CONTROLS MANUAL

SmartVu ™2.0 Control

61AQ 040-140

(R290 A3 refrigerant)

Original document

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PREFACE

The goal of this document is to give a broad overview of the main functions of the control system used to control 61AQ heat pumps 40 to 140 kW cooling/heating capacity.

Instructions in this manual are given as a guide to good practice in the installation, start-up and operation of the control system. This document does not contain full service procedures for the correct operation of the equipment.

It is possible to monitor and manage the operation of the heat pump from either a local colour touch screen panel installed in the electrical cabinet of the machine or the web interface.

The support of a qualified Carrier Service Engineer is strongly recommended to ensure optimal operation of the equipment as well as the optimization of all available functionalities.

Note that this document may refer to optional components and certain functions, options or accessories may not be available for the specific unit. The cover images are solely for illustration and form no part of any offer for sale or any sale contract.

IMPORTANT: All screenshots of the user interface provided in this manual include text in English. After changing the language of the system, all labels will be in the language selected by the user.

Please read all instructions prior to proceeding with any work. Pay attention to all safety warnings.

ABBREVIATIONS

In this manual, the refrigeration circuits are called circuit A and circuit B. Compressor in circuit A are labelled A, whereas compressor in circuit B are labelled B.

The following abbreviations are used frequently:

BMS	Building Management System
CCN	Carrier Comfort Network
DGT	Discharge Gas Temperature
DST	Daylight Saving Time
EHS	Electric Heater Stage
EVSP	External Variable Speed Pump
EXV	Electronic Expansion Valve
UI	User Interface
LED	Light Emitting Diode
LEN	Sensor Bus (internal communication bus linking the CIOB boards and the SmartVu™2.0 controller)
LFL	Lower Flammability Limit
OAT	Outdoor Air Temperature
SCT	Saturated Condensing Temperature
SST	Saturated Suction Temperature
VFD	Variable Frequency Drive
DACH	German-speaking countries (Germany, Austria, Switzerland, Lichtenstein)
DHW	Domestic Hot Water
ZHC	Zone Heating/Cooling

Operating modes:	
Local-Off/LOFF	Operating type: Local Off
Local-On/L-C	Operating type: Local On mode
Local-Schedule/L-SC	Operating type: Local On following a time schedule
Network mode/Net	Operating type: Network
Remote mode/Rem	Operating type: Remote contacts

1 - SAFETY CONSIDERATIONS

1.1 - Safety guidelines

Installation, start-up and servicing of equipment can be hazardous if certain factors particular to the installation are not considered: operating pressures, electrical components, voltages, and the installation site (elevated plinths and built-up structures).

Only qualified installation engineers and fully trained technicians are authorised to install and start the equipment.

All instructions and recommendations provided in the service guide, installation and operation manuals, as well as on tags and labels fixed to the equipment, components and other accompanying parts supplied separately must be read, understood and followed.

Failure to comply with the instructions provided by the manufacturer may result in injury or product damage.

- **Apply all safety standards and practices.**
- **Wear safety glasses and gloves.**
- **Use the proper tools to move heavy objects.**
- **Move units carefully and set them down gently.**

CAUTION: Only qualified service technicians should be allowed to install and service the equipment.

1.2 - Safety precautions

Only personnel qualified in accordance with IEC (International Electrotechnical Commission) recommendations may be permitted access to electrical components.

It is particularly recommended that all sources of electricity to the unit should be shut off before any work is begun. Shut off the main power supply at the main circuit breaker or isolator.

IMPORTANT: The equipment uses and emits electromagnetic signals. Tests have shown that the equipment conforms to all applicable codes with respect to electromagnetic compatibility.

RISK OF ELECTROCUTION! Even when the main circuit breaker or isolator is switched off, specific circuits may still be energised as they may be connected to a separate power source.

RISK OF BURNS! Electrical currents may cause components to get hot. Handle the power cable, electrical cables and conduits, terminal box covers and motor frames with great care.

2.1 - Control system

The heat pump model 61AQ can also be referred to as AWHP004 in the IOM Control. This designation serves as an additional way to identify the device, ensuring clarity and ease of reference in documentation and operations. AWHP004 heat pumps are equipped with SmartVu™2.0 Control that serves as the user interface and configuration tool for Carrier communicating devices. The SmartVu™2.0 Control comes with web connectivity.

AWHP004 units use variable speed fans and compressors. Variable speed fans and compressors reduce the unit energy use during occupied and unoccupied periods, provide condensing or evaporating pressure control and smooth unit start.

For AWHP004 heat pumps, the system may control variable speed pumps with a hydronic module (Option 116V).

IMPORTANT: This document may refer to optional components and certain functions, options or accessories may not be available for the specific unit.

Size equivalent	Power [kW]							
AWHP004	40	50	60	70	80	100	120	140
61AQ	40	50	60	70	80	100	120	140

2.2 - System functionalities

The system controls the start-up of the compressor(s) needed to maintain the desired heat exchanger entering and leaving water temperature. It constantly manages the operation of the fans in order to maintain the correct refrigerant pressure in each circuit and monitors safety devices that protect the unit against failure and guarantee its optimal functioning.

SmartVu™2.0 control system:

- Allows users to control the unit via the SmartVu™2.0 user interface
- Provides web connectivity technology
- Includes the trending functionality
- Support optional About HVAC Performance (Connected Services) - Remote connectivity, alarm notification, remote access, performance and operation automatic reporting, technical advice)
- Provides direct BMS integration capabilities (CCN RS485, Modbus RTU or TCP, BACnet IP)

2.3 - Control panel

Navigation through the SmartVu™2.0 control is either using the touch screen interface or by connecting to the web interface.

2.4 - Operating modes

The control can operate in four independent modes:

- **Local mode:** The unit is controlled by commands from the user interface.
- **Local Schedule:** The unit is managed by commands from the user interface, and all schedules are taken into account for optimal performance.
- **Remote mode:** The unit is controlled by dry contacts.
- **Network mode:** The unit is controlled by network commands (CCN, Modbus RTU through RS-485 cable, Modbus TCP or BACnet IP through an Ethernet cable).

When the control operates autonomously (Local or Remote), it retains all of its control capabilities but does not offer any of the features of the Network.

CAUTION: Emergency stop! The Network emergency stop command stops the unit regardless of its active operating type.

