Chillers and Inverter Air/Water heat pumps with axial fan

Controller Manual

Model

Picco Chiller R32 21
Picco Chiller R32 26
Picco Chiller R32 28
Picco Chiller R32 32

Picco R32 21
Picco R32 26
Picco R32 28
Picco R32 32

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1. PURPOSE AND CONTENT OF THE MANUAL

The purpose of the control manual for Picco units is to provide the essential information necessary for the correct use of all the functions of the machine, in particular, it provides the essential information for the setup of unit control. The informations contained in this manual are written for the installer and for the user who uses the machine: the user, even if he does not have specific information, will find in these pages the indications that will allow him to use it effectively. It is reccomended that the user carefully follows the instructions given in this manual, especially the safety instructions and routine maintenance. The manual describes the machine at the time it was commercialised; the Company reserves the right to make changes and tecnological improvements to the product and it is not obliged to update manual of previous versions. Besides, the Company declines all responsability for any errors contained in the manual, if due to printing or transcription errors. Be sure to use the manual, in case of updates or doubts contact the company.

1.1 HOW TO KEEP THE MANUAL

The manual has to always be kept together with the unit it refers to. It has to be stored in a safe place, protected from dust and moisture and easily accessible to the operator who must consult it any time he is in doubt on how to operate the equipment. Any updates sent to the customer must be kept in an attachment to this manual. The company is available to give any detailed information about this manual and to give information regarding the use and the maintenance of the units.

1.2 GRAPHIC SYMBOLS USED IN THE MANUAL

	**Indicates prohibited operations.**
	**Indicates operations that can be dangerous for people and/or for the correct operation of the machine.**
	**Indicates operations where there is a risk of electrocution due to dangerous electrical voltage.**
	**Indicates important information that the operator has to follow in order to guarantee the correct operation of the unit in complete safety. Also indicates some general information**

2. PERMITTED USE

- The company excludes all contractual and extra-contractual liability for damage caused to persons, animals or things, due to installation, adjustment and maintenance errors, improper use or partial or superficial reading of the information contained in this manual.
- These units are built for the heating and/or cooling of water. Any other use not expressaly authorised by the manufacturer is considered improper and therefore not allowed.
- Modification of the operating logic and/or control parameters must be executed by experienced and qualified personnel. Access to the electrical panel and the connection of external devices are only permitted to qualified personnel.
- This appliance is intended to be used by experienced or trained operators in shops, light industry and on farms, or for commercial use by non-experted personnel.
- The appliance may be used by children at least 8 years old and by persons with reduced physical, sensory or mental capabilities or without experience or the necessary knowledge as long as they are supervised or after they themselves have received instructions on the safe use of the appliance and understand the relevant dangers. Children must not play with the appliance. The cleaning and maintenance which the user is expected to carry out on the unit cannot be done by children without supervision.
- Direct interaction with the unit by personnel with electrically controlled medical devices, such as pacemakers, is prohibited, because it may cause harmful interference. It is reccomended to mantein an appropriate distance from the installation site of the unit, as indicated by the medical system used.

3. GENERAL SAFETY GUIDELINES

Before starting any type of operation on the unit, every user and operator must have perfect knowledge of operation of the machine and of its controls and have read all of the information in this manual and in the user-installer manual.

	**IS PROHIBITED:**
	To remove and/or to manipulating any safety device.
	Unauthorised access to the electrical panel.
	To touch the systems if not autorised to do so.
	To performe any cleaning operation when the master switch in 'ON'
	To pull, detach or twist the appliance's electric cable.
	To step on, sit down on and/or place any type of object on the appliance.
	To spary or pour water directly on the appliance.
	To touch the appliance when barefoot or part of the body are wet or damp.
	Tamper with or replace parts of the machine without express authorisation from the manufacturer. Such interventions release the manufacturer from any civil or criminal responsibility.
	**CAUTION:**
	Refer to the user-installer manual included with the unit before procedeeing.
	Do not place your hands or insert screwdrivers, spanners or other tools on moving parts.
	The person in charge of the machine and the maintenance man must receive appropriate training and instruction to carry out their duties in a safe situation.
	The operator's workplace has to be kept clean, tidy and clear of objects that may restrict free movement. The workplace must be adequately illuminated for the operations planned.
	Not all the configurations described can be activated and/or modified at the same time.
	Different values from the default values can compromise the correct operation of the unit, in case of doubt on the value to set contact the company.

	**Only authorised personell may access the electric panel. Connection to the terminal block must only be made by qualified personnel.**
	All ordinary and/or extraordinary maintenance operations must be carried out with the machine stationary and without electrical power.
	Before performing any operations on the electric panel, IT IS MANDATORY: **-To switch off the unit from the control panel ("OFF" displayed).** **-Set the main switch above the unit to "OFF".** **-Wait 15 seconds before accessing the electrical panel.** **-Ensure the effective grounding.** **-To remain well isolated from the ground, with dry hands and feet, or using insulated platforms and gloves.** **-To keep foreign materials away from the systems.**

3.1 PERSONAL PROTECTIVE EQUIPMENT

Refer to the user-installer manual included with the unit.

3.2 WORKERS' HEALTH AND SAFETY

Refer to the user-installer manual included with the unit.

3.3 SAFETY SIGNALS

Refer to the user-installer manual included with the unit.

3.4 REFRIGERANT SAFETY DATA SHEET

Refer to the user-installer manual included with the unit.

4. USER INTERFACE - CONTROLLER

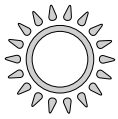
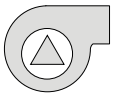
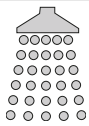
The unit has a 4-digit display with integrated keypad, the main functions and menu navigation are described below. Normally, if the unit is switched on, the display shows the water outlet temperature in degrees Celsius or the alarm code, if active.

4.1 DISPLAY

4.1.1 KEYS

MODE ESC	Select the operating mode and manually reset any alarms. Each time you press the key you have the following sequence: OFF -> COOL -> COOL+SAN* -> HEAT -> HEAT+SAN* -> OFF (*= if sanitary is enabled) During parameter settig has the function of the back key.
PRG	Allows to enter the selected menu to view the sub-folders or to set a value (e.g. summer, winter and domestic set-points or various parameters).
	UP key allows to move to a higher menu or to increase the parameter value.
	DOWN key allows to move to a lower menu or to decrease the parameter value.

4.1.2 LED

	Cooling mode LED: is on if COOL or COOL+SAN mode is selected.
	Heating mode LED: is on if HEAT or HEAT+SAN mode is selected.
	Pump Led: is on if the pump is active.
	Alarm Led: is on if there are active alarms.
	Defrosting Led: flashes to enter defrosting mode, it is on when defrosting is in progress.
	Compressor Led: flashes if the compressor is starting up, it is on if the compressor is active.
	Sanitary led: flashes if sanitary production is in progress, it is on if COOL+SAN or HEAT+SAN mode is selected and sanitary production is not in progress.
	Led KA resistors: is on if the antifreeze resistors are active.

4.2 MENU

The items controlled by the main menu are listed below. Some of this are only visible to the installer, who must access to the PSS menu to enter the password and enable higher privilege access.

MENU	LABEL	LEVEL	OTHER CONDITIONS
Setpoint	**Set**	User	Not accessible if connected at Hi-T2
Password	**PSS**	User	---
Alarms	**Err**	User	Only if active alarms
Probes	**tP**	Installer	---
Digital inputs	**Id**	Installer	---
Parameters	**Par**	Installer	---
Hours of operation	**oHr**	Installer	---
Alarm log	**Hist**	Installer	Only of the log contains data
Firmaware Version	**Fir**	Installer	---
USB	USb	Installer	Only with USB key with update files is present

CAUTION: All operations with INSTALLER visibility must be carried out by QUALIFIED PERSONNEL.

4.3 SETPOINT MENU [Set]

In this menu, it is possible to display and modify the various set-points.

Set	DESCRIPTION	DEFAULT	RANGE	UNIT
Coo	First Summer setpoint	7.0	5 ÷ Coo2	°C
Hea	First Winter setpoint	45.0	Hea2 ÷ 60	°C
***San**	Sanitary setpoint	48.0	25 ÷ 60	°C
Coo2	Second Summer setpoint	18.0	Coo ÷ 25	°C
Hea2	Second Winter setpoint	35.0	25 ÷ Hea	°C

(*) If sanitary function is enabled, see par. .

4.4 PASSWORD MENU [PSS]

Enter the password for the desired access level. Confirming the value with the PRG key automatically activates the access level and the menu items enabled by that level will appear. Once you have exited the menus completely, the password privilege is lost and must be entered again.

4.5 ALARMS MENU [Err]

This menu allows you to see all active alarms, if any. For more details see par. 9.

4.6 PROBES MENU [tP]

Entering with the installer password, the values of the present temperature and pressure sensors can be read in this menu.

tP	DESCRIPTION	UNIT
t01	Water inlet temperature	°C
t02	Water outlet temperatura	°C
t03	Compressor suction temperature	°C
t04	Compressor discharge temperature	°C
t05	Outside air temperature	°C
t06	Domestic hot water temperature (if enabled)	°C
t07	System remote probe temperature (if enabled)	°C
t09	Low pressure	bar
t10	High pressure	bar

The number of visible probes depends on the presence or absence of expansion modules.
Particular situations:
Err: probe faulty
--- = probe not used (no function associated to that probe)

4.7 DIGITAL INPUTS MENU [Id]

Entering with the installer password, the status of the digital inputs can be view in this menu:
0 = input disabled
1 = input enabled
--- = input not configured

It is strictly PROHIBITED to disable the digital input ID1, corresponding to the flow switch.

4.8 PARAMETERS MENU [Par]

Entering with installer password, in this menu you can modify the the main parameters of the unit. The parameters are collected in groups, each group is identified by a three-digit code, while the index of each parameter is preceded by a letter.

Par	DESCRIPTION	INDEX OF THE PARAMETER
CnF	Configuration	H--
ALL	Alarms	A--
CP	Compressor	C--
rE	Regulation	b--
PUP	Pump	P--
Fro	Electrical resistances	r--
dFr	Defrosting	d--
LbH	Minimum Hz	L--
rEC	Desuperheater	rE

4.9 OPERATING HOURS MENU [oHr]

Entering with the installer password this menu displays the operating hours of the compressor (oH1) and of the circulator (oHP1).
It is possible to reset the displayed count by pressing the ESC key for 3 seconds

4.10 LOG MENU [HiSt]

This menu appears, after entering the installer password, only if there is data in the alarm log.

4.11 FIRWARE VERSION MENU [Fir]

Entering with the installer password, in this menu you can read firmware version (uEr), revision (rEu) and sub-revision (SUb).

4.12 USB MENU[USB]

This menu appears, after entering the installer password, only if a USB key containing the relevant update files is connected to the card. The available functions are described below.

CAUTION: The access to the electrical panel is only allowed to QUALIFIED PERSONNEL.

