COMPUTER ROOM AIR CONDITIONER
MODEL

s-MEXT-G00 006-044

TECHNICAL MANUAL
TRANSLATION OF THE ORIGINAL INSTRUCTIONS

For ME28-relC software versions

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Before carrying out any operation on the machine,
you must carefully read this manual
and make sure you understand
all the instructions and information given

Keep this manual in a known and easily accessible place to refer to as necessary during the entire life-span of the unit.

CONTENTS

Description of the symbols

A number of symbols are used to highlight some parts of the text that are of particular importance. These are described below.

ATTENTION
Indicates situations of grave danger which, if ignored, can seriously endanger the health and safety of people.

OBLIGATION
Indicates that it is necessary to act in an appropriate manner in order not to put at risk the health and safety of people and not cause financial damage.

INFORMATION
Indicates technical information of particular importance which should not be neglected.

1 INTRODUCTION

1.1 SAFETY REQUIREMENTS

The software described in this document was designed for use with precision air-conditioning units such as “Close Control” units (for data processing centres).

The software was designed for use on the following control systems:

- control board EVOLUTION+ – Small with user terminals and PGD1 graphic interface

ATTENTION
The EVOLUTION+ controller software is protected by a digital signature.
This means that it can only work on boards supplied by MEHITS and not on boards purchased from other dealers.

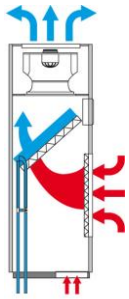
1.2 GENERAL FUNCTIONS

Below is a non-exhaustive list of the functions of the application:

- Adjustment of room temperature and humidity according to the setpoints entered using the user terminal.
- Complete visualisation of the operating status of the unit.
- Possibility of setting the adjustment parameters, both the fundamental ones (entering the “User” password) and the more advanced ones (entering the “Service” and “Factory” password).
- Possibility of manually managing (manual override) all the unit devices.
- Management and acoustic and visual signalling (visual only by default) of faults (alarms), events and maintenance, with memorisation up to 200 events.
- Possibility of serial control and management.
- Possibility of operating up to 10 units connected together in a local network LAN, also with one or two time-switched backup units.

1.3 UNITS CONTROLLED

The software in question can be installed on the following version of air-conditioning units.

Type and diagram	Description	Unit code	Features
SPLIT TYPE 	These direct expansion units use refrigerant for the transfer of heat. The air in the room is, therefore, treated in the evaporating coil where the refrigerant flows. The condensation heat is dumped by a Mr. Slim external air condensing unit with inverter compressor.	**s-MEXT**	• **Direct expansion coil to use in combination with the Mr. Slim condensing unit** • **EC fans**

2 USER INTERFACE

2.1 USER TERMINAL

2.1.1 Technical characteristics

The user interface comprises:

- 132x64 pixel backlit LCD display.
- 6 backlit buttons.

The connection between the microprocessor board and the user terminal involve a 4-pole telephone cable equipped with RJ11 connector. The terminal is fed directly from the control board.

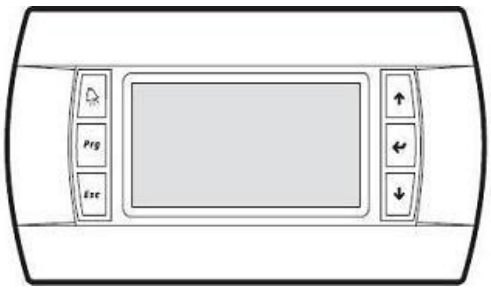


Figure 2-1: *User terminal*

2.1.2 General functions of keys and LEDs

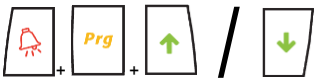
Key	Name	Description	
		Key	Led
	**[ALARM]**	Displays the alarms and resets normal operating conditions.	Fixed in case of alarm and flashing in case of signal. Once the [ALARM] key is pressed, the led becomes fixed. In lack of alarms/signals, the led is off.
	**[PRG]**	Accesses the main menu.	When the unit is operating (ON).
	**[ESC]**	goes back one level in the mask tree if you are in the header masks, or returns to the main mask.	Upon turning on the unit, when pressing any key or activating an alarm/signal. It will disengage after three minutes of inactivity on the keyboard of the user terminal.
	**[UP] / [DOWN]**	Move around the masks and set control parameter values.	
	**[ENTER]**	Confirms entered data.	
	**[ALARM + PRG + UP / DOWN]**	Increase or decrease screen contrast.	
	**[ALARM + ESC]**	In the shared keyboard mode, this combination allows to share screenshots and parameters among LAN connected units.	

Table 1: *List of keys and related functions*

2.2 GENERAL CHARACTERISTICS OF THE INTERFACE

2.2.1 Groups of masks and menu structure

The tree structures for moving around the various menus of the controller are shown below.

The masks may be accessed through different menus using the **[UP]** and **[DOWN]** keys shown in the following figures with a double arrow ↑/↓. The **[ENTER]** or **[ESC]** keys are identified by Esc/ ↵.

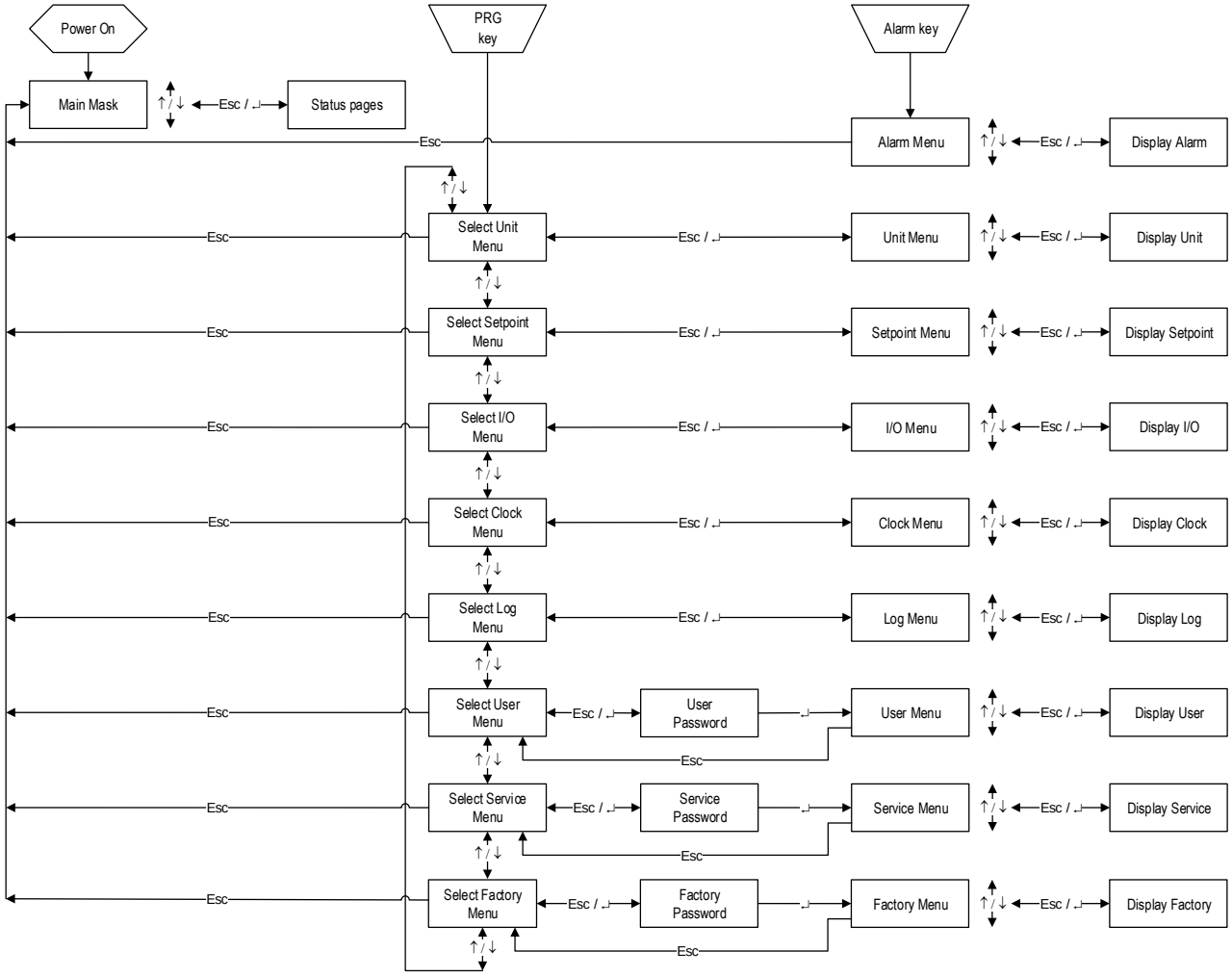


Figure 2-2: *Tree for moving around the menus*

- The **"Unit Menu"** displays information such as temperature, pressure and circuit states.
- The **"Setpoint Menu"** is used to set the setpoints for the various available functions.
  It is possible to set different setpoints depending on the available function modes (heat resources present, humidifier present, and dehumidifier present, etc.).
- The **"In/Out menu"** shows the status of the digital inputs and values read from the analogue inputs.
  It also shows the status of the digital outputs and the voltage supplied to the analogue outputs.
  If I/O expansions are present (depending on the configuration parameters), the inputs and outputs of the latter are also shown.
- The **"Clock menu"** is used to set and display the date and time and configure the time bands.
- The **"Log menu"** is used to display the list of alarm events recorded by the unit.
- The **"User menu"** is used to display and set parameters relative to user programming of the unit.
- The **"Service" menu** is used by Service to display and set unit configuration parameters.
- The **"Factory menu"** is used by the manufacturer to display and set unit configuration parameters.

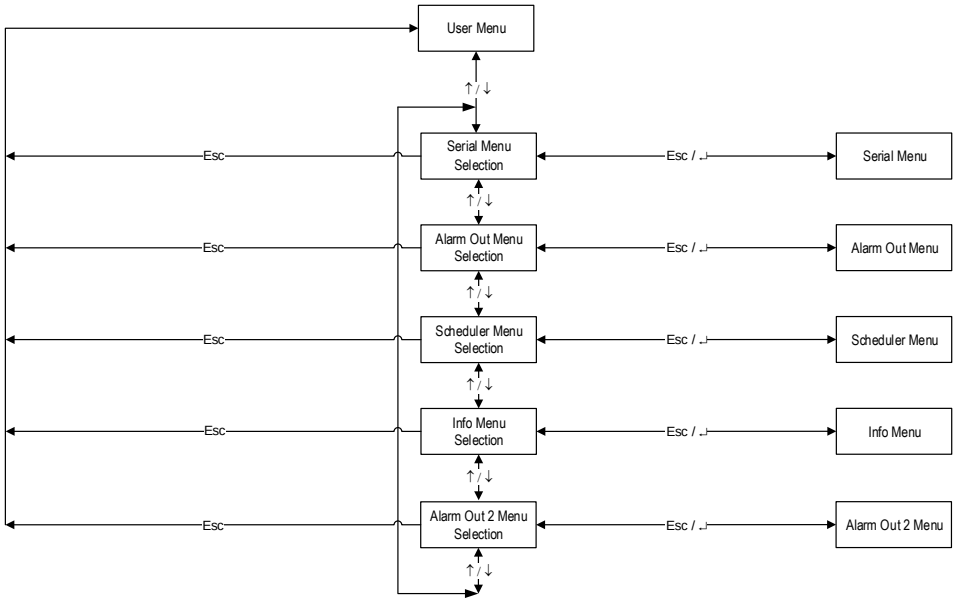


Figure 2-3: *Tree for moving around the "User menu"*

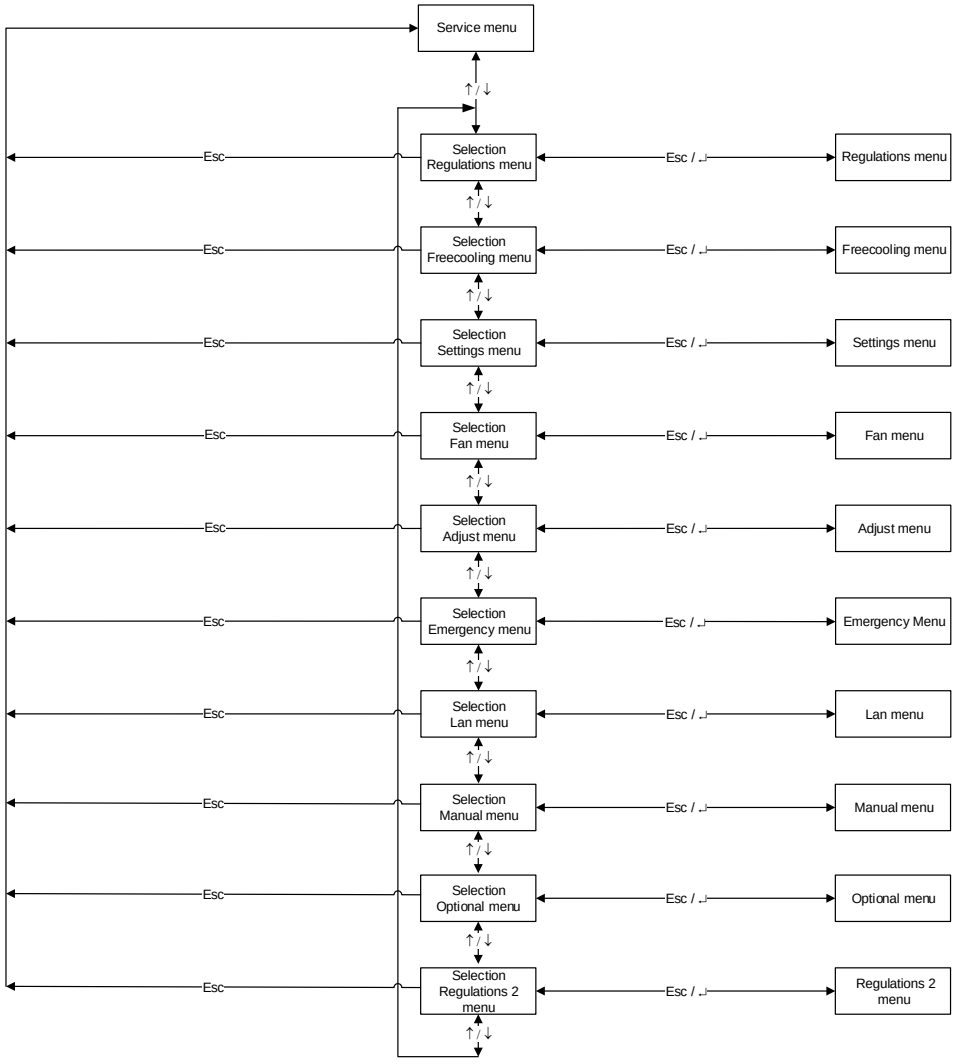


Figure 2-4: *Tree for moving around the "Service" menu*

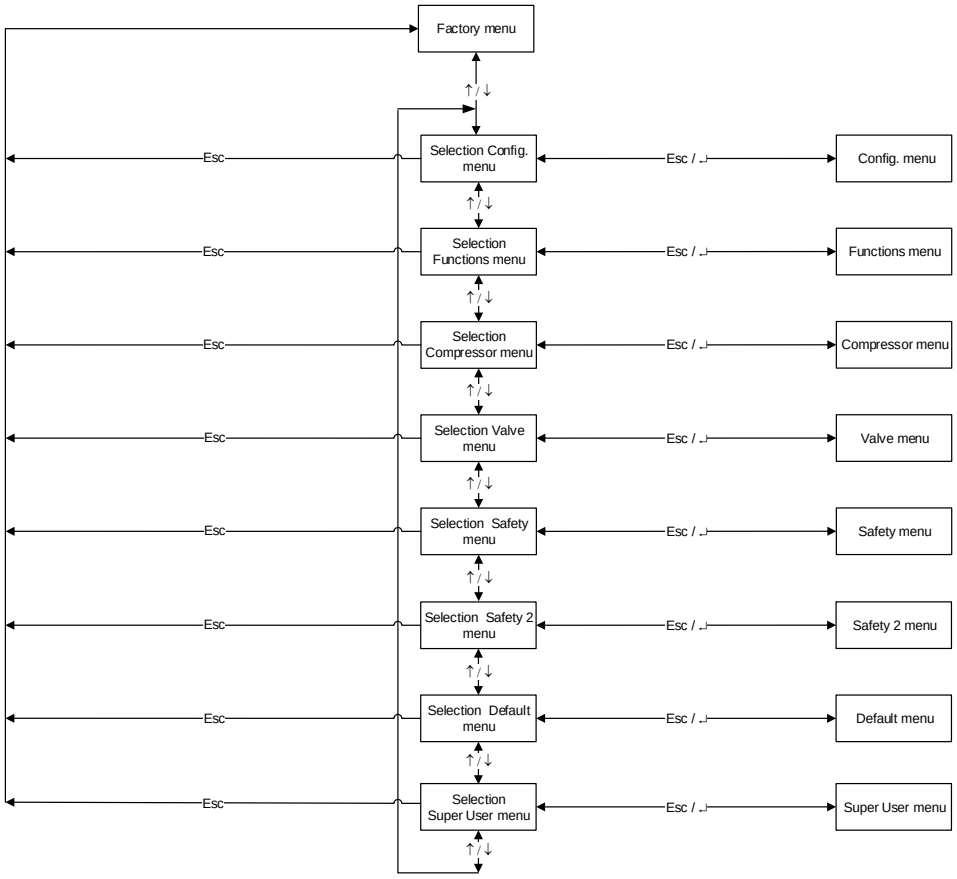


Figure 2-5: *Tree for moving around the "Factory" menu*

The access to the **"User"**, **"Service"** and **"Factory"** menus requires a password. The following chapter explains how to manage the passwords.

2.2.2 Password management

There are three menu levels that may be accessed upon entering a numeric password. The access levels are as follows:

- **"User"** password, for the user.
- **"Service"** password, for maintenance and assistance operators;
- **"Factory"** password, for the sole and exclusive use of the manufacturer's employees (not to be disclosed externally).

To enter the password, type every single digit in the set order from left to right.
To move from one digit to the next, just press the **[ENTER]** key.
To move from one digit to the previous, just press the **[ESC]** key. If the cursor should be on the first digit to the left, then this brings back to the main window.

The following table shows the values of the **"User" password**, the **"Service" password** and the **"Factory" password**:

USER PASSWORD
1234 (modifiable)

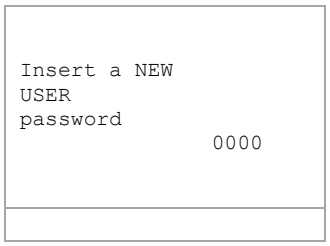
SERVICE PASSWORD	FACTORY PASSWORD
9990 (modifiable)	0000009982 (modifiable)

The **"Factory" password** is managed using the Service software, which for each controller configures a Factory password, which is then saved in the job and is only available to after-sales service.

Once at the last digit of the password, by pressing the **[ENTER]** key the software will compare the entered password with those stored in its memory. If the entered password should not be correct, the message "Wrong Password !!!" will appear for a few instants, all digits will be reset, and the cursor will move back to the first digit, on the left end of the password space.

To go back with the cursor to the previous password digit, just press the **[ESC]** key.
By pressing the **[ESC]** key with the cursor on the first digit on the left, the system goes back by one level.

To change the **"User" password** access the **"Info" menu** inside the **"User" menu** and scroll the masks until the **"User" password** change mask appears:



The window to change the **"Service" password**, which can be accessed by entering the **"Settings" menu**, under the **"Service" menu**.
The window to change the **"Factory" password** can be accessed from the **"Config" menu"**, under the **"Factory" menu**.

OBLIGATION
If the Factory password is changed, remember to re-enter the password generated by the service software at the end of the test, after maintenance is completed.

INFORMATION
Some parameters in the "Factory" menu can only be changed after switching off the unit (OFF).

2.3 MAIN MASK

The figure below shows the main mask layout, including the (numbered) areas in which it is divided.

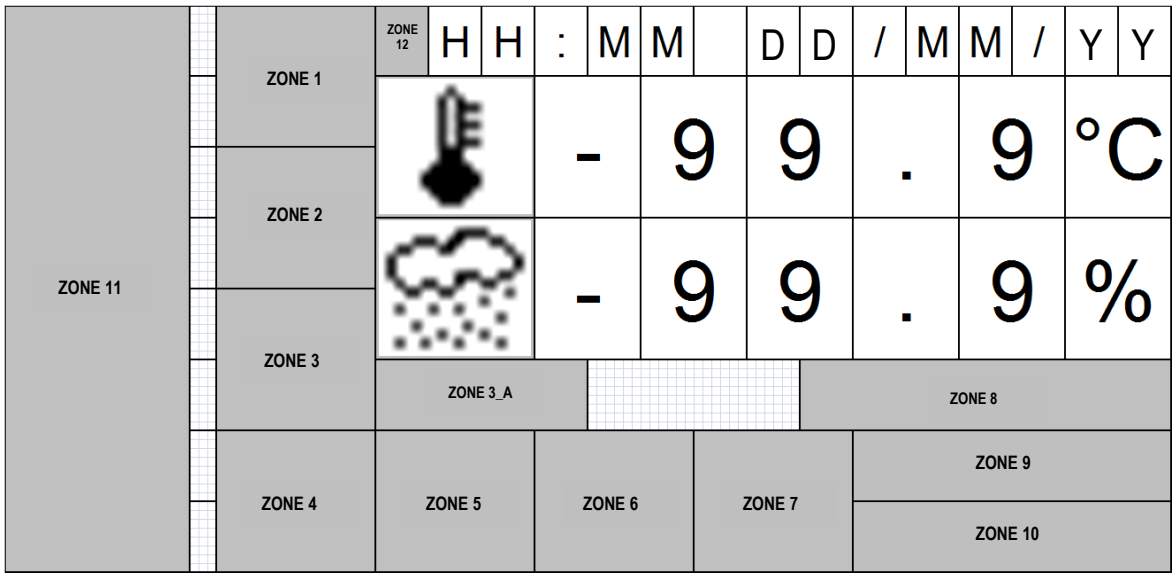


Figure 2-6: *Main mask*

The area above displays the hour and the date.
It also displays room humidity and temperature (only when the probe is installed) in real time (also in case the average value mode for the local LAN units connected should be active). Following is a description of the main mask areas:

Zone 1: General unit status

OFF	Unit off	
	Unit operating in normal mode	
	Unit off but with fan in operation at low speed to prevent gas build-up	
/ /	Unit operating on steady capacity mode	Normal operation / Maximum flow reached / Minimum flow reached
/	Unit operating on steady residual ΔP mode	Normal operation / Minimum flow reached

NOTE

If the icon flashes and the icons also flash at the same time, this means that the unit is on for post-ventilation of the electric heaters (see the relevant paragraph in the chapter Heating). The flashing of the icon together with the flashing of the icon indicates that the unit is on because it is waiting for the Mr Slim external unit to switch off.

Zone 2: Unit detail status

	Presence of an active alarm	STAND BY	Unit on stand-by
	Maintenance signal		Unit on for exceeding the maximum room temperature threshold
	Active manual controls		Unit on for exceeding the minimum room temperature threshold
	Unit on/off from terminal		Unit on for exceeding the maximum room humidity threshold
	Unit on/off from remote contact		Unit on for exceeding the minimum humidity threshold
	Unit on/off from supervision system	Blinking	Unit on for electric heater post-ventilation function
	Unit on in local LAN		Unit off and powered by ULTRACAP
	Unit turned on for LAN disconnection alarm		

Zone 3: Type of event, shown in case of event

	EEPROM faulty		Room temperature probe faulty
	LAN disconnected		Room humidity probe faulty
ADL	ADL function at operating limit		Feed air temperature probe faulty
	Water leaks (flooding)		External air temperature probe faulty
	High ambient temperature		Differential pressure transducer faulty
	Low ambient temperature	1	IO 1 expansion alarm offline (ind. 8)
	High ambient humidity	T+H	T+H probe offline alarm
	Low ambient humidity		Humidifier driver offline alarm
	Air flow alarm		Network transducer offline alarm
L1 L2 L3	Phase sequence wrong	GAS 1	Circuit 1 frost-free function alarm
	Filters clogged	GAS 2	Circuit 2 frost-free function alarm
	Fire/smoke detected	1	BMS1 offline
	Electric element overheating	M	Master PAC-IF offline alarm
	High humidifier current	S1	Slave 1 PAC-IF offline alarm
	Low humidifier current	M	Master PAC-IF alarm
	No water to the humidifier	S1	Slave 1 PAC-IF alarm
	Gas leak detected		

In case of several active events, the area displays the event having higher priority of all the present events. The order of severity for the events displayed in this area reflects the order in which the alarms are reported in the table, from the most to the least severe. The severity of the events is valued based on the consequences they imply for the operation of the conditioning unit.

Area 3_A: Code of the event corresponding to the icon shown in area 3

As well as the code, the event type is also displayed (Signal or Alarm).

Zone 4: "Cold" devices currently in operation

	At least one compressor of an Mr Slim unit is active

NOTE

If icon flashes intermittently, the request for compressor start-up is in process, but a countdown is active for PAC-IF dedicated protection timing purposes (see the corresponding section in the safety function chapter).

Zone 5: Currently active "Freecooling" devices

	Direct Freecooling damper in adjustment

Zone 6: "Humidity" devices currently in operation

	Dehumidifier active
	Humidifier active

When the icon flashes intermittently, the dehumidifier activation request is in process, though a temperature block is active (high or low temperature threshold, minimum temperature threshold).

On the other hand, the icon flashing indicates that there is a pending dehumidification request, but a compressor protection time count is running.

Zone 7: "Hot" devices currently in operation

	First electrical element step active
	Second electrical element step active
	Third electrical element step active
Blinking	Electric heaters Post-Ventilation function active

Zone 8: Current unit ON/OFF status

This parameter can also be used to switch the unit on/off.

Zone 9: Serial address of the unit (when supervision operation enabled).

Zone 10: LAN address of the unit (where the local network (LAN) is engaged).

Zone 11: The type of unit

	Split Type unit	
	Split Type unit with Direct Freecooling	In recirculation position (only internal air)
		In internal air + external air mixing position
		In external air-only position

Zone 12: Display of active functions icon

This area shows the icon, which indicates the presence of active functions, and the "Active function display" mask, where it is possible to see which functions are actually active (more details in the following pages).

2.4 MAIN LOOP MASKS

The main loop masks have the following functions:

- Provide a complete overview regarding the status of the unit.
- Provide useful information to the unit maintenance operator.

2.4.1 List of the main loop masks

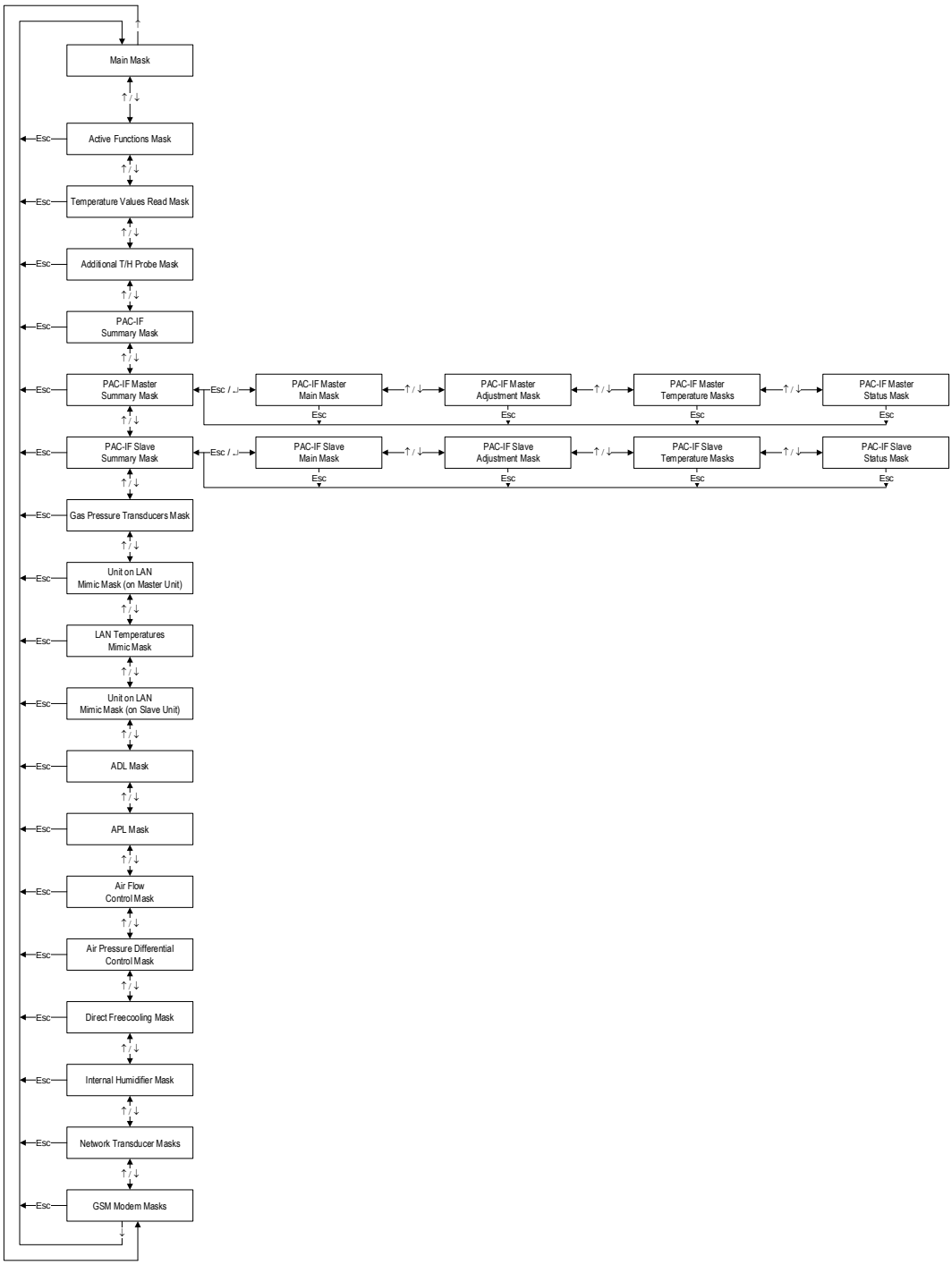


Figure 2-7: *Main menu navigation tree*

2.4.2 Main loop mask table

Press **[UP]** or **[DOWN]** to move from one mask to another.

Below are the main loop masks

Mask of the terminal	Description
ACTIVE FUNCTIONS  **DELAY FOR TIME OBSERVATION**	Mask that displays the active functions of the unit *Visible only when certain functions are active*
24.0 °C .0 °C **35.0 °C**	Active probe value display mask • Return temperature probe • Delivery temperature probe • External temperature probe
AUXILIARY T-H PROBE **Addr. 129** **24.0 °C** **50.0 %** **Status:Offline**	Mask that displays the value of the serial auxiliary probe (address 129). *Visible if the probe is configured*
REQUEST STATUS PAC-IF **Cooling request: 100%** **Step request: 11** **Waiting: NONE**	Mask displaying the requests of cold and steps sent to the PCA-IF013B-E card It also shows if the system is waiting for the expiry of a time delay before sending the steps to the Master PAC-IF013B-E card: • [NONE] No delay • [SHORT WAIT] Short delay (300s / 5min) • [LONG WAIT] Long delay (600s / 10min) • [CHANGING MODE] Cycle inversion/mode change (120 s / 2min) • [MIN T.OFF] Minimum Off (120s / 2min)
PAC-IF013B-E MASTER PAC-IF ⇨DETAIL **Active step: 11** **Mode: COOLING** **Status:Online**	Master PAC-IF013B-E status Pressing [**ENTER**] will take to the section containing additional Master PAC-IF card information In case of alarm, the ⚠ icon will flash showing the "PAC-IF code:" message followed by the alarm code from the PAC-IF card. For additional information on the meaning of the code, see the "Event Mask" chapter.
PAC-IF013B-E SLAVE1 PAC-IF ⇨DETAIL **Active step: 11** **Mode: COOLING** **Status:Online**	Slave 1 PAC-IF013B-E status Pressing [**ENTER**] will take to the section containing additional Slave 1 PAC-IF card information In case of alarm, the ⚠ icon will flash showing the "PAC-IF code:" message followed by the alarm code from the PAC-IF card. For additional information on the meaning of the code, see the "Event Mask" chapter.
0 08.0bar .0bar **03.3°C 03.3°C**	Mask for the display of the values of the active probes and their conversions into temperature • Circuit 1 low pressure switch • Circuit 2 low pressure switch
L 1: STD BY: **: 5:** **: 8:** ADL	*Visible if the local network (LAN) is configured* Local network (LAN) status display mask. This mask is displayed only at the Master unit (LAN address=1). Unit operating STD BY Unit in stand by ! Unit in rescue mode Unit not operating Unit with Hot-Spot protection Unit with Cold-Spot protection When enabled it is possible to view the status of the ADL LAN function: • ADL ADL enabled ! ADL LIMIT ! ADL operating limit reached

Mask of the terminal	Description
99.9 99.9 99.9 99.9 99.9LAN:Local Unit Temp.(°C)	Mask that displays all the temperature values read by the units on the LAN network. This mask is displayed only at the Master unit (pLAN address=1). *Visible if the pLAN is configured*
L 1: 5: 8: 10:	Local network (LAN) status display mask. This mask is displayed only in the Slave unit (LAN address=2÷10). *Visible if the local network (LAN) is configured* Unit operating Unit not operating
01 LAN APL Current 0020 Pa Target 0020 Pa APL APL 0020 Pa Local 0019 Pa Status On target	APL pLAN function operation status display mask. This mask is displayed for all the units (pLAN address=1 to 10). *Visible if the pLAN is configured and the APL function is active*
DT 03.0 XT .0 Status Enabled Position ALL INTERNAL 000%	Direct Free Cooling function operation display mask. *Visible only if the function is enabled* It shows: Internal temperature, external temperature, Freecooling enable, damper position (internal only, mix, external only) and its opening percentage. The image graphically describes the Free Cooling damper position:
000.0kg/h /cm000 Alarm code:00 Warning code:0	**Humidifier** operation status display mask. *Visible if humidifier is present*
Energy Managment Voltages (V) 000 Current (A) 000.0 Active Power(kW)0000.0	Display mask for the values detected by the **network transducer** in case on mono-phase circuit. *Visible if the network transducer is present and configured*
Energy Managment Voltages (V) L1-L2 000 L2-L3 000 L3-L1 000 Neutral 1 000 Neutral 2 000 Neutral 3 000	Display mask for the electric values detected by the **network transducer**. Displays phase-phase and phase voltage (phase-neutral) values. *Only for three-phase units.* *Visible if the network transducer is present and configured*
Energy Managment Current (A) Line 1 000.0 Line 2 000.0 Line 3 000.0 Neutral 000.0	Display mask for the electric values detected by the **network transducer**. Displays phase and neutral current. *Only for three-phase units.* *Visible if the network transducer is present and configured*
Energy Managment Active Power (kW) Phase 1 0000.0 Phase 2 0000.0 Phase 3 0000.0 Total 0000.0	Display mask for the electric values detected by the **network transducer**. The phase active power is displayed *Only for three-phase units.* *Visible if the network transducer is present and configured*

Mask of the terminal	Description
Energy Managment **Energy: 0000000kWh** **Time: 0000000 h**	**Network transducer** active energy and hour counter display mask. *Visible if the network transducer is present and configured*
Input/Output GSM modem **Status:** **Stand-by ext.modem** **Offline 000%** **Timelnextncallr:0000 s** **SMS Queue: 00**	**GSM modem** status display mask. *Visible if the GSM modem is present and configured*
PAC-IF **PAC-IF** **MASTER**	Mask confirming access to the Master PAC-IF013B-E card additional information section. Press “Esc” to return to the Master PAC-IF013B-E card status mask.
PAC-IF013B-E Master **Status: ON** **Mode: COOLING** **Step: 11** **Communication: Online**	Master PAC-IF info mask: • Status • Method • Communication • Adjustment step
PAC-IF013B-E Master **TH11: 10.0°C** **TH5: 13.0°C** **TH2: 09.0°C**	Master PAC-IF info mask: • Suction temperature probe (TH11) • Two-phase temperature probe (TH5) • Liquid temperature probe (TH2)
PAC-IF013B-E Master **TH7: 10.0°C**	Master PAC-IF info mask: • External temperature probe (TH7)
PAC-IF013B-E Master **Compressor Status: ON** **Predefrost: OFF** **Defrost: ACTIVE** **Selfprotection: ACTIVE** **Software ver. 000001**	Master PAC-IF info mask: • Compressor status • Pre-defrost • Defrost • Self protection • PAC-IF SW version
PAC-IF **PAC-IF** **SLAVE1**	Mask confirming access to the Slave 1 PAC-IF013B-E card additional information section. Press “Esc” to return to the Slave 1 PAC-IF013B-E card status mask.

Mask of the terminal	Description
PAC-IF013B-E Slave1 **Status: ON** **Mode: COOLING** **Step: 11** **Communication: Online**	Slave 1 PAC-IF info mask: • Status • Method • Communication • Adjustment step
PAC-IF013B-E Slave1 **TH11: 10.0°C** **TH5: 13.0°C** **TH2: 09.0°C**	Slave 1 PAC-IF info mask: • Suction temperature probe (TH11) • Two-phase temperature probe (TH5) • Liquid temperature probe (TH2)
PAC-IF013B-E Slave1 **TH7: 10.0°C**	Slave 1 PAC-IF info mask: • External temperature probe (TH7)
PAC-IF013B-E Slave1 **Compressor Status: ON** **Predefrost: OFF** **Defrost: ACTIVE** **Selfprotection: ACTIVE** **Software ver. 000001**	Slave 1 PAC-IF info mask: • Compressor status • Pre-defrost • Defrost • Self protection • PAC-IF SW version

2.5 Active function DISPLAY MASK.

The mask that shows the active functions of the unit can be displayed in the Main Loop.

INFORMATION
The mask can be displayed only if one of the functions described below is active.

The appearance of the mask is signalled on the main screen with the icon . It is shown below.

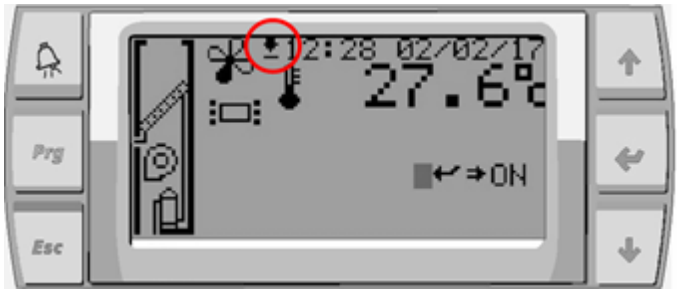


Figure 2-8: *Active function icon on the user terminal*

Press **[DOWN]** in the main display screen to display the active functions mask.

