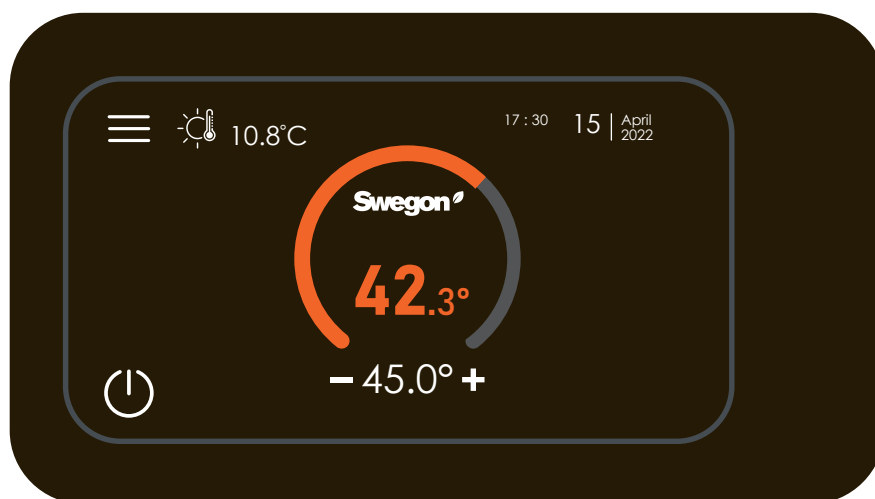


Controller manual

EN

User

06-02-2025



Series:
Epsilon Sky



BlueBox 
by Swegon

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1 INTRODUCTION

1.1 General

Some information on the use of this manual.

1.1.1 Purpose of the manual

The purpose of this manual is to provide all the necessary information for the use of the controller and relevant software application in the units indicated on the cover.

Information regarding installation of the units and relevant tests and checks for the first starting is not given in this manual.

We thank in advance all those who will wish to let us know of any errors, omissions, sections requiring further explanation or operations that have not been included.

1.1.2 iPRO_Lite controller functions

The software application for the electronic microprocessor controller of the iProLite series was designed to manage refrigerant units and heat pumps.

Through appropriate configuration, this gives the possibility of managing a wide range of units with relevant specific functionalities.

By management of refrigerant units we mean safe control of operation of their component parts, during their various operating stages.

There are various sizes of modules in the iPro electronic microprocessor controller family. Through flexibility of the software, this allows their use to be optimized by using those that have the necessary number of inputs and outputs for each application.

Other expansion modules are used for unit control in addition to the iProLite microprocessor controller.

The iProLite board is connected to the various modules and communicates with them via a high speed, highly reliable field bus.

The user interface of the controller consists in a high resolution touch screen display.

1.1.3 Recommendations for digital security

This unit is designed for connection to an Ethernet network.

Unit networking must be implemented by technicians who can take the appropriate security measures required to prevent system violations.

In particular:

- We recommend that access to the unit controller be restricted to the network inside the organization. System exposure to the Internet is strongly not recommended.
- If remote access is required, the connection must be encrypted via SSL/TLS or VPN and through a firewall configuration within the internal IT environment.
- The authorization to use a remote access must only be granted to equipment that the organization has supplied and approved, as specified in the previous item.

2 GRAPHICS ON THE DISPLAY

During development of the application, particular attention was given to intuitive use of the user interface. That is why large use has been made of symbols and icons.

2.1 Graphic conventions

The touch-screen display is designed to browse the interface.

Provision has been made for some intuitive icon buttons that are tapped to easily browse the featured screens and menus.

Other user-friendly symbols are used to locate parts and active functions.

Below is a list of the icons used as buttons and the symbols featured in the various screens of the interface.

2.1.1 Icons

Icons are used as physical buttons in the touch-screen display to browse the menus and screens. The featured icons include:



The “**Commands Menu**” icon placed on the top right-hand side of the screen gives access to a drop-down menu featuring the icons of the other menus.



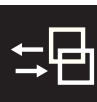
The “**On-Off**” icon in the bottom left-hand side of the screen gives access to the window where the unit is started/stopped.



This icon is featured in the top part of the display during the defrost cycle.



If the function “Domestic hot water” is featured, the icon “**DHW**” on the bottom right-hand side shows the operating status. A tap on the icon gives access to the screen where the setpoint is changed.



If the function “Management of mixed heating/cooling installations” is featured, the icon “**2 zones**” on the left-hand side shows the operating status of the existing zones. A tap on the icon gives access to the function-specific screen: the arrow on the right is used to enable/disable the function and to edit the setpoint. The unit must be in operation in order for the user to be able to edit the setpoint.



If the function “Thermoregulation with tank-mounted probe” is featured, the icon **Tank** is enabled on the left. The colour of the icon gives an indication of whether the unit status is “OFF” or if the unit is operating in either heating or cooling mode.

A tap on the icon “**Tank**” gives access to the screen where the setpoint is edited.



If the “SmartLink”, “SmartLink+” or “SmartLink DX” function is enabled, the icon “**SmartLink**” is provided at the centre of the main screen next to the value measured by the reference sensor.

When the drop-down menu on the left-hand side is opened, icons appear that give access to the other menus.

The drop-down menu features the following icons.



The icon “**LH arrow**” in this position is clicked to close the menu. When in the other screens, it is clicked to go back to the previous screen or to the main screen.



The icon “**Info**” gives access to the information screens.



The icon **“User Menu”** gives access to the screen where the following icons are always featured: “Alarms History”, “Video display”, “Network”, “File Management”, and “Refrigerant circuit”. The icons “Flowzer”, “DHW” and “2 Zones” are featured depending on which functions the controller controls.



The icon **“Change of operating mode”** is clicked to switch operation in units featuring cycle reversal via the keyboard.



The icon **“Night Shift System”** gives access to the screen where it is possible to enable and to programme the time bands of the second set of ventilation parameters in order to reduce noise in the night hours.



The icon **“Time bands”** gives access to the screen where it is possible to enable and to programme the time bands according to which the unit must be switched on/off and the energy saving setpoint.



The icon **“Languages”** gives access to the screen where it is possible to set a new language.