4.12.1 FIRMWARE UPDATE [UPdF]

In case of firmware update, the following steps are necessary:

1. Copy the upgrade files into the main directory of a USB pen;
2. Set the unit to OFF on the keypad and remove power by setting the main switch to OFF;
3. Insert the flash drive into the USB port on the control;
4. Power up the unit, setting the mains witch to the ON position;
5. Access the firmware update menu and start the procedure through the following sequence: PRG -> PSS -> PRG -> (enter installer password) -> PRG -> USB -> UPdF -> PRG
6. A countdown advances on the display, at the end of the procedure the word "boot" appears and the 4 LEDs light up in sequence;
7. Switch off the unit, positioning the main switch on the OFF status;
8. Remove the drive from the USB port;
9. Switch the unit on by turning the main switch to the ON position.

4.12.2 PARAMETERS UPDATE [UPPA]

In case of parameters update, the following steps are necessary:

1. Copy the upgrades files into the main directory of a USB pen;
2. Set the unit to OFF on the keypad and remove power by setting the main switch to OFF;
3. Insert the flash drive into the USB port on the control;

4. Power up the unit, setting the mains witch to the ON position;
5. Access the firmware update menu and start the procedure through the following sequence: PRG -> PSS -> PRG -> (enter installer password) -> PRG -> USB -> UPPA -> PRG
6. A countdown advances on the display, at the end of the procedure the word "boot" appears and the 4 LEDs light up in sequence;
7. Remove the drive from the USB port;
8. Switch the unit on by turning the main switch to the ON position.

5. SYSTEM RESOURCES

The inputs and outputs (I/O) that can be set to activate the control functions are listed below. To configure the I/O, use the installer password to access the configuration parameters: PRG -> PSS -> PRG -> (enter installer password) -> PRG -> **PAr** -> PRG -> **CnF**.

Resource	Parameter	Terminal block	Factory configuration		Description
			Default value	Function	
ST6	**H17**	XC-5.1 XC-5.2	0	Not set	Analogue input configurable with an NTC-10kΩ probe at 25°C β 3435
ST7	**H18**	XC-6.1 XC-6.2	0	Not set	Analogue input configurable with an NTC-10kΩ probe at 25°C β 3435
ST11	**H22**	XC-10.1 (GND) XC-10.2 (+) XC-11.2 (5V)	0	Voltage input	0-10 Vdc input (XC-10.1/2) Ratiometric / PWM input
DI2	**H46**	XC-4.1 XC-4.2	0	Remote summer/winter mode change	Voltage free digital input. To activate the function see par.
DI3	**H47**	XC-3.1 XC-3.2	2	Remote on/off	Voltage free digital input. Active function by default (par.).
DI9	**H53**	XC-7.1 XC-7.2	0	Not set	Voltage free digital input
DO3	**H81**	XP-1.1 (N) XP-1.2 (phase)	22	System integration heater command	Voltage output 230Vac, 50Hz, 2A (AC1) (see paragraph)
DO6	**H84**	XP-4.1 (N) XP-4.2 (phase)	6	HDW valve control	Voltage output 230Vac, 50Hz, 2A (AC1) (see paragraph)
DO7	**H85**	XP-5.1 (N) XP-5.2 (phase)	25	Double setpoint valve control	Voltage output 230Vac, 50Hz, 2A (AC1) (see paragraph)
Modbus RTU RS485	--	XC-1.1 (GND) XC-2.1 (R-) XC-2.2 (R+)	--	--	Factory enabled with CM accessory

For a detailed description of the terminal block, please refer to the user/installer manual.

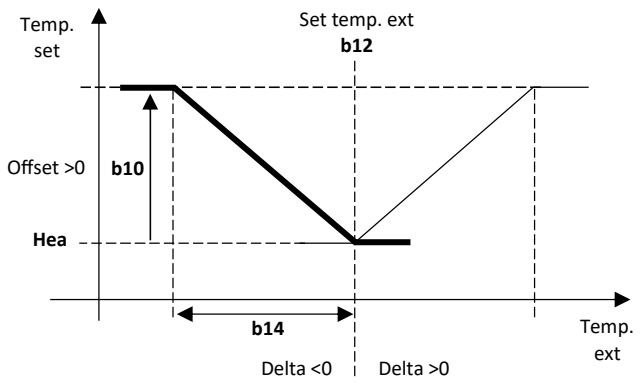
6. EDITING DYNAMIC SET-POINT

The regulation control allows you to modify the set-point by adding an offset value depending on the outside air temperature. To use this function, modify the values of the regulation parameters, from b08 to b14, following the information in this paragraph.PRG -> PSS -> PRG -> (enter installer password) -> PRG -> **PAr** -> PRG -> **rE**
Parameters of regulator:

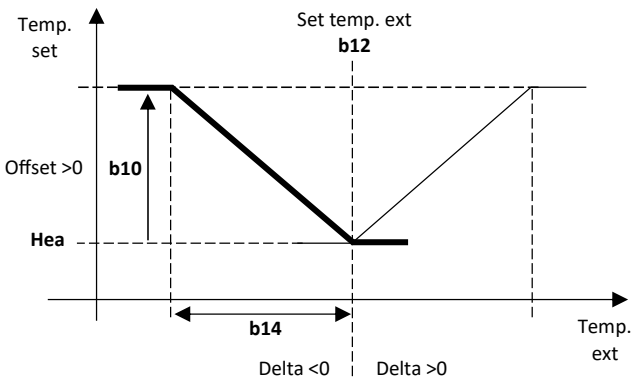
- **b08 = 1** to enable the dynamic set-point / **b08 = 0** to disable the dynamic set-point (default)
- **b09** = maximum cooling offset
- **b10** = maximum heating offset
- **b11** = Cooling outdoor temperature setting
- **b12** = Heating outdoor temperature setting
- **b13** = Cooling temperature delta
- **b14** = Heating temperature delta

Edit the setpoint depending on the outdoor temperature:

HEATING



COOLING



EXAMPLE: consider that we want to obtain the following conditions in heating mode:

- set-point of 28°C with external temperature of 18°C
- set-point of 45°C with external temperature of 2°C

Set Hea = 28 e b08 = 1, while the other parameters will be calculated as follows:

- b10 = 45 – 28 = 17
- b12 = 18
- b14 = 2 – 18 = -16

EXAMPLE: consider that we want to obtain the following conditions in cooling mode:

- set-point of 12°C with external temperature of 25°C
- set-point of 7°C with external temperature of 35°C

Set Coo = 12 e b08 = 1, while the other parameters will be calculated as follows:

- b09 = 7 – 12 = -5
- b11 = 25
- b13 = 35 – 25 = 10

7. SET-POINT MODIFICATION FROM ANALOGUE INPUT

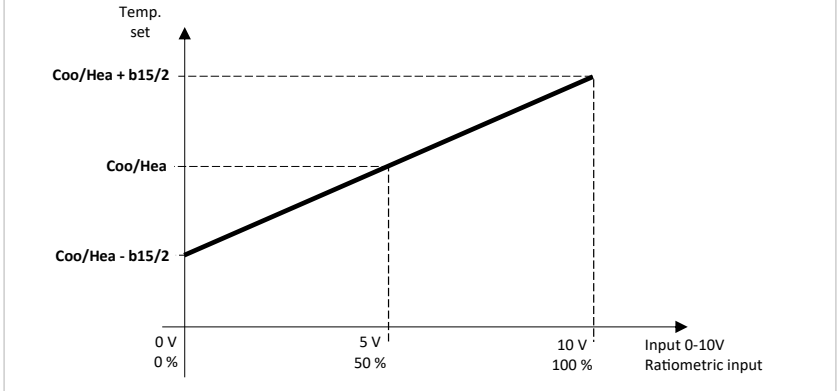
Another type of regulation allows the set-point to be modified by adding (or subtracting) a value according to the voltage input ST11. To enable this function it is necessary to connect the signal between the terminals indicated in chapter 5 and set the parameter H22 = 40. To use this function, change the values of the following control parameters:

- **b15** = Maximum decalibration value
- **b20 = 0** for input type 0-10 V (default)
- **b20 = 1** for ratiometric input

Correction calculation with input 0-10 V (b20=0):

- With input at 0 Volt the current set-point will be: set (Coo/Hea) – b15/2
- With 5 Volt input the set-point will be the one set (Coo/Hea)
- With an input at 10 Volt the current set-point will be: set (Coo/Hea) + b15/2

SETPOINT FROM ANALOGUE INPUT



Correction calculation with ratiometric input (b20=1):

- With input at 0% the current set-point will be: set (Coo/Hea) – b15/2
- With input at 50% the set-point will be that set (Coo/Hea)
- With input at 100% the current set-point will be: adjusted set (Coo/Hea) + b15/2

NOTE: In cooling mode, considering the default set-point set at 7°C, parameter b15 must not assume a value equal to or greater than 6 to prevent the new set-point from assuming values lower than the activation threshold of the antifreeze resistors (4°C).

8. CIRCULATOR

The circulator of the unit can be set in the following operating modes. To configure the circulator is necessary to access the relevant parameter.
PRG -> PSS -> PRG -> (insert installer password) -> PRG -> **PAr** -> PRG -> **PUP**
The circulator can be configured to operate independently of the compressor or on call:

- **P03 = 0** for continuous operation (default)
- **P03 = 1** for operation on thermoregulator call

NOTE:
The circulator switches off immediately in case of a pump blockage alarm, including a manual reset flow switch alarm
The circulator remains on with automatic reset flow switch alarm even if the compressor is switched off.
The circulator is always switched on if the anti-freeze resistors are operating or if the anti-freeze hydraulic pump operation is activated.

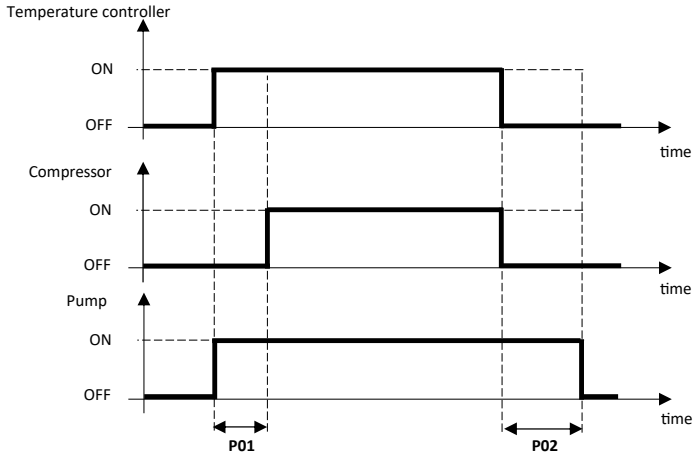
8.1 CONTINUOUS OPERATION

The factory configuration of the unit is for continuous operation (P03 = 0). In this mode, the circulator is only switched off with the unit in OFF, in all other cases it is on. When the unit goes into stand-by, the circulator is switched off with a delay that can be set by parameter P02 in tenths of a minute (default P02 = 20, i.e. 2 minutes).

8.2 OPERATION ON CALL BY TEMPERATURE CONTROLLER

Subsequently, the compressor is also switched on, after a delay time of P01 seconds (default P01 = 30) since the pump was switched on. In the switch-off phase, the pump is switched off with a delay time of P02 minutes (default P02 = 2) from the switch-off of the compressor.