2.5 - Features overview

Feature	Heat pumps	
	Standard	Option
7" touch screen (SmartVu™ 2.0)	✓	
Web connectivity	✓	
E-mail transmission	✓	
Abound HVAC Performance (Option 298)		✓
Language packs	✓	
Language pack customization	✓	
Metric / Imperial unit display	✓	
History trends	✓	
CCN communication	✓	
BACnet IP communication	✓	
Modbus RTU / Modbus TCP communication	✓	
Variable Speed Scroll Compressor	✓	
Variable speed fans	✓	
Water exchanger cooler/ heater	✓	
Air exchanger	✓	
Variable speed pumps control (Option 116V)		✓
Heating / Cooling control	✓	
Boiler control	✓	
Electric heating control	✓	
Buffer tank with electric heaters (Option 307 D/E)		✓
Defrost mechanism	✓	
Frost protection cooler/heater	✓	
User Quick Test	✓	
Diagnostics	✓	
Leakage detection (option 159C)		✓
Smart Grid Ready*	✓	
Domestic Hot Water control**	✓	
Two Heating/Cooling zones control	✓	
Outside Air Temperature	✓	
External Outside Air Temperature (Option 312)		✓
Lead/Lag control up to 4 units (Option 58)		✓

* The Smart Grid Ready label is valid only in the DACH region (Germany, Austria, Switzerland).
* Diverting valve (Option 347A)

3.1 - Control boards

CIOB boards manage all inputs and outputs to control unit circuit(s) including Fan(s), Domestic Hot Water, Heating Cooling Zones control.

These boards communicate via an internal LEN bus.

Variable Frequency Drive(s) allow(s) to control Compressor(s), Pump(s). They are connected via an internal ModBus RTU bus.

3.2 - Power supply to boards

All I/O boards are supplied from a common 24 VAC supply referred to earth.

CAUTION: Maintain correct polarity when connecting the power supply to the boards, otherwise the boards may be damaged.

In the event of a power supply interrupt, the unit restarts automatically without the need for an external command. However, any faults active when the supply is interrupted are saved and may in certain cases prevent a given circuit or the unit from restarting.

3.3 - Light emitting diodes on CIOB boards

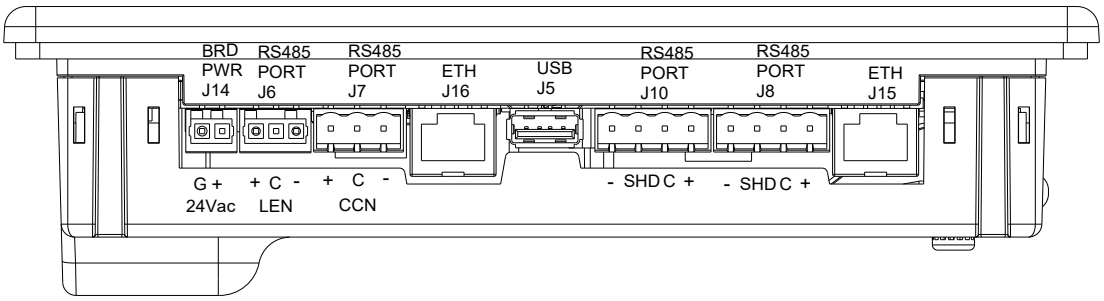
All boards continuously check and indicate the proper operation of their electronic circuits. A light emitting diode (LED) lights on each board when it is operating properly.

- The red LED flashing for a two-second period indicates correct operation. A different rate indicates a board or a software failure.
- The green LED flashes continuously on all boards to show that the board is communicating correctly over its internal bus (LEN bus). If the green LED is not flashing, this indicates a LEN bus wiring problem or a configuration issue.

3.4 - Touch panel connections

Connections are located on the bottom of the controller.

- The control offers RS485 communication protocols such as LEN, CCN (Carrier Comfort Network), Modbus RTU.
- Two Ethernet port allows for IP communication (Web server, BACnet/IP, Modbus TCP, etc.) for BMS (Building Management System) connection.
- J10: ModBus RTU (Customer connection)
- J8: ModBus RTU (Internal use only)

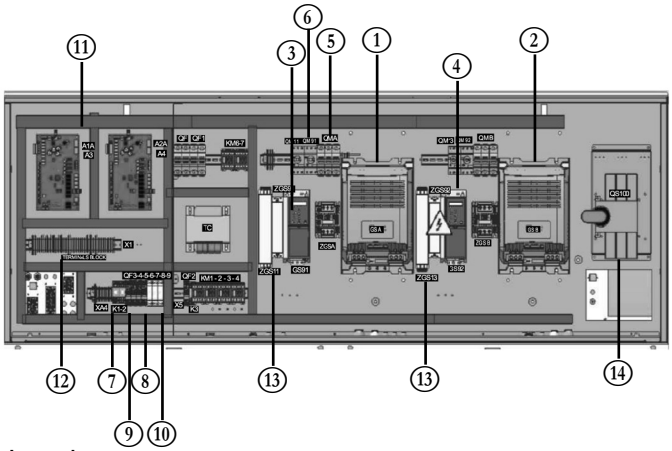


3.5 - Electrical box

The electrical box includes all boards controlling the unit and the user interface (SmartVu™2.0).

The main board continuously monitors the information received from various pressure and temperature probes and accordingly starts the program that controls the unit.

The unit is equipped with the SmartVu™2.0 user interface. The number of boards available in the electrical box depends on the number of selected options.



Legend:

1. Drive Comp A (GS A)
2. Drive Comp B (GS B)
3. Drive Pump A (GS 91)
4. Drive Pump B (GS 92)
5. Breaker Pump A (QM A)
6. Breaker Pump A (QM91)
7. Breaker Comp B (QMB)
8. Breaker Pump B (QM 92)
9. Breaker Fan A (QF3)
10. Breaker Fan B (QF4)
11. CIOB Boards (A1A, A2A, A3, A4)
12. Customer Terminal Block (X1, XA4)
13. Filters
14. Main breaker (QS100)

3.6 - Terminal block connections

The following table summarizes the connections at the user terminal block.

IMPORTANT: Some contacts can be accessed only when the unit operates in Remote mode.