The icon **“Access”** gives access to the screen used to log in to the menu branches that are protected by a password.

2.1.2 “User Menu” icons

A tap on the icon **“User Menu”** gives access to the screen where the following icons are present:



The icon **“Alarms History”** and the text “Alarms History” give access to the screen where the start and end times of alarm activation in the unit are recorded.



The icon **“Video display”** and the text “Video display” give access to the “Video display menu” where the icons “Back-lighting”, “Led”, “Font” and “Network” are featured for video display management.



The icon **“Network”** and the text “Network” give access to the screen where information is given about the “IP” address, the “Modbus” address and the “Baud-rate” of the controller.



The icon **“File management”** and the text “File management” give access to the screen where it is possible to unload the Logs to a USB pen drive. These functions can be used after plugging the USB pen drive into the controller.



The icon **“Refrigerant circuit”** and the text “Refrigerant circuit” give access to the loop of screens where it is possible to view the operating parameters of the unit.



The icon **“Flowzer”** and the text “Flowzer” give access to the loop of screens where it is possible to view the operating parameters of the relevant function.



If the function “Management of mixed heating/cooling installations” is featured, the icon **“2 zones”** on the left-hand side shows the operating status of the existing zones. A tap on the icon gives access to the function-specific screen: the arrow on the right is used to enable/disable the function and to edit the setpoint.

The unit must be in operation in order for the user to be able to edit the setpoint.

2.1.3 “Video Display” Menu icons

The “**User Menu**” features the “**Video display**” icon which is used to access the screen where the following icons are present:



The icon “**Back-lighting**” and the text “Back-lighting” give access to the screen where it is possible to edit the time during which the display is lit when in use. This screen also shows the number of hours during which the back-lighting has been active.



The icon “**Led**” and the text “Led” give access to the screen where it is possible to disable operation of the side LED in the display. Normally, the display is supplied with the side LED enabled.



The icon “**Network**” and the text “Network” give access to the screen where it is possible to view the parameters for video display connection to the Internet.



The icon “**Network**” is only featured if the video display is supplied with an Ethernet port.

2.1.4 “Maintenance” Menu icons

The icon “**Access**” in the drop-down menu on the side of the screen gives access to password-protected menus.

Access to the protected “Maintenance” branch requires entry of the password **200**.

The Maintenance Menu features the icons below.



The icon “**Setpoint**” and the text “Setpoint” give access to the screen where it is possible to set up the parameters of the unit setpoint. The setpoint according to which the unit is operating can be changed from the main screen also.



The icon “**I/O**” and the text “I/O” give access to the screens where it is possible to view the status of the inputs and outputs.



The icon “**Compressors**” and the text “Compressors” give access to the screen where it is possible to enable and disable operation of the compressors, as well as to view and reset, where needed, the number of hours of operation and the number of start-ups.



The icon “**Alarms History**” and the text “Alarms History” give access to the screen where the start and end times of alarm activation in the unit are recorded.



The icon “**Refrigerant circuit**” and the text “Refrigerant circuit” give access to the loop of screens where it is possible to view the operating parameters of the unit.



The icon in this screen and the text “Parameters” give access the “Parameters” menu. The “Parameters” menu includes the screens giving access to parameters, which are sorted in homogeneous groups depending on their function.



The icon “**Pumps**” and the text “Pumps” give access to the screen where it is possible to enable and disable operation of the pumps, as well as to view and reset the number of hours of operation.



The icon “**SM GR**” and the text “Smart Grid ready” give access to the screen where the function management parameters are set up.



This icon and the text “Unit hour meter” give access to the screen where the number of unit hours of operation is reset.



This icon and the wording “Smartlink DX/0-10V signal mode” give access to a loop of screens that are used to change the operating mode of the unit from “Smart Link DX” to “0-10V” and vice versa.

2.1.5 “Service Menu” icons

The icon “**Access**” in the drop-down menu on the side of the screen gives access to password-protected menus.

A password is required to access the screens making up the “Service” menu. The password is available on the SAP portal, in connection with the unit serial number.

The “Service” menu features the icons below.



The icon “**Setpoint**” and the text “Setpoint” give access to the screen where it is possible to set up the parameters of the unit setpoint. The setpoint according to which the unit is operating can be changed from the main screen also.



The icon “**I/O**” and the text “I/O” give access to the screens where it is possible to view the status of the inputs and outputs.



The icon “**Compressors**” and the text “Compressors” give access to the screen where it is possible to enable and disable operation of the compressors, as well as to view and reset, where needed, the number of hours of operation and the number of start-ups.



The icon “**Alarms History**” and the text “Alarms History” give access to the screen where the start and end times of alarm activation in the unit are recorded.



The icon in this screen and the text “Control panel” give access to the “Control panel” menu.



The icon “**Refrigerant circuit**” and the text “Refrigerant circuit” give access to the loop of screens where it is possible to view the operating parameters of the unit.

The next screen contains the icons below.



The icon in this screen and the text “Parameters” give access the “Parameters” menu. The “Parameters” menu includes the screens giving access to parameters, which are sorted in homogeneous groups depending on their function.



The icon “**Pumps**” and the text “Pumps” give access to the screen where it is possible to enable and disable operation of the pumps, as well as to view and reset the number of hours of operation.



The icon “**DHW**” and the text “Domestic hot water” give access to the screens where it is possible to enable and disable domestic hot water production, to edit the setpoint, to override the anti Legionella cycle, and to access the specific parameters to the access level.



The icon “**Flowzer**” and the text “Flowzer” give access to the loop of screens where it is possible to view the parameters of the relevant function. The arrow on the right gives access to the parameters associated with the entered access level.



The icon “**Flame**” and the text “Auxiliary heating” give access to the screens where it is possible to enable/disable and edit the 0-10V setpoint according to the control setpoints of the function.



The icon “SM GR” and the text “Smart Grid ready” give access to the screen where the function management parameters are set up.



This icon and the text “Unit hour meter” give access to the screen where the number of unit hours of operation is reset.