OPERATION ON CALL FROM TEMPERATURE CONTROLLER



8.3 OPERATING ON CALL BY TEMPERATURE CONTROLLER WITH PERIODIC ACTIVATION

With P03 = 1, you can also configure the circulator to run periodically according to the following parameters:

- **P16** = Periodic activation time interval (in minutes)
- **P17** = Pump activation time (in seconds)

In practice, when the pump is turned off for satisfied thermoregulation, the countdown defined by parameter P16 begins and at each interval of time P16 the circulator is turned on for a time equal to P17 seconds.
The function is disabled with P17 = 0 (default). The periodic function is suspended in the case of antifreeze mode intervention.

8.4 OPERATION WITH INTEGRATION RESISTOR ACTIVE

If parameter r33 > 0, the circulator can also be switched on when the system and/or sanitary heating element is activated.

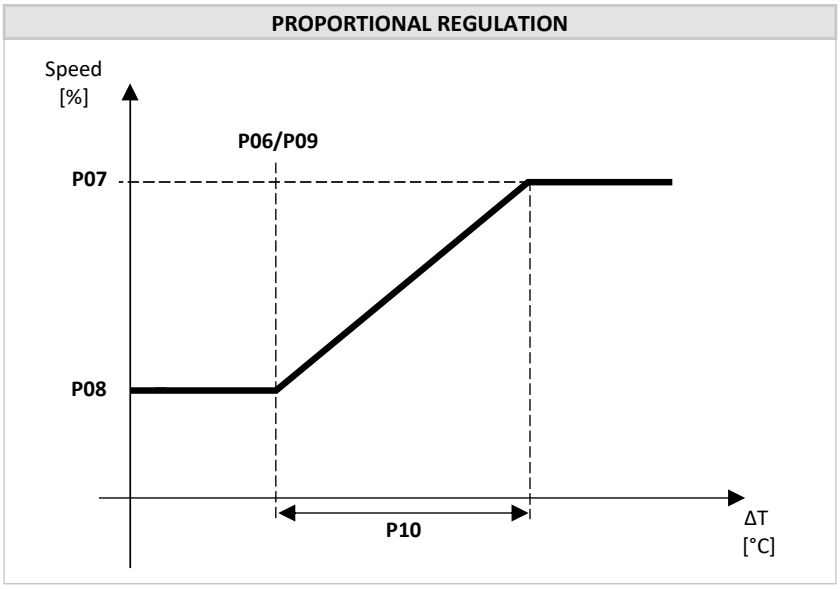
8.5 ANTIFREEZE HYDRAULIC PUMP OPERATION

In this mode, the circulator is always on. Antifreeze operation is enabled if the control temperature falls below P04 (default P04 = 5.0°C), it is disabled if the control temperature rises above P04 + P05 °C (default P05 = 2.0°C).

8.5.1 PROPORTIONAL REGULATION

In cooling or heating mode, the speed of circulator changes depending on the temperature difference between the inlet water and outlet water of the heat exchanger according to the diagram below, where:

- **P06** = Set ΔT water inlet/outlet in heating mode (default P06 = 4,0°C)
- **P07** = Maximum speed (100%)
- **P08** = Minimum speed
- **P09** = Set ΔT water inlet/outlet in cooling mode (default P09 = 2,0°C)
- **P10** = Modulating pump Delta (default P10 = 3,0°C)



In practice, in cooling mode, if the temperature difference between the inlet and outlet is greater than P09 + P10, the circulator runs at maximum speed, but if the difference is less than P09 - 0.2°C, it runs at minimum speed; in the remaining cases, the pump modulates the speed proportionally. In heating mode, the same considerations apply, replacing parameter P06 with parameter P09.
In sanitary production the circulator always runs at maximum speed.

8.6 SYSTEM VENTING

The control allows the use of a manual system venting function with the circulator at maximum speed.
To enable the function the operations to follow are:

- Set unit to OFF
- Access with maintenance privilege PRG -> PSS -> PRG -> (enter installer password) -> PRG
- Press **UP** and **DOWN** simultaneously for 3 seconds.

It is possible to exit the system venting cycle manually by pressing the **MODE/ESC** button,or by pressing **UP** and **DOWN** keys simultaneously for 3 seconds.

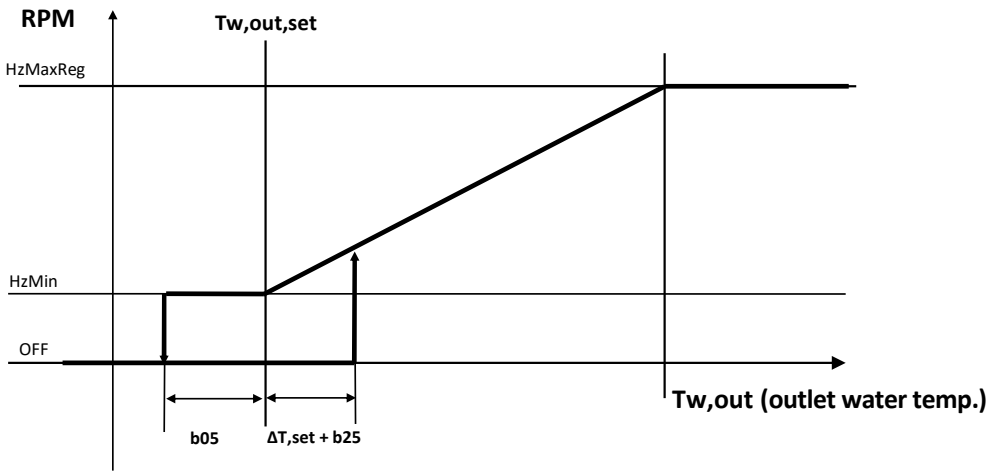
CAUTION: during this function the flow switch alarm is disabled, the maintenance technician must guarantee that there is water inside the system.

9. COMPRESSOR ON/OFF LOGIC

The restart of compressors is in operation of a set point refered to the inlet and outlet water temperature. It is based on calculation of **ΔT,set** that is the difference between outlet and inlet water temperatures, detected while the compressor for thermoregulation is turning off.

9.1 REGULATION IN COOLING MODE

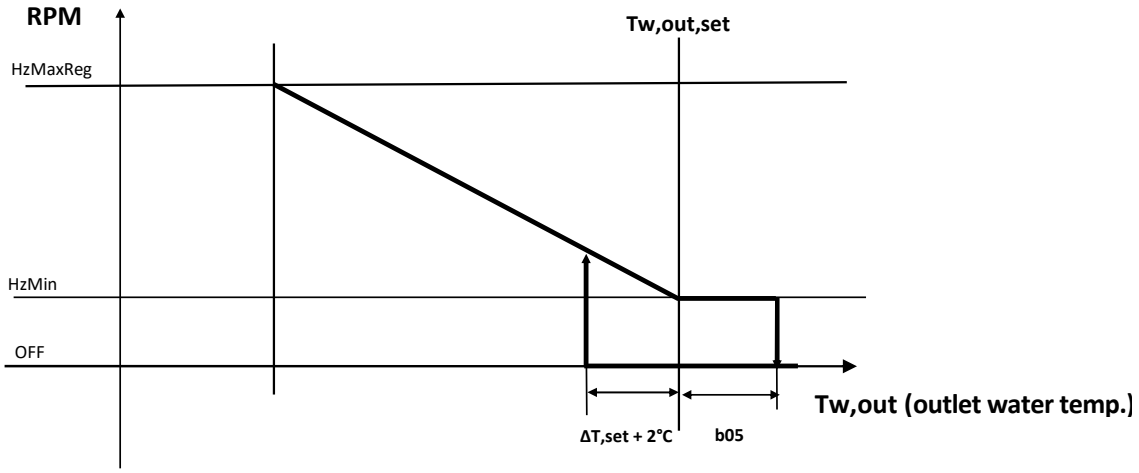
- **Tw,out,set** = setpoint in cooling mode
- **ΔT,set** = Tw,out,set – Tw,in,set
- **b05** = compressor delta cut-off set = 0,2°C (default)
- **b25** = delta cut-on regolazione compressor set = 2°C



- The compressor shutdown is set by the parameter b05: the compressor shutdown when **Tw,out < Tw,out,set - b05**
- The compressor restart when **Tw,out > (Tw,out,set + ΔT,set + b25) EXCEPTION**: se **ΔT,set > 8°C**, the compressors restart when the discharge probe temperature is lower than the setpoint 10°C:**Tw,out > (Tw,out,set + 10°C)**

9.2 REGULATION IN HEAT MODE

- **Tw,out,set** = setting setpoint in heat mode
- **ΔT,set** = Tw,out,set – Tw,in,set
- **b05** = compressor regulation delta cut-off = 0,2°C (default)
- **b25** = compressor regulation delta cut-on= 2°C



- The compressor shutdown is regulated by parameter b05: the compressor shutdown when **Tw,out > Tw,out,set + b05**
- The compressor restart when **Tw,out < (Tw,out,set - ΔTset – b25)**
  EXCEPTION: if **ΔT,set > 8°C**, the compressors restart when the discharge probe temperature is lower than the setpoint 10°C: **Tw,out < (Tw,out,set - 10°C)**

10. FAN

The unit's fan is controlled depending on the operation of the compressor. Ventilation is controlled according to the condensing pressure in cooling mode or according to the evaporating pressure in heating mode. Pre-ventilation takes place every time the compressor is switched on and off.

10.1 SILENCED VENTILATION

Configuring a digital input DI9 with parameter H53=25 it is possible to manage the function of silent ventilation management.

Parameter	VALUE	Function
H53	0 (default)	Function disabled
	25	Open contact -> standard mode Close contact -> silenced mode

With the function active, the noise, output and power of the unit are limited, for additional information see the installer user manual.

11. COMPRESSOR CRANKCASE RESISTENCE

The crankcase resistence is activated if the compressor has been off for at least 30 minutes and if the temperature measured by the discharge probe is below 20 °C (with a hysteresis of 2.0 °C). When the compressor restarts, the crankcase resisitence is disabled.

12. ENABLING DOMESTIC HOT WATER PRODUCTION

To enable the production of domestic hot water it is necessary to connect a probe to the analogue input ST6 to be positioned inside the tank (the relative terminals are indicated in chapter 5 or on the electrical diagram). Once the DHW temperature probe has been positioned and connected, it must be enabled by setting parameter **H17 = 6**.
The DHW valve must be connected to digital output DO6 (see Chapter 5), and the relative control must also be enabled with parameter **H84 = 6** (default).
The domestic hot water (DHW) function is controlled through parameter **H10**:

Parameter	VALUE	Function
H17	6	DHW temperature probe
H84	6	DHW valve control

Parameter	VALUE	Function
H10	0 (default)	Function disabled
	1	Function active in heating and cooling mode. The remote on/off function does not disable DHW production.
	2	Function active in heating and cooling mode. The remote on/off function disables DHW production.
	3	Function active only in heating mode The remote on/off function disable DHW production.
	4	Function active only in heating mode The remote on/off function disable DHW production
	5	Function active only in cooling mode The remote on/off function not disable DHW production
	6	Function active only in cooling mode The remote on/off not disable DHW production

If the DHW temperature is lower than the DHW set (set to 48°C by default), the machine activates the DHW valve and the compressor is set to the maximum frequency, starting the modulation one degree before the set and switching off one degree after the set. Once the set point has been reached, the valve returns to rest mode and the compressor starts to regulate normally. Switching from winter operation to domestic hot water operation, the compressor does not switch off, while switching from summer operation to domestic hot water operation the compressor is switched off to wait for the safety time.
If **H10** = 1/2/3, switching the unit off remotely (remote on/off, see paragraph 13.1) does not affect the DHW operation
If **H10** = 2/4/6, the remote on/off function disables domestic hot water production and operation of the unit in heating or cooling mode.