Terminal block connections				
Description	**Board**	**Input/Output**	**Connector**	**Remarks**
Customer Interlock Switch	CIOB #A	DI-01	J1	Used for the customer safety loops
On/Off switch	CIOB #3	DI-01	J1	Used for the unit on/off control (Remote mode)
Second setpoint switch	CIOB #3	DI-02	J1	Utilized to alternate between Eco and Comfort setpoints
Demand limit switch 1 Demand limit switch 2	CIOB #4	DI-03 DI-04	J1	Used to control demand limit. See section 3.6.3.
Night switch	CIOB #3	DI-04	J34	Used to activate the Night Switch in Remote control type
Heat/Cool select	CIOB #3	DI-05	J3	Used to switch between cooling and heating when the unit is in Remote mode (Heat pumps only)
Setpoint reset signal	CIOB #A	AI-10	J9	Allows the user to reset the currently selected setpoint
Defrost Info Circuit A	CIOB #A	DO-02	J2	Used to indicate when the circuit is in defrost mode
Defrost Info Circuit B	CIOB #B	DO-02	J2	Used to indicate when the circuit is in defrost mode
Customer pump 1	CIOB #A	DO-03	J6	The control system can regulate one or two single speed evaporator pumps and automatically change over between the two pumps
Customer pump 2	CIOB #A	DO-04	J6	The control system can regulate one or two single speed evaporator pumps and automatically change over between the two pumps
Alarm relay	CIOB #3	DO-05	J23	Indication of the unit being in an alarm state
Boiler	CIOB #3	DO-05	J22	Used to control boiler.
Running relay	CIOB #3	DO-06	J22	Used to signal a running status (at least one compressor started)
Electrical Heat Stage 1 Electrical Heat Stage 2 Electrical Heat Stage 3	CIOB #3	DO-07 DO-08 DO-09	J6 J6 J23	Used to control electrical heat stage
External variable speed pump	CIOB #3 CIOB #5	A0-01 A0-01	J10	The control can regulate the customer pump via 0-10 V signal
Accessories:				
Leakage Detector	CIOB #A	DI-02	J1	Used to detect abnormal R290 gas concentrations
Optional OAT Sensor	CIOB #3	AI-03	J42	5k Oms NTC thermistor - OAT Used for heating/cooling zone climatic curves
Domestic Hot Water:				
DHW Thermal Switch	CIOB #3	DI-06	J3	Domestic Hot Water Thermal Switch
DHW Thermistor	CIOB #3	AI-04	J43	Domestic Hot Water Thermistor 5k Ohms NTC thermistor used to measure the internal temperature of the DHW tank
Diverting Valve Position (Opened)	CIOB #3	DI-07	J3	Indicates when the DHW diverting valve is in the open position. In this position, the heat pump is able to heat the DHW tank
Diverting Valve Position (Closed)	CIOB #3	DI-08	J3	Indicates when the DHW diverting valve is in the closed position. In this position, the heat pump is able to heat or cool the zone(s)
Diverting Valve (Opening signal)	CIOB #3	DO-01	J2	A command signal to open the DHW diverting valve
Diverting Valve (Closing signal)	CIOB #3	DO-02	J2	A command signal to close the DHW diverting valve
DHW Heater	CIOB #3	DO-04	J6	Domestic Hot Water Electric Heater command
Heating/Cooling Zones:				
Zone #1 Water Temp	CIOB #4	AI-03	J42	5k Ohms NTC Thermistor used to measure the Zone #1 water loop temperature
Zone #1 3 way valve (Opening signal)	CIOB #4	DO-01	J2	A command to open/close the mixing valve to control the water loop temperature in Zone #1
Zone #1 3 way valve (Closing signal)	CIOB #4	DO-02	J2	A command to open/close the mixing valve to control the water loop temperature in Zone #1
Zone #1 Pump/Circulator command	CIOB #4	DO-07	J7	On/Off command for the Pump/Circulator in the Zone #1 water loop
Zone #2 Water Temp	CIOB #4	AI-04	J43	5k Ohms NTC Thermistor used to measure the Zone #2 water loop temperature
Zone #2 3 way valve (Opening signal)	CIOB #4	DO-03	J6	A command to open/close the mixing valve to control the water loop temperature in Zone #1

Terminal block connections				
Description	**Board**	**Input/Output**	**Connector**	**Remarks**
Zone #2 3 way valve (Closing signal)	CIOB #4	DO-04	J6	A command to open/close the mixing valve to control the water loop temperature in Zone #1
Zone #2 Pump/Circulator command	CIOB #4	DO-08	J7	On/Off command for the Pump/Circulator in the Zone #2 water loop
Floor Temperature	CIOB #4	AI-11	J45	5k Ohms NTC Thermistor used to measure the floor temperature of the heating/cooling system
Smart Grid:				
SGR0_BST	CIOB #4	DI-01	J1	Smart Grid Ready Boost
SGR1_LCK	CIOB #4	DI-02	J1	Smart Grid Ready Lock
Option 307 D/E:				
Water Tank Temperature	CIOB #5	AI-01	J40	5k Ohms NTC Thermistor used to measure internal water tank temperature
Electric Heater 1	CIOB #5	DO-07	J7	6kW Electric Heater
Electric Heater 2	CIOB #5	DO-08	J7	6kW Electric Heater
Electric Heater 3	CIOB #5	DO-09	J7	6kW Electric Heater
Modular:				
Common Water System Temperature (Lead/Lag)	CIOB #3	AI-01	J40	5k Ohms NTC Thermistor used to measure the common leaving water temperature of the modular system

3.6.1 - Volt-free contact (on/off and cooling/heating)

On/off and cooling/heating contacts are as follows:

Contact	Off	Cooling	Heating	Auto
On/Off contact	open	closed	closed	open
Cooling/heating contact	open	open	closed	closed

Off: Unit is stopped
Cooling: Unit is allowed to start in Cooling
Heating: Unit is allowed to start in Heating (heat pump)
Auto: Unit can run in Cooling or Heating in accordance with the changeover values. If the automatic changeover is enabled (Heat/Cool Select, GENUNIT – General Parameters), the operating mode is selected based on OAT.

3.6.2 - Volt-free setpoint selection contact

This dry contact input is used to switch between setpoints. It is active only when the control is in Remote mode.

Contact	Cooling		Heating	
	Comfort Setpoint	Eco Setpoint	Comfort Setpoint	Eco Setpoint
Setpoint selection contact	open	closed	open	closed

3.6.3 - Volt-free demand limit selection contact

Up to two dry contacts can be used to limit unit capacity.

Capacity limitation with two contacts is as follows:

Contact	100%	Limit 1	Limit 2	Limit 3
Demand limit 1 contact	open	closed	closed	open
Demand limit 2 contact	open	open	closed	closed

3.6.4 - Volt-free contact - Night

Use to reduce the capacity of the unit and generated noise.

Contact	Demand Limit active	Night capacity Limit active
Night contact	open	close

3.6.5 - Volt-free contact - DHW Thermal Switch

Use a thermal switch to measure the DHW demand instead of a thermistor sensor.

Contact	DHW Demand	No DHW Demand
Demand contact	open	close

3.6.6 - Volt-free contact - DHW Diverting Valve (Option 347A)

Use to determine the position of the diverting valve.