This icon and the wording “Smartlink DX/0-10V signal mode” give access to a loop of screens that are used to change the operating mode of the unit from “Smart Link DX” to “0-10V” and vice versa.

2.1.6 “Control Panel Menu” icons

The “Control Panel” screen contains the icons below.



This icon and the text “Parameter file management” give access to the screen where the following control buttons are featured: “Update parameters from control”, “Save current configuration”, and “Upload default parameters”.

2.1.6.1 Update control parameters



When updating the controller, if it is already installed on a unit, disconnect the 230V auxiliary circuit.

This function makes operational the parameters of the “actual.conf” file stored in the controller.



This operation must always be carried out whenever the software is updated: it consists in the downloading of the files to the controller with a USB pen drive, as instructed in the chapters titled “Software deployment” and “Software upgrade”.

The function gets started by merely pressing the control button and is normally completed in a few seconds.



When the update is finished, turn the power to the controller off and then on again.

2.1.6.2 Save current configuration

The “Save current configuration” control creates a file with extension “conf” in the memory of the controller; the parameters with which the unit is configured are present in this file.

This file can be requested from the manufacture to check the correct setting of the parameters in the unit.

The function gets started by merely pressing the control button and is normally completed in a few seconds.

The saved file can be downloaded to a USB pen drive using the “Copy current configuration to USB” function featured in the “Log file management” menu.

2.1.6.3 Upload default parameters

The “Upload default parameters” control automatically restores the original setting of the factory parameters in the controller.

This operation may become necessary if, after making changes to the software parameters, the parameters fail to meet the operating requirements and not all the initial values can be restored manually.

The function gets started by merely pressing the control button and is normally completed in a few seconds.

The saved file can be downloaded to a USB pen drive through the “Copy current configuration to USB” function.



This icon and the text “Log file management” give access to the screen where the following control buttons are featured: “Copy ALARMLOG to USB”, “Copy ACCESSLOG to USB”, “Copy TIMELOG to USB”, “Copy current configuration to USB”, “Copy alarm configuration to USB”, and “Copy all LOG files to USB”.



These control buttons are only enabled if a pen drive is inserted in the USB port.

If the message “Warning: USB not ready” appears after inserting the pen drive in the USB port, check that the USB pen drive is formatted and in good working order.

2.1.6.4 Log File Management

Some measured or calculated values are saved in the memory of the controller during operation. These values are saved every 15 seconds.

In addition to recording at intervals, the alarms and accesses are recorded automatically and the setting of the parameters present in the unit is recorded manually.

The controller saves these data in files that can be copied to a USB pen drive.

When copying, the controller creates the folder structure shown in the figure in the USB pen drive.

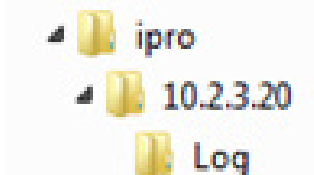


Fig. 1 Structure created in the USB pen drive

The files are copied to the "Log" folder



If considered useful, the manufacturer can ask for some or all of the Log files to be sent.



To upload log files to USB, the unit must be OFF!

When the control starts, a copy progress bar appears in the screen.

Depending on the amount of data, the copying operation can take from a few seconds to a few minutes.

At the end of data copying, a message appears confirming that the operation has been completed successfully.



Before continuing with this operation, make sure the USB pen drive has sufficient free space, "at least 30 Mb".

Free the memory in the pen drive or replace it with one that has more free space available.



If the problem persists, replace the USB pen drive.

2.1.6.5 Copy ALARMLOG to USB

In the USB pen drive, this control creates the "alarmlog.txt" file containing the operating parameters of the previous 5 minutes for each alarm.

2.1.6.6 Copy ACCESSLOG to USB

In the USB pen drive, this control creates the "accesslog.txt" file that contains a record of the time of access to the parameters of the service menu from the display or via WEB and the edited values.

2.1.6.7 Copy TIMELOG to USB

In the USB pen drive, this control creates a "timelog_dd_a.txt" file for each day of controller operation where the operating values, with 15 seconds as acquisition frequency, are recorded.

2.1.6.8 Copy current configuration to USB

This command creates the file "Sb10000xxxx_settings.txt" in the USB pen drive. The file contains the current setpoints of the controller operating parameters.

The file needs to be renamed "actual.conf" in order for it to be reused.

To upload the file "actual.conf" into the controller, it must be copied onto an empty "USB" pen drive in the "ipro/10.2.3.20/conf" directory.



When a file needs to be imported back into the main controller after a software upgrade or for any other reason, the file must be renamed "actual.conf".

2.1.6.9 Copy alarm configuration to USB

This command creates a copy of the “alarm.conf” stored in the controller on the USB pen drive. The file “alarm.conf” helps manage the alarms on the two digital outputs or treat the alarm as merely a warning message.

The file “alarm.conf” can be changed using a text editor. Instructions to edit the file are given in the first line of the file.

If you wish to update the file “alarm.conf” on the controller, you should reference the section “iPRO update”.

2.1.6.10 Copy all LOG files to USB

This command copies all the log files mentioned above at the same time.



This icon and the text “System information” give access to the screen where it is possible to set the IP address of the board, the Modbus address, the communication speed, i.e. the Baud-rate, and the BACnet address.

2.1.6.11 System information

In this screen, the IP address, the serial address, the communication speed, and the "device number" if the BACnet protocol is present, are shown and can be changed.

The numbers making up the IP address can be changed individually using the virtual keypad on the display.



To activate the changes, the controller must be restarted.

3 THE SCREENS

3.1 User Interface

The display is the interface between the unit and the user. The display is the tool used for interaction with the unit and for access to parameters.

Information regarding installation of the units and relevant tests and checks for the first starting is not given in this manual.

Navigate through the various menus to access the screens where you can carry out the necessary operations for operation of the unit, edit the operating parameters and download the records.



The images and the values shown in the screens are for illustrative purposes only. They can vary according to the configurations and functions featured in the controller.

3.1.1 Home page

The display switches off after it has been inactive for a while. The time during which the display is ON is set up in the video display management page(s) of the user menu.

When the display is touched, access is gained to the main screen. The “LH arrow” is pressed to go back to the main screen. The main screen is the starting point for navigating through the various branches of the application.