NOTE: defrosting during winter operation is always performed on the user side, never on the domestic hot water tank.

12.1.1 MEMORISING THE PROBE IN HEATING MODE

When switching from the system to DHW, the reference probe changes from "water outlet probe" to "DHW probe". The display on the machine shows the temperature read by the probe located inside the DHW tank; once the DHW cycle is over, the display returns to show the water outlet temperature. In heating mode, before entering DHW mode, the last value read by the flow probe of the heat pump is memorised. Once the DHW temperature control is satisfied, the reference temperature on the system side returns to the previously memorised one.
La funzione di memoria si interrompe:

- when the temperature read by the probe becomes lower than the stored value;
- or a time equal to **b06** seconds has elapsed (default b06 = 45).

12.1.2 HEATING MODE ON DHW STORAGE TANK

If parameter H130 = 1, the machine also uses the DHW storage tank for heating on the system side. Under these conditions, the DHW valve output is also active during hot operation. The valve is deactivated during defrosting and in cold mode. In this mode (H130 = 1) it is possible to make the domestic hot water integration resistor also act as integration resistor on the system side.le to make the DHW integration resistor also act as an integration resistor on the plant side.

13. REMOTE FUNCTION

The terminal block has digital inputs to control the unit via an external consent (see chapter "SYSTEM RESOURCES").

13.1 ON/OFF

The function is enabled by default on digital input DI3 (parameter **H47 = 2**), to activate it, the electrical bridge must be removed from the terminal block. With the contact open, the unit will be in stand-by mode, in this state the message E00 will appear on the display on the machine. When the contact is closed, the machine comes out of stand-by and the circulator is activated for 2 minutes.
The function is disabled by reinserting the electrical bridge or setting parameter H47 = 0.

NOTE: If the remote off command is activated during defrosting, the unit finishes defrosting and then switches to OFF mode.

13.2 SUMMER/WINTER MODE CHANGE

The control offers the possibility to remotely manage the operating mode of the machine in heating or cooling mode.
The function can be set on digital input is settable DI2 via parameter **H46**:

Parameter	VALUE	Function
H46	0 (default)	Function disabled
	3	Open contact -> cooling mode Clesd contact -> heating mode

The polarity of the digital input DI2 can be reversed by setting H75 = 2.

13.3 DHW CALL FROM DIGITAL INPUT

If DHW operation is enabled and parameter **H51 = 28**, is set, as an alternative to using the DHW temperature probe (H17 = 0), the DHW function can be activated by closing/opening digital input DI7. The unit goes into DHW mode when the contact closes and exits DHW production when the contact opens.
The polarity of digital input ID7 can be inverted by setting H75 = 64.

NOTE: this function is not activated if the double set-point management is used.

This function is recommended when using two or more heat pumps in cascade, hydronically connected to the same domestic hot water storage tank. In this case, the activation of the domestic hot water function can be set on the first machine via the DHW probe of the tank, while the other machines are automatically enabled thanks to the consent given by the digital input.

CAUTION:The SAN setpoint of the heat pump is not considered; management of this setpoint is delegated to the designer, who must take into account the DHW protection and the configuration of the entire system.

13.4 SYSTEM WATER REMOTE PROBE

In some system solutions (e.g.: heat pump in parallel with the boiler on the same hydronic circuit and exclusion diverter valve) it may be necessary to enable a temperature probe of the system so that the on-board control can process the management correctly. The system remote probe is activated by setting parameter **H18 = 41**.
The system remote probe thermoregulates the heat pump only during the compressor start-up phase, the switch-off is managed by the probe on the heat pump delivery.
In heating mode, the call is active if the following conditions are verified:

- Flow probe temperature < **Hea – 2°C**;
- Temperature of the system remote probe < **Hea – b22** (default b22 = 5,0°C).

In cooling mode the call is active if the following conditions occur

- Flow probe temperature > **Coo + 2°C**;
- Temperature of the system remote probe > **Coo + b22** (default b22 = 5,0°C).

14. DEFROSTING CYCLE

The defrost cycle is a function active only in heat pump mode and is used to prevent the formation of ice on the surface of the finned coil. The formation of ice on the evaporator, which occurs more frequently at very low external ambient temperatures, not only considerably reduces the thermodynamic efficiency of the machine, but also leads to the risk of damage to the machine itself.

NOTE: if the remote off command is activated during defrosting, the unit finishes defrosting and then switches to OFF mode.

15. DOUBLE SET-POINT

This function introduces a second working set-point on the plant side, both in cooling and heating mode.
The user terminal board allows a consent to be connected to switch from the first to the second set-point and configured at digital input DI9 with parameter **H53 = 26**. The valve,on the other hand, is connected in the terminal board to digital output DO7 and is configured via parameter **H85**.

Parameter	VALUE	Function
H53	26	Call for second set-point
H85	25	3-way valve for radiant panels
H129	0	Function disabled
	1	Function configured but not active
	2	Enabled only in cooling mode
	3	Enabled only in heating mode
	4	Enabled in cooling and heating mode

16. MINIMUM HZ FUNCTIONS

Configuring parameter L02=1 and L03≠0 reduces the nominal operating Hz of the compressor.

Parameter	VALUE	Function
L02	0	Function not active
	1	Enable Hz minimum
L03	0	Function not active
	1	Function active only in cooling mode
	2	Function active only in heating mode
	3	Function active only in sanitary mode
	4	Function active in cooling and sanitary mode
	5	Function active in heating and sanitary mode
	6	Function in cooling and heating mode
	7	Function always active

With the function active, the output and power of the unit are limited, for additional information see the installer user manual.

17. MINIMUM HZ FUNCTIONS

When the function is activated, the power of the unit is increased, for information contact the company.

18. AUXILIARY RESISTANCES

In some system solutions it may be necessary to use an integration heater for the system and/or for the sanitary area. This is an additional resource for heating in case the compressor cannot meet the set in a reasonable time. The resistor controller only operates in heating mode and if **r10 = 1**.
To define how the integration resistors are to operate, parameter **r24** must be se:

- **r24 = 0** for integration resisitors not used;
- **r24 = 1** for use of system integration resisitor;
- **r24 = 2** for use of sanitary integration resisitance;
- **r24 = 3** for use of both the system integration resistor and the sanitary integration resistor.

18.1 SYSTEM RESISTANCE

The system resistance must be connected to the digital output DO3 and can be configured by setting parameter **H81 = 22**.
If the regulation temperature remains lower than the hot water set-point **Hea – r11** (°C) for a time equal to **r12** the integration resistor is activated according to the operation of the machine in the combined or replacement bands.
The resistor is also activated if the control temperature remains below the water set-point **Hea – r11** (°C) and the machine is in lockout due to the intervention of an alarm. It switches off when the machine exits the alarm block.
Setting **r21 = 1**, during the defrost cycle, if required (temperature lower than **Hea - r11**), the system resistor is activated without waiting for the time defined by **r12**.
The resistor switches off when the set-point is reached (also taking into account any offset set with parameters **r29** or **r30**).

Parameter	VALUE	Function
H81	22	System integration resistance
r10	1	Enabling of system resistors
r11	5 (default)	Delta resistances in system integration (in tenths of °C)
r12	10 (default)	System integration activation delay (in minutes)
r21	1	Enabling resistors during defrosting
r24	1/3	Type of use resistors

18.2 SANITARY RESISTANCE

This function can be activated as an alternative to the system integration resistance. The DHW resistance must be connected to digital output DO3 and can be configured by setting parameter **H81 = 26**, in addition the DHW function must be active.
The resistance is activated if the production of domestic hot water lasts longer than **r16** (minutes) or if the machine goes into lockout due to the intervention of an alarm. It switches off when the machine finishes DHW production (also taking into account any offset on the set-point set with parameter **r31**).

Parameter	VALUE	Function
H81	26	DHW integration resistor
r15	1	Enabling of DHW resistors
r16	10 (default)	Sanitary integration activation delay (in minutes)
r24	2/3	Type of use of resistance

18.3 INDIVIDUAL SYSTEM/HEALTH INTEGRATION RESISTENCE

Configuring the DHW resistance it is also possible to use it as a system resistor, by setting the parameter **r15 = 2** and **r24 = 3**.
In this way, in the event of a request for system integration, the resistance declared as DHW integration is activated, thus making it possible to have a single integration resistance for the system, DHW and defrosting.

18.4 INTEGRATION RESISTANCE SELECTION MODE

The resistors can be activated simultaneously if **r14 = 0** (default), otherwise the priority of the order of activation of the system-side and DHW-side integration resistors can be set, in particular the configurations are:

- **r14 = 1** for resistance activation in exclusion of each other;
- **r20 = 0** for system priority (the domestic heating element is activated only if the system-side thermoregulation is satisfied);
- **r20 = 1** sanitary priority (the system resistor is activated only if the thermoregulation on the sanitary side is satisfied).

18.5 CIRCULATOR MANAGEMENT WITH ACTIVE RESISTANCE

The circulator of the heat pump can be activated when the plant and/or DHW integrations resistences are active with the compressors not running (by substitution, by alarm or by integration in bracket II or III):

- **r33 = 0** for activation on request of the compressors or for any boiler request.
- **r33 = 1** for activation with system resistance active.
- **r33 = 2** for activation with sanitary heating element active.
- **r33 = 3** for activation with system or sanitary resistor active.

The circulator switched off after post-pumping (P02).

