regulation range goes from 1 to 250.



Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value

6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

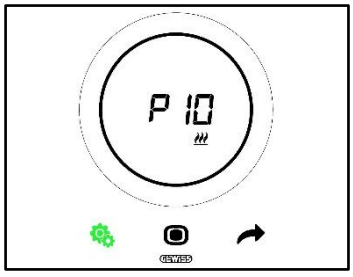
11.4.10. P10 – PWM cycle time

Prerequisites for the installer:

This parameter is only visible if:

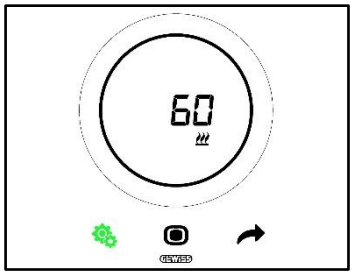
- Control algorithm: PWM proportional integral

This parameter is used to modify the value of the cycle time of the PWM proportional-integral control algorithm. The regulation range goes from 5 to 60.



Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value

6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

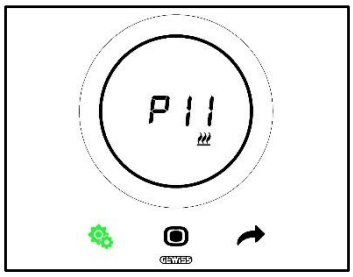
11.4.11. P11 - Minimum % value for sending command (continuous PI)

Prerequisites for the installer:

This parameter is only visible if:

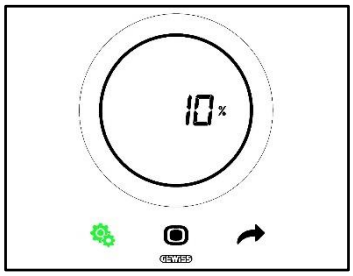
- Control algorithm: Continuous proportional integral

This parameter is used to modify the minimum percentage value for sending the command of the continuous proportional-integral control algorithm. The regulation range goes from 1% to 20%.

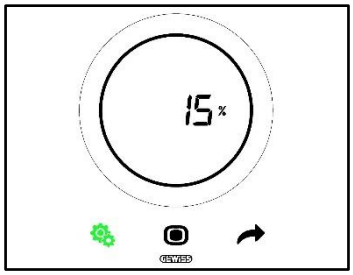


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value

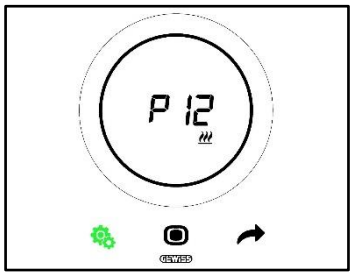


6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.12. P12 – Hysteresis width (2 points)

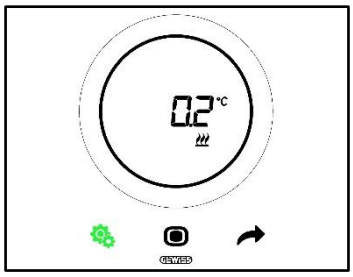
Prerequisites for the installer:
This parameter is only visible if: • Control algorithm: Two points ON-OFF or Two points 0%-100%

This parameter is used to modify the value of the regulation differential of the two-point control algorithm. The regulation range goes from 0.1 to 2°C.

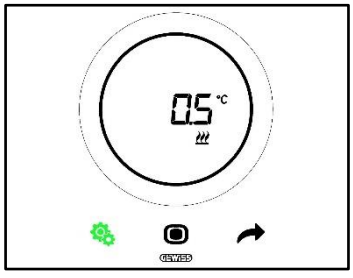


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.13. P13 – Hysteresis width (2 points fan coil)

Prerequisites for the installer:

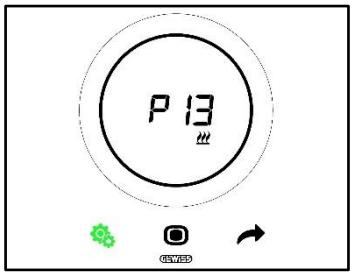
This parameter is only visible if:

- Heating/Cooling control logic: Common (2-way)
- Control algorithm: Fan coil with 3-speed regulation (ON-OFF) or Fan coil with continuous speed regulation (0%-100%)
- Management of the fan coil valves: Two points ON-OFF or Two points 0%-100%

Or:

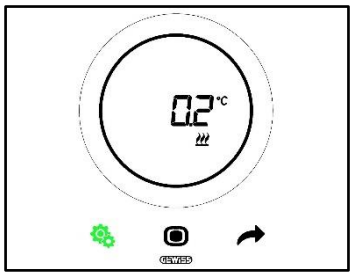
- Heating/Cooling control logic: Separate (4-way)
- Control algorithm: Fan coil with 3-speed regulation (ON-OFF) or Fan coil with continuous speed regulation (0%-100%)
- Heating/Cooling – Management of the fan coil valves: Two points ON-OFF or Two points 0%-100%

This parameter is used to modify the value of the regulation differential of the two-point control algorithm. The regulation range goes from 0.1 to 2°C.

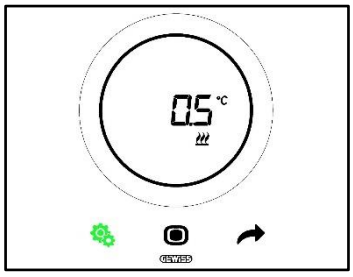


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.14. P14 – Proportional band (continuous PI - fan coil)

Prerequisites for the installer:

This parameter is only visible if:

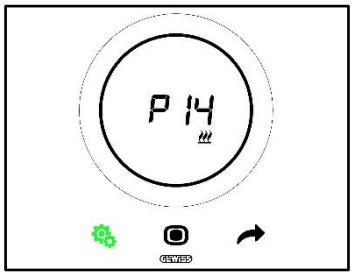
- Heating/Cooling control logic: Common (2-way)

- Control algorithm: Fan coil with 3-speed regulation (ON-OFF) or Fan coil with continuous speed regulation (0%-100%)
- Management of the fan coil valves: Continuous proportional integral

Or:

- Heating/Cooling control logic: Separate (4-way)
- Control algorithm: Fan coil with 3-speed regulation (ON-OFF) or Fan coil with continuous speed regulation (0%-100%)
- Heating/Cooling – Management of the fan coil valves: Continuous proportional integral

This parameter is used to modify the value of the proportional band of the proportional-integral control algorithm. The regulation range goes from 2°C to 10°C.



Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen

5. Use the circular slider or the NEXT button key to modify this value

6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.15. P15 – Integration time (continuous PI - fan coil)

Prerequisites for the installer:

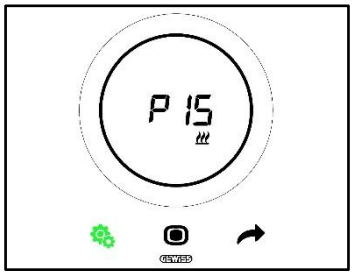
This parameter is only visible if:

- Heating/Cooling control logic: Common (2-way)
- Control algorithm: Fan coil with 3-speed regulation (ON-OFF) or Fan coil with continuous speed regulation (0%-100%)
- Management of the fan coil valves: Continuous proportional integral

Or:

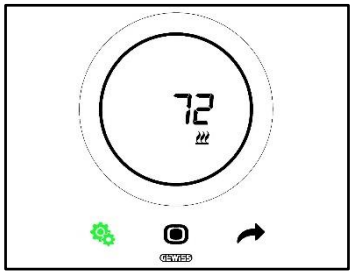
- Heating/Cooling control logic: Separate (4-way)
- Control algorithm: Fan coil with 3-speed regulation (ON-OFF) or Fan coil with continuous speed regulation (0%-100%)
- Heating/Cooling – Management of the fan coil valves: Continuous proportional integral

This parameter is used to modify the value of the integration time of the proportional-integral control algorithm. The regulation range goes from 1 to 250.

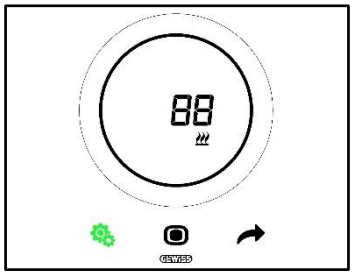


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.16. P16 - Minimum % value for sending command (continuous PI - fan coil)

Prerequisites for the installer:

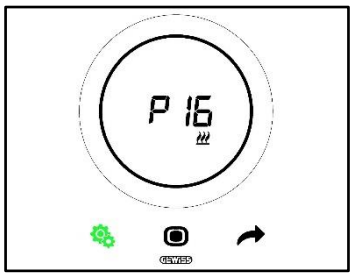
This parameter is only visible if:

- Heating/Cooling control logic: Common (2-way)
- Control algorithm: Fan coil with 3-speed regulation (ON-OFF) or Fan coil with continuous speed regulation (0%-100%)
- Management of the fan coil valves: Continuous proportional integral

Or:

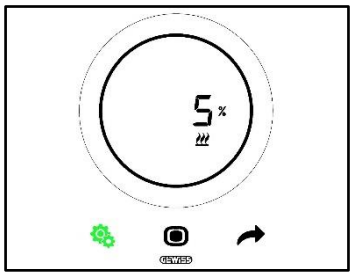
- Heating/Cooling control logic: Separate (4-way)
- Control algorithm: Fan coil with 3-speed regulation (ON-OFF) or Fan coil with continuous speed regulation (0%-100%)
- Heating/Cooling – Management of the fan coil valves: Continuous proportional integral

This parameter is used to modify the minimum percentage value for sending the command of the continuous proportional-integral control algorithm. The regulation range goes from 1% to 20%.

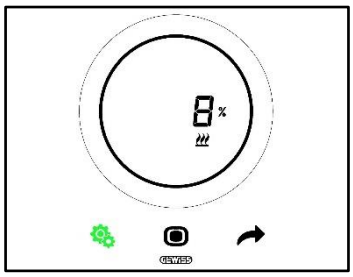


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

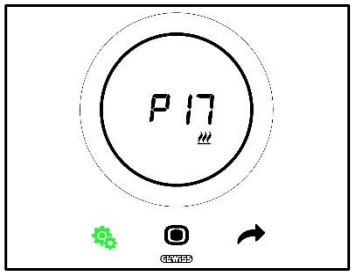
11.4.17. P17 – P18 – P19 – V1, V2, V3 hysteresis

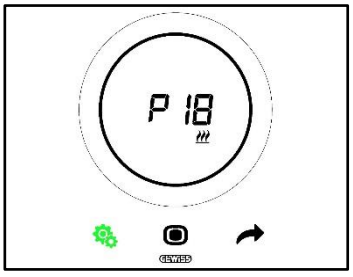
Prerequisites for the installer:

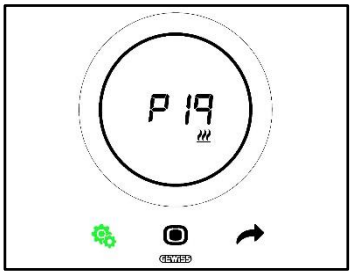
This parameter is only visible if:

- Control algorithm: Fan coil with 3-speed regulation (ON-OFF)

These parameters are used to modify the value of the regulation differential of the three fan coil speeds. The regulation range goes from 0.1 to 2°C.