Visible from: Main loop

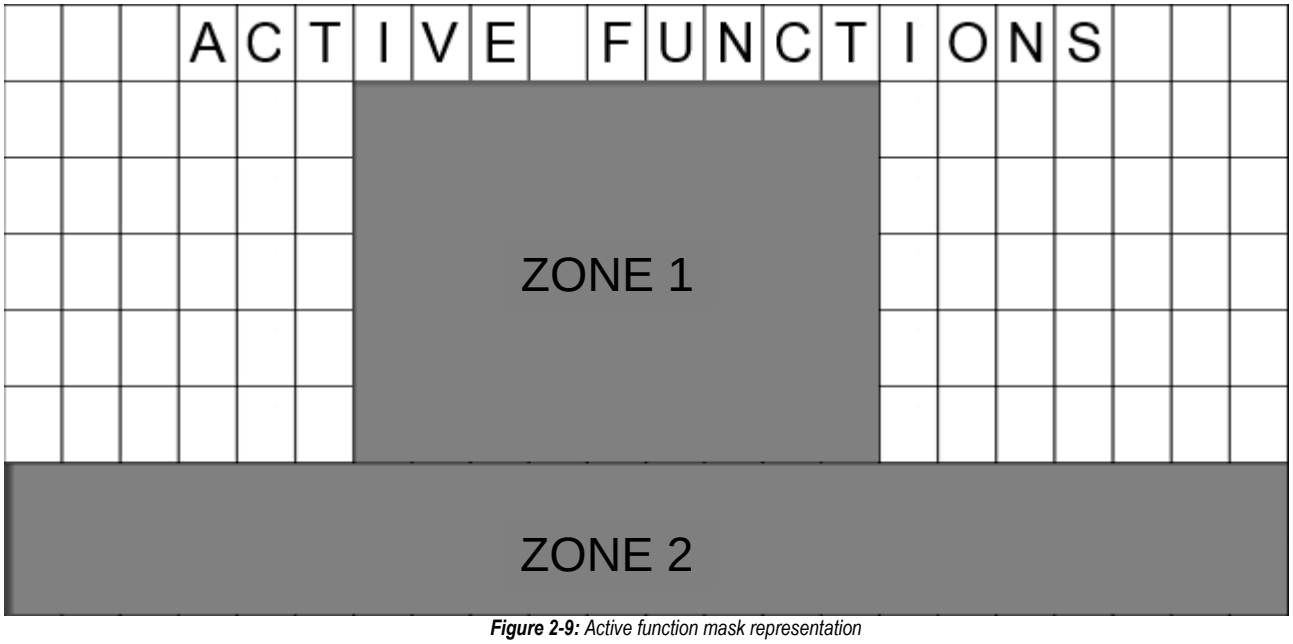


Figure 2-9: *Active function mask representation*

Zone 1 and 2: Flashing of all the active functions

Icon	Function	Meaning
TIME BANDS ACTIVATED	Time bands active	Time bands active
FREE COOLING ACTIVATED	Freecooling active	Unit in Freecooling mode
DELIVERY AIR TEMP. PROTECTION ACTIVATED	Delivery air temperature protection active	The minimum delivery air temperature protection is active
DEHUMIDIFY PROTECTION ACTIVATED	Dehumidification protection active	The dehumidification protection is active (maximum or minimum temperature)

Icon	Function	Meaning
 SAFETY REDUCTION LOAD (LP) ACTIVATED	Safety Reduction Load LP	Minimum override of at least one circuit is active due to reduced evaporation pressure
 POST-VENTILATION ACTIVATED	Post-ventilation active	The heater cooling post-ventilation is active
 DELAY FOR TIME OBSERVATION	Delay for time obs.	One or more compressors are blocked to comply with the start-up times, or the unit is awaiting regulation
 HIGH TEMPERATURE pLAN RESCUE ACTIVATED	High temperature pLAN rescue active	The unit is in pLAN rescue mode due to the high temperature limit being exceeded
 LOW TEMPERATURE pLAN RESCUE ACTIVATED	Low temperature pLAN rescue active	The unit is in pLAN rescue mode due to the low temperature limit being exceeded
 HIGH HUMIDITY pLAN RESCUE ACTIVATED	High humidity pLAN rescue active	The unit is in pLAN rescue mode due to the high humidity limit being exceeded
 LOW HUMIDITY pLAN RESCUE ACTIVATED	Low humidity pLAN rescue active	The unit is in pLAN rescue mode due to the low humidity limit being exceeded
 HOT SPOT PROTECTION ACTIVATED	Hot Spot protection for a pLAN network	The unit considers its local temperature instead of the average temperature to control the Hot Spot concerned.
 COLD SPOT PROTECTION ACTIVATED	Cold Spot protection for a pLAN network	The unit considers its local temperature instead of the average temperature to control the Cold Spot concerned.
 ACTIVE FAN ON STAND-BY ACTIVATED	Active Fan on Standby	The unit is on standby but the fan continues to run at a set speed
 PERIODIC CHECK	Periodic override	The unit forces the cooling demand sent to the PAC-IF cards to minimum and keeps ventilation at maximum to help prevent the formation of ice on the piping.
 FAN ACTIVE FOR GAS BUILD-UP PREVENTION	Ventilation active for gas build-up prevention	The unit is off, but the fans are kept in operation at reduced speed to prevent gas build-up in case of leaks
 FAN BOOST BY ALARM IN THE LAN	Forcing of ventilation to maximum level due to a LAN alarm	Ventilation has been forced to maximum level due to an alarm (no air flow or gas leak detected) in one of the other units connected to the pLAN network
 EXTERNAL UNIT STOPPED BY ALARM IN THE LAN	External unit stopped due to a LAN alarm	The Mr Slim external unit has been stopped due to an alarm (gas leak detected) in one of the other units connected to the pLAN network
 FC DAMPER OPENED BY ALARM IN THE LAN	Direct Free Cooling damper open to maximum level due to a LAN alarm	The Direct Free Cooling damper has been opened to maximum level due to an alarm (gas leak detected) in one of the other units connected to the pLAN network

Note: All the active functions of the unit are displayed in the same mask (with the flashing of various icons).

2.6 SAFETY REDUCTION LOAD (LP) DISPLAY MASK

Visible from: "Unit" menu

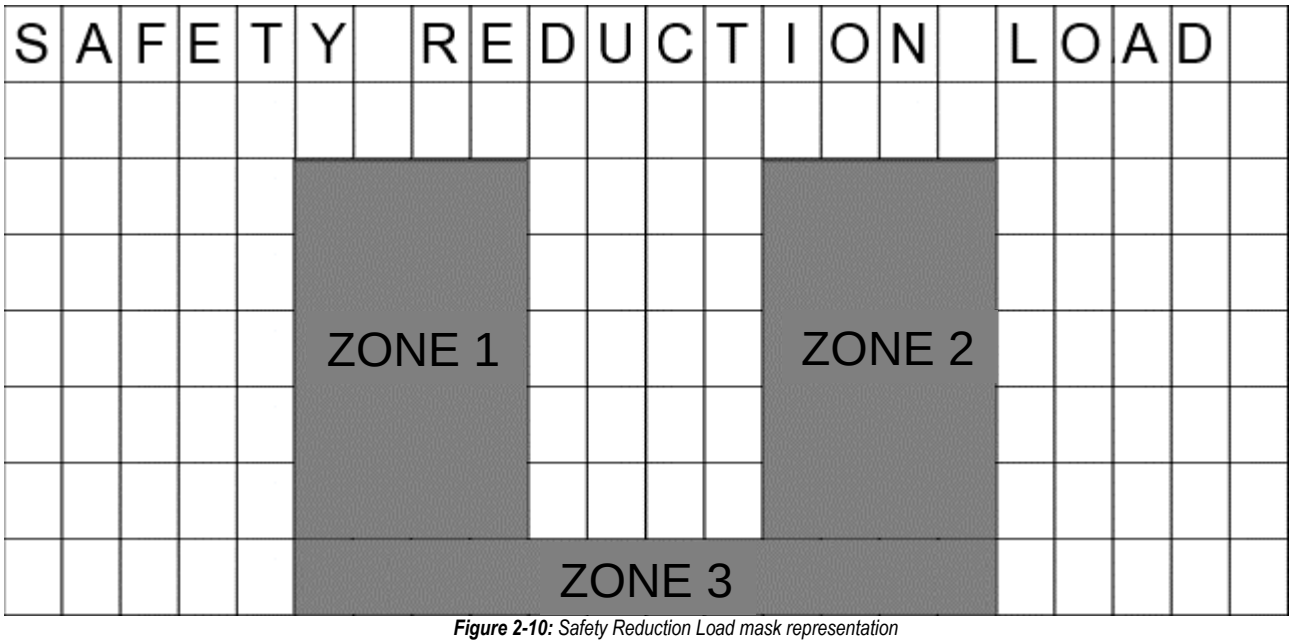
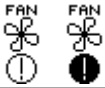
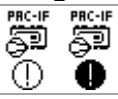
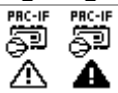


Figure 2-10: *Safety Reduction Load mask representation*

Zone 1: Fan status

Icon	Meaning
	Normal fan operation
	Fan in **Alert** mode (Flashing): • With SRL (LP) active: The speed of the fans increases with 2 alert steps

Zone 2: Status of the unit controlled by the PAC-IF interface

Icon	Meaning
	Normal operation
	Unit in **Alert** mode (Flashing): • With SRL (LP) active: The request is stopped at its last value before entering alert mode
	Unit in **Protection** mode (Flashing): • With SRL (LP) active: The request sent to the unit decreases based on the set parameters

Zone 3: Protection status

Icon	Meaning
NORMAL WORK	Protection enabled but not active
(LP) → ACTIVE	SRL (LP) low pressure protection active

2.7 CHANGING THE PARAMETERS

2.7.1 Access to parameter changing

The settable parameters can be distinguished according to the modification access mode, into three groups:

- Parameters that can be reached using the **"User" menu** with the **"User" password**.
- Parameters that can be reached using the **"Service"** menu with the **"Service"** password.
- Parameters that can be reached using the **"Factory"** menu with the **"Factory"** password.

2.7.2 Menu mask table

To access the main menu, showing the available submenus, click **[HOME]**.
Press **[UP]** or **[DOWN]** to move from one mask to another inside the same menu.
Press **[ENTER]** to access the parameter, press **[UP]** or **[DOWN]** to change the value of the parameter.

Below are the masks of the menus used to set the parameters. As well as the information displayed on every single mask, the unit setting parameters (Par N. column) are also included.

Mask of the terminal	Description	N. Par.
Factory Password: 0000000000	Manufacturer menu access mask. Enter the manufacturer password for access. This menu must be accessed only by authorised personnel.	
 Config. ← ↓	Access mask to configuration submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
---------- P10.32 Number of PAC-IF013B-E: 1 ---------- P10.33 MIN time OFF MR SLIM: 120s	Parameters for setting Internal fan project speed Internal fan minimum project speed (maximum project speed reduction)	 10.32 10.33
---------- P10.10 Int. fan proj. speed: 070%	Parameters for setting Internal fan project speed	 10.10
---------- P10.16 DP trans. lower lim.: 0000Pa ---------- P10.17 DP trans. upper lim.: 1000Pa	Parameters for setting the Start scale of the differential pressure transducer and the End scale of the differential pressure transducer	 10.16 10.17
---------- P10.30 LP transd. lower lim.: 00.0 bar ---------- P10.31 LP transd. upper lim.: 30.0 bar	Parameters for setting Start scale value of low pressure transducer End scale value of low pressure transducer	 10.30 10.31

Mask of the terminal	Description	N. Par.
---------- P10.20 Outdoor temperature probe: N	Configuration of the external T probe on I/O pCO (N:disabled - Y:enabled)	10.20
---------- P10.22 Brand: Mitsubishi - RC	Initial logo: Mitsubishi - RC	10.22
---------- P10.26-28 Unit serial number: 032000000	Parameters for configuring the serial number of the unit	10.27 10.28
Insert a NEW MANUFACTURER password 0000000000	Sets a new “Factory” password. **Warning**: The password entered in this field is the only one that allows access to the manufacturer menu.	
Evolution+ Code ME 28.00 EN HW pCO5+S NAND 50MB Flash 2MB + 7MB + 4MB Ram 2048KB Boot 05.01 Bios06.21	This mask contains the reference information of the software [Code ME 28.00 EN]. The closed padlock symbol shows that the board is provided with its propriety software. The second part of the mask shows information about the hardware: size (S), memories (NAND, Flash, Ram) and the versions of the installed operating system (boot and bios).	
 Function ← ↓	Access mask to functions submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
---------- P11.01 Air flow type conf.: Disabled	Parameter for configuring the air flow control type (0:disabled - 1:Flow - 2:DeltaP)	11.01
---------- P11.02 EC fan nr.: 1	Parameter for setting the number of EC fans	11.02
---------- P11.03 EC fans diameter: dn355	Parameter used to set the Diameter of the EC fans (0:dn355 - 1:dn500 - 2:dn630 - 3:dn500PL - 4:dn310 Vpro-ZH - 5:dn500 Vpro-ZH - 6:dn560 Vpro-ZH - 7:dn630 Vpro-ZH - 8:dn630PL - 9:dn710 Vpro-Z)	11.03

Mask of the terminal	Description	N. Par.
 Compressor ← ↓	Access mask to Compressors submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
---------- P12.01 MIN time ON comp.: 180s ---------- P12.02 MIN time OFF comp.: 180s	Parameters for setting Minimum compressor ON time Minimum compressor OFF time	12.01 12.02
---------- P12.03 MIN time ON-ON: same compressor: 360s	Parameters for setting Minimum time between two ON's of the same compressor	12.03
 Valve ← ↓	Access mask to valves submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
---------- P13.05 EEV status: N	Parameters for setting the electronic valve (N:disabled - Y:enabled)	13.05
 Safety ← ↓	Mask confirming access to the Protections submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
---------- P14.03 Probe alarm delay time: 060s ---------- P14.04 Low Pressure alarm delay time: 180s	Parameters for setting Sensors alarm delay Low pressure alarm delay	14.03 14.04
---------- P14.08 Cooling set point lower limit: 10.0°C	Parameters for setting the Manufacturer lower limit cooling setpoint	14.08
---------- P14.14 Max t. for man. test: 1800s	Parameters for setting Maximum manual operation time Maximum manual electronic valve operation time	14.14 14.15

Mask of the terminal	Description	N. Par.
Safety 2 ← ↓	Mask confirming access to the Protections 2 submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
Safety 2 parameter NOT Available	It informs that no parameters are available in the menu for the unit	
Default ← ↓	Access mask to initialisation menu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
Default Setup N	This restores the default values. Deletes the memory and installs "logical" values. The chiller must then be programmed with the parameter set during factory testing. The mask is not displayed when the chiller is ON.	
Reset Historical Alarm N	Deletes the contents of the alarms log on the display	
Service Password: 0000	Access mask to Service menu Enter the “Service” password for access. This menu must be accessed only by authorised personnel.	
Regulations ← ↓	Access mask to the Regulation submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
---------- P20.01 Regulat. probe choice: Delivery Temp ---------- P20.02 Fan delay from power-on: 000s	Parameter for configuring the type of regulation probe (0:return - 1:delivery) and parameter for configuring the fan start delay from power on	20.01 20.02
---------- P20.03 Fan modulation delay: 120s ---------- P20.04 Fan regulation delay: 050s	Parameter for setting the fan modulation start delay and the fan adjustment start delay.	20.03 20.04

Mask of the terminal	Description	N. Par.
---------- P20.06 Inv. compressor reg. intergral time: 900s	Parameter for setting Integral adjustment time	20.06
---------- P20.07 Inv. compressor reg. derivative time: 000 s	Parameter for setting the inverter compressor adjustment derivative time (units with inverter compressor)	20.07
---------- P20.08 Dirty filters sensor presence: N ---------- P20.09 Fire/smoke sensor presence: N	Parameter for configuring the dirty filters sensor (N:disabled - Y:enabled) and for configuring the fire smoke sensor (N:disabled - Y:enabled)	20.08 20.09
---------- P20.10 Flooding sensor presence: N	Parameter for configuring the flooding sensor (N:disabled - Y:enabled)	20.10
---------- P20.13 Remote ON/OFF presence: N	Parameter for configuring the ON/OFF remote contact (N:disabled - Y:enabled).	20.13
---------- P20.18 Regulation band in cooling: 2.0°C ---------- P20.19 Regulation band in heating: 1.5°C	Parameter for setting the cooling regulation band and the heating regulation band	20.18 20.19
---------- P20.20 Regulation band for dehumidif.: 5%RH ---------- P20.21 Regulation band for humidification: 5%RH	Parameter for setting the dehumidification regulation band and the humidification regulation band	20.20 20.21
---------- P20.22 Integral time reg. humidifier 900s ---------- P20.23 Derivative time reg. humidifier 000s	Parameter for setting the Humidification integral time (PID) Humidification regulation derivative time (PID)	20.22 20.23
---------- P20.24 Cooling set point lower limit: 24.0°C ---------- P20.25 Cooling set point upper limit: 32.0°C	Parameter for setting the Lower setpoint cooling limit and the Upper cooling setpoint limit	20.24 20.25

Mask of the terminal	Description	N. Par.
---------- P20.26 Heating set point lower limit: 12.0°C	Parameter for setting the Lower setpoint heating limit and the Upper setpoint heating limit	20.26
---------- P20.28 Discharge air limit function: N ---------- P20.29 Disch. air limit: 09.0 °C	Parameter for configuring the discharge air temperature limit (N:disabled - Y:enabled) and parameter for setting the discharge air temperature limit	20.28 20.29
---------- P20.44 Frost function status: Y	Parameter to configure the frost-free control function (0:disabled- 1:enabled)	20.44
---------- P20.47 LP setpoint frost protect: 06.5bar ---------- P20.48 LP differential frost protect: 0.5bar	Parameters to set the low delivery and differential pressure set point for the frost-free function	20.47 20.48
---------- P20.49 Delay to activate frost protect: 10min	Parameter to set the frost-free activation delay time	20.49
---------- P20.50 Enable Frost count status: Y ---------- P20.51 Number stop count per hour: 3	Parameter to configure the number of interventions per hour count for the frost-free function (0:disabled-1:enabled). Parameter to set the number of interventions per hour for the passage from the automatic reset alarm to the manual reset. **Warning**: If the number of counts per hour is disabled, the alarm is **only** in Manual reset mode	20.50 20.51
---------- P20.56 Supply temp set point lower limit: 10.0°C ---------- P20.57 Supply temp set point upper limit: 25.0°C	Parameter to configure the lower and upper limit for setting the delivery air control setpoint. ***Only*** *visible when delivery air adjustment is active.*	20.56 20.57
---------- P20.71 Enable T&H limit alarm on Unit OFF: Y ---------- P20.72 Delay T&H limit alarm after unit ON: 600s	Parameter for configuring the control of the ambient temperature limits with the unit OFF Parameter for configuring the delay before activation of the ambient temperature limit alarms after the unit is activated	20.71 20.72
---------- P20.74 SRL (LP) setpoint circuit 1: 7.2bar ---------- P20.75 SRL (LP) differencial circuit 1: 0.6bar	Parameters for configuring the values for activation and deactivation of the Safety Reduction Load Low Pressure function for circuit 1 *Visible when the Safety Reduction Load Low Pressure function is enabled*	20.74 20.75

Mask of the terminal	Description	N. Par.
---------- P20.82 Aux TH sensor addr.129 status enable : N	Parameter for configuring the presence of the auxiliary temperature / humidity probe (address 129) (0:disabled-1:enabled)	20.82
 Freecooling ← ↓	Mask confirming access to the Freecooling operation submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
 Unit WITHOUT Freecooling	Mask displayed if the Free Cooling mode is not present.	
---------- P21.21 Cold Ramp value for max position FC: 050%	Parameter for configuring the value of the cold ramp at which the Freecooling damper is at maximum opening point *only visible after enabling Free Cooling*	21.21
---------- P21.09 Freecooling damper reg. enable: N ---------- P21.10 Freecooling damper control type: Analogic	Parameter for configuring Freecooling damper regulation (N:disabled - Y:enabled) and parameter for configuring the Freecooling damper control type (0:Digital - 1:Modulating)	21.09 21.10
---------- P21.11 Freecooling damper reg. set point: 03.0°C ---------- P21.12 Freecooling damper reg. band: 01.0°C	Parameter for setting the Setpoint ($T_{\_ROOM}$-$T_{\_EXTERNAL}$) for Freecooling damper control, and the parameter for setting the Freecooling damper control band	21.11 21.12
---------- P21.13 Freecooling damper MIN opening: 000% ---------- P21.14 Freecooling damper MAX opening: 100%	Parameter for setting the Minimum Freecooling damper opening and parameter for setting the Maximum Freecooling damper opening	21.13 21.14
---------- P21.32 Freecooling damper with CMP/V3V: Y ---------- P21.33 Delay Freecooling damper On after Off CMP/V3V: 0180s	Parameter for setting the configuration of the simultaneous operation of Direct Freecooling and compressor, or 3-way valve Parameter for setting the delay for opening Freecooling after the compressor is switched off/the closing of the cold water valve *Only visible if the parameter P21.32 is disabled*	21.32 21.33
---------- P21.15 Freecooling damper for high humid. status: N ---------- P21.16 %RH set to deact. freec. damper: 60.0%RH	Parameter for configuring Freecooling damper management for high humidity and humidity limit for disabling Freecooling damper	21.15 21.16

Mask of the terminal	Description	N. Par.
---------- P21.17 %RH band to deact. freec. damper: 01.0%RH	Parameter for setting the humidity band to disable the Freecooling damper	21.17
---------- P21.18 Freecooling damper management during compr. alarm status: N	Parameter for configuring Freecooling damper management with compressor alarm (N:disabled - Y:enabled)	21.18
---------- P21.19 Set point for freec. damper during compr. alarm: 01.0°C	Parameter for setting the Setpoint (T_{ROOM}-$T_{EXTERNAL}$) to regulate the Freecooling damper with compressor alarm	21.19
---------- P21.20 Band for freec. damper during compr. alarm: 00.5°C	Parameter for setting the Freecooling damper regulation band with compressor alarm	21.20
Settings ← ↓	Access mask to Settings submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu. The Settings menu contains the parameters relative to the alarm settings.	
---------- P22.92 Unit gas type: R32	Parameter used to set the type of gas used in the cold circuit	22.92
---------- P22.01 Low temperature alarm set point: 10°C ---------- P22.02 High temperature alarm set point: 32°C	Parameter for setting the Low temperature alarm setpoint Parameter for setting the High temperature alarm setpoint	22.01 22.02
---------- P22.03 Low humidity alarm set point: 30%RH ---------- P22.04 High humidity alarm set point: 80%RH	Parameter for setting the Low humidity alarm setpoint Parameter for setting the High humidity alarm setpoint	22.03 22.04
---------- P22.13 Set unit working hours to maintenance: 00000h ---------- P22.14 Set comp. 1 working h. to maintenance: 00000h	Parameter for setting the unit operating hours setpoint for maintenance Parameter for setting the compressor 1 operating hours setpoint for maintenance	22.13 22.14

Mask of the terminal	Description	N. Par.
---------- P22.17 Set heat. 1 working h. to maintenance: 00000h ---------- P22.18 Set heat. 2 working h. to maintenance: 00000h	Parameters for setting Step 1 heater operating hours for maintenance setpoint Step 2 heater operating hours for maintenance setpoint	22.17 22.18
---------- P22.19 Set humid. working h. to maintenance: 00000h	Parameter for setting the humidifier working hours for maintenance setpoint	22.19
---------- P22.21 Reset alarm by supervision system: N	Parameter for configuring the alarm reset with supervision (N:disabled - Y:enabled)	22.21
---------- P22.55 Enable BMS1 offline management: N ---------- P22.56 Timeout BMS1 for detect offline: 015s	Parameters for configuring BMS port 1 offline management and timeout.	22.55 22.56
---------- P22.79 Air flow alarm delay time: 045s ---------- P22.80 Clogged filters alarm delay time: 008s	Parameter for selecting the delay time before signalling of the air flow alarm Parameter for selecting the delay time before signalling of the dirty filters alarm	22.79 22.80
---------- P22.83 Type flood alarm: A-M ---------- P22.84 Type phase sequence alarm rearm: A-M	Parameter for setting if the flooding event should cause a notification or an alarm, and the reset type Parameter for setting the phase sequence error alarm reset type	22.83 22.84
---------- P22.85 Type f/smoke alarm: A-M	Parameter for setting the Fire/Smoke alarm reset type	22.85
Insert a NEW SERVICE password 0000	Sets a new “Service” password. **Warning**: The value set in this field is the one and only to access the service menu	
Evolution+ Code ME 28.00 EN HW pCO5+S NAND 50MB Flash 2MB + 7MB + 4MB Ram 2048KB Boot 05.01 Bios06.21	This mask contains the reference information of the software [Code ME 28.00 EN]. The closed padlock symbol shows that the board is provided with its propriety software. The second part of the mask shows information about the hardware: size (S), memories (NAND, Flash, Ram) and the versions of the installed operating system (boot and bios).	

Mask of the terminal	Description	N. Par.
Fan ← ↓	Access mask to fan submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
---------- P23.01 Fan nominal speed: 070%	Parameter for setting the nominal speed of the internal fan	23.01
---------- P23.02 Economy mode fan status: N ---------- P23.03 Fan speed in economy mode: 50%	Parameter for configuring the internal fan Economy Mode function (N:disabled - Y:enabled) Parameter for setting the internal fan speed with the Economy Mode function enabled	23.02 23.03
---------- P23.07 Air Flow modulation with inverter mod. status: Y	Parameter for configuring the Internal fan modulation function for inverter compressor units (N:disabled - Y:enabled) *Only visible with constant flow rate check and constant DeltaP disabled*	23.07
---------- P23.08 MIN fan speed when modul. active: 050%	Parameter for setting the minimum speed of the internal fan in modulation for inverter compressor units (maximum reduction of design speed)	23.08
---------- P23.10 Fan speed when active dehumidif.: 060%	Parameter for setting the fixed internal fan speed for units with inverter compressor in dehumidification	23.10
---------- P23.11 Air pressure diff. scan time: 060s	Parameter for setting the differential air pressure scan time and parameter for configuring the EC condensation control function (N:disabled - Y:enabled)	23.11
---------- P23.61 Post-ventilation for el.heater status:Y ---------- P23.62 Post-ventilation time for el.heater: 060s	Parameters for configuring the post-ventilation function for the heaters and the post-ventilation time. *Visible when the electric heaters are present*	23.61 23.62
---------- P23.65 Const. flow rate set: 02500 m3/h	Parameter used to set the Constant flow rate control setpoint (divided by 100)	23.65

Mask of the terminal	Description	N. Par.
---------- P23.66 Const. flow rate diff: 025 Pa ---------- P23.67 Const. deltaP set: 0020 Pa	Parameters used to set the Constant Flow pressure adjustment differential and the Constant deltaP adjustment setpoint	23.66 23.67
---------- P23.68 Int. min speed: 020 % ---------- P23.69 Const. deltaP diff: 015 Pa	Parameters used to set the Minimum speed reduction of the fan, the Constant DeltaP and the Pressure difference adjustment for Constant DeltaP	23.68 23.69
---------- P23.70 Fan speed var. step: 1.0 Vdc	Parameter used to configure variation for each step of the fan during adjustment of the Constant DeltaP and Constant Flow	23.70
FLOW SENSOR ADJUSTMENT Real Value 0000 Current Value 0000 Set flow 0000 Store K? N	Parameters for calibrating the constant flow function	
 Adjust ← ↓	Access mask to the Adjust submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
---------- P24.01 Ambient temp. probe adjustment: 0.0 °C ---------- P24.02 Ambient humid. probe adjustment: 00.0%RH	Parameters for calibrating the ambient temperature probe and for calibrating the ambient humidity probe	24.01 24.02
---------- P24.03 Supply air temp. probe adjustment: 0.0 °C ---------- P24.04 Outd. air temp. probe adjustment: 0.0 °C	Parameters for calibrating the delivery air temperature probe and calibrating the external air temperature probe	24.03 24.04
---------- P24.08 Circuit 1 LP sensor adjustment: 0.0 bar	Circuit 1 low pressure probe calibration parameter	24.08
---------- P24.10 Circuit 2 LP sensor adjustment: 0.0 bar	Circuit 2 low pressure probe calibration parameter	24.10

Mask of the terminal	Description	N. Par.
---------- P24.20 Aux address 129 temp. probe adjust: 0.0 °C ---------- P24.21 Aux address 129 humid. probe adjust: 00.0 %	Parameter for calibrating the auxiliary temperature / humidity probe *Only visible when the probe is present*	24.20 24.21
---------- P24.23 Temp. updating diff. probe ind.128: 0.5°C ---------- P24.24 Humid. updating diff. probe ind.128: 0.5 %	Parameter for setting the room temperature / humidity sensor resolution	24.23 24.24
---------- P24.25 Temp. updating diff. probe ind.129: 0.5°C ---------- P24.26 Humid. updating diff. probe ind.129: 0.5 %	Parameter for setting the auxiliary temperature / humidity sensor resolution	24.25 24.26
⚠ Demand Limit ← ↓	Access mask to Demand Limit submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
⚠ Demand Limit NOT Available	Mask displayed to warn that the Demand Limit function cannot be enabled.	
 Lan ← ↓	Access mask to Lan submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
 Available ONLY for the MASTER unit (Addr.:1)	This mask indicates that the LAN menu is only available for the Master unit. *This mask is displayed only at the Slave units (pLAN address=2÷10).*	
---------- P26.01 Unit number in LAN: 2 ---------- P26.02 Average calcul. in LAN status: N	Parameter for configuring the number of units in LAN (2 to 16) and for configuring the average calculation in LAN function (N:disabled - Y:enabled)	26.01 26.02
---------- P26.03 Stand-by mode in LAN status: N ---------- P26.04 Stand-by cycle time in LAN: 168h	Parameter for configuring the standby mode in LAN function (N:disabled - Y:enabled) and parameter for setting the standby cycle time in LAN	26.03 26.04

Mask of the terminal	Description	N. Par.
---------- P26.05 Units in stand-by in LAN: 2 ---------- P26.06 Stand-by mode limits in LAN status: Y	Parameter for configuring the number of units in stand-by in LAN (0 1 unit - 1 2 units) and for configuring the Stand-by mode limits in LAN function (N:disabled - Y:enabled)	26.05 26.06
---------- P26.11 H&L Local Temp prot. enable : N ---------- P26.12 Diff. for On with High local temp : 02.0°C	Parameter for enabling Hot&Cold spot management Parameter for configuring the differential according to the average temperature for activation of the Hot Spot function *Only visible for units with adjustment according to average temperature*	26.11 26.12
---------- P26.13 Diff. for On with Low local temp : 02.0°C ---------- P26.14 Time before Off protection with T.room in range: 300s	Parameter for configuring the differential according to the average temperature for activation of the Cold Spot function Parameter for configuring the time for deactivation of the Hot & Cold Spot function	26.13 26.14
---------- P26.15 Time before On protection with T.room out of range: 060s	Parameter for configuring the time of activation of the Hot & Cold Spot function after exceeding of the limits	26.15
---------- P26.16 Active Fan on Stand by Enable: N ---------- P26.17 Active fan speed: 070%	Parameter for enabling the Active Fan on Standby function Parameter for setting the fan speed during operation in Active Fan on Standby mode	26.16 26.17
---------- P26.18 Active Pressure Load enable: N ---------- P26.19 Disable APL during Diff.P probe alarm: N	Enable the Active Pressure Load function (APL). Enable disabling of the APL function during the air differential pressure probe alarm. *Only visible for units with air flow control according to DeltaP enabled*	26.18 26.19
---------- P26.20 H&L Local Press. prot. enable : N ---------- P26.21 Diff. for On with High local press: 010Pa	Parameters for setting Hi & Low local pressure protection function enable On differential for floor pressures above average	26.20 26.21
---------- P26.22 Diff. for On with Low local press: 010Pa ---------- P26.23 Time before Off protection with local DeltaP in range: 300s	Parameters for setting On differential for floor pressures below average Time before stopping protection in case of local pressure differences within the limits	26.22 26.23
---------- P26.24 Time before On prot. with local DeltaP out of range: 060s	Parameter for setting the time delay before the start of the protection in case of local pressure differences outside the limits	26.24

Mask of the terminal	Description	N. Par.
 Manual ← ↓	Access mask to the Manual submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu. This submenu contains the masks for the manual control of the unit. This menu is used to reset the energy meter counts and reset the operating hours and the start counts of the various unit components	
Manual operation enabling: N Internal fan manual operation enabling: N	Enables manual operation and manual operation of the internal fan	
Compressor 1 manual operation enabling: N	Enables the manual operation of compressor 1	
Heaters step 1 manual operation enabling: N Heaters step 2 manual operation enabling: N	Enables manual operation of heater 1 and enables manual operation of heater 2	
Internal Humidifier >not active Humidifier manual operation enabling: N	Displays the operation of the internal humidifier and enables the manual operation of the humidifier	
Start pre-cleaning: N >not active Manual Drain: N	Start pre-cleaning command and manual drain command for internal humidifier	
Dehumidify manual operation enabling: N	Manual dehumidification control (if dehumidification control enabled)	
Digital freecooling damper manual opening: N	Manual opening of the digital Freecooling damper	
Analog freecooling damper manual opening: 000%	Manual opening of the analogue Freecooling damper	

Mask of the terminal	Description	N. Par.
Energy Managment Config CPT network: Y 0:NO ERROR 0:NO ERROR baud rate CPT OK CT Ratio OK System OK Programming OK (Esc)	Network transducer configuration. Baud rate change from 9600 to 19200 and sending of TA ratio and system type parameters.	
Energy Managment Energy: 0000005kWh Time: 0000001 h Reset counters: Y	Display and possible reset of the energy counters and energy transducer timer	
h000000 1 h000000	Operating time of the fans and compressors in the various unit configurations	
1 h000000 2 h000000 h000000	Operating time of the heaters and humidifier	
1 000002 RES:N	Reset number of compressor starts	
1 000000 RES:N 2 000002 RES:N 000000 RES:N	Reset number of heater and humidifier starts	
Manual Set h000000 RES:N 1 h000000 RES:N	Reset times of operation of the fans and compressors in the various configurations of the unit and manual setting of the times at which to start	
Manual Set 1 00000 2 00000 00000	Reset times of operation of the heaters and humidifier and manual setting of the times at which to start	
Manual Set 1 0000002	Reset number of compressor starts and manual setting of the times at which to start	

Mask of the terminal	Description	N. Par.
Manual Set ↑ ON 1 000000 2 000002 000000	Reset number of heater and humidifier starts and manual setting of the times at which to start	
Humidity/temperature simulation enabling: Y Ambient temperature simulation: 24.0°C	Mask for simulating the presence of the temperature/humidity probe and relative set temperature value	
Ambient humidity simulation: 50.0 %RH	Mask for selecting simulated humidity value	
Force rotation pLAN Force:N Time to next:00000sec	Mask for manual forcing of pLAN rotation *Only visible for Master units when the pLAN is configured and rotation is active*	
Optional ← ↓	Access mask to the Optional submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
---------- P27.02 Config heater: N ---------- P27.03 Electric heater type: ON-OFF	Electric heater configuration (N:disabled - Y:enabled). Configuration type Electric heating elements (0:ON/OFF - 1:Modulating heating element)	27.02 27.03
---------- P27.04 Humidity sensor: N ---------- P27.05 Humidifier: Disabled	Hot gas valve configuration (N:disabled - Y:enabled) Humidifier configuration (0:disabled - 1:internal)	27.04 27.05
---------- P27.06 Humidif. config 001-1 kg/h Reduct 200V 1-ph Drain Pump Confirm change: Y	Mask for configuring the internal humidifier model (cylinder type). Choice of the cylinder and confirmation of the chosen cylinder. *Visible only if the humidifier is internal.*	27.06
---------- P27.07 Max steam production: 100%	Parameter for selecting Maximum steam production from 0 to 100 % if an internal humidifier is present. *Visible only if the humidifier is internal.*	27.07

Mask of the terminal	Description	N. Par.
---------- P27.16 Enable Humidif. Periodical Drain: N ---------- P27.17 Time to wait for Periodical Drain: 024h	Parameter for enabling the periodical drain function when the humidifier is in operation (N:disabled - Y:enabled) Parameter for selecting the number of hours of continuous operation after which to perform the periodical drain function *Visible only if the humidifier is internal.*	27.16 27.17
---------- P27.18 Enable Humidif. Inactivity Drain: N ---------- P27.19 Time to wait for Inactivity Drain: 03d	Parameter for enabling the periodical drain function when the humidifier is inactive (N:disabled - Y:enabled) Parameter for selecting the number of days of inactivity of the humidifier after which to perform draining *Visible only if the humidifier is internal.*	27.18 27.19
---------- P27.09 Dehumidification: N	Dehumidifier configuration (N:disabled - Y:enabled)	27.09
---------- P27.11 Damper config.: N ---------- P27.12 Damper opening time: 120sec	Parameters used to configure the air delivery damper (N:disabled - Y:enabled) and the damper opening time	27.11 27.12
---------- P27.13 Energy management: N	Parameter to set the presence of the network transducer (N:absent - Y:present)	27.13
---------- P27.14 System type: 3 -ph Aron ---------- P27.15 Transformer ratio: 00020	Parameter for configuring the power supply system that can be 1-2-3 phases with balanced/unbalanced load, with or without neutral (Default: system 3/4 unbalanced wires) Parameter for configuring the input current transformer ratio (Default: 20)	27.14 27.15
Config CPT network: N Serial baud CPT:4800 -3:INVALID DATA -3:INVALID DATA baud rate CPT OK Chek Connections (Esc)	Mask for setting the correct transducer communication speed. "Config CPT network" is used to set the correct speed in the transducer (from 9600 to 19200). The transformer ratio and the desired system type is sent to the transducer (P16.01 and P16.02). The "NO ERROR" and "Transducer OK" messages indicate correct communication with the transducer for changing speed. "Ct ratio OK" and "System OK" indicate the transformer ratio and the the system type indicated in parameters P16.01 and P16.02 have been correctly sent to the transducer. The various transducer configuration phases are indicated at the bottom of the mask. For further details see the section relative to the network transducer.	
---------- P27.20 Enable setpoint compensation: N ---------- P27.21 Type of signal for compensation: 0-1V	Parameters for setting Setpoint offset function enable Setpoint compensation signal type	27.20 27.21

Mask of the terminal	Description	N. Par.
----------P27.22 Minimum temp. for cool compensation: 00.0 °C ----------P27.23 Maximum temp. for cool compensation: 10.0 °C	Parameters for setting Offset start time (cooling) Offset end time (cooling)	27.22 27.23
----------P27.24 Maximum cool setpoint compensation: 00.0 °C	Parameter for setting the maximum setpoint offset (cooling)	27.24
----------P27.25 Minimum temp. for heat compensation: 00.0 °C ----------P27.26 Maximum temp. for heat compensation: 10.0 °C	Parameters for setting Offset start point (cooling) Offset end point (Cooling)	27.25 27.26
----------P27.27 Maximum heat setpoint compensation: 00.0 °C	Parameter for setting the maximum setpoint offset (heating)	27.27
 Regulations 2 ← ↓	Access mask to Regulations submenu 2. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
 Regulation 2 parameter NOT Available	It informs that no parameters are available in the menu for the unit.	
User Password: 0000	Access mask to “User” menu. Enter the “User” password for access.	
 Serial ← ↓	Access mask to BMS management submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
---------- P30.01 Enable supervision: Y	Supervision presence configuration parameter	30.01

Mask of the terminal	Description	N. Par.
---------- P30.02 BMS Address: 011 ---------- P30.03 BMS protocol config.: ModBus	Parameters for configuring the BMS address and protocol (0:Standard - 1:Modbus - 2:GSM Modem - 3:LON - 4:Bacnet - 5:TCP/IP - 6:WinLoad)	30.02 30.03
---------- P30.04 BMS baud rate config.: 19200	BMS baud rate configuration parameter (0:1200 - 1:2400 - 2:4800 - 3:9600 - 4:19200)	30.04
---------- P30.05 ON/OFF by BMS status: N	Parameters to configure ON/OFF from BMS (N:disabled - Y:enabled) and, in case of cooled water unit, to change the Summer/Winter mode from BMS (N:disabled - Y:enabled)	30.05
---------- P30.09 Enable T.regulation from Supervisor: N	Parameter for enabling adjustment according to the temperature provided by BMS (N: disabled - Y: enabled)	30.09
---------- P30.11 Enable FC STOP by supervisor: N	Enable stopping of Freecooling from BMS *Visible only on unit with Direct Freecooling*	30.11
GSM modem management Modem password 1234 Maximum numbers in address book: 4	GSM modem management. Requests modem password	
GSM modem management Address book position: 2 Phone Number: 432100	Select a telephone number from the list	
GSM modem management SMS message text: **test messaggio **	Insert message text. Digit 1 – Digit 60 SMS message text (numbers and letters)	
GSM modem management SMS sending fuction status: N	SMS forwarding function status	

Mask of the terminal	Description	N. Par.
GSM modem management Send SMS Test: N Hang Up: N	Text SMS sending mask.	
 Alarm out ← ↓	Access mask to "Alarm out" submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
---------- P31.01 Alarm out A logic: __ ---------- P31.02 Alarm out B logic: __	Parameters to configure the alarm A contact status (0:NO - 1:NC) and the alarm B contact status (0:NO - 1:NC)	31.01 31.02
---------- P31.03 (003) Fire/smoke alarm out addressing:A	Fire/smoke alarm addressing on digital output (0:A - 1:none - 2:B)	31.03
---------- P31.04 (004) Phase seq. alarm out addressing:A	Phase sequence alarm addressing on digital output (0:A - 1:none - 2:B)	31.04
---------- P31.10 (101) Air flow alarm out addressing:A	Air Flow alarm addressing on digital output (0:A - 1:none - 2:B)	31.10
---------- P31.11 (120) Room temp. probe alarm out addressing: A	Ambient air temperature probe alarm addressing on digital output (0:A - 1:none - 2:B)	31.11
---------- P31.12 (125) Ambient humidity probe alarm out addressing:A	Ambient humidity probe alarm addressing on digital output (0:A - 1:none - 2:B)	31.12
---------- P31.13 (130) Diff. pressure probe alarm out addressing:A	Differential pressure probe alarm addressing on digital output (0:A - 1:none - 2:B)	31.13