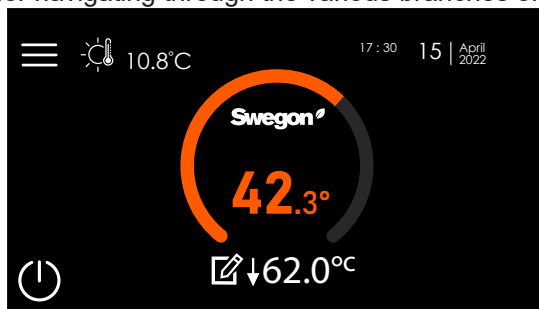


Fig. 2 Home page

The “On-Off” icon is featured on the bottom left-hand side of the screen and it is pressed to start/stop the unit.

The “Controls Menu” icon is featured on the top left-hand side of the main screen. The “Controls Menu” icon is sided by the symbol of the outside air temperature, which shows the detected value.

The date and time are displayed on the top right-hand side. Refer the “Changing the time and date” chapter for the procedure to edit the date and the time.

The central part of the screen shows base information on the operating status of the unit.



The colour of the dial shows the operating status.

Grey indicates that the unit is off; orange indicates operation in heating mode; and cyan indicates operation in cooling mode.

The value inside the box is the reference water temperature value.

The bottom part of the screen shows the operating setpoint. Refer to the “Changing the setpoint” chapter to edit the setpoint value.

The right-hand side of the screen indicates the enabled functions. Symbols are provided to indicate the various functions. The symbols of the functions are as follows.



The “**Alarm**” symbol indicates that at least one alarm is active: the figure aside the symbol indicates the number of active alarms.



The “**Night Shift System**” symbol indicates that the “Night Shift System” function is active. Refer to the section titled “Night Shift System” for further information on how to manage this function.



The “**Energy saving**” symbol indicates that the “Energy Saving” function is active. Refer to the section titled “Time bands” for further information on how to manage this function.



The “**Set OFF Time**” symbol indicates that the “Set OFF Time” function is active. Refer to the section titled “Time bands” for further information on how to manage this function.

3.1.2 Screen tree

The user interface gives access to any and all information on the operating parameters of the unit. The software manual describes the access procedure to the desired information and to the parameter pages where the various functions can be set up.

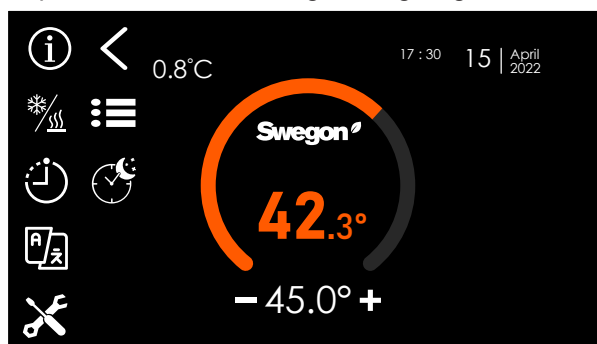
Menus are also provided, which the user can browse, to find additional information to that given in the main screen. For easier browsing, the screen tree is given below.

- Side Menu
 - Info
 - Close side menu
 - summer/winter
- User Menu
 - Alarm History
 - Video display
 - Back-lighting
 - LED
 - Font
 - Network
 - Network
 - File Management
- Time bands
- Night Shift System

Access to the protected menus requires entry of the relevant password.

3.1.3 Controls Menu

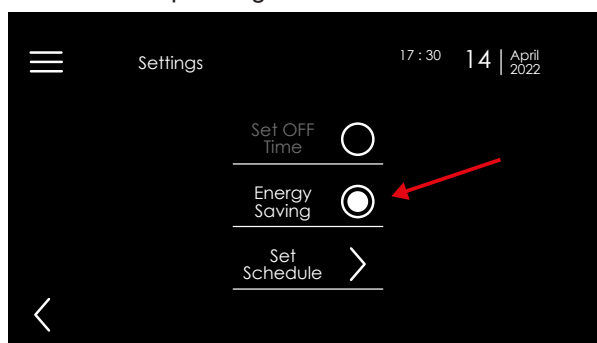
The icon “Controls Menu” opens a drop-down menu featuring icons giving access to the other menus.



The icons featured in this menu give access to all available information and parameters.

3.1.4 Time bands

The icon “Time bands” gives access to the corresponding menu.

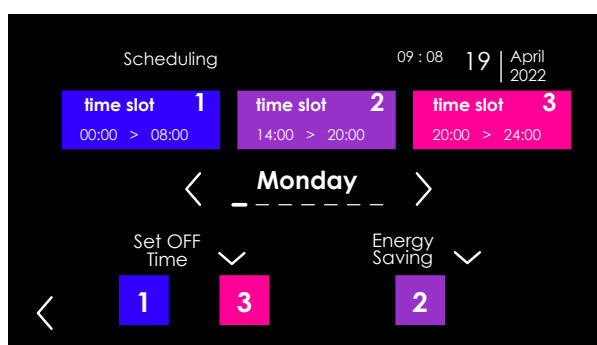


The first screen is used to enable any functions controlled according to time bands: “Set OFF Time” and “Energy Saving”. The “Set OFF Time” function is designed to control the time bands, over a 24 hour period, in which the unit is off.

The “Energy Saving” function is designed to control the time bands, over a 24 hour period, in which the unit operates with the operating setpoint enabled for energy saving.

In the image, the “Set OFF Time” function is disabled as the bullet is blank; on the other hand, when the bullet is solid, the “Energy Saving” function is enabled.

Pressing of the icon “RH arrow” gives access to the screens where the time bands referred to all the days in the week are enabled.



The controller offers the possibility to set up 3 time bands for the “Set OFF Time” and “Energy saving” functions.

The time bands are common for all the days in the week and they may also be set up spanning over two consecutive days (e.g. a time band may start in the afternoon and finish the following day).

A click on the corresponding coloured rectangle gives access to the page(s) where the time bands are set up.

The cycle is matched with the corresponding functions using the arrow down next to the “Set OFF Time” and the “Energy Saving” function options.

