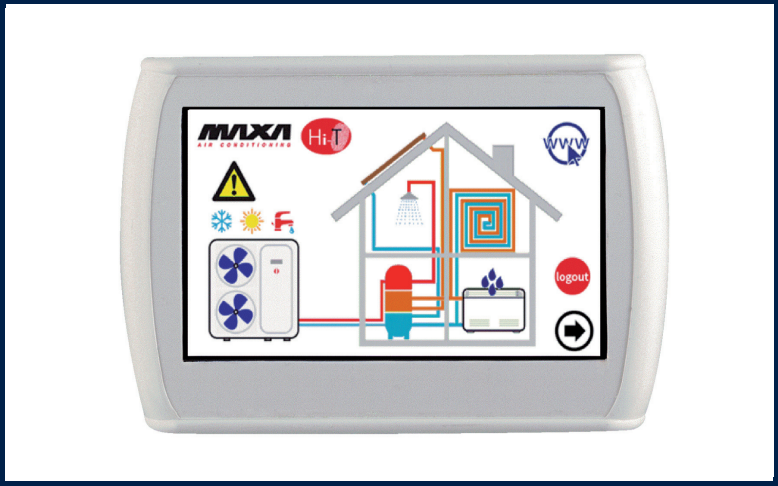
CE

R410A

Hi-T

MIXA AIR CONDITIONING



USER'S AND INSTALLER'S MANUAL

Hi-T LCD touch-screen centralized controller for hydronic terminal coupled with N-i-HWAK/WP V2/V2+ minichillers and i-HP/i-HP LT chillers

Serie/*Series*/Serie/*Série*	Emissione/*Edition*/Ausgabe/*Issue*
Hi-T LCD Touch-Screen Centralized Controller	**04 – 2014**
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MUI01137E0120-00	**–**

MIXA

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Rev	Date	Issued	Approved	Updates description
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Catalogo / Catalogue / Katalog / Catalogue	Serie / Series / Serie / Serie / Série
MUI01137E0120-00	**CONTROLLO REMOTO PER CHILLER E TERMINALI IDRONICI**

The electrical and electronic products and any waste should not be disposed of with normal household waste, but disposed of according to law in accordance with the WEEE EU directives 2002/96/EC and 2003/108/EC as amended, and inquire at the place of residence or at the retailer in the case where the product is replaced with a similar one.

NOTE: The statements and described in this manual may not coincide fully with the device in question (“Hi-T: Centralized Control LCD touch screen for hydronic terminal coupled to N-i-HWAK/WP V2/V2+ minichillers and i-HP/i-HP-LT chillers”). The Company reserves the right to make changes and upldates than indicated in nthis manual.

INDEX

1 Hi-T: GENERAL NOTES

1.1 PERMITTED USE

The Hi-T is a touch screen remote control for centralized management of a network of chiller/heat pump system and of the HNS system. It can also be used for partial functions (i.e. as a remote control panel for a single chiller/heat pump or thermostat for some fan coils management).
It integrates humidity and temperature sensors for the thermo hygrometric analysis of the environment and for the management of the double set point for radiant floor heating systems that use a dehumidification system.
The intuitive interface simplifiers the use of the control; all the functions are easily set through the use of immediate understanding synoptic.

1.2 USE NOT PERMITTED

Any use other than that permitted is PROHIBITED.

1.3 TECHNICAL DATA

	Nominal	Min.	Max.
Power supply voltage	12Vac	10Vac	14Vac
Power supply frequency	50 - 60Hz	Tip-5%	Tip+5%
Operating ambient temperature	25°C	0°C	50°C
Operating humidity (non-condensing)	30%	10%	90%
Ambient storage temperature	25°C	-20°C	70°C
Ambient storage humidity (non-condensing)	30%	10%	90%

1.4 ELECTROMECHANICS CHARACTERISTICS

Terminals and connectors	Screw terminals
Analogue inputs	1 NTC probe on board 1 humidity sensor on board
Serial	1 USB Host (for mass storage plug) 1 isolated RS485 network for chiller/heat pump and fan coil 1 TTL serial port for future use (optional plug-ins) 1 Ethernet port
Transformer	Device not included
Watch	RTC watch with backup condenser
Display	LCD TFT 4.3” 480x272 pixels
Keys	Resistive touch screen mounted on the LCD
Dimensions	128x81.2mm depth 35mm (box)
Case	White plastic

2 I/O RESOURCES

2.1 TOUCH SCREEN PCB

2.1.1 LAYOUT

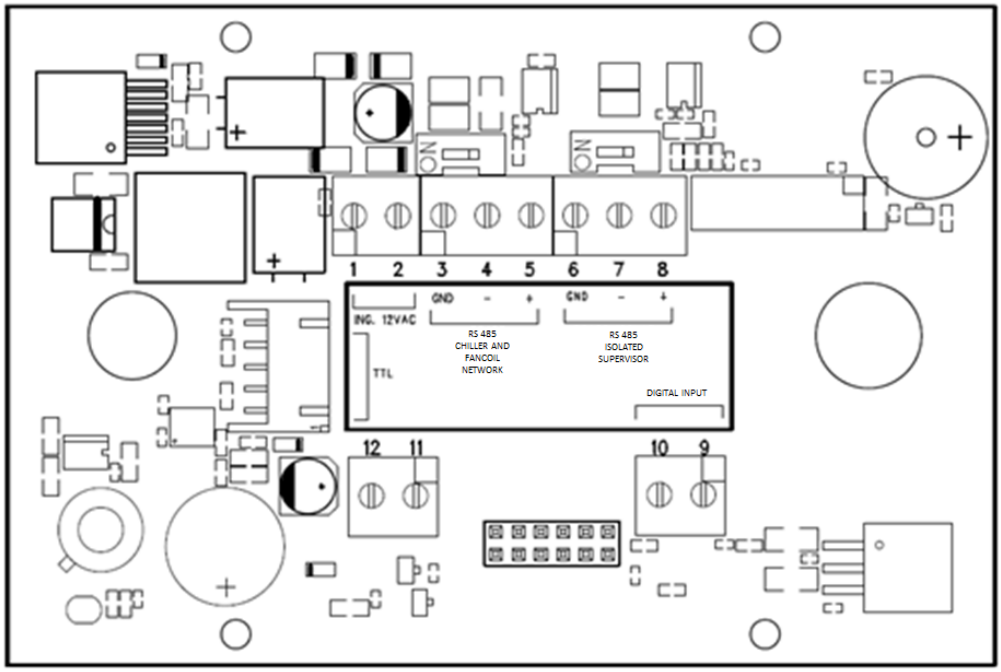


Figure 1. Layout.

2.1.2 TOUCH-SCREEN USE

The interface has a resistive touch-screen LCD with sensitive areas applied to the contextual content of the active screen.
It allows you to select items or perform functions with ease.
Do not exert too much pressure on the touch screen with your fingers and do not use a sharp object on the touch screen. Doing so may damage the touch screen or cause it to malfunction.
It is advisable to exert weaker pressure and not too fast on the screen and to become familiar with the use of the touch-screen itself, well calibrating the touch of your fingertip on the sensitive areas of the screens.
Do not put the touch-screen in contact with other electrical devices. Electrostatic discharge may cause a malfunction.

2.1.3 DISPLAY

The display is a TFT LCD 16/9 format with a diagonal 4.3 ". The resolution is 480 x 272 pixels. The LCD is handled with 16bit colour depth (65535 colours).

2.1.4 POWER SUPPLY

Description	Characteristics	ID
POWER SUPPLY 12VAC	12Vac (min. 10Vac – max. 14Vac)	

2.1.5 ANALOGUE INPUT

Description	Characteristics	ID
Room temperature	NTC probe, conversion range -20°C ÷ +100°C	
Relative humidity	0% - 90% at temperature between -20°C and 60°C	

2.1.6 SERIAL AND CONNECTIVITY

Description	Characteristics	ID
USB	USB Host (for mass storage plug) / connector type A	USB
RS485 isolate	Isolated RS485 to Modbus Serial chiller/heat pump and fan coil	
TTL	Modbus serial TTL for future use	
ETH	Ethernet port 10/100 BASE T for minimal web-server	

2.2 CLOCK

It's present a clock with backup battery.

2.3 CONNECTIONS

Open the control applying a slight pressure in the lower and upper parts of the control, in order to separate the rear cover from the front one. Pass the cables through the hole in the rear panel and make connections according to the following guidelines.
Terminals 1 and 2: 12 V ac power connect supply (terminal on chiller 12V- e 12V+).
Terminals 3-4-5: connect the RS-485 bus: terminal 3 to terminal GNDR, terminal 4 to R- and terminal 5 to R+.

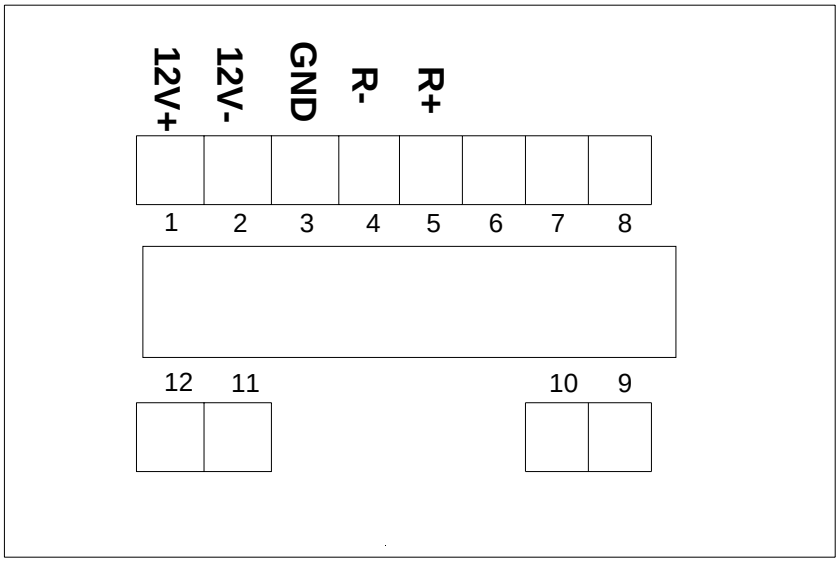


Figure 2. Connections.

2.1 INSTALLING

The Hi-T control is used for fixing to the wall according to the standard 503.
In the rear part of the control some pre-drilled holes are present to be detached pursuing a pressure with a screwdriver, in such a way as to obtain the holes useful to the fixing. Of the 6 holes, use only the outer 2 holes of the horizontal series (see Figure 3).
Before you do this, open the control itself, applying a slight pressure in the lower and upper parts of the control, in order to separate the rear cover from the front one.
Use the rear panel and apply the holes in the two slots shown in the figure below.
Do not directly use the panel as a template to drill the holes on the wall, the electronics may be damaged during this operation.

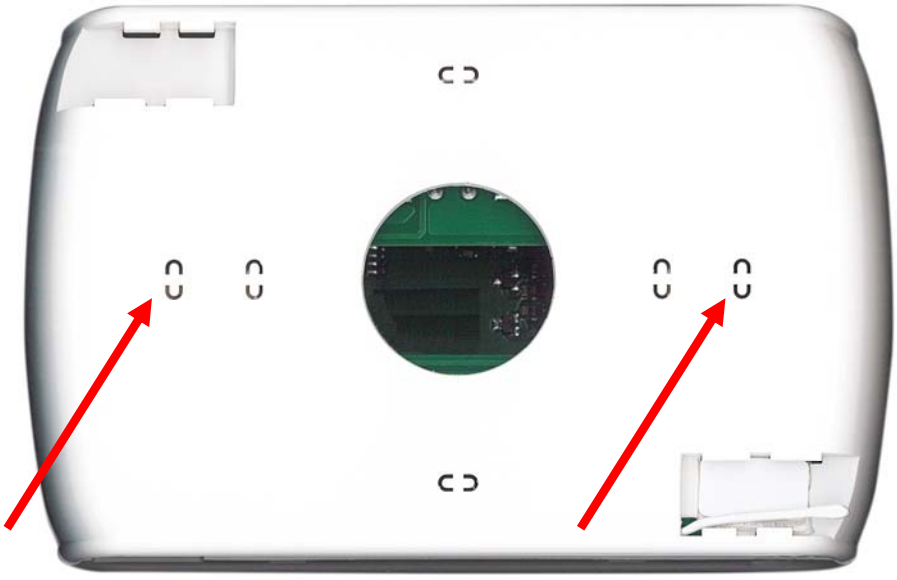


Figure 3. Holes for wall mounting.

3 USER INTERFACE

The touch-screen can be used in the following ways:

- Interface panel (unit interface) for a single heat pump
- Network controller for multi heat pump installation
- Network controller for multi heat pump and fan coil installation
- Network controller for multi fan coil installation

To manage the system modularity, the interface foresees a home page which summarizes the whole plant, showing dynamically the enabled resources and hiding the ones not available in the current configuration. The interface also provides a second summary page including all the values of temperature and humidity detected in the system.
Through the menu it is possible to access to:

- Plant configuration
- Single units statuses
- Zones, machines and plant settings

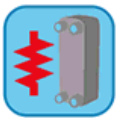
As alternative it is possible to directly access from the home page to detailed information, pressing on the display where are located the summarized information. E.g., pressing where are located the main information of the heat pump, you can enter in the menu of the heat pump status.

3.1 ICONS DISPLAY

All icons on the different screens can be shown in full colours or de-saturated as in the following example:

The colour saturation indicates that icon is usable; when pressed the related function is performed.
The transparency (de-saturated) indicates that icon is not usable and any touch on it has no resulting action.

For what concerns the side sliding bar which appears on the left side of the screen related to the single units connected into a network (see Paragraphs 3.4.1.3 e 3.4.2.1), if an icon appears fully coloured the related function is enabled and, in that specific moment is also active (i.e. if the "*water anti-freeze*" icon of the heat pump is present and coloured, as shown below, the plate exchanger electrical heating elements are switched on).



Instead, if the icon appears but is transparent (de-saturated), the related function is enabled but not that moment activated (i.e. if the "*water anti-freeze*" icon of the heat pump appears transparent, as shown below, the plate exchanger electrical heating elements are ready to work but currently switched off).

3.2 SCREENS AND ICONS

There might be some differences between screens and icons as they are currently shown. The Company reserves itself to modify and update them without prior notice and in relation to what shown in the present manual.

3.3 START PAGE

Figure 4. Start page.

On Hi-T start, while system loading, a splash screen appears with a logo.

3.4 HOME PAGE

The home page has the following appearance:

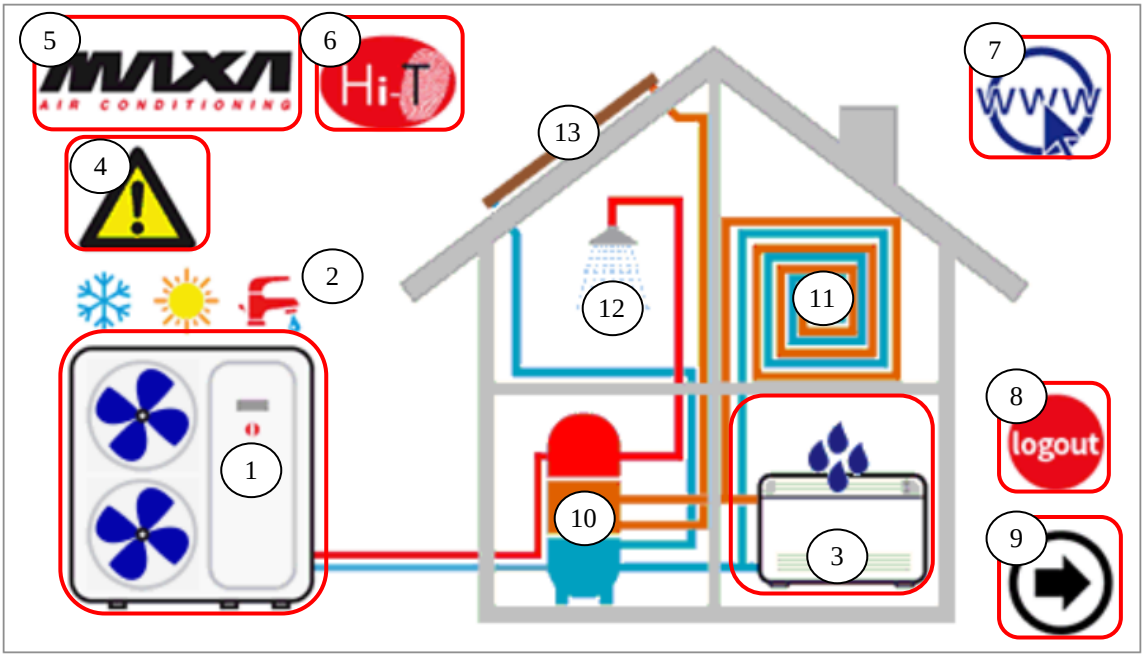


Figure 5. Home page – indication meanings.

From the home page it is possible to access to the different device's screens, simply touching the displayed resource.
The sensible areas (indicated in the image by red boxes) inside this page are:

1. Heat pump/chiller (showing the working mode)
2. Status system and mode system display
3. Fan coil (with a status message of dehumidification active mode)
4. Display of any active alarms in the system
5. Information and location of the company
6. Name of the keyboard (access to information on the firmware version)
7. Configuring the Ethernet network
8. Log-out (intermittent symbol if it's active)
9. Arrow navigation, next page.

Graphically, it also contains information on the presence or absence on the following utilities:

10. Tank
11. Radiant panels
12. Sanitary
13. Solar.

On the main screen, in fact, it appears only utilities present and properly installed in the network or the active warnings at the time of viewing.
If, for example, the network consists only of one or more chiller/heat pumps, without production of sanitary water and without storage, the screen shows graphically the presence of the chiller, but inside the house do not appear other object; in this case the appearance is the following:

Figure 6. Home screen – only chiller is networked.

Figure 7. Chiller/Heat Pump.

Referring to the above figure is it possible to obtain the following information:

- presence of chillers connected in the network (the chiller is correctly accepted when touching its figure you can access to the pages dedicated to itself);
- operating mode of the chiller (winter  , summer  , sanitary  , OFF if does not appear the previous three symbols);
- operating status of the chiller (compressor running): the operation of the chiller shows graphically by the rotation of the fans). 

In addition, directly on the home page, you can get the following information about the fan coils:

- Presence of fan coils connected in a network, if the symbol appears (Figure 8. Fan coil network.);
- Dehumidification fan coil operation, if the symbol of the drops appears (Figure 9. Fan coil dehumidification.).

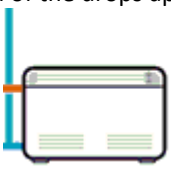


Figure 8. Fan coil network.

Figure 9. Fan coil dehumidification.

3.4.1 CHILLER SCREEN/HEAT PUMP

From the main page, by touching the symbol of the chiller (sensitive area number 1, Figure 5. Home page – indication meanings.), you can access to the chiller on network screen.
From here you can access to the information related to the operations of the chiller; then you can uniquely identify each chiller present, assigning each a name.

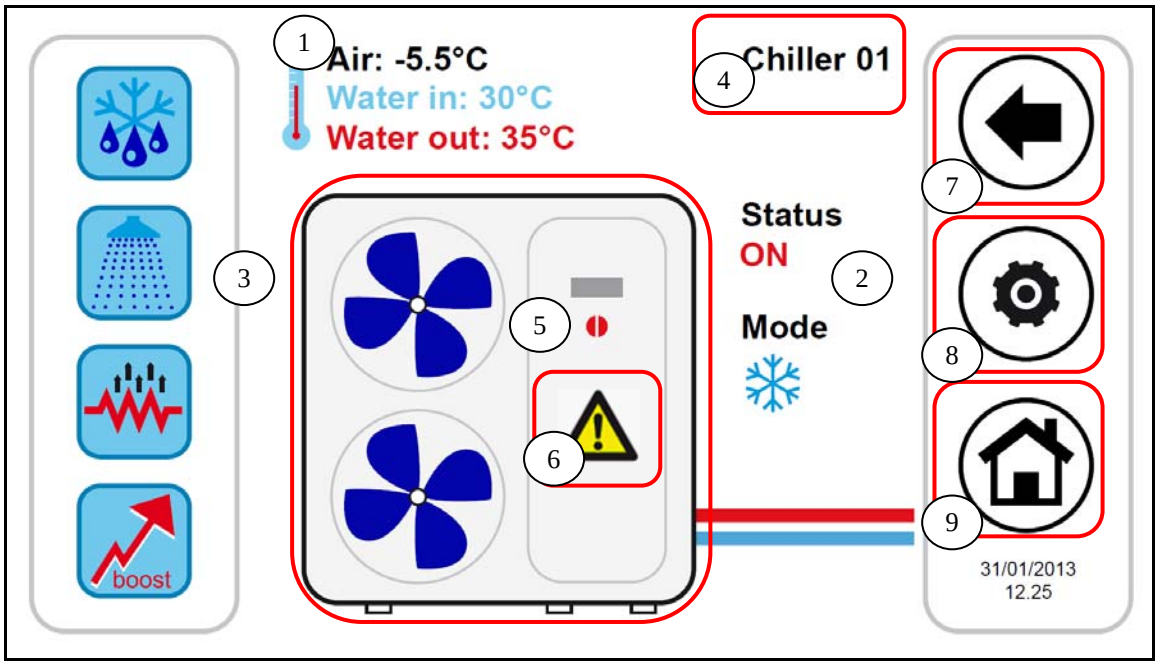


Figure 10. Chiller page – information and sensitive areas.