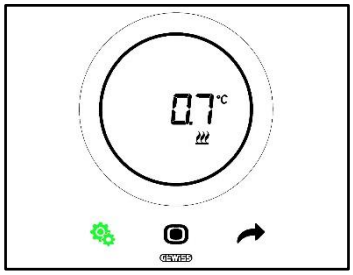




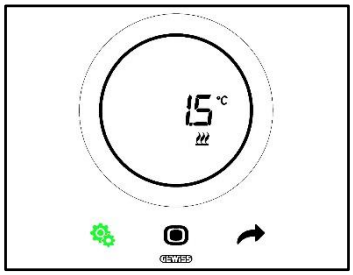


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

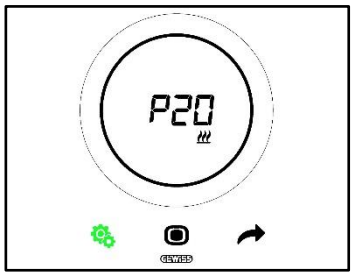
11.4.18. P20 – P21 – P22 – V1, V2, V3 inertia

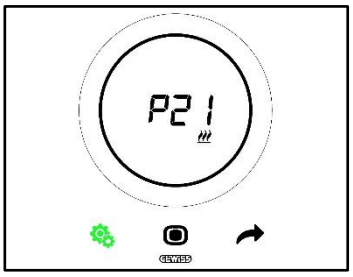
Prerequisites for the installer:

This parameter is only visible if:

- Control algorithm: Fan coil with 3-speed regulation (ON-OFF)

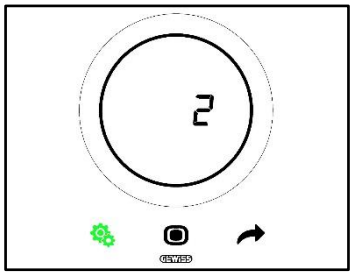
These parameters are used to modify the value of the inertia time of the three fan coil speeds. The regulation range goes from 1 to 10.



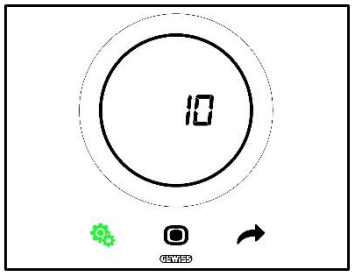


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.19. P23 - Fan coil speed proportional band (fan speed PI)

Prerequisites for the installer:

This parameter is only visible if:

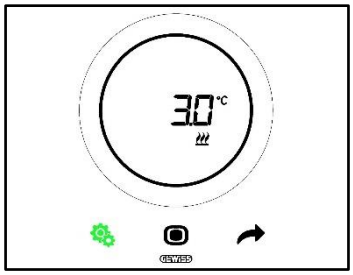
- Control algorithm: Fan coil with continuous speed regulation (0% -100%)
- Heating/Cooling – Management of the fan coil valves: Continuous proportional integral

This parameter is used to modify the value of the proportional band of the continuous proportional-integral control algorithm. The regulation range goes from 1 to 10°C.

Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen

5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.20. P24 - Fan coil speed integration time (fan speed PI)

Prerequisites for the installer:

This parameter is only visible if:

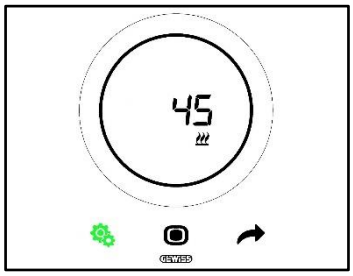
- Control algorithm: Fan coil with continuous speed regulation (0% -100%)
- Heating/Cooling – Management of the fan coil valves: Continuous proportional integral

This parameter is used to modify the value of the integration time of the continuous proportional-integral control algorithm. The regulation range goes from 1 to 250.

Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen

5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.21. P25 - Minimum % value for sending Fan coil speed command (fan speed PI)

Prerequisites for the installer:

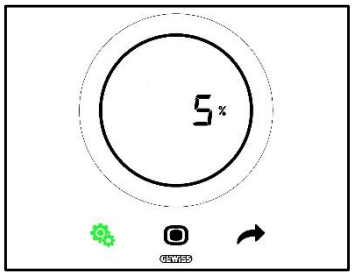
This parameter is only visible if:

- Control algorithm: Fan coil with continuous speed regulation (0% -100%)
- Heating/Cooling – Management of the fan coil valves: Continuous proportional integral

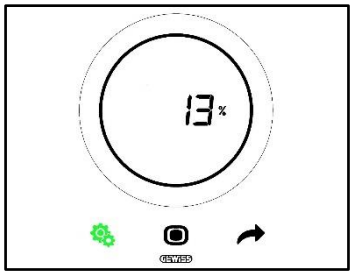
This parameter is used to modify the minimum percentage value for sending the command of the continuous proportional-integral control algorithm. The regulation range goes from 1% to 20%.

Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.22. P26 - Limit threshold for fan coil intervention (fan speed PI)

Prerequisites for the installer:

This parameter is only visible if:

- Control algorithm: Fan coil with ON-OFF regulation
- Management of the fan coil valves: Continuous proportional integral

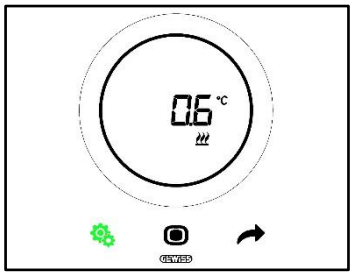
Or

- Control algorithm: Fan coil with continuous speed regulation (0% -100%)
- Heating/Cooling – Management of the fan coil valves: Continuous proportional integral

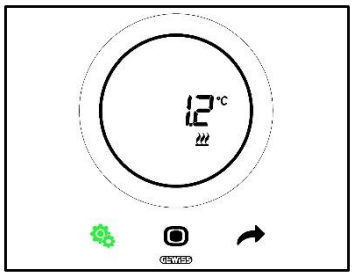
This parameter is used to modify the value of the limit threshold for fan coil intervention. The regulation range goes from 0.1°C to 2.0°C.

Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value

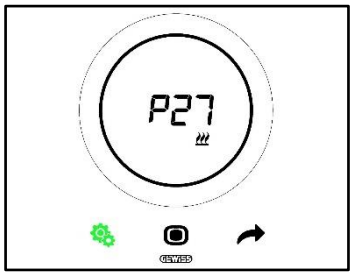


6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.23. P27 – 2nd stage hysteresis

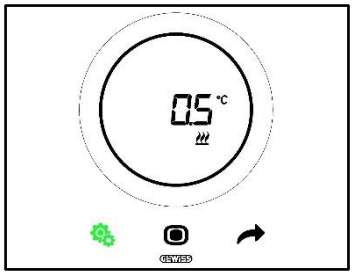
Prerequisites for the installer:
This parameter is only visible if: • Heating/Cooling – 2nd stage: Enables Two points ON-OFF control or Two points 0%-100% control

This parameter is used to modify the value of the regulation differential of the two-point control algorithm (2nd stage). The regulation range goes from 0.1°C to 2.0°C.

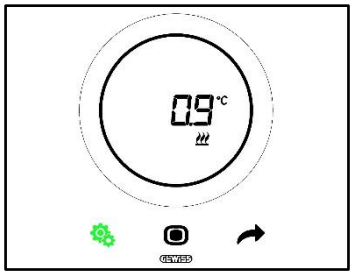


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.24. P28 – Control type: Autonomous, Slave

Prerequisites for the installer: This parameter is only visible if: • Control type: Slave

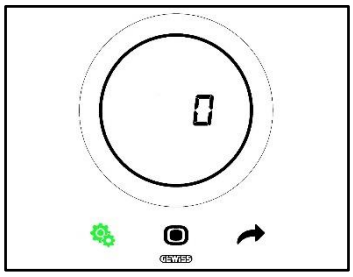
This parameter is used to modify the thermostat control type, switching from Slave to Autonomous and vice versa.

The possible values are:

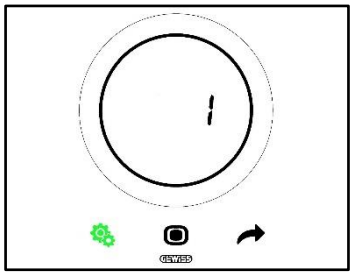
P28	
0	Autonomous
1	Slave

Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to pass from one value to the other



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.25. P29 – P30 – P31 – P32 – P33 – Humidity threshold enabling

Prerequisites for the installer:

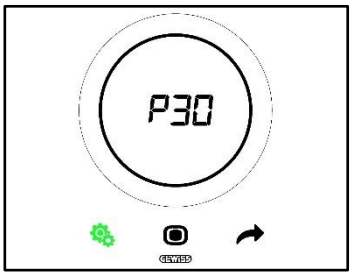
This parameter is only visible if:

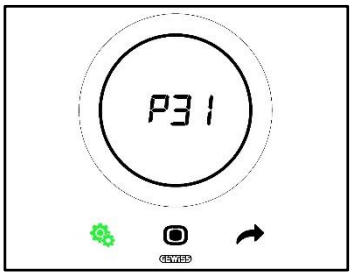
- Relative humidity threshold (1/2/3/4/5): enabled
- Enable/disable humidity threshold (via BUS and local menu): yes

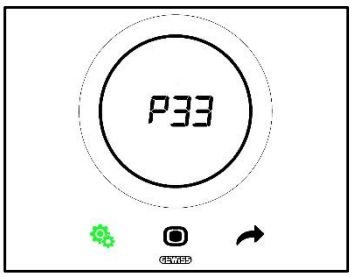
These parameters are used to modify the activation status of the five relative humidity thresholds.