The software includes the possibility to combine the time bands and all possible combinations to both functions.



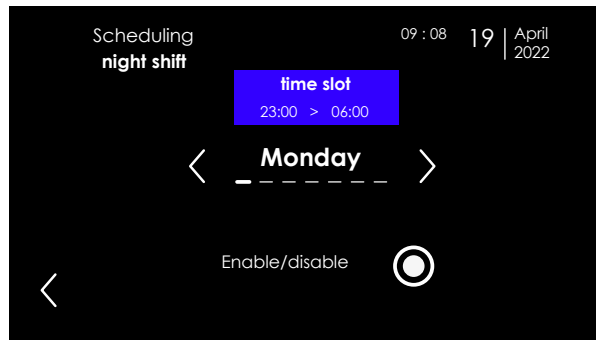
If you plan to use multiple bands in one single day, they must be set up so that they do not overlap.



We recommend that one band should not be matched to both functions in one single day. When the unit is switched off, operation in energy saving mode is cancelled.

3.1.5 Night Shift System

The icon “Night Shift System” gives access to the corresponding menu.

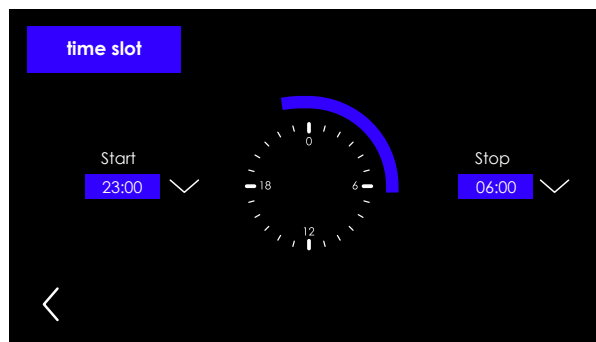


The “Night Shift System” function is designed to control a time band, over a 24 hour period, in which the unit operates with the parameters controlling ventilation in order to reduce its noise levels.

The arrows provided along the days of the week are used to scroll the screens in the menu.

In the different menu screens the user can enable the function for each single day.

The time band during which the function will be enabled can be set in any screen of the “Night Shift System” menu.



The “Night Shift System” function can be controlled within a 24-hour period and it may also be set up spanning over two consecutive days (e.g. it may start in the afternoon and finish the following day).



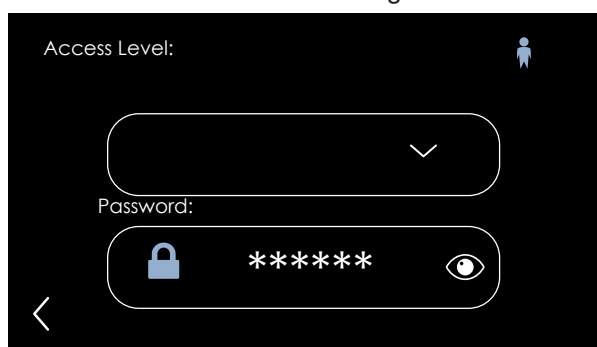
If you plan to use multiple bands in one single day, they must be set up so that they do not overlap.



If the time bands overlap, we recommend that the “Night Shift System” and the “Set OFF Time” functions are not enabled in one single day.

3.1.6 Access to protected menus

The “Access” icon gives access to the screen where the user can log in to access the password-protected menus.



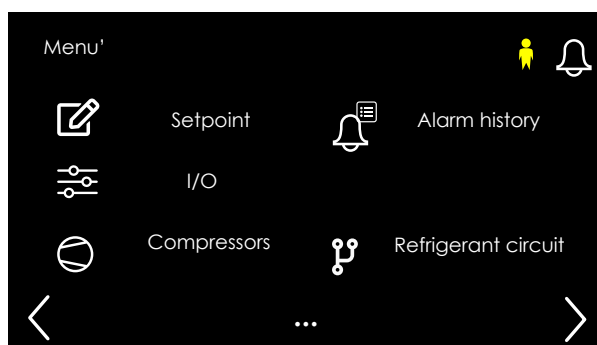
In the top area, the user has to select the profile for which he has credentials to access the protected menus.

The bottom area is used to enter the password.

A click on the asterisks enables the virtual keypad used for password entry.

The password needs to be confirmed by clicking the green tick symbol located on the right-hand side of the keypad.

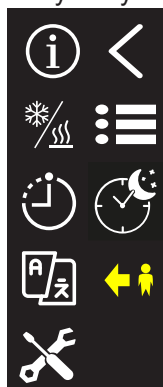
Tap on the “RH arrow” icon to confirm the request for access. Entry of the correct password gives access to the protected menu screen.



Once in the protected menus, you can browse them for an unlimited period of time.

When you exit password-protected menus, you can enter them again without having to log in for the following thirty minutes.

When you log in, the symbol “logout” appears in the “Command menu”: this symbol is used to override exit from the protected menus, which would in any case occur automatically thirty minutes after access.



3.2 Base setup parameters

The base setup parameters can be entered either on the main screen or in easy-to-reach menus.

3.2.1 Switching the unit on and off

The user can switch the unit either on or off from the display or via an external signal, as well as from the time bands and serially.

3.2.1.1 Switch the unit on and off from the display.

Use the "On/Off" icon on the main screen to go to the screen where the buttons to start and stop the unit are featured.

The top area of the screen shows the status of the unit: the "On/Off" icon is provided in the central area.

A tap on the icon changes the status of the unit from "on" to "off" and vice versa.

When the unit switches status, the On/Off icon goes from green (unit ON, in operation) to white (unit OFF).

3.2.1.2 Switch the unit on and off from external OK signal

In order to switch the unit on and off from external OK signal, make sure the feature is active.

To switch the unit on, close the external OK signal. To switch it off, open it.

The external OK signal should be connected to terminals "1" and "2" present in the terminal board.



The external OK signal must be a potential-free contact.

3.2.2 Change of set points

The setpoint is displayed in the bottom part of the main screen.

To edit the setpoint value, access must be gained to relevant parameters. Direct access to the parameters is gained by tapping the icon "**Setpoint**" or the field with the setpoint value.