The information in the chiller's page are:

1. Temperature read in the chiller (about to a specific chiller):
    a. Air temperature (°C)
    b. Inlet water temperature (°C)
    c. Outlet water temperature (°C)
2. Status and operation mode about a specific chiller
3. Active/activable functions (in the scroll bar on the left)

Sensitive areas (indicated by red boxes in the figure) in this page are:

1. Chiller name (each time you press on it, you go to the next chiller unit in the network; otherwise, with prolonged pressure, you can rename the chiller)
2. Chiller/heat pump (with working signalling function given by the rotation of the fans); from here you access to an additional page of information about that specific chiller.
3. Active alarms in the unit displayed
7. Icons of the navigation sidebar
8. Icons of the navigation sidebar

9. Icons of the navigation sidebar

3.4.1.1 ASSIGNMENT OF NAMES TO THE CHILLERS

For the assignment of the name to a chiller, you must navigate between the pages of the chiller connected to the network until you get to the page of the chiller which you want to change the name: for apply this, you have to make single press into the pressure sensitive area **4**. Once you find the chiller, press and hold for a few seconds in the same area 4. Then compose with the keyboard that appears the desired name.

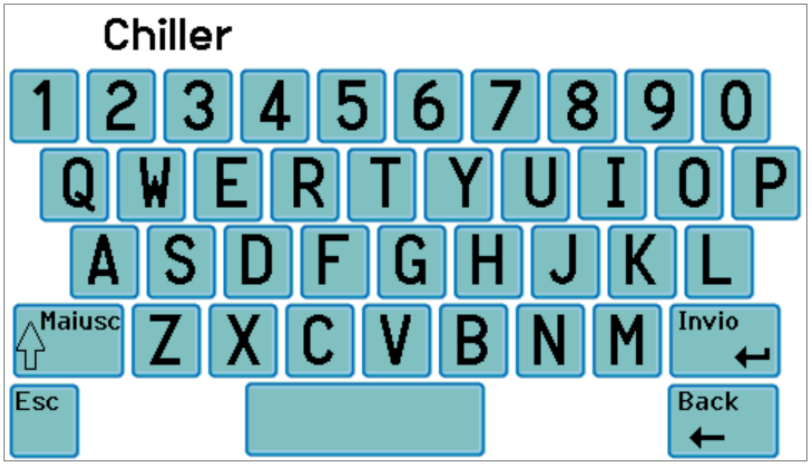


Figure 11. Insert chiller name.

The name of the chiller can have a maximum of 13 characters.

3.4.1.2 CHILLER AREA

The area **5** shown in Figure 10 gives indications about the operation (compressor running) of the chiller, graphically displaying the fan rotation. 

Pushing down on the area **5** you access to a further screen that shows a list of read data in real time related to the involved chiller:

- Inlet water temperature (°C)
- Outlet water temperature (°C)
- Sanitary probe temperature (if it's present and configured, °C).

Accessing the same page with service or manufacturer access right (to enable the access right, press on the "configurations" icon present in the sensitive area **8** of Figure 10 and set the service/manufacturer password), the data displayed in real-time are:

- Inlet water temperature (°C)
- Outlet water temperature (°C)
- Sanitary probe temperature (if it's present and configured)
- High pressure (bar)
- Low pressure (bar)
- Compressor speed (Hz)
- Opening expansion valve (step)
- Fan speed (%)
- Pump speed (%)
- Overheating (°C)
- Compressor operating hours (Hr.)
- Pump operating hours (Hr.)

3.4.1.3 TOOLBAR CHILLER AREA

On the left scroll sidebar there are icons that symbolize the active/activable functions in the chiller taken into account. In particular:

Colourful icon = function enabled,

Faded icon = function configured on the machine but not currently active.

Below there is a table with icons that may appear in the scroll side bar.
The presence or absence of the icon in the sidebar will be determined by the enable or disable of the function on the chiller.

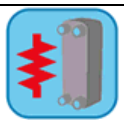
ORDER OF APPARANCE	ICON	FUNCTION
1		SANITARY HOT WATER
2		SANITARY INTEGRATION RESISTANCE
3		PLANT INTEGRATION RESISTANCE
4		BOILER ENABLING
5		DOUBLE SET-POINT
6		DEHUMIDIFYING
7		SLAB FEATURE
8		DEFROST
9		ANTIFREEZE WATER
10		ANTIFREEZE TRAY RESISTANCE

Table 1. Order of appearance of the icons in the toolbar on the chiller.

3.4.1.4 NAVIGATION AREA

In the toolbar that appears at the right side of the chillers' page, three icons are shown for the navigation between the pages:

The first icon on the top allows you to return to the previous screen, the second allows you to enable maintainer/manufacturer access rights through a password to further information in real-time, the last returns to the Home screen.
The lower part shows date and time.
If an icon appears transparent, it is not accessible.

3.4.2 FANCOIL PAGE

From the main page, by touching the symbol of the fan coil (hot spot number **3**, Figure 5), you enter the screen of the fan coils on the network.
From here you can access the information related to the operation of the individual fan coil, identified by area of belonging and identification number of the individual fan coil.

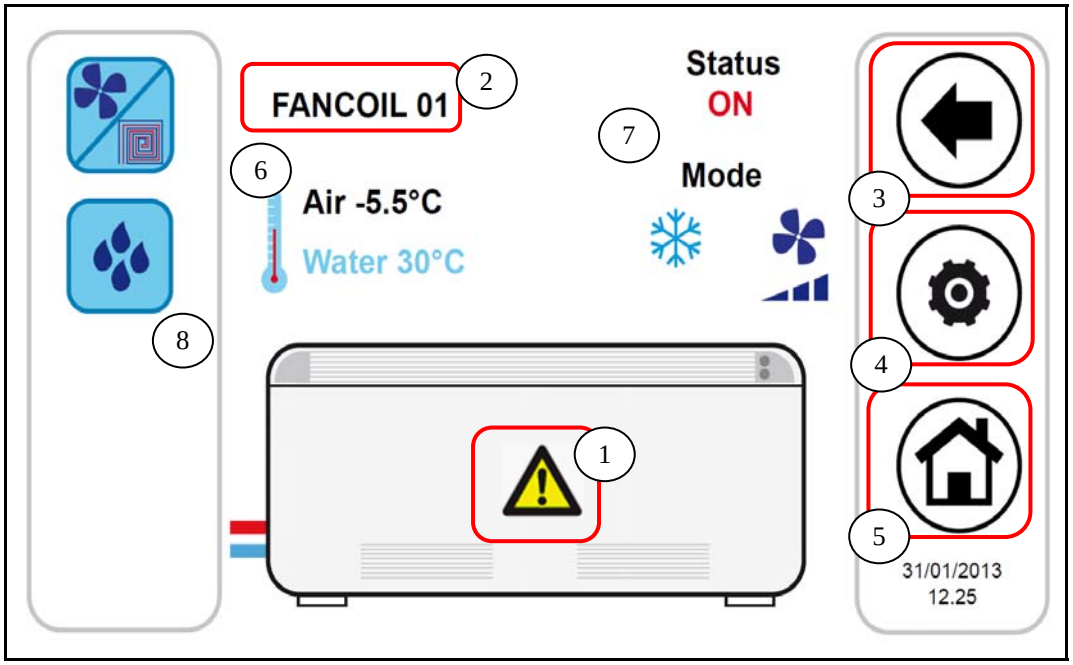


Figure 12. Information fan coils page and sensitive areas.

The sensitive areas (indicated by red boxes in the figure) in this screen are:

1. Active alarms of the displayed unit
2. Name of the fan coils (it shows the name of the zone to which the fan coil belongs and the identification number of the fan coil unit ; for each pressure on the area name , you move to next the fan coil unit in the network)
3. Icons of the navigation sidebar
4. Icons of the navigation sidebar
5. Icons of the navigation sidebar

The information on the fan coils page is:

6. Temperatures read in the fan coil zones (average temperature of the fan coils in the area)
    a. Air temperature (°C)
    b. Inlet water temperature (°C)

7. Status and mode of operation related to a specific fan coil (with fan speed)
8. Active/activable functions (in the scroll bar on the left)

Pressing the configuration symbol (Sensitive Area **4**) leads to the setting of ventilation. The ventilation is changed for zones; hence changing the ventilation of a fan coil of a given area, the changes are applied to the entire area. The page for setting the ventilation looks like this:

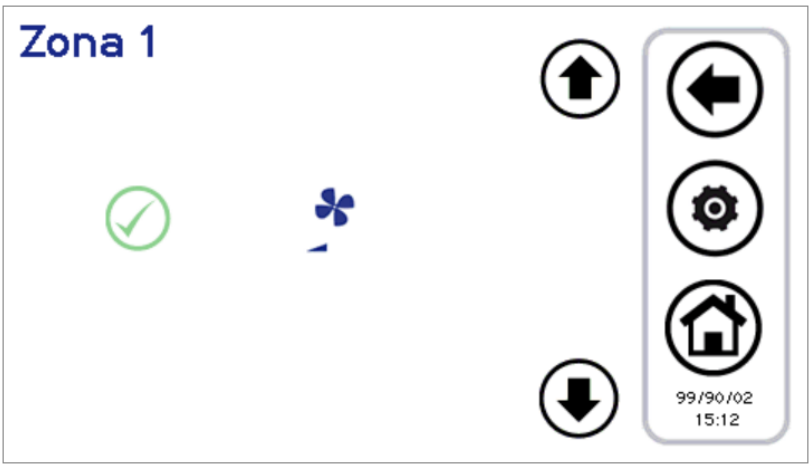


Figure 13. Ventilation speed configuration.

The speed can be set are:

- Minimum speed
- Average speed
- Maximum speed
- Automatic regulation (auto-mode)

With the up and down arrows you choose the speed, with the green button  you confirm the value set.

3.4.2.1 TOOLBAR OPERATION FANCOIL AREA

In the left scroll sidebar there are icons that symbolize the active/activable functions in the fan coil zone considered. In particular:

Colourful icon = function enabled,

Faded icon = function unit configured but not currently active.

Below there is a table with icons that may appear in the scroll side bar.
The presence or absence of the icon in the sidebar will be determined by the enable or disable of the function which you refer on board the fan coil unit.

ORDER OF APPARANCE	ICON	FUNCTION
1		WINDOW SWITCH
2		DOUBLE SET-POINT
3		HUMIDITY CONTROL

Table 2. Order of appearance of the icons in the toolbar on the fan coil.

3.4.3 Hi-T AREA

Pressing in the sensitive area **6** of Figure 5, you have access to a screen showing the version and the date of release of the firmware installed.

3.4.4 ETHERNET CONNECTION CONFIGURATION

Pressing in the sensitive area **7** of Figure 5, it appears the page:

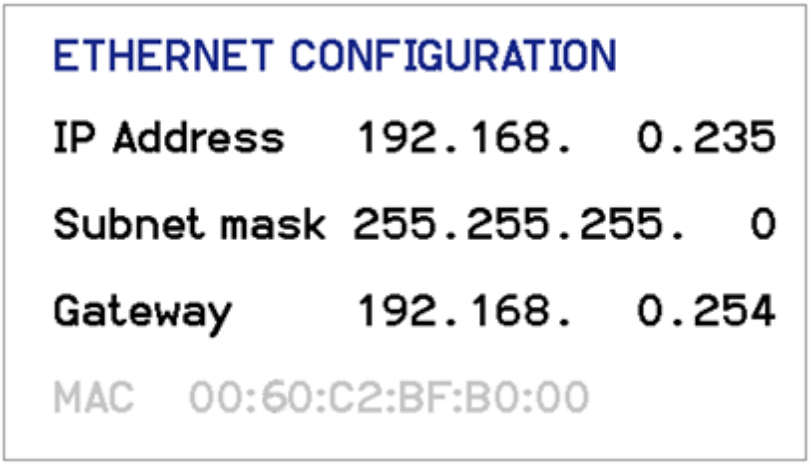


Figure 14. Ethernet network configuration page.

On this page there are the addresses for the configuration of an Ethernet connection.
Logging in with maintainer/manufacturer permission, you can change the default addresses.
It's implemented a local web server to access to the Hi-T from local area network with a HTML 4.01 compatible browser (see Paragraph 5.2).

3.5 SECOND MAIN PAGE

From the home page, touching the arrow icon to navigate to the next screen, you go to a second screen showing all of the detections carried out by the temperature sensors and humidity sensors in the system.

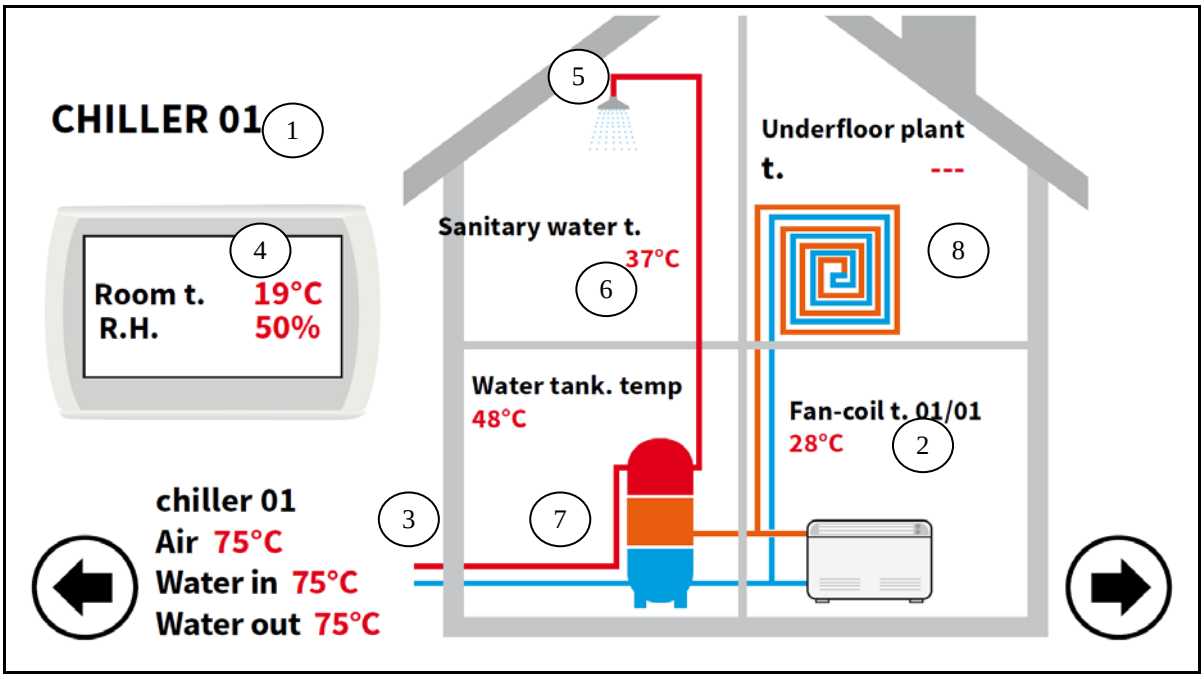


Figure 15. Second Main page.

Referring to the figure above:

- Field 1 indicates the zone to which you are referring ; applying pressure on it, you switch to the next zone.
- Field 2 indicates the fan coil which is referenced within the zone selected from the field 1; pressing on it the index of the selected zone progresses in a cyclic manner, giving away all the fan coil units in the area. For each fan coil is shown the detected air temperature. These indications appear only if there are fan coils configured in the system.
- Field 3 indicates the chiller which it refers; by pressing on it, you progress to the next chiller in the network. For each chiller shown, you see the readings on the temperature of the water inlet and outlet of the chiller and on the air temperature measured by the probes on board.
- Field 4 shows the ambient temperature and the relative humidity measured by the sensors integrated in the Hi-T panel.
- Field 5 indicates the presence of the solar system; then the indication on the temperature of the solar panels is shown. These indications appear only if in the system is configured a solar panel.
- Field 6 shows the enabling of the production of domestic hot water related to the chiller selected from field 3 . It also indicates the temperature of the domestic hot water production.
- Field 7 indicates the presence of a storage tank connected to the chiller selected from field 3. It also indicates the temperature of the domestic hot water production.
- Field 8 indicates the presence of radiant floor; this field is connected to the enabling of the function of double set -point.

In the case of probes in error or not properly configured and connected , it appears the indication of error.

NOTE: The presence of accumulation and the sanitary mode are here referred to the fact that in the network is present a heat pump in which the sanitary mode is enabled.

3.6 HOME SYSTEM

From the second page, touching the arrow icon to navigate to the next screen, you go to a third screen for general settings, the "system main page", showing the following functional icons:

Figure 16. System main page.

Above, from the left to right:

1) STATUS SETUP;
2) SET-POINT SETUP;
3) PROGRAMS AND CHRONO-THERMOSTAT.

In the bottom, from the left to right:

4) SPECIAL FUNCTIONS;
5) CONFIGURATION;
6) HELP MENU.

3.6.1 STATUS SETUP PAGE

Pressing the icon above, you access to the page: "*Status setup*".

Figure 17. "Status setup" page.

Pushing on "*System*" you can set the status of the entire system, otherwise you can act on individual unit.

3.6.2 SET-POINT SETUP PAGE

Pushing on the icon above, you access to the page: "*Set-point setup*".

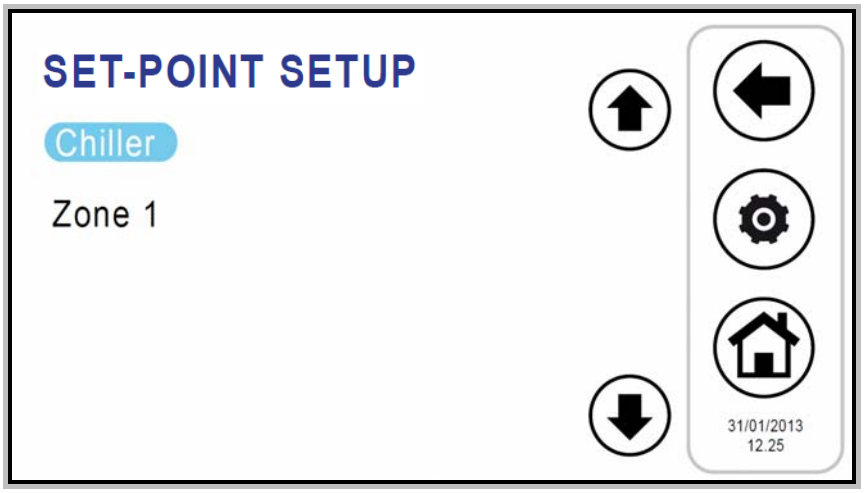


Figure 18. "Set-point setup" page.

From this screen you can set the chiller' set and fan coil zones configured. If enabled, you can also set the sanitary hot water set (see Paragraph 4.6.2), the second set-point (see Paragraph 4.9) and the offset for the climatic compensation(see Paragraph 4.10).

3.6.3 PROGRAMS PAGE (CHRONOTHERMOSTAT)

Pushing on the icon above to access the page "*Programs*".