Mask of the terminal	Description	N. Par.
---------- P31.14 (140) Air delivery temp. probe alarm out addressing: A	Delivery air temperature probe alarm address on digital output (0:A - 1:none - 2:B)	31.14
---------- P31.16 (144) Outdoor air temp probe alarm out addressing:A	External air temperature probe alarm addressing on digital output (0:A - 1:none - 2:B)	31.16
---------- P31.18 (150) El Heaters alarm out addressing: A	Electric heater alarm addressing on digital output (0:A - 1:none - 2:B)	31.18
---------- P31.19 (180)Probe T-H offline alarm out addressing: A	T+H probe offline alarm addressing on digital output (0:A - 1:none - 2:B)	31.19
---------- P31.23 (192)exp offline alarm out addressing: A ---------- P31.24 (199)Transd. offline alarm out addressing: A	Inverter IO expansion offline alarm addressing on digital output (0:A - 1:none - 2:B) Network transducer offline alarm addressing on digital output (0:A - 1:none - 2:B)	31.23 31.24
---------- P31.25 (195) Humidifier Offline out addressing:A	Humidifier CPY module alarm addressing (0:A - 1:none - 2:B)	31.25
---------- P31.42 (402) Life timer expired out addressing: A	Humidifier life expired alarm addressing on digital output (0:A - 1:none - 2:B)	31.42
---------- P31.43 (404) Humidifier Drain alarm out addressing: A	Humidifier discharge alarm addressing on digital output (0:A - 1:none - 2:B)	31.43
---------- P31.44 (406) Humidif no water alarm out addressing: A	Humidifier insufficient water alarm addressing on digital output (0:A - 1:none - 2:B)	31.44

Mask of the terminal	Description	N. Par.
---------- P31.45 (408) Humidifier low current alarm out addressing: A	Humidifier low current alarm addressing on digital output (0:A - 1:none - 2:B)	31.45
---------- P31.46 (410) Humidifier high current alarm out addressing: A	Humidifier high current alarm addressing on digital output (0:A - 1:none - 2:B)	31.46
---------- P31.47 (412) Humid. generic alarm out addressing: A	Humidifier generic alarm addressing on digital output (0:A - 1:none - 2:B)	31.47
---------- P31.49 (010 510) Flooding alarm out addressing:A	Flooding alarm addressing on digital output (0:A - 1:none - 2:B)	31.49
---------- P31.50 (520) LAN alarm out addressing: A	LAN alarm addressing on digital output (0:A - 1:none - 2:B)	31.50
---------- P31.51 (530) Low room temp. alarm out addressing: A	Low temperature alarm addressing on digital output (0:A - 1:none - 2:B)	31.51
---------- P31.52 (531) High room temp. alarm out addressing: A	High temperature alarm addressing on digital output (0:A - 1:none - 2:B)	31.52
---------- P31.53 (540) Low room humid alarm out addressing: A	Low humidity alarm addressing on digital output (0:A - 1:none - 2:B)	31.53
---------- P31.54 (541) High room humid alarm out addressing: A	High humidity alarm addressing on digital output (0:A - 1:none - 2:B)	31.54

Mask of the terminal	Description	N. Par.
---------- P31.55 (601) EEPROM alarm out addressing:A ---------- P31.56 (610) Maintenance al out addressing:A	Eeprom alarm addressing on digital output (0:A - 1:none - 2:B) Maintenance alarm addressing on digital output (0:A - 1:none - 2:B)	31.55 31.56
---------- P31.58 (630) Dirty filters al out addressing: A	Dirty filters alarm addressing on digital output (0:A - 1:none - 2:B)	31.58
---------- P31.62 (323) Frost funct C1 out addressing: A	Circuit 1 and 2 frost-free function alarm addressing on digital output (0:A - 1:none - 2:B)	31.62
---------- P31.67 (711) BMS1 offline al. out addressing: A	BMS port 1 offline alarm addressing on digital output (0:A - 1:none - 2:B)	31.67
---------- P31.70 (121)Aux Temp addr.129 probe alarm out addressing:A	Auxiliary temperature probe alarm address on digital output (0:A - 1:none - 2:B) *Visible when the auxiliary probe with address 129 is configured*	31.70
---------- P31.71 (126)Aux Hum. addr.129 probe alarm out addressing:A	Auxiliary humidity probe alarm address on digital output (0:A - 1:none - 2:B) *Visible when the auxiliary probe with address 129 is configured*	31.71
---------- P31.72 (181)Aux Temp addr.129 offline out addressing:A	Auxiliary probe offline alarm address on digital output (0:A - 1:none - 2:B) *Visible when the auxiliary probe with address 129 is configured*	31.72
---------- P31.73 (525) ADL on LIMIT out addressing:A	Active Distribution Load (ADL pLAN) at operating limit alarm addressing on digital output (0:A - 1:none - 2:B) *Visible if Active Distribution Load function is configured*	31.73
---------- P31.84 (319)LP1 probe alarm out addressing:A ---------- P31.85 (321)LP2 probe alarm out addressing:A	Circuit 1 low pressure probe alarm addressing on digital output [0: A | 1: None | 2: B] Circuit 2 low pressure probe alarm addressing on digital output [0: A | 1: None | 2: B]	31.84 31.85

Mask of the terminal	Description	N. Par.
 Alarm out 2 ← ↓	Access mask to "Alarm out 2" submenu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
---------- P33.15 (188)Offline PAC-IF013B-E Master add. 21 al out addressing: A	PAC-IF013B-E Master offline alarm addressing on digital output (0:A - 1:none - 2:B)	33.15
---------- P33.16 (810)PAC-IF013B-E Master P1 alarm out addressing: A	P1 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.16
---------- P33.17 (811)PAC-IF013B-E Master P2 alarm out addressing: A	P2 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.17
---------- P33.18 (812)PAC-IF013B-E Master P6 Freezing al out addressing:A	P6 Freezing PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.18
---------- P33.19 (813)PAC-IF013B-E Master P6 Overheating al out addressing:A	P6 Overheating PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.19
---------- P33.20 (814)PAC-IF013B-E Master P9 alarm out addressing: A	P9 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.20
---------- P33.21 (815)PAC-IF013B-E Master E0/E4 alarm out addressing: A	E0/E4 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.21
---------- P33.22 (816)PAC-IF013B-E Master E1 alarm out addressing: A	E1 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.22

Mask of the terminal	Description	N. Par.
---------- P33.23 (817)PAC-IF013B-E Master E2 alarm out addressing: A	E2 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.23
---------- P33.24 (818)PAC-IF013B-E Master E3/E5 alarm out addressing: A	E3/E5 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.24
---------- P33.25 (819)PAC-IF013B-E Master E6 alarm out addressing: A	E6 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.25
---------- P33.26 (820)PAC-IF013B-E Master E7 alarm out addressing: A	E7 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.26
---------- P33.27 (821)PAC-IF013B-E Master Fb alarm out addressing: A	Fb PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.27
---------- P33.28 (822)PAC-IF013B-E Master PL alarm out addressing: A	PL PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.28
---------- P33.29 (823)PAC-IF013B-E Master PU alarm out addressing: A	PU PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.29
---------- P33.30 (824)PAC-IF013B-E Master EE alarm out addressing: A	EE PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	33.30
---------- P33.31 (189)Offline PAC-IF013B-E Slave 1 add. 22 al out addressing: A	PAC-IF013B-E Slave 1 offline alarm addressing on digital output (0:A - 1:none - 2:B)	33.15 33.31

Mask of the terminal	Description	N. Par.
---------- P33.32 (825)PAC-IF013B-E Slave 1 P1 alarm out addressing: A	P1 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.32
---------- P33.33 (826)PAC-IF013B-E Slave 1 P2 alarm out addressing: A	P2 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.33
---------- P33.34 (827)PAC-IF013B-E Slave 1 P6 Freezing al out addressing:A	P6 Freezing PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.34
---------- P33.35 (828)PAC-IF013B-E Slave 1 P6 Overheating al out addressing:A	P6 Overheating PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.35
---------- P33.36 (829)PAC-IF013B-E Slave 1 P9 alarm out addressing: A	P9 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.36
---------- P33.37 (830)PAC-IF013B-E Slave 1 E0/E4 alarm out addressing: A	E0/E4 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.21
---------- P33.38 (831)PAC-IF013B-E Slave 1 E1 alarm out addressing: A	E1 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.38
---------- P33.39 (832)PAC-IF013B-E Slave 1 E2 alarm out addressing: A	E2 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.39
---------- P33.40 (833)PAC-IF013B-E Slave 1 E3/E5 alarm out addressing: A	E3/E5 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.40

Mask of the terminal	Description	N. Par.
---------- P33.41 (834)PAC-IF013B-E Slave 1 E6 alarm out addressing: A	E6 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.41
---------- P33.42 (835)PAC-IF013B-E Slave 1 E7 alarm out addressing: A	E7 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.42
---------- P33.43 (836)PAC-IF013B-E Slave 1 Fb alarm out addressing: A	Fb PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.43
---------- P33.44 (837)PAC-IF013B-E Slave 1 PL alarm out addressing: A	PL PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.44
---------- P33.45 (838)PAC-IF013B-E Slave 1 PU alarm out addressing: A	PU PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.45
---------- P33.46 (839)PAC-IF013B-E Slave 1 EE alarm out addressing: A	EE PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	33.46
---------- P33.47 (050) Gas Leak Detected alarm out addressing: A	Detected gas leak alarm addressing on digital output (0:A - 1:none - 2:B)	33.47
 Scheduler ← ↓	Access mask to Scheduler menu. Press "Up" or "Down" to scroll through the other masks and "Esc" to return to the menu selection list. Submenu allowing the activation of time band management.	
---------- P32.01 Scheduler config: N	Parameter to set the time bands (N:disabled - Y:enabled)	32.01

Mask of the terminal	Description	N. Par.
 Info ← ↓	Access mask to Info menu. Press "Up" or "Down" to scroll through the other masks and "Esc" to return to the menu selection list. Submenu that can be used to change user password and display software info.	
Insert a NEW USER password 0000	Sets a new "User" password. **Warning**: the value set in this field is the one and only to access the "User" menu.	
Evolution+ Code ME 28.00 EN HW pCO5+S NAND 50MB Flash 2MB + 7MB + 4MB Ram 2048KB Boot 05.01 Bios06.21	This mask contains the reference information of the software [Code ME 28.00 EN]. The closed padlock symbol shows that the board is provided with its propriety software. The second part of the mask shows information about the hardware: size (S), memories (NAND, Flash, Ram) and the versions of the installed operating system (boot and bios).	
 Historical ← ↓	Access mask to Alarms Log menu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
Filter  for alarm event: Location: ALL	Mask selecting the alarm type from the display history. It is possible to select from COMPRESSOR, CIRCUIT, UNIT, and SYSTEM alarms. For a description of the location field, please refer to the "EVENTS" chapter	
15:32:28 11/05/12 pLAN Address: 01 Event n° 004 SET A002 Type:AUTO Wrong Power Phases Sequence Location :PLANT Action :UNIT	Mask displaying the event history. Each event recorded contains the following details: • Date and time • Unit pLAN address (if there is a LAN controller network) • Event number • Engagement or disengagement event (SET, RESET) • Event code • Type of reset (AUTO, MANUAL) • Event description • Event localisation (COMPR, CIRCUIT, UNIT, PLANT) • Type of event block action (COMPR, CIRC, UNIT, CW, HU, EH, FN)	
 In/Out ← ↓	Access mask to In/Out menu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
DIGITAL INPUT STATUS: ID1 ID8 ID2 ID3 ID4 ID5 ID6 ID7	Displays the status of the digital inputs. The number of displayed inputs depends on the unit type. For the meaning of each digital input, please refer to the "input/output configuration tables"	

Mask of the terminal	Description	N. Par.
DIGITAL OUTPUT STATUS: NO1 ⊥⌐ NO8 ⊥⌐ NO2 ⊥⌐ NO3 ⊥⌐ NO4 ⊥⌐ NO5 ⊥⌐ NO6 ⊥⌐ NO7 ⊥⌐	Displays the status of the digital outputs. The number of outputs displayed depends on the type of unit. For the meaning of each digital output, please refer to the "input/output configuration tables"	
ANALOG INPUT STATUS: U1:00.0 bar U2:00.0 °C U3:00.0 °C U4:00.0 bar U5: ⊥⌐	Displays the status of the universal inputs. The number of displayed inputs depends on the unit type. For the meaning of each universal input, please refer to the "input/output configuration tables"	
ANALOG OUTPUT STATUS: Y1: 00.0V Y2: 00.0V Y3: 00.0V Y4: 00.0V	Displays the status of the analogue outputs. The number of outputs displayed depends on the type of unit. For the meaning of each analogue output, please refer to the "input/output configuration tables"	
Input/Output GSM modem Status: Stand-by ext.modem Offline 000% Timelnextncallr:00000s SMS Queue: 00	**GSM modem** status display mask. *Visible if the GSM modem is present and configured*	
 Setpoint ← ↓	Access mask to Setpoint menu. Press "Up" or "Down" to scroll through the other masks and "Esc" to return to the menu selection list. Submenu used to change the working point.	
Active set point Set point cooling: 24.0 °C Set point heating: 00.0 °C	Active set point display mask	
---------- P50.01 Set point cooling: 24.0 °C ---------- P50.02 Set point heating: 24.0 °C	Parameters for setting Cold setpoint Hot setpoint, if the hot sources enabled	50.01 50.02
---------- P50.03 Set point dehumidif. 55%RH ---------- P50.04 Set point humidif.: 45%RH	Parameters for setting Dehumidification setpoint Humidification setpoint	50.03 50.04
---------- P50.05 Set point cooling by LAN limits: 30.0°C ---------- P50.06 Set point heating by LAN limits: 18.0°C	Parameters for setting Cold setpoint for LAN limits Hot setpoint for LAN limits	50.05 50.06

Mask of the terminal	Description	N. Par.
---------- P50.07 Set point dehumdif. by LAN limits: 75%RH ---------- P50.08 Set point humdif. by LAN limits: 35%RH	Parameters for setting Dehumidification setpoint for LAN limits Humidification setpoint for LAN limits	50.07 50.08
---------- P50.09 MIN room temperature for deumid OFF: 23.0°C	Parameter for setting the minimum room temperature for dehumidifier off	50.09
Unit ← ↓	Access mask to unit menu. Press "Up" or "Down" to scroll the other masks and "Esc" to return to the submenu.	
INTERNAL FAN Speed: 100% Regulation Type: STANDARD	Mask that displays the speed of the internal fans and type of adjustment	
24.0 °C 15.0 °C 35.0 °	Active probe value display mask • Return temperature probe • Delivery temperature probe • External temperature probe	
AUXILIARY T-H PROBE Addr. 129 24.0 °C 50.0 % Status:Offline	Mask that displays the value of the serial auxiliary probe (address 129). *Visible if the probe is configured*	
REGULATION RAMP: Cooling ramp: 000.0 Heating ramp: 000.0 Post Heat ramp: 000.0 FC damper ramp: 000.0	Regulation ramp punctual value reading.	
SAFETY REDUCTION LOAD FAN PRC-IF NORMAL WORK	Mask that displays the status of the Safety Reduction Load function	

Mask of the terminal	Description	N. Par.
Average Temp. Regulat. from BMS 24.5°C Status:Online	Display of the temperature sent by BMS. If the temperature sent is not correct, error is displayed instead of the temperature. If the BMS signal is lost, the words SIGNAL LOST flash instead of the word Online	
ON h000000 1 h000000	Operating time of the fans and compressors in the various unit configurations	
ON 1 00000 2 00000 00000	Operating time of the heaters and humidifier	
ON 1 000002	Number of compressor start-ups	
ON 1 000000 2 000002 000000	Number of compressor, heater and humidifier start-ups	
UNIT SERIAL NUMBER 032000000	Mask that *displays* the serial number of the unit.	
Evolution+ Code ME 28.00 EN HW pCO5+S NAND 50MB Flash 2MB + 7MB + 4MB Ram 2048KB Boot 05.01 Bios06.21	This mask contains the reference information of the software [Code ME 28.00 EN]. The closed padlock symbol shows that the board is provided with its propriety software. The second part of the mask shows information about the hardware: size (S), memories (NAND, Flash, Ram) and the versions of the installed operating system (boot and bios).	
Clock ← ↓	Mask confirming access to the Clock menu. Press "Up" or "Down" to scroll through the other masks and "Esc" to return to the menu selection list. Submenu that can be used to adjust the internal clock and configure the time bands.	
Clock card not installed	Mask indicating the lack or damage to the clock board.	

Mask of the terminal	Description	N. Par.
Clock config.: Date Tme 01/05/13 10:40	Current date and time setting.	
Time bands not enabled. See user menu	Indicates that the time bands have been set correctly, though they are not enabled. To enable them, see user menu.	
Time band programming: advanced	Advanced time band programming manages four different daily time bands (type A and type B, C, D); each type can be personalised and each is independent from the other. Standard programming only allows for the use of A-type time bands.	900.01
Weekly timetable Monday A Tuesday B Wednesday B Thursday B Friday B Satur. C Sunday disabled	Weekly timetable setting.	900.02 900.03 900.04 900.05 900.06 900.07 900.08
Band 1A Off Time 00:00 / 06:00 Sp C 24.0°C H 20.0°C Band 2A Regulat. Time 06:00 / 20:00 Sp C 24.0°C H 20.0°C	Setting of time bands A to D, first and second daily time band. In the example, the unit is set from 6.00 am to 8.00 pm, and it remains off all other hours of the week.	901.01 901.02 901.03 901.04 901.05 901.07 901.08 901.09 901.10 901.11
Band 3A Off Time 20:00 / 20:00 Sp C 24.0°C H 20.0°C Band 4A Off Time 20:00 / 20:00 Sp C 24.0°C H 20.0°C	Setting of time bands A to D, third and fourth daily time band. In the example, the unit is set from 6.00 am to 8.00 pm, and it remains off all other hours of the week.	901.13 901.14 901.15 901.16 901.17 901.19 901.20 901.21 901.22 901.23
Band 5A Off Time 20:00 / 20:00 Sp C 24.0°C H 20.0°C Band 6A Off Time 20:00 / 20:00 Sp C 24.0°C H 20.0°C	Setting of time bands A to D, fifth and sixth daily time band. In the example, the unit is set from 6.00 am to 8.00 pm, and it remains off all other hours of the week.	901.25 901.26 901.27 901.28 901.29 901.31 901.32 901.33 901.34 901.35
Band 7A Off Time 20:00 / 20:00 Sp C 24.0°C H 20.0°C Band 8A Off Time 20:00 / 20:00 Sp C 24.0°C H 20.0°C	Setting of time bands A to D, seventh and eighth daily time band. In the example, the unit is set from 6.00 am to 8.00 pm, and it remains off all other hours of the week.	901.37 901.38 901.39 901.40 901.41 901.43 901.44 901.45 901.46 901.47

Mask of the terminal	Description	N. Par.
Band 9A Off Time 20:00 / 20:00 Sp C 24.0°C H 20.0°C Band 10A Off Time 20:00 / 20:00 Sp C 24.0°C H 20.0°C	Setting of time bands A to D, ninth and tenth daily time band. In the example, the unit is set from 5.00 am to 10.00 pm, and it remains off all other hours of the week.	901.49 901.50 901.51 901.52 901.53 901.55 901.56 901.57

2.7.3 Parameter Table

The numbering of the parameters is divided by menu.

- 1x corresponds to a submenu of the **"Factory menu"**
- 2x corresponds to a submenu of the **"Service menu"**
- 30 corresponds to a submenu of the **"User" menu**.
- 50 corresponds to the **"Setpoint" menu**.

The following table lists the controller parameters and the relative maximum and minimum values.

N. Par.	Description	Default	U.M.	Min.	Max.
10.10	Internal fan project speed	70	%	0	100
10.16	Start scale value of differential pressure transducer	0	Pa	0	1000
10.17	End scale value of differential pressure transducer	100	Pa	0	5000
10.30	Start scale value of low pressure transducer	0.0	bar	0.0	2.0
10.31	End scale value of low pressure transducer	30.0	bar	0.0	10.0
10.22	Initial logo [Mitsubishi - RC]	5	-	0	5
10.26	High part serial number of unit	32	-	1	999
10.27	Medium part serial number of unit	0	-	0	999
10.28	Low part serial number of unit	0	-	0	999
10.32	Number of PAC-IF013B-E	1	-	1	2
10.33	Minimum Mr. Slim OFF time	120	S	1	999
11.01	Configuration of air flow control type [0: Disabled | 1: Flow | 2: DeltaP]	0	-	0	2
11.02	Number of EC fans	1	-	1	5
11.03	EC fan diameters [0: dn355 | 1: dn500 | 2: dn630 | 3: dn500PL | 4: dn310 Vpro-ZH | 5: dn500 Vpro-ZH | 6: dn560 Vpro-ZH | 7: dn630 Vpro-ZH | 8: dn630PL | 9: dn710 Cpro-ZH | 10: dn255 | 11: dn310 | 12: dn400 | 13: dn450 | 14: dn560]	0	-	0	14
12.01	Minimum compressor ON time	60	s	60	600
12.02	Minimum compressor OFF time	60	s	60	600
12.03	Minimum time between two ON's of the same compressor	360	s	360	999
13.05	Electronic valve configuration [0: Disabled | 1: Enabled]	0	-	0	1
14.03	Sensors alarm delay	60	s	5	999
14.04	Low pressure alarm delay	180	s	2	999
14.08	Constructor cold setpoint minimum limit	10.0	°C	10.0	30.0
14.09	Timed dehumidification control enable [0: Disabled | 1: Enabled]	0	-	0	1
14.10	Minimum settable room temperature value for disabling dehumidification	22.0	°C	18.0	30.0
14.11	Maximum dehumidification cycle ON time	10	min	5	15
14.12	Minimum delay for new dehumidification cycle	3	min	3	20
14.13	Enabling of air flow reduction in dehumidification for direct expansion unit with dehumidification active	0	-	0	1
14.14	Maximum manual operation time	1800	s	0	3600
20.01	Regulation probe configuration [0: Return | 1: Delivery]	1	-	0	1
20.02	Fan start delay after power on	0	s	0	999
20.03	Ventilation modulation start delay	120	s	0	500
20.04	Ventilation adjustment start delay	50	s	20	999
20.06	Integral adjustment time (units with inverter)	900	s	0	999
20.07	Inverter compressor adjustment derivative time (unit with inverter)	0	s	0	999
20.08	Dirty filter sensor configuration [0: Disabled | 1: Enabled]	0	-	0	1
20.09	Smoke sensor configuration [0: Disabled | 1: Enabled]	0	-	0	1

N. Par.	Description	Default	U.M.	Min.	Max.
20.10	Flooding sensor configuration [0: Disabled | 1: Enabled]	0	-	0	1
20.13	Remote ON/OFF contact configuration [0: Disabled | 1: Enabled]	0	-	0	1
20.18	Cold adjustment band	2.0	°C	0.5	9.9
20.19	Hot adjustment band	1.5	°C	0.5	9.9
20.20	Dehumidification adjustment band	5	%UR	3	15
20.21	Humidification adjustment band	5	%UR	3	15
20.22	Humidification adjustment integral time (PID)	900	s	0	999
20.23	Humidification adjustment derivative time (PID)	0	s	0	999
20.24	Cold setpoint minimum limit	24.0	°C	10.0	30.0
20.25	Cold setpoint maximum limit	32.0	°C	25.0	40.0
20.26	Hot setpoint minimum limit	12.0	°C	5.0	30.0
20.28	Delivery limit temperature configuration [0: Disabled | 1: Enabled]	0	-	0	1
20.29	Delivery air temperature minimum limit	9.0	°C	0.0	25.0
20.44	Frost-free function configuration [0: Disabled | 1: Enabled]	1	-	0	1
20.47	Low pressure set point for frost-free function	6.5	bar	6.0	P 99.25
20.48	Low differential pressure for frost-free function	0.5	bar	0.5	9.9
20.49	Frost-free function activation delay	10	min	1	99
20.50	Configuration and activation of the counting of number of interventions per hour count for the frost-free function [0: Disabled | 1: Enabled]	1	-	0	1
20.51	Number of interventions per hour for the frost-free function	3	-	1	5
20.56	Delivery air adjustment setpoint minimum limit	10.0	°C	5.0	40.0
20.57	Delivery air adjustment setpoint maximum limit	25.0	°C	5.0	40.0
20.71	T&H limits alarm configuration with unit OFF [0: Disabled | 1: Enabled]	1	-	0	1
20.72	T&H limits alarm delay when unit ON	600	s	1	999
20.74	Circuit 1 Safety Reduction Load LP function activation setpoint	7.2	bar	5.0	9.0
20.75	Circuit 1 Safety Reduction Load LP function differential	0.6	bar	0.0	1.0
20.82	Auxiliary humidity probe address 129 configuration [0: Disabled | 1: Enabled]	0	-	0	1
21.21	Value of the cold ramp for maximum opening of freecooling valve	50	%	0	100
21.09	Free Cooling damper adjustment configuration [0: Disabled | 1: Enabled]	0	-	0	1
21.10	Free Cooling damper control type configuration [0: Digital | 1: Modulanting]	0	-	0	1
21.11	Setpoint (T_{ROOM}-$T_{EXTERNAL}$) for Free Cooling damper adjustment	3.0	°C	0.0	50.0
21.12	Free Cooling damper adjustment band	1.0	°C	0.0	9.9
21.13	Minimum Free Cooling damper opening	0	%	0	100
21.14	Maximum Free Cooling damper opening	100	%	P 21.13	100
21.32	Configuration of simultaneous operation of Direct Freecooling and compressor	1	-	0	1
21.33	Direct Freecooling activation delay after compressor shutdown	180	s	0	9999
21.15	Free Cooling management configuration for high humidity	0	-	0	1
21.16	Humidity limit for Free Cooling damper disable	60.0	%UR	0.0	99.9
21.17	Humidity band to disable Free Cooling damper	1.0	%UR	0.0	9.9
21.18	Free Cooling damper adjustment configuration with compressor alarm [0: Disabled | 1: Enabled]	0	-	0	1
21.19	Setpoint (T_{ROOM}-$T_{EXTERNAL}$) to regulate the Free Cooling damper with compressor alarm	1.0	°C	1.0	50.0
21.20	Free Cooling damper adjustment band with compressor alarm	0.5	°C	0.0	9.9

N. Par.	Description	Default	U.M.	Min.	Max.
22.92	Type of gas used by the unit (0:R410A - 1:R32)	1	-	0	1
22.01	Low temperature alarm setpoint	10	°C	0	30
22.02	High temperature alarm setpoint	32	°C	20	50
22.03	Low humidity alarm setpoint	30	%UR	0	70
22.04	High humidity alarm setpoint	80	%UR	30	99
22.13	Unit operating hours for maintenance setpoint (Thousands)	0	h	0	99
22.14	Compressor 1 operating hours for maintenance setpoint (Thousands)	0	h	0	99
22.17	Step 1 heater operating hours for maintenance setpoint (Thousands)	0	h	0	99
22.18	Step 2 heater operating hours for maintenance setpoint (Thousands)	0	h	0	99
22.19	Humidifier operating hours for maintenance setpoint (Thousands)	0	h	0	4
22.21	Reset alarm by supervision systems [0: Disabled | 1: Enabled]	0	-	0	1
22.55	BMS1 offline alarm management configuration [0: Disabled | 1: Enabled]	0	-	0	1
22.56	Timeout for BMS1 offline alarm	15	s	1	999
22.79	Airflow alarm delay	45	s	15	180
22.80	Dirty filters alarm delay	8	s	2	180
22.83	Configuration of flooding event reset and type [0: Not validated | 1: Automatic signal | 2: Manual signal | 3: Automatic alarm | 4: Manual alarm]	4	-	0	4
22.85	Configuration of fire/smoke alarm reset[3: Automatic alarm | 4: Manual alarm]	4	-	3	4
23.01	Nominal speed of internal fan	70	%	P 99.01	100
23.02	Internal fan Economy Mode function configuration [0: Disabled | 1: Enabled]	0	-	0	1
23.03	Internal fan speed with Economy Mode enabled	50	%	0	99
23.07	Internal fan modulation function configuration for units with inverter compressor [0: Disabled | 1: Enabled]	1	-	0	1
23.08	Minimum internal fan speed in modulation (Maximum reduction in project speed)	50	%	0	P 10.11
23.10	Internal fan speed in dehumidification (Maximum reduction in project speed)	60	%	P 99.01	P 10.10
23.11	Air differential check time	60	s	0	999
23.61	Heater post-ventilation configuration for unit OFF [0: Disabled | 1: Enabled]	1	-	0	1
23.62	Heater post-ventilation time	60	s	1	999
23.65	Set Constant Flow adjustment (Divided by 100)	25	m³/h	10	400
23.66	Pressure regulation differential for Constant Flow	25	Pa	5	100
23.67	Constant DeltaP adjustment setpoint	10	Pa	5	300
23.68	Minimum internal fan speed in constant DeltaP (maximum nominal speed reduction)	20	%	0	P 10.11
23.69	Pressure regulation differential for Constant DeltaP	5	Pa	3	50
23.70	Fan analogue outlet variation step	1.0	Vdc	0.0	5.0
24.01	Room temperature probe calibration	0.0	°C	-9.9	9.9
24.02	Room humidity probe calibration	0.0	%UR	-20.0	20.0
24.03	Delivery air temperature probe calibration	0.0	°C	-9.9	9.9
24.04	External air temperature probe calibration	0.0	°C	-9.9	9.9
24.08	Circuit 1 low pressure probe transducer	0.0	bar	-9.9	9.9
24.10	Circuit 2 low pressure probe transducer	0.0	bar	-9.9	9.9
24.20	Serial temperature probe address 129 calibration	0.0	°C	-9.9	9.9
24.21	Serial humidity probe address 129 calibration	0.0	%UR	-20.0	20.0
24.23	Temperature differential for the update of the reading of probe T+H 128	0.5	°C	0.1	2.0

N. Par.	Description	Default	U.M.	Min.	Max.
24.24	Humidity differential for the update of the reading of probe T+H 128	0.5	%UR	0.1	2.0
24.25	Temperature differential for the update of the reading of probe T+H 129	0.5	°C	0.1	2.0
24.26	Humidity differential for the update of the reading of probe T+H 129	0.5	%UR	0.1	2.0
26.01	Number of units in LAN	1	-	1	16
26.02	Configuration of average calculation function in LAN [0: Disabled | 1: Enabled]	0	-	0	1
26.03	Configuration of standby mode function in LAN [0: Disabled | 1: Enabled]	0	-	0	1
26.04	Standby cycle time in LAN	168	-	0	999
26.05	Configuration of number of units on standby in LAN [0: 1 unit | 1: 2 units]	0	-	0	1
26.06	Configuration of standby mode limits function in LAN [0: Disabled | 1: Enabled]	1	-	0	1
26.11	Enable the H&L Local Temperature Protection function [0: Disabled | 1: Enabled]	0	-	0	1
26.12	Hot Spot function On differential	2.0	°C	0.5	99.9
26.13	Cold Spot function On differential	2.0	°C	0.5	99.9
26.14	Time before protection Off when the temperature is between the limits of the Cold and Hot Spot	300	s	10	600
26.15	Time before protection On when outside the limit of the Hot or Cold Spot	60	s	10	600
26.16	Enable the Active Fan on Standby function [0: Disabled | 1: Enabled]	0	-	0	1
26.17	Internal fan speed with Active Fan on Standby in use	70	%	P 99.01	100
26.18	Enable the Active Pressure Load function [0: Disabled | 1: Enabled]	0	-	0	1
26.19	APL operation enable in case of pressure transducer alarm [0: Disabled | 1: Enabled]	0	-	0	1
26.20	Enable the H&L Local Pressure Protection function [0: Disabled | 1: Enabled]	0	-	0	1
26.21	High local pressure function On differential	10	Pa	2	999
26.22	Low local pressure function On differential	10	Pa	2	999
26.23	Time before protection Off when the temperature is between the high and low local pressure limits	300	s	10	600
26.24	Time before protection On when outside the limit of the high or low local pressures	60	s	10	600
27.02	Heating element configuration [0: Disabled | 1: Enabled]	0	-	0	1
27.03	Heating element type [0: ON/OFF | 1: Modulanting]	0	-	0	1
27.04	Humidity probe configuration [0: Disabled | 1: Enabled]	0	-	0	1
27.05	Humidifier configuration [0: Disabled | 1: Internal]	0	-	0	1
27.06	Humidifier model configuration (cylinder type)	0	-	0	121
27.07	Maximum steam production	100	%	10	100
27.16	Enable the humidifier periodical drain function [0: Disabled | 1: Enabled]	0	-	0	1
27.17	Delay before each periodical drain	24	h	0	240
27.18	Enable the humidifier inactive draining function [0: Disabled | 1: Enabled]	0	-	0	1
27.19	Delay before each draining during inactivity	3	d	1	99
27.09	Dehumidifier configuration [0: Disabled | 1: Enabled]	0	-	0	1
27.11	Delivery air damper configuration [0: Disabled | 1: Enabled]	0	-	0	1
27.12	Damper opening stroke time	120	s	0	500
27.13	Presence of network transducer	0	-	0	1
27.14	Type of power supply system [0: 3-ph unbalanced 3/4-wires | 1: 1-ph 2-wires | 2: 2-ph 3-wires | 3: 3-ph balanced 3-wires | 4: 3-ph balanced load | 5: 3-ph Aron system]	5	-	0	5
27.15	Input current transformation ratio	20	-	1	32767
27.20	Setpoint offset function enable [0: Disabled | 1: Enabled]	0	-	0	1
27.21	Setpoint offset signal type [0: 0-1V_{DC} | 1: 0-5 V_{DC} | 2: 0.5-4.5V_{DC} | 3: 0-20mA | 4: 4-20mA | 5: Remote T+H | 6: External T+H]	0	-	0	6

N. Par.	Description	Default	U.M.	Min.	Max.
27.22	Offset start point (Cooling)	0.0	°C	-30.0	P 27.23
27.23	Offset end point (Cooling)	10.0	°C	P 27.22	50.0
27.24	Maximum setpoint offset (Cooling)	0.0	°C	-30.0	50.0
27.25	Offset start point (Heating)	0.0	°C	-30.0	P 27.26
27.26	Offset end point (Heating)	10.0	°C	P 27.25	50.0
27.27	Maximum setpoint offset (Heating)	0.0	°C	-30.0	50.0
30.01	Supervision presence configuration	0	-	0	1
30.02	BMS address configuration	11	-	1	207
30.03	BMS protocol configuration [0: Standard | 1: Modbus | 2: GSM Modem | 3: LON | 4: Bacnet | 5: TCP/IP | 6: WinLoad]	1	-	0	6
30.04	BMS baud rate configuration [0: 1200 | 1: 2400 | 2: 4800 | 3: 9600 | 4: 19200 | 5: 38400]	4	-	0	5
30.05	ON/OFF configuration from BMS [0: Disabled | 1: Enabled]	0	-	0	1
30.06	Summer/Winter switch configuration from BMS [0: Disabled | 1: Enabled]	0	-	0	1
30.09	Enable for adjustment according to the temperature supplied from BMS [0: Disabled | 1: Enabled]	0	-	0	1
30.11	Enable the stop of direct Freecooling from supervisor [0: Disabled | 1: Enabled]	0	-	0	1
31.01	Alarm A contact status configuration [0: NO | 1: NC]	0	-	0	1
31.02	Alarm B contact status configuration [0: NO | 1: NC]	0	-	0	1
31.03	Fire/smoke alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.04	Phase Sequence alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.10	Air flow alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.11	Ambient air temperature probe alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.12	Ambient humidity probe alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.13	Differential pressure probe alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.14	Delivery air temperature probe alarm address on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.16	External air temperature probe alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.18	Electric heater alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.19	T+H probe offline alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.23	Inverter IO expansion offline alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.24	Network transducer offline alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.25	Humidifier CPY offline module alarm addressing [0: A | 1: None | 2: B]	0	-	0	2
31.42	Humidifier life expired alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.43	Humidifier discharge alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.44	Humidifier insufficient water alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.45	Humidifier low current alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.46	Humidifier high current alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.47	Humidifier generic alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.49	Flooding alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.50	LAN alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.51	Low temperature alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.52	High temperature alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.53	Low humidity alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.54	High humidity alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2

N. Par.	Description	Default	U.M.	Min.	Max.
31.55	Eeprom alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.56	Maintenance alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.58	Dirty filters alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.62	Circuit 1 frost-free protection alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.67	BMS1 serial offline alarm addressing [0: A | 1: None | 2: B]	0	-	0	2
31.70	Auxiliary temperature probe alarm address 129 on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.71	Auxiliary humidity probe alarm address 129 on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.72	Auxiliary probe offline alarm address 129 on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.73	ADL On Limit alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.84	Circuit 1 low pressure probe alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
31.85	Circuit 2 low pressure probe alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
33.15	PAC-IF013B-E Master offline alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.15	PAC-IF013B-E Master offline alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.16	P1 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.17	P2 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.18	P6 Freezing PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.19	P6 Overheating PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.20	P9 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.21	E0/E4 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.22	E1 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.23	E2 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.24	E3/E5 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.25	E6 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.26	E7 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.27	Fb PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.28	PL PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.29	PU PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.30	EE PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.15	PAC-IF013B-E Master offline alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.31	PAC-IF013B-E Slave 1 offline alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.32	P1 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.33	P2 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.34	P6 Freezing PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.35	P6 Overheating PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.36	P9 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.21	E0/E4 PAC-IF013B-E Master alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.38	E1 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.39	E2 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.40	E3/E5 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.41	E6 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.42	E7 PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.43	Fb PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2

N. Par.	Description	Default	U.M.	Min.	Max.
33.44	PL PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.45	PU PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.46	EE PAC-IF013B-E Slave 1 alarm addressing on digital output (0:A - 1:none - 2:B)	0	-	0	2
33.47	Detected gas leak alarm addressing on digital output [0: A | 1: None | 2: B]	0	-	0	2
50.01	Cold setpoint	24.0	°C	P 99.27	P 99.28
50.02	Hot setpoint	24.0	°C	P 20.26	P 50.01
50.03	Dehumidification setpoint	55	%UR	P 99.02	99
50.04	Humidification setpoint	45	%UR	10	P 99.03
50.05	Cold setpoint for LAN limits	30.0	°C	P 50.01	50.0
50.06	Hot setpoint for LAN limits	18.0	°C	0.0	P 50.02
50.07	Dehumidification setpoint for LAN limits	75	%UR	P 50.03	90
50.08	Humidification setpoint for LAN limits	35	%UR	10	P 50.04
50.09	Minimum room temperature for dehumidifier disable	23.0	°C	P 14.10	35.0
50.14	Setpoint for the adjustment of the fan using the fan adjustment based on return temperature function	24.0	°C	P 20.24	P 20.25
50.15	Setpoint for the adjustment of the fan using the fan adjustment based on return temperature for LAN limits function	30.0	°C	P 50.14	40.0

Par.N.	Description
	Minimum limit that can be set for the internal fan speed. Calculated as: P10.10 - P10.11%
	Minimum limit that can be set for the dehumidification setpoint. Calculated as: P50.04 + 5
	Maximum limit that can be set for the dehumidification setpoint. Calculated as: P50.03 - 5
	Maximum value that can be set for low pressure setpoint for frost-free function
	Minimum value that can be set for cold setpoint depending on whether adjustment is enabled
	Maximum value that can be set for cold setpoint depending on whether adjustment is enabled

2.8 EVENTS MASKS

Press the **[ALARM]** key once to enter the **"Alarm"** menu and view the event messages along with their codes.
If there is more than one event, scroll the menu using the **[UP]** and **[DOWN]** keys. Press any other button to exit this menu.

In order to reset an event, press the **[ALARM]** key another time. The event will be reset only if the condition that caused it has been solved. The event otherwise remains active.
By pressing the **[ALARM]** key, no events being there for display, the system shows the message "No Alarm detected".

For every type of alarm, the following properties are defined:

- Type of Event: Reports the presence of a Signal (S) or an Alarm (A).
- Type of Reset: Indicates whether reset is Manual or (MANUAL) or Automatic (AUTO).
- Location: Reports where in the unit the alarm has taken place.
- Action: Indicates where the *block* caused by the alarm is located.

With regard to the Type, the parameters of some events may be set and it is possible to define whether the reset should be Manual or Automatic, as well as define the maximum number of interventions after which the alarm will automatically switch to Manual reset.