Tap the value requiring editing to call up the virtual keypad.

The new setpoint value must be (green) ticked to be confirmed.

3.2.3 Change language

The "User Menu" icon enables a drop-down menu where all the function icons are featured.

A click on the "Languages" icon gives access to the screen where a list of the available languages is given.

A click on the language name or its flag causes switching to a new language.

3.2.4 Change date and time



The unit must be Off to edit the date and the time.

When the unit is off, a click on the area where the time and the date are displayed on the main screen gives access to the edit screen.

Select the write icon in the bottom right-hand side to access the edit screen.

The keypad appears when the values of the time and the date are tapped individually. Use the keypad to set up the value you wish to edit and then tap the green save icon on the bottom right-hand side of the keypad to confirm.

After all the necessary changes have been made, tap the green icon on the bottom right-hand side of the screen to update the values.

The controller gets restarted as soon as the updated value is confirmed by pressing the green "OK" icon.



Controller restarting takes a couple of minutes.

4 SOFTWARE FUNCTIONS

4.1 Controller functions

The controller manages the units through specially developed logics.

Some functions are always present in all the units, others are connected with the type of unit or expressly requested by the customer.

The managed functions are summarized in the following chapters.

4.1.1 Set point management

The operating set point is the temperature value for which the controller activates the compressors in order to make the handled fluid reach its value.

Normally, the operating set point is set on the controller; in some cases its value can be linked to the operating conditions or be set from controllers outside the unit.

4.1.2 Circuits and compressors

The application of the controller includes the activation and deactivation of the compressors and correct management of them in order to prevent malfunctions and faults.

Through its inputs, the controller constantly checks the operating conditions and acts promptly when necessary, with the aim of ensuring uninterrupted service of the system.

The switching on and off of the compressors is linked to compliance with delays in order to ensure they remain in good working order for as long as possible.

4.1.3 Ventilation

Ventilation depends on the constructional features of the unit and on the operating conditions.

The controller manages ventilation to ensure that the operating conditions of the refrigerant circuit remain within optimal operating values.

According to the type of unit, control can be stepped or modulating and can be just one for the entire unit or separate for each refrigerant circuit.

4.1.4 Pumps

For system water circulation, the controller can manage one or two pumps (when there are two pumps, they act as backup to each other).

Management by the controller ensures that water is flowing through the heat exchangers of the unit before starting the compressors and that it is kept within the set limits until after they are switched off.

If this is not possible, the controller will stop operation of the unit.

If included in the unit, the controller can manage the pumps to circulate the water inside the unit in order to prevent ice from forming in the heat exchangers.

4.1.5 Heat recovery

During operation of the unit in chiller mode, this function allows recovery of the heat that is normally rejected by the condensing coil. Heat recovery takes place by heating the water.

When the function is active, condensation takes place in a water exchanger while the condensing coil and the ventilation are deactivated.

4.1.6 Pump down

This function causes the compressors to stop and confines most of the refrigerant charge inside the high-pressure circuit.

4.1.7 Refrigerant leak detection management

When it is active, this function manages refrigerant leaks.

Leaks are controlled through a refrigerant detector whose sensor is installed in the compressor compartment of the unit. On the controller, for each refrigerant circuit of the unit, there are digital inputs to which the refrigerant detectors are connected.

If the amount of refrigerant measured by the sensor exceeds the alarm threshold, the detector opens a digital input of the controller of the unit.

According to the settings, in case of refrigerant leaks, the controller stops the relevant circuit in pump down or just gives a warning.

4.1.8 Defrost

Defrosting is a procedure in which frost accumulation on the condensing/evaporating coil is prevented and/or any frost that has formed is removed during operation in heat pump mode of an air/water unit.

An effective defrost cycle ends with a completely clean condensing/evaporating coil.

The controller manages defrosting differently according to the settings made and the air temperature conditions.

4.1.9 Anti-freeze heaters

During operation of the units, or while they are in stand-by conditions and the ambient temperature is below zero, the water inside the exchangers can freeze.

Ice formation inside the exchangers can irreparably damage them.

To prevent ice formation inside the exchangers, the controller can manage auxiliary heaters.

4.1.10 Fast Restart

To protect the integrity of the compressors, the controller manages the maximum number of starts per hour by means of the delay between two consecutive starts.

When present, the Fast Restart function allows a quick restart of the unit in case of blackout.

The quick restart after a blackout depends on the thermoregulation request. The reference water temperature must be above the activation off-set.

4.1.11 Auxiliary heating

When present, this function allows management of a heating device to supplement operation in heat pump mode or as an alternative to it.

Its activation is linked to the system water temperature and the air temperature.

4.1.12 "DHW: domestic hot water".

When featured, this function is designed to feed the air conditioning system and the domestic hot water system.

The unit produces either hot or cold water for the air conditioning system or hot water for the domestic hot water system. A 3-way valve managed by the unit controller causes the unit to switch between the two operating modes above.

4.1.13 Flowzer

When featured, this function helps manage the variable flow pump installed in the unit.

Depending on the installation type, the pump equipped in the unit can also operate as the system pump

The logic that manages the pump speed depends on the installation type and the parameters set in the controller.

4.1.14 2-zone control

When featured, this function is designed to control two system zones for the sake of ensuring comfort where different temperatures apply. The two zones can be controlled using either one or two 3-way modulating valves.

The function also includes optimisation of the unit operating setpoint, taking as reference the setpoints in the active zones.

4.1.15 Thermoregulation from tank-mounted probe

Where the system consists of one primary and multiple secondary circuits, the pump in the primary circuit only gets started when required by the probe mounted in the storage tank.

This function is intended to save on the power absorbed by the pump in the primary circuit when the water temperature in the storage tank meets the required load.

4.1.16 SMART Link , SMART Link+, and SMART Link DX

The "SMART Link" and "SMART Link+" functions equip the refrigerant units for connection with "GOLD" ventilating units.

The two functions differ in the type of network they use: The "SMART link" function uses an RS485 serial network; the "SMART Link+" function uses an Ethernet network.