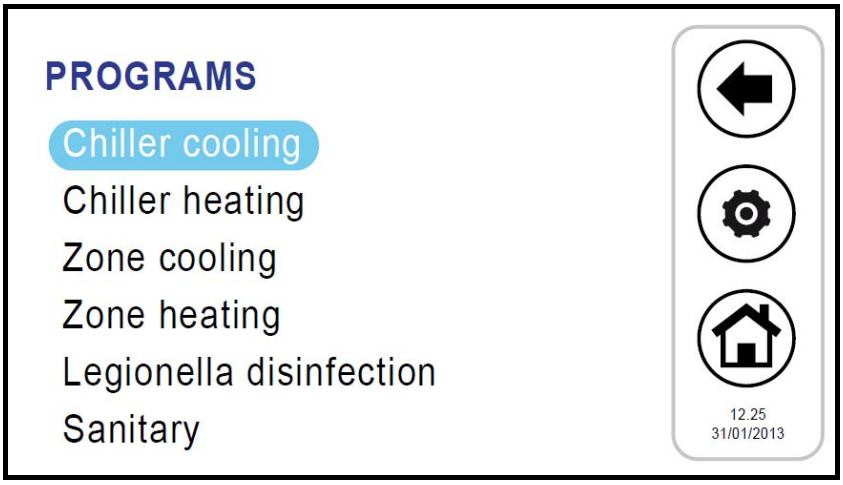


Figure 19. "Programs" page.

From this page you can set the weekly program of chillers and fan coil zones separately. You can also program the legionella's cycle and the production of hot water, if enabled (see Paragraph 4.6.5).

3.6.4 SPECIAL FUNCTIONS PAGE

Pressing the icon above to access the page "*Special Functions*" (see Paragraph 4.12).

3.6.5 CONFIGURATION PAGE

Pushing on the icon above, you enter into the page "*Configuration*".

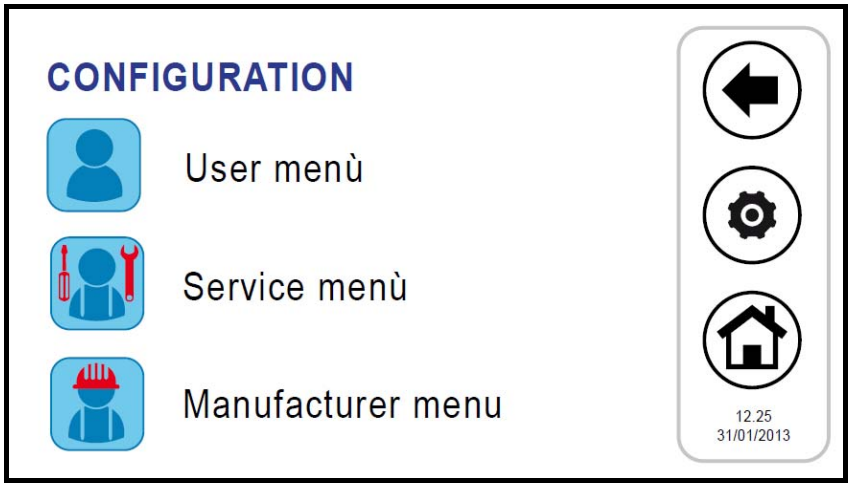


Figure 20. "Configuration" page.

From the configuration screen, you can access to the User-Setup menu, to the service menu and to the manufacturer menu. Pushing on each of these items, it appears a numeric keypad for entering a password.

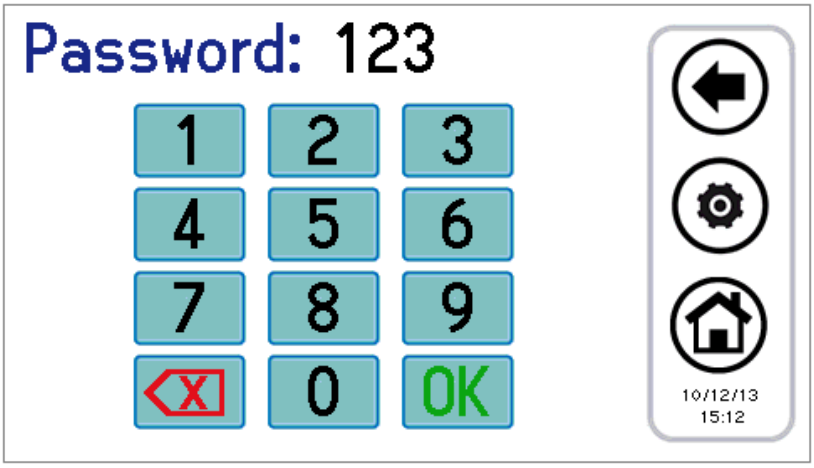


Figure 21. Password entry.

The user password is set by default to "0" (modifiable).

3.6.5.1 USER MENU – KEYBOARD SETUP

To access the user menu you have to set the user password (modifiable): **0.**

From here you can:

- Set the date and the time by pressing on "*Clock*" (it appears the screen shown in Figure 22);
- Set the language by pressing on "*Language*";
- Access to the setup of the keyboard, pressing on "*Parameters*".

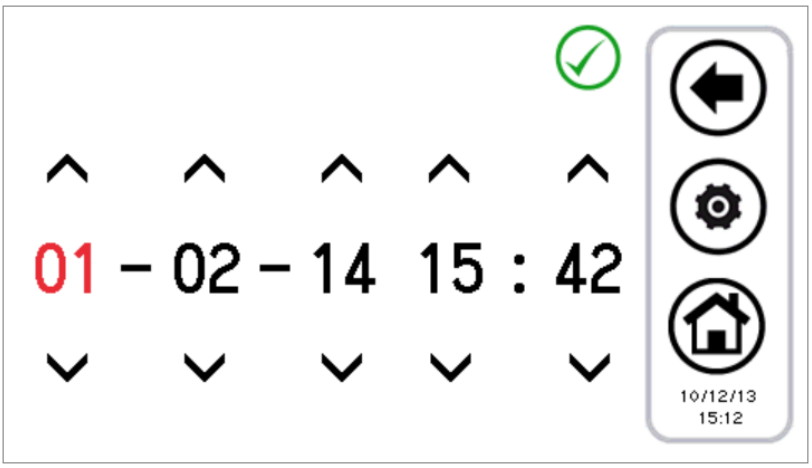


Figure 22. Date and time page settings.

It is possible to change the setup of the keyboard according to the parameters shown in the following table:

N.	PARAMETERS NAME	UNIT	DEFAULT VALUE	MINIMUM VALUE	MAXIMUM VALUE
1/3	User password	Numb	0	0	999
2/3	Idle Backlight intensity	%	5	0	100
3/3	Screensaver unlock Psw	Numb	0	0	999

Table 3. User's parameters menu (keyboard setup).

To change the value of a parameter:

- entered in "*Parameters*", use the up and down arrows to scroll through the pages of the parameters, until you find the desired parameter;
- press on the currently set value;
- the present value turns red to indicate that it can be changed by using the up and down arrows;
- select the desired value and press the confirmation tick.
-

Note: If you press outside the confirmation area, it returns again the previously value.

3.6.5.2 SERVICE MENU

To access the menu, you must set the service password.

From here you can:

- configure the network, by pushing on "*Address configuration*";
- configure zones, by pushing on "*Area Configuration*";
- access to service's parameters Chiller, Hi-T and Fan coil, pressing on "*Parameters*";
- access to the alarm history, by pushing on "*Alarm list*".

The screens shown are as follows:

1. Address configuration
   1.1. Addresses assigns
   1.2. Scan network
2. Area configuration
   2.1. Zone 01
   2.2. Zone 02
   2.3. Zone xx
3. Maintenance parameters
   3.1. Chiller
      3.1.1. Chiller 01

3.1.2. Chiller 02
3.1.3. Chiller xx
3.2. Keyboard
3.3. Fan coil
4. Alarm list

The service's parameters of the chiller correspond to those listed in the user-installer manuals of the minichiller/heatpumps i-HWAK/WP V2/V2+ and of the chiller/heat pumps i-HP.
The service parameters of the keyboard are shown in the following table:

N.	PARAMETERS NAME	UNIT	DEFAULT VALUE	MINIMUM VALUE	MAXIMUM VALUE
1/44	Communication timeout	Numb	120	10	255
2/44	Maintenance PSW	Numb	/	0	999
3/44	Min FC cooling setpoint	°C	15.0	1.0	60.0
4/44	Max FC cooling setpoint	°C	45.0	1.0	60.0
5/44	Min FC heating setpoint	°C	5.0	1.0	60.0
6/44	Max FC heating setpoint	°C	45.0	1.0	60.0
7/44	Keypad address	Numb	100	100	130
8/44	Number of chiller in network	Numb	0	0	7
9/44	Rotation time	Minutes	30	0	800
10/44	Diff. Between units	°C	2.0	1.0	60.0
11/44	Set Text comp CHIL Cool	°C	20.0	0.0	50.0
12/44	Set Text comp CHIL Heat	°C	10.0	-20.0	35.0
13/44	m1 coefficient for compensation Text CHIL in cool with low temp.	Numb	0.0	-10.0	10.0
14/44	m2 coefficient for compensation Text CHIL in cool with high temp.	Numb	0.0	-10.0	10.0
15/44	m3 coefficient for compensation Text CHIL in heat with low temp.	Numb	0.0	-10.0	10.0
16/44	m4 coefficient for compensation Text CHIL in heat with high temp.	Numb	0.0	-10.0	10.0
17/44	Set Text comp FC Cool	°C	25.0	0.0	50.0
18/44	Set Text comp FC Heat	°C	15.0	-20.0	35.0
19/44	m5 coeff for compensation Text Fan Coil cool	Numb	0.0	-10.0	10.0
20/44	m5 coeff for compensation Text FanCoil heat	Numb	0.0	-10.0	10.0
21/44	Set2 Text cmp CHIL Cool	°C	20.0	0.0	50.0
22/44	Set2 Text cmp CHIL Heat	°C	10.0	-20.0	35.0
23/44	m1 coefficient for compensation Text CHIL in cool with low temp., double set-point	Numb	0.0	-10.0	10.0
24/44	m2 coefficient for compensation Text CHIL in cool with high temp., double set-point	Numb	0.0	-10.0	10.0
25/44	m3 coefficient for compensation Text CHIL in heat with low temp., double set-point	Numb	0.0	-10.0	10.0
26/44	m4 coefficient for compensation Text CHIL in heat with high temp., double set-point	Numb	0.0	-10.0	10.0
27/44	ID su 15-16	Numb	0	0	1
28/44	Enable Beep	Numb	1	0	1
29/44	Installer Psw Timeout	Minutes	5	0	120
30/44	Installer Psw exit time	Minutes	20	0	120
31/44	Legionella disinfection eneable time	Minutes	60	10	600
32/44	User Password	Numb	0	0	999
33/44	Enable user alarm log	Numb	0	0	1
34/44	Idle Backlight intensity	%	5	0	100
35/44	Screensaver unlockPsw	Numb	0	0	999
36/44	Screed function Set	°C	35.0	35.0	55.0
37/44	Duration screed function	Ore	10	0	100
38/44	Timeout LCD Navigation	Seconds	60	30	300
39/44	Thermostat t decalibration	°C	0.0	-10.0	10.0
40/44	Thermostat unit probe decalibration	%	0.0	-10.0	10.0

41/44	Bitmap forcing icons	Numb	0	0	4095
42/44	Dew-point temp. margin	°C	5.0	0.0	50.0
43/44	Min. staying time in dehumidification	Seconds	300	0	600
44/44	Max. staying time in dehumidification	Seconds	600	0	1200

Table 4. Keyboard menu service parameters.

The fan coil service parameters are shown in the following table:

N.	PARAMETERS NAME	UNIT	DEFAULT VALUE	MINIMUM VALUE	MAXIMUM VALUE
1/9	Knob offset	°C	0.0	0.0	15.0
2/9	Hot start setpoint	°C	0.0	0.0	50.0
3/9	Too cool setpoint	°C	0.0	0.0	50.0
4/9	T OFF fan for Heat floor	Minutes	0	0	255
5/9	T OFF fan for Heat ceiling	Minutes	0	0	255
6/9	T OFF fan for Cool	Minutes	0	0	255
7/9	T ON fan for Heat floor	Seconds	0	0	255
8/9	T ON fan for Heat ceiling	Seconds	0	0	255
9/9	T ON fan for Cool	Seconds	0	0	255

Table 5. Fan coil service's parameters.

To change a the value of a parameter:

- entered in the parameter list of chillers, fan coils or keyboard, use the up and down arrows to scroll through pages of the parameters, until you find the desired parameter;
- Press on the currently set value;
- the present value turns red to indicate that it can be changed by using the up and down arrows;
- Select the desired value and press the confirmation tick. 

Note: If you press outside the confirmation area, it returns again the previously value.

3.6.5.3 MANUFACTURER MENU

To access to the manufacturer menu you must set the manufacturer password.
From here you can:

- access to the manufacturer parameters of the chiller, by pushing on "Chiller";
- access to the manufacturer parameters of the Hi-T, by pushing on "Keyboard".

3.6.6 HELP PAGE

On the instructions are given guidance on the meaning of the icons; in the list that appears, for each icon is indicated its function.

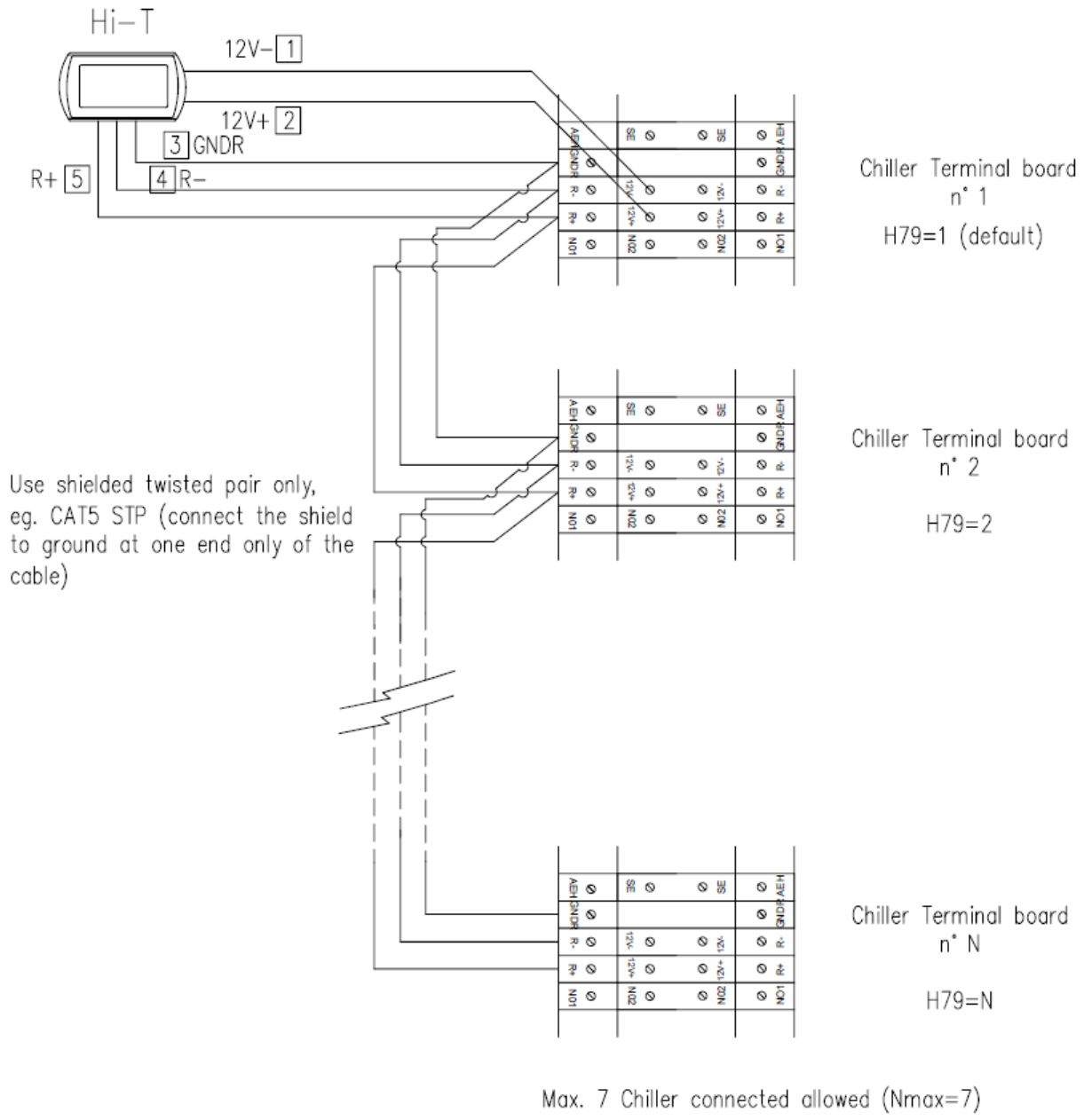
4 STATUS MACHINES AND FUNCTIONS

4.1 NEWTORK MANAGEMENT

The network which is headed by the remote control Hi-T can be composed of a maximum of 7 chiller/heat pumps and up to 80 fan coils. For what concerns the configuration of the network, there are the following functions:

- addressing procedure of fan coil;
- automatic scanning of the network to discover devices;
- radiant panel's management (according to the set-point).

4.2 REMOTE CONTROL CONNECTED WITH MORE CHILLER IN THE NETWORK



In the each on-board control panel, set the chiller (parameter **H79**) as described above .
Then connect the chiller and the remote control Hi -T as shown in the drawing .
In the remote control Hi- T, by setting the parameter **Par 8/44** (*Configuration- > Service Menu > Keyboard*) related to the number of chillers in the network , you can configure the network: with **Par 8/44 = 0** all the chiller in network feature a similar operation (parallel operation , according to a single set point) , while whit **Par 8/44 ≠ 0** we have a decalibration on the steps of the chiller set

point, allowing a cascade operation. In particular, the parameters to be set in a network of the chiller to be configured in a cascade are:

- **Par 8/44**: number of chillers in the network (for cascade operation);
- **Par 9/44:** Rotation period (for cascade operation);
- **Par 10/44**: (default 2.0 ° C): differential chiller (for cascade operation).

In the case of cascade configuration (**Par 8/44 ≠ 0**), the set point of each chiller is changed by a multiple value of the parameter **Par 10/44** (° C) (differential chiller), according to a step-decalibration. After each period equal to **Par 9/44** minutes, the priorities for the intervention of the chillers change, by rotating the decalibration of the set point of the chillers, in order to balance the load on the various machines. If a chiller is in alarm, it is excluded from the regulation. By default **Par 8/44=0**.

4.3 CHILLER/HEAT PUMPS MANAGMENT

With the remote control Hi-T, up to 7 MAXA chiller (i-HWAK V2/V2+ series and i-HP series) will run. The main functions regulated are:

- ON/OFF controlling;
- Change of season (summer, winter, summer with sanitary mode, winter with sanitary mode, sanitary mode);
- Set-point setting;
- Display current alarms;
- Alarm history residing in the keyboard with the date and the time of the event;
- Access to the parameters of the chiller (password protected);
- Display of the main statuses of the chiller;
- Weekly programming in summer, winter, sanitary mode and of the legionella disinfection cycle.

4.3.1 ENABLING THE INDIVIDUAL CHILLER FOR THE PRODUCTION OF SANITARY WATER

Of all the chiller in the network enabled to produce sanitary water, you can choose using the appropriate sub-menu in "*Status setup*", which of these may participate in the sanitary production (see Paragraph 4.6.2). Only those selected will be enabled to the production of sanitary water, all the others are used exclusively for the plant.

4.4 FANCOIL MANAGE

With the remote control Hi-T, up to 80 MAXA fancoil with HNS Box, divided into up to 9 zones, will handle. The settings of the fan coil can be made for individual zones (not for individual units). The main regulation functions are:

- ON/OFF (system and / or zone with its scheduler);
- Season (system);
- Fan speed (of the area);
- Dehumidification control.

To the Fan coils is also sent the set-point of the zone. It is taken into account the adjustment made locally on the knob of the fan coil.

4.5 PROCEDURE BEFORE SETTING THE Hi-T REMOTE CONTROL

NOTE: To facilitate the installation phase and the interfacing of the keyboard with the hydronic terminals, it is advisable to supply the terminal units separately; each terminal unit must be intercepted by its switch.

4.5.1 ADRESSING

During the first start it is necessary to supply each hydronic terminal separately. The phase of addressing is done according to the following steps:

1. Power on the first fan coil;
2. From the main page of the system, go to "*Configuration*"  ;
3. Enter inside "*Service Menu*"  ;

4. Enter the service password and press on the mark's confirmation;
5. Enter inside the "Addresses configuration";
6. Enter inside the "*Addresses assigns*";
7. Change the address with the arrows: the addresses can be assigned from the number 10;
8. Push on the confirmation icon next to the word "Start:";
9. After a few seconds you will see "*Set*";
10. Remove power supply from the first fan coil and power on the second;
11. Perform the same steps 7 through 9 for each fan coil units connected to the same keyboard.
12. It is important to assign to the fan coil units that will be bound to the same zone a series of consecutive addresses (e.g. whether there are 3 fan coil units within the same hall and if you want to associate them with a single thermal zone that we call HALL, you must give the themselves a series of addresses from 10 to 12, etc..).