18.6 BOILER ENABLING

Function which can be activated instead of managing the double setpoint.
This is an additional resource to enable the boiler in integration or substitution of the heat pump.
The relative digital output for enabling the boiler is DO7, it can be configured by setting parameter **H85 = 29**.
Define the mode of use by setting parameter **r23**:

- **r23 = 0** (default) for boiler not used (priority of resistor intervention);
- **r23 = 1** for boiler use on system only (priority of resistor intervention);
- **r23 = 2** for boiler use only in DHW mode (priority intervention of the heaters);
- **r23 = 3** per utilizzo caldaia sia in sanitario sia su impianto (priorità di intervento delle resistenze);
- **r23 = 4** for boiler use in DHW and on system (priority intervention of resistors);
- **r23 = 5** for boiler use only in DHW mode with priority;
- **r23 = 6** for boiler use in DHW mode and on system with priority;

Define the boiler equipment by setting parameter **r32**:

- **r32 = 0** for boiler without circulator with thermoregulation charged to the heat pump
- **r32 = 1** for boiler with autonomous circulator with thermoregulation charged to the heat pump
- **r32 = 2** for boiler without circulator with autonomous thermoregulation
- **r32 = 3** for boiler equipped with circulator with autonomous thermoregulation

Parameter	VALUE	Function
H81	29	Boiler enabling
r10	1	Enabling in system integration
r12	10 (default)	System integration activation delay (in minutes)
r15	1	Enabling of sanitary integration
r16	10 (default)	DHW integration activation delay (in minutes)
r23	1 ÷ 6	Type of boiler use
r32	1 ÷ 3	Boiler equipment

18.7 LOGIC OF INTEGRATION HEATERS AND/OR BOILER IN JOINT OPERATION OR IN SUBSTITUTION OF THE HEAT PUMP COMPRESSOR

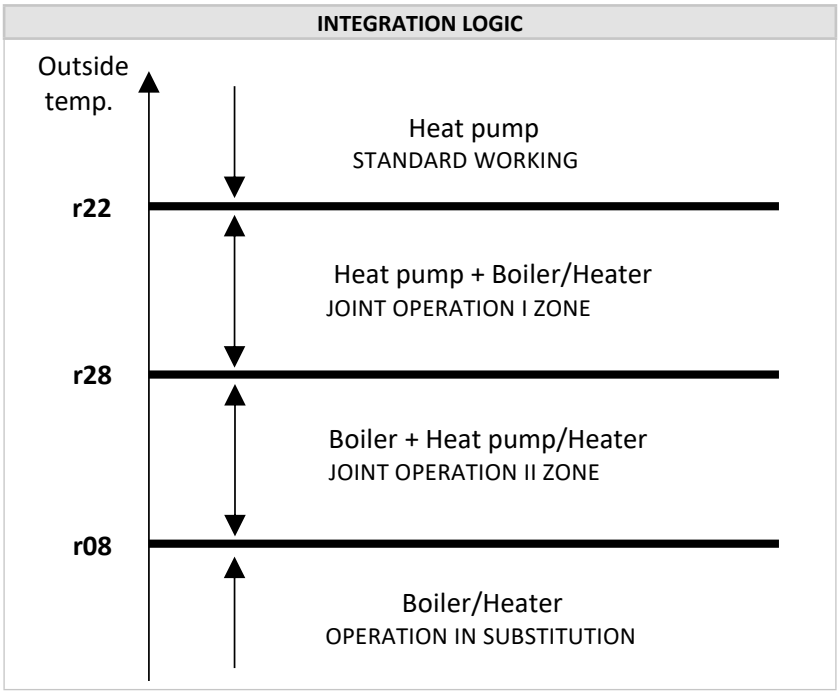
The auxiliary parts that can be used for joint or for operation in substitution are:

- boiler
- system integration resistor
- domestic hot water integration resistor

The parameters to be considered for adjusting this operating logic are:

- **r22** = set for joint operation with heat pump priority
- **r28** = set for joint operation with priority of auxiliary units
- **r08** = set for replacement operation

Considering the heating and/or DHW operating modes, there are 4 operating areas:



If it is necessary to change the values of the parameters, the formula **r22 ≥ r28 ≥ r08** must be followed.
Setting **r22 = r28** it is possible to eliminate the zone relative to joint operation 1st band; by setting **r28 = r08** it is possible to eliminate the zone relative to joint operation 2nd band; by setting **r22 = r28 = r08** it is possible to eliminate both bands relative to joint operation.
The intervention priorities of the auxiliary heaters are defined by parameters **r14**, **r20**, **r23**, **r24** (as described above).

CAUTION:Parameter r08 must not be set to a value lower than -20°C, as this could impair the operation of the unit.

18.8 OPERATION HEAT PUMP MODE

Normal operation of the heat pump in which the integration heaters and-or the boiler only intervene when a heat pump alarm is triggered.

18.9 JOINT OPERATION (I BRACKET)

If the outdoor temperature is between **r22** and **r28**, the compressor operates in synergy with the auxiliary heaters in winter or DHW mode. In this operating bracket, first the heat pump is activated and after **r12** minutes the plant side auxiliary heaters, or after **r16** minutes the sanitary side auxiliary heaters.
Operation returns to normal if the outside temperature is greater than **r22 + 1,0** °C.
Note: In the joint operation band, the boiler is thermoregulated by the system water remote probe (if active), in particular if the temperature detected by the remote probe is lower than the **Hea** setpoint,the boiler is activated, and then deactivated when the temperature detected by the remote probe is higher than **Hea** setpoint. The heat pump is also thermoregulated by the system water remote probe (as described above).
If the remote system water probe is not active, the boiler is controlled by the flow probe of the heat pump.

18.10 JOINT OPERATION (II BRACKET)

If the outside temperature is between **r28** and **r08**, the auxiliary heaters are enabled in combination with the heat pump in heating or DHW mode. In this operating range, the boiler is activated first, then the heat pump and auxiliary heaters are activated after a time defined by **r12** minutes for the system side or after **r16** minutes for the DHW sanitary.
Operation returns to normal if the temperature rises above **r28 + 1,0** °C.
Note: In the joint operation band, the boiler is thermoregulated by the remote system water probe (if active), in particular if the temperature detected by the remote probe is lower than the **Hea** setpoint,the boiler is activated, and then deactivated when the temperature detected by the remote probe is higher than **Hea** setpoint. The heat pump is also thermoregulated by the system water remote probe (as described above).
If the remote system water probe is not active, the boiler is controlled by the flow probe of the heat pump.

18.11 OPERATION IN SUBSTITUTION

If the outside temperature falls below **r08** the heat pump compressor is disabled and the auxiliary devices operate in place of it. The compressor is enabled again if the temperature rises above **r08 + r09** (default r09 = 1.0 °C).
If the auxiliary system consists of system and/or DHW resistors, they operate according to the times defined by parameters **r12** (minutes) for the system side and **r16** (minutes) for the DHW side. In the substitution operation band, it is not necessary to enable the integrations with **r10** or **r15** since the resistances must operate as a replacement for the heat pump (it is therefore sufficient to select the type of use from parameter **r24**).
If the auxiliary system is a boiler with autonomous thermoregulation (**r32** = **2** or **3**),it is enabled independently of the thermoregulation of the heat pump.
If the replacement auxiliary system is a boiler without a circulator (**r32** = **0** or **2**), the heat pump circulator is active when the boiler is enabled.
If the auxiliary system is a boiler with its own circulator (**r32** = **1** or **3**), the heat pump circulator is switched off and after **P01** (default 30 seconds) the boiler is enabled.

NOTE: in the event of water-side antifreeze protection, the circulator is still activated (or kept active).

18.12 OPERATING BANDS

The possible configurations of the integration parameters are listed in tables 1,2,3 and 4 shown below, divided by operating brackets (In the boxes relating to the parameters **rXX** are indicated the possible values of the parameters for a given order of intervention of the integrations to occur in a given operation of the machine).

TABLE 1. NORMAL OPERATING IN HEAT PUMP MODE

INTEGRATIONS INTERVENTION ORDER	STATUS	OPERATION	r10	r15	r12	r16	r23	r24
1) System integration resistence	HEAT/ HEAT+SAN	HEAT	1	0/1/2	/	/	0/2/5	1/3
1) Boiler	HEAT/ HEAT+SAN	HEAT	0/1/2	0/1/2	/	/	1/3/4/6	0/2
1) Plant integration resistence 2) After r12 minutes, boiler	HEAT / HEAT+SAN	HEAT	1	0/1/2	Set the minutes	/	1/3	1/3
1) Boiler 2) After r12 minutes, system integration resistence	HEAT / HEAT+SAN	HEAT	1	0/1/2	Set the minutes	/	4/6	1/3
1) DHW integration resistence	HEAT+SAN	SANITARY	0/1	1	/	/	0/1/4	2/3
1) Boiler	HEAT+SAN/ COOL+SAN	SANITARY	0/1	0/1/2	/	/	2/3/5/6	0/1
1) DHW integration resistence 2) After r16 minutes, boiler	HEAT+SAN	SANITARY	0/1	1	/	Set the minutes	2/3	2/3
1) Boiler 2) After r16 minutes, DHW integration resistence	HEAT+SAN	SANITARY	0/1	1	/	Set the minutes	5/6	2/3
1) System/DHW integration resistence	HEAT / HEAT+SAN	HEAT/SANITARY	1	1	/	/	0	3
1) Boiler	HEAT / HEAT+SAN	HEAT/SANITARY	0/1	0/1/2	/	/	3/6	0
1) System/DHW integration resisitence 2) After r12 minutes, boiler	HEAT / HEAT+SAN	HEAT/SANITARY	1	1	Set the minutes	Set the minutes	3	3
1) Boiler 2) After r12 minutes, system/DHW integration resistence	HEAT / HEAT+SAN	HEAT/SANITARY	1	1	Set the minutes	Set the minutes	6	3

TABLE 2. JOINT OPERATION, BRACKET 1

INTERVENTION ORDER	STATUS	OPERATION	r10	r15	r12	r16	r23	r24
1) Heat pump 2) After r12 minutes, system integration resistence	HEAT / HEAT+SAN	HEAT	1	0/1/2	Set the minutes	/	0/2/5	1/3
1) Heat pump 2) After r12 minutes, boiler	HEAT / HEAT+SAN	HEAT	0/1	0/1/2	Set the minutes	/	1/3/4/6	0/2
1) Heat pump 2) After r12 minutes, system integration resistence 3) After further r12 minutes, boiler	HEAT / HEAT+SAN	HEAT	1	0/1/2	Set the minutes	/	1/3	1/3
1) Heat pump 2) After r12 minutes, boiler 3) After further r12 minutes, system integration resistence	HEAT / HEAT+SAN	HEAT	1	0/1/2	Set the minutes	/	4/6	1/3
1) Heat pump 2) After r16 minutes, system integration resistence	HEAT+SAN	SANITARY	0/1	1	/	Set the minutes	0/1/4	2/3
1) Heat pump 2) After r16 minutes, boiler	HEAT+SAN/	SANITARY	0/1	0/1/2	/	Set the minutes	2/3/5/6	2/3
1) Heat pump 2) After r16 minutes, system integration resistence 3) After further r16 minutes, boiler	HEAT+SAN	SANITARY	0/1	1	/	Set the minutes	2/3	2/3

TABLE 2. JOINT OPERATION, BRACKET 1								
INTERVENTION ORDER	**STATUS**	**OPERATION**	**r10**	**r15**	**r12**	**r16**	**r23**	**r24**
1) Heat pump 2) After r16 minuti, boiler 3) After further r16 minutes, system integration resistence	HEAT+SAN	SANITARY	0/1	1	/	Set the minutes	5/6	2/3
1) Heat pump 2) After r12 minutes, system/DHW integration resistence	HEAT / HEAT+SAN	HEAT / SANITARY	1	1	Set the minutes	Set the minutes	0	3
1) Heat pump 2) After r12 minutes, boiler	HEAT / HEAT+SAN	HEAT / SANITARY	0/1	0/1/2	Set the minutes	Set the minutes	3/6	0
1) Heat pump 2) After r12 minutes, system/DHW integration resistence 3) After further r12 minutes, boiler	HEAT / HEAT+SAN	HEAT / SANITARY	1	1	Set the minutes	Set the minutes	3	3
1) Heat pump 2) After r12 minutes, boiler 3) After further r12 minutes, system/DHW integration resistence	HEAT / HEAT+SAN	HEAT / SANITARY	1	1	Set the minutes	Set the minutes	6	3