2.8.1 Events table

Letters	Display description	Description
Key to "Type of Event" column		
A	A###	Alarm with resource/unit block. Sets the "alarm cumulative".
S	S###	Display signal. Does not set the "alarm cumulative".
S/A	S### A###	Signal or Alarm. One mode or the other may be selected from the parameter. The "alarm cumulative" is set in the case the event is an alarm.
S*	S###	Display signal with "alarm cumulative" setting.
Key to Type of Reset" column		
A	Type:AUTO	Automatic rearm (if the condition causing the alarm disappears, the alarm resets automatically).
M	Type:MANUAL	Manual rearm (if the condition causing the alarm disappears, the alarm must be reset from the keyboard).
A/M	Type:AUTO Type:MANUAL	Automatic reset if the type of reset set in the parameter is automatic. Manual reset if the type of reset set in the parameter is manual.
A->M	Type:AUTO Type:MANUAL	Automatic rearm alarm for the first "N" interventions, then manual.
Key to "Position" column		
CO	Location:COMPR	Alarm / Signal involving the compressor.
CI	Location:CIRC	Alarm / Signal involving the cooling circuit.
U	Location:UNIT	Alarm / Signal involving the unit.
P	Location:PLANT	Alarm / Signal involving the system
Key to "Action" column		
NO		No block.
U	Action:UNIT	Unit block.
NO/U	Action:UNIT	No Block if the type of reset set in the parameter is automatic. Block of the unit if the type of reset set in the parameter is manual.
CI	Action:CIRC	Block of the cooling circuit involved in the event.
CO	Action:COMPR	Block of the compressor involved in the event.
HU	Action:HU	Block of the humidifier.
EH	Action:EH	Block of the electric heater or heat resource involved in the event.
FN	Action:FN	Block of the function involved in the event.
Key of the "Action" column for the "Function" category		
FC	Not Displayed	Block of the Free Cooling function
FC Ind		Block of the Indirect Free Cooling function (FC unit).
Lim		Block of the function regarding the output air temperature limit.
HU		Block of the humidity control function.
DH		Block of the dehumidifier control function.

The descriptions and codes of the events are given on the following pages.

Code	Display description	Details	Event Time	Reset Time	Position	Action
-	No Alarm detected	No event available.				
003	Presence of SMOKE/FIRE	Fire/smoke detector engagement. *Visible only if the detecting input is present.*	A	A/M	P	U
010[1]	Flood Alarm: check Water Connections	Engagement of the flooding sensor. *Visible only if the detecting input is present.*	S/A	A/M	P	NO/U
050	Gas Leak Detected	Coolant gas leak detected by the Leak Detector. This event causes the forcing to maximum operation level of the fans of the unit (if on), the switching off of the external unit and the maximum opening of the Direct Free cooling damper (if present). The same actions are performed by all the other units connected to the pLAN network (the forcing of the fans only for the units that are on).	A	A	U	CI
101	Loss of Air Flow Check Fan/Switch	Lack of air flow on the evaporator. This event causes the forcing to maximum operation level of the fans of any other units connected to the pLAN network, if on.	A	M	U	U
120	Room Temp.Sensor Failed/Disconnected	Room air temperature sensor fault.	A	A	U	FN FC
121	Aux Temp.Sensor Address 129 Failed/Disconnected	Auxiliary air temperature sensor fault serial probe address 129. *Only visible when the remote T+H sensor is available.*	A	A	U	NO
125	Room Humidity Sensor Failed/Disconnected	Room humidity sensor fault. *Visible only when the T+H sensor is available.*	A	A	U	FN HU+DH
126	AUX Humidity Sensor Address 129 Failed/Disconnected	Auxiliary humidity sensor fault serial probe address 129. *Only visible when the remote T+H sensor is available.*	A	A	U	NO
140	Delivery Air Temperature Sensor Failed/Disconnected	Delivery air temperature sensor faulty.	A	A	U	FN Lim
144	Outdoor Temp.Sensor Failed/Disconnected	External air temperature sensor faulty. *Only visible for Freecooling units*	A	A	U	FN FC
150	Heaters Overheating or Heaters Contactor Failed	Heater safety thermostat engagement. *Visible only if the unit is configured with heating elements.*	A	M	U	EH
170	PAC-IF013B-E Master Address 21 OFFLINE	Master PAC-IF013B-E card disconnection alarm (serial connection address 21) *Visible only when the unit is configured as a Split Type unit.*	A	A	P	NO
171	PAC-IF013B-E Slave 1 Address 21 OFFLINE	Slave 1 PAC-IF013B-E card disconnection alarm (serial connection address 22) *Visible only when the unit is configured as a Split Type unit.*	A	A	P	NO
180	Serial probe T-H address 128 OFFLINE	T+H probe disconnection alarm (serial connection address 128). *Visible only if the unit is configured with T+H probe.*	A	A	U	FN
181	Serial probe T-H address 129 OFFLINE	T+H probe disconnection alarm (serial connection address 129). *Only visible if they unit is configured with remote T+H probe.*	A	A	U	NO
195	Humidifier Board Offline	CPY driver disconnection alarm (serial connection). *Only visible with humidifier installed*	A	A	U	HU
199	Transducer Offline	Network transducer disconnection alarm (serial connection). *Visible only id the network transducer control is active.*	A	A	U	FN
319	Low Pressure circuit 1 sensor Failed/Disconnected	Circuit 1 low pressure transducer fault alarm.	A	A	CI	FN

[1] This event is displayed only if the P22.83 parameter is set as “Alarm - Automatic” or “Alarm - Manual

Code	Display description	Details	Event Time	Reset Time	Position	Action
321	Low Pressure circuit 2 sensor Failed/Disconnected	Circuit 2 low pressure transducer fault alarm.	A	A	CI	FN
323	Frost Protection Active circuit 1	Circuit 1 frost-free function protection alarm.	A	A->M	CI	CI
324	Frost Protection Active circuit 2	Circuit 2 frost-free function protection alarm.	A	A->M	CI	CI
402	Life timer expired Reset/Clean cylinder	Humidifier cylinder expiry alarm. *Visible only if internal humidity control is present.*	A	A	U	HU
404	Humidifier: Drain alarm	Humidifier discharge alarm. *Visible only if internal humidity control is present.*	A	A	U	HU
406	Humidifier: Loss of Water	Leak of humidifier water alarm. *Visible only if internal humidity control is present.*	A	A	U	HU
408	Humidifier: Low Current	Low humidifier current alarm. *Visible only if internal humidity control is present.*	A	A	U	HU
410	Humidifier: High Current	High humidifier current alarm. *Visible only if internal humidity control is present.*	A	A	U	HU
412	Generic alarm Humidifier	Generic humidifier alarm. For alarm details, please refer to the chapter on internal humidifier control.	A	M	U	HU
510[2]	Flood Alarm: check Water Connections	Reports the engagement of the flooding sensor. *Visible only if the detecting input is present.*	S	A/M	P	NO
520	LAN Interrupted Units not connected:	Reports a disconnection or interruption in the local network (LAN). *Visible only if the local network (LAN) management is set.*	S	A	P	NO
530	Room Temperature Below Min. Limit	Reports that the temperature is below the minimum set level.	S*	A	P	NO
531	Room Temperature Above Max. Limit	Reports that the temperature is above the maximum set level.	S*	A	P	NO
540	Room Humidity Below Min. Limit	Reports that room humidity is below the minimum set level. *Visible only if humidity control is present..*	S	A	P	NO
541	Room Humidity Above Max. Limit	Reports that room humidity is below the maximum set level. *Visible only if humidity control is present..*	S	A	P	NO
601	EEPROM Error: Replace Control Board	Reports a problem to the controller permanent memory.	S	A	U	NO
610	Maintenance needed	Request of maintenance due to operating hour limit exceeded (fan unit, compressors, heating elements, humidifier).	S	A	U	NO
630	Clogged Filters Clean or Replace Filter Element	It indicates that the air filters are dirty. *Visible only if the detecting input is present.*	S	A	U	NO
711	BMS1 bus OFFLINE	Signals that the BMS1 bus is Offline (the supervisor no longer queries the controller).	S	A	P	NO
712	BMS2 bus OFFLINE	Signals that the BMS2 bus is Offline (the KIPlink no longer queries the controller).	S	A	P	NO
810	PAC-IF013B-E Master P1 Alarm	Target air temperature sensor faulty TH1 (Master PAC-IF013B-E)	A	A	P	NO
811	PAC-IF013B-E Master P2 Alarm	Liquid temperature sensor faulty TH2 (Master PAC-IF013B-E)	A	A	P	NO
812	PAC-IF013B-E Master P6 Freezing Alarm	Freezing protection (Master PAC-IF013B-E)	A	A	P	NO
813	PAC-IF013B-E Master P6 Overheating Alarm	Overtemperature protection (Master PAC-IF013B-E)	A	A	P	NO

[2] This event is displayed only if the P22.83 parameter is set as “Alarm - Automatic” or “Alarm - Manual

Code	Display description	Details	Event Time	Reset Time	Position	Action
814	PAC-IF013B-E Master P9 Alarm	Two-phase temperature sensor faulty TH5 (Master PAC-IF013B-E)	A	A	P	NO
815	PAC-IF013B-E Master E0/E4 Alarm	Loss of communication between remote controller and Master PAC-IF013B-E	A	A	P	NO
816	PAC-IF013B-E Master E1 Alarm	Loss of communication between remote controller and Master PAC-IF013B-E	A	A	P	NO
817	PAC-IF013B-E Master E2 Alarm	Loss of communication between remote controller and Master PAC-IF013B-E	A	A	P	NO
818	PAC-IF013B-E Master E3/E5 Alarm	Loss of communication between remote controller and Master PAC-IF013B-E	A	A	P	NO
819	PAC-IF013B-E Master E6 Alarm	Loss of communication between Master PAC-IF013B-E and Mr Slim external unit	A	A	P	NO
820	PAC-IF013B-E Master E7 Alarm	Loss of communication between Master PAC-IF013B-E and Mr Slim external unit	A	A	P	NO
821	PAC-IF013B-E Master Pb Alarm	Master PAC-IF013B-E faulty	A	A	P	NO
822	PAC-IF013B-E Master PL Alarm	Cooling circuit fault (Master PAC-IF013B-E)	A	A	P	NO
823	PAC-IF013B-E Master PU Alarm	Inlet temperature probe faulty TH11 (Master PAC-IF013B-E)	A	A	P	NO
824	PAC-IF013B-E Master EE Alarm	DIP SWITCH setup error (Master PAC-IF013B-E)	A	A	P	NO
825	PAC-IF013B-E Slave 1 P1 Alarm	Target air temperature sensor faulty TH1 (Slave 1 PAC-IF013B-E)	A	A	P	NO
826	PAC-IF013B-E Slave 1 P2 Alarm	Liquid temperature sensor faulty TH2 (Slave 1 PAC-IF013B-E)	A	A	P	NO
827	PAC-IF013B-E Slave 1 P6 Freezing Alarm	Freezing protection (Slave 1 PAC-IF013B-E)	A	A	P	NO
828	PAC-IF013B-E Slave 1 P6 Overheating Alarm	Overtemperature protection (Slave 1 PAC-IF013B-E)	A	A	P	NO
829	PAC-IF013B-E Slave 1 P9 Alarm	Two-phase temperature sensor faulty TH5 (Slave 1 PAC-IF013B-E)	A	A	P	NO
830	PAC-IF013B-E Slave 1 E0/E4 Alarm	Loss of communication between remote controller and Slave 1 PAC-IF013B-E	A	A	P	NO
831	PAC-IF013B-E Slave 1 E1 Alarm	Loss of communication between remote controller and Slave 1 PAC-IF013B-E	A	A	P	NO
832	PAC-IF013B-E Slave 1 E2 Alarm	Loss of communication between remote controller and Slave 1 PAC-IF013B-E	A	A	P	NO
833	PAC-IF013B-E Slave 1 E3/E5 Alarm	Loss of communication between remote controller and Slave 1 PAC-IF013B-E	A	A	P	NO
834	PAC-IF013B-E Slave 1 E6 Alarm	Loss of communication between Slave 1 PAC-IF013B-E and Mr Slim external unit	A	A	P	NO
835	PAC-IF013B-E Slave 1 E7 Alarm	Loss of communication between Slave 1 PAC-IF013B-E and Mr Slim external unit	A	A	P	NO
836	PAC-IF013B-E Slave 1 Pb Alarm	Slave 1 PAC-IF013B-E Faulty	A	A	P	NO
837	PAC-IF013B-E Slave 1 PL Alarm	Cooling circuit fault (Slave 1 PAC-IF013B-E)	A	A	P	NO
838	PAC-IF013B-E Slave 1 PU Alarm	Inlet temperature probe faulty TH11 (Slave 1 PAC-IF013B-E)	A	A	P	NO
839	PAC-IF013B-E Slave 1 EE Alarm	DIP SWITCH setup error (Slave 1 PAC-IF013B-E)	A	A	P	NO

2.8.2 Table of internal humidifier alarms with CPY control

The internal humidifier alarms managed by the CPY control are transmitted by the CPY control to the EVOLUTION+ controller via the serial line.
The CPY control alarm codes are grouped below for each alarm that is read by the controller.

EVOLUTION+			CPY alarms		
Code	**Display description**	**Type**	**Code**	**Red indicator LED**	**Description**
195	Humidifier Board Offline	Al-Auto	1	2 slow flashes	Device Offline
402	Life timer expired Reset/Clean cylinder	Al-Auto	3	8 fast flashes	Mn - Cylinder life
404	Humidifier: Drain alarm	Al-Auto	12	5 slow flashes	Ed - Drain alarm
406	Humidifier: Loss of Water	Al-Auto	11	3 slow flashes	EF - Missing water
408	Humidifier: Low Current	Al-Auto	8	4 slow flashes	EP - Low production
410	Humidifier: High Current	Al-Auto	4	5 fast flashes	EC - High conductivity
			7	2 fast flashes	EH - High current
412	Generic alarm Humidifier	Al-Auto	2		I64/I82 val. Incorrect
			5	4 fast flashes	E1 - Params not dwnld
			6	3 fast flashes	E0 - Calib.Par. not ok
			9	8 slow flashes	EU - Full cylinder
			10	7 slow flashes	E3 - Probe not conn.
540	Room Humidity Below Min. Limit	**S-Auto**			
541	Room Humidity Above Max. Limit	**S-Auto**			

Differently from alarms, warnings forwarded by the CPY to the EVOLUTION+ controller are not grouped into notifications, but can only be displayed in the internal humidifier dedicated mask.

CPY warnings	
Code	**Description**
0	No warning
1	CY: Maintenance warning
2	EA: Foam present
3	CP: Cylinder depletion forewarning
4	CL: Depleted cylinder
5	E2: Damaged Eeprom

Refer to the CPY manual for further info.

3 STARTING THE UNIT

3.1 SOFTWARE UPLOAD

Upon initial installation the cards must be programmed by **uploading** the software inside the Flash memory.
This operation can be performed only using the Service software.
The computer communicates with the pCO board using a USB-RS485 converter.

3.2 UNIT POWER SUPPLY

ATTENTION
Connect the unit to the power supply at least 8 hours before starting it; if this is not done, the guarantee will become null and void.

ATTENTION
Pay attention to the fans. They are kept on at reduced speed when the power is connected, even if the unit is switched off from the terminal, and while the controller has not yet started, to ensure the dispersion of possible gas leaks.

When the unit is fed, wait approximately 35 seconds before the application starts to run. This time interval may not be cancelled because it is necessary for the control board to initialise the user terminal. In this phase the user terminal display is lit but does not display anything.

When starting the programme, ventilation starts automatically without any delay, unless the unit is connected to the local LAN network. In this case, each unit of the network is activated after a delay in seconds equal to the unit LAN address multiplied by 5, in order to prevent the evaporating fans of all the units from starting at the same time when the power returns after a black-out. This risk cannot be avoided if there are several units that are not connected with each other in a network.

During start-up of the direct expansion units, a control is carried out to check that the sequence of the phases is correct before ventilation is started. If it is not correct, ventilation is not started and the incorrect sequence of phases alarm is triggered.

3.3 VENTILATION START-UP

There are different procedures for starting or stopping the unit: using the user interface buttons or selecting from the display. The procedures take the following priority in case of conflicts (from highest to lowest priority):

1. On/Off from user interface.
2. On/Off from digital input.
3. On/Off from local network (LAN).
4. On/Off from time bands.
5. On/Off from protocol.

Using the user interface
The “On/Off” parameter is displayed on the main mask. “Off” means that the unit is switched off while “On” means that the unit is switched on.

Proceed as follows:

- *Switching On*: Move to the “On/Off” parameter by pressing **[ENTER]** and then press **[UP]** or **[DOWN]** until “On” appears. Press **[ENTER]** again to confirm. If “On” continues to be displayed it means that the unit has been switched on.
- *Switching Off*: Move to the “On/Off” parameter and change to “Off” using the same procedure used to switch the unit on. Press **[ENTER]** again to confirm. If “Off” continues to be displayed it means that the unit has been switched off.

Using the digital input
Only if "Enable On/Off from digital input" has been set at "Yes" in the **“Regulations” menu**, which can be accessed by entering the **“Service” password**.

Proceed as follows:

- *Switching On*: Close the remote On/Off contact (U5). The corresponding icon is displayed in the main mask.
- *Switching Off*: Open the remote On/Off contact (U5). The corresponding icon is displayed in the main mask.

Using local network (LAN) protocol:
This mode requires the unit to be connected in a LAN network.
The On/Off control comes from the Master, that is, the unit whose LAN address is=1.
The corresponding icon is displayed on the main mask.

Using time bands
Make sure that “Clock card not installed” is not displayed in the **“Clock”** menu.
Check that the “Scheduler config” parameter in the **“User”** menu is set to “Yes”.

Proceed as follows:

- *Switching On*: Set the required switching on time in the **“Clock”** menu. The unit switches on when the set time is reached.
  The “On from time bands” message appears in the main mask to show that the unit has been switched on.
  Note: The unit does not switch on if it is set to “Off from keypad” or “Off from digital input”.
- *Switching Off*: Set the required switching off time in the **“Clock” menu**. The unit switches off when the set time is reached.
  The “Off from time bands” message appears in the main mask to show that the unit has been switched off.

After enabling time bands from the "Enable time bands" parameter in the **"Scheduler" menu**, time bands can be set and different setpoints can be specified according to requirements.

The following must be defined to ensure correct use of the time bands:

1. The type of programming of the time bands:
   - *Standard*: For setting a single programming category (A), with a maximum of 10 time bands, that can be assigned to each day of the week.
   - *Advanced*: For setting up to 4 different types of programming category (A, B, C and D), with a maximum of 10 different time bands, that can be assigned to each day of the week.
2. For each day of the week:
   - Disable the time bands: On the day selected, the controller runs without the time bands.
   - Enable a type of time band (A, B, C or D): On the day selected, the controller runs as programmed.
3. For each time band:
   - Unit status: OFF (unit turned off by time bands) or in adjustment mode (unit turned ON by time bands).
   - Time band start time (for the first time band, this is fixed at 00:00).
   - Time band end time (for the tenth time band, this is fixed at 23:59).
   - Cooling setpoint.
   - Heating setpoint (when applicable and configured).

INFORMATION
The time bands B, C and D are shown only when Advanced programming is selected.

INFORMATION
To use a smaller number of bands, simply set the time a band ends to the same time it begins. In this way, the band in question is ignored.

Below are a few examples that, in graphical form, use bands A, B and C in the clock menu.
The weekly chart uses band A for Monday, band B for Tuesday, Wednesday, Thursday and Friday, and band C for Saturday, while for Sunday the bands are disabled.

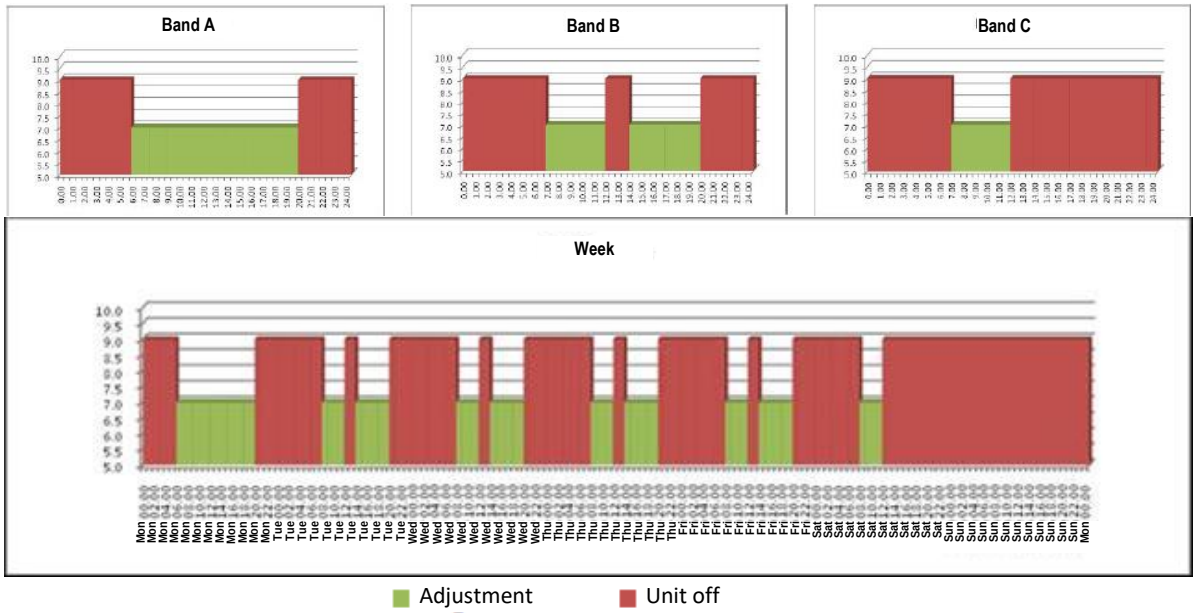


Figure 3-1: *Example ofdaily time band settings*

Using the supervision protocol
Only if the serial board is fitted.
Check in the **"User menu"** that the parameters "Serial line enabling" and "On/Off enabling from supervisor" are set at "Yes".

Proceed as follows:

- *Switching On*: Send the switching on command from the protocol. The corresponding icon is displayed in the main mask.
  Note: The unit does not switch on if it is set to "Off from keypad" or "Off from digital input".
- *Switching Off*: Send the switching off command from the protocol. The corresponding icon is displayed in the main mask.

3.4 START OF AUTOMATIC ADJUSTMENT

Temperature and humidity adjustment is enabled 60 seconds (settable time, minimum value: 20 seconds) after the unit is activated, that is, after ventilation is started. The aim is to give the unit time to circulate the ambient air for long enough to assure correct reading of ambient temperature and humidity values.
Automatic adjustment permission is immediately withdrawn when ventilation is disabled or when the manual commands are enabled.

3.5 FORCED VENTILATION ACTIVATION

When a unit is switched off using one of the procedures previously described, the shutdown command will be sent to the PAC-IF cards and ventilation will remain in operation until the Mr. Slim units are switched off. This transitional period will be notified by the ventilation and the compressor icons flashing at the same time.

In case of s-MEXT unit blocking alarm, ventilation is immediately disabled and the external Mr Slim unit immediately stops.

The blocking alarms are:

- Air flow differential pressure switch
- Clogged filter differential pressure switch
- Heater thermostat
- Fire/Fumes sensor
- Flooding sensor
- Gas leak detected (ventilation forced to maximum level).

3.6 MANUAL MANAGEMENT

It is possible to manually start the devices connected to the outputs without using delays, rotating the compressors and regardless of the adjustment and the values measured by the probes. The only support available in manual mode is the management of the alarms protecting the safety and integrity of the devices. Manual activation of the analogue outputs allows a value between 0 V and 10 V to be forced. This is expressed on the user terminal as a percentage (between 0% and 100%).
The manual procedure can be activated at any time during unit operation and terminates if it is manually disabled by the user or if a maximum time of 30min has elapsed (this time can be set from the **"Factory" menu** up to a maximum of 60min). There is always a flashing signal on the display.
The parameters for activating and managing the manual mode are in the **"Manual" menu**, which can be accessed by entering the **"Service" password**.

4 NOTES ON TEMPERATURE ADJUSTMENT

The heating and cooling devices are managed on the basis of the temperature values measured by the return or delivery probe depending on the parameter settings. This temperature is compared with the set value (setpoint), and based on the difference, the devices may activate. The proportional band selects the working area and may assume (as for the setpoints) different heating and cooling values.
The software can be used to manage three temperature adjustment types:

- Purely Proportional adjustment;
- Proportional + Integral adjustment;
- Proportional + Integral + Derived adjustment (only in units with inverter compressor).

The basic programme setting (default) features Proportional + Integral adjustment with an elevated integral time constant, therefore very close to purely proportional adjustment.
All the adjustment diagrams shown in this manual refer to a purely proportional adjustment.
Compared with the diagrams described further on, Proportional + Integral adjustment can reduce (with respect to the distance between ambient temperature and setpoint) the activation time of the cooling and heating devices and consequently delay shutdown. This effect is more marked the longer the "permanent off-balance" phenomenon continues, that is, the immobility of the ambient temperature in a different point from the set setpoint. In any case, the delay/anticipation of the unit enable/disable never goes beyond the limit of the opposite proportional band.

Integral adjustment is inhibited (and therefore pure proportional adjustment is active) when the two cold and hot setpoints are set, so that a dead zone is included (when the two setpoints are different). In this case, no adjustment resources must ever be enabled in the temperature zone between the two setpoints; the integral adjustment delay is therefore disabled;

4.1 MANAGEMENT OF THE LIMITS OF THE COLD SETPOINT

The parameter for setting the setpoint is automatically limited to specific values set during the design of the units themselves.

The set values are given in the table below.

Unit code	Description	P20.24 (°C)	P20.25 (°C)
s-MEXT DX/DW	Direct expansion to be used in combination with the Mr Slim condensing unit	20	32

The parameters P20.24 and P20.25 are in the **"Regulation" menu**, which can be accessed by entering the **"Service" password**.

INFORMATION
Although the parameters P20.24 and P20.25 can be accessed with the "Service" password, please contact MEHITS before setting different values.

When the unit is equipped with heating sources (electric heaters or hot water coil), the minimum allowable setpoint value is limited by the value of the hot setpoint value.
The chart below illustrates the limitation described above.

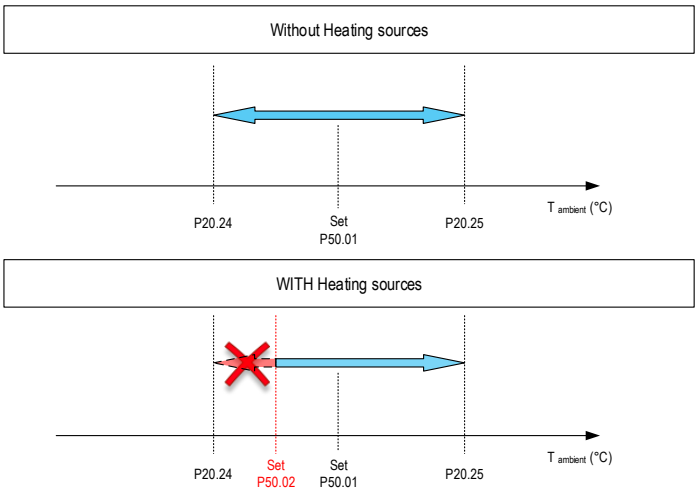


Figure 4-1: *Charts of management of the setpoint limits*

4.2 REGULATION PROBE MANAGEMENT

For the unit, it is possible to define which probe to use for the adjustment, selecting from:

- Intake air probe.
- Delivery air probe.

The regulation with delivery air probe is allowed only if the heaters are not present.

4.3 RETURN SETPOINT COMPENSATION

This function allows automatic air return setpoint variation within a preset range, based on a signal sent to the unit controller. The function monitors in real time the input value (temperature read by the remote T+H probe) and calculates the offset value based on the parameters. This value is then added to the return setpoint or subtracted from it, therefore becoming an "offset" setpoint.
Enabling the function forces to controller to consider the return temperature as controlled temperature, unless it is specified that the unit fan adjust their own numbers of revolutions based on the return temperature.

The logic is shown below.

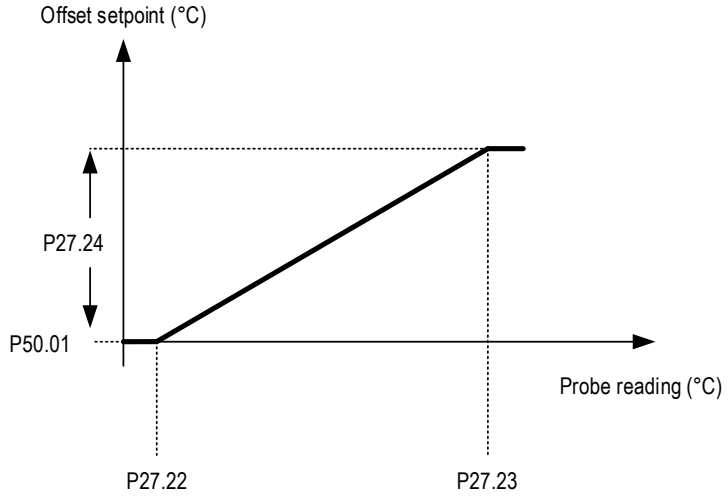


Figure 4-2: *Chart showing the setpoint offset based on the T+H probe*

To ensure independent management of the offset both during cooling and heating, a second set of three parameters for the heating setpoint has been introduced.

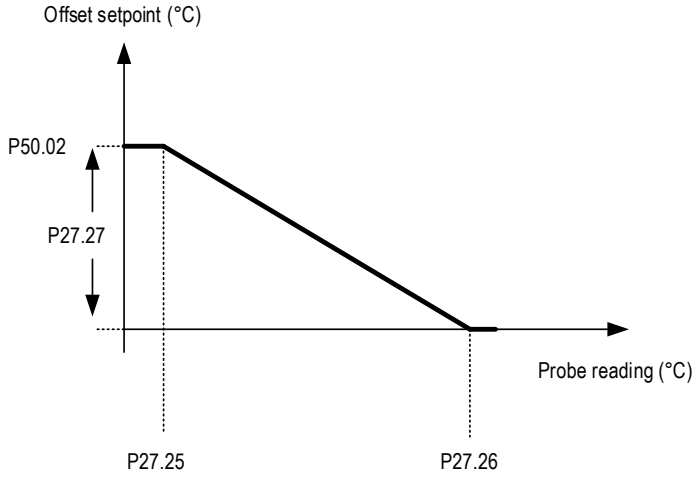


Figure 4-3: *Chart showing the setpoint offset based on the T+H probe*

Note: The previous chart shows a condition when the entered P27.27 value is below 0.
The parameters for enabling and managing the function are under the **"Optional" menu**, which can be accessed by entering the **"Service" password**.

5 COOLING

5.1 COMMUNICATION WITH THE MR SLIM UNIT

During the management and control of Mr Slim units, it is necessary to use interface cards (PAC-IF013B-E), through which the s-MEXT unit will send commands and request information from the Mr. Slim units.
There are 2 possible types of connections for the use of Mr Slim units, depending on the number of them being used with the s-MEXT unit.
The following diagrams identify the connections.

5.1.1 Connection to only one external Mr Slim unit

The connection, represented in the figure below, requires the internal unit (s-MEXT) to control through the RTU Modbus protocol the PAC-IF013B-E card, which will then manage the Mr Slim external unit.

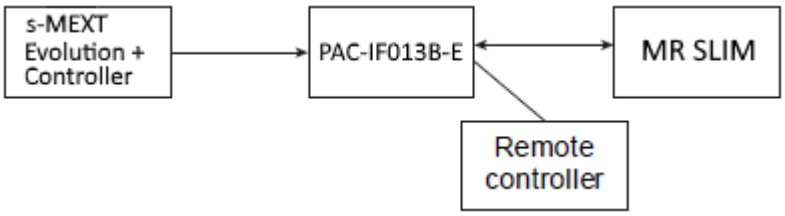


Figure 5-1: *Logic diagram for connection to 1 Mr. Slim unit*

5.1.2 Connection to more than one external Mr Slim unit

With this connection, represented in the figure below, the internal unit (s-MEXT) controls through the RTU Modbus protocol the Master PAC-IF013B-E card, which will then manage both the first external Mr Slim unit (address 0) and the Slave PAC-IF013B-E card.
The Slave PAC-IF013B-E card manages the second Mr Slim unit (address 1).

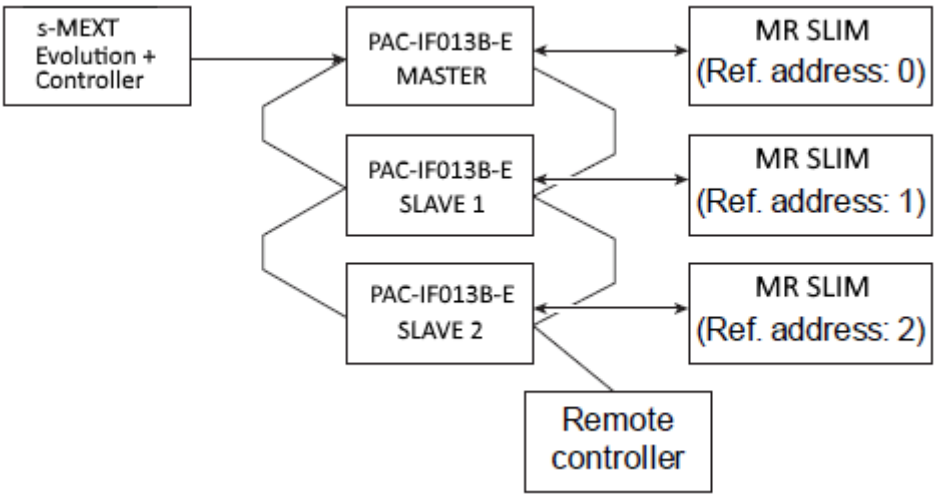


Figure 5-2: *Logic diagram for connection to 2 Mr. Slim unit*

In this case, the PAC-IF013B-E Master card must be configured for the IMOUC function (Intelligent Multiple Outdoor Unit Control), independently managed by the PAC-IF013B-E.

5.2 COLD REQUEST GENERATION

The external unit control logic requires DIP temperature control. This logic operates as follows.

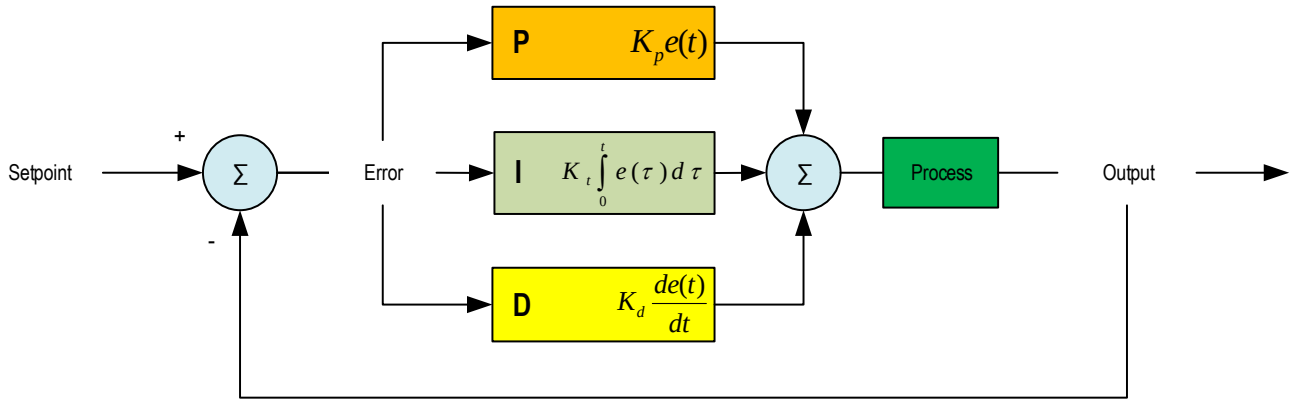


Figure 5-3: *PID control logic operation*

The control variable is the ambient or delivery temperature and the controlled variable is the adjustment ramp (define in values from 0 to 100%). The higher the ramp value, the higher the request sent to external units.

It is also possible to enable fan modulation, together with speed change, in order to improve system adjustment.

The request of cooling capacity, calculated by the s-MEXT unit (0-100%) using the DIP adjuster, will then be converted into 11 request steps and sent to the Master PAC-IF card. The Master PAC-IF card will then send the capacity request to any connected Slave PAC-IF cards.

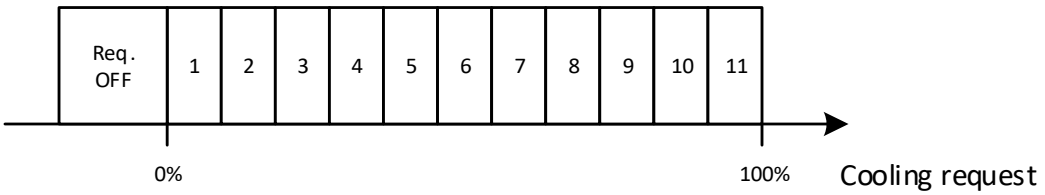


Figure 5-4: *Step subdivision logic operation*

During the operation of the PAC-IF card, the passage through the steps is sent in accordance with the following time scales:

- **5 min** if the last step forwarding was equal or lower than 5 (in relation to the already active power)
- **10 min** if the last step forwarding exceeded 5.

The following chart shows the way the above time scales work.

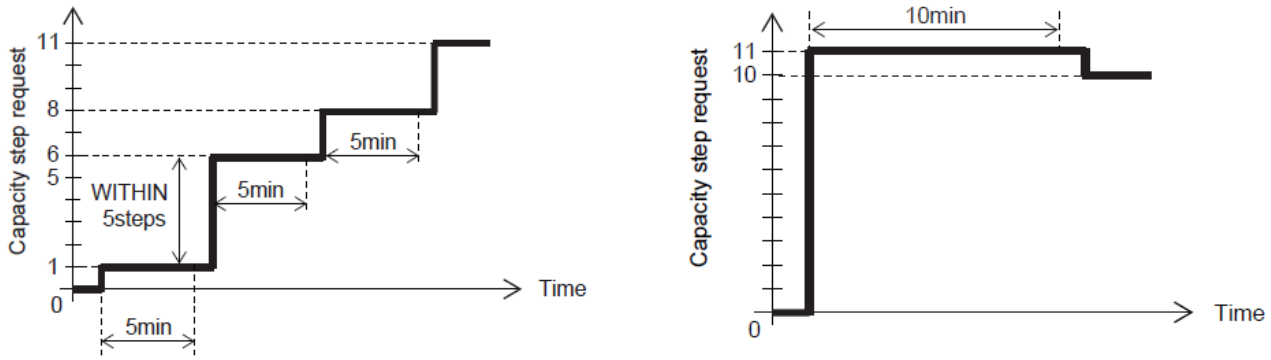


Figure 5-5: *Time scale logic operation*

In view of the long wait between two variations of request to the Master PAC-IF card, there is a time delay of 5 seconds before sending a power variation, to make sure that the value is the actually requested value, and not subjected to transitional and sudden request variations.

Moreover, a minimum On time of 3 minutes before switching off will be ensured.
In case of recalling of PAC-IF card step 0 (switch OFF), it will also be necessary to wait a minimum switch off time (maintaining of step 0).

The activation of these time delays will be notified on PGD1 in the following way:

- No delay.
- Short delay (5 minutes).
- Long delay (10 minutes).
- Hot/cold mode change (2 minutes)
- Minimum OFF time.

In addition to the compliance with the above time scales, the switching on of the PAC-IF card will also be subjected to the consent from the s-Mext unit to carry out the adjustment (example: Unit ON from keypad/KIPLink), and to the absence of any critical/blocking alarms that would cause the switching off of the s-Mext unit.

ATTENTION
In case of blocking alarm from a PAC-IF card, step 0 is forced until the normal operating conditions are reinstated. This forcing is necessary in order to reset the alarm, but causes the switching off of all PAC-IF cards.

5.2.1 Management of dehumidification

In order to be able to dehumidify as soon as consent is given by the logic (see the "Activating dehumidification" section in the "Dehumidification chapter), the request is set to the maximum step.

The flow rate reduction function can be enabled in dehumidification.
If the function is enabled, the fan speed is taken to a fixed value equal to the "Fan Speed when Dehumidif active" speed.

The parameters for enabling the required flow reduction and speed are under **"Fan" menu**, which can be accessed by entering the **"Service" password**.
For the default values, see the parameters table.

5.3 MINIMUM DELIVERY TEMPERATURE LIMIT

5.3.1 Objectives

Setting a minimum limit to the delivery temperature may be a request justified by the presence, very close to the unit delivery outlet, of devices that are sensitive to relatively low temperatures.
The delivery temperature can only fall excessively if there is a sudden decrease in the temperature of the cold coil (evaporation temperature or, more likely, the temperature of the chilled water coming from a chiller). This has effects on the room temperature that can only be measured after a certain period of time (the time required for the mixing of the delivery air with the ambient air to decrease the temperature sufficiently for it to be measured by the probe on the unit).
As soon as the delivery temperature falls below the set value, the cold demand is reset, and subsequently the compressor turns off in the direct expansion unit or the valve in the chilled water unit closes.