The possible values are:

P29 – P30 – P31 – P32 – P33	
0	Disabled
1	Enable

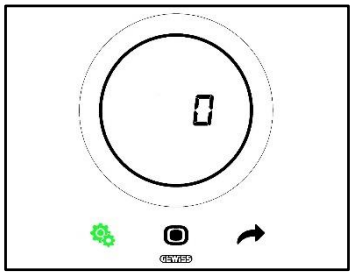




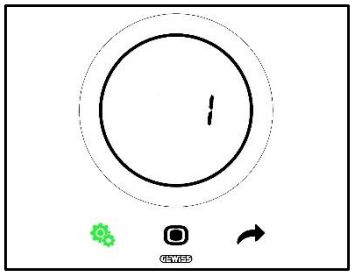


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to pass from one value to the other



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

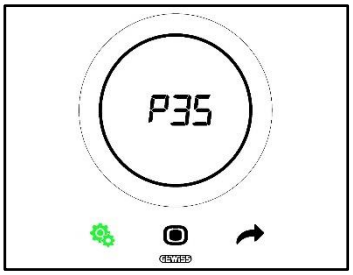
11.4.26. P34 – P35 – P36 – P37 – P38 – Humidity thresholds

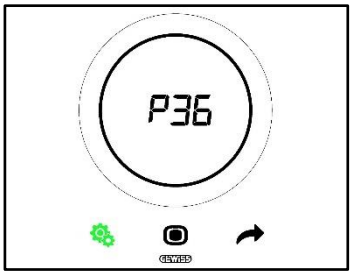
Prerequisites for the installer:

This parameter is only visible if:

- Relative humidity threshold (1/2/3/4/5): enabled
- Enable/disable humidity threshold (via BUS and local menu): yes

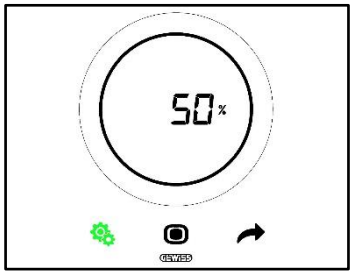
These parameters are used to modify the value associated with each of the five relative humidity thresholds. The regulation range goes from 1% to 100%.



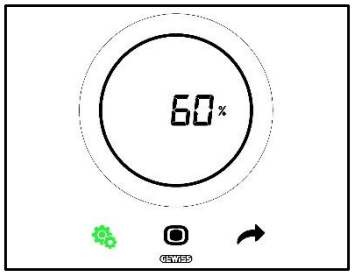


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

11.4.27. P39 – Dew point enabling

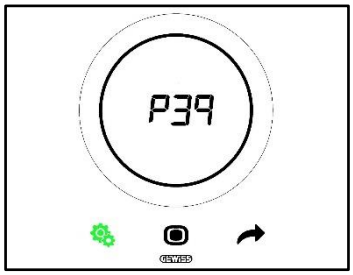
Prerequisites for the installer:
This parameter is only visible if: • Dew point – dew point temperature alarm signal [P39]: enabled • Activate/Deactivate the alarm threshold (via BUS and locally): Yes • The objects of the group are already connected

This parameter is used to modify the activation status of the dew point alarm.

The possible values are*:

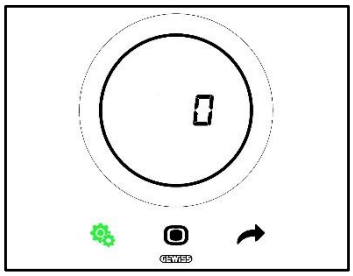
P39	
0	disabled
1	enabled

** Attention: these values may be inverted, depending on the settings made via the configurator*

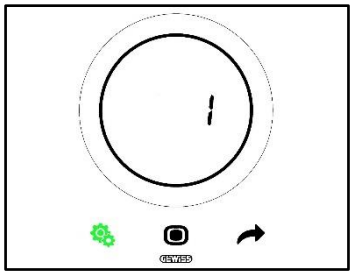


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to pass from one value to the other



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

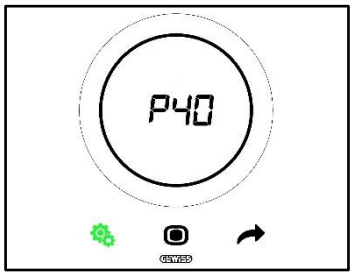
11.4.28. P40 - Dew point alarm signal limit

Prerequisites for the installer:

This parameter is only visible if:

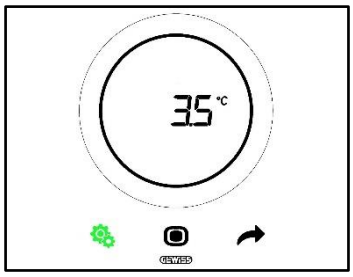
- Dew point – dew point temperature alarm signal [P39]: enabled
- Activate/Deactivate the alarm threshold (via BUS and locally): Yes
- The objects of the group are already connected

This parameter is used to modify the value associated with the dew point alarm signal limit [tenths of °C]. The regulation range goes from 0°C to 10°C

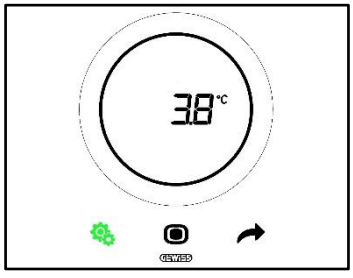


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value

8. Use the SET button key to quit the advanced SET menu

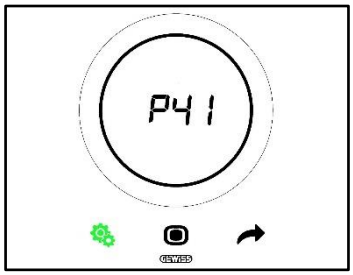
11.4.29. P41 - Dew point alarm threshold hysteresis

Prerequisites for the installer:

This parameter is only visible if:

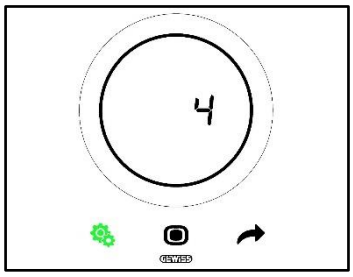
- Dew point – dew point temperature alarm signal [P39]: enabled
- Activate/Deactivate the alarm threshold (via BUS and locally): Yes
- The objects of the group are already connected

This parameter is used to modify the value associated with the dew point alarm threshold hysteresis [tenths of °C]. The regulation range goes from 1 to 20.

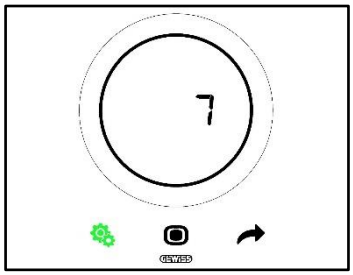


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

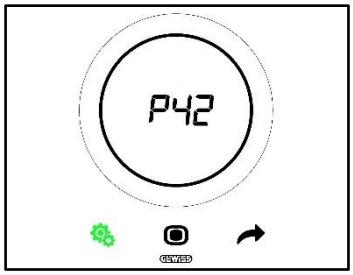
11.4.30. P42 - Correction factor for internal temperature sensor

Prerequisites for the installer:

This parameter is only visible if:

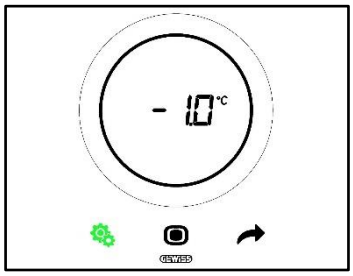
- Dew point – dew point temperature alarm signal [P39]: enabled
- Activate/Deactivate the alarm threshold (via BUS and locally): Yes
- The objects of the group are already connected

This parameter is used to modify the value associated with the correction factor of the internal temperature sensor. The regulation range goes from -5°C to +5°C.

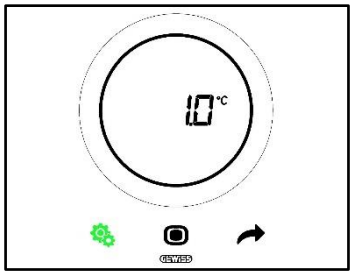


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



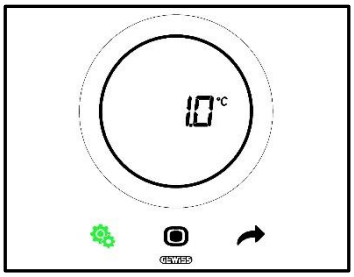
5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

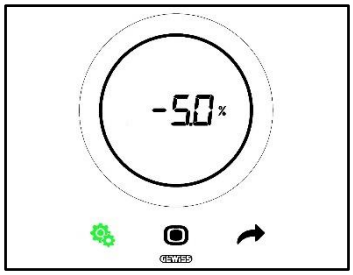
11.4.31. P43 - Correction factor for internal humidity sensor

This parameter is used to modify the value associated with the correction factor of the internal humidity sensor. The regulation range goes from -10% to +10%.

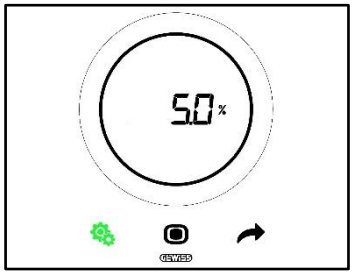


Procedure:

4. Once you have accessed the parameter, the defined value will flash on the screen



5. Use the circular slider or the NEXT button key to modify this value



6. When the required value has been set, the MODE button key will begin flashing
7. Press the MODE button key to confirm the newly entered value
8. Use the SET button key to quit the advanced SET menu

USING THE THERMOSTAT WITH THE HOTEL CONTROL TYPE

12 Hotel

12.1 Introduction

This chapter explains how the thermostat works with the Hotel control type.

As the name suggests, the Hotel control type is designed for accommodation facilities.