4.5.2 SCAN NETWORK

Once each fan coil has been addressed , it is essential to perform a network scan to check whether all the fan coils are correctly recognized. To do this:

1. restore power supply to all the fan coil;
2. enter to the service menu following the same procedure described in the previous section (points 2-4) and enter "*Scan network*";
3. press the tick confirmation closer to the word "*Start*" and let the system scans the network;
4. after scanning the system should find all of the chiller (max. 7 in cascade) and all fan coil units connected to the same network. If the number of fan coils found does not match those installed, the wiring was not performed properly.

If one or more fan coil properly addressed and identified, get disconnected from the network (for example, due to a failure of the fan coil power supply), the keyboard proceed with the updating of the number of the actually working fan coils in the system with a delay of 2 minutes from the occurrence of the event, accompanying the update with a an error message. When the fan coils are re-connected, the keyboard recognizes them automatically, saving the settings previously set.

4.5.3 AREAS FAN COIL ASSIGNMENT AND CUSTOMIZING THE AREA'S NAME

To match the fan coil to the desired areas you must perform the following steps:

1. enter the "*Configuration*" and from here going in "*Service menu* " following the same procedure described in Paragraph 4.5.1 (steps 2-4) and select the "*Area configuration*";
2. press on "*Zone 1*";
3. press on the second line where it appears the current name "*Zone 1*" and change the zone name using the keyboard that appears (you can enter up to 9 characters);
4. to confirm the new name, press "*Enter*", otherwise press on "*Esc*";
5. press the value that appears at the words "*From*" (the value is highlighted in red);
6. use the arrows to select the address of the first fan coil units in the area that you are configuring;
7. press the tick confirmation;
8. press the value that appears in correspondence of "*To*" (the value is highlighted in red);
9. use the arrows to select the address of the last fan coil units in the area that you are configuring;
10. press the confirmation tick;
11. repeat steps 2 through 10, using the procedure to other areas that you want to configure.

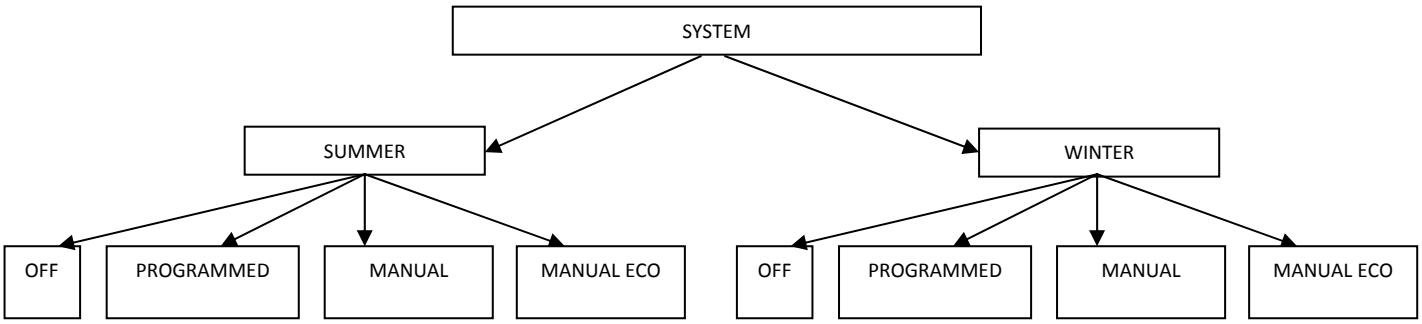
4.6 ASSOCIATES UNIT OPERATION

4.6.1 ON/OFF

Once executed the zone configuration and the association of the fan coil, you can proceed to the "first start" of the connected units. You can turn on or off with a single tap the whole system headed by a single keyboard Hi-T; otherwise you can individually turn on the chiller and manage individual zones.

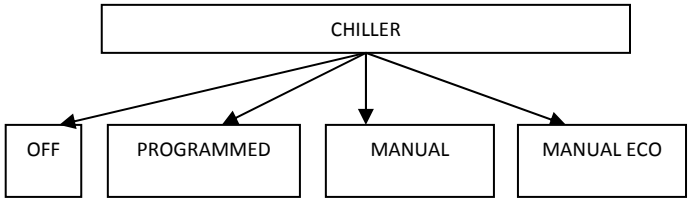
For operate the entire system:

1. from the main page of the system, go to "Status setup 
2. in the menu that appears are listed: SYSTEM, CHILLER, ZONE-nth.
3. Push on "System" and with a single operation you can turn on or off all fan coil units of all the areas connected to the keyboard Hi-T and all the chillers that are part of the same system:

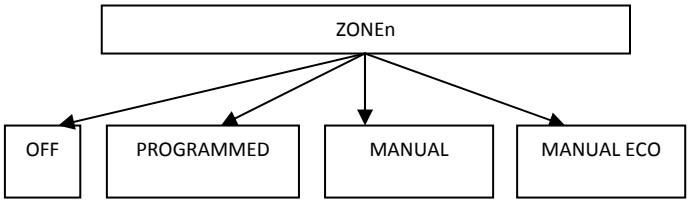


With "*Manual*" and "*Manual eco*" the set-point temperature set in the menu "*Set water*" and "*Set water eco*" is activated; they respectively correspond to the temperature of "normal" operation (1st set-point) and to the working temperature during the energy-saving operation (set-point economy).

By accessing "*Set Status*" and press on "*Chiller*" you can only manage the chiller interested in:



With "*Manual*" and "*Manual eco*", the set-point temperature set in the menu "*Set water*" and "*Set water eco*" is activated; they correspond respectively to the temperature of the outlet water during normal operation and during the energy-saving operation (Ex: in summer mode "*Set water*" might be 7 ° C, while "*Set water eco*" could be 10 ° C).
By accessing "*Set Status*" and press on "*ZoneN*" you can manage each area separately (e.g. the activation of the zone 1 is not a sufficient condition for the chiller to power on, if it is off):



With "*Manual*" and "*Manual eco*" the set-point temperature set in the menu "*Set water*" and "*Set water eco*" is activated; they respectively correspond to the temperature of "normal" operation (1st set-point) and to the working temperature during the energy-saving operation (set-point economy).

Once you have set the status, in the "*Set Status*" the following icons may appear in the coincidence of the unit/zone set:

OFF MANUAL ECONOMY MANUAL PROGRAMMED

Another way to set only certain areas/units in a given status can be as follows:

1. set "*System*" in the manual, manual eco or programmed mode;
2. put off units/areas that you do not want to activate.

Note: Once the status is set, you must wait a minute to ensure that communication with the on-board control of the units in the network is going and the units themselves are activated in the set status.

4.6.2 ON/OFF SANITARY MODE

If enabled the sanitary mode (from *Home* -> *Configuration* -> *Service Menu* -> *Parameters* -> *Chiller* -> Chiller name -> **H10: sanitary presence = 1**), in "*Status setup*" also appears the word "*Sanitary mode*". From here you can decide which chiller enable to produce the domestic hot water:

1. Enter the “Settings status”, then in “Sanitary mode”;
2. On the next screen select "All" to enable all the chiller to the production of sanitary water, or select only the chiller interested in this production (the other will be used exclusively for the plant);
3. Confirm by pressing the tick confirmation in the upper right area;

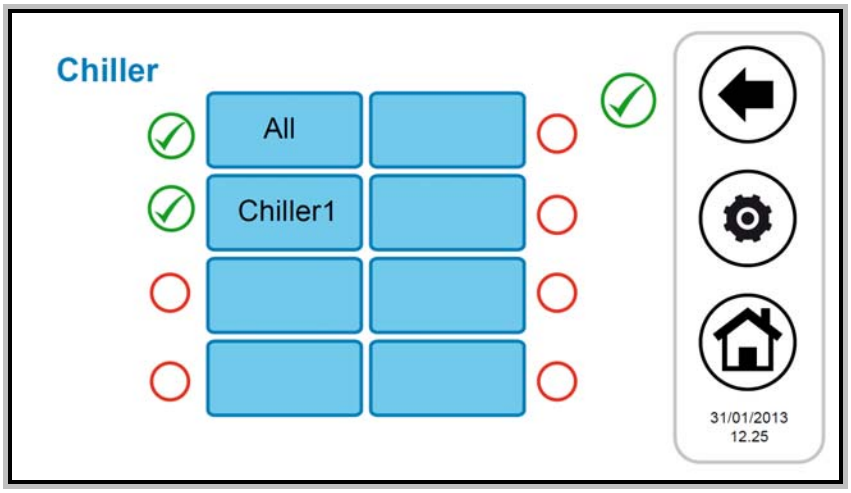
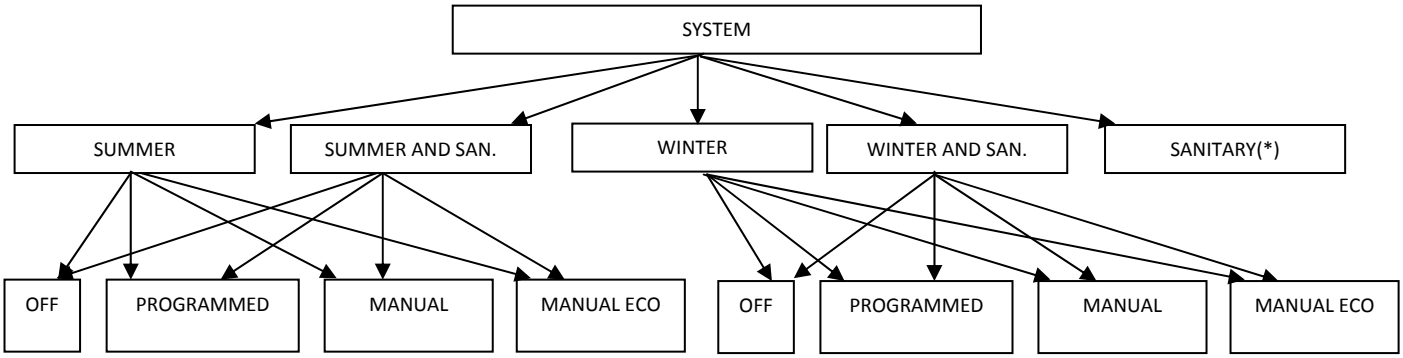


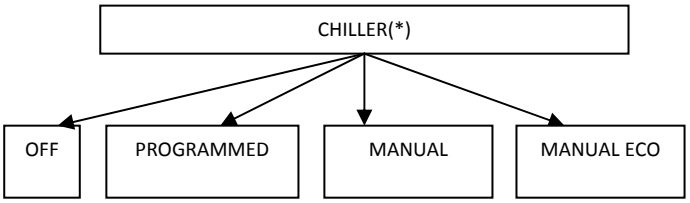
Figure 23. Chiller choice for sanitary water.

4. In the "*System*" menu (system main page -> "*Status setup*" -> "*System*"), with the sanitary mode enabled by the parameter H10, it appears also the words "*Winter and san*", "*Summer and san*", "*Sanitary*" .



5. If the status of the system is set to "*Summer and san*" or "*Winter and san*", the priority is given on the production of domestic hot water; therefore the system goes first in domestic hot water production, when the sanitary is satisfied, the system switches the mode to summer or winter operation.

(*)If from: System main page -> "*Status setup*" -> "*System*" you select only the "*Sanitary*":
to put the sanitary in "*OFF*" or "*Programmed*" or "*Manual*" mode, then go to "*Status setup*", enter to "*Chiller*" and from there select the status (in this case both "*Manua*l" and "*Manual eco*" set the chiller in the sanitary manual mode).



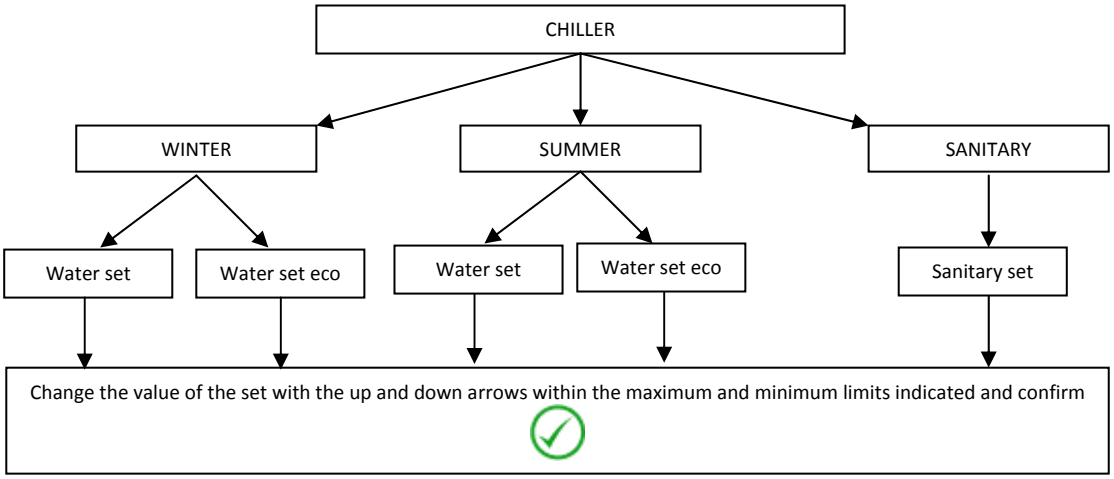
Note: Once the status is set, you must wait a minute to ensure that communication with the on-board control of the units in the network is going and the units themselves are activated in the set status.

4.6.3 SET-POINT SETUP

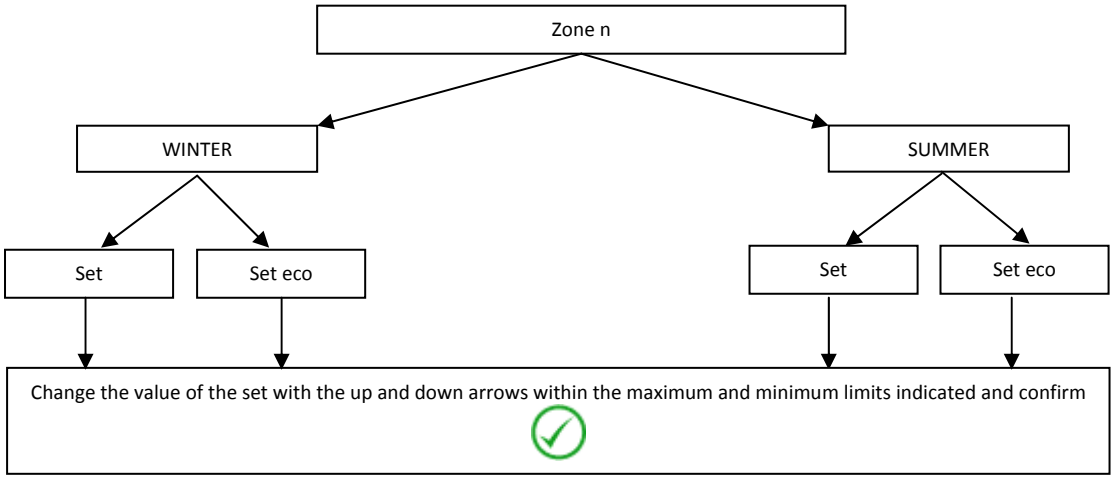
To manage the set point of the different zones and of the chiller is necessary:

1. from the system main page, go to "*Set-point setup*";
2. here you will find a list of the chillers and the areas previously assigned:
   - CHILLER
   - ZONE1
   - ZONE2
   - ……
3. Select chiller or zone of consideration;
4. possible settings are "Winter", "Summer", "Sanitary" for the chiller, "Winter" and "Summer" for the fan coil zones:

CHILLER

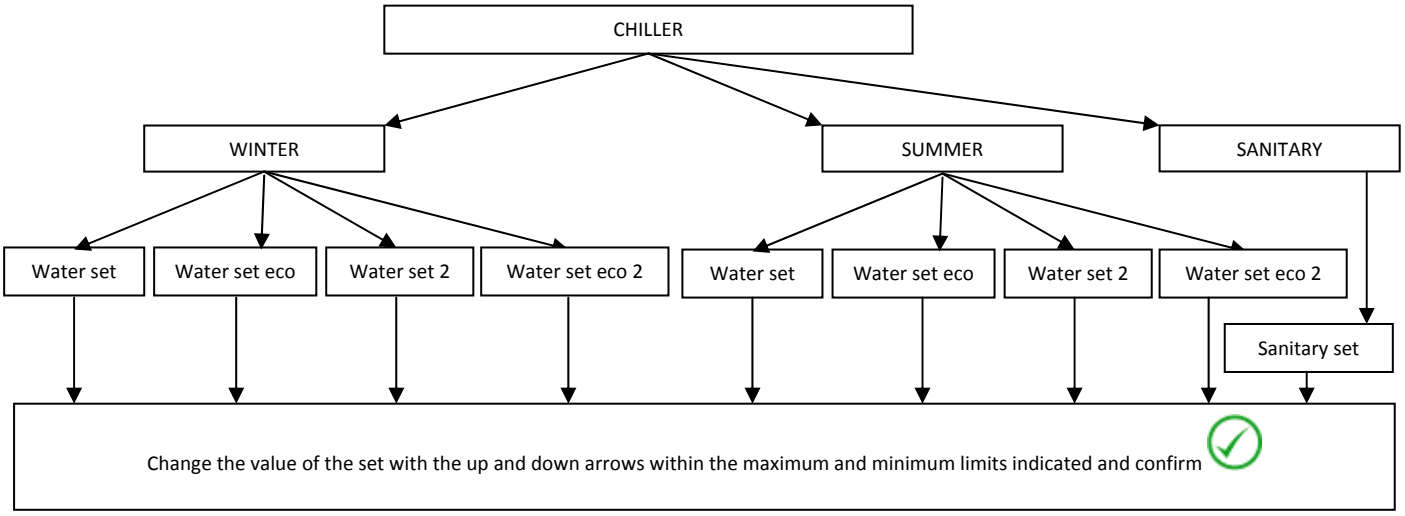


ZONE n



If enabled the double set-point (from Home System -> *Configuration* -> *Service Menu* -> *Parameters* -> Chiller -> *Chiller name* -> **H82: Enable second setpoint = 2, 3, or 4**), (see Paragraph 4.9), the possible settings for the chiller are:

DOUBLE SET-POINT



4.6.4 FAN SETUP

To set the fan speed refer to what is stated in Paragraph 3.4.2.

4.6.5 PROGRAMS SETUP (CHRONOTHERMOSTAT)

The programming of the chronothermostat is done separately on the chiller and on the fan coil terminals: you must program both the activation and the deactivation of the chiller, and both the activation and the deactivation of the areas which are associated with the fan coils; the activation of a programmed area is not a sufficient condition to activate the chiller/chillers connected in parallel to the system.

From the main page of the system, go to "*Programs*"  ;

Now you can choose between 5 programs:

- "*Summer Chiller*", to set the weekly time programming of chillers in cooling mode;
- *"Winter Chiller"*, to set the weekly time programming of chillers in winter mode;
- *"Summer Zone"*, to set the weekly time programming of the zones in summer mode;
- *"Winter Zone"*, to set the weekly time programming of the zones in winter mode.

In addition, if is enabled the sanitary mode (from System main page-> *Configuration* -> *Service menu* -> *Parameters* -> *Chiller* -> *Chiller name* -> ***H10: sanitary presence = 1***), you can access to two other programs:

- "*Sanitary mode*" to set the weekly time programming mode of the chiller in sanitary mode.
- *"Legionella disinfections"* to set the weekly time programming of the legionella disinfection cycle.

4.6.5.1 WEEKLY CHILLER PROGRAMMING

For the chiller can be defined on the seven days, independently and with minimum steps of 15 minutes, the status of operations:

- Off
- Normal operation (use of normal water control set)
- Economical operation (use of the set of economic regulation of water)

The weekly programming in summer operation is distinct from that one in winter mode.