Contact	CIOB #3 DI-07
DHW production	close

3.6.7 - Volt-free contact - Smart Grid

Use to manage the four Smart Grid Modes (see section 10)

3.6.8 - Volt-free contact - Customer Interlock Switch

Use to stop the unit and trigger an alarm when the unit is ON and the pump is running.

Contact	No Alarm	Alarm
Customer Interlock Switch	close	open

3.6.9 - Volt-free contact - Gas Leakage Sensor

Use to detect a gas leak. One sensor will detect refrigerant leakage.

Contact	No Alarm/ Alert	Alarm/Alert
Leakage Detector Switch	close	open

3.7 - Pressure transducers

Three types of transducers (high pressure, low pressure, water pressure) are used to measure various pressures in each circuit. These transducers deliver 0 to 5 VDC. They are connected to the CIOB board.

- **Discharge pressure transducers (high pressure type)**
  These transducers measure the discharge pressure in each circuit. They are used to control condensing pressure or high pressure load shedding. Discharge pressure sensors are mounted on the discharge line piping of each circuit.
- **Suction pressure transducers (low pressure type)**
  These transducers measure the suction pressure in each circuit. They are used to control EXV, evaporating pressure (in heating mode) and monitor suction pressure safeties related to the compressor operating envelope. Suction pressure sensors are located on the common suction piping of each circuit.
- **Pump inlet/outlet water pressure transducers**
  These transducers measure the pump water inlet/outlet water pressure and monitor the water flow (Option 116V)

3.8 - Temperature sensors

Temperature sensors constantly measure the temperature of various components of the unit, ensuring the correct operation of the system.

- **Water heat exchanger entering and leaving water temperature sensors**
  The water heat exchanger entering and leaving water temperature sensors are used for capacity control and safety purposes.
- **Outdoor air temperature sensor**
  This sensor measuring the outdoor air temperature is used for start-up, setpoint temperature reset and frost control.
- **Suction gas temperature sensors**
  These sensors measure the suction gas temperature. They are used for the EXV control. Suction gas temperature sensors are located at the suction side of each circuit.
- **Discharge gas temperature sensors**
  On each circuit, this sensor is used to measure the Discharge Gas Temperature in order to maintain it below 150°C (302°F).
- **Defrost temperature sensors (heat pumps)**
  These sensors are used to determine the end of the defrost cycle for a given circuit.
- **Lead/Lag water sensor (optional)**
  This sensor measures the common water temperature in the cascade system capacity control. It is installed only in the case of lead/lag units.
- **Water tank temperature sensor (Option 307 D/E)**
  This sensor is used to measure the Water Tank Temperature.
- **Zone water loop temperature sensor**
  One sensor per zone is used to measure the Water loop Temperature.
- **Floor Temperature sensor:**
  This sensor is used to measure the Floor Temperature for a zone with a Heating/Cooling Floor.
- **Outdoor Air Temperature sensor (Accessory)**
  If configured, this sensor, which measures outdoor air temperature, is utilized to calculate the Zone or Heat Pump Control points.
- **Domestic Hot Water Temperature sensor**
  This sensor monitors the internal water temperature of the Domestic Hot Water (DHW) tank.
- **Common Water System Temperature**
  The leaving water temperature sensor is used for modular Lead/Lag units.

3.9 - Actuators

- **Electronic expansion valve**
  The electronic expansion valve (EXV) is used to adjust the refrigerant flow to changes in the operating conditions of the machine. The high degree of accuracy with which the piston is positioned provides precise control of the refrigerant flow and suction superheat.
- **Water flow switch(es)**
  The configuration of the water flow switch enables automatic control of the minimum water flow setpoint (one per circuit). This setup occurs automatically during startup. In the event of a flow switch failure, an alarm condition will trigger a shutdown of the unit.
- **Water heat exchanger pumps (optional)**
  The controller is capable of regulating one variable speed water pump per cicrcuit (see also section 6.5).
- **Variable speed fan (EC Motor)**
  The controller shall be used to control 0-10V Variable Speed Fan (one per circuit).
- **Heating/Cooling Zone - mixing valve**
  One actuator per Zone, the mixing valve is controlled by a 3-point signal.
- **Four-way valve (Heat Pump)**
  The control actuates the 4-way valve to manage cooling, heating and defrost.
- **Domestic Hot Water (DHW) - Diverting Value**
  The diverting valve is of the 3-point type. The control command directs the valve to switch between the Heating/Cooling Zone and Domestic Hot Water (DHW) production, or the other way around.
- **Zone(s) circular pump**
  One actuator per Zone, the pump is of the On/Off type.

3.10 - RS485 wiring (best practice)

For RS485 ports, one of the following cables can be used:

- For CCN or Modbus communication which is over 300 m or in a noisy environment with Variable Frequency Drive (VFD), a cable with two twisted pairs is recommended. For example, Belden 3106A or Alpha Wire 6454.
- For applications where the length of the cable is up to 300 m and there is no Variable Frequency Drive (VFD), it is possible to use cost-effective cable solutions, for example, Belden 8772.

Note that "+" and "-" are communication signals and they are from the same twisted pair.

The signal ground could be a single wire or a twisted pair and it should be connected to the "C" pin of J10 (Modbus RTU) or J7 (CCN). This wire is required so that all nodes on the bus share a common ground reference connection.

If a shield is used, then the shield cable should be properly terminated and connected as short as possible at ONLY ONE END to the chassis ground (or to SHD connector pin)

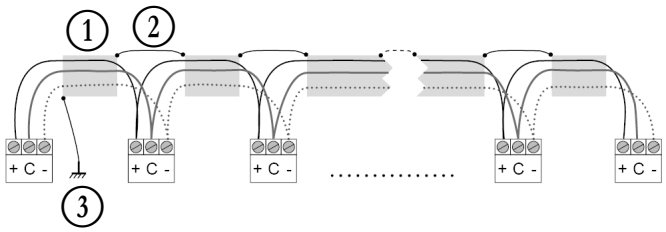
3.10.1 - RS485 wiring: 7-inch controller

The following diagrams illustrate possible RS485 wiring schemes for 7-inch controllers.

The first wiring scheme is the best option (RECOMMENDED), but the second or the third wiring can also be used.

3.10.2 - RS485: Daisy chain configuration

The following illustration shows proper 3-wire termination with a shield in a daisy chain configuration.