5.3.2 Adjustment logic

In detail, adjustment takes place as follows: When the value of the delivery temperature is nearer to the setpoint (minimum limit) than the cooling demand, adjustment automatically switches to the cooling demand of the ramp for the adjustment of the delivery temperature.
For example, if cold demand is 90%, while the delivery temperature adjustment ramp requires 50%, the cold demand adapts to the seconds and considers the 50% value.
This function is managed by considering the ramp of the minimum values shown in the following figure.

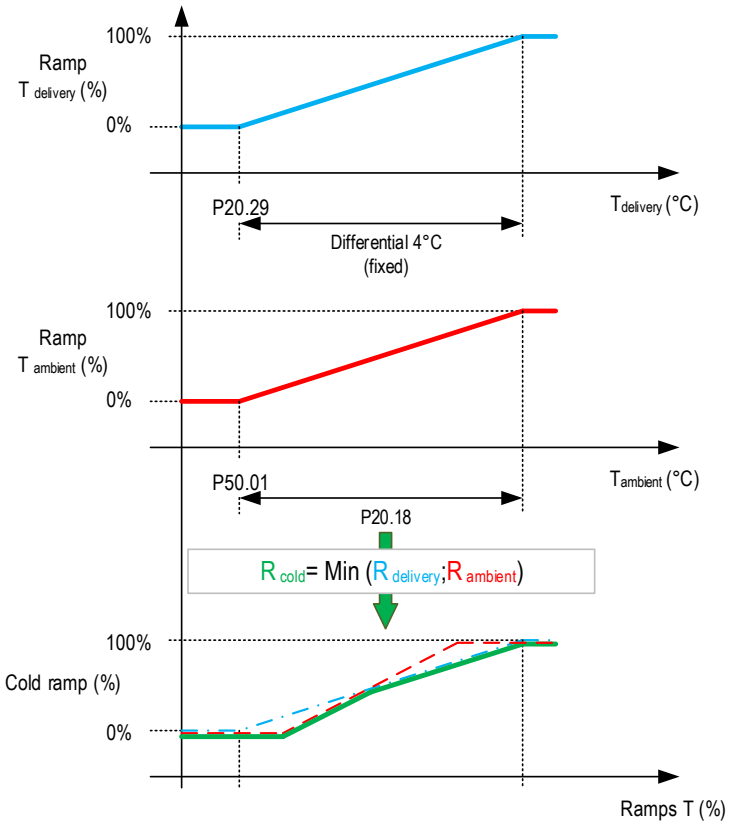


Figure 5-6: *COOLING demand limit graph*

The minimum delivery set parameter is in the **"Regulations" menu**, which can be accessed by entering the **"Service"** password.
For the default values, see the parameters table.
The minimum delivery differential is fixed, may not be modified, and is set at 4°C.

INFORMATION
If a Freecooling unit is selected, the programme will automatically enable this function.

6 HEATING

6.1 ON/OFF HEATING ELEMENT MANAGEMENT

The parameter indicating the presence of on/off electric heaters is in the **"Optional" menu**, which can be accessed by entering the **"Service" password**
The heating elements, when present, are given by two loads having different power; they are, therefore, always managed according to three heat steps, as shown below.

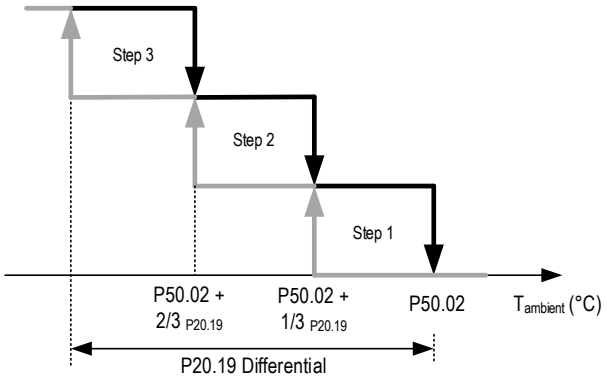


Figure 6-1: *Heat resources management graph*

The heat setting parameter is under the **"Set point" menu**.
The heat Differential parameter is under the **"Regulations" menu**, which can be accessed by entering the **"Service" password**.
For the default values, see the parameters table.
The association of the heaters with the steps reflects the "binary management":

- *Step 1*: Heaters 1
- *Step 2*: Heaters 2
- *Step 3*: Heaters 1 + Heaters 2

Activating the heating elements is possible only when all the following conditions are met:

1. Adjustment consent is active.
2. The heating element overheating alarm is not present (from thermostat).
3. None of the compressors are in cooling mode.

6.2 POST-VENTILATION FUNCTION FOR THE ELECTRIC HEATERS

This function, available for all the units equipped with electric heaters, is for cooling the electric heaters when the unit is turned off and the electric heaters are still active.
When the OFF command is given (at the keyboard, by the supervisor, or remotely), the fan continues to run at nominal speed for a period of time set in the parameter (P23.61).
The diagram below illustrates the function described above.

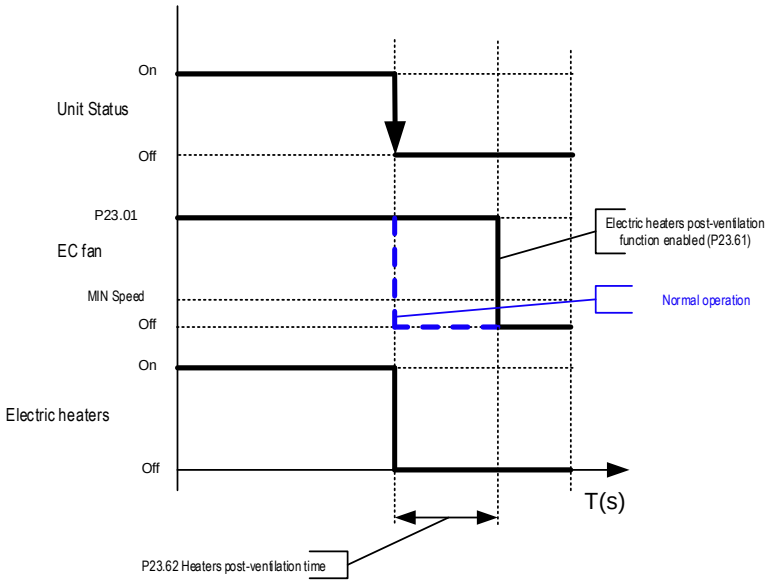


Figure 6-2*: The chart illustrates the Post-Ventilation function for the electric heaters.*

During the post-ventilation cycle, the icons of the electric heaters and fans flash on the main mask.
The parameters for enabling and configuring the Post-Ventilation function are in the **"Fan" menu**, which can be accessed by entering the **"Service" password**.
For the default values, see the parameters table.

7 DEHUMIDIFY

7.1 DEHUMIDIFICATION START-UP

Activating dehumidification happens through an on/off logic according to the step reported in the following diagram.

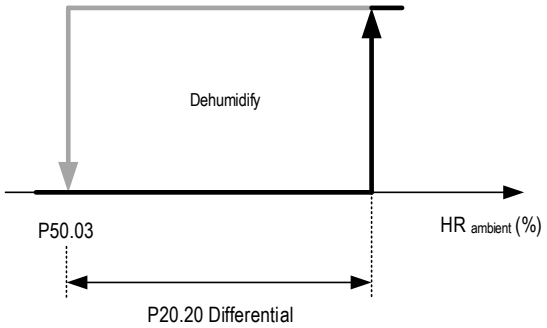


Figure 7-1: *Dehumidification start-up graph*

The dehumidify setting parameter is under the **"Set point" menu**. The dehumidify differential parameter is under the **"Regulations" menu**, which can be accessed by entering the **"Service" password**.
For the default values, see the parameters table.
The actions following the above step activation are enabled:

1. After regulation consent.
2. If the room humidity probe is present.
3. If the dehumidify regulation is enabled.
4. If there is no room humidity probe alarm.

The step activates only when 6 minutes have expired from the previous activation.
The s-MEXT unit will forward the dehumidification request 0/1, which will then be converted into maximum cooling capacity request for the PAC-IF card, and sent to the same in accordance with the time scales indicated in the subsection "Split Type unit Cooling".
The ventilation will switch to the percentage dictated by parameter P23.10.

7.2 DEHUMIDIFICATION LIMITS

7.2.1 General considerations

When the dehumidification function is enabled, the reaction of the ambient temperature depends on the heat load present at that moment:

- If the heat load is such as to require maximum cooling power, the decrease in sensible power caused by the activation of the dehumidification function may not allow the thermal load to be addressed and thus the ambient temperature may thus increase excessively.
- If the thermal load does not require cooling resources, activation of dehumidification lowers the temperature below the setpoint.

To avoid losing control of the temperature in these two cases, upper and lower limits must be set, beyond which the dehumidification function is disabled.

7.2.2 Upper limit

In the first case, the following must be observed.
For units with one compressor, even in the absence of an upper limit the temperature increase cannot continue indefinitely, as with the increase of the room temperature:

- The sensible capacity of the unit increases and the latent capacity increases.
- The relative humidity decreases (up to three percentage points for each degree).

It should also be considered that the sensible power of the unit is very often higher than that requested by the maximum ambient thermal load.
For all the units, there is an absolute upper limit managed according to the step shown in the graph below.

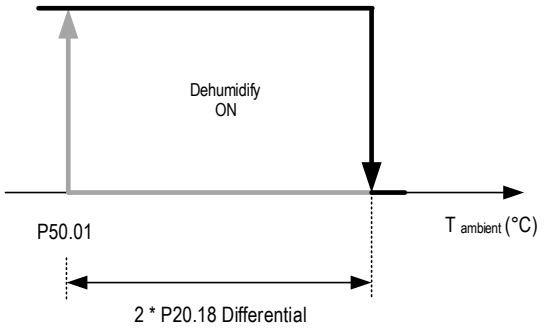


Figure 7-2: *Upper dehumidification limit graph*

Dehumidification is deactivated if room temperature exceeds the limit set out in the following formula:

$$Upper\ limit = Cold\ Set\ [P50.01] + (Cold\ differential\ [P20.18] * 2)$$

The dehumidifier will restore normal operation when the room temperature value falls below the "Cool setting" parameter value.
The Cooling Setting parameter is in the **"Set point"**menu. The cold setting parameter is under the **"Regulations" menu**, which can be accessed by entering the **"Service" password** .
For the default values, see the parameters table.

7.2.3 Lower limit

There is also an absolute lower limit for dehumidifier operation; it is managed according to a step whose position on the room temperature axis depends on the presence or absence of resources for post-heating, if any.
If there are no heat sources available (heaters or hot water coil), the lower limit step refers to the cold setpoint, as shown in the following figure.

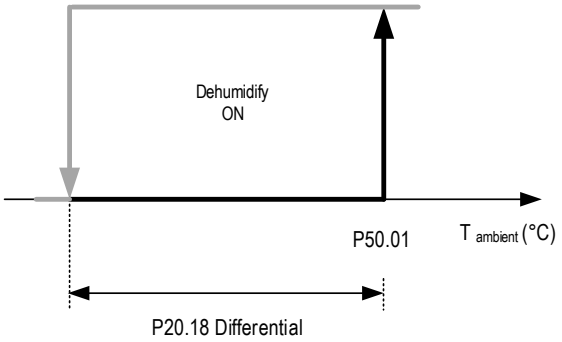


Figure 7-3: *Cold only unit dehumidification lower limit graph*

If there are heat resources available (heaters), the lower limit step refers to the hot setpoint, as shown in the following figure.

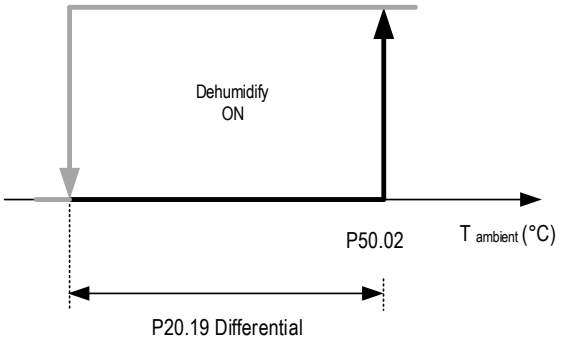


Figure 7-4: *Lower dehumidification limit graph for units with heat resources*

The Hot and Cold setting parameters are under the **"Set Point" menu**. The Hot and Cold differential parameters are under the **"Regulations" menu**, which can be accessed by entering the **"Service" password**.
For the default values, see the parameters table.
Disabling occurs after 60 seconds (this value cannot be changed) if heating resources are present (if, therefore, post-heating is active), otherwise it is immediate.
Dehumidification continues as normal when the room temperature value rises above the "cold setting" or "hot setting" parameter value.

7.2.4 Combination of the limits

Combined use of the high and low limits is shown in the graph below.

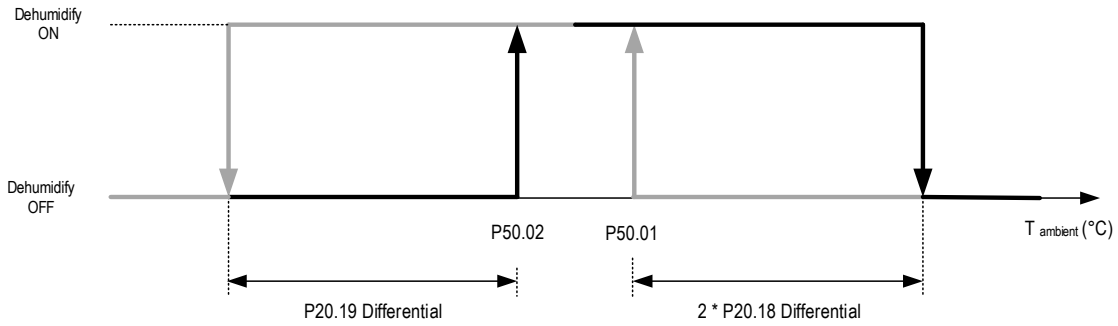


Figure 7-5: *Dehumidification temperature limit graph*

7.2.5 Low dehumidification temperature limit

In case of a direct expansion unit, there is another limit above which, irrespective of whether there are any heating/post heating resources, the dehumidification function is immediately inhibited.
This limit keeps the unit from operating under low evaporation conditions.
The parameter for the definition of the low temperature limit can be found in the **"Setpoint" menu**. The lower limit of this parameter is defined by the low temperature minimum limit parameter in the **"Safety" menu**, which can be accessed by entering the **"Factory" password**.
For the default values, see the parameters table.

7.2.6 Timed dehumidification function

For direct expansion units, another function is added in order to time the operation of the dehumidification.
The following graph shows how this function works.

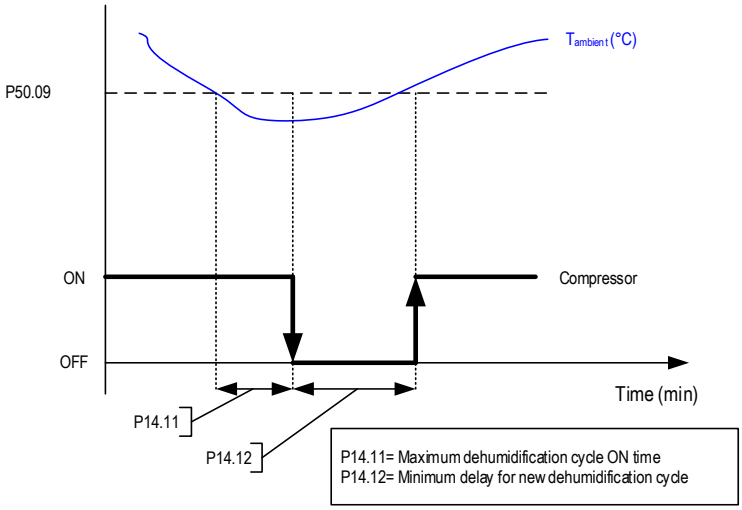


Figure 7-6: *Timed dehumidification adjustment graph*

Dehumidification therefore remains enabled for a time equal to the "Max DH time" parameter (expressed in minutes). When this time elapses the compressor is disabled for a time equal to the "Max waiting time" parameter (expressed in minutes) and then compressor operation is enabled once again.
The parameters used to configure this function are under the **"Safety" menu**, which can be accessed by entering the **"Factory" password**.
For the default values, see the parameters table.

7.2.7 Post - heating

If heating resources are present it is possible to enable them for post-heating, that is, heating the air after it crosses the cooling coil. This makes it possible to avoid prematurely interrupting the dehumidification function to reach the previously described lower limit.
For this purpose, the activation of the heating resources must not be distributed inside the heat differential band as it would be expected for heating as, in this case, maximum heating power would occur simultaneously with dehumidification disabling
Therefore, the heating power must be distributed over an ambient temperature band, so that the maximum heating power occurs at a value that is not only higher than the previously indicated lower limit, but also relatively distant from the same.
This allows the heat resources, after being enabled, to effectively change the ambient air temperature before it reaches the lower dehumidification limit. This is particularly important in small environments, where the activation of the dehumidification causes a quick decrease of the temperature.
As a result, the post-heating resources are enabled in sequence on the first half of the heating band, as shown in the following figure.

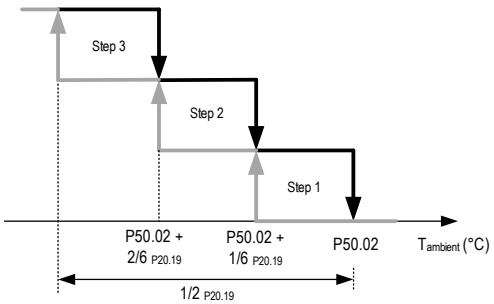


Figure 7-7: *Post heating resource management*

The resources, if present, can be selected from the **"Optional" menu**, which can be accessed by entering the **"Service" password**.
The Cooling Setting parameter is under the **"Set point" menu**. The cold setting parameter is under the **"Regulations" menu**, which can be accessed by entering the **"Service" password** .

7.3 DEHUMIDIFICATION SETPOINT LIMIT

Limits for the humidification and dehumidification setpoints are set on the controller to ensure correct operation of the humidification and dehumidification functions.

In particular, the dehumidification setpoint should always be:
Greater than or equal to the Humidification setpoint + 5% (fixed ready-only value).
Greater than or equal to the minimum limit for the dehumidification setpoint.
The first condition permits the creation of a dead zone between the dehumidification and humidification logics. This condition is considered only if the unit is configured to work with complete humidity control (with humidification and dehumidification).
The second condition is always present if the unit is configured to control dehumidification and protects the unit by preventing it from working in conditions of low humidity - conditions that could cause the unit to run at low evaporation temperatures.
Operation in the two conditions described above can be summarised with the chart below:

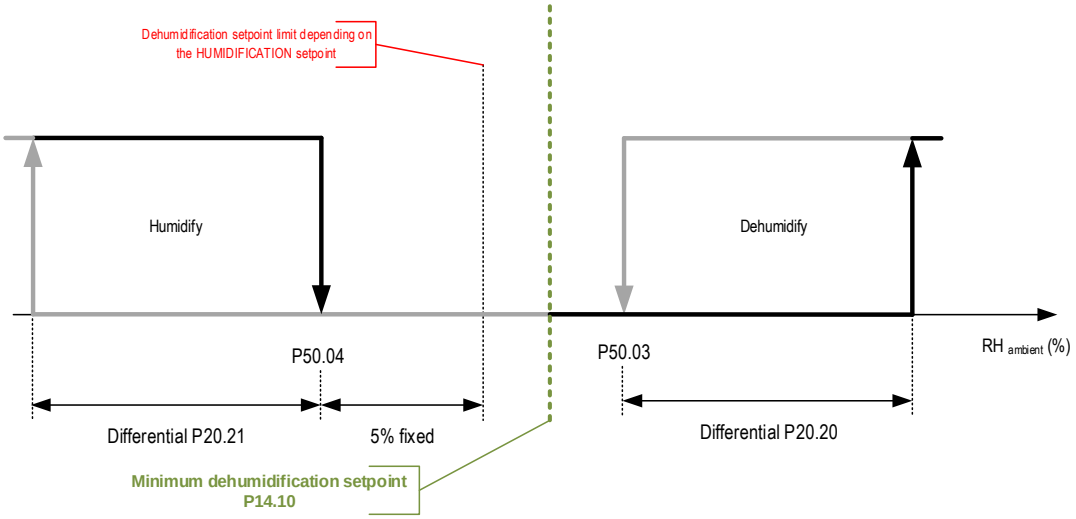


Figure 7-8: *Chart of management of the limit of the dehumidification setpoint*

The Dehumidification and Humidification setting parameters are under the **"Set Point" menu**. The Dehumidification and Humidification differential parameters are under the **"Regulations" menu**, which can be accessed by entering the **"Service" password**.
The Dehumidify set point minimum limit parameter is under the **"Safety" menu**, which can be accessed by entering the **"Factory" password**.

OBLIGATION
All changes made to the minimum limit of the dehumidifcation setpoint must be authorised by MEHITS who will provide the new minimum value to be set for the single unit in use.

8 HUMIDIFY

8.1 INTRODUCTION

The software allows the humidification to be performed by the integrated humidifier installed on the unit.

Activating the humidify device is enabled:
1. After regulation consent.
2. If there is no humidity probe alarm.
3. If the humidifier has not been temporarily disabled for maintenance.

8.2 INTEGRATED HUMIDIFIER

In case of built-in humidifier, disabling may also occur in the following cases:
- If the network communication (serial RS485) is interrupted, CPY stops the KUE unit by opening the contactor, and then remains on standby without producing steam, and the "Humidifier Offline" alarm is displayed.
  When communication with the external controller is reinstated, CPI automatically meets the demand of the external controller, and the alarm disappears.
- When the driver M2.4 and M2.5 (enable) contact is opened.

8.2.1 Operating principle

The integrated humidifier belongs to the steam humidifier category, and, in particular, consists of an OEM Carel immersed electrode humidifier.
Configure the type of humidifier in use under the **"Optional" menu** that can be accessed with the **"Service" password**.

INFORMATION
The relationship between the value of the parameter and the set type of cylinder is described in annex C.

The immersed electrode humidifier produces vapour by heating cylinder water to ebullition. Vapour production regulation. Heat is obtained from the flow of electricity through the water in the cylinder. This procedure is performed by applying voltage to the electrodes (network) immersed in the water.
Initially, when the cylinder is new or after it has been cleaned, the quantity of current almost exclusively depends in the type of supply water: the saltier the water, the more it conducts current, and the earlier it reaches the required steam production level. Over time, the salt deposit in the cylinder increases (as it does not evaporate with the water), contributing towards reaching nominal production.
At full capacity, the required production level is automatically maintained by adjusting the absorbed current and maintaining the water level in the cylinder.
The salt deposits that build up over time progressively exhaust the cylinder. To prevent excessive buildup, the humidifier periodically automatically discharges and replaces a certain amount of water

8.2.2 Vapour production regulation

The production of vapour by the integrated humidifier constantly depends on the humidification demand according to ambient humidity adjustment.
The programme adjusts humidity according to the reading of the humidity probe, the humidity setpoint and the humidity differential. Using the PID control the humidity level is taken to the "Humidity setpoint" value as quickly as possible. The production of vapour is proportional to the PID outlet demand.
The humidify setting parameter is under the **"Set point" menu**.

The range of values that may be set for the set point depend on the activation or deactivation of the dehumidify function. In particular:

- Dehumidification **enabled** The maximum humidify set point is the dehumidify setpoint - 5%.
- Dehumidification **disabled** The maximum humidify set point is 99%.

This avoids overlapping of the set points and not to have a dead zone on adjustment.
The humidify differential parameter (regulation band) is under the **"Regulations" menu**, which can be accessed by entering the **"Service" password**.
For the default values, see the parameters table.
The humidifier is enabled/disabled when demand (PID outlet) is 10% greater or lower. The maximum production of vapour (P0 parameter in the CPY controller module) is set by default to 100%.
To change the maximum vapour adjustment set the relative parameters under the **"Optional" menu**, which can be accessed by entering the **"Service" password**.

8.2.3 Cylinder and line initial pre-wash

Allows to clean the water lines and cylinder, most importantly after the hydraulic connections and/or replacing the cylinder.
The cylinder is filled and emptied 3 times in order to remove any impurities present in the pipes and cylinder.
The lines and the cylinder can be pre-washed at any time, using the screen or using terminal M2.7.

Pre-washing using the screen:

1. Access the **"Manual" menu** by entering the **"Service" password**.
2. Enable manual operations on the humidifier.
3. Access the pre-wash start mask, without the serial humidification request.
   The service also finds the manual discharge override command in the same mask.

Pre-washing via terminal M2.7:

1. Switch off the CPY board.
2. Short circuit M2.7 on M2.5.
3. Switch on the CPY board.
4. Pre-washing starts.

8.2.4 Reset cylinder hour counter

The reset can be performed in the following way:

1. Access the **"Manual" menu** by entering the **"Service" password**.
2. Enable manual operations on the humidifier.
3. Access the mask used to reset the cylinder operating hours.

The cylinder hour counter must be reset whenever the cylinder is changed in order to allow it to start rapidly.

8.2.5 Dilution drain

The humidifier drains and replaces automatically a part of water contained in the cylinder, in order to prevent excess concentration of salts following the evaporation process.
The drain valve is activated for a set time when internal conductivity exceeds the maximum limit. This situation is indirectly detected by calculating evaporation speed. The electrodes are not powered during automatic draining to ensure the drained water is not live.

8.2.6 Periodic drain

It is recommended that this function is enabled through parameter P27.16 when using water rich in substances such as humus and slit. The humidifier drains and automatically replaces the water in the cylinder to prevent the accumulation of these substances. The function requires the humidifier to drain and replace the water in the cylinder after 24h (P27.17) of continuous operation (continuous production of steam).
The parameters for enabling and configuring the function are in the **"Optional" menu**, which can be accessed by entering the **"Service" password**.

8.2.7 Drain due to inactivity

When the function is enabled, using parameter P27.18, the humidifier drains all the water in the cylinder after 3 days (P27.19) of inactivity (not producing steam) to avoid stagnation and hygiene risks.
The parameters for enabling and configuring the function are in the **"Optional" menu**, which can be accessed by entering the **"Service" password**.

8.2.8 Alarm management

The terminal displays the active alarms.

The Alarms and Signals relative to humidifier operation are detailed in the controller alarms section.
A crucial point of humidifier operation is excess current control. In fact, whenever voltage is applied to the boiler electrodes after a period of shutdown, short but very intense current peaks can be observed.
In the initial period, if excess current occurs, the algorithm responds immediately by removing voltage from the electrodes and performing a forced discharge for approximately 5/10 seconds, depending on whether a current peak occurs in the first 20 seconds after switch on, or after.
In particular, if there is no current peak in the first 20 seconds the next peak generates a 5 second discharge.
If there is a current peak during the first 20 seconds, a 10 second discharge is performed after the first peak and a 30 second discharge is performed if a subsequent peak occurs.
If the excess current continues, the humidifier is disabled, a forced discharge is performed and a high current alarm is signalled.

The conductivity of the supply water is measured by the conductivity meter when the inlet electrovalve
is opened (max. measurable value 2000 µS/cm). The low conductivity alarm is generated by the EP-Low production alarm of the CPY module.
The humidifier detects the lack of inlet water (or low flow) and checks whether the current at the electrodes increases after the inlet electrovalve is opened. In this case the controller displays the no water alarm.
The controller sets parameters b1 and b2 of the CPY to 0 and parameter b5 (conductivity pre-alarm threshold) to 1500 µS/cm and b6 (conductivity alarm threshold) to 2000 µS/cm. For details, consult the CPY controller driver manual.

8.2.9 Maintenance of the integrated dehumidifier

As well as the periodic inspections of the vapour distributor and the water inlet and outlet electrovalves, maintenance of these appliances normally involves cleaning or replacing the vapour production cylinder. This is generally required for the following reasons:

- Formation of solid lime scale deposits on the surface of the electrodes due to the temporary hardness of the water: As they are dielectric, these deposits prevent current from passing through.
- The storage boiler filling with large pieces of solid waste that occupy the space until they prevent the inlet and outlet water from flowing correctly.
- Patina of non-conductive substances covering the electrodes due to the foam forming as a result of the possible presence of surface-active agents in the water.
- Corrosion of the metal electrodes. This phenomenon occurs when the water, rich in aggressive chemicals such as chlorine, is excessively concentrated due to outflow difficulties or insufficient drainage (softened water is rich in chlorides and should therefore be avoided). In the more significant cases electrical discharges can take place between the electrodes which amplify the phenomenon as they produce metal particles that dissolve in the water and make it even more conductive.
- Possible damage to the boiler walls due to the current that allows the solid deposits to pass and create a short circuit between the electrodes.

To prevent this, the suitability of the water used in the humidifier should always be verified.

In any case, the storage boiler must be inspected once a month and maintenance performed when necessary. Depending on the conditions of the water, maintenance must be performed after a maximum of 4000 operating hours, after which the “Life timer expired” alarm appears.
Maintenance can involve one of the following two operations:

- Replacing the storage boiler.
- Cleaning the storage boiler.

Though it is common practice remove the power from the humidifier and then perform maintenance, the programme still provides the pre-washing and forced draining procedures under the **“Manual” menu** as described above.

9 TEMPERATURE AND HUMIDITY PROBE

9.1 ROOM T+H PROBE

This probe is available for all the units that require humidity control.
It permits enabling of the following functions:

- Dehumidification function
- Humidification function

It can measure the humidity and the temperature in the room.

The following alarms are associated with the probe:

- T+H probe address 128 Offline.
- Room temperature probe faulty.
- Room humidity probe faulty.

The probe is connected to Modbus pCO5+ at the address 128.

9.2 REMOTE T+H PROBE

This probe is available for all the units, but differently from the room T+H probe it is read-only.
It also allows the management of the setpoint offset function.
It permits only the viewing of the humidity and temperature.

The following alarms are associated with the probe:

- T+H probe address 129 Offline
- Additional temperature probe faulty
- Additional humidity probe faulty

The probe is connected to Modbus pCO5+ at the address 129.

10 INTERNAL AIR FAN MANAGEMENT

10.1 INTRODUCTION

ATTENTION
Pay attention to the fans. They are kept on at reduced speed when the power is connected, even if the unit is switched off from the terminal, and while the controller has not yet started, to ensure the dispersion of possible gas leaks.

The unit is fitted with EC radial evaporating fans. it is possible to adjust ventilation in two ways based on the cold request (settable using parameter P23.07):

- STANDARD
- MODULATING [default]

10.2 STANDARD OPERATION

Under normal operation conditions, the fan is operated always at the same speed, corresponding to the speed set by means of the user interface during testing.

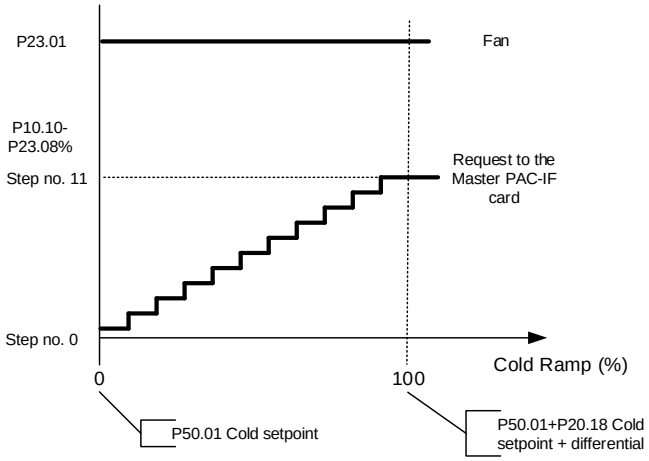


Figure 10-1: *Standard fan representation*

10.3 Modulating FUNCTION

The ventilation is modulated based on the adjustment step requested to the Master PAC-IF013B-E card.

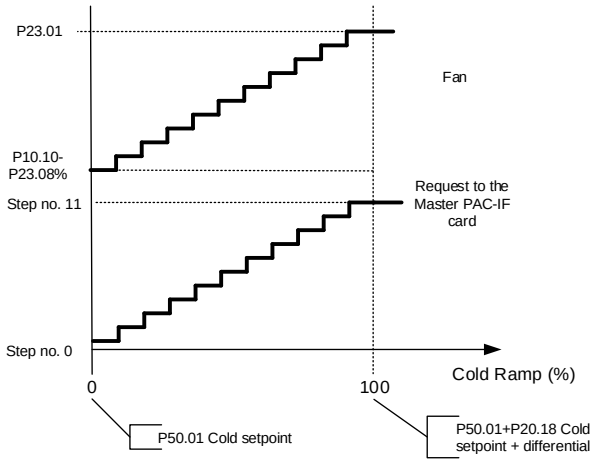


Figure 10-2: *Modulating fan management representation*

10.4 ECONOMY FUNCTION

There is also a function, called Economy, which consists of lowering the fan speed (at a given value) when no regulation devices are active (basically, when compressors, heaters, humidifiers, etc. are not active).
The goal is to obtain energy savings, which may be remarkable if the device thermal load in the environment is arranged in different proportions depending on varying time bands.
This function can be enabled in the fan configuration masks at the user terminal.

10.5 AUTOMATIC SPEED REGULATION FUNCTION

This function allows to automatically adjust EC radial fan speed. It may follow two logics:

- Constant flow rate regulation.
- Constant residual ΔP regulation.

For these two logics, a differential pressure transducer is used and positioned so as to detect the pressure value used for regulation.

10.5.1 Constant flow rate regulation

The pressure transducer detects the pressure difference on the fan outlet, as shown in the figure below:

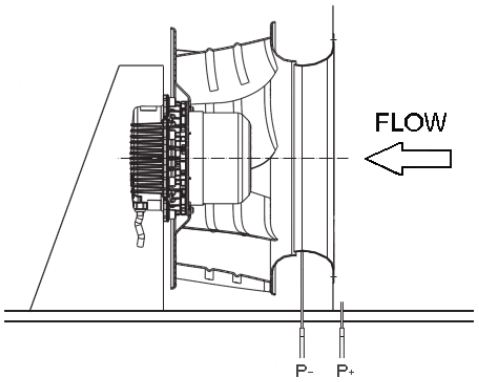


Figure 10-3: *Chart for positioning the pressure taps for the differential pressure sensor*

After acquiring the ΔP it is compared with the setpoint derived from the following function:

$$\Delta P = \frac{Q_{set}^{\ 2}}{k^2} = \frac{\left(Q_t / n\right)^2}{k^2}$$

Where:

- Q_{set} = desired calculated flow setpoint.
- Q_t = flow setpoint entered from the keypad.
- n = Number of fans.
- k = Characteristic value of the measurement inlet (varies according to the diameter).

The following table shows the k value associated to each diameter and type of outlet used in s-MEXT units.
This value can be set by changing parameter P11.03.

Value P11.03	k	Type	Fan models
0	155	dn355	R3G 355-AM29 -71
4	112	dn310 Vpro-ZH	RH31V-6IK.BD.1R
7	445	dn630 Vpro-ZH	RH63V-ZIK.GG.1R RH63V-ZIK.GL.1R

The controller adjusts following the chart below.

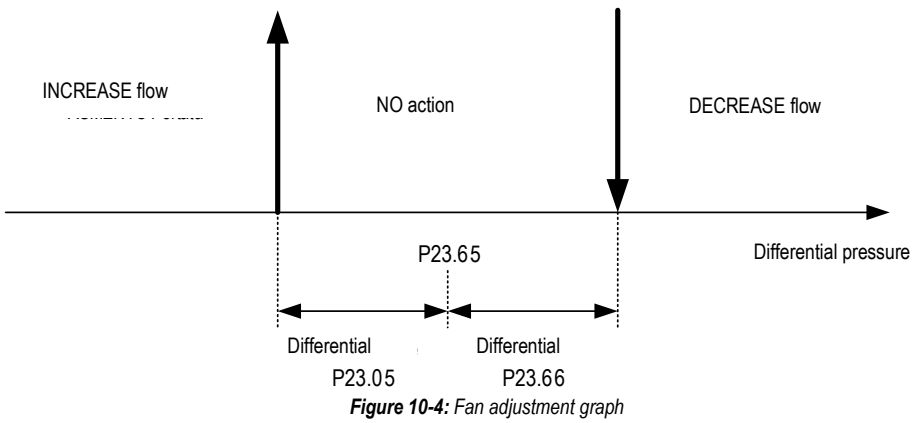


Figure 10-4: *Fan adjustment graph*

The Diff. press set is derived from the above formula.

When configuring the unit the project flow value and the number of fans in the unit are entered.
The programme also requires that the fan flow is never less than the set rated flow.

The parameters entry mask is under the **"Fan" menu** accessible through the **"Service" password**
The purpose of regulation is to keep the flow rate constant when there is an increase in the loss of load, with reference to the graph below.

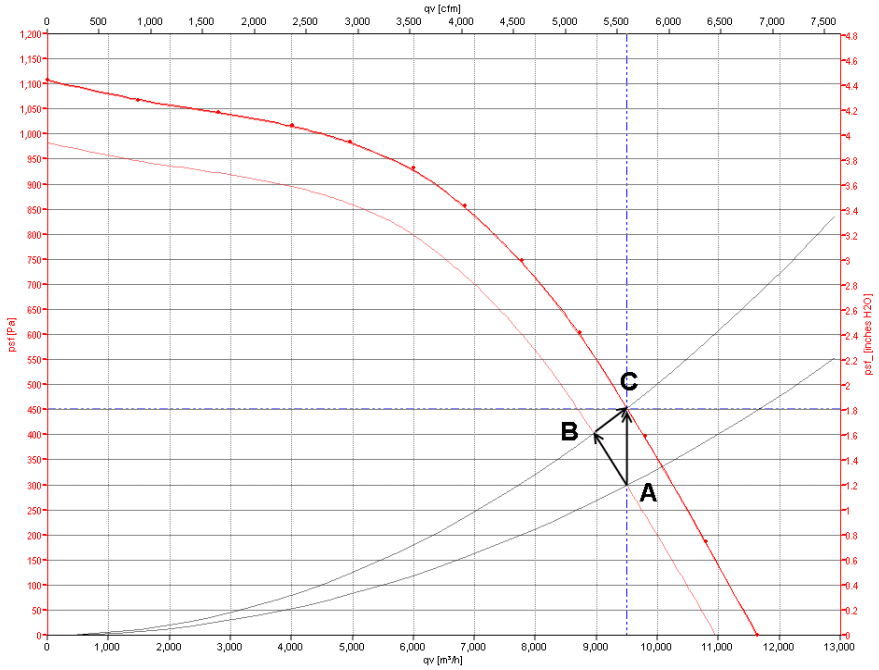


Figure 10-5: *Constant flow rate fan operation curve*

Starting from nominal work point (A), the increase in load loss (due, for instance, to clogged filters) from P1 and P2 causes a shift in the fan work point along the curve towards point B, with the ensuing capacity decrease. The logic tries to restore the work point by increasing the speed and move back towards work point C.

To avoid continuous speed adjustment without giving the fan time to adjust to the new speed value and consequently not allowing the pressure transducer to measure the new differential pressure value, there is a "scan time" that sets the time between the two fan signal variations.

The EC control parameters are under the **"Fan" menu**, accessible through the **"Service" password**.
The default values are are the following:

- Scan time = 60 sec
- Step voltage = 10 (corresponds to a 0.1V_{DC} signal increase / decrease).
- Hyst flow = 25
- Fan modulation delay = 120 sec

The Fan modulation delay is used whenever the unit is started in order to allow the fan to start. Once this time elapses, speed adjustment begins.
This parameter is in the **"Regulations" menu** that can be accessed with the **"Service" password**.

10.5.2 Calibrating the constant flow function

To allow greater adjustment precision a calibration mask has been included, which evaluates the difference between the real value read by the transducer and the value to reach. Calibration is performed during production testing using the following mask:

```
FLOW SENSOR ADJUSTMENT
Real Value     0000
Current Value  0000
Set flow       0000


Store K?       N
```

Once the value of "k" has been memorised correct, operation can be resumed.

This mask is under the **"Function" menu** accessible through the **"Factory" password** and only appears during the function configuration phase.

As soon as the offset is memorised, the mask is automatically hidden.
To re-calibrate, disable the function and enable it again.

10.5.3 Constant residual ΔP regulation

The pressure transducer is positioned according to the following figure.

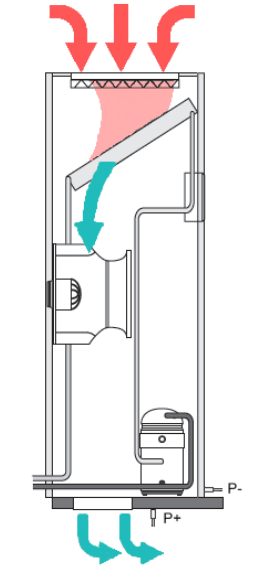


Figure 10-6: *Chart for positioning the pressure taps for the differential pressure sensor*

The controller adjusts following the chart below.