It has a simplified graphic interface:

LOGO	NAME	FUNCTIONS
	MODE / Enter	• Used to pass from the page showing the measured temperature, operating mode (and, if enabled, the fan coil speed) to the specific fan coil page (if enabled) • Confirms the modifications made to the thermostat
	Circular slider	Backlit circular slider • Shows the previous and next value of the parameter to be modified • Temporary setpoint variation • Temporary fan speed variation (if the fan coil is enabled) The circular light guide that illuminates the slide area changes colour during the heating (red) and cooling/ humidity management (pink) activation phases.
8888	**Display for visualisation**	• Temperature/Relative humidity/Time • Parameter name and value • Fan speed % • Cleaning function countdown
°F	**Temperature range**	Indication of the value in degrees Fahrenheit
°C	**Temperature range**	Indication of the value in degrees Centigrade
%	**Percentage**	• Percentage of relative humidity in the atmosphere • Speed of the fan coil with continuous control algorithm 0% ÷ 100%
A	**Fan speed**	Fan coil speed: automatic operation enabled (A) Fan coil speed: manual forcing
	Forcing	Temporary setpoint forcing active
	Type of operation	Heating
	Type of operation	Cooling

12.2 Standby

When the thermostat is not being used, there are three possible situations depending on the settings made via the configurator:

SITUATION A

When the thermostat is in standby, it cyclically displays the pages indicating:

- The temperature, operating type, and fan coil speed (if enabled)
- The humidity
- The time

TEMPERATURE, OPERATING MODE, FAN SPEED

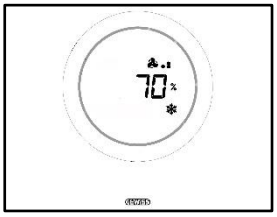
HUMIDITY

HOURS

SITUATION B

When the thermostat is in standby, it continuously displays the last page visualised by the user (the page showing the temperature, operating type and possible fan speed, or the page showing the fan coil speed)

TEMPERATURE, OPERATING MODE, FAN SPEED



FAN SPEED

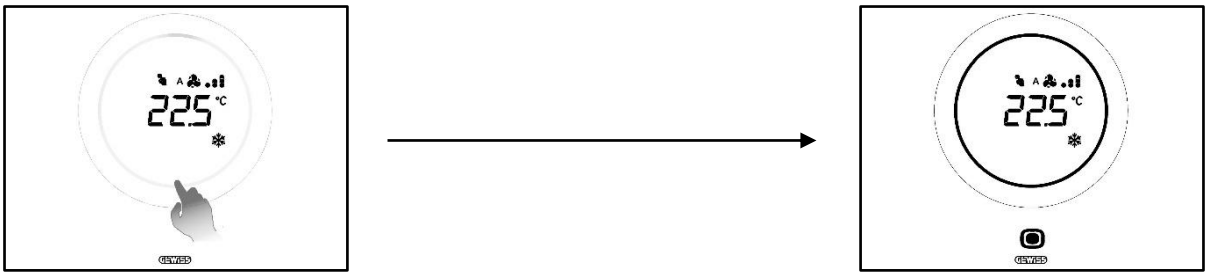
SITUATION C

When the thermostat is in standby, the plate is disabled. No information is displayed on the screen.

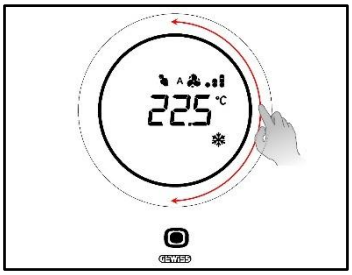
12.3 Modifying the setpoint

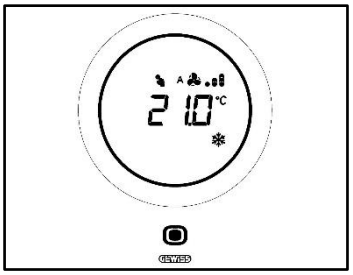
The user can modify the thermostat setpoint in the following way:

1. Activate the thermostat (just bring your hand close to it if the proximity sensor is enabled; otherwise, touch the plate)



2. Once the thermostat has been activated, use the circular slider to modify the setpoint
3. Press the MODE button key to confirm the new setpoint.





12.4 Fan coil speed

The fan speed can be managed manually or it can be managed automatically by the system. In the latter case, the letter A A will appear alongside the fan symbol. The spots to the right of the fan indicate the speed level that the fan is rotating at.

If the algorithm selected for fan coil control is “Fan coil with 3-speed regulation (ON-OFF)”, the fan speed can be adjusted on a scale with three stages:

Speed 1 (V1):	A
Speed 2 (V2):	A
Speed 3 (V3):	A

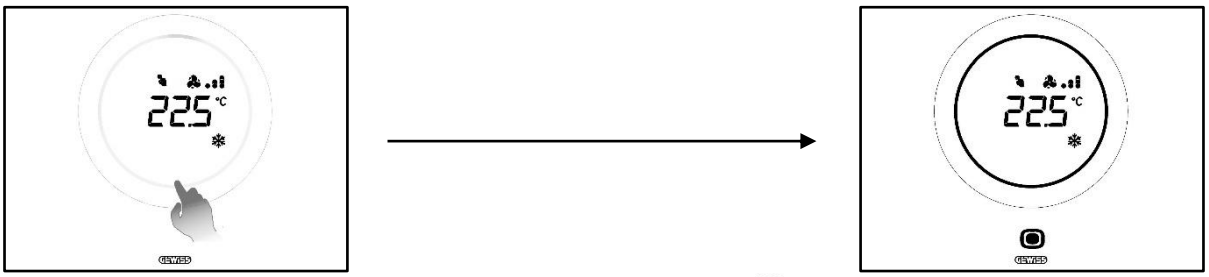
If, on the other hand, the algorithm is “Fan coil with continuous speed regulation (0-100%)”, the fan speed can be adjusted on a continuous scale ranging from 0% to 100%. This scale is split into three different speed thresholds (merely to make it simpler to represent in graphic form), as indicated below:

Speed x%:	0-32%	A
Speed x%:	33-65%	A
Speed x%:	66-100%	A

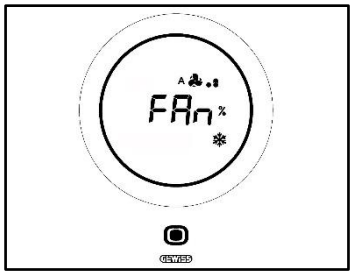
12.5 Modifying the fan coil speed

If the system is fitted with a fan coil, the fan rotation speed can be modified. Proceed as follows:

1. Activate the thermostat (just bring your hand close to it if the proximity sensor is enabled; otherwise, touch the plate)

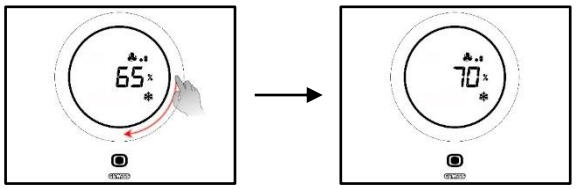
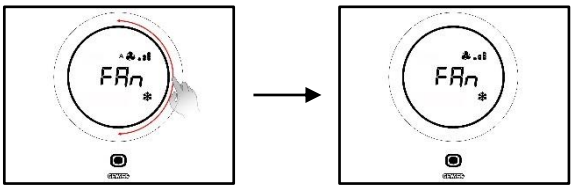


2. Once the thermostat has been activated, press the MODE button key
3. The thermostat will switch to the fan coil management page



From this point on, the graphic interface can assume two different configurations depending on the control algorithm selected. There are two algorithm options:

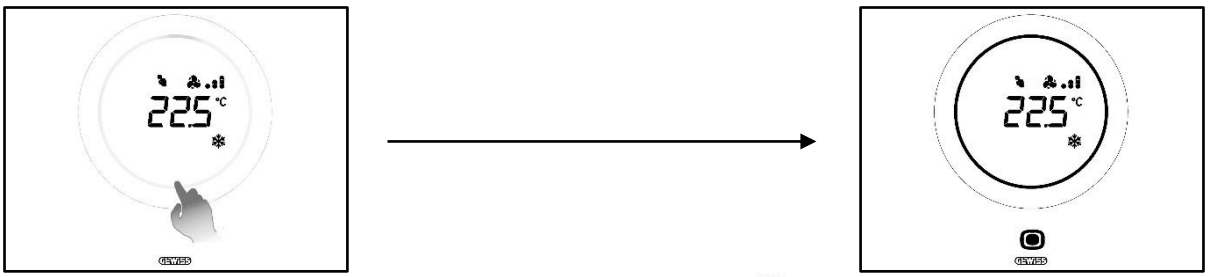
- Fan coil with continuous speed regulation
- Fan coil with 3-speed regulation (ON-OFF)

FAN COIL WITH CONTINUOUS SPEED REGULATION:	**FAN COIL WITH 3-SPEED REGULATION (ON-OFF)**
4. The next page that appears will be the one showing the fan rotation speed 5. Use the circular slider to modify the speed value  6. The new speed will flash for 2 seconds. If no further modifications are made, this will become the new set speed	4. Use the circular slider to modify the fan speed  5. There are 3 possible speed levels, indicated by the spots next to the fan symbol: Speed 1 or A Speed 2 or A Speed 3 or A 6. The new speed will flash for 2 seconds. Confirm your choice by pressing the MODE button key.

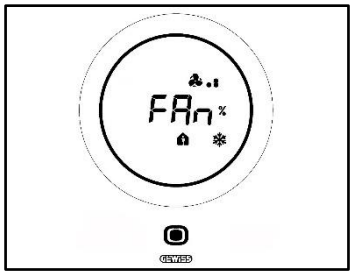
12.6 Passing from manual to automatic fan coil speed management

If you do not want to manage the fan rotation speed manually, it can be done automatically by the system. To impose this setting, proceed as follows:

1. Activate the thermostat (just bring your hand close to it if the proximity sensor is enabled; otherwise, touch the plate)



2. Once the thermostat has been activated, press the MODE button key
3. The thermostat will switch to the fan coil management page

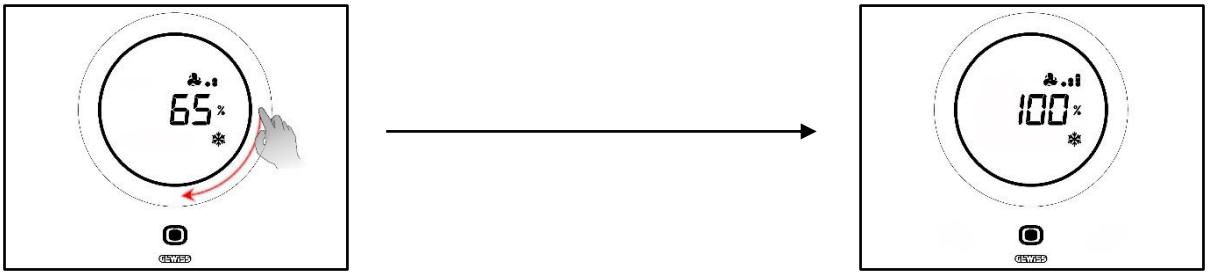


From this point on, the graphic interface can assume two different configurations depending on the control algorithm selected. There are two algorithm options:

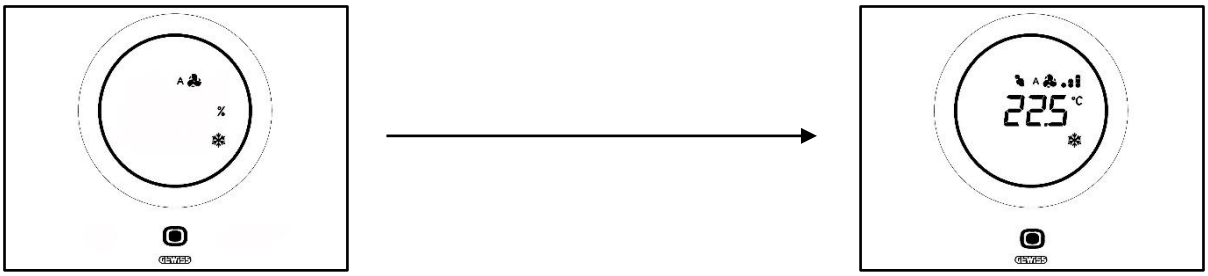
- Fan coil with continuous speed regulation
- Fan coil with 3-speed regulation (ON-OFF)

- **Procedure with the "FAN COIL WITH CONTINUOUS SPEED REGULATION" algorithm:**

4. The next page that appears will be the one showing the fan rotation speed
5. Use the circular slider to modify the speed value
6. Bring the speed value to 100%. The value and the icon showing the speed level will begin flashing

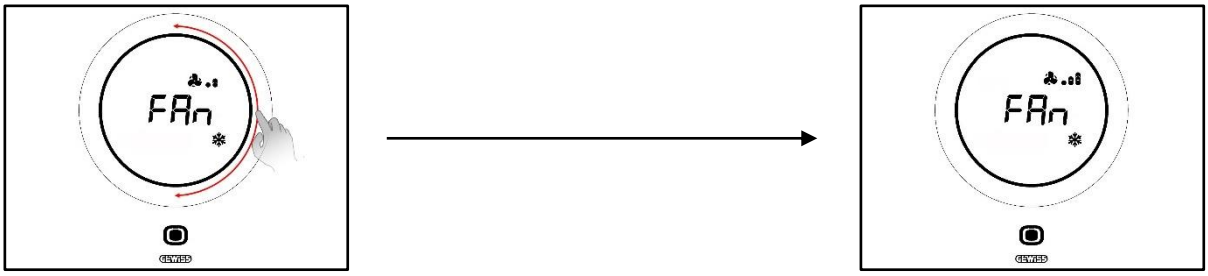


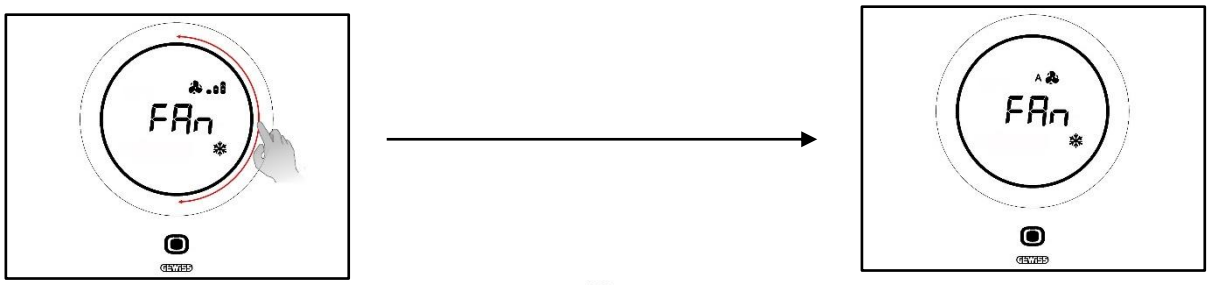
7. Turn the circular slider slightly to change the page: the value will disappear, along with the logo showing the fan speed level. To the left of the fan you will see the letter A A. Wait 2 seconds. The modification is made effective



- **Procedure with the: "FAN COIL WITH 3-SPEED REGULATION (ON-OFF)**

4. After passing to the page showing the fan coil speed, use the circular slider to modify the speed value. The fan logo and the spots indicating the fan speed level will begin flashing. Rotate the slider until the Speed 3 threshold is exceeded, then move on to the next option A





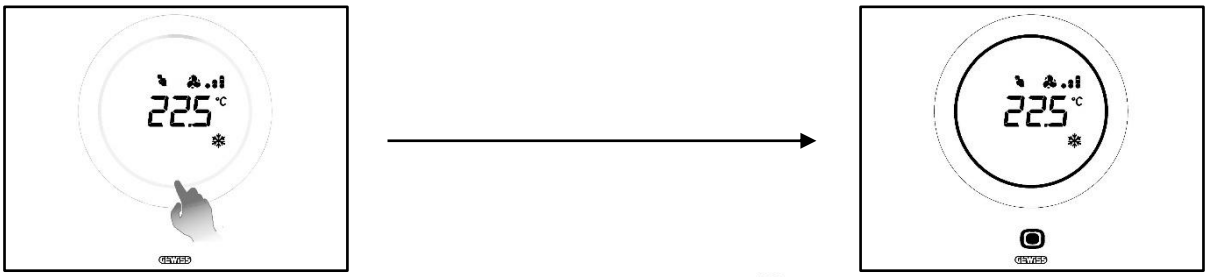
5. Confirm your choice by pressing the MODE button key
6. Press the MODE button key again to return to the page showing the measured temperature

12.7 Switching off the system

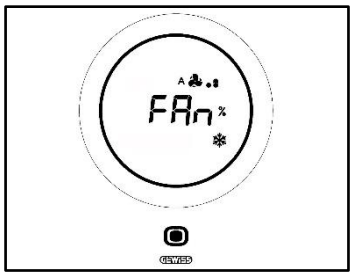
Prerequisites for the installer:
• Consent local switch-off: enabled

If you want to switch the system off, proceed as follows:

1. Activate the thermostat (just bring your hand close to it if the proximity sensor is enabled; otherwise, touch the plate)



2. Once the thermostat has been activated, press the MODE button key
3. The thermostat will switch to the fan coil management page

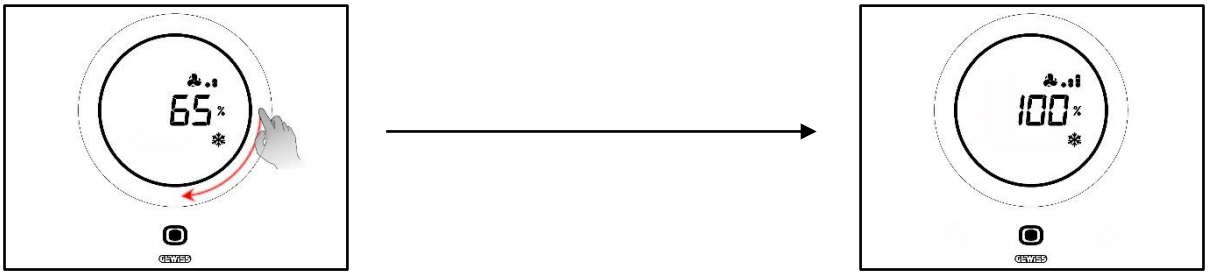


From this point on, the graphic interface can assume two different configurations depending on the control algorithm selected. There are two algorithm options:

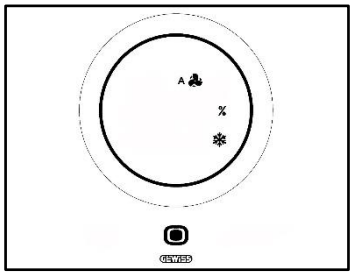
- Fan coil with continuous speed regulation
- Fan coil with 3-speed regulation (ON-OFF)

- **Procedure with the "FAN COIL WITH CONTINUOUS SPEED REGULATION" algorithm:**

4. The next page that appears will be the one showing the fan rotation speed
5. Use the circular slider to modify the speed value
6. Bring the speed value to 100%. The value and the icon showing the speed level will begin flashing



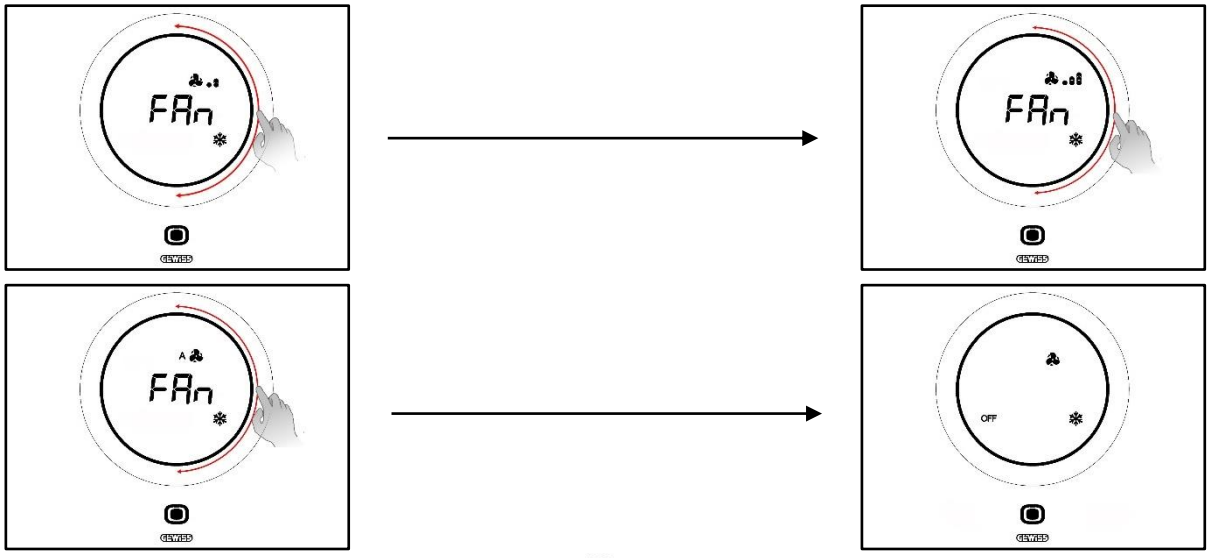
7. Move the circular slider slightly to pass to the next option (Automatic mode activation). The spots next to the fan logo will disappear and you will see a letter A A to the left of the logo



8. Move the circular slider slightly again. The A A and % will disappear. The word OFF will appear at the bottom left
9. If no further changes are made for 2 seconds, the modification will become effective. The thermostat will then switch to OFF mode

- **Procedure with the: "FAN COIL WITH 3-SPEED REGULATION (ON-OFF)**

4. After passing to the page showing the fan coil speed, use the circular slider to modify the speed value. The fan logo and the spots indicating the fan speed level will begin flashing. Rotate the slider until the Speed 3 threshold and the automatic operation option A are exceeded. The next option is OFF, which switches off the system