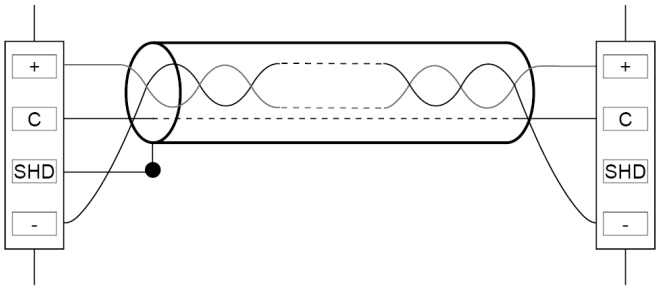
Legend
① Shield
② Keep shield continued
③ Connect shield to earth ground only at one point

End of Line Resistor: Termination is only needed when running at bus at very high speed over long distances.

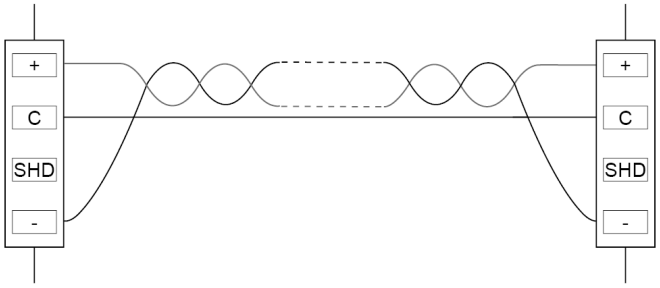
The speed of the bus and the cable distance determines whether termination is needed. It is meant to balance the bus to minimize the ringing that may be caused by fast signals and the inductance of the cabling.

At 9600 baud, termination will have little or no effect on the bus.

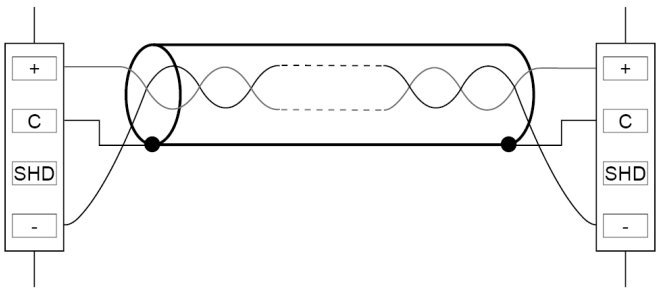
No.1 RS485 wiring diagram (RECOMMENDED)



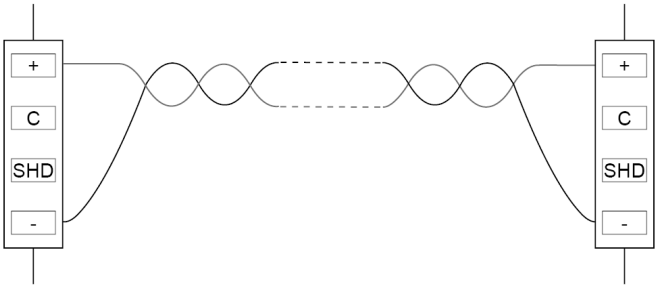
No. 2 RS485 wiring diagram (CORRECT)



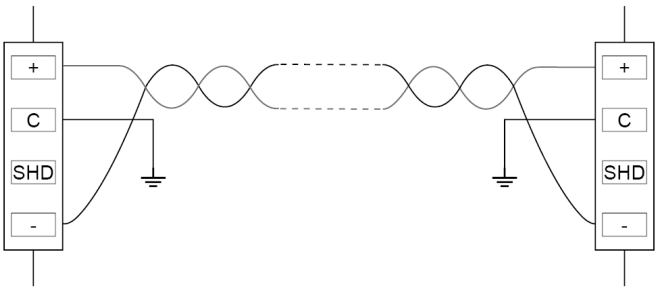
No. 3 RS485 wiring diagram (CORRECT)



No. 4 RS485 wiring diagram (INCORRECT- Do not use!)



No. 5 RS485 wiring diagram (INCORRECT- Do not use!)



4.1 - SmartVu™ 2.0 touch screen

SmartVu™ 2.0 allows you to control the touch screen with a bare finger or a suitable pen (a capacitive stylus pen). Pointed or cutting tools should not be used (e.g. screwdrivers).

During commissioning, the first screen displayed on the touchscreen provides an intuitive configuration wizard to guide you through the setup process.

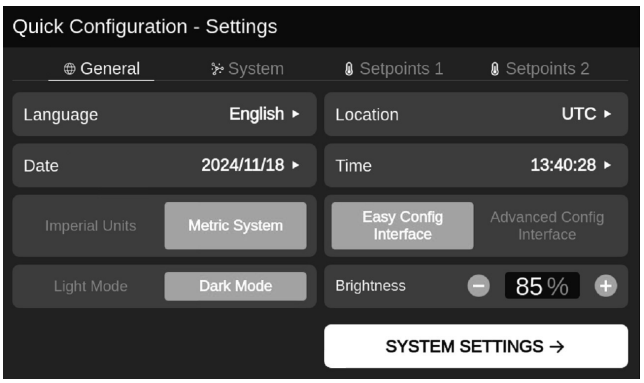
4.1.1 - Quick Configuration - initial settings

Upon starting the controller, the presets are displayed on the screen.

4.1.2 - General Settings

The Customer Preference Configuration is used to set language, units brightness, user interface skin.The location setting allows the controller to manage winter and summer times.Once completed, click "System Settings" to proceed,

Note: If the "Advanced Config Interface" is selected, the system will automatically navigate to the advanced interface homepage. From the advanced interface homepage, click the "Home" button to return to the "Easy Config Interface" ("Smart User Interface").



4.1.3 - System Settings

The "System" view allows for the activation of modes, such as:

- **Modular**

This function enables plant control between up to four heat pump assemblies connected via the CCN network. The mandatory configuration is as follows:

1. Units are in parallel

2. Each unit has its own pump(s). Select the unit role: Lead or Lag. For the Lead unit, select the number of units configured as Lag

- **External Temp. Sensor**

This accessory (Option 312) can be used to measure the outside air temperature if the temperature read by the heat pump is not representative.

- **Heaters**

Allows configuration of up to 3 customer heaters or Option 307 D/E (buffer tank with heaters).

- **Smart Grid**

Available for DACH countries. It allows an energy supplier to access the heat pump and manage four heat pump control states (Normal, Locked, Boost, Forced).

- **Heating/Cooling or Cooling Only Mode**

AWHP004 is a reversible heat pump. Selecting "Cooling Only" will disable the heating functionality.

- **Boiler**

Allows the heat pump to control a boiler as backup heating.

- **DHW (Domestic Hot Water)**

Allows the heat pump to heat a domestic hot water tank based on a DHW schedule and a Legionella prevention schedule.