Through the connection, the "GOLD" unit intervenes in the water temperature value of the refrigerating unit

This function is available for both chiller units and heat pump units.

4.1.17 Energy meter

The option "Energy meter" is designed to control the main electrical parameters of the unit.

This measuring instrument is installed in the electrical cabinet of the unit and it is configured at the factory. It communicates with the controller serially.

With this accessory there can be a function that limits the current absorbed by the unit.

4.1.18 System management

The Multilogic function is designed to allow for coordinated operation of several units on condition that they are properly connected.

This function is characterised by the presence of a Master unit that controls several Slave units and enables the compressors depending on the set parameters and the demands from the systems.

5 ALARMS

5.1 Introduction

The controller is programmed to manage the components of the unit safely, by adjusting their operation as conditions change with the aim of maintaining uninterrupted service.

Within the scope of this control function, the controller will partially or completely limit operation of the unit when hazardous conditions are approaching.

When the controller limits operation of the unit, the “Alarm” symbol appears on the display.

A click on the “Alarm” symbol gives access to the screen where the code and the description of all active alarms are given.

If you notice there are error messages with the unit running and with it stopped, you should promptly inform the customer support centre and given them the code and the message description and wait for their instructions.

The alarms history log shows both active alarms and the cleared alarms.



Do not take initiatives before consulting the customer support centre.

5.2 Alarm table

A list of alarm codes with their descriptions is given below.

Code	Description	Code	Description
AL1	Internal memory error	AL33	Liquid temp. probe error 1
AL2	User Pump Flow switch	AL34	Error condensation pressure probe 1
AL3	User Pump Flow switch	AL35	Error evaporation pressure probe 1
AL5	High Pressure 1	AL36	Error intake temp. probe 1
AL6	High pressure switch circ. 1	AL37	Flow meter alarm
AL7	Low Temp Water used HP	AL38	“ACS” reference probe alarm
AL8	Master/Slave status not aligned	AL39	Temp. error at system secondary circuit outlet
AL9	Master communication error	AL40	Heat exch. Pressure transducer alarm
AL10	BMS communication error	AL41	Dynamic set point probe error
AL11	Circ. 1 - Therm. comp. 1	AL42	Current measuring inlet probe error
AL14	Oper. limit ext. air	AL43	Low press. diff. (HP/LP) circ. 1
AL15	Therm. fan circ. 1	AL44	Tank probe error
AL16	Therm. user pump 1	AL45	Secondary circuit 1 alarmed
AL22	Wrong phase sequence	AL46	Unit Maintenance
AL23	High discharge temp. cir.1	AL47	Circ.1 - Maintenance compr. n. 1
AL24	Probe alarm discharge temp. 1	AL50	Maintenance user-side pump 1
AL25	Probe alarm user common inlet	AL55	High temp. at H2O inlet (CH)
AL27	Probe alarm user outlet	AL56	Err Temp. input plant (Multilogic)
AL31	Temp. probe error for AE/SD/AH	AL57	Err Temp. output plant (Multilogic)
AL32	Temp. probe error for H.P. coil 1	AL61	Pump Down Leak Detector circ. 1

Code	Description	Code	Description
AL62	Off-line inverter 1	AL123	Refrigerant sensor calibration time expired
AL63	Low SH/DSH Evap.circ.1	AL124	System transducer error in delivery circuit
AL68	Defrosting timeout circ. 1	AL125	System transducer error in return circuit
AL69	Min/Max voltage (24h)	AL126	Bypass temperature probe error
AL70	Evap. low pressure (Un) circ. 1	AL127	Auxiliary heating alarm
AL71	Cond. high pressure (Un) circ. 1	AL128	Error in liquid pressure probe 1
AL72	Min/Max voltage	AL129	Error: oil filter pressure probe in circuit 1
AL73	Evaporation low pressure circ. 1	AL130	Err. in temperature probe in motor 1
AL74	RTC alarm	AL131	Unit OFF - The time for leak detector calibration has expired.
AL76	User-side flow switch bypassed	AL138	User AHU 1 Offline
AL98	Generic alarm	AL144	User AHU 7 Offline
AL99	Flowzer offline	AL145	User AHU 8 Offline
AL102	Thermal overload switch in heater 1	AL146	User AHU 9 Offline
AL103	Thermal overload switch in heater 2	AL147	User AHU 10 Offline
AL104	Thermal overload switch in heater 3	AL148	cPcoe offline
AL105	Thermal overload switch in heater 4	AL149	Inverter Fault
AL106	Maximum ACS time	AL150	STO inverter active-High pressure switch
AL107	Maximum AL time	AL151	Probe error in secondary circuit 1
AL108	Defrost failed - user disab.	AL152	Probe error in secondary circuit 2
AL109	ACS overridden output	AL153	Gold air flow below minimum running threshold
AL110	Failure to perform AL cycle	AL154	Gold air flow below minimum defrost threshold
AL117	Secondary circuit 2 alarmed	AL155	Maintenance required
AL119	Refrigerant sensor inspection/calibration about to expire	AL156	Unità Gold offline
AL120	Out of envelope - compr. 1	-	-

6 FAQ

Frequently Asked Questions

The necessary instructions for working on the controller, with regard to the main functions of the unit, are given below.

6.1 Switching the unit on and off

The user can switch the unit either on or off from the display or via an external signal, as well as from the time bands and serially.

6.1.1 Switch the unit on and off from the display.

Use the "On/Off" icon on the main screen to go to the screen where the buttons to start and stop the unit are featured.

The top area of the screen shows the status of the unit: the "On/Off" icon is provided in the central area.

A tap on the icon changes the status of the unit from "on" to "off" and vice versa.

When the unit switches status, the On/Off icon goes from green (unit ON, in operation) to white (unit OFF).

6.1.2 Switch the unit on and off from external OK signal

In order to switch the unit on and off from external OK signal, make sure the feature is active.

To switch the unit on, close the external OK signal. To switch it off, open it.

The external OK signal should be connected to terminals "1" and "2" present in the terminal board.



The external OK signal must be a potential-free contact.

6.1.3 Switch the unit on and off from the BMS

In order to switch the unit on and off from the BMS, make sure the feature is active.