TABLE 3. JOINT OPERATION, BRACKET 2								
INTERVENTION ORDER	**STATUS**	**OPERATION**	**r10**	**r15**	**r12**	**r16**	**r23**	**r24**
1) Boiler 2) After r12 minutes, heat pump	HEAT / HEAT+SAN	HEAT	0/1	0/1/2	Set the minutes	/	1/3/4/6	0/2
1) Boiler 2) After r12 minues, system integration resistence 3) After further r12 minutes, heat pump	HEAT / HEAT+SAN	HEAT	1	0/1/2	Set the minutes	/	1/3	1/3
1) Boiler 2) After r12 minutes, heat pump 3) After further r12 minutes, system integration resistence	HEAT / HEAT+SAN	HEAT	1	0/1/2	Set the minutes	/	4/6	1/3
1) System integration resistence 2) After r12 minutes, heat pump	HEAT / HEAT+SAN	HEAT	1	0/1/2	Set the minutes	/	0/2/5	1/3
1) Boiler 2) After r16 minutes, heat pump	HEAT+SAN	SANITARY	0/1	0/1/2	/	Set the minutes	2/3/5/6	0/1
1) Boiler 2) After r16 minutes, system integration resistence 3) After further r16 minutes, heat pump	HEAT+SAN	SANITARY	0/1	1	/	Set the minutes	2/3	2/3
1) Boiler 2) After r16 minutes, heat pump 3) After r16 minutes, system integration resistence	HEAT+SAN	SANITARY	0/1	1	/	Set the minutes	5/6	2/3
1) System integration resistence 2) after r16 minutes, heat pump	HEAT+SAN	SANITARY	0/1	1	/	Set the minutes	0/1/4	2/3
1) Boiler 2) After r12 minutes, heat pump	HEAT / HEAT+SAN	HEAT / SANITARY	1	1	Set the minutes	Set the minutes	3/6	0
1) Boiler 2) After r12 minutes, system/DHW integration resistence 3) After further r12 minutes, heat pump	HEAT / HEAT+SAN	HEAT / SANITARY	1	1	Set the minutes	Set the minutes	3	3
1) Boiler 2) After r12 minutes, heat pump 3) After further r12 minutes, system/DHW integration resistence	HEAT / HEAT+SAN	HEAT / SANITARY	1	1	Set the minutes	Set the minutes	6	3
1) system/DHW integration resistence 2) After r12 minutes, heat pump	HEAT / HEAT+SAN	HEAT / SANITARY	1	1	Set the minutes	Set the minutes	0	3

TABLE 4. OPERATIO IN SUBSTITUTION								
INTERVENTION ORDER	**STATUS**	**OPERATION**	**r10**	**r15**	**r12**	**r16**	**r23**	**r24**
1) Boiler 2) After r12 minutes, system integration resistence	HEAT / HEAT+SAN	HEAT	0/1	0/1/2	Set the minutes	/	4/6	1/3
1) System integration resistence 2) After r12 minutes, boiler	HEAT / HEAT+SAN	HEAT	0/1	0/1/2	Set the minutes	/	1/3	1/3
1) Boiler 2) After r12 minutes, system integration resisitence	HEAT+SAN	SANITARY	0/1	0/1/2	/	Set the minutes	5/6	2/3

TABLE 4. OPERATIO IN SUBSTITUTION								
INTERVENTION ORDER	**STATUS**	**OPERATION**	**r10**	**r15**	**r12**	**r16**	**r23**	**r24**
1) Sanitary integration heater 2) After r12 minutes, boiler	HEAT+SAN	SANITARIO	0/1	0/1/2	/	Set the minutes	2/3	2/3
1) Boiler 2) After r12 minutes, system/ sanitary integration resistence	HEAT / HEAT+SAN	HEAT/SANITARY	0/1	0/1/2	Set the minutes	Set the minutes	6	3
1) System/ sanitary integration resistence 2) After r12 minutes, boiler	HEAT / HEAT+SAN	HEAT/SANITARY	0/1	0/1/2	Set the minutes	Set the minutes	3	3
1) Boiler	HEAT / HEAT+SAN	HEAT	0/1	0/1/2	Set the minutes	/	1/3/4/6	0/2
1) System integration resistence	HEAT / HEAT+SAN	HEAT	0/1	0/1/2	Set the minutes	/	0/2/5	1/3
1) Boiler	HEAT+SAN	SANITARY	0/1	0/1/2	/	Set the minutes	2/3/5/6	0/1
1) Sanitary integration resistence	HEAT+SAN	SANITARY	0/1	0/1/2	/	Set the minutes	0/1/4	2/3
1) Boiler	HEAT / HEAT+SAN	HEAT / SANITARY	0/1	0/1/2	Set the minutes	Set the minutes	3/6	0
1) System/DHW integration resistence	HEAT / HEAT+SAN	HEAT / SANITARY	0/1	0/1/2	Set the minutes	Set the minutes	0	3

Table 5 shows the settings to be configured to enable the integrations COOL + SAN mode.
In this case, the only integration that can be activated is the domestic hot water integration resistor and the division into operating bands does not apply. The DHW integration resistor is activated when the set-point is satisfied after **r16** minutes from the compressor start-up or when the set-point is not satisfied with the machine in lockout or alarm.

TABLE 5.OPERATION IN COOL+SAN MODE (DHW RUNNING)								
INTEGRATION INTERVENTION ORDER	**STATUS**	**OPERATION**	**r10**	**r15**	**r12**	**r16**	**r23**	**r24**
1) DHW integration resistance	COOL+SAN	SANITARY	0/1	1	/	Set the minutes	0/1/2/3/4/5/6	2/3

Table 6 shows the behaviour of the plant and DHW integration heaters in all the operating modes of the unit.

TABLE 6. INTEGRATION HEATERS OPERATION			
STATUS	**OPERATION**	**PLANT INTEGRATION RESISTENCE**	**DHW INTEGRATION RESISTENCE**
HEAT+SAN	HEAT	Works as indicated in TABLES 1, 2, 3 and 4.	DHW thermoregulation takes precedence over the system thermoregulation, so if the thermoregulation requires it, the machine switches to "DHW" operation and the DHW integration resistor behaves as indicated in TABLES 1, 2, 3 and 4.
HEAT+SAN	SANITARY	Only if all 3 of the following conditions are met: system heater output configured, **r24 = 1/3**,remote system water temperature probe present and configured. the system integration resistor is activated in the following cases: • after **r12** minutes from the beginning of its previously activated count in "HEAT" mode (see previous line); • if not already activated its counting in the previous "HEAT" operating mode, after **r12** minutes from the thermoregulation request. In HEAT mode, with remote probe not configured, the plant integration resistor is deactivated or its counting is interrupted. With open remote on-off contact, the plant integration resistor is deactivated.	Works as indicated in TABLES 1,2,3 and 4.
COOL+SAN	SANITARY	Not active	Works as indicated in TABLE 5.
COOL+SAN	COOL	Not active	Not active

18.13 AUXILIARY SYSTEMS OFFSET MANAGEMENT

Setting offsets, it is possible to establish that the boiler and/or integration resistors (depending on the selected resources and priorities) have a higher setpoint in heating or DHW mode than the heat pump:

- **r29** = temperature offset for boiler and system resistors first set point (**Hea**);
- **r30** = Temperature offset for boiler and system resistors second set point (**Hea2**);
- **r31** = temperature offset for boiler and domestic hot water heaters (**San**).

In this way the heat pump will stop at the set point and the thermal jump, according to the set offset, will be borne by the boiler and/or the integration resistors.

19. ANTIFREEZE PROTECTION RESISTANCES (IF KA ACCESSORY IS PRESENT)

In units with KA accessory, this function is active from the factory configuration. The kit consists of an antifreeze heater positioned on the exchanger on the system side and a heating cable placed on the base of the unit. The installer can modify the operation of the antifreeze resistors by accessing the relative parameter menu:
PRG -> PSS -> PRG -> (enter installer password) -> PRG -> **PAr** -> PRG -> **Fro**
In heating mode, the water antifreeze heater is activated when the flow water temperature falls below **r02** (default r02 = 4,0°C), it is switched off when the temperature measured by the outlet water probe exceeds **r02 + r06** °C.
If the unit is in OFF or cooling mode, the water antifreeze heater is activated when the flow water temperature falls below **r03** (default r03 = 4,0°C), it switches off when the temperature measured by the outlet water probe exceeds **r03 + r06** °C.
The crankcase heater, on the other hand, switches on when the outside air temperature falls below 3°C and switches off when the outside temperature exceeds 5°C.

20. PARTIAL RECOVERY WITH DESUPERHEATER (IF DS ACCESSORY IS PRESENT)

This option allows to produce free hot water through partial heat recovery by desuperheating the gas from the compressor outlet. Units with DS accessory are equipped with a control expansion board, which allows the connection of a water temperature probe for DS to activate the call for recovery.
To enable operation, the following parameters must be set and the DS water temperature probe must be connected to terminal XC-121.1/12.2:

Parameter	VALUE	TERMINAL	Function
rE01	1		DS enabled in chiller mode
H17	6	XC-121.1/12.2	DS water temperature sensor

Recovery is enabled for operation if all the following conditions are met:

- Compressor in operation
- Defrosting is not in progress and is not counting to enter defrost mode.
- There are no safety controls or restrictions active

The recovery call is activated if the temperature detected by the probe falls below the setpoint **San – 4,0**°C and is deactivated when the temperature exceeds the setpoint **San**.
For more information see the technical bulletin of the unit.

NOTE: The partial recovery function does not activate if a defrost is in progress or if the countdown to enter defrost is in progress.

21. LOGICS THAT CAN BE ACTIVATED WITH GI MODULE - SYSTEM MANAGEMENT (ACCESSORY)

If the System Management kit (optional) is present, a second control is located inside the electrical panel that acts as an I/O resource expansion module. With this second control it is possible to increase the number of logics that can be managed by the main control; in particular, these logics are used for system management and are listed below:

Parameter	VALUE	Function
H86	9	Compressor operation signalling
H87	24	Alarm signalling
H88	47	Machine block signalling
H89	31	*Plant season signalling
H90	21	*Defrosting in progress signalling

(*) only for heat pump units

22. PERMITTED CONFIGURATION TABLES

Below is a table of user and installer parameters including all the permitted configurations. Not all the configurations listed can be selected at the same time. The values listed below may be subject to updates, in case of doubt please contact the company.

CAUTION:
• All operations with INSTALLER visibility must be carried out by QUALIFIED PERSONNEL.
• Values that differ from the default values may compromise the correct operation of the machine; if in doubt about the value to be set, contact the head office.
• The company excludes all contractual and extra-contractual liability for damage caused to persons, animals or things, due to installation, adjustment and maintenance errors, improper use or partial or superficial reading of the information contained in this manual.
• No responsibility is accepted for damage or malfunctions caused by changes to the factory parameters made by third parties who have not been expressly authorised to do so.