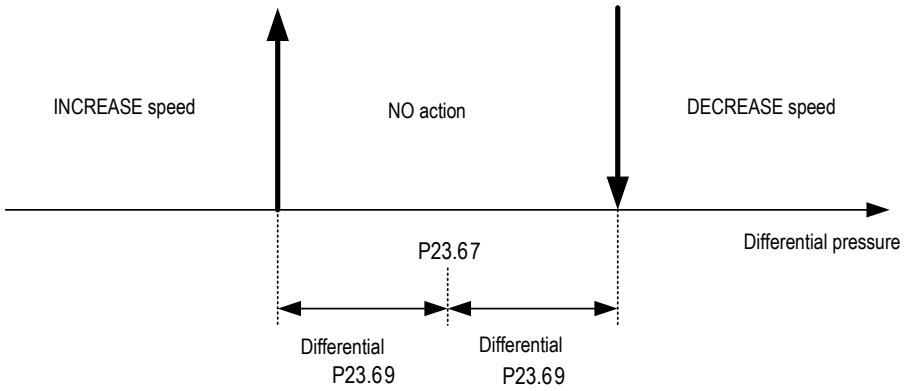


Figure 10-7: *Fan adjustment graph*

During the configuration of the unit the design differential pressure value is entered.
The programme also requires the fan to have a minimum flow rate below which the controller cannot go. This value is also entered during unit configuration.

The parameters entry mask is under the **"Function" menu** accessible through the **"Factory" password**.

INFORMATION
The minimum fan speed cannot fall below the value of P23.01 - P23.68%.

The purpose of regulation is to keep the residual ΔP constant when there is an increase in the counter-pressure, with reference to the following graph.

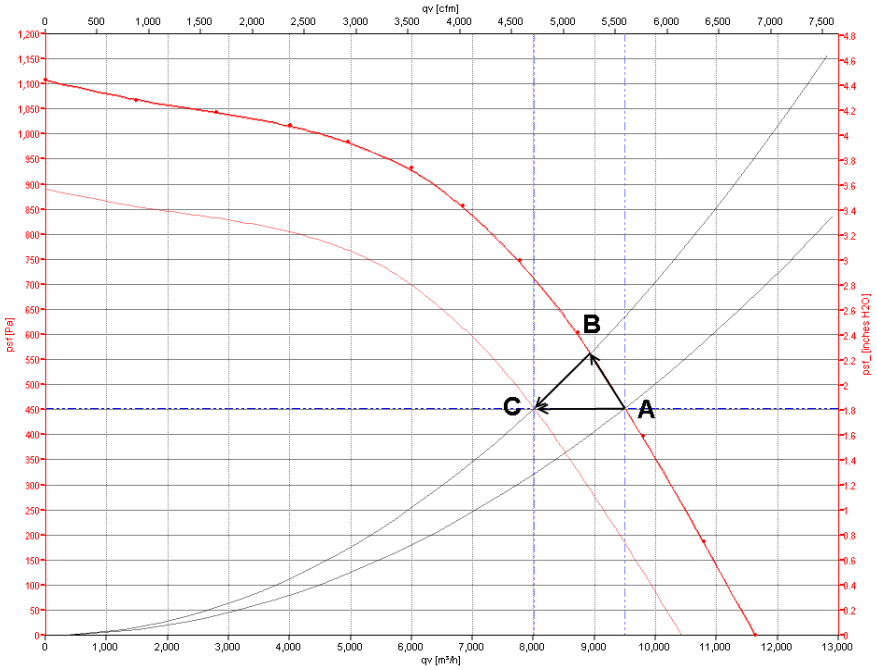


Figure 10-8: *Constant head fan operation curve*

Starting from nominal work point (A), the increase in counter-pressure (due, for instance to a damper closing) causes a shift in the fan work point along the curve towards point B, with the ensuing increase in pressure. The logic tries to restore the work point by decreasing the speed and move back towards work point C.

To avoid continuous speed adjustment without giving the fan time to adjust to the new speed value and consequently not allowing the pressure transducer to measure the new differential pressure value, there is a "scan time" that sets the time between the two fan signal variations.

The EC control parameters are under the **"Fan" menu**, accessible through the **"Service" password**.
The default values are are the following:

- Scan time = 60 sec
- Step voltage = 10 (corresponds to a 0.1V_{DC} signal increase / decrease).
- Hyst flow = 25
- Fan modulation delay = 120 sec

The Fan modulation delay is used whenever the unit is started in order to allow the fan to start. Once this time elapses, speed adjustment begins.
This parameter is in the **"Regulations" menu** that can be accessed with the **"Service" password**.

10.5.4 Operation data display

From the main loop, it is possible to open the following masks that display the operation data of the two functions.

FLOW REG Target 02500 m3/h Current 00000 m3/h Status Regulating…	Constant Capacity operation display mask.
DP REG Target 0020 Pa Current 0000 Pa Status Regulating…	Constant Residual ΔP operation display mask.

11 DAMPER MANAGEMENT

11.1 DELIVERY DAMPER

There is a delay before the fan is started, to allow for the delivery damper to open. This involves use of the auxiliary damper contact. As soon as the damper is almost completely open, the fan is cleared for start-up.
For further details, please refer to the electrical diagrams.
The parameter for configuring the damper presence is under the **"Optional" menu**, which can be accessed by entering the **"Service" password**.

Moreover, once the damper is enabled, a delay is inserted in order to allow the air flow alarm to be detected. This delay is set according to the contents of the datasheet of the damper motor.
The parameter for configuring the damper opening time is under the **"Optional" menu**, which can be accessed by entering the **"Service" password**.
For the default values, see the parameters table.

11.2 DIRECT FREE COOLING DAMPER

The Direct Freecooling damper is available for all unit types, with the exception of units with Indirect Freecooling.

It remains shut if:

- The fan is off (unit OFF).
- Direct Freecooling is not enabled.
- The compressor or the valve are active and temporary operation is not enabled.

In all the other cases, the opening is defined by the following adjustment charts, showing the modulating (analogue, on the left) and on/off (digital, on the right) adjustments.

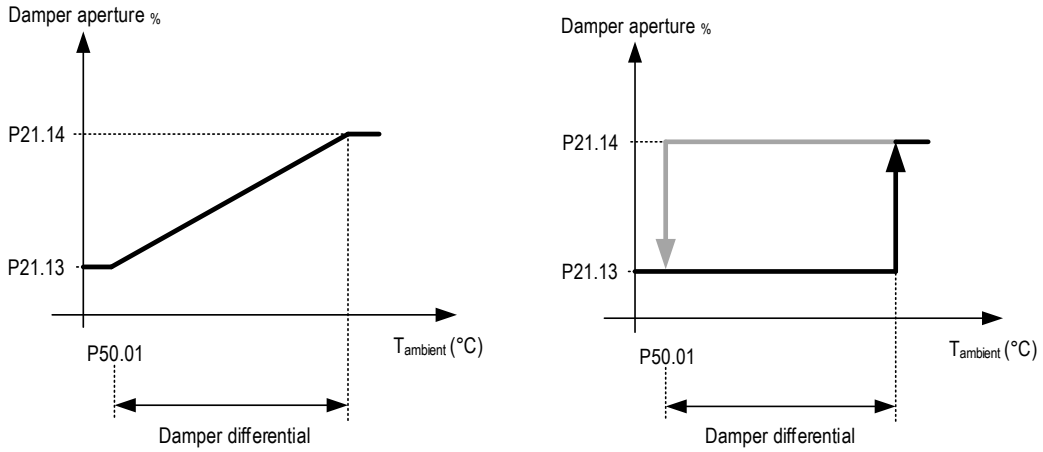


Figure 11-1: *Free Cooling damper adjustment chart*

Damper modulation, if enabled, is integral proportional.
The parameter for the selection of the type of damper adjustment (P20.10) can be found under the **"Freecooling" menu**, which can be accessed by entering the **"Service" password**.

11.3 TEMPERATURE ADJUSTMENT IN UNITS WITH DIRECT FREECOOLING

INFORMATION
Parameter P21.21 is set as follows, depending on the type of unit:
- *P21.21 = 33% if the unit has two connected Mr Slim units.*
- *P21.21 = 50% if the unit only has one connected Mr. Slim unit.*

The parameter can in any case be set using the "Freecooling" menu, which can be accessed by entering the "Service" password.

The temperature adjustment charts are modified as shown in the following paragraphs.
The parameters for configuring the Freecooling function are in the **"Freecooling" menu**, which can be accessed by entering the **"Service" password**.
The setpoint and adjustment band values for all the types of units are in the **"Freecooling" menu**, which can be accessed by entering the **"Service"** password.

11.3.1 Adjustment of Split Type units and Direct Freecooling with damper

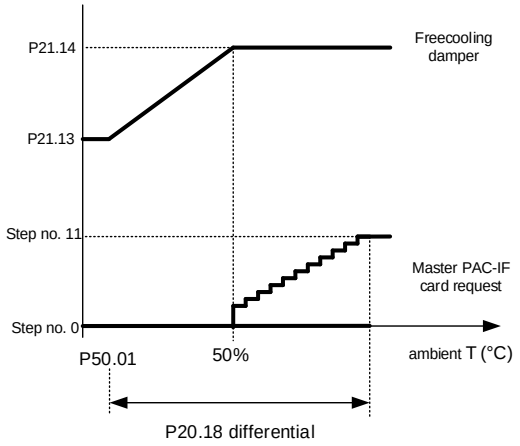


Figure 11-2: *Resource activation chart for Split Type unit with 1 Mr Slim and Freecooling damper*

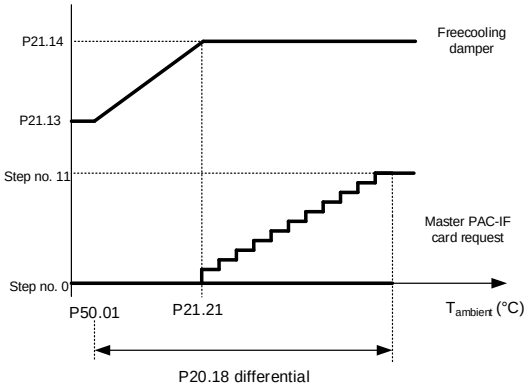


Figure 11-3: *Resource activation chart for Split Type unit with 2 Mr Slim and Freecooling damper*

11.4 ENABLING DIRECT FREE COOLING

Enabling Direct Free Cooling is allowed by the difference between external and room temperatures. In case the difference between room and external temperature should be higher that a set value, the Free Cooling regulation is enabled.

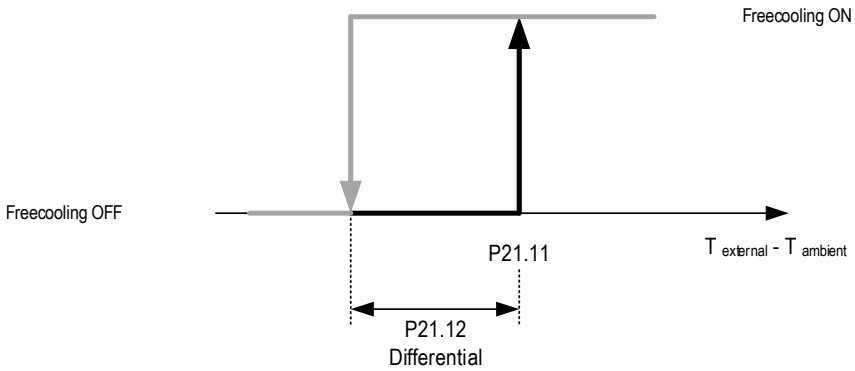


Figure 11-4: *Free cooling use enable chart*

In the **"Free Cooling" menu**, accessible using the **"Service" password**, the operator can set the setpoint and the band for enabling Free Cooling.
The FC and FC band parameter settings are under the **"Free Cooling" menu**, which can be accessed by entering the **"Service" password**. For the default values, see the parameters table.

11.5 MAXIMUM HUMIDITY LIMIT

If the high humidity limitation function is enabled, the controller behaves according to the following chart.

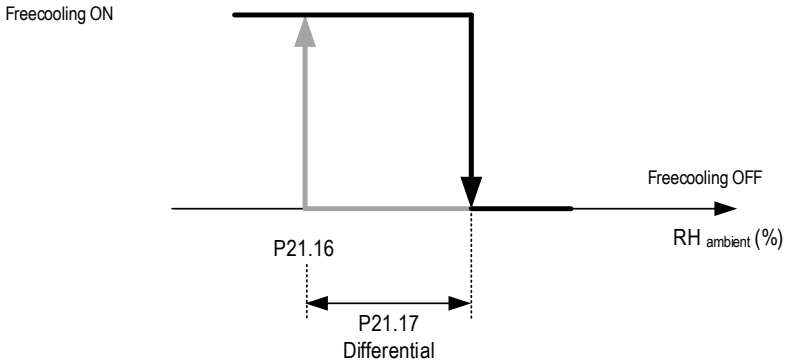


Figure 11-5: *Freecooling high humidity limitation chart*

The parameters for this function are under the **"Free Cooling" menu**, which can be accessed by entering the **"Service" password**.
For the default values, see the parameters table.

11.6 DIRECT FREE COOLING OPERATION DURING COLD RESOURCE ALARM

With Direct Free Cooling enabled, it is possible to select whether or not to enable Free Cooling operation when a cold resource alarm appears (compressor or water flow alarm). In particular, the parameter can be used to select compressor alarm setpoint and band in case of direct expansion resource, or water flow (no water) alarm condition for water-cooled units.
The setpoint and adjustment band values for all the types of units are in the **"Freecooling" menu**, which can be accessed by entering the **"Service"** password. For the default values, see the parameters table.

11.7 DIRECT FREE COOLING STATUS DISPLAY MASK

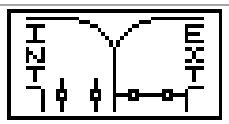
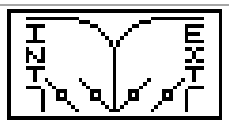
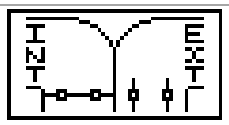
Free Cooling status can be viewed at any time. From the main mask, by pressing the **[DOWN]** key, the operator opens the following mask.

```
      DT 03.0

T.INT           T.EXT
24.0            21.0

Status   Enabled
Position ALL INTERNAL
         000%
```

The centre image offers a graphic representation of the Free Cooling damper position.

	Damper in internal air **only** position
	Damper in mixing position indoor and outdoor air.
	Damper in external air **only** position.

The following values are also reported

- External air temperature (left of the image).
- External air temperature (right of the image).
- Temperature difference (centre, above the image).
- Free Cooling status (enabled or disabled).
- Damper position (internal only, mixing, external only) and the opening percentage.

12 PRESSURE PROTECTION AND CONTROL FUNCTIONS

In Split Type units, the condensation pressure (HP) is controlled by the external condensing unit. However, there is the need to control and protect the unit from excessively low evaporation pressures (LP), and keep them within certain operating limits.
For this, and to ensure the safety of the unit, several protection levels (functions) are available, outlined in the chart that follows.

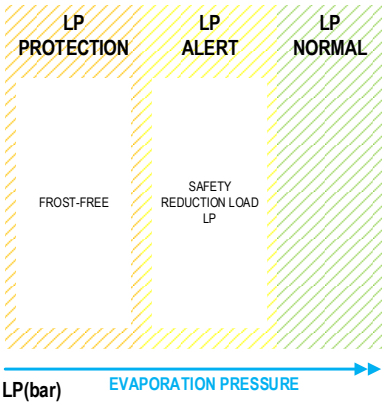


Figure 12-1: *Chart showing the LP pressure safety functions*

Protections against low pressures (LP):

- Safety Reduction Load LP.
- Frost-free function, which follows the low pressure probe

The following paragraphs explain the above functions.

12.1 FROST-FREE FUNCTION WITH LOW PRESSURE PROBE

This function enables to control and prevent the formation of frost on the evaporator coil.
If the low pressure value falls below a set point, and remains there for a time that can be set in the parameter, the compressor is deactivated and the corresponding alarm is generated. In any case, this will respect the safety times (minimum ON time).
When the low pressure read by the probe goes back above a value equal to set + differential, the compressor will be enabled again. In any case, this will respect the safety times (minimum OFF time and minimum ON-ON time).

INFORMATION
The handling of the alarm starts with a delay equal to the "low pressure activation delay" parameter value from the turning on of the compressor (default value 180s).

The reset of the alarm is Automatic for a number of interventions/hour defined by the parameter. Once this value is reached, the alarm reset will pass to Manual reset.
The count of the number of interventions per hour can be deactivated. If deactivated, the alarm can only be resent in Manual.
The diagram below illustrates the function described above.

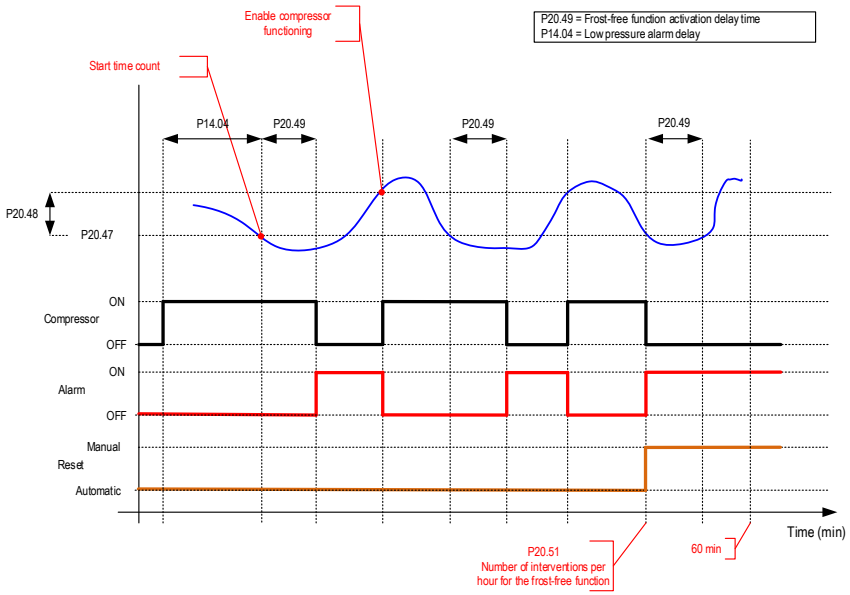


Figure 12-2: *Graph of the frost-free function with control on low pressure*

The parameters to enable and configure the frost-free function are under the **"Regulations" menu**, which can be accessed by entering the **"Service" password**.
For the default values, see the parameters table.

12.2 SAFETY REDUCTION LOAD (LP) FUNCTION

The main purpose of the function is to keep the low pressure at a parameter set value, should it decrease below a "setpoint value, to avoid the activation of the frost-free function at low temperatures, which would stop the unit due to the possibility of ice forming on the coil.
The function activates if the pressure falls below the setpoint value (P20.86 for circuit 1 and P20.91 for circuit 2), and operates on two levels: A less incisive "Alert" level and a "Protection" level.

INFORMATION
The time between steps is set by parameters P20.76 for circuit 1 and P20.81 for circuit 2.
The number of steps is set by parameter P20.77 for both circuits and its minimum value is fixed at 1.

INFORMATION
The function prevents the compressor from dropping below the minimum frequency, irrespective of the number of steps and Hz value to be scaled for each step.

If the pressure does not increase again even after all the protection steps have been carried out, the frost-free function trips, turning off the faulty circuit.
If the pressure increases again above the setpoint + differential (P20.74 + P20.75 for circuit 1 and P20.79 + P20.80 for circuit 2), irrespective of the level and step at the time, the unit returns to normal adjustment mode.

INFORMATION
The safety times of the compressors are observed.

The charts in the following pages show the operation described above.

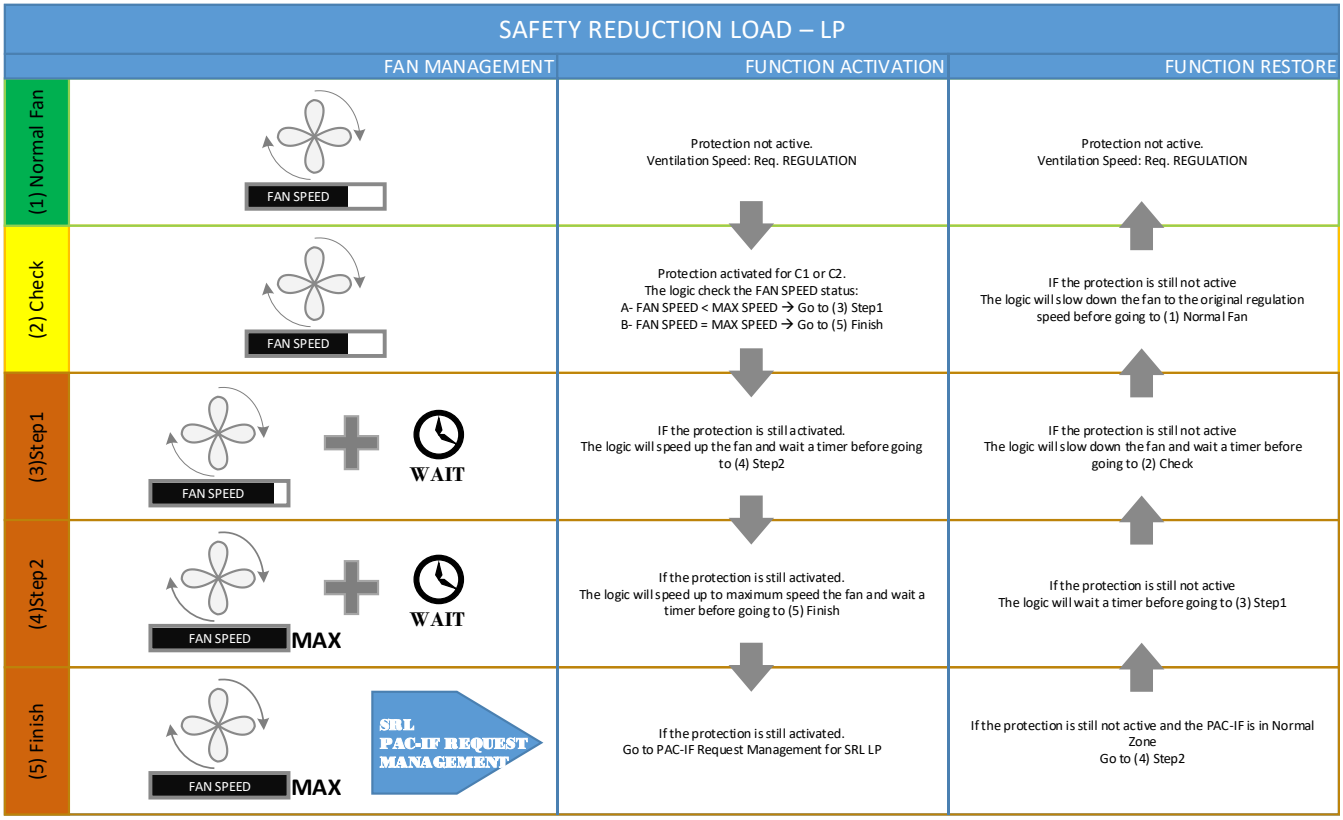


Figure 12-3: *Representation of fan management, reduction load safety function*

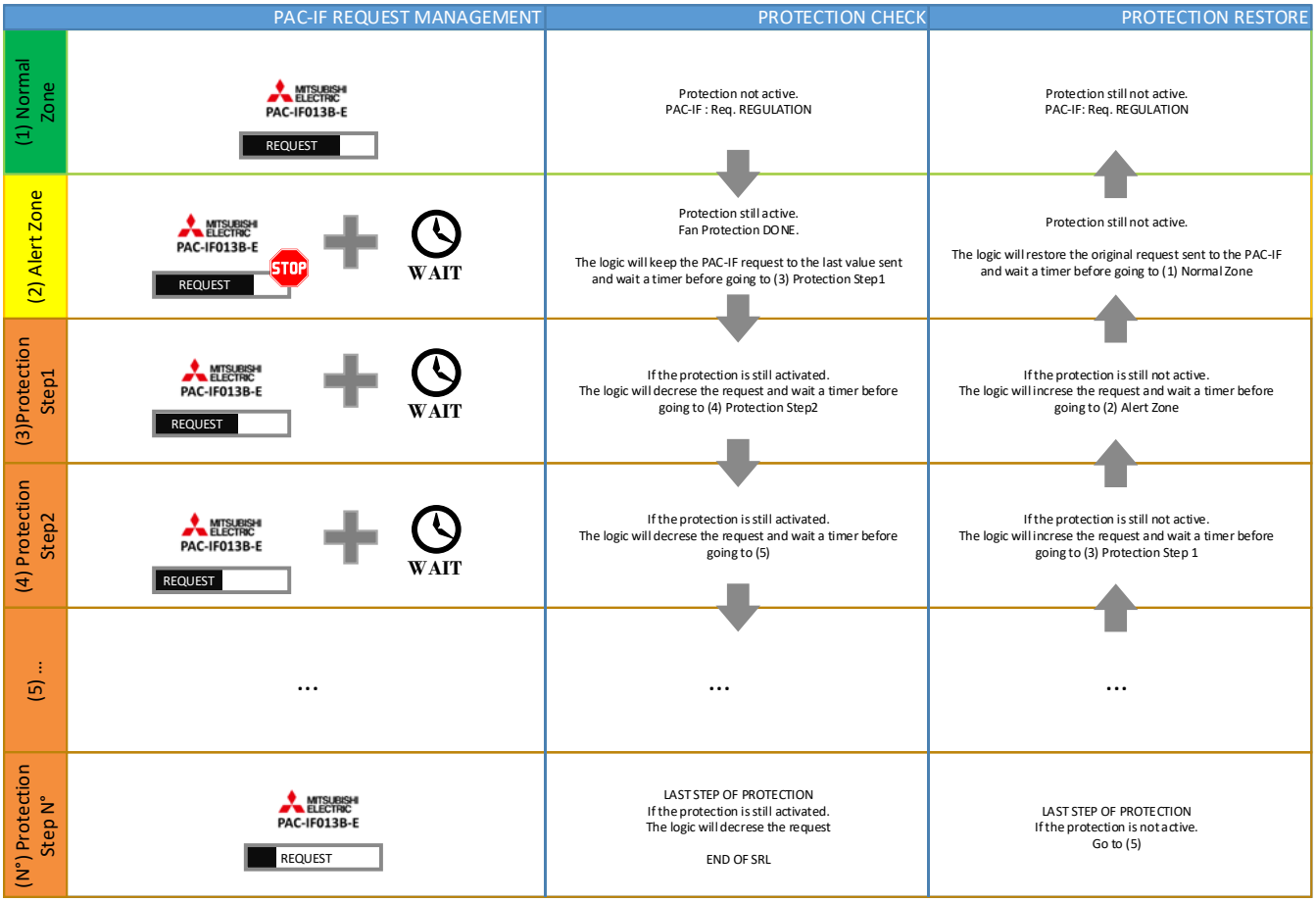


Figure 12-4: *Representation of Mr. Slim management, reduction load safety function*

As indicated by the chart, the alert level is bypassed if the fan is already running at maximum nominal speed
The way the function works can be displayed from the **"Unit" menu**.

13 NETWORK TRANSDUCER

A Gavazzi model CPT-DIN.AV5.3.H.S1.AX network transducer is used to measure the main electrical variables.
The converter is connected to the controller via the RS485 port (fieldbus2) using the Modbus protocol.
the communication parameters are:

- Baud rate 19200
- No parity
- 8 data bits
- 1 stop bit

Communication with the transducer can be enabled using the **"Optional" menu**, which can be accessed by entering the **"Service" password**.
The system type (single-phase, three-phase) and the transformation ratio of the current transformers connected between the power supply and the transducer can be set in the **"Optional" menu**, which can be accessed by entering the **"Service" password**. It is also possible to configure the Modbus network between the transducer and the controller (transducer baud rate change from 4800 to 19200).
The mask displays information on the status of the parameters in the network transducer. If the configuration is successful "Programming OK (Esc)" is displayed, otherwise "Check Connections (Esc)" appears.

Transducer mng Config CPT network: Y Serial baud CPT:9600 0:NO ERROR 0:NO ERROR Programming …	Transducer mng Config CPT network: Y Serial baud CPT:19200 0:NO ERROR 0:NO ERROR Transducer OK CT Ratio OK System OK Programming OK (Esc)	 Transducer mng Config CPT network: N Serial baud CPT:9600 -3:INVALID DATA -3:INVALID DATA Check Connections (Esc)

If configuration is performed correctly, the masks for displaying the electrical measurements made by the network transducer are enabled in the main menu. The displayed variables are:

- Phase to phase voltage, only for three-phase units.
- Phase voltage (phase-neutral).
- Phase current.
- Neutral current only for three-phase units.
- Active phase power, only for three-phase units.
- Total active power.
- Active energy.
- Hour counts.

The power counter and hour counter are reset from the **"Manual" menu**, which can be accessed by entering the **"Service" password**.
The **"Manual" menu** can also be used to reconfigure the transducer if, for example, it is replaced.
If the transducer does not communicate with the controller due to a broken cable or communication errors, an offline signal appears (Automatic reset).

14 MANAGEMENT OF DUAL SUPPLY

Units with management of dual supply with ATS (Automatic Transfer Switch) can be combined with a buffer battery module that keeps the controller powered during automatic switch-over from one supply to the other.

The logic constantly monitors the supply of power between the G and G0 terminals of the controller, and the state of the contact of the phase sequence relay.
When there is a mains power cut, the logic of the controller remains active because the buffer battery supplies power to the controller.
At this point, the logic implements the following steps:

- The unit is turned OFF due to an alarm.
- All the digital inputs are bypassed (except ID1 that detects the presence of power).
- The alarms of the inverter (when applicable) are bypassed.
- The safety times of the compressors are reset.
- The alarm log and the BBX are bypassed.

These steps are carried out to then allow the unit to restart as soon as the mains power supply returns.

When the mains power supply returns, the controller is powered again between terminals G and G0, and the unit turns ON again, ready to continue normal operation.
To do this, the logic does the following:

- Turns ON the unit.
- Activates reading of the status of the digital inputs.
- Activates management of inverter alarms.
- Activates management of the alarm log and BBX.
- Resets all the alarms 5 seconds after the power supply is restored.
- The unit runs again according to the normal adjustment logic.

The icon  on the main mask indicates activation of dual supply.

15 ALARM AND MAINTENANCE MANAGEMENT

15.1 ORIGIN OF ALARMS

The alarms managed by the software fall into the following categories:

- Alarms from external contacts: When the contact switches from closed to open, an alarm event is generated.
- System alarms: Alarms coming directly from the control board diagnostics routine.
- Threshold alarms: Alarms directly generated by the software as a result of thresholds that can either be fixed or set from the user terminal.

15.2 THRESHOLD ALARMS

INFORMATION
The high/low temperature and high/low humidity alarms may occur even when the unit is turned off.
The parameters for enabling and configuring are in the **"Settings" menu**, which can be accessed by entering the **"Service" password**.

The setpoint and differential parameters of the following alarms can be found under the **"Settings" menu**, which can be accessed by entering the **"Service" password**. For the default values, see the parameters table.

15.2.1 High and low room temperature alarm.

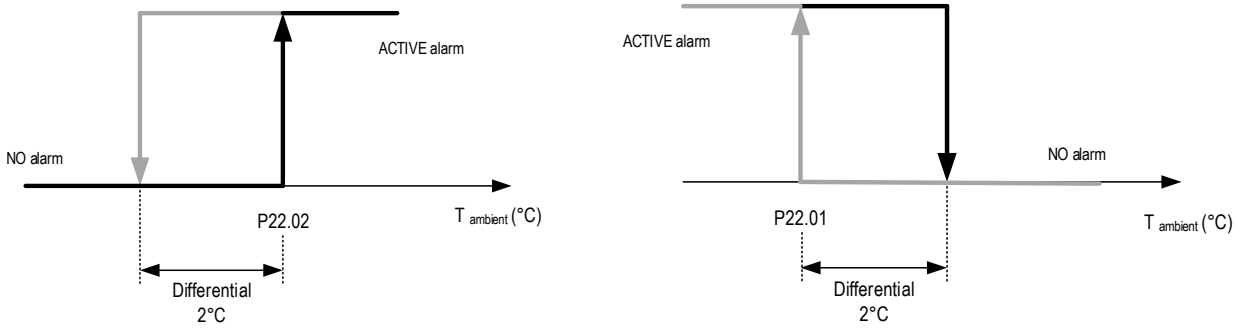


Figure 15-1: *High and low room temperature alarm activation chart*

15.2.2 High and low room humidity alarm

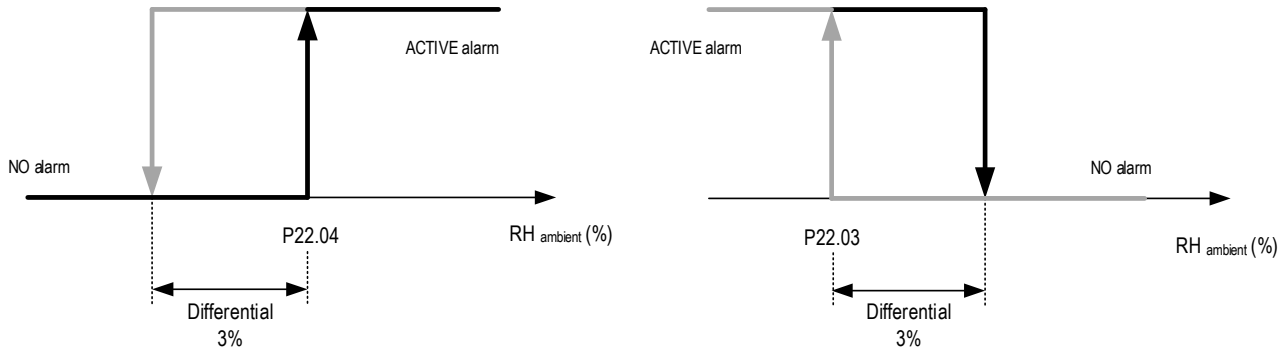


Figure 15-2: *High humidity alarm enable chart*

15.3 PAC-IF013B-E ALARMS

The PAC-IF013B-E card info dedicated masks show the alarm codes read by the card, if present, as represented below.

Mask of the terminal	PAC-IF013-E position
PAC-IF013B-E MASTER PAC-IF ⚠ DETAIL Active step: 11 Mode: COOLING Status:Online PAC-IF code: 5101	**Master**
PAC-IF013B-E Slave1 PAC-IF ⚠ DETAIL Active step: 11 Mode: COOLING Status:Online PAC-IF code: 5102	**Slave 1**

Below is the list for decoding the code read by the PAC-IF013B-E card:

Error code (Modbus)	Error code (Remote controller)	Description
5101	P1	Refer to the PAC-IF013B-E installation manual
5102	P2	
1503	P6 (Freezing)	
1504	P6 (Overheating)	
5103	P9	
6831 6834	"E0" or "E4"	
6201	E1	
6202	E2	

Error code (Modbus)	Error code (Remote controller)	Description
6832 6833	"E3" or "E5"	Refer to the PAC-IF013B-E installation manual
6840 6843	E6	
6842	E7	
0404	Fb	
1514	PL	
5111	PU	
7130	EE	

Code 9999 indicates that the PAC-IF card is Offline.

15.4 ALARM OR SIGNAL EVENTS

First of all, a distinction should be made between three types of event:

- Warning: This event does not stop anything but, if the condition continues, it could generate an Alarm event. The alarm cumulative does not need to be set.
- Signal: event that does not stop anything and does not compromise the unit operation. It helps to set the alarm cumulative.
- Alarm: Event blocking a device or the whole unit. It helps to set the alarm cumulative.

In case of an event:

- The red led flashes intermittently in case of a Signal.
- The red led is fixed in case of an Alarm event.
- The main mask lights up.
- The area 2 in the main mask displays the alarm icon, represented by an operating buzzer.
- The area 3 of the main mask displays an icon reporting the cause of the alarm and, next to it, the type of event (Signal/Alarm) and the associated event code.

By pressing the **[ALARM]** key once, the event detail mask appears. This mask provides the following information:

- Event type (Signal/Alarm).
- Event code.
- Rearm type (Manual/Automatic).
- Event position (Compressor/Circuit/Unit/System).
- Action type (Compressor/Circuit/Unit/Water Circuit/Heater/Humidifier/Specific Function Block).
- Event description.

The event reset is done by pressing the **[ALARM]** key on the event masks. If the **[ESC]** key is pressed, there is no reset and the event stays active.
For the event type details, refer to the table in the "Event Table" section of the "User interface" chapter.
Under the **"Safety" menu**, accessible through the **"Factory" password**, it is possible to modify the alarm cut-in times relative to air flow, exceeded limits, clogged filter signalling and low pressure alarm, compatibly with unit configuration.

15.5 EVENT NOTIFICATION RELAY

The control board provides two relay outputs for event signalling.
The **"Alarm Out" menu**, which can be accessed by entering the **"User" password**, it is possible to configure the outputs differently from the default setting.
More specifically, these masks may:

- Set the idle status of the output contacts.
- Set the contact to direct the alarm to.

The **"Alarm Out" menu**, accessible through the **"User" password**, it is possible to configure the output contact idle status. The status may be:

- Normally open
- Normally closed (in this case it is possible to detect also the lack of power feed to the board)

The **"Alarm Out" menu**, accessible through the **"User" password**, it is possible to configure, for every type of event included in the configured unit, the contact to address the alarm to. The operator may choose from:

- Output "A".
- No outlet.
- Output "B".

All events are set by default to output "A".

15.6 EVENT HISTORY

15.6.1 General information

Thanks to the control board buffer memory, events can be recorded.
The recorded events are the following:

- All events.
- Every time the conditioning unit turns on, meant as controller start.
- Any intervention in the Demand Limit mode (if enabled).

The events log has two access levels:

- User level.
- Service level.

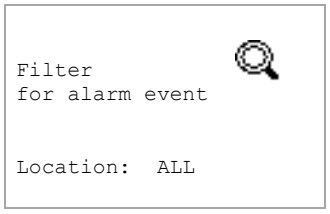
15.6.2 Event log display - User Level

The User level log, which can be accessed from th **"History" menu**, which can be accessed from the main menu, shows all the events, with the exception of Warnings.

It is possible to filter the events according to position by choosing between:

- ALL: All events, without any distinctions in terms of position, will be displayed.
- Compressor: Only the events involving the compressor will be displayed.
- Circuit: Only the events involving the circuit will be displayed (water or gas).
- Unit: Only the events involving the unit will be displayed.
- Plant: Only the events involving the system will be displayed (external from the unit).

A screenshot of the filter-setting mask for the User level is shown below:



Once the filter to be applied has been selected, press the **[ENTER]** key to access the event mask.

15.6.3 Event log display - Service Level

The Service level log, under the **"History" menu**, which can be accessed by entering the **"Service" password** displays all the events, applying up to two filters.

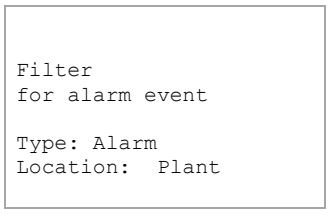
The first filter can be used to select the event type to display:

- ALL: All events, without any distinctions in terms of type, will be displayed.
- Signal: Only Signal events are displayed.
- Alarm: Only Alarm events are displayed.
- Signal & Alarm: Only Signal and Alarm events are displayed.
- Warning: Only Warning events are displayed.

Similarly to the user level, the second filter is used to select the location to display:

- ALL: All events, without any distinctions in terms of location, are displayed.
- Compressor: Only the events involving the compressor will be displayed.
- Circuit: Only the events involving the circuit will be displayed (water or gas).
- Unit: Only the events involving the unit will be displayed.
- Plant: Only the events involving the system will be displayed (external from the unit).

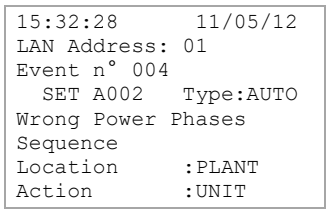
A screenshot of the filter-setting mask for the Service level is shown below:



Once the filter to be applied has been selected, press the **[ENTER]** key to access the event mask.

15.6.4 Events mask

Once the filter has been selected, as explained in the previous chapters, the operator may access the event history mask.



The layout contains the following information:

- Event date and time.
- Local network (LAN) address (if configured).
- Event number.
- Event status (Set / Reset).
- Event code and type (Signal / Alarm / Warning).
- Type of event reset (Auto / Man).
- Text describing the event.
- Location where the problem is found (COMPR, CIRC, UNIT, PLANT).
- Alarm block action, that is, what the event has caused to block (COMPR, CIRC, UNIT, PLANT, CW, HU, EH, FN).