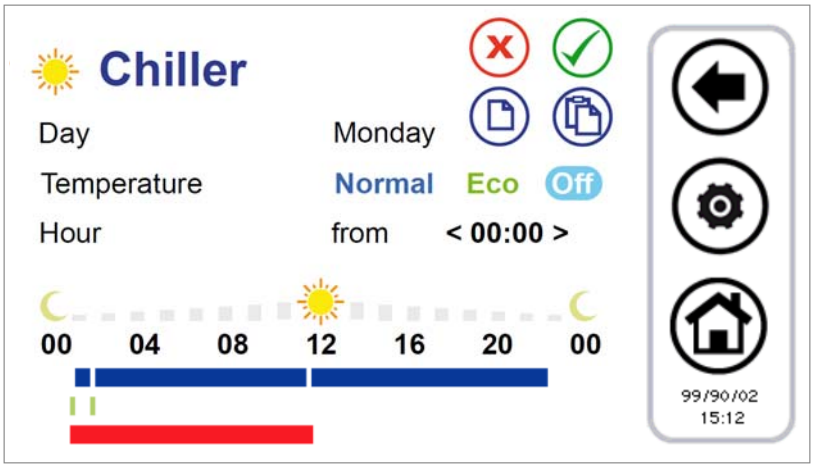


Figure 24. Chronothermostat, "Summer Chiller" page.

1. Scheduling of a day time-line:

- press on the day currently displayed to move to the next days and select a day;
- choose if you want to set the way of operation in normal mode (press "*Normal*"), or Economy (press *"Eco*"), or if you want to set to Off (press "*Off*");
- check that after "*Hour*" appears the word "*From*" (if appears instead the word "*To*", you need to press it once to display the word "*From*") and select the hour and minute (the minimum allowable variation is 15 minutes)for the beginning of the time period;
- press once on the *"From*" in a manner that appears the word "*To*" and select the hour and minute (the minimum variation permitted is 15 minutes) for the end of the time period;
- confirm the single time period pressing the green symbol of confirmation ;
- afterwards you can observe that, correspondingly to the selected time period, you will see a time-line bar of the colour of the type of the selected set (if normal blue, green when in economy mode, no bar in "Off") ;
- repeat the above steps for all the time slots that you want to set on that particular day.

2. It is possible to <u>copy the programming</u> for a particular day in another day; to do this:

- select the day you want to copy the scheduling;
- press the copy icon ;
- select the day on which you want to copy the scheduling;
- press the paste icon .

3. It is possible to <u>erase the programming of certain day or of all days</u>, to do this:

- press the delete icon ;
- at this point a screen will appear where you can select individual days to delete or select all the days;
- to confirm your selections, press the icon on the top right part .

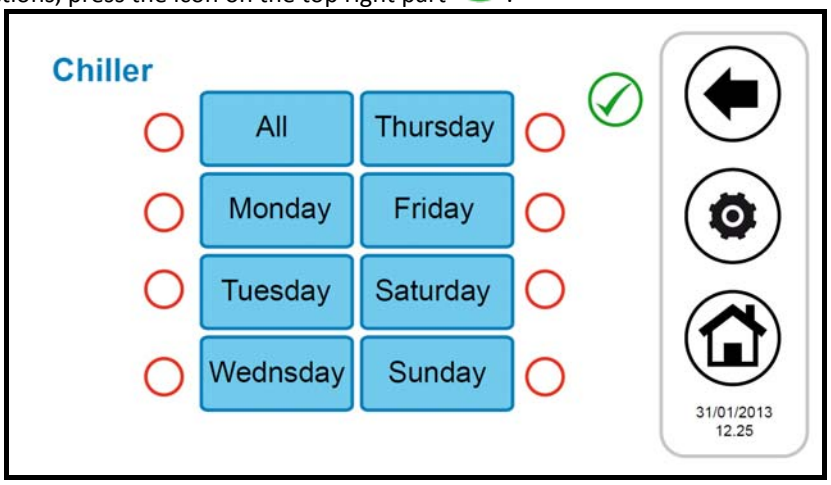


Figure 25. Chronothermostat, erase programming page.

In the configuration pages on the chronothermostat colourful time-lines appear: the blue time-line indicates normal operation, the green time-line indicates the economical operation, the red time-line indicates the time in which the legionella cycle it is programmed (thus the machine in that condition may be active even if the scheduler is set to Off).

4.6.5.2 WEEKLY PROGRAMMING FAN COIL ZONE

In a similar way to the scheduling of chillers, a weekly program of each zone can be set (independently between summer and winter), with minimum steps of 15 minutes.
The possible settings are:

- Off zone;
- Normal operation zone (normal ambient set-point);
- Economical function zone (economic ambient set-point).

Going in "Summer Zone" or "Winter Zone" the list of all zones set is shown. At this point you need to choose the area you want to set; the configuration procedure on the chronothermostat is then equal to that one previously reported for the chiller. The features and the functionalities of the page are identical to those already described.

4.6.5.3 WEEKLY PROGRAMMING SANITARY WATER PRODUCTION

In a similar way to what is reported for the settings on the chronothermostat of chillers and fan coils, you can define when to enable the production of sanitary hot water (by setting the individual days of the week, with a minimum step of 15 minutes). The settings that you can do are:

- Normal: Enable function;
- Off: Disabled function.

To set the programming, go to "*Programs*" -> "*Sanitary*" (the word "*Sanitary*" appears only if you have enabled the sanitary mode: System Main -> *Configuration* -> *Service menu* -> *Parameters* -> *Chiller* -> *Chiller name* -> ***H10: Sanitary presence = 1***).
The procedure for configuring the programmable chronothermostat is therefore similar to those described above, with the only difference that the choice of the operation is only between "*Normal*" and "*Off*" (see figure below).

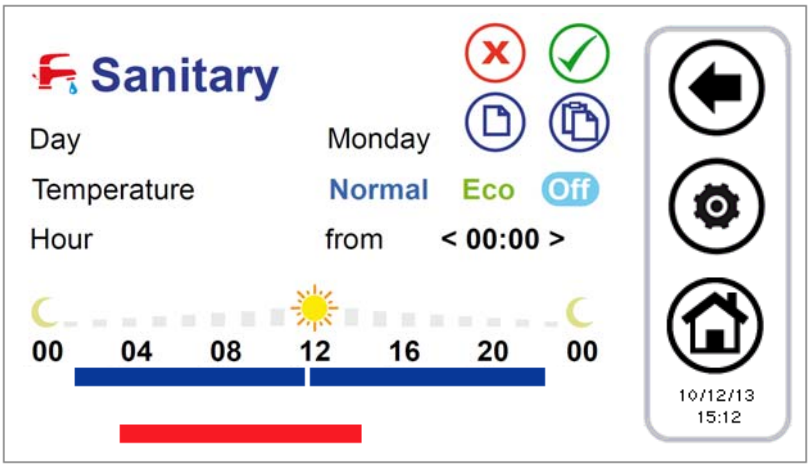


Figure 26. Chronothermostat, "Sanitary" page.

In the period when the function is active, the machines enabled to produce sanitary water are placed in the seasonal operation of the plant scheduled by the plant scheduler with the addition of the sanitary mode, that is, respectively:

- Summer + sanitary
- Winter + sanitary
- Only sanitary

4.6.5.4 LEGIONELLA DISINFECTION WEEKLY PROGRAM FUNCTION

If the sanitary function is enabled (from system main page -> *Configuration* -> *Service menu* -> *Parameters* -> *Chiller* -> *Chiller name* -> ***H10: Sanitary presence = 1***), you can program the hours of the individual days of the week for activating the cycle of anti-legionella disinfection.
You select only the starting time (with 15 minutes steps), since the duration of the cycle is defined by a parameter with maintainer access rights (System main page --> *Configuration* -> *Service menu* -> *Parameters* -> *Keyboard* ***-> Par 31/44: Legionella disinfection enable time*****).**
To carry out the programming you must enter into "*Programs*" -> "Legionella disinfection"; the procedure is simple because you have to select only the starting day and hour for the cycle (see Figure below).

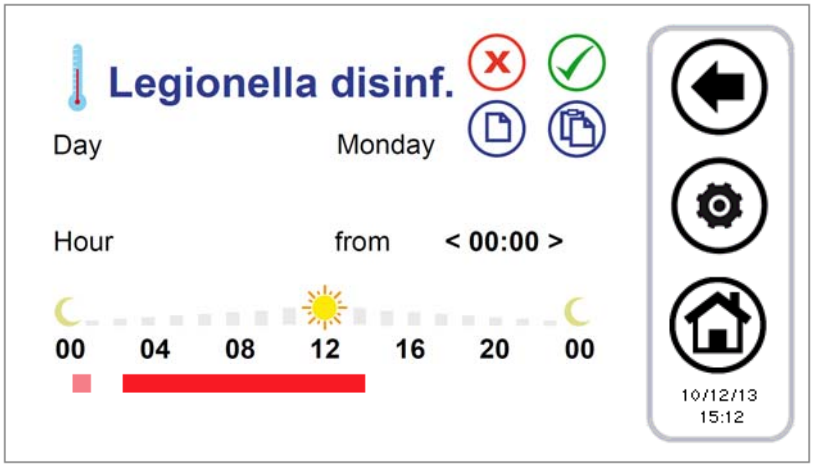


Figure 27. Chronothermostat, "Legionella disinfection" page.

The set timeline appears red-colored.
The pink line shows the eventual setting of the previous day that overruns in current day because the duration exceeds the midnight.

4.7 KEYBOARD SETTINGS PROCEDURE

4.7.1 SETTING OF THE LANGUAGE AND OF THE DATE/TIME

To set the keyboard language:

1. from the system main page, go to "*Configuration*"  ;
2. then, go to "User menu"  ;
3. enter the user password and press the confirmation tick (The default password is 0);
4. go to "*Language*";
5. select the desired language.

To set the date and the time of the keyboard:

1. from the system main page, go to "*Configuration*" - > "User m*enu*";
2. enter the user's password and press the tick key to confirm;
3. go to "Clock";
4. set date and time using the arrows (the values to adjust will be red-colored);
5. when all values have been set, press the icon with the tick to confirm.

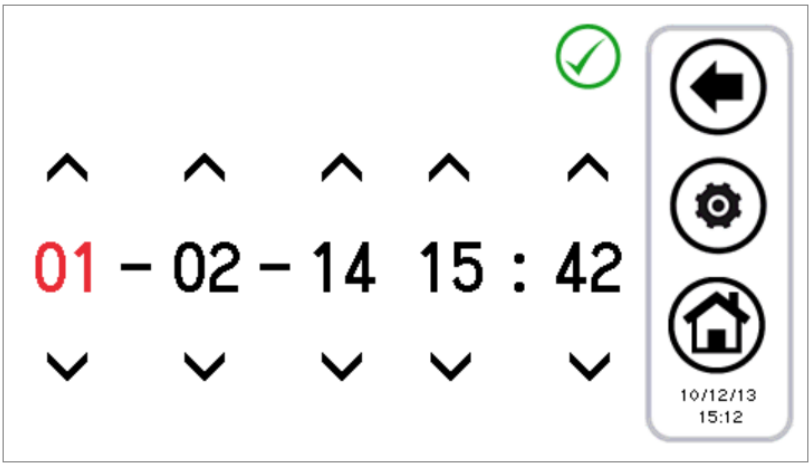


Figure 28. Page "Clock".

4.8 FAULT DIAGNOSTIC

4.8.1 ACTIVE ALARMS

You can view the current alarms of the connected units. To do this, from the home page, press the triangle icon of danger, if present; from here you can access to the list of all active alarms in the system.
Also, when you are in an unit page (i.e. Chiller page, see Paragraph 3.4.1, and fan coil page, see Paragraph 3.4.2), by pressing the triangle that appears on the machine, you go to a menu where you can see current alarms of the selected machine.

4.8.2 ALARM HISTORY

The keyboard manages a detected alarms list for all the plant that shows the date and time of the alarm, the affected machine and alarm type. In the historic are stored up to 100 alarms, once exceeded the limit, it automatically deletes the older alarms.
To go to the alarm history: from the system main page, go into "*Configuration*" -> "*Service menu*" -> "*Alarm list*".
Having maintainer password, you can set that the alarm history is also accessible from the user menu; to do this go into "*Configuration*" -> "*Service menu*" -> "*Parameters*" -> "K*eyboar*d" -> **Par 33/44: Enable user alarm log = 1**.

4.9 DOUBLE SET-POINT AND DEHUMIDIFICATION FUNCTIONS

The double set-point function introduces a second plant side set-point (both in cooling mode and in heating mode).
The application field is primarily that of the floor cooling assisted by fan coil for dehumidification.
The purpose of the application is to prevent in any condition the formation of condensation on the floor, and in any case to ensure the welfare thermo hygrometric.

The activation of the double set-point is by means of maintainer parameters (from System main page -> *Configuration* -> *Service menu* -> *Parameters* -> *Chiller* -> *Chiller name* -> **H82: Enable second setpoint ≥ 2**, ref. chiller manual for allowable values). Must also be set a digital output for controlling the three-way valve used to divert the flow of water between the floor and fan coils. The function of humidistat is instead carried out directly by the remote control Hi-T, by means of its integrated sensors and the logic internally implemented related to the control of dew point and dehumidification.
Please refer to the manual of the chiller for the correct setting of parameters related to the double set-point, as well as for the electrical connections to be done in the terminal board of the chiller.

The set-points can be set with double set-point function enabled are:

Setpoint	Setpoint on Hi-T	Setpoint onboard control panel	Summer	Winter
First setpoint (°C)	T water	Coo/Hea	7 (5÷18)	45 (35÷55)
First setpoint eco (°C)	T eater ECO		12 (5÷18)	40 (35÷55)
Second setpoint (°C)	T2 water	Co2/He2	18 (7÷23)	35 (25÷45)
Second setpoint eco (°C)	T2 water ECO		23 (7÷23)	30 (25÷45)

Table 6. Set point settings with enable double set point.

To manage the setpoint:
- from Hi-T →"*Set-point setup*" menu -> "*Chiller*" ->"*Summer*" o "*Winter*" (see Paragraph 0).
- from on-bard control panel → SET button.

The second setpoint is greater than the first set point in summer and lower in winter:
- in summer: $T_2 \geq T$
- in winter: $T_2 \leq T$

The parameters to be set for the management of dehumidification are accessible from the maintenance menu (*Configuration* -> *Service menu* -> *Parameters* -> K*eyboard*):

Parameter	Name	Unit	Default	Min.	Max.
Par 42/44	Dew-point temp. margin	°C	5.0	0.0	50.0
Par 43/44	Min. staying time in dehumidification	Seconds	300	0	600
Par 44/44	Max. staying time in dehumidification	Seconds	600	0	1200

Table 7. Service keyboard parameters for dehumidification.

Note: If in the chiller is configured the presence of a digital input to the management of the second set point (chiller parameter **H44 = 26,** terminals SE-SE, ref. Chiller manual), the management of the humidity control is not done from the remote control.
The digital input is also possibly used for switch between the first and second set point during operation in winter mode.

With double set-point function enabled, if the chiller works on the second set-point (radiant panels side), the double set-point icon appears in the toolbar of the functions in the pages of chillers and fan coils and it remains transparent.
If, however, the chiller switch to thermoregulate on the first set-point (fan coil side), the double set-point icon appears colourful.
Similarly, the entry into dehumidification is marked in the function bar of chillers and fan coils by the transition from transparent icon to colourful icon.

With parameters **H82>1**:

	FLOOR SIDE FUNCTION (2° SET-POINT)	FAN COIL SIDE FUNCTION (1° SET-POINT)
DOUBLE SET-POINT ICON		
ICON DEHUMIDIFICATION		 if dehumidification is active

Table 8. Double set-point/dehumidification icon.

In addition, in the home page, you will see a visual indication of activation of the fan coil dehumidification (see Figure 9. Fan coil dehumidification.).

4.9.1 MEASUREMENT OF TEMPERATURE AND HUMIDITY

The ambient temperature and the relative humidity measured by the sensors built into the Hi-T remote control, are available to the chiller, which can then use these values measured for their regulators, where required.

4.9.2 DEW POINT AND DEHUMIDUFUCATION CONTROL

Given the environmental temperature and the humidity, the Hi-T remote control calculates the dew point.
In operation of the plant in summer mode, with the double set-point function active on chillers and thermoregulation normally made with the radiant panels (second set of work), it activates a control to keep the dew point of at least a quantity defined by the keyboard maintainer parameter ***Par42/44:*** *" Dew-point temp. margin* "° C below the ambient temperature detected by the control itself.
Instead, when *ambient temperature < Dew Point + Margin temp. Point*:

- The fan coils for dehumidification turn on.
- The chiller start working with the set-point for the fan coils.

The permanence remains in this status until the temperature returns to:

Ambient temperature ≥ Dew point + Dew temp. margin + 1°C.

Even in the case where the above condition is verified, it remains in the status of dehumidification for at least the time set by maintainer parameter ***Par43/44:*** *" Min. staying time in dehumidification"*, in order to avoid annoying oscillations.
If the above condition is not satisfied after a maximum time given by the maintainer parameter **Par44/44**: "*Max Dehumidification time* ", the machine comes out from dehumidification. To avoid returning immediately, in this case it requires a minimum staying in adjustment to the radiant panels, still given by ***Par43/44:*** *" Max. staying time in dehumidification ".*

4.10 CLIMATIC COMPENSATION

It is possible to compensate the set-point according to outdoor temperature, in a different way between heating and cooling modes, first and second set-point.
In such a case be sure that the ***b08*** parameter *(System main page -> Configuration -> Service menu -> Parameters -> Chiller -> Chiller name -> **b08: Enab. dynamic set point)*** is disabled (=0) on the chiller.

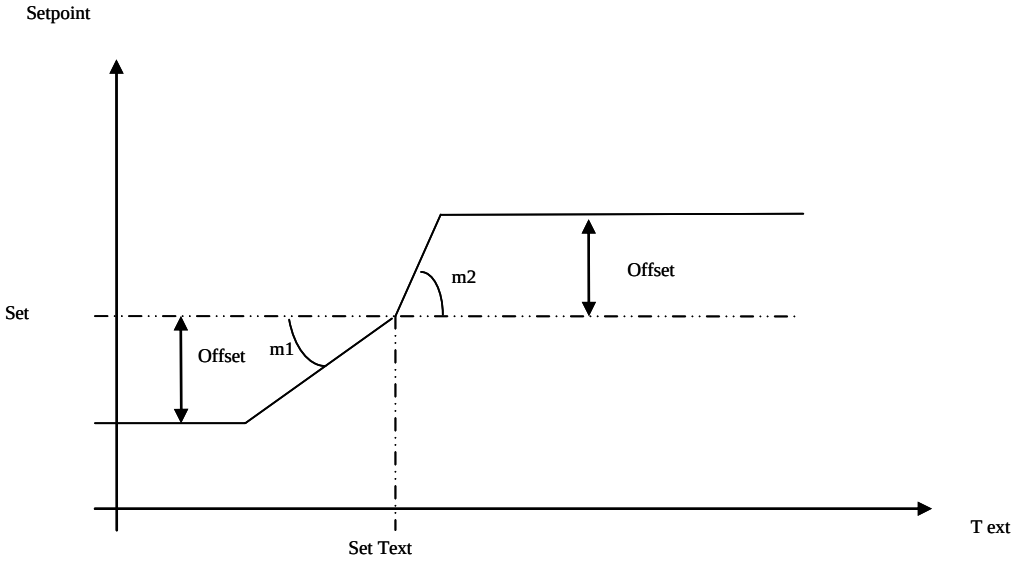


Figure 29. Climatic compensation.

- Set = T water, T water ECO o T_2 water, T_2 water ECO, settable from the page: "*Set-point setup*" -> *"Chiller".*
- *Offset* = offset settable from the page: "*Set-point setup*" -> *"Chiller"* (the variable "*Offset*" appears only if the *"m" coefficients have been configured*).
- *Set Text*, *m1*, *m2* = parameters which can be set from: "*Configuration"* -> "*Service menu*" -> "*Parameters*" -> "*Keyboard*" (see parameters list in Table 4).

To exclude the climatic compensation by the user, you have to set to zero all the offsets in the menu "*Set-point setup*" -> *"Chiller".*
To exclude the climatic compensation by the service, you have to set to zero the "*m*" coefficients in the service menu, keyboard parameters.
The outdoor temperature is detected by a dedicated sensor already wired to the heat pump.

4.11 OTHER FUNCTIONS

For any information related to other functions of the chiller or of the fan coils which are shown in the Hi-T display (e.g. enabling or activation of plant electrical heater, sanitary electrical heater, boiler integration, defrosting cycle, water-side or air-side anti-freeze heaters, etc…), please refer to chiller or fan coil manuals.

4.12 SPECIAL FUNCTIONS

From the main menu, choosing the icon "additional functions", you go to the following menu:

Figure 30. Page "Special functions".