Parameter	Description	Unit	Default	Range	Visibility	Allowed configurations:	
						Description	Notes
Coo	First cooling setpoint	°C	7.0	25÷Coo2	U		
Hea	First heating setpoint	°C	45.0	Hea2÷H01	U		
San	Sanitary setpoint	°C	48.0	25÷H01	U		If sanitary function active
Coo2	Second cooling setpoint	°C	18.0	Coo÷25	U		
Hea2	Second heating setpoint	°C	35.0	25÷Hea	U		
H01	Maximum value in heating setpoint	°C	60.0	-50÷80	I		
H04	Minimum value in cooling setpoint	°C	5.0	-50÷80	I		
H10	Sanitary function enabling	/	0	0÷6	I	See par. .	
H17	Analogue input configuration ST6	/	0	0÷49	I	0 = Input disabled 6 = Domestic hot water probe/DS	
H18	Analogue input configuration ST7	/	0	0÷49	I	0 = Input disabled 41 = Remote water temperature probe	
H22	Voltage input configuration 0-10V DC Analogue ST11	/	0	0÷30	I	0 = Input disabled 40 = System setpoint decalibration	
H46	Digital input configuration ID2	/	0	0÷30	I	0 = Input disabled 3 = Summer/winter change mode	
H47	Digital input configuration ID3	/	0	0÷30	I	0 = Input disabled 2 = Remote On / Off	
H51	Digital input configuration ID7	/	0	0÷30	I	0 = Input disabled 28 = DHW thermostat call	
H53	Digital input configuration ID9	/	0	0÷30	I	0 = Input disabled 25= silenced ventilation 26 = double set-point call	
H75	Digital inputs polarity	/	0	0÷255	I	0 = Digital inputs N.A. 1 = ID1 polarity inverted 2 = ID2 polarity inverted 4 = ID3 polarity inverted 8 = ID4 polarity inverted 16 = ID5 polarity inverted 32 = ID6 polarity inverted 64 = ID7 polarity inverted 128 = ID8 polarity inverted	
H76	Digital inputs polarity	/	0	0÷255	I	0 = Digital inputs N.A. 1 = ID9 polarity inverted 2 = ID10 polarity inverted 4 = ID1E1 polarity inverted 8 = ID2E1 polarity inverted 16 = ID3E1 polarity inverted 32 = ID4E1 polarity inverted 64 = ID5E1 polarity inverted 128 = ID6E1 polarity inverted	
H77	Digital inputs polarity	/	0	0÷255	I	0 = Digital inputs N.A. 1 = ID7E1 polarity inverted 2 = ID8E1 polarity inverted 4 = ID9E1 polarity inverted 8 = ID10E1 polarity inverted	
H83	Output configuration In voltage DO5	/	22	0÷47	I	0 = Output disabled 25 = Double set-point valve 29 = Boiling enabling	
H84	Output configuration In voltage DO6	/	6	0÷47	I	0 = Output disabled 6 = Sanitary valve	
H126	Serial address	/	1	1÷200	I	In the cascade configuration, assign a different address to each control.	
H129	Enable second setpoint	/	0	0÷4	I	See par. .	
H130	Heating with DHW storage tank	/	0	0÷1	I	0 = Normal operation 1 = In Heat, machine always turned towards DHW	
A08	Antifreeze alarm activation setting	°C	3	-127÷127	I		Different values can compromise the correct operation of the machine
b04	Radiant panels valve switching time	sec	30	0÷600	I		Different values may compromise the correct operation of the machine.
b05	Compressor cut-off hysteresis	°C	0.2	0÷255	I		
b06	Transient hot sanitary output	sec	45	0÷255	I		
b07	PI regulator integral time	sec	150	0÷255	I		

Parameter	Description	Unit	Default	Range	Visibility	Allowed configurations:	
						Description	Notes
b08	Enable dinamic setting	/	0	0÷1	I	See par.	
b09	Maximum cooling offset	°C	3.0	-50.0÷80.0	I	See par.	
b10	Maximum heating offset	°C	-3.0	-50.0÷80.0	I	See par.	
b11	Cooling outdoor temperature setting	°C	25	-127÷127	I	See par.	
b12	Heating outdoor temperature setting	°C	15	-127÷127	I	See par.	
b13	Cooling temperature delta	°C	-10.0	-50.0÷80.0	I	See par.	
b14	Heating temperature delta	°C	10.0	-50.0÷80.0	I	See par.	
b15	0-10V analogue input setting decalibration band	°C	5.0	0.0÷10.0	I	See par.	
b20	Input enabling 0-10V / ratiometric	/	0	0÷1	I	0 = Input 0-10V 1 = Ratiometric inut	
b22	Plant probe temperature control cut-off hysteresis	°C	5.0	0.0÷25.5	I		See par.
b25	Compressor cut-on hysterisis	°C	2.0	0.0÷25.5	C		
P01	Pump ON compressor OFF delay	sec	30	0÷255	I		
P02	Pump OFF compressor OFF delay	min	2.0	0÷25.5	I		
P03	Pump operating mode	/	0	0÷1	I	See par.	The pump is always on if the antifreeze resistances are active.
P04	Pump setting in antifreeze	°C	5	-15÷15	I	See par.	
P05	Pump hysteresis in antifreeze	°C	2.0	0.0÷15.0	I	See par.	
P09	Modulating pump inlet/outlet water delta T setting	°C	2.0	0÷15	I	See par.	
P16	Interval between 2 periodical activations of the pump	min	0	0÷600	I	See par.	
P17	Operating time of the pump in periodical mode	sec	0	0÷255	I	See par.	
r02	Antifreeze heaters setpoint in heating mode	°C	4	3÷6	I		Only change if glycol water is present. Contact company.
r03	Antifreeze heaters setpoint in cooling mode	°C	4	3÷6	I		Only change if glycol water is present. Contact company.
r06	Antifreeze heaters delta	°C	2.0	0.0÷25.5	I		Only change if glycol water is present. Contact company.
r08	Operation in substitution upper limit	°C	-20	-20÷50	I	Respect r22 ≥ r28 ≥ r08	
r10	System integration enabling	/	0	0÷1	I	0 = Function disabled 1 = Function enabled	See par.
r11	System integration heater delta	°C	0.5	0,0÷25.5	I	See par.	
r12	System/heat pump integration heater activation	min	10	0÷255	I	See par.	
r14	Exclusive resistor operation	/	0	0÷1	I	0 = Resistors that can be activated simultaneously 1 = Resistors that can be activated exclusively	
r15	Enabling sanitary integration	/	0	0÷2	I	0 = Fuction disabled 1 = Function enabled	See par.
r16	Heater activation delay DHW/heat pump integration	min	15	0÷255	I		
r19	Duration of activation of basin resistances from last defrost	min	10	0÷255	I	0= attivazione resistenza indipendente da sbrinamento.	
r20	Priority use of resistors	/	1	0÷1	I	0 = Priorità lato impianto 1 = Priorità lato sanitario	Il settaggio di questo parametro si rende necessario solo se r14=1
r21	Enable system side mitigation with defrosting resistors	/	0	0÷1	I	0=Funzione disabilitata 1=Funzione abilitata	

Parameter	Description	Unit	Default	Range	Visibility	Allowed configurations:	
						Description	Notes
r22	Upper limit Joint function I band	°C	7	-16÷50	I	Respect r22 ≥ r28 ≥ r08	It is recommended not to change this value, as this could affect the operation of the unit
r23	Type of boiler use	/	6	0÷6	I	See par.	
r24	Type of use integration resistors	/	3	0÷3	I	See par.	
r28	Upper limit for joint operation 2nd band	°C	-7	-16÷50	I	Respect r22 ≥ r28 ≥ r08	It is recommended not to change this value, as this could affect the operation of the unit
r29	Temperature offset for boiler and system resistors first set point (HEA)	°C	0	0÷100	I	See par.	
r30	Offset temperatura per caldaia e resistenze impianto secondo set point (HEA2)	°C	0	0÷100	I		
r31	Temperature offset for boiler and sanitary heating elements (SAN)	°C	0	0÷100	I		
r32	Boiler equipment	/	1	0÷3	I	See par.	
r33	Pump management with active resistors	/	3	0÷3	I		
L02	User enablement for minimum Hz	/	0	0÷1	I	0=function disabled 1=function enabled	
L03	Minimum active Hz	/	6	0÷6	I	See chapter "16. MINIMUM HZ FUNCTIONS".	
rE01	Enabling DS in chiller	/	0	0÷1		0=function disabled 1=function enabled	

23. ALARMS

Some of the alarms that may occur on the unit are described below. When the control is switched off, the alarms are reset and the counts of the relevant operations are also reset. If the alarms are still present when the machine is switched on again, contact technical assistance. The above information may be subject to updates, in case of doubt please contact the company.

23.1 [E006] FLOW SWITCH

The water-side flow switch is already installed inside the unit and must not be tampered with or bypassed in any way.The flow switch is bypassed by the control for a period of 10 seconds from the start of the machine, after the bypass time the status of the digital input is considered, if it is active the presence of flow is considered. If a lack of flow is diagnosed for a time of at least 5 seconds, the alarm is active and the circulator is activated for 120 seconds.
Once the flow of water is restored, the alarm is automatically reset, but if the alarm occurs more than 3 times per hour, the reset becomes manual.
The alarm is not active in the following conditions:

- during domestic hot water production;
- during the system venting function.

23.2 [E018] HIGH TEMPERATURE

If the water delivery probe detects a value higher than **65°C** for longer than **50** seconds the alarm is active. It deactivates when the temperature returns below **62°C**.

23.3 [E005] ANTIFREEZE

If the outlet water probe has a value lower than **A08** (default A08 = 3,0°C), the alarm is active. The deactivation occurs if the temperature recorded by the same probe is higher than **A08 + 3,0°C** (default 6,0°C). The alarm is bypassed for 120 seconds after switching on in heating mode. This alarm is manual reset.

23.4 [E611÷E681] PROBE ALARMS OR PRESSOSTAT

The corresponding alarm is activated if any connected and enabled probe is short-circuited or interrupted. The alarm is also active if the upper limit of the probes (150C) or the lower limit (-50°C) is exceeded. A probe configured as a DHW probe does not give rise to an alarm if DHW production is not enabled.

NOTE:
•Error E641 also appears when the pressure switch on the machine detects a pressure higher than 42.8 ±1 bar. In this case the driver and compressor are immediately disconnected. The alarm is reset when the pressure drops below 34 ±1 bar.
•Error E651 also appears if the fan thermal protection is triggered

23.5 [E691÷E701] TRANSDUCER ALARMS

The alarm is activated if the relevant pressure transducers are faulty or disconnected. This alarm is manual reset.

23.6 [E801] INVERTER TIMEOUT

When the on-board control does not communicate with the compressor driver board, a time-out alarm is activated to avoid losing control of the system.

23.7 [E851 ÷E971] INVERTER ALARMS

These alarms are related to the compressor driver, each model has its own list of alarms.

23.8 [E00] REMOTE ON/OFF SIGNALLING

This message appears on the display when the remote on/off contact is open.

23.9 [E001] HIGH PRESSURE

The alarm is activated when the pressure transducer on board the machine detects a pressure higher than **41.5 bar**, in which case the compressor is immediately blocked. The alarm is reset automatically when the pressure drops below **32.5 bar**; if it occurs more than 3 times per hour the alarm becomes a manual reset.

23.10 [E002] LOW PRESSURE

In chiller mode, the alarm is active if the pressure transducer on board the machine detects a pressure lower than **3.5 bar**. In heat pump mode, the alarm is active if the pressure transducer on board the machine detects a pressure of less than **1.3 bar**. Each time the compressor is activated, a bypass time of 60 seconds is counted. When the alarm is active, the circuit compressor is blocked. The alarm is automatically reset when the pressure rises **2.0 bar** above the intervention threshold; if the number of interventions in one hour is 3, the alarm becomes manual reset.