15.6.5 Deleting the events log

To delete the events log on the display, access the relative mask in the **"Default" menu**, which can be accessed by entering the **"Factory" password**.

15.7 BLACK BOX FOR PARAMETERS

The application software logs all changes made to the unit parameters, recording the date and time of the change and indicating the old value and the new one after the change. It also keeps a record of all the unit parameters, to offer an overview of its status.

The file generated by the Parameters black box is encrypted and only readable using the Service software.

15.8 MAINTENANCE SIGNALS

The software displays, in the same form as an Alarm / Signal event, the need to perform maintenance on the devices inside the unit, i.e.:

- Fan
- Compressors
- Electric heaters
- Humidifier

The signal is displayed when the set number of operating hours is exceeded. If the number of hours is equal to 0 (default value) the maintenance signal for that device is disabled and therefore never appears.
The unit devices that certainly require periodic maintenance are the air filters and the humidifier. As regards the air filters, the maintenance signal coincides with the ventilation signal, as the filter operating hours are the same as the fan operating hours.
After the signal is acknowledged, the counter can be reset and the hours start from zero.
Both the setting of the operating hour thresholds and the reset procedure are performed on the **"Settings" menu**, accessible through the **"Service" password.**

16 HARDWARE

The various pieces of hardware used for the software architecture are shown below

Figure 16-1: *Version "S" of the hardware*

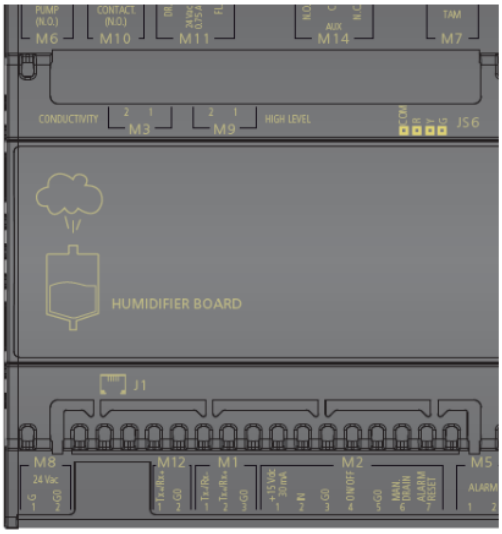
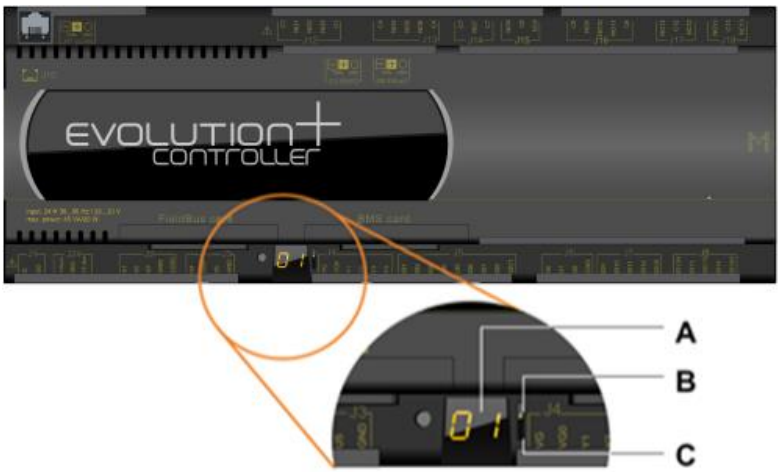


Figure 16-2: *Humidifier control board*

16.1 DESCRIPTION OF THE LEDS



A	A 7-segment display for viewing and setting the address of the board
B	Power LED
C	Overload LED

Figure 16-3: LEDs on the base board.

17 INPUT/OUTPUT CONFIGURATION TABLE

17.1 MAIN CONTROLLER

s-MEXT-G00

pCO size **Small**

Circuits **1-2**

Fieldbus

Connector	Address	Description
Fieldbus 2	21	PAC-IF 013B-E Master
Fieldbus 2	22	PAC-IF 013B-E Slave 1
Fieldbus 1	1	Gavazzi CPT network transducer
Fieldbus 1	8	pCOe 1 expansion board
Fieldbus 1	128	Room T+H probe
Fieldbus 1	129	Remote T+H probe
Fieldbus 1	148	CPY humidifier card

Analogue Inputs

Connector		Type	Description
J2	U1	4-20mA	Circuit 2 evaporation pressure transducer(1)
	U2	NTC	Ambient air temperature
	U3	NTC	Delivery air temperature
J3	U4	4-20mA	Evaporation pressure transducer
	U5	/	Remote on/off
Free		0	

Analogue Outputs

Connector		Type	Description
J4	Y1	0-10V_{DC}	Internal Electronic Fan
	Y2		
	Y3		
	Y4		
Free		**3**	

Digital Inputs

Connector		Type	Description
J5	ID1	/	Phase Sequence
	ID2	/	Air flow differential pressure switch
	ID3	/	Clogged filter differential pressure switch
	ID4	/	Heater thermostat
	ID5	/	Fire / Fumes sensor
	ID6	/	Flooding sensor
	ID7		
	ID8	/	Gas leak sensor
Free		**1**	

Digital Outputs

Connector		Type	Description
J12	NO1	/	Internal Fan + Delivery Damper
	NO2		
	NO3		
J13	NO4	/	Heating element 1
	NO5	/	Heating element 2
	NO6		
J14	NO7	/	Alarm A
J15	NO8	/	Alarm B
Free		**3**	

Notes: (1) in case of unit with two circuits

17.2 EXPANSION NO. 1 (ADDRESS 8)

s-MEXT-G00

Analogue Inputs

Connector		Type	Description
J9	B1	4-20mA 0-5V_{DC}	Air differential pressure transducer **As an alternative:** Delivery air temperature from superv.
	B2		**Free**
J10	B3	NTC	External Air Temperature
	B4		**Free**
Free		**2**	

Digital Inputs

Connector		Type	Description
J4	ID1	/	Internal electronic fan 1 alarm(2)
	ID2	/	Internal electronic fan 2 alarm(2)
	ID3		**Free**
	ID4		**Free**
Free		**2**	

Analogue Outputs

Connector		Type	Description
J2	Y1	0-10V_{DC}	Direct Freecooling damper
Free		0	

Digital Outputs

Connector		Type	Description
J5	NO1 NC1	/	Direct OPEN FC
J6	NO2 NC2		**Free**
J7	NO3 NC3		**Free**
J8	NO4 NC4		**Free**
Free		**3**	

Notes: (2) Only with fan ADL function enabled (P23.71)

18 HARDWARE ARCHITECTURE

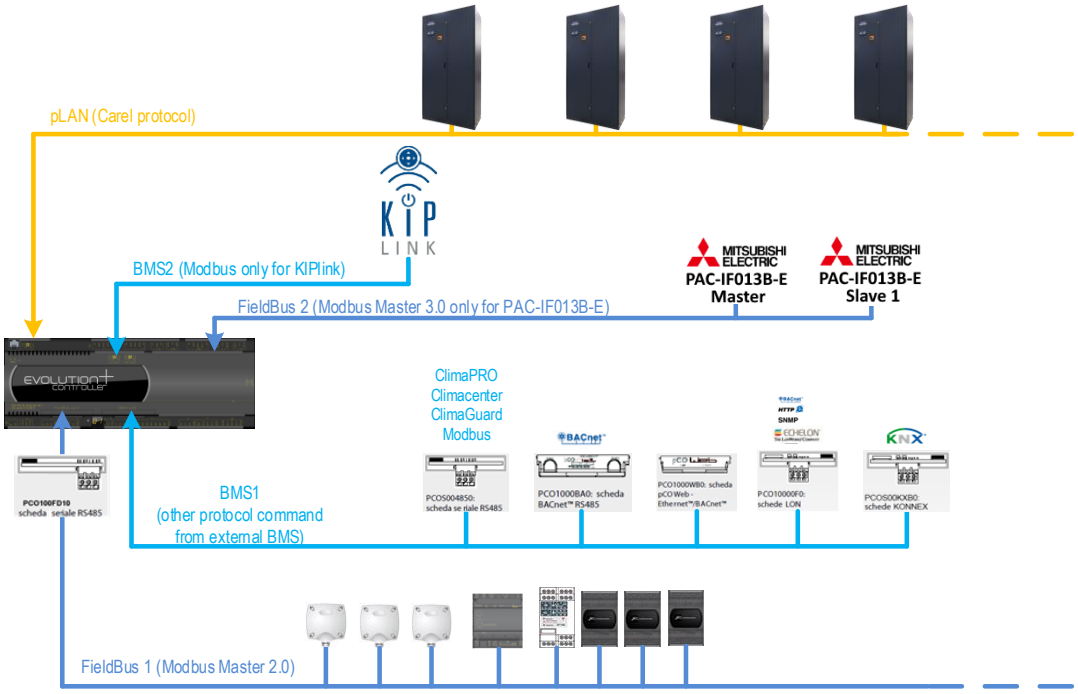


Figure 18-1: *Hardware architecture diagram*

19 ADDRESSING THE MODBUS COMMUNICATION MODULES

Each device connected to the controller via the Modbus protocol must have a univocal Modbus address.
The addresses that must have the devices connected to the Modbus network are listed below, together with the methods for changing address with respect the one initially set by the supplier.

19.1 FIELDBUS 1

The following devices are connected to the FieldBus 1 port through Serial Card code: C5111046 (RS485 BOARD FIELD BUS x PCO1-PCO100FD10).

Module	Modbus address	Method for changing address
T+H probe	128	Dip switch (see next chapter)
Additional Room T+H probe	129	Dip switch (see next chapter)
CPY	148	Default
Network transducer Gavazzi	1	The address remains fixed at 1 In the **"Config." menu**, which can be accessed by entering the **"Factory" password** communication is enabled with the transducer.

19.1.1 Configuration of T+H probe module communication

The T+H probe communication parameters are configured using the Dip-Switches on the probe electric boards.

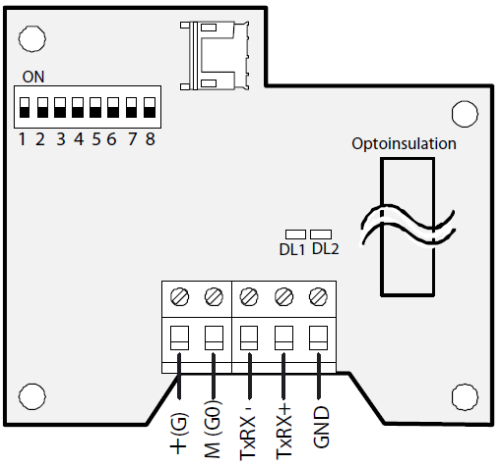


Figure 19-1: *T+H probe module layout*

Configuration of the room T+H probe (address 128)

Dip-switches	Description	Position	Value
1÷5	Device address	**OFF**	**128**
6	Protocol	OFF	Modbus 8-None-2
7		ON	
8	Baud Rate	OFF	19200

Configuration of the remote T+H probe (address 129)

Dip-switches	Description	Position	Value
1	Device address	**ON**	**129**
2÷5		**OFF**	
6	Protocol	OFF	Modbus 8-None-2
7		ON	
8	Baud Rate	OFF	19200

19.2 FIELDBUS 2

The following devices are connected to the FieldBus 2 port on the controller:

Module	Modbus address	Method for changing address
Master PAC-IF013B-E	21	Dip switch
Slave 1 PAC-IF013B-E	22	Dip switch

19.2.1 Master PAC-IF013BE interface card communication configuration

The configuration of the communication parameters for the Master PAC-IF013B-E interface card is completed using the Dip Switches of the electronic cards.

Master PAC-IF013B-E card configuration (address 21)

Dip-switches	Description	Position		Value	
SW6: 1÷2	Protocol	OFF		Manual step control through the Modbus protocol	
SW1: 1÷3		ON			
SW1: 8		**OFF**	**ON**	with IMOUC disabled (single Mr Slim unit)	with IMOUC enabled (multiple Mr Slim unit)
SW3: 6÷7	Baud Rate	OFF		19200	
SW3: 8		ON			
SW4: 1	Device address	**ON**		**21**	
SW4: 2		**OFF**			
SW4: 3		ON			
SW4: 4		OFF			
SW4: 5		ON			
SW4: 6	Parity type	OFF		NONE	
SW4: 7		ON			
SW4: 8	Stop bits	ON		2 bit	
Nessuno	Data length	-		8 bit	

Slave 1 PAC-IF013B-E card configuration (address 22)

Dip Switch	Description	Position	Value
SW6: 1÷2	Protocol	OFF	Manual step control through the Modbus protocol with IMOUC enabled
SW1: 1÷3		ON	
SW1: 8		**ON**	
SW3: 6÷7	Baud Rate	OFF	19200
SW3: 8		ON	
SW4: 1	Device address	**OFF**	**22**
SW4: 2		**ON**	
SW4: 3		ON	
SW4: 4		OFF	
SW4: 5		ON	
SW4: 6	Parity type	OFF	NONE
SW4: 7		ON	
SW4: 8	Stop bits	ON	2 bit
Nessuno	Data length	-	8 bit

20 LOCAL LAN NETWORK MANAGEMENT

20.1 PURPOSE OF THE LOCAL LAN NETWORK

Connecting the units to the LAN network (meaning the PCO boards mounted on each unit) allows the following functions to be performed:

- Balancing the operating hours among the different units by rotating the reserve units (Stand-by).
- Turning on the reserve units in case other units should turn off due to an alarm, maintenance or power feed interruption.
- Turning on reserve units to offset the excessive thermal load.
- Checking up to 10 units with a single user terminal (shared user terminal).
- Operating with all units based on the average temperature and humidity values read by the temperature probes only in the operating units.

OBLIGATION
To allow the LAN to operate correctly, the units must have the same software version and revision (e.g.: ME28r00).
If there is more than one version, update to the latest version or create two different LAN's.

20.2 PRELIMINARY OPERATIONS

20.2.1 Introduction

As the BIOS contained inside the control board is already fitted out to manage a local network connection of the board:

- It cyclically performs a check-up of the hardware (of the local board) required for network communication and of its settings (for example, the network address, which must be different from 0).
- It cyclically performs a check-up of the connection status of the local unit with the rest of the LAN.
- It cyclically performs a global check-up of the rest of the LAN which can be seen by the unit in question.
- It cyclically performs the transmission and reception routine of the variables of the local unit involved in transmission.

For correct operation of the units connected to the local LAN network, it is necessary to perform the following operations.

20.2.2 Network cabling

For the purposes of setting a local LAN network among the units, it is necessary for the installer to lay an electrical connection among the same by means of a screened cable (not included in the supply).

INFORMATION
it is recommended to use twisted couple of AWG24 cabling (2 wires in total) + Belden 8723 or 8102 type sheath.

ATTENTION
the electrical connections must be installed when the units are off and not fed. The LAN serial low safety voltage (SELV) cabling must be kept safely far from the power cables.

ATTENTION
The electrical connections must be installed by qualified staff, when the unit is off and not fed.

ATTENTION
The connections must be made directly on the unit main terminal board: The RX/TX+, RX/TX-, and GND connection terminals do not vary from unit to unit and are clearly indicated on the electrical diagram on board the unit.

All control boards being part of the local network are connected according to a bus arrangement.
The following image shows the type of connection to be made:

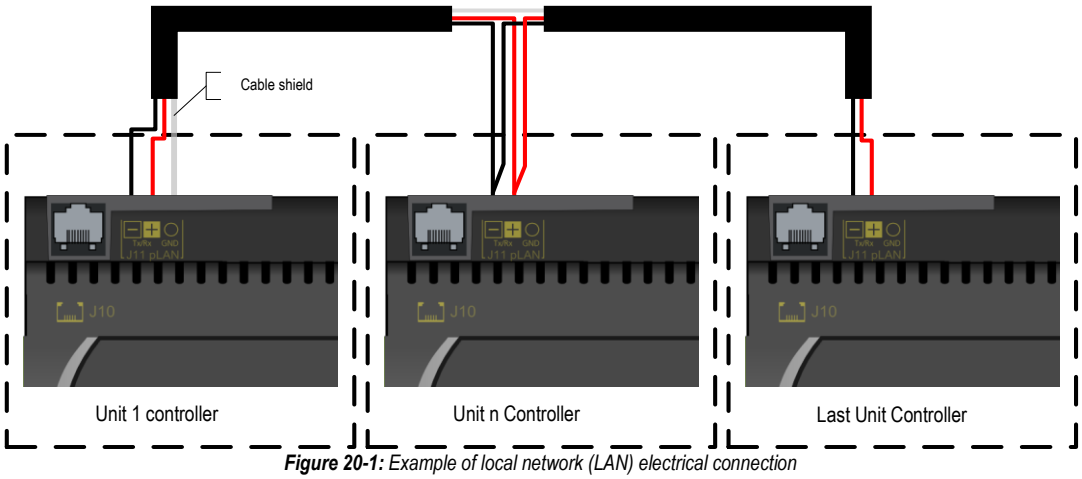


Figure 20-1: *Example of local network (LAN) electrical connection*

The user terminals are directly connected to the board. Each control board sends, in turn, the network variables to the other control boards in the LAN network. Moreover, each control board constantly sends display management data to its private user terminal and the shared one.

As there is a fairly large quantity of display management data (especially if graphic symbols are present), one line is entirely reserved (the above-mentioned bus) to transmitting the variables, and at the most to managing the shared terminal, whilst setting private terminal management on direct connection lines (dedicated) between the user terminal and the relative control board, so as not to slow down the global transmission speed of the network.

20.2.3 Network configuration

The configuration requires the following assignments.

Unit adddress	Managed terminals
1	11 (private) 32 (shared)
2	12 (private) 32 (shared)
3	13 (private) 32 (shared)
4	14 (private) 32 (shared)
5	15 (private) 32 (shared)
6	16 (private) 32 (shared)
7	17 (private) 32 (shared)
8	18 (private) 32 (shared)
9	19 (private) 32 (shared)
10	20 (private) 32 (shared)

INFORMATION
The control board is supplied with LAN address = 1.

The address may be checked directly on the control board or by means of the user terminal, following the steps indicated under the following sections.

20.2.4 Addressing the control board - From the board

The control board address is displayed by 7-segment screen in the following image:

Figure 20-2: *Control board addressing*

In order to display the current address, press the button on the left of the display briefly (for no more than 2 seconds) using, for instance, the tip of a screwdriver (Ø < 3mm). After 5 seconds from releasing the button, the address display turns off.

In order to change the board address, follow the process below:

1. Press the button with a screwdriver for at least 3 seconds. The saved address starts flashing.
2. Press the button repeatedly, or press and hold it to scroll through automatically, to find the required address.
3. Wait for at least 10 seconds. The display starts flashing quickly to indicate that the new address has been saved.
   In order to cancel the operation, turn off the control within 7 seconds of pressing the button last.
4. Turn off and restart the EVOLUTION+ controller in order to activate the new address.

20.2.5 Address setting the control board - from the user terminal

1)	Press and hold **[UP]**+**[DOWN]**+**[ENTER]** at the same time for at least 3 seconds to enter configuration mode. A mask is displayed with the cursor flashing in the top left corner.	Display address Setting.....: 21 I/O Board address: 01
2)	Press **[ENTER]** once to modify the address of the terminal (display address setting). The cursor will move on the address field. Press **[UP]** or **[DOWN]** to select the value 0 and then press **[ENTER]** again to confirm. The value will be saved in the permanent memory of the terminal.	Display address Setting.....: 00 I/O Board address: --
3)	The appearance of the next mask indicates that the keyboard address has been set.	Display address Changed
4)	Turn the board off and then on again by pressing and holding **[ALARM]**+**[UP]** at the same time. Wait until the board address setting mask appears, then release the keys. The mask appears for setting the required address.	################ selftest pleasewait... ################

ATTENTION
This is a *time procedure*; hence if the parameters are not set in a few seconds, the display turns off. In such case, repeat the process.

20.2.6 User terminal address setting

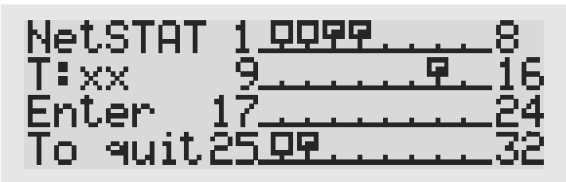
Once the keyboard has been connected to the device, run the following procedure.

1)	Press and hold **[UP]**+**[DOWN]**+**[ENTER]** at the same time for at least 3 seconds to enter configuration mode. A mask is displayed with the cursor flashing in the top left corner.	Display address Setting.....: 00 I/O Board address: --
2)	Press **[ENTER]** once to modify the address of the terminal (display address setting). The cursor will move on the address field. Press **[UP]** or **[DOWN]** to select the required value of the address and then press **[ENTER]** again to confirm. The value will be saved in the permanent memory of the terminal.	Display address Setting.....: 21 I/O Board address: --
3)	The appearance of the next mask indicates that the keyboard address has been set.	Display address Changed
4)	If an empty mask or a mask showing "NO LINK" appears after pressing **[ESC]**, it means that the keyboard is not communicating with any boards. It is necessary to set the address of the board or configure the local network (LAN).	NO LINK

ATTENTION
This is a *time procedure*; hence if the parameters are not set in a few seconds, the display turns off. In such case, repeat the process.

20.2.7 Network status display (NetSTAT)

Press and hold the **[UP]**+**[DOWN]**+**[ENTER]** configuration buttons for at least 10 seconds (only in the LAN mode) to open the synoptic screen of the network seen from the user terminal in question. The screen exemplifies the status of the LAN, showing how many and what devices are connected, and with which address.



To exit the NetSTAT procedure, press **[ENTER]**.

20.3 SETTINGS ON THE USER TERMINAL

In the case of units connected to a local LAN network, indicate the total number of connected units on the Master unit, then, if needed, enable the functions provided by the LAN, which are the following:

- Regulation based on the temperature and humidity average value read by all network units.
- The presence of one (or maximum two) backup units in rotation and, if need be, ready to kick in in the presence of extreme room temperature and humidity conditions.

The configuration parameters for the LAN network are under the **Lan menu**, which can be accessed by entering the **"Service" password**.
More specifically, the settable parameters are:

- Number of units connected to the local LAN network.
- Enabling average calculation functions in LAN.
- Enabling the backup unit and its rotation.
- Interval of time between one rotation and the next (in other words: stand-by time.
- Number of backup units (fixed from 1 to 3 LAN units, selectable between 1 or 2 for networks from 4 to 10 LAN units).
- Enabling the start function for the backup units when exceeding the room temperature and humidity limits.

20.4 BACKUP UNIT MANAGEMENT (STAND-BY)

20.4.1 Introduction

In an installation made up of on units and stand-by units, there may be imbalances in the operating hours that cause the former to age faster because of the failure to use the latter. In order to solve this problem, the local network (LAN) always runs unit rotation in order to even out the operating hours. Basically, the rotation puts an active unit in stand-by and turns on a unit that was previously in stand-by.

20.4.2 Rotation management

The rotation of the reserve unit is managed entirely by the address 1 unit (which in this case acts as Master unit, while all the others are Slaves) and is based on time parameters, starting from the unit with the lower address, that is, address 1, and works its way up. Two reserve units can be set, but only when there are at least three units connected to the local LAN network. In this case, the units are rotated in standby starting with the first two (addresses 1 and 2) and then the second two (2 and 3) and so forth.
The parameter for configuring the rotation time is in the **"Lan" menu**, which can be accessed by entering the **"Service" password**.

INFORMATION
If the rotation time interval is set to zero, from that moment on rotation no longer takes place, and therefore the backup unit always remains the same, only becoming active if the faults and alarms indicated in the following sections occur.

INFORMATION
It is possible to manually force the rotation of the reserve unit using a dedicated command found in the "Manual" menu, which can be accessed by entering the "Service" password. For safety reasons, an interval of 10 minutes (fixed time that cannot be changed) is necessary between one forcing and the next. The time remaining until the next instance of forcing is indicated in the forcing mask.

20.4.3 Reserve unit activation mode

The stand-by unit comes out of its "idle" state and activates under the following circumstances:

- An alarm blocks an active unit.
- One of the active units is turned off from the user terminal.
- Local LAN disconnection detected (including power feed disconnection of one or more units).
- Exceeding the set room temperature and humidity limits.

As regards the first two bullet points, turning on the stand-by unit is entirely managed by the unit having address = 1 (Master).

20.4.4 Backup activation events

The alarms that activate the emergency unit are shown in the table below.

Code	Display description	Details	Event Time	Reset Time	Position	Action
010[3]	Flood Alarm: check Water Connections	Engagement of the flooding sensor. *Visible only if the detecting input is present.*	S/A	A/M	P	NO/U
101	Loss of Air Flow Check Fan/Switch	Lack of air flow on the evaporator.	A	M	U	U
120	Room Temp.Sensor Failed/Disconnected	Room air temperature sensor fault.	A	A	U	FN FC
125	Room Humidity Sensor Failed/Disconnected	Room humidity sensor fault. *Visible only when the T+H sensor is available.*	A	A	U	FN HU+DH
140	Delivery Air Temperature Sensor Failed/Disconnected	Delivery air temperature sensor faulty.	A	A	U	FN Lim
144	Outdoor Temp.Sensor Failed/Disconnected	External air temperature sensor faulty. *Only visible for Freecooling units*	A	A	U	FN FC
150	Heaters Overheating or Heaters Contactor Failed	Heater safety thermostat engagement. *Visible only if the unit is configured with heating elements. Alarm managed both with ON/OFF heating elements and with modulating heating element.*	A	M	U	EH
319	Low Pressure circuit 1 sensor Failed/Disconnected	Circuit 1 low pressure transducer fault alarm. *Visible only if the transducer is present.*	A	A	CI	FN
321	Low Pressure circuit 2 sensor Failed/Disconnected	Circuit 2 low pressure transducer fault alarm. *Visible only if the transducer is present.*	A	A	CI	FN
510[4]	Flood Alarm: check Water Connections	Reports the engagement of the flooding sensor. *Visible only if the detecting input is present.*	S	A/M	P	NO
531	Room Temperature Above Max. Limit	Reports that the temperature is above the maximum set level.	S*	A	P	NO
601	EEPROM Error: Replace Control Board	Reports a problem to the controller permanent memory.	S	A	U	NO

ATTENTION
The "High ambient temperature" event (S531) activates rotation only when the "LAN "Standby Limits" function is not activated (the function is described further on).

If one of the units in operation stops due to one of the alarms described above and causes activation of a back-up unit, calculation of the time for rotation is stopped until all the units return to normal operation and are no longer in alarm mode.
Below is an example of calculation of the time for rotation.

Assuming there are 2 units where U1 is the Master and U2 is the Slave, counting of the time for rotation is as follows:

A. STARTING SITUATION
- U1: Stand-by
- U2: ON

Counting of the time of unit 2 for rotation is in progress.

B. EVENT 1
- U1: ON
- U2: OFF for alarm

Counting of the time for rotation is blocked at the last value reached.

C. RETURN TO NORMAL CONDITIONS
- U1: Stand-by
- U2: ON

Counting of the time of unit 2 for rotation resumes at the last value reached before the alarm.

[3] This event is displayed only if the P22.83 parameter is set as "Alarm - Automatic" or "Alarm - Manual".
[4] This event is displayed only if the P22.83 parameter is set as "Automatic signal" or "Manual signal".

20.4.5 Management of two backup units

In the presence of two reserve units, always turn on the one with the lower address, while the other reserve unit keeps rotating normally, excluding a unit in alarm, given that it may already be off or with limited performance.
In case of a second alarm event stopping another LAN local network unit, the second back-up unit also activates and the time count for rotation is suspended. If the cause that brought to the activation of the first unit in stand-by should cease, the second back-up unit reactivates and the first stays idle.

20.4.6 Exceeding the limits

The backup unit activates and deactivates automatically depending of the four activation steps shown below. It is sufficient for one of the four steps to be active to request unit activation.

ATTENTION
The set points in the following diagrams are different from those normally used in the regulation process, and are those purposefully set for the reserve unit; as regards the differentials, they coincide with those used during normal regulation.

The Dehumidification and Humidification setting parameters are under the **"Set Point" menu**.
The Hot and Cold differential parameters are under the **"Regulations" menu**, which can be accessed by entering the **"Service" password**.
For the default values, see the parameters table.

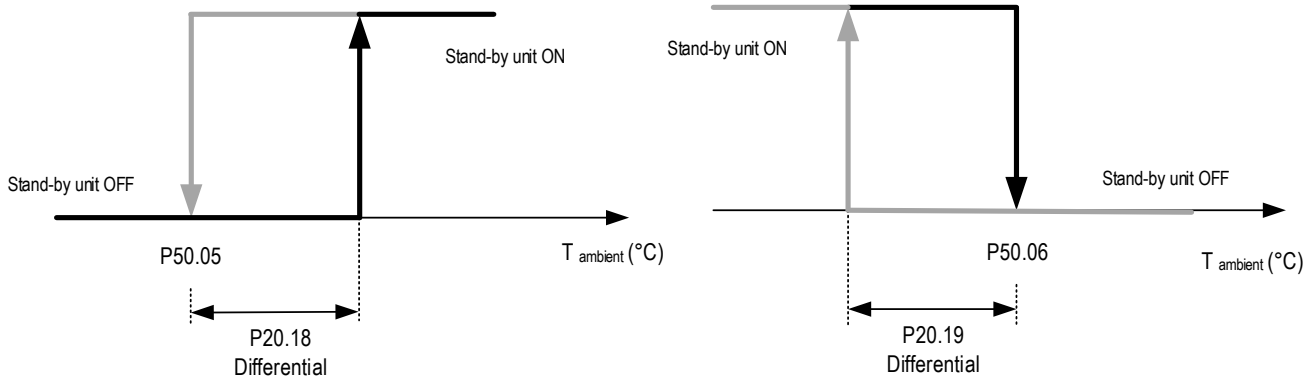


Figure 20-3: *Chart showing the activation of the reserve unit due to the exceeding of the Cold or Hot setpoint*

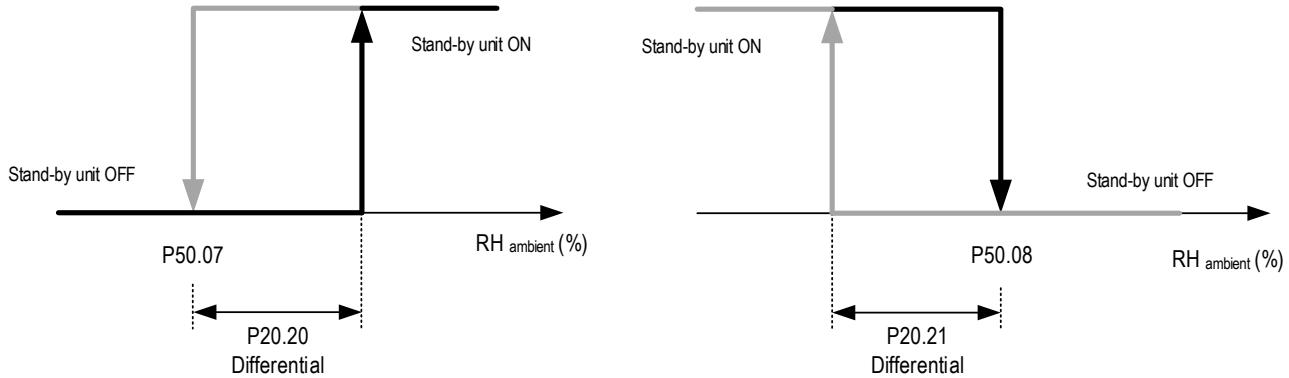


Figure 20-4: *Chart showing the activation of the reserve unit due to the exceeding of the dehumidification or humidification setpoint*

When one of the above four steps is activated, 30 seconds (unmodifiable value) must elapse before the backup unit is actually active, meaning before ventilation is active.
After ventilation starts, wait for adjustment permission (60 seconds) before the conditioning unit adjustment devices activate. Humidity and temperature adjustment occurs as per normal operation, the only difference being the active setpoints that in this case are those relative to the backup unit (stand-by).
The activation of the unit in stand-by for exceeding the limits lasts for a minimum of 10 minutes (cannot be set).
As regards the alarms for exceeding the temperature and humidity limits, the thresholds used by the backup unit for managing these alarms are moved (up or down depending on whether the type of limit is high or low) by an amount equal to the difference between the normal setpoint and the one relative to the unit in stand-by.
There is also a procedure whereby, when the value of a setpoint is modified, the corresponding value relative to the unit in stand-by is automatically moved and updated.

The chart below illustrates operation of the units in LAN with the standby function active.

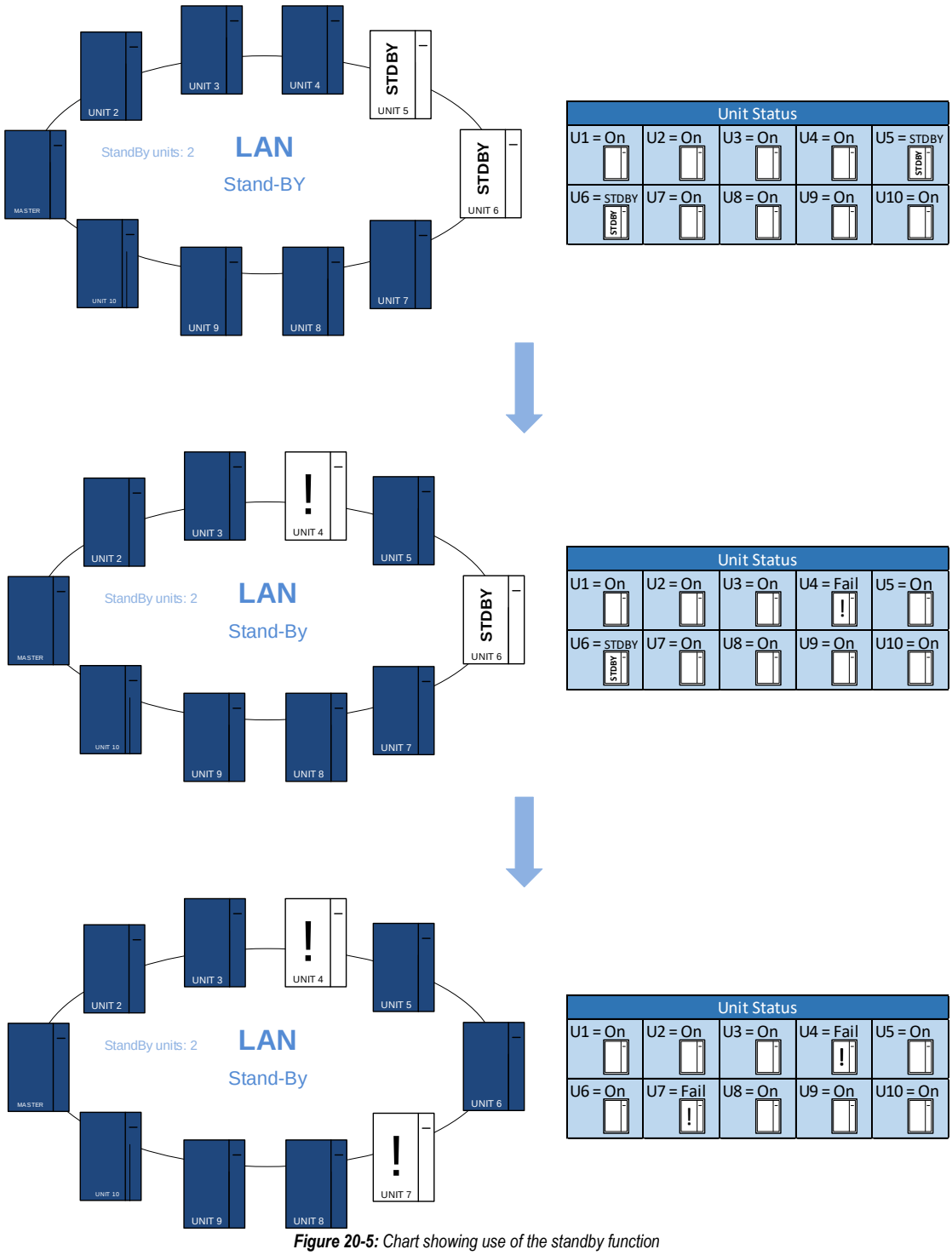


Figure 20-5: *Chart showing use of the standby function*

The parameters for enabling and configuring the Stand-by function are under the **"Lan" menu**, which can be accessed by entering the **"Service" password**. For the default values, see the parameters table.

ATTENTION
The menu can be viewed only at the Master unit (Address 1).

20.5 ACTIVE FAN ON STAND-BY

Adjustment is available only for units with stand-by management activated.
The function allows the use of dynamic standby: during standby, reserve units do not keep the fan off, but keep it running at the speed set in parameter P26.17. When the Master decides to turn on the unit in AFS mode, it returns to adjustment mode and the unit that will go into stand-by stops, and it keeps the fan running at the speed set in parameter P26.17.

The following functions are used to manage the LAN network:

- Management of back-up units (Stand-by).
- Active Fan on Stand-by (AFS).

Both functions manage the LAN network as follows:

1. Management of the back-up units and their activation is managed by the Stand-by function (P26.03) according to its own rules (described in the chapter on stand-by management) for switching the back-up units on/off.
2. Operation of the units in stand-by is managed by the AFS function (P26.16) which controls dynamic stand-by.

The diagram below represents the operating mode described above.

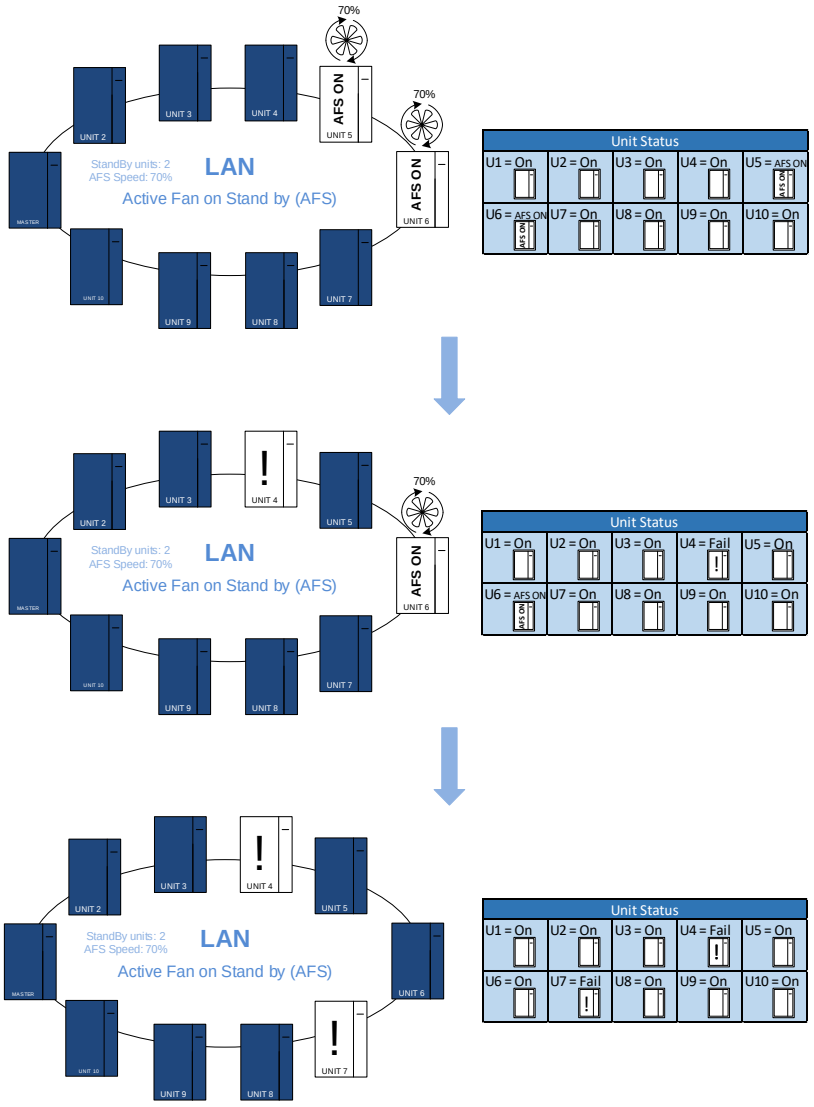


Figure 20-6: Graph showing operation of the Active Fan on Stand-by

The parameters for enabling and configuring the Active Fan on Stand-by function are in the **"Lan" menu**, which can be accessed by entering the **"Service" password**. For the default values, see the parameters table.

ATTENTION
The menu can be viewed only at the Master unit (Address 1).

20.6 TEMPERATURE AND HUMIDITY AVERAGE MANAGEMENT

20.6.1 Introduction

When the units are connected to a LAN network, it is possible to leverage their connection to operate them according to the average humidity and temperature value of all active units (that is, with active ventilation) not in the alarm status.