The available functions are described in the following paragraphs.

4.12.1 SCREED FUNCTION

By pressing the icon related to the screed function you access to a new menu in which you can choose which units should be enabled to this function:

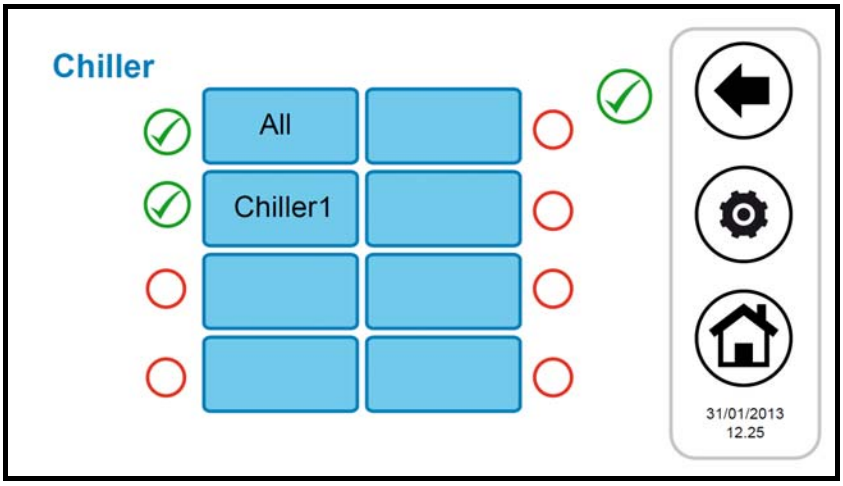


Figure 31. Chiller multiple choice, screed function.

Once you choose the chillers which participate to this regulation, the system has the following behaviour:

- All the heat pumps enabled in the screed function are forced to heat mode.
- All the heat pumps not enabled in the screed function are forced to off mode.
- The heat pumps set-point is given by the parameter "Screed function set", which can be set among the service parameters (*Configuration -> Service menu -> Keyboard -> **Par 36/44**: " Screed function Set"*).
- The function has a duration given by the service parameter: *Configuration -> Service menu -> Keyboard -> **Par 37/44**: " Duration screed function"*. After such period the system returns to the previous settings.

4.13 PASSWORD AND PROTECTIONS

There are more protection and password levels.
An initial distinction includes the following three access levels:

- User's level
- Service level
- Manufacturer's level

To each of these three different levels you can access from the "Configuration" screen, previously inserting a dedicated password.
The user's password, default set to "0", can be modified by accessing to user's parameters (see Paragraph 3.6.5.1).
The service's password can be modified by accessing to service parameters (see Paragraph 3.6.5.2).

The manufacturer's password can be modified by accessing to manufacturer's parameters (see Paragraph 3.6.5.3).

Once the password has been inserted, is allowed the full navigation in all the pages in which the access has been granted.
Once the navigation has terminated, log-out should be done by a touch on the related symbol which is flashing in the low-right side of the home page.

The log-out happens automatically after 5 minutes of touch-screen inactivity or after 20 minutes from the access to the current level of protection. These timing values can be modified from service or manufacturer's parameter.

There is a password to unlock the screensaver, set by default to "0" and modifiable by accessing to user's parameters (see Paragraph 3.6.5.1).

5 REMOTE ACCESS

The device can interact with the local network by an Ethernet port access.
The access must be enabled through a manual installation in the local network (no DHCP services are forecasted).
The device can communicate through browsers compatible with HTML 4.01 and/or TPFT services RFC 1350 compliant.
The web-server interface is a textual type and is below described.

5.1 SECURITY

The insertion of the touch screen in a LAN network must guarantee a higher level security, which must be ensured by the installer, against undesired attacks from outside agents (hacker).
The device will not enforce security systems and will assume that anyone who interacts from the network is enabled to do so.

5.2 LOCAL WEB SERVER

A local web-server has been implemented to access to Hi-T from the local network with a browser HTML 4.01 compatible.
To access check on page "*Ethernet Configuration*" accessible from the home page by pushing on the following icon:

Accessing by service/manufacturer's allowances, it is possible to modify the default values of each address. After having modified the addresses, please shut down and restart the Hi-T to make modifications affective.
The shown pages, once connected, are:

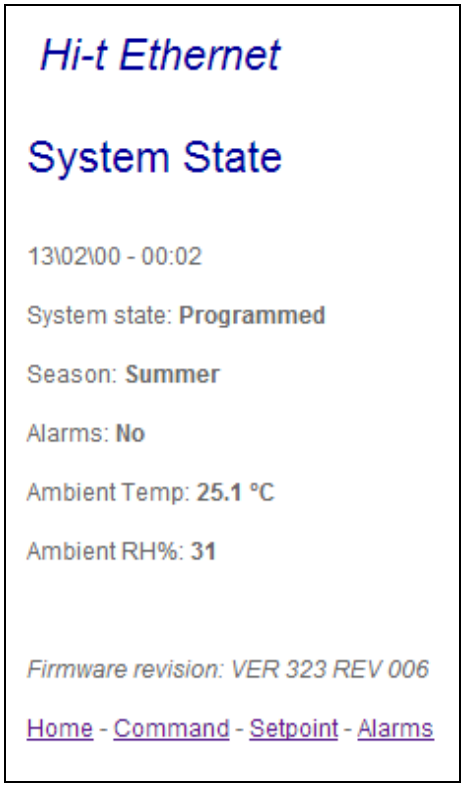


Figure 32. Hi-T Ethernet main page.

The indication on Status, Season and Alarms is related to the entire system.
The room temperature and the relative humidity are the ones measured from the sensors integrated inside the current Hi-T. To shift to next available pages, click on the links at the page bottom.

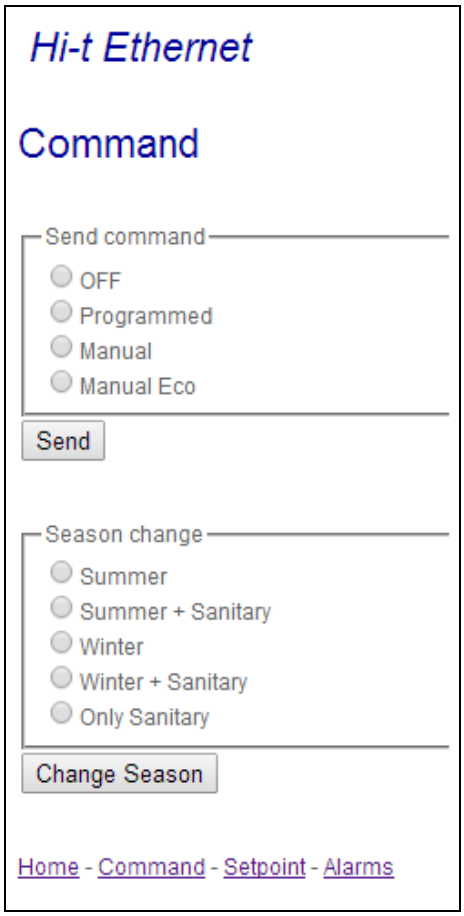


Figure 33. Hi-T Ethernet "Command" page.

The commands present in the “Command” page are referred to the entire system.
Once sent the commands, a confirmation page appears.

Figure 34. Command sent confirmation page.

Figure 35. Hi-T Ethernet "Set-point" page.

In the "Set-point" page are available, in read only mode, the set-point set by Hi-T.

Figure 36. Hi-T Ethernet “Alarms” page.

The “Alarms” page is related to all the active alarms inside the system at the moment when the page is shown.

6 FIRMWARE UPDATE

In the home page, by pressing on the symbol in the left-high side, showing Hi-T, it is possible to see the current firmware version installed in the touch-screen.

In case of firmware update, it is possible to make the upgrade by means of an USB key, using the on-board USB port.
For the upgrade:

- copy the upgrade file in the main root of a USB pen-drive;
- insert the pen-drive into the Hi-T USB port;
- enter into “Configurations -> “User’s menu” (see Paragraph 3.6.5.1);
- after having inserted the user’s password and entered into “User’s menu”, select the string which appears “*Firmware update*”;
- the controller automatically recognizes the firmware presence inside the USB pen-drive and starts the updating procedure;
- follow the instructions shown in the display and extract the pen-drive only when requested by the message “*Remove the USB pen. The panel will reboot to finish the update*”;
- wait until the update has completed.

7 HNS SYSTEM DESCRIPTION

The HNS system can be coupled only with the following hydronic units:

- HWF/HWI fan coils;
- LWF/LWI fan coils;
- HCA/B and HCA/4B hydronic cassette types;
- HCN ducted types.

NOTE: the installation with the MI wall mounted types is not possible.

There are 2 ways to install an HNSbox system:

1) Purchase of the DRAL-NET and the SB modules separately and subsequent installation on the unit at customer's expenses. In this case, it is possible to install the DRAL-NET control on the wall in order to make accessible the temperature's knob, which allows an adjusting of the same within a prefixed control set by the Hi-T. For example, supposing the ambient temperature set at 20°C (via Hi-T), it is possible, by means of the DRAL-NET's knob, to adjust the set within a given temperature range, such as +/-5°C, +/-6°C (adjusting by parameter), and the like. In this case, the whole installation's procedure is at the installer's expenses. By and large, the DRAL-NET is fixed on the wall while the SB interface has to be installed on board. Use a TTL connecting cable (standard provided, max. length 4m) between the DRAL-NET and the SB interface:

2) Purchase of the HNSbox where, inside, the DRAL-NET and the SB devices are already fitted and pre-wired, thus providing the customer with a terminal board for connecting the hydronic units. In so doing, it is not possible to locally adjust the temperature by means of the DRAL-NET device as it is installed inside the BOX. The hydronic units' temperatures and setting parameters can all be controlled via the Hi-T panel. As a rule of thumb, the HNSbox (IP56 GW44207 Gewiss box) is installed close to the hydronic unit, wall built-in or on the side of the hydronic unit, in case of fan coils with or without body, or upon the false ceiling, in case of hydronic cassette types or ducted types installed onto the false ceiling:

The Hi-T control panel allows the visualization of the working parameters of every single hydronic unit and those of every single zone.
It is possible to manage up to no.80 hydronic units, divided into no. 9 thermal zones. Every hydronic unit, once set in accordance with the related belonging zone, uses its own probe as a working probe.
Should the HNS system be coupled with our i-HWAK/WP V2/V2+ and i-HP chillers, it is possible to manage, via a single Hi-T control panel, n° 7 chillers in cascade and no.80 hydronic units divided into no.9 thermal zones. The connection among the Hi-T panel, the minichillers and the hydronic units is very simple: it is made by means of a SSTP (ex. CAT 5) shielded twisted cable connected in series.
Possible configurations

- n° 1 Chiller terminal units not connected

- until n° 7 cascade chillers with terminal units not connected
- n°1 chiller with connected terminal units (until n° 80 terminal units)
- until n° 7 cascade chillers with terminal units connected (until n° 80 terminal units)

The chillers connected in series do not need further working probes to be placed onto the system total discharge piping as the centralized system acquires the single temperature of every unit and “thermal-regulates” as per the average discharge temperature. The advantage of a combined HNS system is mainly based on the fact that the user has the Hi-T panel as the sole interface which, in an easy and intuitive way, allows the setting and the monitoring of the “hydronic units + chillers” system. It is possible to connect in cascade also chillers having different capacities; the Hi-T control will be capable of “self-learning” the installed capacity and of visualizing (by pressing F2 button and selecting the unit) in “real time”, on the main menu, the percentage of provided capacity in comparison with the installed one (under installer’s password). It is also possible, from the display of the main controller, to know the working hydronic units number in comparison with installed ones and respecting the number of running chillers connected in the network.

SANITARY HOT WATER FUNCTION: the chillers can also provide sanitary water by managing an external 3-way valve and a properly sized boiler. By connecting in cascade several chillers, the user can decide whether all or only just a few of them can be used to supply “sanitary water”.

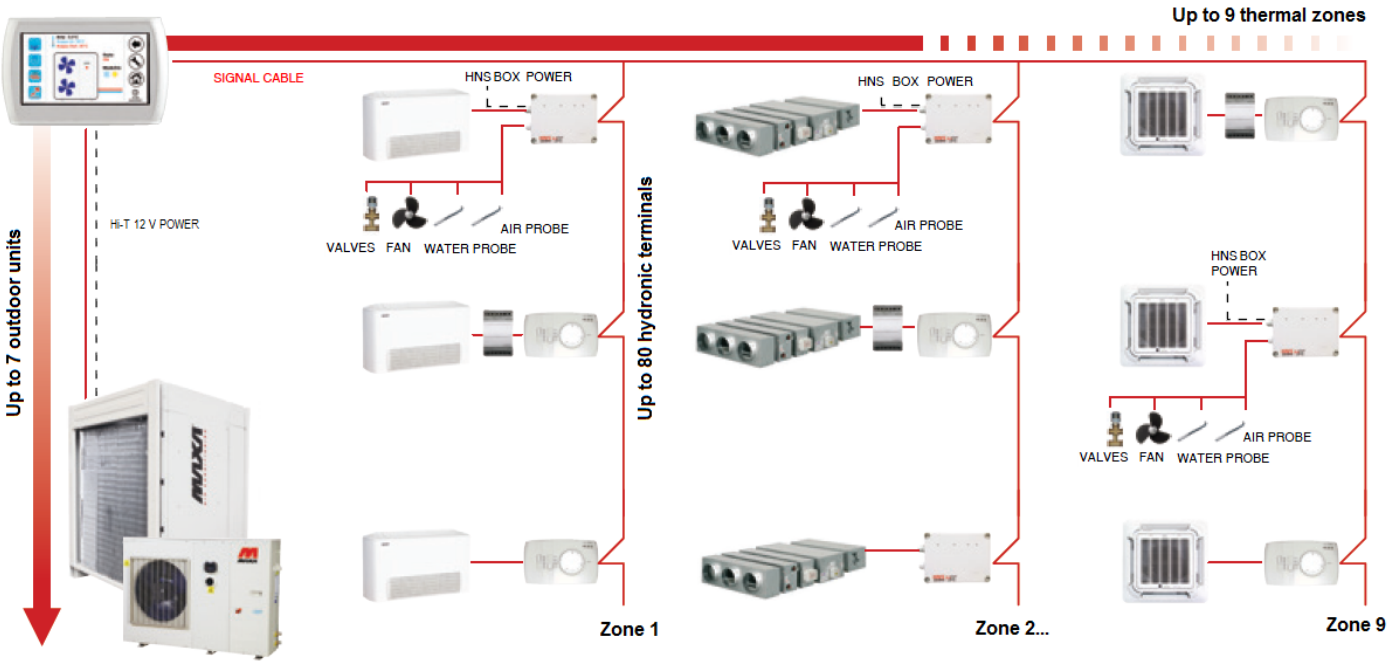
CHRONOTHERMOSTAT FUNCTION: the Hi-T remote touch-screen control contains the function of weekly chronothermostat with two levels of temperature T and Teco, for the control of hydronic terminals and chillers. The weekly programming is performed in separate way for hydronic terminals and for chiller (e.g., in a hypothetical office you can program the power-on of the chiller 30 'before the opening time, so the water in the pipes is heated/cooled and only 10' before the start of the activities the hydronic terminals are switched). Furthermore, the thermostat sets the weekly scheduling also for the production of domestic hot water and for the Legionella disinfection.

HUMIDITY CONTROL FUNCTIONS/DOUBLE SET POINT: humidity and temperature sensors integrated in the Hi-T remote control enable the management of a double set-point adjustment and the thermohygrometric environmental regulation. The remote control Hi-T manages dehumidification for underfloor heating systems.

8 The HNSbox

8.1 FUNCTIONS

The HNSbox has been conceived to get the greatest flexibility and adaptability as for the connection among the hydronic units and the HYDRONIC NET SYSTEM managing system. Find below the connecting logic layout of the HNS system components:



8.2 HNSbox DESCRITPION

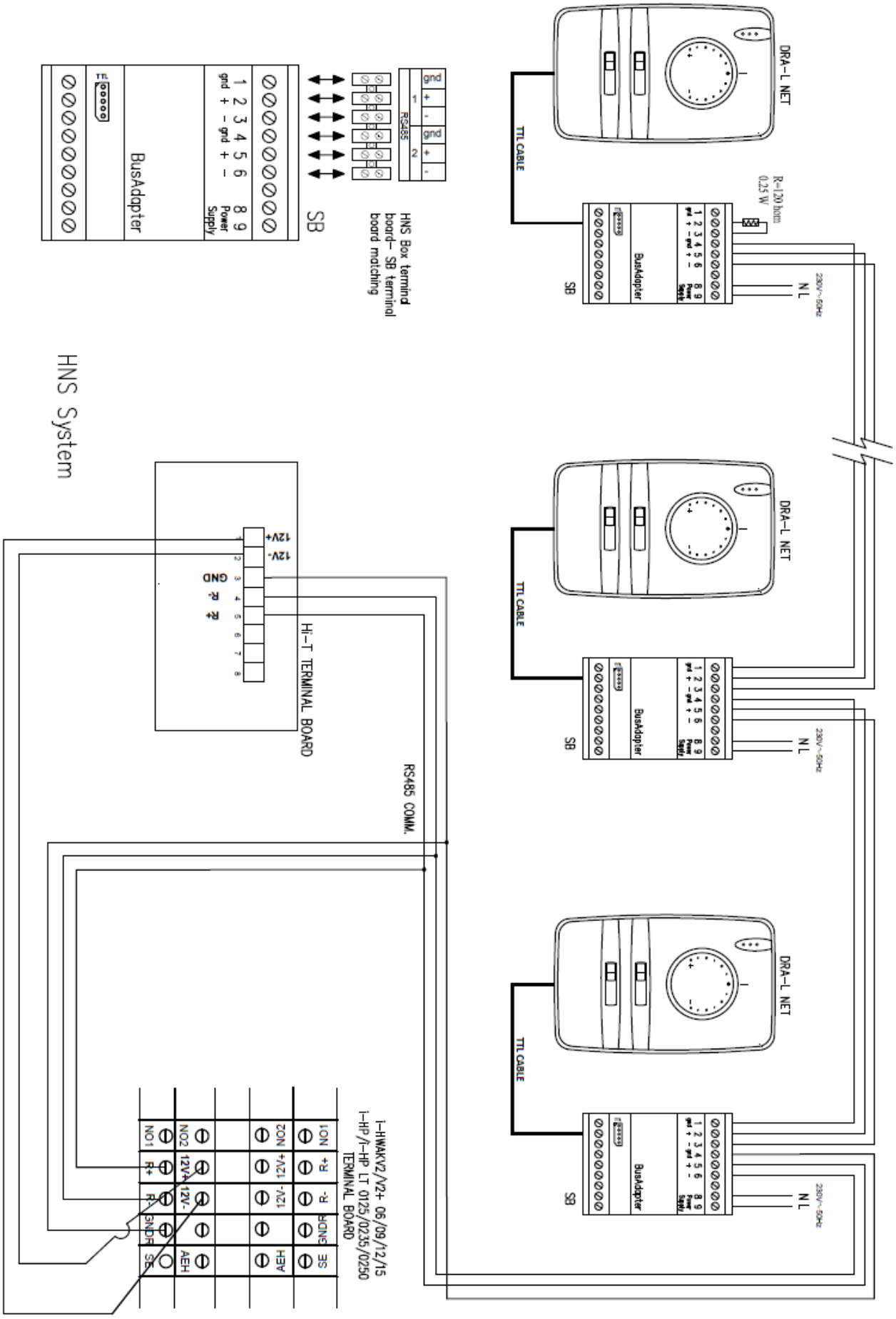
The HNSbox is made up of the following components:

- DRAL-NET, control;
- SB, serial adaptor;
- 2.5 mm^2 terminal board (“Mammut” model type);
- IP56 Gewiss 44207 box;
- Power cables;
- Signal cables.

	***WARNING: The connections described in the wiring diagrams (power and signal connections) of this manual have to be realized only by QUALIFIED PERSONNEL. Make sure to get the power supply disconnected before any intervention on the unit.***

The HNSbox (IP56 GW44207 Gewiss box) can be installed close to the hydronic unit, wall built-in or on the side of the hydronic unit, in case of fan coils with or without body, or upon the false ceiling, in case of hydronic cassette types or ducted types installed onto the false ceiling. Should you decide to install the box in the hydronic unit, make sure not to drill the water and/or the finned battery piping, not to damage possible electrical cables and, by and large, not to alter the hydronic unit’s working integrity.