Options:

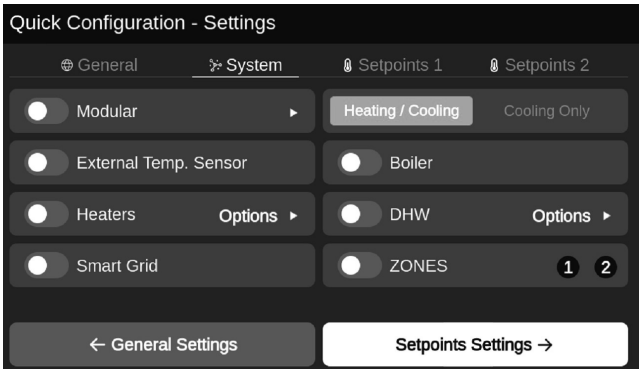
1. To configure a DHW tank equipped with a heater.

2. To configure a DHW tank equipped with a thermal contact instead of a thermistor.

- **ZONES**

Allows the heat pump to control up to two Heating/Cooling Zones. For each zone, two operating modes (Comfort and Eco) can be scheduled.

For each zone, a mixing valve and an On/Off pump/circulator will be controlled based on the water temperature setpoint.

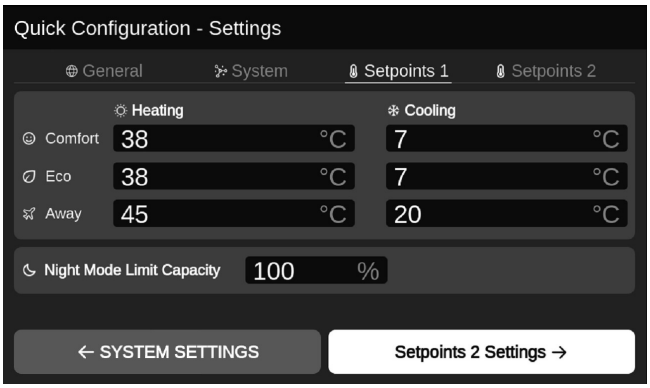


4.1.4 - Setpoints 1 Settings

The "Setpoints 1" gives ability to set the Heating/Cooling values and to configure the Night Mode Limit Capacity.

The Night Mode allows noise reduction by decreasing the unit's capacity.

Heat pump setpoints are enabled if no zone is configured. In this case, the heat pump control point is determined by the configured setpoints.



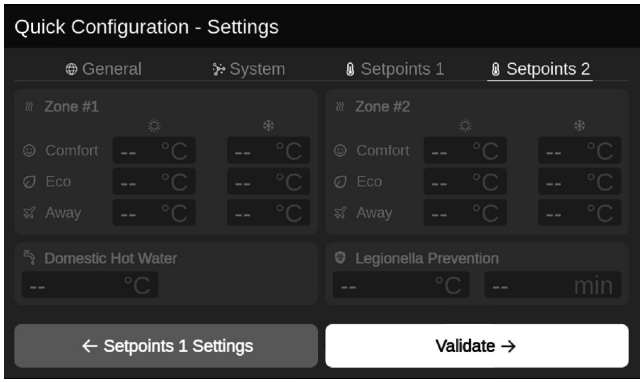
4.1.5 - Setpoints 2 Settings

The "Setpoints 2" provides the ability to manage settings for Zone 1 and Zone 2.

If DHW (Domestic Hot Water) is configured, both DHW setpoints and the Legionella prevention setpoint can be set.

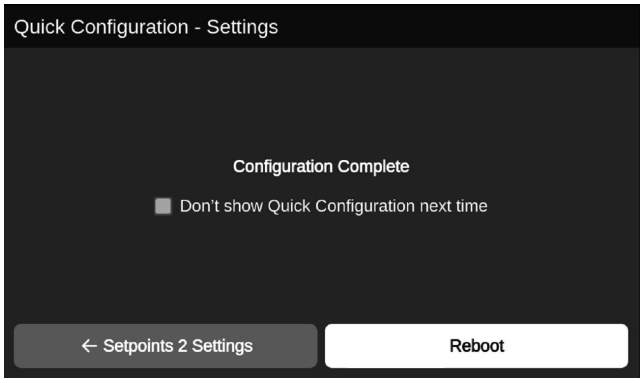
When zones are configured, the heat pump control point is determined based on the Heating/Cooling and Comfort/Eco setpoints for each zone.

Setpoints for each zone can be adjusted to accommodate different types of emitters, such as radiators, fan coils and underfloor heating.



4.1.6 - Validation

Once the initial settings have been made, the configuration is complete, and the unit can be restarted by clicking the "Reboot" button.



Regarding the "Don't show this next time" checkbox:

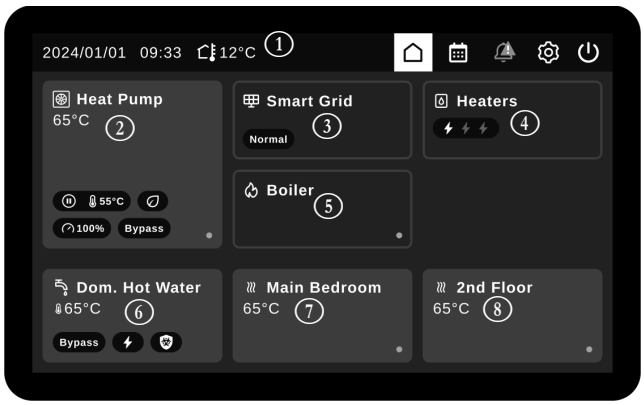
1. Selecting and rebooting saves the parameters. The AWHP004 home page will be displayed after reboot (commissioning complete).

2. Deselecting and rebooting saves the parameters. The AWHP004 Quick Configuration page will be displayed after reboot (commissioning pending).

Note: Once commissioning is complete, the System screen is disabled. All configuration changes must be made through the advanced configuration screens. User password is required.

4.2 - SmartUse Home Screen

The home screen is the first screen displayed on the touch screen panel after the commissioning. This screen allows you to monitor basic information about the operation of the heat pump and its working conditions. upon starting the controller, the presets are displayed on the screen.

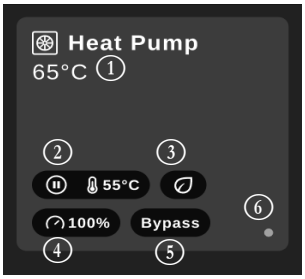


Legend:

1. Unit or External OAT
2. Heat Pump status
3. Smart Grid status
4. Heaters status
5. Boiler status
6. Domestic Hot Water status
7. Zone 1 status
8. Zone 2 status

4.2.1 - Heat Pump tile

This tile displays the current heat pump status.