5. Confirm your choice by pressing the MODE button key

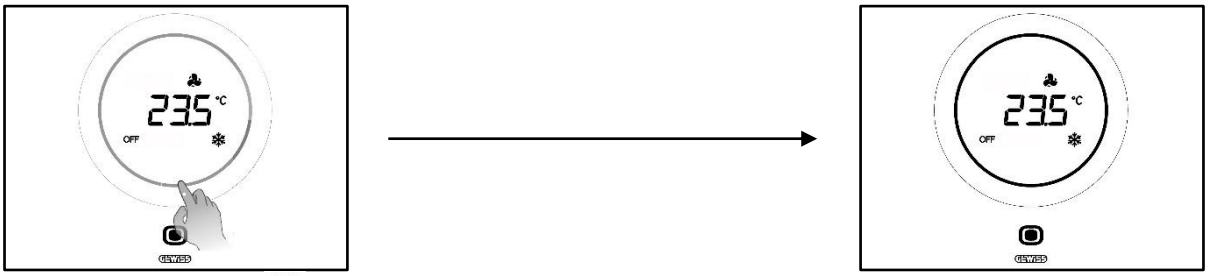
6. Press the MODE button key again to return to the page showing the measured temperature

12.8 Reactivating the system

Prerequisites for the installer:
• Consent local switch-off: enabled

If you want to reactivate the system after switching it off, proceed as follows:

1. Activate the thermostat (just bring your hand close to it if the proximity sensor is enabled; otherwise, touch the plate)



2. Press the MODE button key for a few seconds

3. The thermostat will be reactivated and the spots indicating the fan speed will appear again next to the fan symbol A. Wait 3 seconds for the reactivation to become effective

4. Press the MODE button key again
5. The page showing the fan speed will be displayed. Use the circular slider to modify the predefined speed value

ANNEX

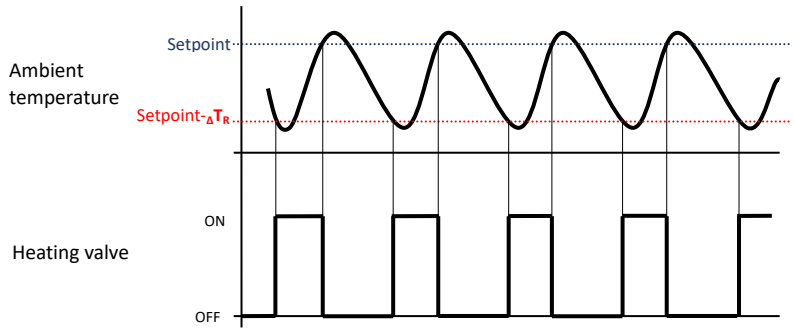
13 Algorithms

13.1 Control algorithms

13.1.1. Two points ON-OFF

This type of control involves the switch-on and switch-off of the temperature adjustment system following a hysteresis cycle. Two thresholds (hysteresis cycle) are defined and used to distinguish between system switch-on and system switch-off.

Type of operation: Heating

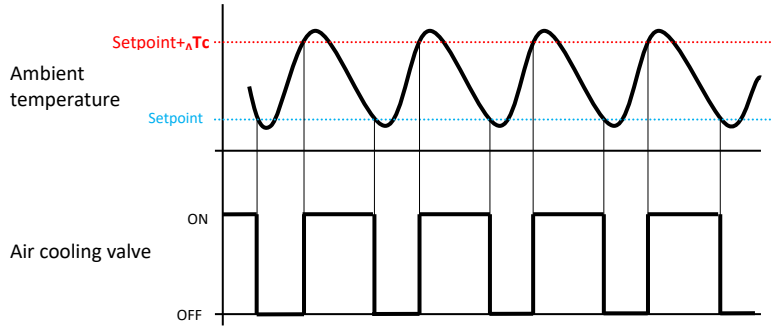


There are therefore two thresholds that determine the activation and deactivation of the heating system:

- **Setpoint-$_{\Delta}T_R$**: when the temperature falls below this threshold, the system is activated
- **Setpoint**: when the measured temperature exceeds the value set here, the system is deactivated

When the measured temperature is lower than the "Setpoint-$_{\Delta}T_R$" value in heating mode, the device activates the heating system by sending the relative command to the actuator that manages it; when the measured temperature reaches the defined Setpoint value, the device deactivates the heating system.

Type of operation: Cooling



In this case too, there are two thresholds that determine the activation and deactivation of the cooling system:

- **Setpoint**: when the measured temperature falls below the value set here, the system is deactivated
- **Setpoint+$_{\Delta}$Tc**: when the measured temperature exceeds this value, the system is activated.

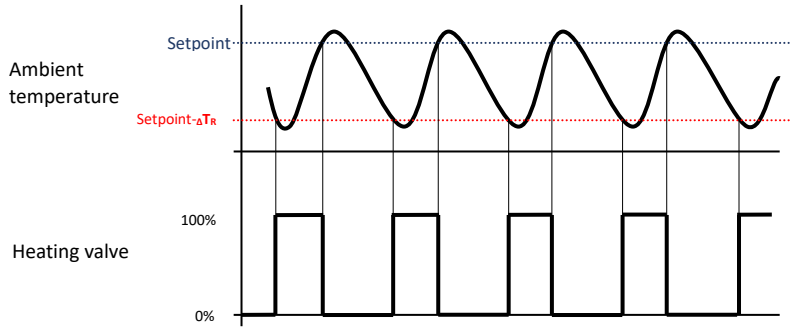
When the measured temperature is higher than the "Setpoint+$_{\Delta}$Tc" value in cooling mode, the device activates the cooling system by sending the relative command to the actuator that manages it; when the measured temperature reaches the defined Setpoint value, the device deactivates the cooling system.

To avoid the continuous switching of the solenoid valves, after an OFF-ON-OFF sequence, the next ON command can only be sent after at least 2 minutes have elapsed.

13.1.2. Two points 0-100%

The operating principle is similar to that of Two points ON-OFF, with the difference that the communication objects for temperature adjustment management are 1 byte.

Type of operation: Heating

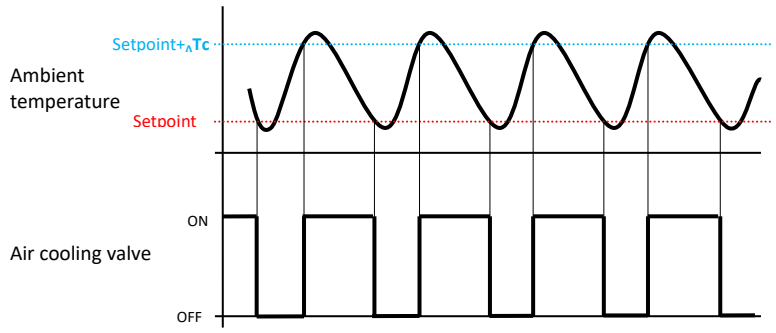


There are two thresholds that determine respectively the activation and deactivation of the heating system:

- **Setpoint-$_{\Delta}T_R$**: when the measured temperature falls below this threshold, the system is activated
- **Setpoint**: when the measured temperature exceeds this value, the system is deactivated

When the measured temperature is lower than the "Setpoint-$_{\Delta}T_R$" value in heating mode, the device activates the heating system by sending the relative percentage command to the actuator that manages it; when the measured temperature reaches the defined Setpoint value, the device deactivates the heating system.

Type of operation: Cooling



There are two thresholds that determine respectively the activation and deactivation of the cooling system:

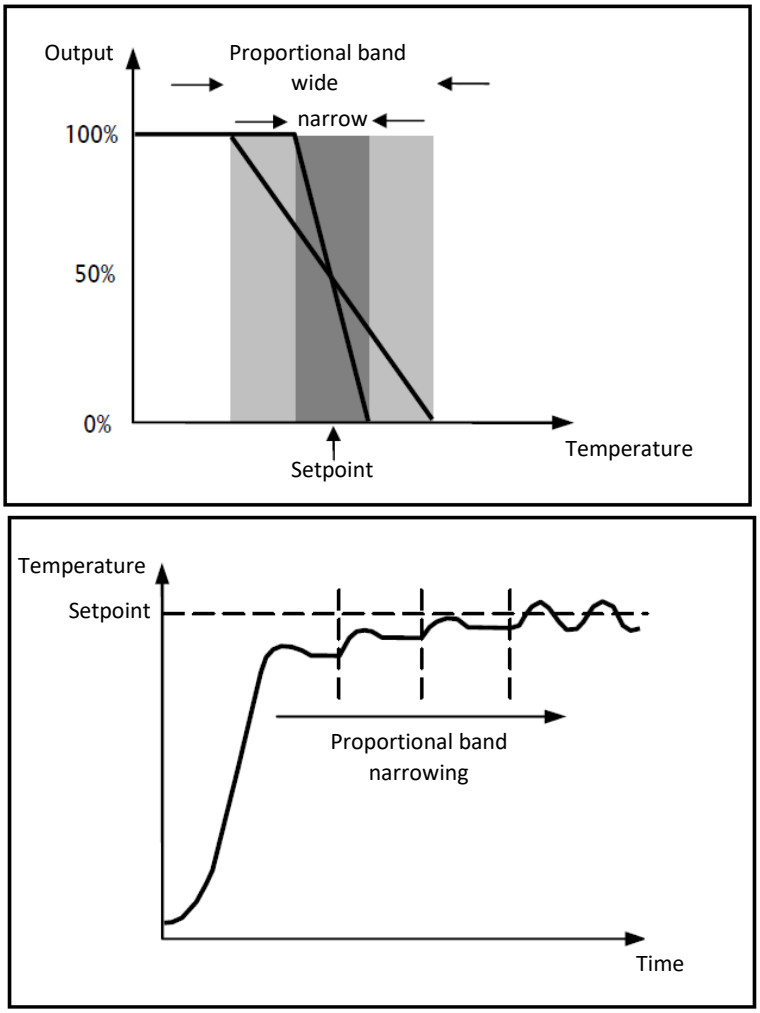
- **Setpoint**: when the measured temperature falls below this threshold, the system is deactivated
- **Setpoint+$_{\Delta}$Tc**: when the measured temperature exceeds this value, the system is activated

When the measured temperature is higher than the "Setpoint+$_{\Delta}$Tc" value in cooling mode, the device activates the cooling system by sending the relative percentage command to the actuator that manages it; when the measured temperature reaches the defined Setpoint value, the device deactivates the cooling system.

To avoid the continuous switching of the solenoid valves, the next 100% command after a 0%-100%-0% sequence can only be sent after at least 2 minutes have elapsed.