8.3 CONNECTING THE Hi-T KEYBOARD, THE CHILLER AND THE HYDRONIC UNITS



8.4 DIP SWITCHES SETTING

Modify the Dip Switches inside the DRA-L NET control as per:

- Installed unit;
- Water unit installation position;
- Operation logic.

Dip Switches functions:

Dip Switch no.	ON	OFF	Description
1		**x**	Floor unit
	x		Ceiling unit
2		**x**	On demand ventilation (1)
	x		Continuous ventilation (2)
3	**x**		Valve thermal regulation
		x	Fan thermal regulation

Dip Switch no.			Description
4 - 5	**OFF**	**OFF**	2-pipe and no resistance unit
	OFF	**ON**	4-pipe unit
	ON	**OFF**	2-pipe with setting resistances unit
	ON	**ON**	2-pipe with integration resistances unit

NOTES:

(1) on demand in heating, continuous in cooling.
(2) no Hot Start and Too Cool.

		Dip Switches setting			
		Dip4 OFF DIP5 OFF	Dip4 ON DIP5 ON	Dip4 ON Dip5 OFF	Dip4 OFF Dip5 ON
System type	System	2-pipe	2-pipe	2-pipe	4-pipe
	Electrical resistances	NO	Integration	Setting	NO
Outlets	Heating	OUT 1	OUT 1	-	OUT 2
	Cooling	OUT 1	OUT 1	OUT 1	OUT 1
	Electrical resistances	NO	OUT 2	OUT 2	NO

To enter the DIP Switches, follow this procedure:

- First, separate the connectors' base plate from the main interface by means of a small screwdriver – insert the screwdriver into the special holes (onto the container's side) and slightly twist until the two parts are divided;
- By turning the back of the main interface, it is possible to see the Dip Switches fitted onto the printed circuit board.

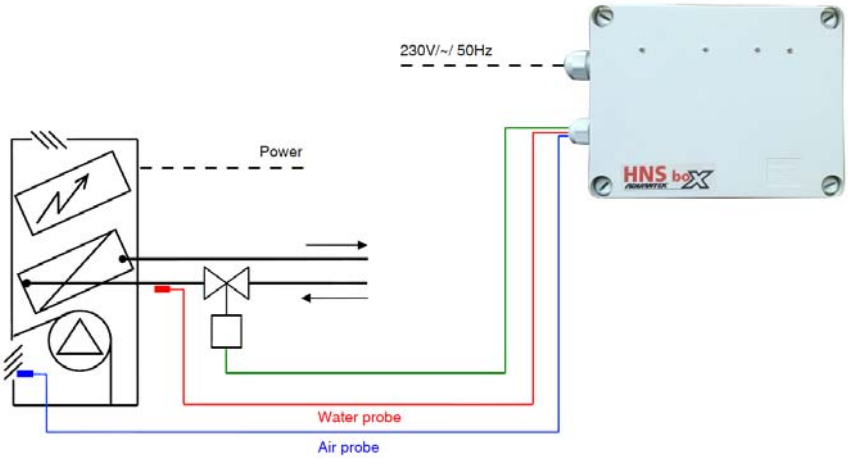
8.5 WATER PROBE

- Install the probe downstream the valve and insulate it by means of aluminium tape;
- As for the 4-pipe systems, it has always to be fitted onto the hot water circuit, and never onto the cold water one;
- Use only the probe supplied as accessory – NTC temperature probe, reinforced insulation, PVC cable, cable length = 1,5 m.

Note: Set the no.3 Dip Switch on the ON position –valve thermal regulation.

8.6 AIR SENSOR

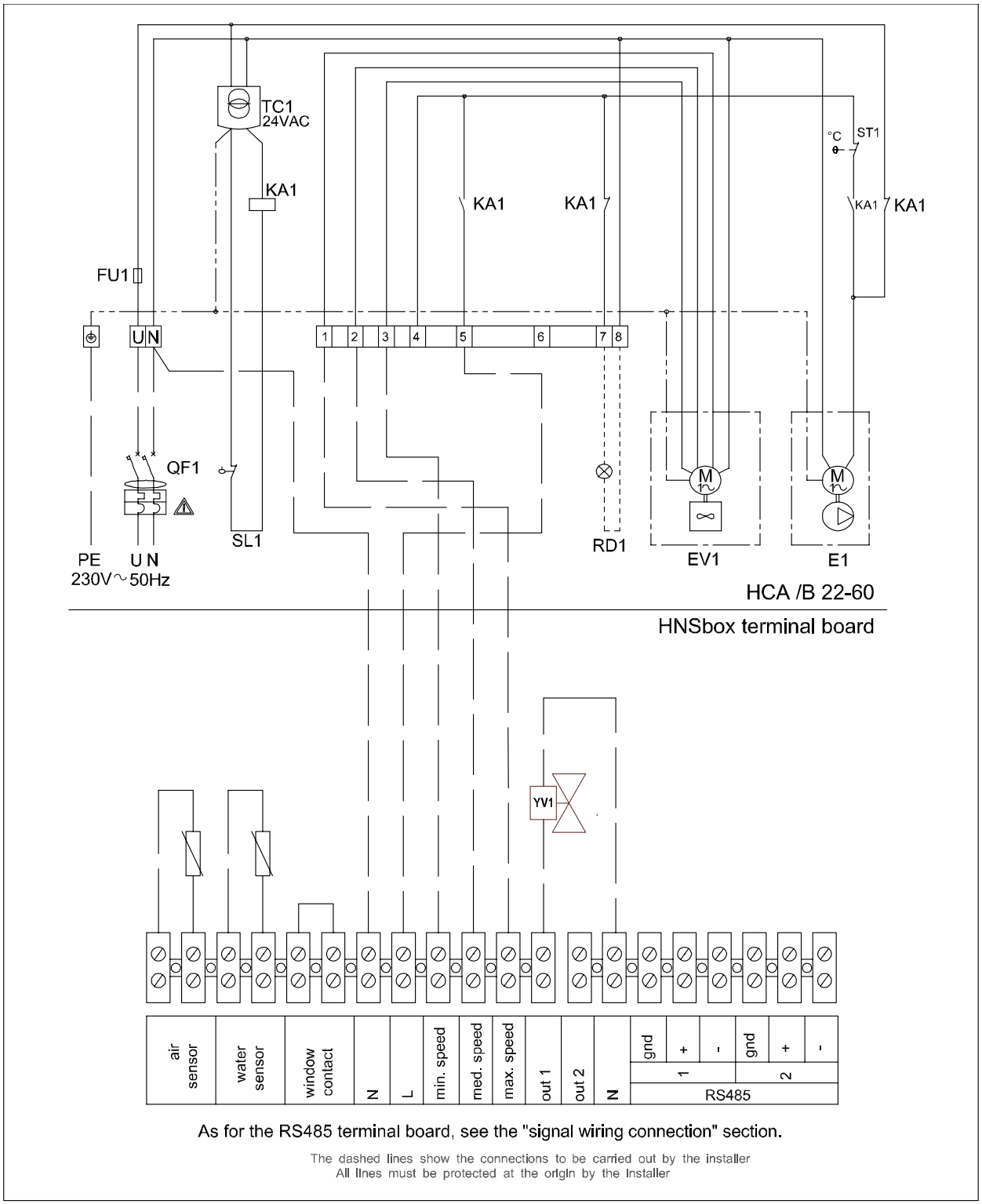
Install the air sensor in the unit's finned battery inlet opening, and fix it by means of an electrical type clamp.



8.7 WIRINGS

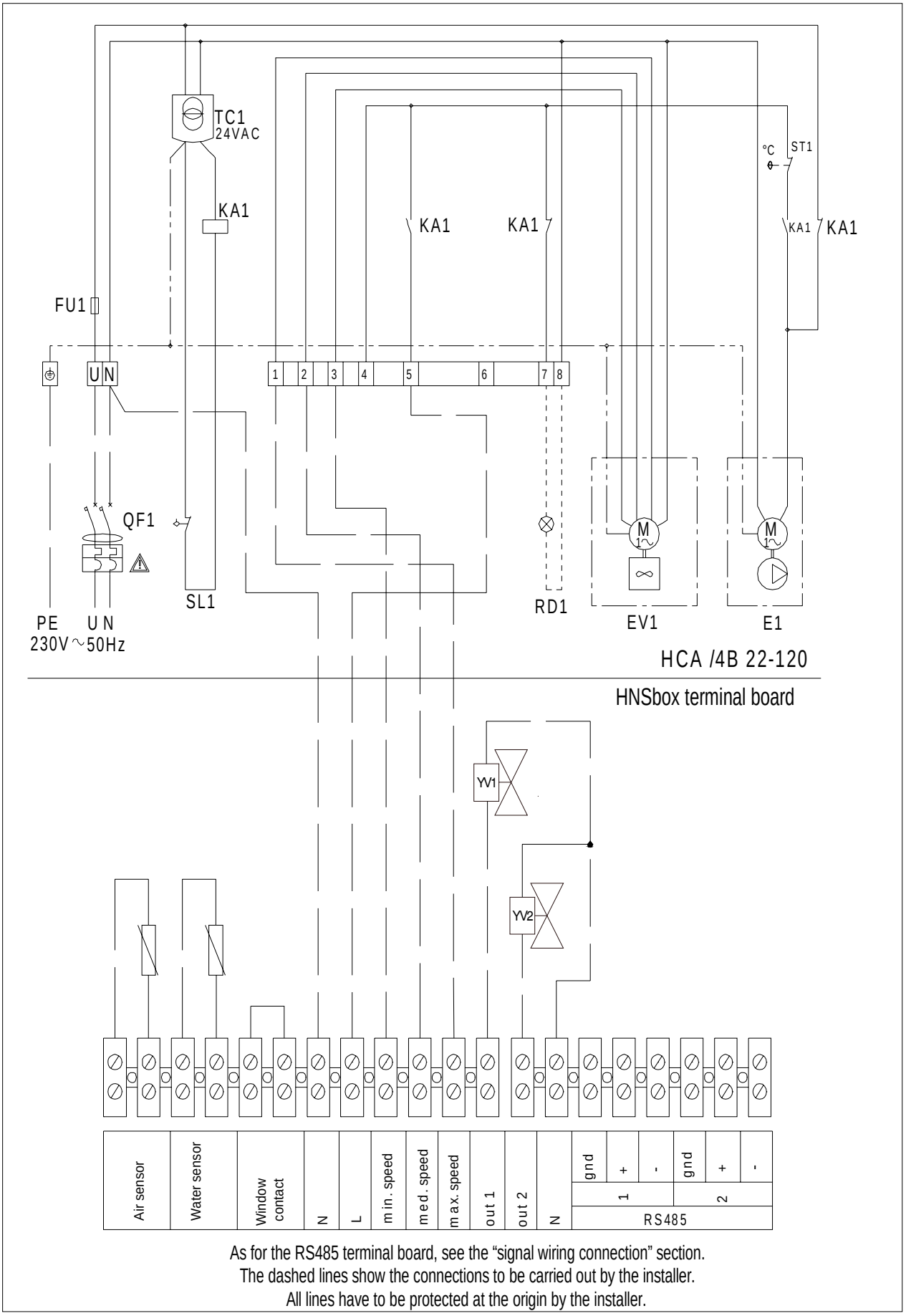
Hydronic cassettes type: See the user – installer manual to get information as for the cassettes type wiring diagrams.

HCA/B



Picture 1. HNSbox connection with HCA/B.

HCA 4/B

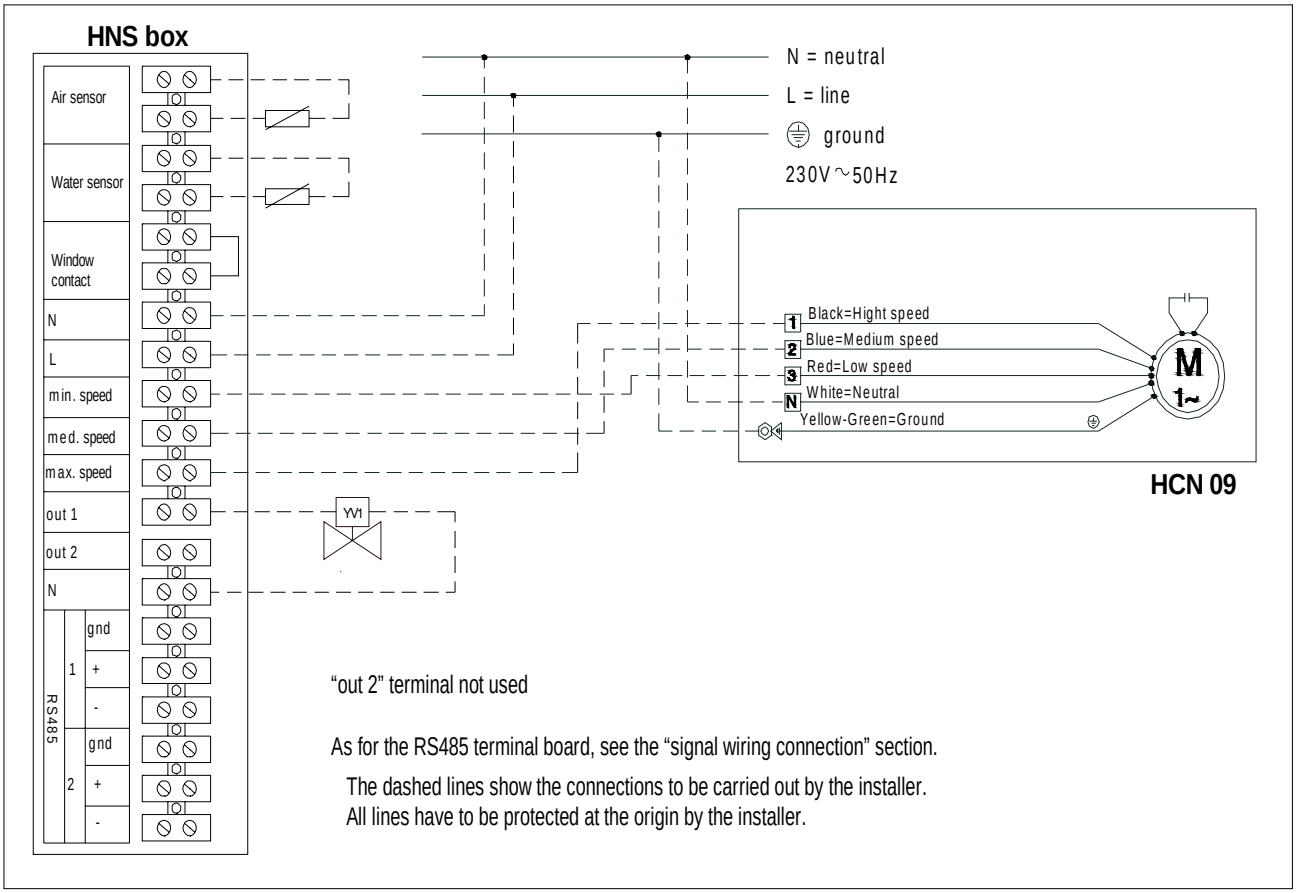


As for the RS485 terminal board, see the "signal wiring connection" section.
The dashed lines show the connections to be carried out by the installer.
All lines have to be protected at the origin by the installer.

Picture 2. HNSbox connection with HCA 4/B.

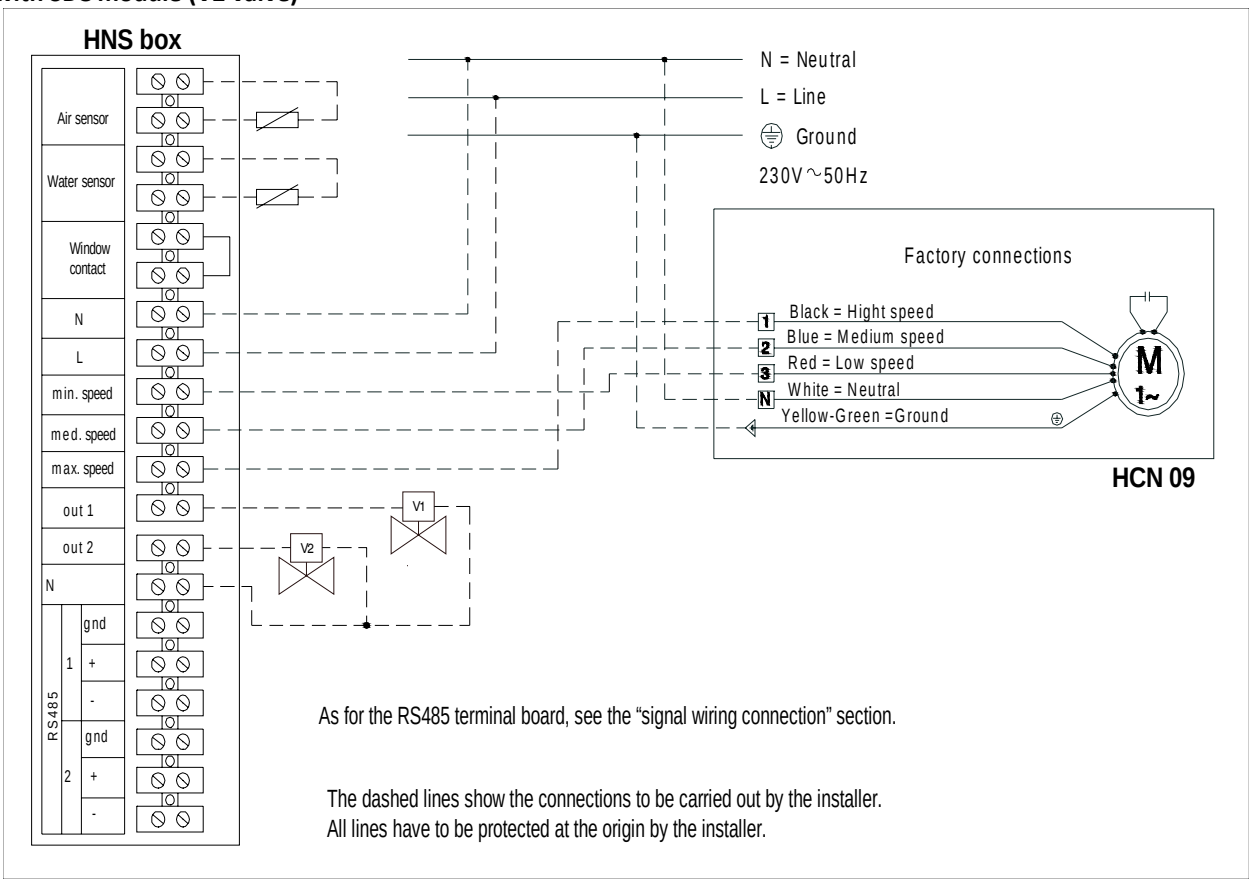
Ducted type:
See the user – installer manual to get information as for the ducted type wiring diagrams.