20.6.2 Average calculation

The Master unit (that is, the unit having LAN address = 1) calculates the average only if the regulation based on the average value has been enabled from the user terminal. In order to do this, the Master unit receives the room temperature and humidity values detected by the probes or all units in the LAN network, calculates the average and sends the resulting value to all units.
The average temperature and humidity consider only those units that:

- Are not in stand-by (in case the reserve unit rotation function is enabled).
- Are not in alarm (see following chapters).
- Are not off from user terminal.

The user terminal of each individual unit also displays the value read by its own temperature probe.

20.6.3 Enabling the average for use

Use of the average temperature and humidity value is only enabled if:

- The function is enabled.
- Faults in the LAN connection of the unit are not found.

If faults are detected in the LAN network, the unit immediately exits average based adjustment mode and only works based on local values (i.e.: the values read by the unit probes).
The diagram below represents the operating mode described above.

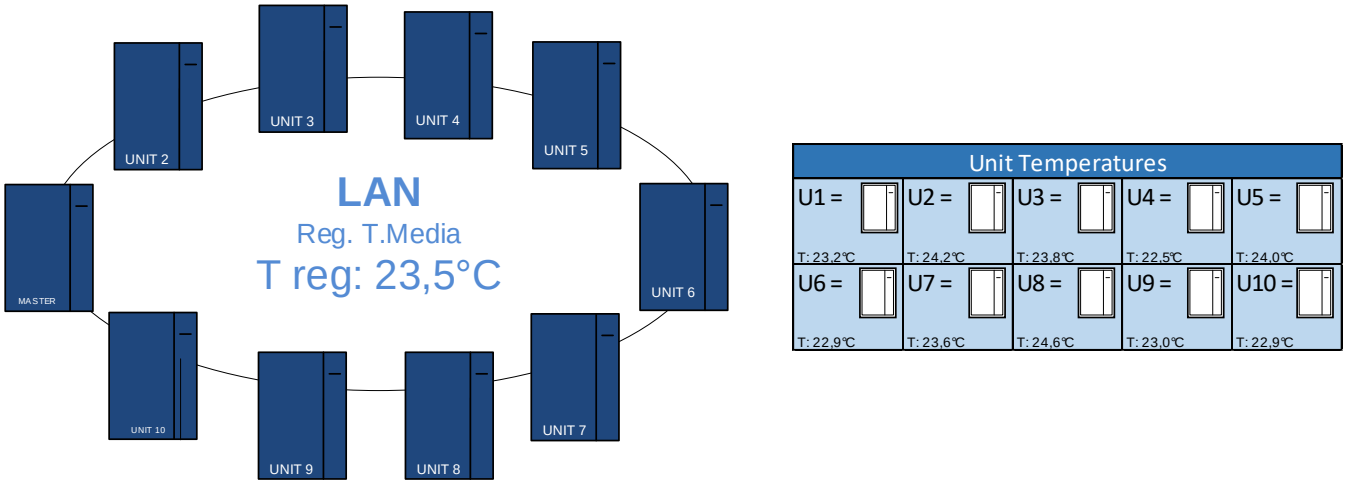


Figure 20-7: *Chart illustrating adjustment according to the average temperature and humidity*

The parameters for enabling and configuring the average based adjustment mode are under the **"Lan" menu**, which can be accessed by entering the **"Service" password**. For the default values, see the parameters table.

20.7 H&L LOCAL TEMPERATURE PROTECTION

This function, available for all units connected to the LAN network (P26.01>0) and that adjust according to the average temperature (P26.02=Y), permits monitoring the formation of Hot and Cold Spots in a room controlled by various units on the LAN network.

INFORMATION
The function can be viewed only after enabling the LAN network and adjustment according to the average temperature.

The protection is enabled so that the air temperature in the room is not too high or too low, according to the following criteria:

- Hot Spot protection: $Room\ Air\ Temperature > Average\ Air\ Temperature + P26.12$
- Cold Spot protection: $Room\ Air\ Temperature < Average\ Air\ Temperature - P26.13$

When the function is activated as a result of one of the above limits being reached, it "frees" the protected unit from having to adjust according to the average temperature, so that it can adjust according to its own local air temperature, and the temperature fault detected in that individual unit can be managed independently.
After the local air temperature has been brought by the independent unit back within the Hot Spot and Cold Spot limit for the time in parameter P26.14, the unit is reconnected to the LAN and made to adjust according to the average temperature.

INFORMATION
This function is available for units in standby and in ADL mode, which must be configured for adjustment according to average temperature and humidity.

INFORMATION
The parameters for setting and enabling this function can be viewed only at the Master unit.

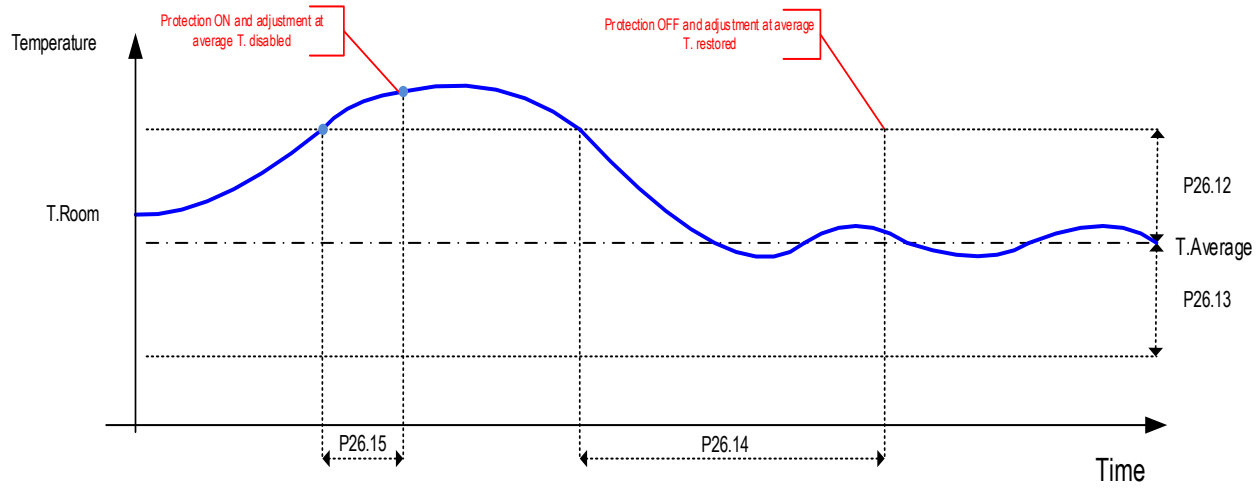
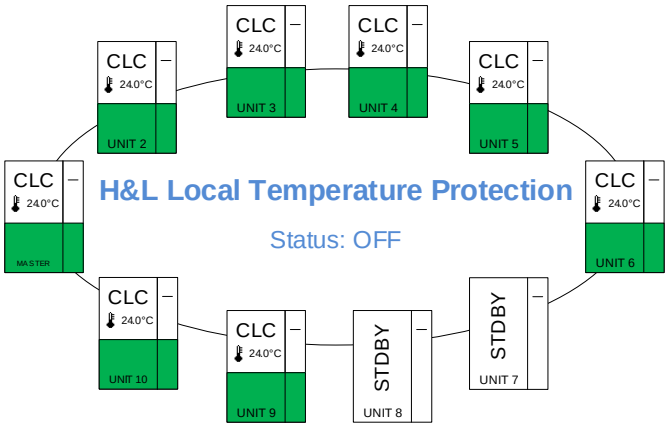


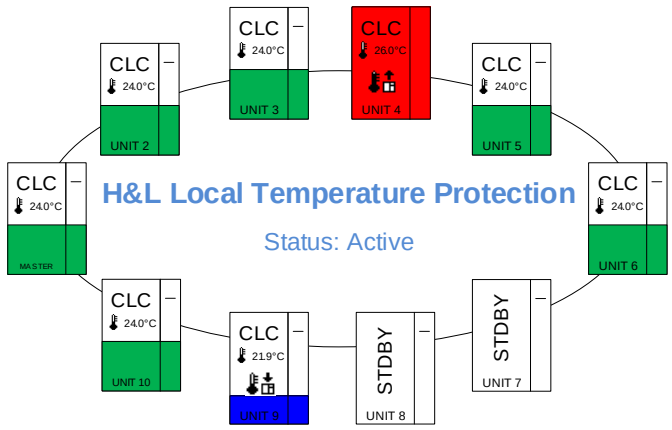
Figure 20-8: *Chart of H&L Local Temperature Protection*

The diagram below illustrates the function described above.

- Setpoint: 23.0°C
- Band : 2.0°C



LAN Status					
UNIT	T.LOCAL	T.MEDIA	DELTA HOTSPOT	DELTA COLDSPOT	T.REG.
U1	24.0°C	24.01°C	2.0°C	2.0°C	24.0°C
U2	24.2°C				24.0°C
U3	23.8°C				24.0°C
U4	24.1°C				24.0°C
U5	23.7°C				24.0°C
U6	24.1°C				24.0°C
U7	-				-
U8	-				-
U9	23.9°C				24.0°C
U10	24.3°C				24.0°C



LAN Status					
UNIT	T.LOCAL	T.MEDIA	DELTA HOTSPOT	DELTA COLDSPOT	T.REG.
U1	24.0°C	24.03°C	2.0°C	2.0°C	24.0°C
U2	24.2°C				24.0°C
U3	23.8°C				24.0°C
U4	26.0°C				26.0°C
U5	23.7°C				24.0°C
U6	24.1°C				24.0°C
U7	-				-
U8	-				-
U9	21.9°C				21.9°C
U10	24.3°C				24.0°C

Figure 20-9: *Example of operation of the H&L Local Temperature Protection*

The parameters for enabling and configuring the Precise function are in the **"Lan" menu**, which can be accessed by entering the **"Service" password**.
For the default values, see the parameters table.

20.8 LAN ALARM MANAGEMENT

20.8.1 Preliminary considerations

The network may be disconnected because of one of the following instances:

- Fault in the LAN board of the controller (integrated into the board: in this case the entire board must be replaced).
- LAN board connection cable disconnected.
- Unit or controller power feed disconnected.
- Cable broken in between the two units.

The options are two:

- One or more units are no longer visible.
- The network is broken into one (or more) sections.

Every unit constantly receives status information (namely, visibility or invisibility) of all other units that should be connected to the network (based on the number of LAN units set through the user terminal). Every unit is capable of detecting any disconnection.

20.8.2 Management algorithm

The algorithm generally involves the following:

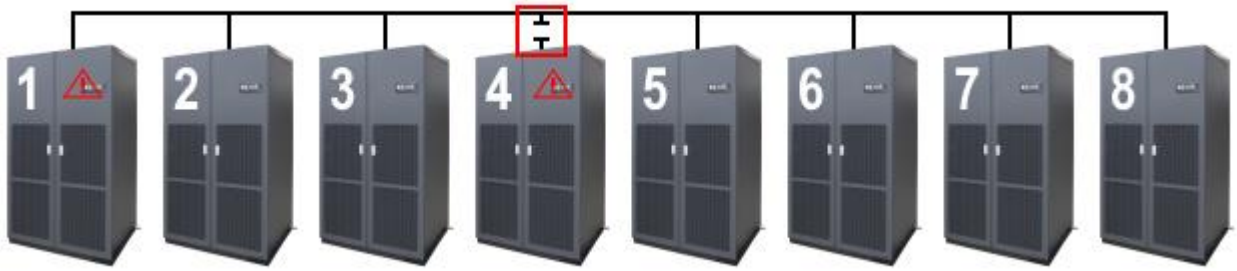
- The signal is always provided by the unit that is disconnected (isolated) from all the others, provided it is powered.
- If the highest visible addressing unit coincides with the last one planned for the network, the signal is provided by the unit that sees itself as the one with the lowest address of the visible ones.
- If the highest visible addressing unit does not coincide with the last one planned by the network, the signal is provided by the unit that sees itself as the one with the highest address of the visible ones.
- If the highest visible unit is not the one planned to be last and the lowest one is not 1 (that is, the one planned to be first), the unit in question is inside an internal LAN section and the signal is provided by the highest and the lowest units of that section.

20.8.3 Examples

The following examples refer to a LAN with 8 units connected.

Example 1

- Situation: Unit 4 disconnected from all the others.
- Units signalling the LAN disconnected alarm: 1 and 4 (if powered and working).



Example 2

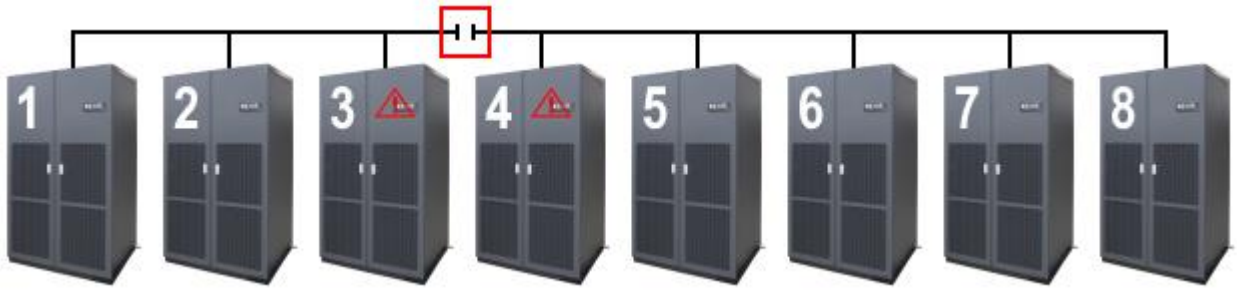
- Situation: Unit 1 disconnected from all the others.
- Units signalling the LAN disconnected alarm: 1 (if powered and working) and 2.

Example 3

- Situation: Unit 8 disconnected from all the others.
- Units signalling the LAN disconnected alarm: 7 and 8 (if powered and working).

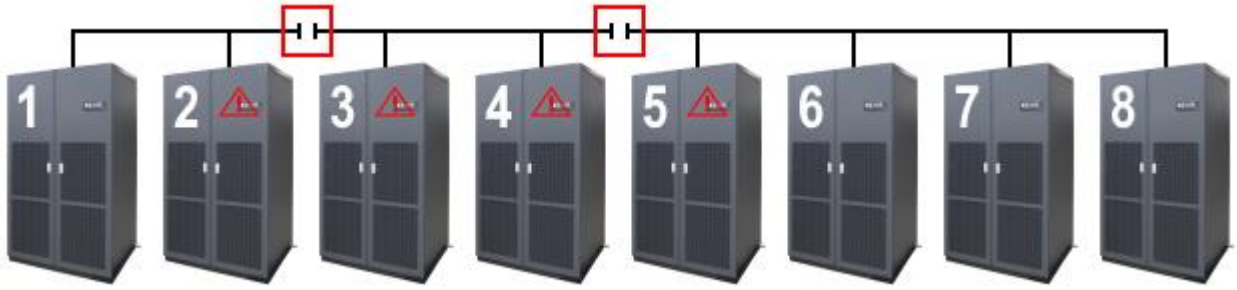
Example 4

- Situation: Network split into two sections.
- Units signalling the LAN disconnected alarm: 3 and 4.



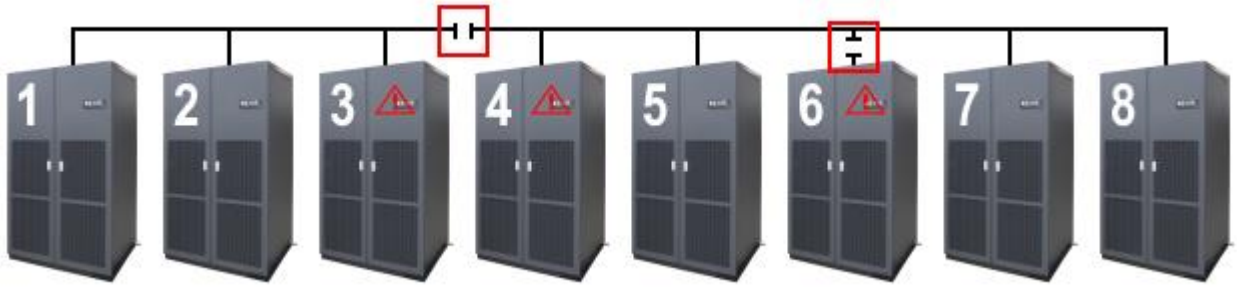
Example 5

- Situation: Network split into three sections.
- Units signalling the LAN disconnected alarm: 2, 3, 4 and 5.



Example 6

- Situation: Network split into two sections and one unit disconnected (n° 6).
- Units signalling the LAN disconnected alarm: 3, 4 and 6:



20.8.4 Consequences of the alarm

When a unit detects a disconnection on the local LAN network, the following occurs:

- Signal on the main mask.
- Forced unit activation in case it is in stand-by.
- Average regulation inhibited, in case it has been previously enabled.
- Time count interruption for reserve unit rotation.

Moreover, the Master unit activates the reserve units (if they are two, then both).

20.9 REACTIONS TO ALARMS WITHIN THE LAN NETWORK

Some events cause reactions in all the units connected to the pLAN network of the unit where the event itself occurred. These reactions are aimed at preventing the formation of gas build-up.
The units not in alarm condition will show this reaction through the flashing of the Active Functions mask, to indicate that the behaviour is due to the presence of an alarm in at least one of the other units connected to the LAN network.

20.9.1 Missing Air Flow alarm event

With this alarm active, the other network units switch the speeds of their fans to maximum level. Units Off from terminal or in Standby from LAN are excluded from the forcing of the fans and keep the fan speed at the minimum preset limit.

20.9.2 Gas Leak Detected alarm event

With this alarm active, the other network units switch the speeds of their fans to maximum operation level, switch off their external units and open the Direct Free Cooling dampers (if present) to maximum level. Units Off from terminal or in Standby from LAN are excluded from the forcing of the fans and keep the fan speed at the minimum preset limit.

20.10 SHARED USER TERMINAL

The shared user terminal (address 32) is managed by the application as follows:

- Usually, it displays the information regarding the unit selected by the user by pressing **[ESC]** and **[ALARM]** simultaneously. Whenever this is done the terminal switches onto the upper unit address.
- In case of maintenance alarm or signal on any of the units connected to the LAN network, the user terminal automatically switches onto the alarm or signal unit, in order to allow proper signalling.

Physically, the shared terminal may be connected to any of the network boards. Moreover, it may be connected both on the unit (panel terminal) or in remote position (wall terminal).

20.10.1 Connecting the remote keyboard

As a standard, there is only the on-board keyboard, directly connected to the J10 connector.
It is possible to connect a remote keyboard to the unit and it is possible to choose from different configurations.

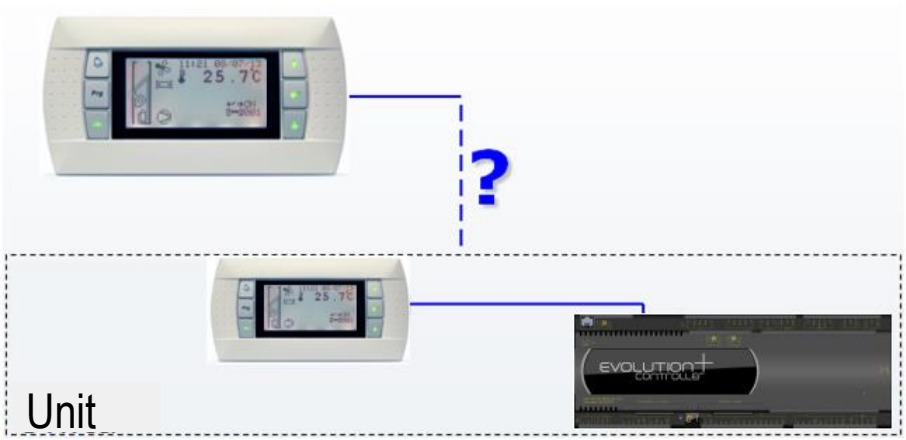
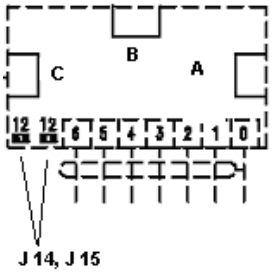


Figure 20-10: *Basic scheme to connect a remote keyboard*

20.10.2 "T" shunt

This is a shunt with phone connectors that is used in both the local network (LAN) and global network.
The two jumpers J14 and J15 must short circuit pins 1 and 2.
There is also a terminal board. The meanings of the various terminals are explained below.

<table>
<tr><td rowspan="2">1.</td><td rowspan="2">Image and wiring diagram
of a T-shunt.</td><td> 
</td><td> 
</td></tr>
<tr><td rowspan="8">2.</td><td rowspan="8">Meaning of the terminal board</td><td>Screw terminal</td><td>Function</td></tr>
<tr><td>0</td><td>Earth (shielded cable sheath)</td></tr>
<tr><td>1</td><td>+VRL=30V</td></tr>
<tr><td>2</td><td>GND</td></tr>
<tr><td>3</td><td>Rx-/Tx-</td></tr>
<tr><td>4</td><td>Rx+/Tx+</td></tr>
<tr><td>5</td><td>GND</td></tr>
<tr><td>6</td><td>+VRL=30V</td></tr>
</table>

20.10.3 Remote keyboard up to 200 metres

To connect a remote keyboard two “T” shunt boards must be used, one near the controller and one near the remote keyboard.

In case of a remote keyboard monitoring a single unit for a distance of less than 200 metres, the correct configuration is as follows.

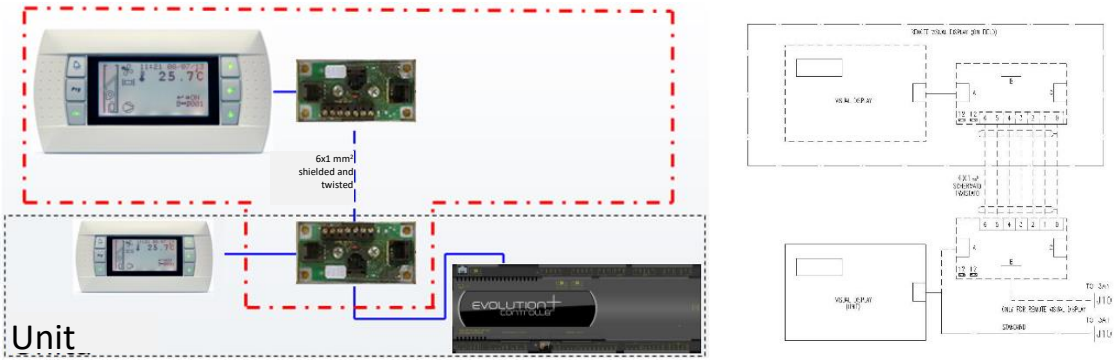


Figure 20-11: *Electric diagram for connecting a remote keyboard at a distance of up to 200 m*

20.10.4 Remote keyboard from 200 metres up to 500 metres

If the remote keyboard must be installed over 200m away from the local network (LAN), a power unit must be installed near the remote keyboard.
The remote keyboard cannot be installed more than 500 m away.
The only difference between this and a remote keyboard up to 200 metres is that the power unit must be to terminals 1 and 2 of the T shunt (the one near the remote keyboard). In this case a 3-wire cable connecting the two T-shunts is sufficient.
If just one chiller is connected, the connection diagram is:

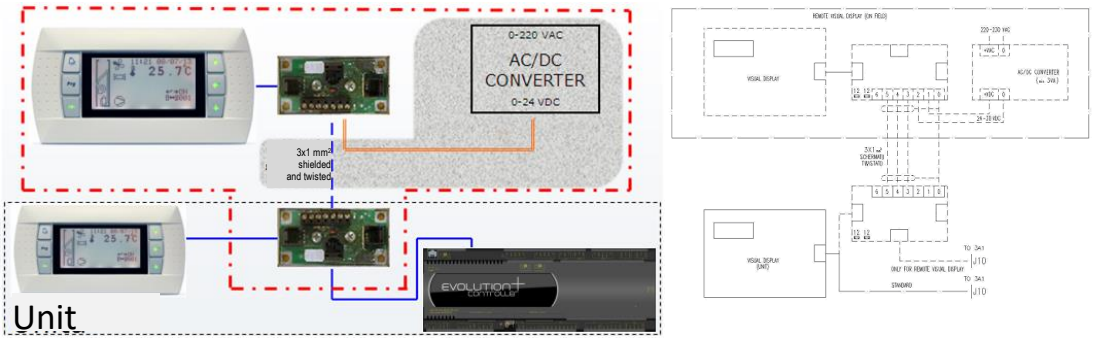


Figure 20-12: *Electric diagram for connecting a remote keyboard at a distance between 200 m and 500 m*

20.10.5 Remote keyboard for more than one unit

To connect more than one chiller to the same remote keyboard, connect the two boards together by jumpering connectors J11.
A configuration similar to the two shown above should only be used on the first board in the network (the one nearest the remote keyboard).

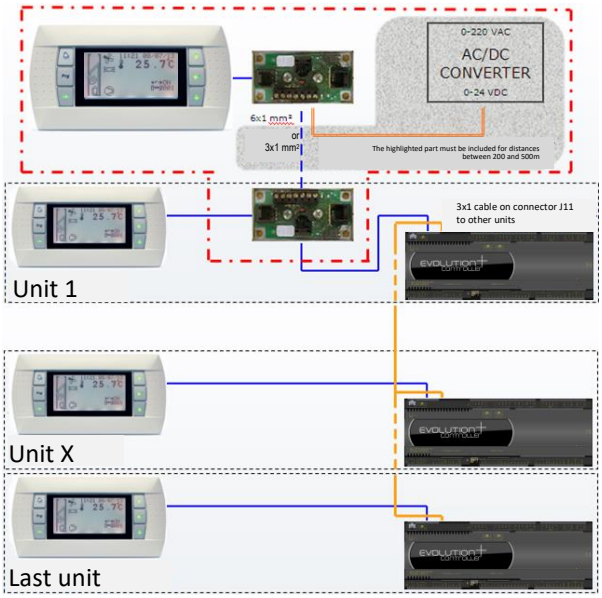


Figure 20-13: *Basic scheme to connect a remote keyboard to more units*

21 ANNEXES

21.1 PID ADJUSTER CONTROL PARAMETERS

The EVOLUTION+ software is equipped with some PID adjusters for controlling:

- Cold request
- Humidifier

The graph below shows the operating logic of a PID control:

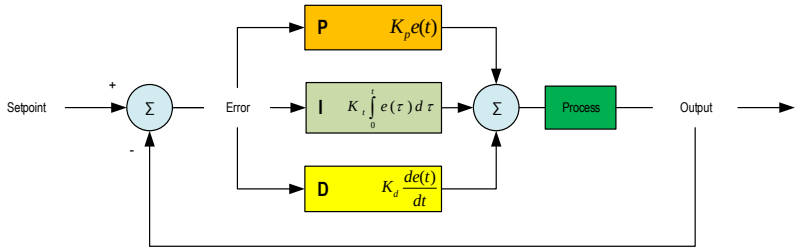


Figure 21-1: *PID operating control logic*

This type of control involves three types of action:

- **P**roportional action
- **I**ntegral action
- **D**erived action

The values of the three types of action can be modified to change the effects on the controlled output variable (inverter frequency, valve opening, steam production, fan speed, etc.) and, therefore, the adjustment itself.
The default parameters of the controller allow sufficiently precise and rapid adjustment within the response times. However, in certain cases it may be necessary to make certain changes depending on the required result of the adjustment.
The parameters can all be set under the **"Regulations" menu**, which can be accessed by entering the **"Service" password**.
For the default values, see the parameters table.
Below are a few guidelines concerning the effect of each action.

21.1.1 Proportional Action

The proportional action sets a basic control action for what is currently happening. The value of this action is proportional to the error, i.e. the deviation of the measured unit in relation to the setpoint.
This action is defined using the proportional constant K_p (also known as proportional gain) calculated with this formula:

$$K_p = \frac{100}{B_p}$$

Where B_p is the value of the proportional band defined by one of the following parameters:

- P20.18 (for temperature adjustment)
- P20.21 (for humidity adjustment)

The proportional band B_p defines the maximum error capable of bringing the proportional action to 100%.
A low B_p value can therefore cause an extreme reaction even when there are slight variations in the error, while a high value ensures little variation of the control variable even when there are serious errors.
The following table shows the reactions on the system caused by the **decrease** of the proportional band and resulting increase of the proportional constant.

Parameter (Decreases)	Constant (Increases)	Promptness of response	Overshoot	Balancing time	Error at full power	Stability
B_p	K_p	Increases	Increases	Decreases (slightly)	Decreases	Worsens

21.1.2 Integral Action

The integral action is an action of control on the basis of what has happened in the past. The value of this action is proportional to the sum of the errors of the previous moments.
This action is defined using the integral constant K_i (also known as integral gain) calculated with this formula:

$$K_i = \frac{K_p}{T_i}$$

T_i is the value of the integral time defined by one of the following parameters:

- P20.05 (for the adjustment of direct expansion units with on/off compressor or chilled water units)
- P20.06 (for the adjustment of direct expansion units with inverter compressor)
- P20.22 (for humidifier adjustment)
- P20.95 (for the adjustment of direct expansion units with compressors with delivery air adjustment active and Free Cooling).

The following table shows the reactions on the system caused by the **decrease** of the integral time and resulting increase of the integral constant.

Parameter (Decreases)	Constant (Increases)	Promptness of response	Overshoot	Balancing time	Error at full power	Stability
T_i	K_i	Increases	Increases	Increases	Cancels out	Worsens

The integral action can be disabled by setting the integral time to 0.

21.1.3 Derivative Action

The derivative action sets a control action based on the prediction of what will happen in the future. The value of this action is proportional to the error trend (increase or decrease).
This action helps to improve dynamic performance, while maintaining the high value of the proportional action, but is less simple to adjust. It is useful in that, if the output deviates too quickly from the setpoint value, the error derivative and, therefore, the derivative action, can be significant.
This action is defined using the derivative constant K_d (also known as derivative gain) calculated with this formula:

$$K_d = K_p * T_d$$

Where T_d is the value of the derivative time defined by one of the following parameters:

- P20.07 (for the adjustment of direct expansion units with inverter compressor)
- P20.23 (for humidifier adjustment)
- P20.96 (for the adjustment of direct expansion units with compressors with delivery air adjustment active and Free Cooling).

The T_d time defines the projected time horizon: If too small, it will not have a good anticipatory effect; if too large, its forecast may be completely wide of the mark.
The following table shows the reactions on the system caused by the **increase** of the derivative time and resulting increase of the derivative constant.

Parameter (Increases)	Constant (Increases)	Promptness of response	Overshoot	Balancing time	Error at full power	Stability
T_d	K_d	Increases (slightly)	Decreases	Decreases (slightly)	Does not change	Improves

The derivative action can be disabled by setting the derivative time to 0.

21.1.4 The combined effect of the three actions

The control action of the system is, therefore, calculated, one moment at a time, as the sum of the three contributions (Proportional, Integral and Derivative).
The **P**roportional Action represents the **component most sensitive to the current value of the error**:

- High K_p values entail a significant reaction also for slight error variations.
- Reduced values transfer on the control variable limited variations also in case of significant errors.

The **I**ntegral action varies in a linear manner following the action of proportionality coefficient K_p/T_i and, as mentioned above, **takes the past trend of the error into account**:

- Reduced T_i values lend greater importance to past system history.
- High values decrease the weight of the integral action by transferring to the control variable variations that are more dependent on the current error value.

The **D**erivative action varies in a linear manner with the error derivative following the action of proportionality coefficient K_p*T_d and, as mentioned before, **takes the current trend of the error into account**:

- High T_d values place greater importance on what may be the future trend of the error, with greater reliance on the algorithm
- Lower values transfer to the control variable variations that are less dependent on future trends.

The image below illustrates what has been said above.

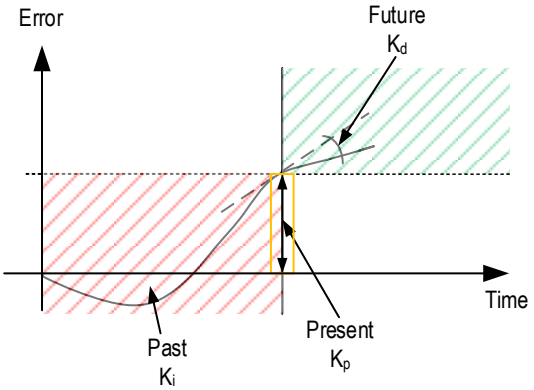


Figure 21-2: *DIP control contribution relation chart*

21.1.5 Anti-Windup control (control of integral error)

The PID adjuster has an integral error control function called Anti-Windup.
This function is used when the demand of the PID reaches 100%. In this case, without the function, the integral action of the controller would continue to integrate the error and render the PID adjuster inactive even if the error were to decrease in relation to the setpoint, causing the system to overshoot. This would continue until the end of the integral period (time T_i).
This function stops the calculation of the integral action until demand falls again below 100%.

21.2 DEFINITION OF THE HUMIDIFIER'S CONFIGURATION PARAMETER

Below is the conversion table for the value of the parameter P27.06 and the configured type of cylinder.

Value P27.06	Definition
0	<Select the Model>
1	001-1 kg/h Reduct 200V 1-ph Drain Pump
2	002-1 kg/h Reduct 208V 1-ph Drain Pump
3	003-1 kg/h Reduct 230V 1-ph Drain Pump
4	004-1 kg/h 200V 1-ph Drain Pump
5	005-1 kg/h 208V 1-ph Drain Pump
6	006-1 kg/h 230V 1-ph Drain Pump
7	007-3 kg/h Reduct 200V 1-ph Drain Pump
8	008-3 kg/h Reduct 208V 1-ph Drain Pump
9	009-3 kg/h Reduct 230V 1-ph Drain Pump
10	010-3 kg/h Reduct 208V 3-ph Drain Pump
11	011-3 kg/h Reduct 230V 3-ph Drain Pump
12	012-3 kg/h Reduct 400V 3-ph Drain Pump
13	013-3 kg/h 200V 1-ph Drain Pump
14	014-3 kg/h 208V 1-ph Drain Pump
15	015-3 kg/h 230V 1-ph Drain Pump
16	016-3 kg/h 200V 3-ph Drain Pump
17	017-3 kg/h 208V 3-ph Drain Pump
18	018-3 kg/h 230V 3-ph Drain Pump
19	019-3 kg/h 400V 3-ph Drain Pump
20	020-3 kg/h 460V 3-ph Drain Pump
21	021-5 kg/h 200V 1-ph Drain Pump
22	022-5 kg/h 208V 1-ph Drain Pump
23	023-5 kg/h 230V 1-ph Drain Pump
24	024-5 kg/h 200V 3-ph Drain Pump
25	025-5 kg/h 208V 3-ph Drain Pump
26	026-5 kg/h 230V 3-ph Drain Pump
27	027-5 kg/h 400V 3-ph Drain Pump
28	028-5 kg/h 460V 3-ph Drain Pump
29	029-5 kg/h 575V 3-ph Drain Pump
30	030-8 kg/h 200V 3-ph Drain Pump
31	031-8 kg/h 208V 3-ph Drain Pump
32	032-8 kg/h 230V 3-ph Drain Pump
33	033-8 kg/h 400V 3-ph Drain Pump
34	034-8 kg/h 460V 3-ph Drain Pump

Value P27.06	Definition
35	035-8 kg/h 575V 3-ph Drain Pump
36	036-9 kg/h 208V 1-ph Drain Pump
37	037-9 kg/h 230V 1-ph Drain Pump
38	038-10 kg/h 200V 3-ph Drain Pump
39	039-10 kg/h 208V 3-ph Drain Pump
40	040-10 kg/h 230V 3-ph Drain Pump
41	041-10 kg/h 400V 3-ph Drain Pump
42	042-10 kg/h 460V 3-ph Drain Pump
43	043-10 kg/h 575V 3-ph Drain Pump
44	044-15 kg/h 200V 3-ph Drain Pump
45	045-15 kg/h 208V 3-ph Drain Pump
46	046-15 kg/h 230V 3-ph Drain Pump
47	047-15 kg/h 400V 3-ph Drain Pump
48	048-15 kg/h 460V 3-ph Drain Pump
49	049-15 kg/h 575V 3-ph Drain Pump
50	050-18 kg/h 400V 3-ph Drain Pump
51	051-18 kg/h 460V 3-ph Drain Pump
52	052-18 kg/h 575V 3-ph Drain Pump
53	053-25 kg/h 200V 3-ph Drain Pump
54	054-25 kg/h 208V 3-ph Drain Pump
55	055-25 kg/h 230V 3-ph Drain Pump
56	056-25 kg/h 400V 3-ph Drain Pump
57	057-25 kg/h 460V 3-ph Drain Pump
58	058-25 kg/h 575V 3-ph Drain Pump
59	059-35 kg/h 200V 3-ph Drain Pump
60	060-35 kg/h 208V 3-ph Drain Pump
61	061-35 kg/h 230V 3-ph Drain Pump
62	062-35 kg/h 400V 3-ph Drain Pump
63	063-35 kg/h 460V 3-ph Drain Pump
64	064-35 kg/h 575V 3-ph Drain Pump
65	065-45 kg/h 400V 3-ph Drain Pump
66	066-45 kg/h 460V 3-ph Drain Pump
67	067-45 kg/h 575V 3-ph Drain Pump
68	068-1 kg/h Reduct 1-ph Drain Pump
69	069-1 kg/h Reduct 1-ph Drain Valve

Value P27.06	Definition
70	070-1 kg/h Reduct 1-ph Drain Valve
71	071-1 kg/h 200V 1-ph Drain Valve
72	072-1 kg/h 208V 1-ph Drain Valve
73	073-1 kg/h 230V 1-ph Drain Valve
74	074-3 kg/h Reduct 200V 1-ph Drain Valve
75	075-3 kg/h Reduct 208V 1-ph Drain Valve
76	076-3 kg/h Reduct 230V 1-ph Drain Valve
77	077-3 kg/h Reduct 208V 3-ph Drain Valve
78	078-3 kg/h Reduct 230V 3-ph Drain Valve
79	079-3 kg/h Reduct 400V 3-ph Drain Valve
80	080-3 kg/h 200V 1-ph Drain Valve
81	081-3 kg/h 208V 1-ph Drain Valve
82	082-3 kg/h 230V 1-ph Drain Valve
83	083-3 kg/h 200V 3-ph Drain Valve
84	084-3 kg/h 208V 3-ph Drain Valve
85	085-3 kg/h 230V 3-ph Drain Valve
86	086-3 kg/h 400V 3-ph Drain Valve
87	087-3 kg/h 460V 3-ph Drain Valve
88	088-5 kg/h 200V 1-ph Drain Valve
89	089-5 kg/h 208V 1-ph Drain Valve
90	090-5 kg/h 230V 1-ph Drain Valve
91	091-5 kg/h 200V 3-ph Drain Valve
92	092-5 kg/h 208V 3-ph Drain Valve
93	093-5 kg/h 230V 3-ph Drain Valve
94	094-5 kg/h 400V 3-ph Drain Valve
95	095-5 kg/h 460V 3-ph Drain Valve

Value P27.06	Definition
96	096-5 kg/h 575V 3-ph Drain Valve
97	097-8 kg/h 200V 3-ph Drain Valve
98	098-8 kg/h 208V 3-ph Drain Valve
99	099-8 kg/h 230V 3-ph Drain Valve
100	100-8 kg/h 400V 3-ph Drain Valve
101	101-8 kg/h 460V 3-ph Drain Valve
102	102-8 kg/h 575V 3-ph Drain Valve
103	103-9 kg/h 208V 1-ph Drain Valve
104	104-9 kg/h 230V 1-ph Drain Valve
105	105-10 kg/h 200V 3-ph Drain Valve
106	106-10 kg/h 208V 3-ph Drain Valve
107	107-10 kg/h 230V 3-ph Drain Valve
108	108-10 kg/h 400V 3-ph Drain Valve
109	109-10 kg/h 460V 3-ph Drain Valve
110	110-10 kg/h 575V 3-ph Drain Valve
111	111-15 kg/h 200V 3-ph Drain Valve
112	112-15 kg/h 208V 3-ph Drain Valve
113	113-15 kg/h 230V 3-ph Drain Valve
114	114-15 kg/h 400V 3-ph Drain Valve
115	115-15 kg/h 460V 3-ph Drain Valve
116	116-15 kg/h 575V 3-ph Drain Valve
117	117-18 kg/h 400V 3-ph Drain Valve
118	118-18 kg/h 460V 3-ph Drain Valve
119	119-18 kg/h 575V 3-ph Drain Valve
120	120-3 kg/h Reduct 460V 3-ph Drain Pump
121	121-3 kg/h Reduct 460V 3-ph Drain Valve

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