13.1.3. PWM proportional integral

The PWM control algorithm, used to control the temperature adjustment system, allows you to drastically reduce the times due to thermal inertia and introduced by the two-point control. This type of control involves the modulation of the impulse duty-cycle (represented by the temperature adjustment system activation time) on the basis of the difference between the defined setpoint and the measured temperature. Two components are needed to calculate the output function: the proportional component and the integral component, used to improve the response in order to reach the defined setpoint temperature. Once the proportional band has been defined (from setpoint to setpoint **– ΔT** for heating, and from setpoint to setpoint **+ ΔT** for cooling), its width determines the extent of the system response: if it is too narrow, the system will be more reactive but with swings; if it is too wide, the system will be slower. The ideal situation is one where the band is as narrow as possible, without swings. The integration time is the parameter that determines the action of the integral component. The longer the integration time, the slower the modification of the output and hence the slower the system response. If the time is too short, the threshold value will be exceeded, and the function will swing around the setpoint.



The device keeps the temperature adjustment system switched on for a cycle time percentage that depends on the output function of the proportional-integral control; the device continually adjusts the system, modulating the system ON-OFF times with a duty-cycle that depends on the value of the output function (calculated at each time gap equal to the cycle time). The cycle time is reinitialised every time the reference setpoint is modified. With this type of algorithm, there is no longer a hysteresis cycle on the heating/cooling element, so the inertia times introduced by the two-point control are eliminated. This produces energy savings because the system does not remain switched on when it is not needed and, once the required temperature has been reached, it continues to provide a limited contribution to compensate for the environmental heat dispersion.

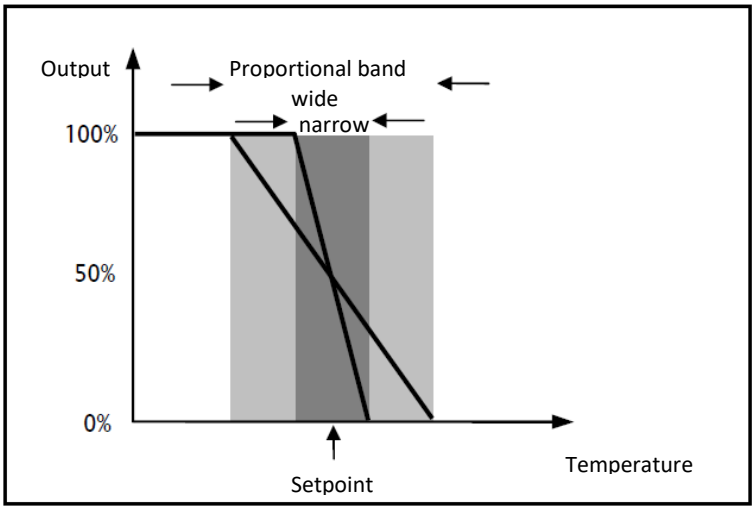
13.1.4. Continuous proportional integral

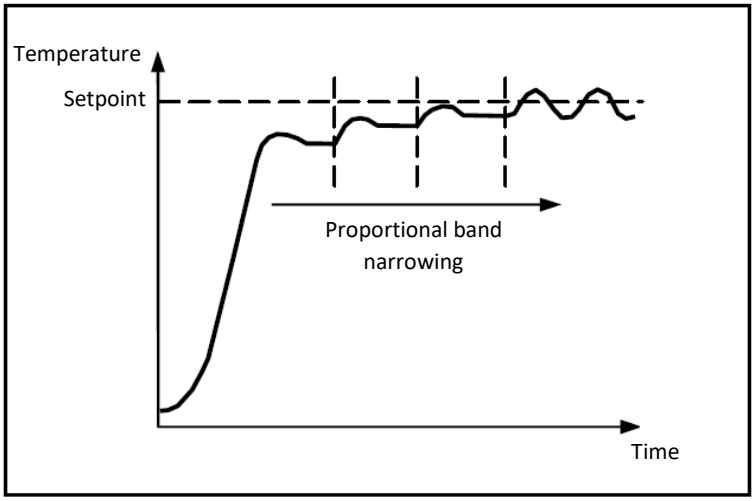
The operating principle is similar to that of PWM proportional integral, with the difference that the communication objects for temperature adjustment management are 1 byte. This type of control involves the continuous management of the difference between the defined setpoint and the measured temperature. Two components are needed to calculate the output function: the proportional component and the integral component, used to improve the response in order to reach the defined setpoint temperature. Once the proportional band has been defined (from setpoint to setpoint **– ΔT** for heating, and from setpoint to setpoint **+ ΔT** for cooling), its width determines the extent of the system response: if it is too narrow, the system will be more reactive but with swings; if it is too wide, the system will be slower. The ideal situation is one where the band is as narrow as possible, without swings. The integration time is the parameter that determines the action of the integral component. The longer the integration time, the slower the modification of the output and hence the slower the system response. If the time is too short, the threshold value will be exceeded, and the function will swing around the setpoint. The device continually adjusts the temperature adjustment system, sending percentage activation values to the solenoid valve. With this type of algorithm, there is no longer a hysteresis cycle on the heating/cooling element, so the inertia times introduced by the two-point control are eliminated. This produces energy savings because the system does not remain switched on when it is not needed and, once the required temperature has been reached, it continues to provide a limited contribution to compensate for the environmental heat dispersion.

Proportional component:

Once the proportional band has been defined: the output within the band varies from 0% to 100%; outside the band, the output will be the maximum power or minimum power, depending on the reference limit.

The width of the proportional band determines the extent of the response to the error. If the band is too “narrow”, the system swings as a result of its excessive reactivity; If it is too “wide” on the other hand, the control system is slow. The ideal situation is when the proportional band is as narrow as possible, but without causing swings.





Integral component:

The integral component accelerates the dynamics of the process towards the setpoint, and eliminates the residuals of the stationary error status that arises with a pure proportional controller.

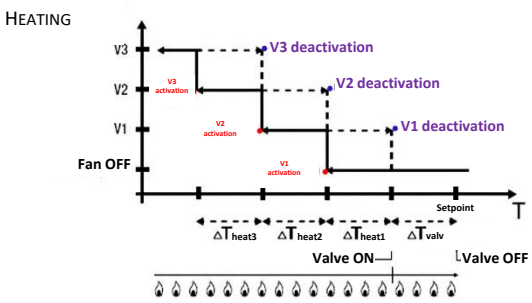
The integration time is the parameter that determines the action of the integral component. The longer the integration time, the slower the modification of the output and hence the slower the system response. If the time is too short, the threshold value will be exceeded (overshoot), and the function will swing around the setpoint.

13.1.5. Fan coil with 3-speed regulation (ON-OFF)

This type of algorithm is used when the fan coil offers 3-speed fan regulation.

The algorithm uses three stages for defining the activation of the hysteresis cycle. Each stage is associated with a speed (V): when the difference between the measured temperature and the defined setpoint determines the activation of a certain speed, the other two must necessarily be deactivated.

The fan coil has three different operating speeds for its fan: V1, V2 and V3



Type of operation: Heating

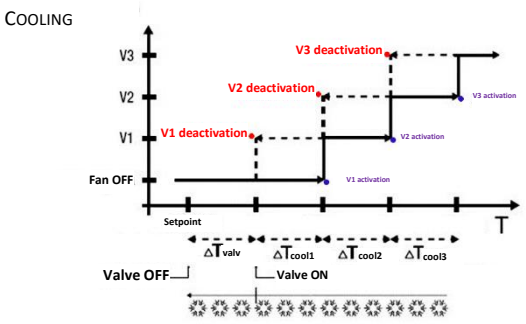
The figure refers to the speed control of the fan coil with three operating stages and two-point fan coil valve management (ON-OFF or 0-100%) with regards heating. The chart shows that each stage has a hysteresis cycle, and each speed is associated with two thresholds that determine its activation and deactivation.

The thresholds are determined by values set for the various regulation differentials, and can be summarised as follows:

- **Speed V1 (1st stage)**: the speed is activated when the temperature value is lower than the “Setpoint-ΔTvalv-ΔT1 heat” value, and deactivated when the temperature value reaches the “Setpoint-ΔTvalv” value (or the “Setpoint” value if ΔT1 heat=0). The first speed is also deactivated when a higher speed (V2 or V3) needs to be activated
- **Speed V2 (2nd stage)**: the speed is activated when the temperature value is lower than the “Setpoint-ΔTvalv-ΔT1 heat-ΔT2 heat” value, and deactivated when the temperature value reaches the “Setpoint-ΔTvalv-ΔT1 heat” value. The second speed is also deactivated when speed V3 needs to be activated
- **Speed V3 (3rd stage)**: the speed is activated when the temperature value is lower than the “Setpoint-ΔTvalv-ΔT1 heat-ΔT2 heat-ΔT3 heat” value, and deactivated when the temperature value reaches the “Setpoint-ΔTvalv-ΔT1 heat-ΔT2 heat” value

The heating solenoid valve is regulated on the basis of the management configured.

In the case of two-point fan coil valve management (ON-OFF or 0-100%), note that the thermostat sends the activation command to the solenoid valve that manages the heating system when the measured temperature is lower than the “Setpoint-ΔTvalv” value; the solenoid valve, on the other hand, is deactivated when the measured temperature reaches the defined setpoint value. In this way, the heating of the fan coil can also be exploited for irradiation, without any speed being activated.



Type of operation: Cooling

The figure refers to the speed control of the fan coil with three operating stages and two-point fan coil valve management (ON-OFF or 0-100%) with regards cooling. The chart shows that each stage has a hysteresis cycle, and each speed is associated with two thresholds that determine its activation and deactivation. The thresholds are determined by values set for the various regulation differentials, and can be summarised as follows:

- **Speed V1 (1st stage)**: the speed is activated when the temperature value is higher than the "Setpoint+ΔTvalv+ΔT1cool", and deactivated when the temperature value reaches the "Setpoint+ΔTvalv" value (or the "Setpoint" value if ΔT1 cool=0). The first speed is also deactivated when a higher speed (V2 or V3) needs to be activated
- **Speed V2 (2nd stage)**: the speed is activated on when the temperature value is higher than the "Setpoint+ΔTvalv+ΔT1 cool+ΔT2 cool" value, and deactivated when the temperature value reaches the "Setpoint+ΔTvalv+ΔT1 cool" value. The second speed is also deactivated when speed V3 needs to be activated
- **Speed V3 (3rd stage)**: the speed is activated when the temperature value is higher than the "Setpoint+ΔTvalv+ΔT1 cool+ΔT2 cool+ΔT3 cool" value, and deactivated when the temperature value reaches the "Setpoint+ΔTvalv+ΔT1 cool+ΔT2 cool" value

In the case of two-point fan coil valve management (ON-OFF or 0-100%), note that the thermostat sends the activation command to the solenoid valve that manages the cooling system when the measured temperature is higher than the "Setpoint+ΔTvalv" value; the solenoid valve, on the other hand, is deactivated when the measured temperature reaches the defined setpoint value. In this way, the cooling of the fan coil can also be exploited for irradiation, without any speed being activated.