See dedicated BMS management document.

6.2 Change of set points

6.2.1 Editing the setpoint from the keypad

The setpoint is displayed in the bottom part of the main screen.

The icon "-" and "+" on the sides of the setpoint are used to adjust the setpoint.

If the setpoint needs to be edited, a click on the setpoint value causes the keypad to get enabled.

Set the new value and apply the green tick to confirm.

6.2.2 Editing the setpoint from the BMS

Setpoints can be edited from the BMS only if this function is enabled.

See dedicated BMS management document.

6.2.3 Change of the set point from external OK signal

If the unit is configured with two setpoints from an external OK signal, the first setpoint is active when the physical contact is open and the second setpoint is active when the physical contact is closed.

Terminals "200" and "206" are present in the terminal board for connection of the external OK signal.



The external OK signal must be a potential-free contact.

6.3 “ACS” management

6.3.1 How to enable and disable the function from the keypad and how to edit setpoints

If the unit features this function, the icon “DHW” is enabled on the bottom right-hand side of the main screen. The function is disabled if the icon is crossed out and it is active when the icon is red.

The “DHW” icon gives access to the main screen of this function. The main screen is also used to edit the setpoint.

The “Commands menu” on the top left-hand side of the screen opens a drop-down menu with the “DHW” and “Time bands” icons.

The “DHW” icon gives access to the screen where the “ACS” function and the air conditioning system can be enabled/disabled. On this screen, the arrow on the right gives access to the list of parameters of the function. The parameters include those required to control the anti Legionella cycle.

The “Time bands” icon is used to manage the time bands for energy saving on domestic hot water.

The main parameters and a graphic representation of the function are displayed by clicking the “DHW” icon in the “User Menu”.

6.3.2 How to enable and disable the “ACS” function using an external OK signal

If you wish to enable/disable domestic hot water production using an external OK signal, you must check that the function is featured.

If the unit is configured for “ACS” function activation using an external OK signal, the function is enabled when the physical contact is closed and it is not enabled when the physical contact is open.

Terminals “1” and “9” are present in the terminal board for connection of the external OK signal.



The external OK signal must be a potential-free contact.



If the unit is configured for “ACS” function activation using an external OK signal, the controller requires that the external physical contact be closed and the OK signal from the keypad be activated to control the function.

6.3.3 How to enable and disable the air conditioning system using an external OK signal

In units featuring the “ACS” function it may be useful to have the option to enable/disable operation of the air conditioning system using an external OK signal.

If you wish to enable/disable the air conditioning system using an external OK signal, you must check that the function is featured.

If the unit is configured for activation of the air conditioning system using an external OK signal, the function is enabled when the physical contact is closed and it is not enabled when the physical contact is open.

Terminals “1” and “7” are present in the terminal board for connection of the external OK signal.

6.4 RS485 serial port and Ethernet

6.4.1 RS485 serial connection

The connection must be made through serial port “**RS485 C**” using terminals 103, 104 and 105 and observing the indicated polarities.



Terminal "103", marked with "gnd", should be used only if you are certain it is not earthed.
The serial communication works even without its connection.



Connection of the "gnd" terminal to earth will damage the controller with consequent shutting down of the unit.

6.4.2 Ethernet connection

RJ45 connectors and a 8 twisted wire cable must be used for the connection.

The connectors can be of either plastic or metal material.



Fig. 3 Plastic connector, RJ45

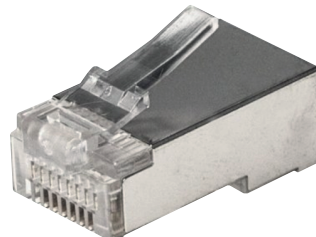


Fig. 4 Metal connector, RJ45

The cables can be either “FTP” (with aluminium shielding) or “UTP” type (without shielding). Cable type **Cat.5e** is a suitable choice.



The shielding must not be linked to the connector if metal RJ45 connectors and a shielded cable are used.
Connecting the shielding to the metal connector may damage the controller irreparably.

6.5 Resetting of partial counters

6.5.1 Resetting the compressor hours of operation and starts

The number of compressor hours of operation and starts can be reset in the password-protected Service menu or in the Maintenance menu.

First, access one of the two menus above and then select "Compressors".

The screen features the following selections: "Hours of operation" and "Starts".

The selected option gives access to the screen where the related counters are reset.

If the unit is fitted with multiple compressors on multiple refrigerant circuits, the arrow buttons can be used to select the compressor whose counter needs resetting.

Click the green thumb icon to reset the counter and to go back to the previous screen; the red thumb icon gives access to the previous screen only.

The maintenance branch is password protected.

The password is "200".

6.5.2 Resetting of the number of hours of operation of the pumps

The number of pump hours of operation can be reset in the password-protected Service menu or in the Maintenance menu.

First, access one of the two menus above and then select "Pumps".

The screen features the following selections: "Hours of operation".

Once selected, the option gives access to the screen where the related counters are reset.

If the unit is fitted with multiple pumps, the arrow buttons can be used to select the pump whose counter needs resetting.

Click the green thumb icon to reset the counter and to go back to the previous screen; the red thumb icon gives access to the previous screen only.

The maintenance branch is password protected.

The password is "200".

6.6 Controller functions

6.6.1 Change language

The “User Menu” icon enables a drop-down menu where all the function icons are featured.

A click on the “Languages” icon gives access to the screen where a list of the available languages is given.

A click on the language name or its flag causes switching to a new language.

6.6.2 Change date and time



The unit must be Off to edit the date and the time.

When the unit is off, a click on the area where the time and the date are displayed on the main screen gives access to the edit screen.

Select the write icon in the bottom right-hand side to access the edit screen.

The keypad appears when the values of the time and the date are tapped individually. Use the keypad to set up the value you wish to edit and then tap the green save icon on the bottom right-hand side of the keypad to confirm.

After all the necessary changes have been made, tap the green icon on the bottom right-hand side of the screen to update the values.

The controller gets restarted as soon as the updated value is confirmed by pressing the green “OK” icon.



Controller restarting takes a couple of minutes.

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