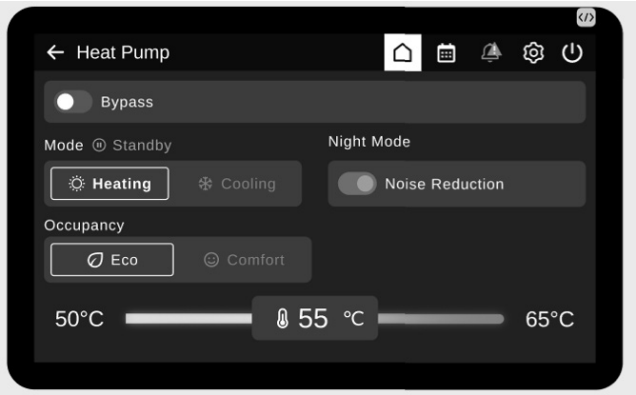
Legend:

1. Control Point
2. Heat/Cool/Standby mode and Leaving Water Temperature
3. "Eco" leaf
4. Current capacity
5. Bypass status
6. Local Operating Type

After selecting the "Heat Pump" tile, the settings screen will be displayed as shown below. This view allows to activate the Bypass mode, set the operating mode (Heating/Cooling), choose the unit occupancy (Eco/Comfort), activate Nigh Mode (Noise Reduction).

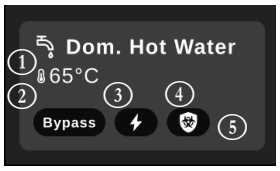
Heat Pump Bypass

If the Bypass selector is on, any changes to mode, occupancy or noise reduction selectors will be applied for 3 hours. If the Bypass selector is off, the heat pump will determine the running status automatically.



4.2.2 - Domestic Hot Water tile

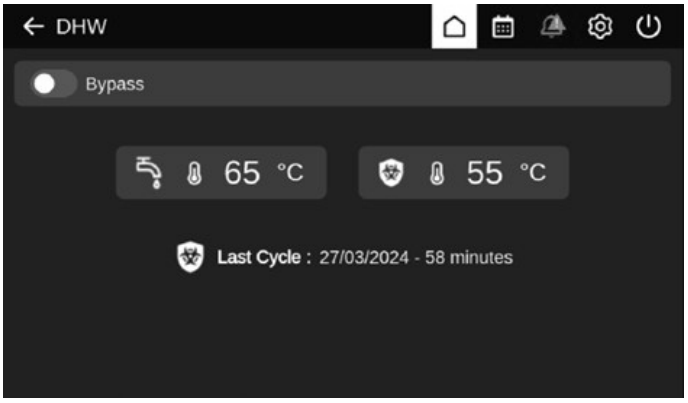
This tile displays the current DHW status.



Legend:

1. Control Point
2. Bypass status
3. Heater status
4. Legionella prevention status
5. Green bullet DHW mode on/off

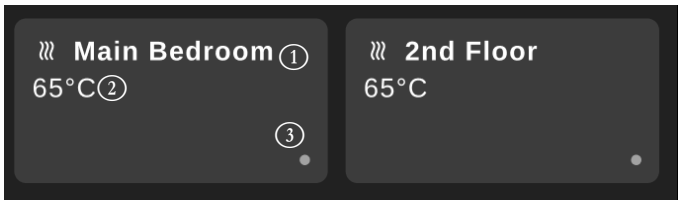
After selecting the "DHW" tile, the settings screen will be displayed as shown below:



DHW Bypass: If the Bypass selector is on, the heat pump will heat the DHW tank for 3 hours (The setpoints displayed are read-only values).

4.2.3 - Zone(s) tile

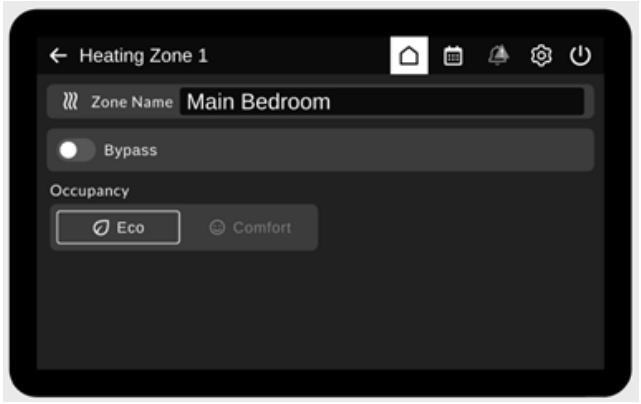
These tiles display the current Zone(s) status.



Legend:

1. Zone name
2. Control point
3. Zone status (Eco/Comfort)

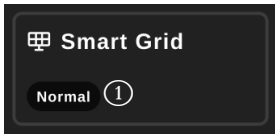
Clicking on the "Zone #1" or "Zone #2" tile opens a view as shown below. The Zone name can be modified in this view.



Zone Bypass: If the Bypass selector is on, according to the selection (Eco/Comfort), the heat pump will control the Zone water loop using Zone Comfort/Eco setpoint for 3 hours.

4.2.4 - Smart Grid tile

Allows for reading the status of the Smart Grid.

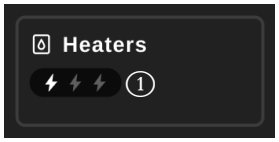


Legend:

1. Smart Grid Status

4.2.5 - Heaters tile

Allows for reading the status of the Electric Heaters.

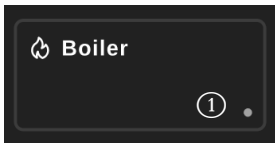


Legend:

1. Electric Heaters on/off

4.2.6 - Boiler tile

Allows for reading the status of the boiler.

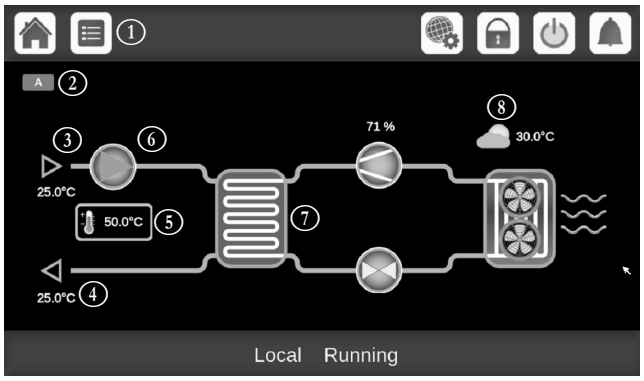


Legend:

1. Boiler on/off

4.2.7 - Advanced Home Screen

Selecting 'Advanced Configuration Interface' provides access to the advanced view of the unit



Legend:

1. Header buttons ("header bar")
2. Circuit icon
3. Entering Water Temperature
4. Leaving Water Temperature
5. Setpoint
6. Water pump
7. Refigeration cycle
8. Outdoor Air Temperature

■ **Circuit**

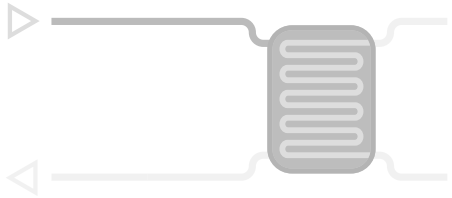
For single-circuit heat pump, there is only one circuit icon displayed (A for circuit A).