HCN09



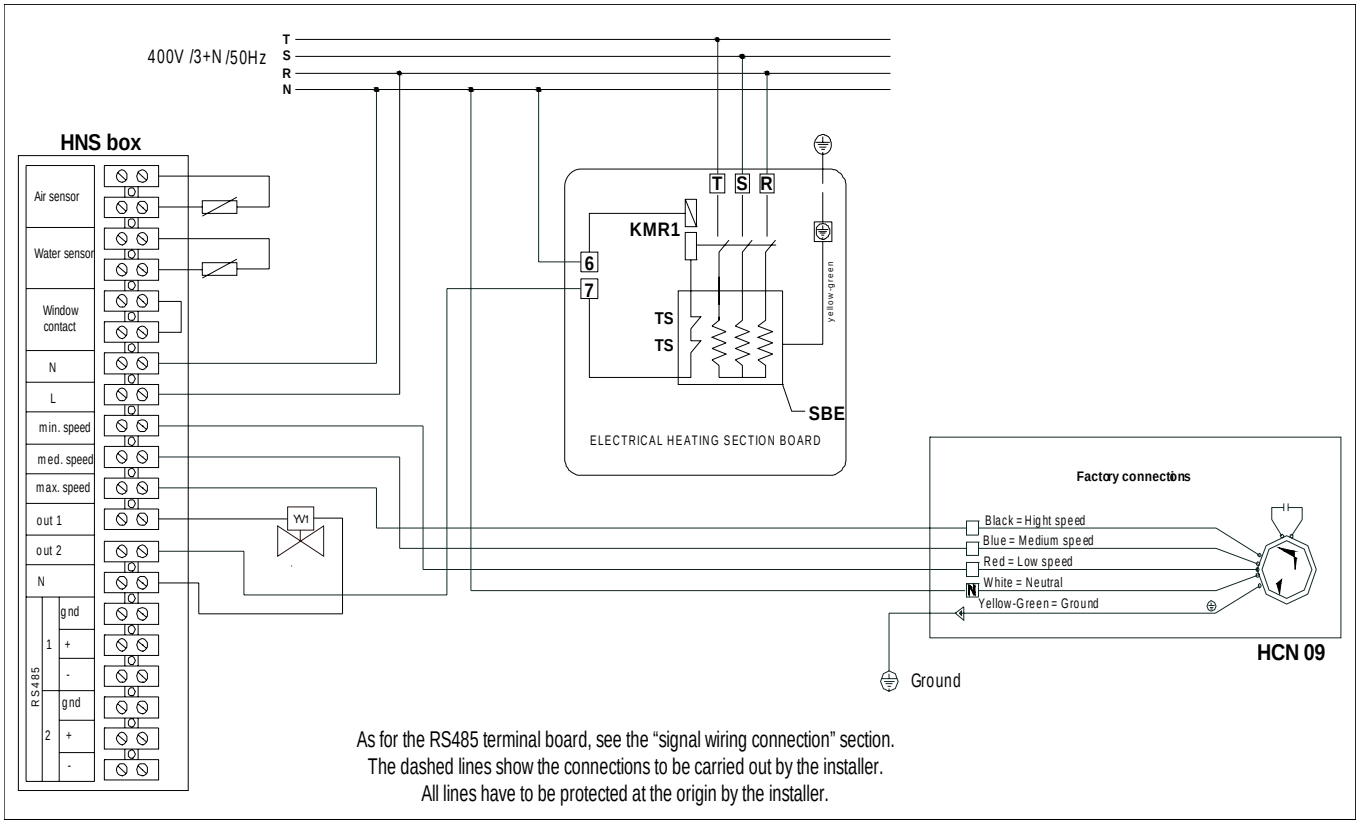
Picture 3. HNSbox connection with HCN09

.HCN09 with SBC module (V2 valve)



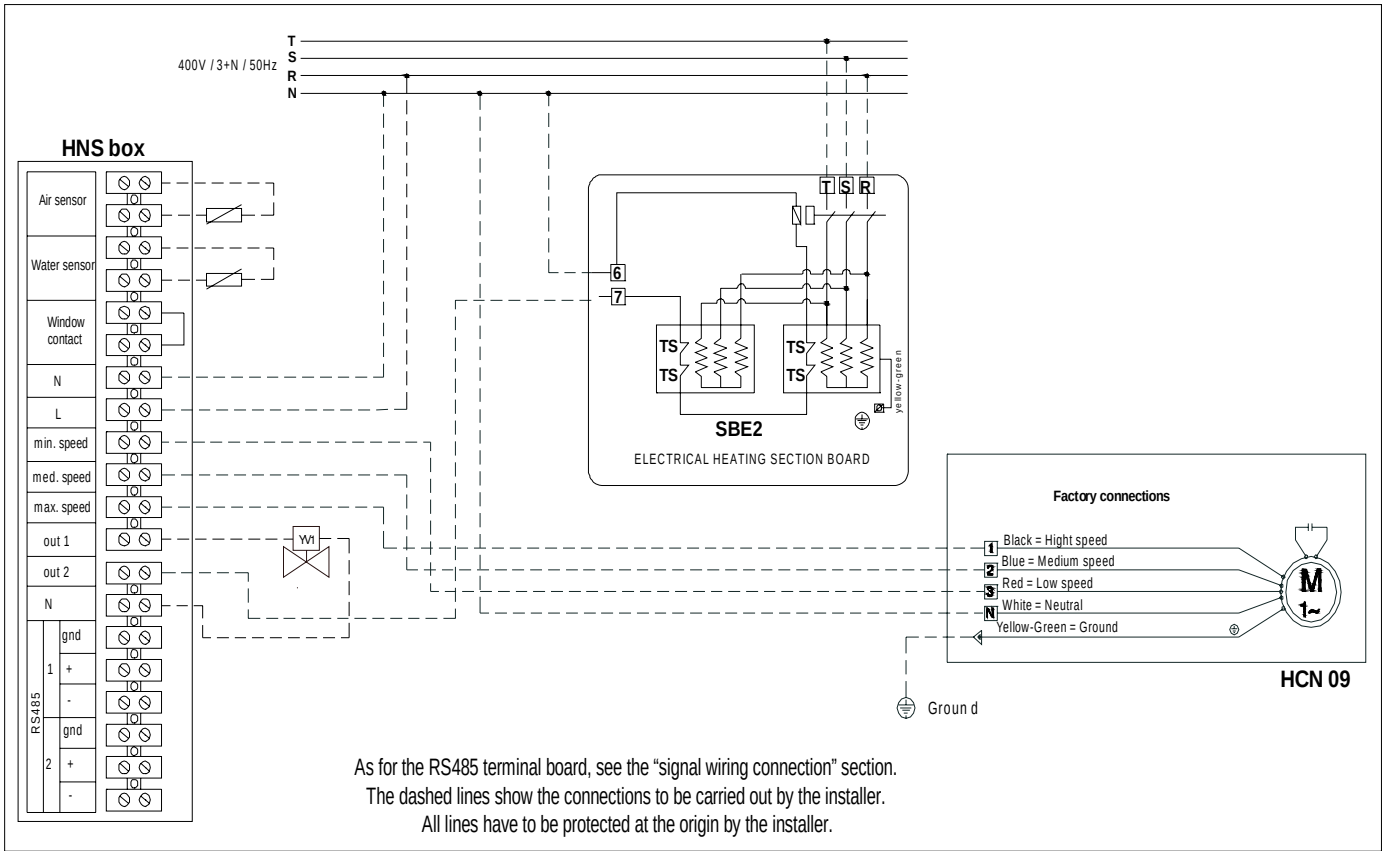
Picture 4. HNSbox connection with HCN09 with SBC module (V2 valve).

HCN09 with SBE module



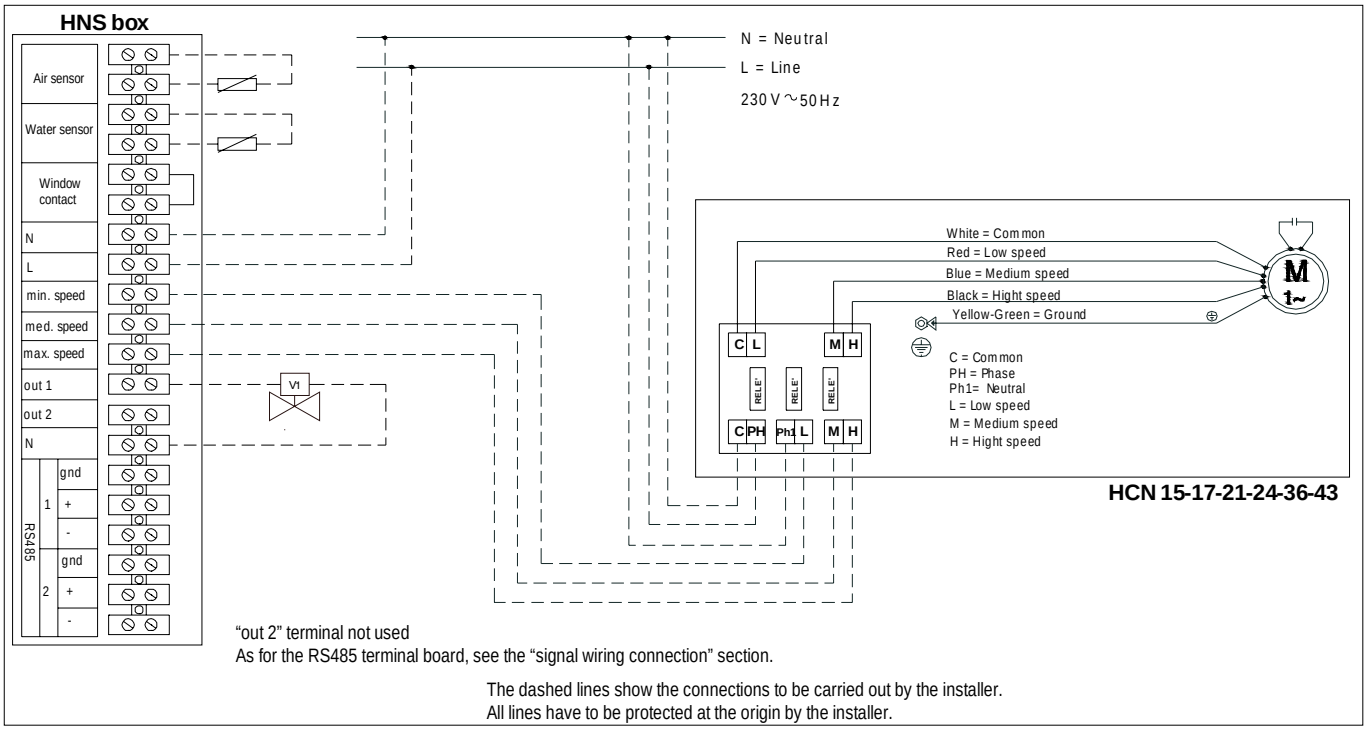
Picture 5. HNSbox connection with HCN09 with SBC module.

HCN09 with SBE2 module



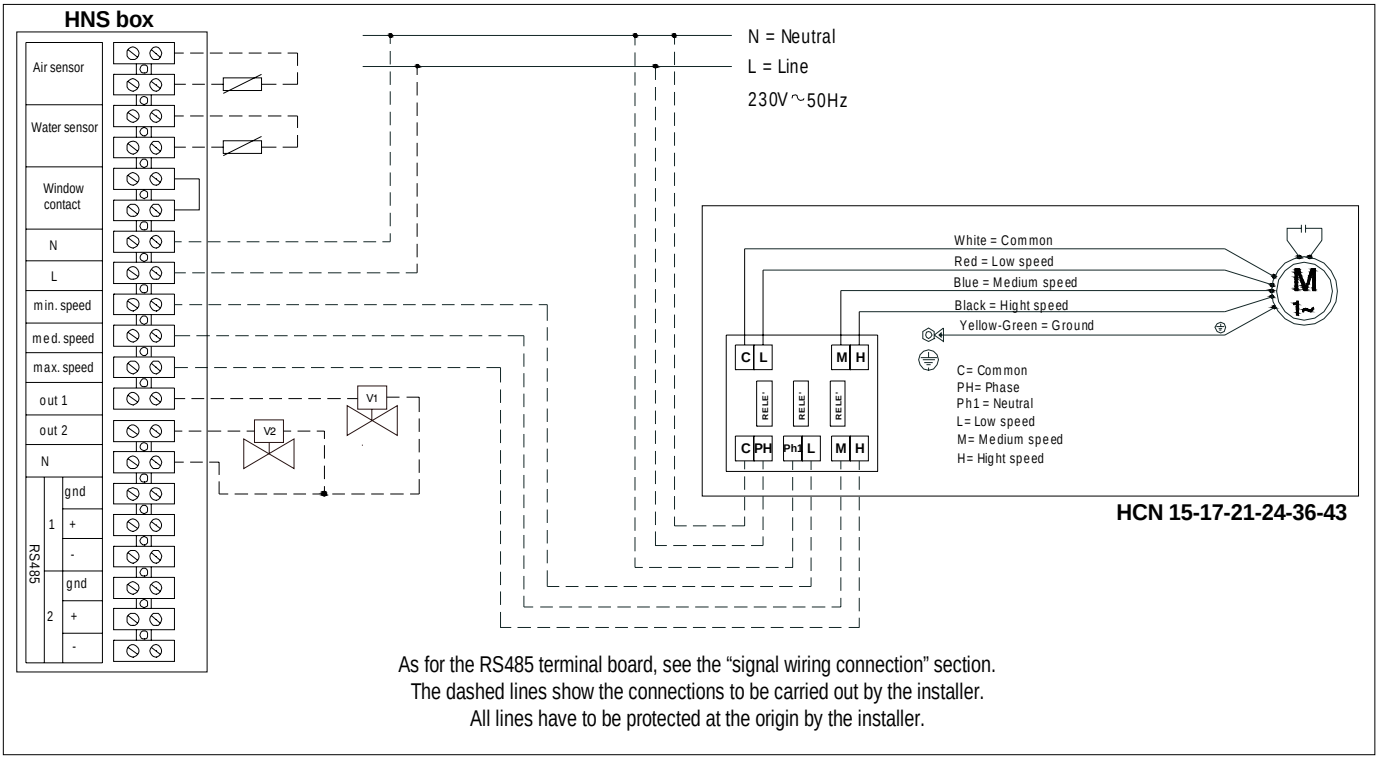
Picture 6. HNSbox connection with HCN09 with SBE2 module.

HCN13÷43



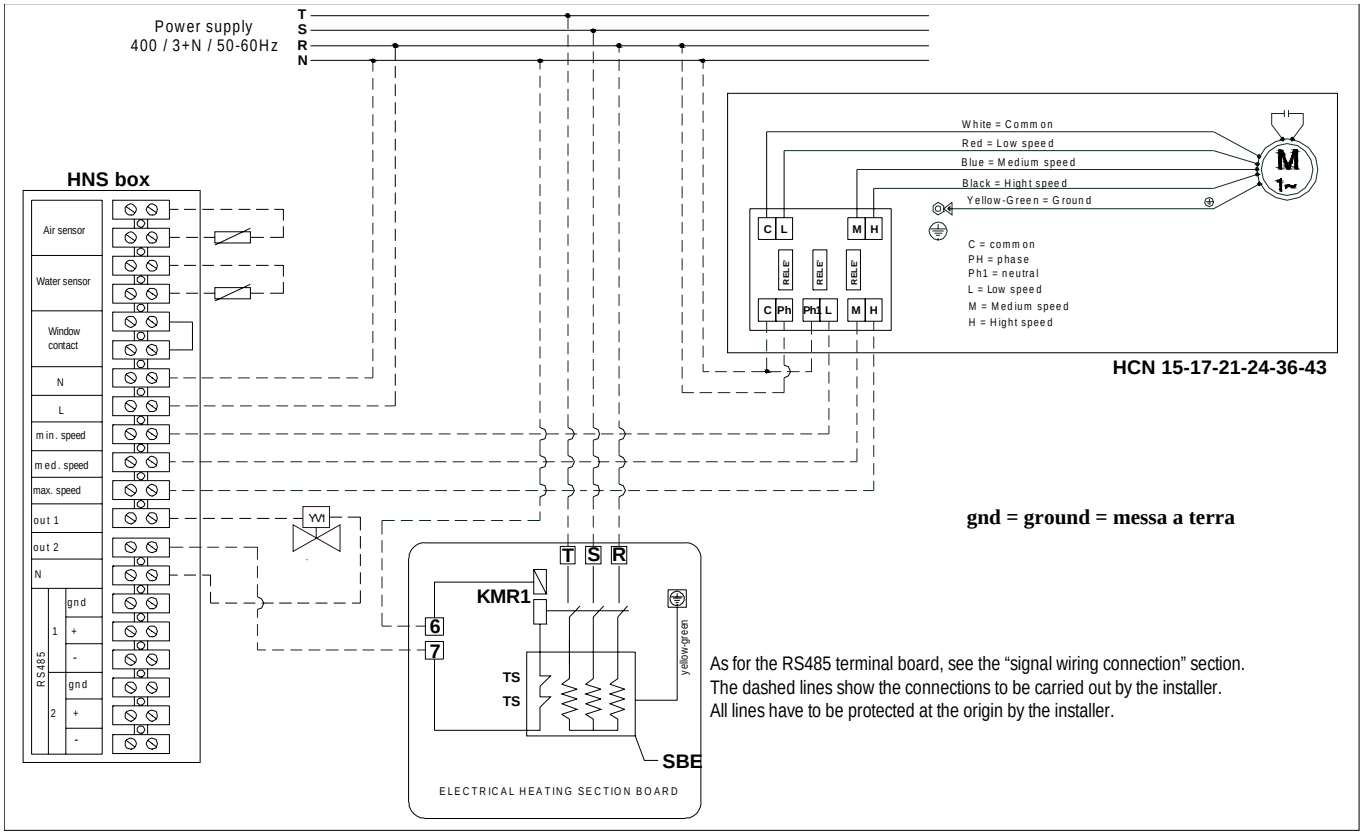
Picture 7. HNSbox connection with HCN13-43.

HCN13÷43 with SBC module (V2 valve)



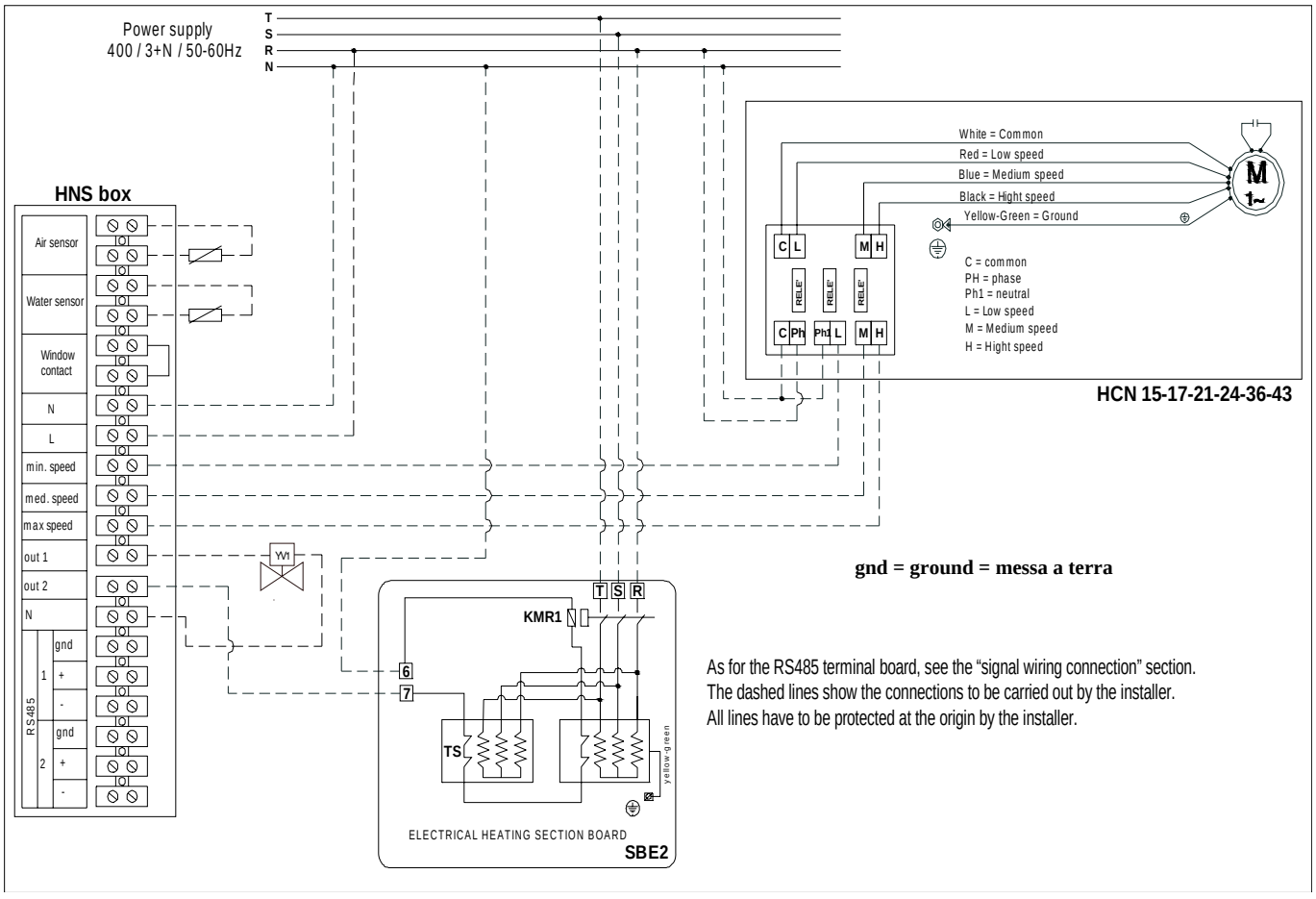
Picture 8. HNSbox connection with HCN13-43 with SBC module (V2 valve).

HCN13÷43 with SBE module



Picture 9. HNSbox connection with HCN13-43 with SBE module.

HCN13÷43 with SBE2 module



Picture 10. HNSbox connection with HCN13-43 with SBE2 module.

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