In the case of fan coil valve management in continuous proportional-integral mode, note that the thermostat begins the continuous regulation (with reference to the setpoint) by sending the activation commands to the solenoid valve that manages the cooling system on the basis of the values of the function used for continuous PI control.

By exploiting the fan action delay caused by the "Setpoint+ΔTvalv+ΔT1heat" threshold, and in particular ΔTvalv (where ΔTvalv is the result of the valve regulation differential or the fan coil intervention limit for two points ON-OFF / 0%-100% or continuous proportional integral management respectively), fan coil cooling can also be exploited for irradiation, without any speed being activated.

13.1.6. Fan coil with continuous speed regulation (0-100%)

This type of algorithm is used when the fan coil offers fan speed management within a continuous range from 0 to 100%.

This type of control involves the continuous control of the difference between the measured temperature and the defined setpoint, and consequently the sending of commands to modulate the speed of the temperature adjustment system fan. Two components are needed to calculate the output function: the proportional component and the integral component. If you want the valve to open before the fan is activated, the start of continuous fan speed control can be delayed by checking the intervention threshold (ΔTvent) - the fan coil intervention limit.

The heating solenoid valve is regulated on the basis of the management configured.

In the case of two-point fan coil valve management (ON-OFF or 0-100%), note that the thermostat sends the activation command to the solenoid valve that manages the heating system when the measured temperature is lower than the "Setpoint-ΔTvalv" value; the solenoid valve, on the other hand, is deactivated when the measured temperature reaches the defined setpoint value. Thanks to the delay introduced by the intervention threshold - fan coil intervention limit (which in practice shifts the reference of the continuous fan speed control

of “Setpoint-ΔTvalv-ΔTvent”), fan coil heating can also be exploited for irradiation, without fan speed regulation being activated.

In the case of fan coil valve management in continuous proportional-integral mode, note that the thermostat begins the continuous regulation (with reference to the setpoint) by sending the activation commands to the solenoid valve that manages the heating system on the basis of the values of the function used for continuous PI control. Thanks to the delay introduced by the intervention threshold - fan coil intervention limit (which in practice shifts the reference of the continuous speed control of “Setpoint-ΔTvent”), fan coil heating can also be exploited for irradiation, without fan speed regulation being activated.

The cooling solenoid valve is regulated on the basis of the management configured.

In the case of two-point fan coil valve management (ON-OFF or 0-100%), note that the thermostat sends the activation command to the solenoid valve that manages the cooling system when the measured temperature is higher than the “Setpoint+ΔTvalv” value; the solenoid valve, on the other hand, is deactivated when the measured temperature reaches the defined setpoint value. Thanks to the delay introduced by the intervention threshold - fan coil intervention limit (which in practice shifts the reference of the continuous fan speed control of “Setpoint+ΔTvalv+ΔTvent”), fan coil heating can also be exploited for irradiation, without fan speed regulation being activated.

In the case of fan coil valve management in continuous proportional-integral mode, note that the thermostat begins the continuous regulation (with reference to the setpoint) by sending the activation commands to the solenoid valve that manages the cooling system on the basis of the values of the function used for continuous PI control. Thanks to the delay introduced by the intervention threshold - fan coil intervention limit (which in practice shifts the reference of the continuous speed control of “Setpoint+ΔTvent”), fan coil cooling can also be exploited for irradiation, without fan speed regulation being activated.

14 F.A.Q.

What does the temperature value on the display actually represent?

If no external temperature probe has been enabled in the ETS programming, the value on the display is the temperature measured by the sensor built into the thermostat. If, however, an external temperature probe (of the KNX or NTC type) has been enabled, the thermostat shows the average between the values measured by the external probe and the built-in sensor, using a variable weight between 10% and 100% (which can be defined in ETS).

The temperature shown on the display (and measured by the internal sensor) does not vary, even in the face of temperature changes. Why?

As a result of intensive use of the device (for instance during the programming stages) while the back-lighting is enabled, there could be minor changes in the ambient temperature. To therefore guarantee accurate measuring in these conditions too, the device inhibits any measurement updates for a few minutes.

How is the humidity level measured?

If no external humidity probe has been enabled in the ETS programming, the value on the display is the humidity value measured by the sensor built into the thermostat. If, however, an external humidity probe (of the KNX type) has been enabled, the thermostat shows the average between the values measured by the external probe and the built-in sensor, using a variable weight between 10% and 100% (which can be defined in ETS).

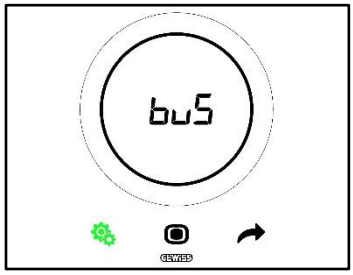
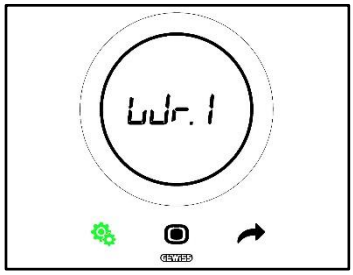
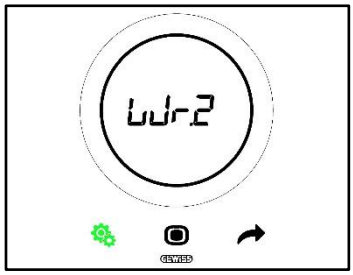
What happens to the time set on the thermostat if there is an auxiliary power supply (110-230V AC, 50/60 Hz) failure and reset?

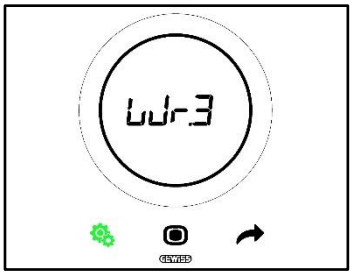
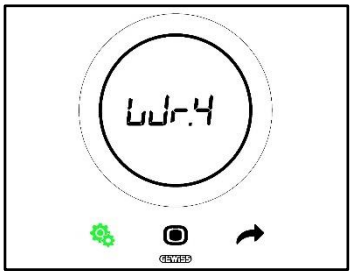
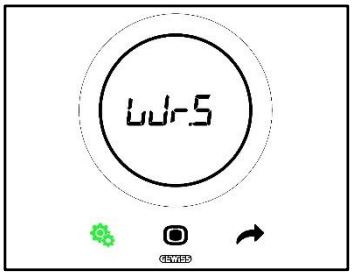
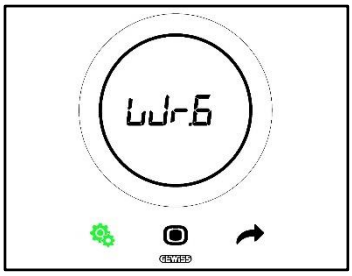
The thermostat does not have an energy accumulation system. It cannot keep the information up-to-date if there is a power failure; upon reset, the time information resumes the value displayed prior to failure. If the power supply remains disconnected for a long time, the time information must be manually reset via the menu, or automatically via the BUS (it can be defined in ETS), from a KNX device (timed thermostat, weather station, Master, Smart Gateway, etc.).

15 Messages and errors

In the event of system faults or malfunctioning, various warning messages will appear on the screen to inform the user. The relevant indications for the user are listed below.

You are advised to always contact your installer if an error, fault or malfunction message appears on the screen.

INDICATION ON THE SCREEN	DESCRIPTION
	Warning of lack of KNX BUS connection. This malfunction blocks all communication on the BUS, and therefore all temperature adjustment or humidity management functions and so on. The KNX BUS connection must be checked to reset correct operation. Once the error has been detected and indicated on the screen, the message remains and the temperature adjustment and humidity management functions are blocked because the situation is critical for device operation. The user can quit the error display page by pressing the NEXT button key, but the page will continue to be displayed in addition to the normal operating status pages (temperature, humidity, time and fan speed) as long as the error persists. The error will only stop being displayed when it has been resolved. Contact your installer.
	Warning of internal board communication malfunctioning. This malfunction may jeopardise the normal operation of the internal temperature and humidity sensors, along with the circular slider. It is displayed if the incidence of the internal temperature and humidity sensors is other than 0%. Once it has been displayed on the screen, the warning persists. You can quit the warning display page by pressing the NEXT button key, but the page will continue to be displayed in addition to the normal operating status pages (temperature, humidity, time and fan speed) until the cause of the problem has been resolved. The warning will only stop being displayed when the condition linked to it is no longer detected. Contact your installer.
	Warning of auxiliary temperature sensor malfunctioning. Visualised if the sensor is enabled. Once it has been displayed on the screen, the warning persists. You can quit the warning display page by pressing the NEXT button key, but the page will continue to be displayed in addition to the normal operating status pages (temperature, humidity, time and fan speed) until the cause of the problem has been resolved. The warning will only stop being displayed when the condition linked to it is no longer detected. Contact your installer.

	Signal or malfunctioning warning received from external device. The seriousness of the warning is strictly linked to the system type and configuration. Once it has been displayed on the screen, the warning persists. You can quit the warning display page by pressing the NEXT button key, but the page will continue to be displayed in addition to the normal operating status pages (temperature, humidity, time and fan speed) until the cause of the problem has been resolved. The warning will only stop being displayed when the condition linked to it is no longer detected. Contact your installer.
	Signal or malfunctioning warning received from external device. The seriousness of the warning is strictly linked to the system type and configuration. Once it has been displayed on the screen, the warning persists. You can quit the warning display page by pressing the NEXT button key, but the page will continue to be displayed in addition to the normal operating status pages (temperature, humidity, time and fan speed) until the cause of the problem has been resolved. The warning will only stop being displayed when the condition linked to it is no longer detected. Contact your installer.
	Signal or malfunctioning warning received from external device. The seriousness of the warning is strictly linked to the system type and configuration. Once it has been displayed on the screen, the warning persists. You can quit the warning display page by pressing the NEXT button key, but the page will continue to be displayed in addition to the normal operating status pages (temperature, humidity, time and fan speed) until the cause of the problem has been resolved. The warning will only stop being displayed when the condition linked to it is no longer detected. Contact your installer.
	Signal or malfunctioning warning received from external device. The seriousness of the warning is strictly linked to the system type and configuration. Once it has been displayed on the screen, the warning persists. You can quit the warning display page by pressing the NEXT button key, but the page will continue to be displayed in addition to the normal operating status pages (temperature, humidity, time and fan speed) until the cause of the problem has been resolved. The warning will only stop being displayed when the condition linked to it is no longer detected. Contact your installer.

code 70198544

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LAST REVISION 10/2020