23.11 [E008] DRIVER LIMITATION

If the compressor does not reach the speed at the expected ramp value within 30 minutes, the alarm becomes active and the compressor is switched off for safety. If the number of alarm interventions in one hour is 3, the alarm becomes manual reset.

23.12 [E041] 4-WAY VALVE

This alarm identifies a malfunction of the 4-way valve for reversing and is manual reset. The alarm is not active for a bypass time of approximately 180 seconds from the start of the compressor.
In heating or DHW mode, after the bypass time has expired, the alarm is active when the water flow temperature is lower than the water return temperature - 1°C.
In cooling mode, after the bypass time has elapsed, the alarm is active when the water flow temperature is higher than the water return temperature + 1°C.

23.13 [E042] DOMESTIC HOT WATER SANITARY

The alarm is activated during DHW production when the flow probe detects a temperature higher than **H01** (default H01 = 60°C). The compressor is stopped, if present, the auxiliary heating systems operate with the relative offset until the DHW setpoint detected by the DHW probe is satisfied or the digital input disables the DHW call.
The alarm returns and the compressor restarts when the flow temperature of the heat pump detects a temperature lower than **H01 - 4.0°C** (default 56°C) and the call from the temperature controller is present.
If the alarm occurs 3 consecutive times during the same DHW production phase, DHW production is inhibited and the machine returns to system operation (if required). Once switched to the system, after a minimum waiting time of **b06** seconds, it is evaluated whether to remove the inhibition (if no thermoregulation is required on the system or if it is close to the set). During the entire phase in which domestic hot water production is inhibited, alarm E042 remains active.

23.14 LACK OF VOLTAGE

If the power supply fails, when it is restored the unit goes back to the state before the power failure.

NOTE:
•If a defrosting cycle is in progress, the procedure is cancelled.
•All the timings in progress are cancelled and reinitialised.

23.15 UTILITIES BLOCK ALARM TABLE

Alarm code	DESCRIPTION	Block
E00	Remote off	Machine
E001	High pressure alarm	Machine
E002	Low pressure alarm	Machine
E005	Antifreeze alarm	Machine
E006	No flow alarm	Machine
E008	Compressor driver limitation alarm	Machine
E009	High discharge temperature alarm	Compressor
E018	High temperature in cooling mode alarm	Machine
E041	Incongruent temperature alarm	Machine

Alarm code	DESCRIPTION	Block
E042	Insufficient heat exchange alarm	Macchine/Sanitary
E050	High DHW tank temperature alarm	-
E611	Water inlet probe failure	Machine
E621	Water outlet probe failure	Machine
E631	Compressor suction probe failure	Machine
E641	Compressor discharge probe failure / high pressure switch intervention	Machine
E651	External air / fan thermal probe failure	Machine
E661	DHW probe failure (ST6)	Machine
E671	Fault in remote plant probe (ST7)	Machine
E691	Low pressure transducer failure	Machine
E701	High pressure transducer failure	Machine
E711	Fault in voltage input 0-10V DC	Machine
E801	Inverter communication timeout	Compressor
E851	Inverter hardware problem	Compressor
E861	Motor current too high	Compressor
E871	High inverter heatsink temperature	Compressor
E881	Supply voltage out of limits (DC bus)	Compressor
E891	Compressor not connected	Compressor
E901	Wrong compressor model	Compressor
E911	Overload protection	Compressor
E921	PFC/POE overcurrent	Compressor
E931	Internal communication error	Compressor
E941	PFC fault	Compressor
E951	Heatsink and/or ambient temperature sensor fault	Compressor
E961	Abnormal condition	Compressor
E971	EEPROM error	Compressor

24. MODBUS VARIABLES

The control has the following modbus configuration by default:

- Baud rate: 9600
- Parità: EVEN
- Data bit: 8
- Stop bit: 1
- Device ID: 1

To configure the Modbus communication according to your requirements, you must modify the following parameters:

Parameter	VALUE	Function
H124	0	Baud rate 4800 bit/s
	1	Baud rate 9600 bit/s
	2	Baud rate 19200 bit/s
	3	Baud rate 38400 bit/s
H125	0	Parity NONE e stop bit 2
	1	Parity ODD e stop bit 1
	2	Parity EVEN e stop bit 1
	3	Parity NONE e stop bit 1
H126	1 ÷ 120	Serial address (Device ID)

The following table lists the Modbus registers of the control:

Register	Format	Bit	R/W	Range	Name	Description	Note
1	INT	-	R	-	Data version	Firmaware version	
2	INT	-	R	-		Firmware release	
3	BYTE (H)	-	R	-		Firmware sub-release	
	BYTE (L)	-	R	-		Firmware creation day	
4	BYTE (H)	-	R	-		Firmaware creation month	
	BYTE (L)	-	R	-		Firmware creation year	
10	BOOL	0	R	-	Digital inputs	ID1 (flow swich)	
		1				ID 2	If active
		2				ID 3 (on/off)	Active by default

Register	Format	Bit	R/W	Range	Name	Description	Note
80 ÷ 95	ASCII	-	R	-	Serial number	Serial number	
200	INT	0	R/W	-	Machine settings	Stand by	Writing non-permissible values to this address can lead to unexpected operation, so stick to the only values permitted for writing (those above).
		1	R/W			Cooling	
		2	R/W			Heating	
		5	R/W			Cooling + *Sanitary	
		6	R/W			Heating + *Sanitary	
		-1	W			Defrost Manual	
1089	INT	-	R/W	1 ÷ 200	Serial address	Modbus serial ID	
1001	°C/10	-	R/W	5.0 ÷ 23.0	Set point	Cooling	
1002	°C/10	-	R/W	25.0 ÷ 55.0		Heating	
1003	°C/10	-	R/W	25.0 ÷ 55.0		*Sanitary	If active
1004	°C/10	-	R/W	5.0 ÷ 23.0		Second cooling	If active
1005	°C/10	-	R/W	25.0 ÷ 55.0		Second heating	If active
240	BIT MASK	0 ÷ 1	R		General status	0= off	
						1 = on	
						2 = only sanitary	
						3 = remote on/off	
		2			System mode	0 = cool	
						1 = heat	
		3			Machine mode	0 = cool	
						1 = heat	
		4			Sanitary	0 = off	If active
						1 = running	
		5 ÷ 7			Defrost status	0 = inactive	
						1 = starting	
						2 = active	
						3 = dripping	
						4 = finished	
253	°C/10	-	R	-	Transducer temperatures	evaporazione	
254	°C/10	-	R	-		evaporation	
305	ora	-	R	-	Operating hours	compressor 1	
406	bar/100	-	R	-	Pressions	High	
414	bar/100	-	R	-		Low	
400	°C/10	-	R	-	Temperatures	Water inlet	
401	°C/10	-	R	-		Water outlet	
405	°C/10	-	R	-		ACS	If active
428	°C/10	-	R	-		External	
433	°C/10	-	R	-		Compressor 1 discharge	
440	°C/10	-	R	-		Remote system	If active
7000	%/10	-	R	-	Analogue outputs	Condensation fan	
7001	%/10	-	R	-		Circulator pump	
950	BOOL	0	R	-	ALARM - E01	* High pressure	Reset alarms use command 6 to write the value 0 to any of the registers in the alarm area.
		1			ALARM - E02	* Low pressure	
		2			ALARM - E03	*thermal compressor 1	
		3			ALARM - E04	* thermal fan1	
		4			ALARM - E05	Ice	
		5			ALARM - E06	Flow switch	
		6			ALARM - E07	* Low temperature DHW preparer	
		7			ALARM - E08	Forced compressor shutdown for lack of lubrication	
		8			ALARM - E09	High exhaust temperature	
		9			ALARM - E10	* High temperature solar collector	
		12			ALARM - E13	* Compressor 2 thermal	
		13			ALARM - E14	* thermal fan 2	
		15			ALARM - E16	*Thermal pump 1	

Register	Format	Bit	R/W	Range	Name	Description	Note
951	BOOL	1	R	-	ALARM - E18	High temperature	
		9			ALARM - E26	* Thermal pump 2	
		11			ALARM - E41	Incongruent temperatures	
		12			ALARM - E42	Insufficient heat exchange	
		13			ALARM - E50	high temperature domestic hot water storage tank	
		14			ALARM - E101	Gi module disconnected	
952	BOOL	0	R	-	ALARM - E611	Inlet water probe	
		1			ALARM - E621	Outlet water probe	
		2			ALARM - E631	Intake temperature	
		3			ALARM - E641	Exhaust temperature	
		4			ALARM - E651	Outside temperature	
		5			ALARM - E661	Probe 6	If active
		6			ALARM - E671	Probe 7	If active
		7			ALARM - E681	Probe 8	If active
		8			ALARM - E691	low pressure transducer	
		9			ALARM - E701	high pressure transducer	
		10			ALARM - E711	Probe 11	If active
		11			ALARM - E612	*module Gi - Probe 1	If active
		12			ALARM - E622	*module Gi -Probe 2	If active
		13			ALARM - E632	*module Gi - Probe 3	If active
		14			ALARM - E642	*module Gi - Probe 4	If active
		15			ALARM - E652	*module Gi - Probe 5	If active
953	BOOL	0	R	-	ALARM - E662	*module Gi - Probe 6	If active
		1			ALARM - E672	*module Gi - Probe 7	If active
		2			ALARM - E682	*module Gi - Probe 8	If active
		3			ALARM - E692	*module Gi - Probe 9	If active
		4			ALARM - E702	*module Gi - Probe 10	If active
		5			ALARM - E712	*module Gi - Probe 11	If active
954	BOOL	1	R	-	ALARM- E801	Inverter link 1	
		2			ALARM - E802	*Inverter link 2	
		4			ALARM - E851	Hardware fault inverter 1	
		5			ALARM - E852	*Hardware fault inverter 2	
		7			ALARM - E861	Overcurrent inverter 1	
		8			ALARM - E862	High temperature inverter 1	
		10			ALARM - E871	Bad voltage inverter 1	
		11			ALARM - E872	*High temperature inverter 2	
		13			ALARM - E881	Bad voltage inverter 1	
		14			ALARM - E882	*Bad voltage inverter 2	
955	BOOL	0	R	-	ALARM - E891	Phase sequence inverter 1	
		1			ALARM - E892	*Phase sequence inverter 2	
		3			ALARM - E901	Model error inverter 1	
		4			ALARM - E902	*Model error inverter 2	
		6			ALARM - E911	Overload error inverter 1	
		7			ALARM - E912	*Overload error inverter 2	
		9			ALARM.- E921	Overcurrent PFC inverter 1	
		10			ALARM - E922	*Overcurrent PFC inverter 2	
		12			ALARM - E931	Internal communication error inverter 1	
		13			ALARM - E932	*Internal communication error inverter 2	
		15			ALARM - E941	Fault PFC inverter 1	
956	BOOL	0	R	-	ALARM - E942	*Fault PFC inverter 2	
		2			ALARM - E951	Probe error inverter 1	
		3			ALARM - E952	*Probe error inverter 2	
		5			ALARM - E961	Abnormal condition inverter 1	
		6			ALARM - E962	*Abnormal condition inverter 2	
		8			ALARM - E971	EEPROM inverter 1	
		9			ALARM - E972	*EEPROM inverter 2	

(*) if present