For dual-circuit heat pump, two circuit icons will be displayed (A for circuit A, B for circuit B).

- Grey circuit icon = circuit is stopped
- Green circuit icon = circuit is running

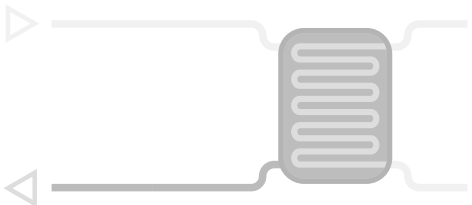
■ **Evaporator Entering Water Temperature (EWT)**

This is the temperature of the water returned from the building ("return water temperature").



■ **Evaporator Leaving Water Temperature (LWT)**

This is the temperature of the chilled water produced by the heat pump and supplied to the building ("supply water temperature").

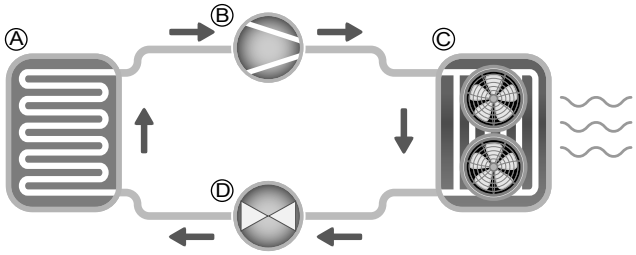


■ **Setpoint**

Setpoint is used to define the desired supply water temperature (Evaporator LWT).

Logged-in users are allowed to access heat pump setpoint settings directly from the home screen: Tap 6.7C to open the setpoint configuration menu.

■ **Refrigeration cycle (Cooling mode)**



A) Evaporator
- Evaporator absorbs heat from the fluid (pure water or brine), it does the opposite of the condenser which is rejecting the heat out of the unit. Evaporator converts liquid refrigerant into vapours.

B) Compressor / circuit capacity
- This value shows current unit capacity.
- The compressor is used to squeeze the compressor refrigerant gas and turn it into high pressure gas.

C) Condenser
- Condenser is a heat exchanger used to reject the heat by cooling down the high pressure gases and taking advantage to condense the vapours into a liquid.

  The number of fans given in the picture may be different from the actual number of fans installed on the unit.

D) Electronic Expansion Valve (EXV)
- EXV is used to control the flow of refrigerant into the evaporator.
- Valve position is given in %, where 0% means closed position and 100% means open position.

■ **Outdoor Air Temperature**

OAT sensor reading. The outdoor air temperature sensor used to measure and monitor the temperature helps to optimize the cooling/heating process whenever possible.

4.3 - Header buttons

Button	Description
	**Home screen:** Press the button to go to the Home screen.
	**Previous screen:** Press the button to go back to the previous screen.
	**Main menu:** Press the button to go to the Main menu.
	**System menu:** Press the button to go to the System menu.
	**Login menu:** Used to login in to the controller in order to access higher configuration level.
	 User is not logged in.  User access level.  Service technician access level.  Factory access level.
	**Start/Stop menu:** Used to control the unit control mode.
	 Unit is currently stopped (blue icon).  Unit is currently running (green icon).
	**Alarm menu:** Press the button to go to the Alarms menu.
	 The **grey** bell means there is currently no alarm active on the unit.  The **yellow** ringing bell means that there is a partial alarm (one circuit affected by the alarm) or Alert (no action taken on the unit).  The **red** ringing bell means that the unit is affected by the alarm.

4.4 - Other buttons

Button	Description
	Save button: Press the button to save the modification.
	Cancel button: Press the button to cancel the modification.
	Log in button: Press the button to log in at specific access level.
	Log off button: Press the button to log off.
	Confirm button: Press the button to confirm the modification.
	Cancel button: Press the button to cancel the modification.
	Up button: Press the button to scroll up.
	Down button: Press the button to scroll down.
	On SmartVu™ 2.0 touch screen: Swipe up from the bottom of the screen or swipe down from the top of the screen to display and reach other items. Note: You can swipe up or down only in the menu view (the top bar and the bottom bar will not respond to swipe gestures).
	Force button: Press the button to force the parameter.
	Remove Force button: Press the button to remove the forced parameter.
	Trending button: Press the button to display trends.
	Refresh button: Press the button to refresh the view.
	Zoom in button: Press the button to magnify the current view.
	Zoom out button: Press the button to expand the current view.
	Left button: Press the button to go to the left.
	Rewind button: Press the button to go to the left faster than normal.
	Right button: Press the button to go to the right.
	Fast-forward button: Press the button to go the right faster than normal.

4.5 - Warning messages

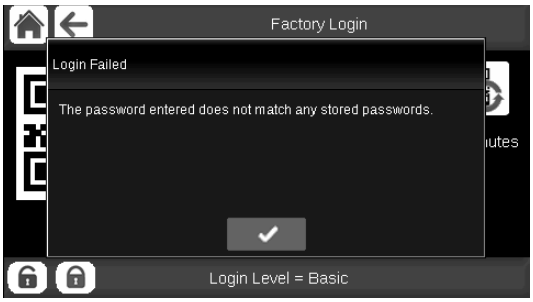
Warning messages are used to inform the user that a problem occurred and the requested action cannot be completed successfully.

Login failure

If the wrong password is provided, the following warning message will be displayed:

"The password entered does not match any stored passwords"

Example: Login failed (SmartVu™ touch screen)

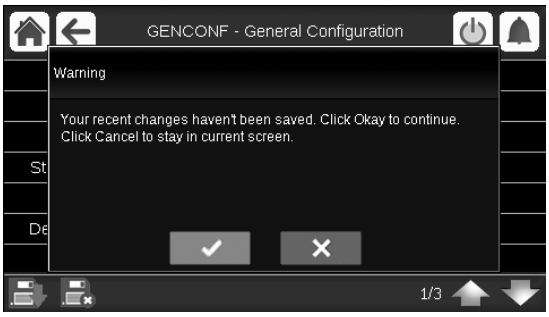


- Press the **Confirm** button and type the correct password (see section 5.7).

Saving modifications

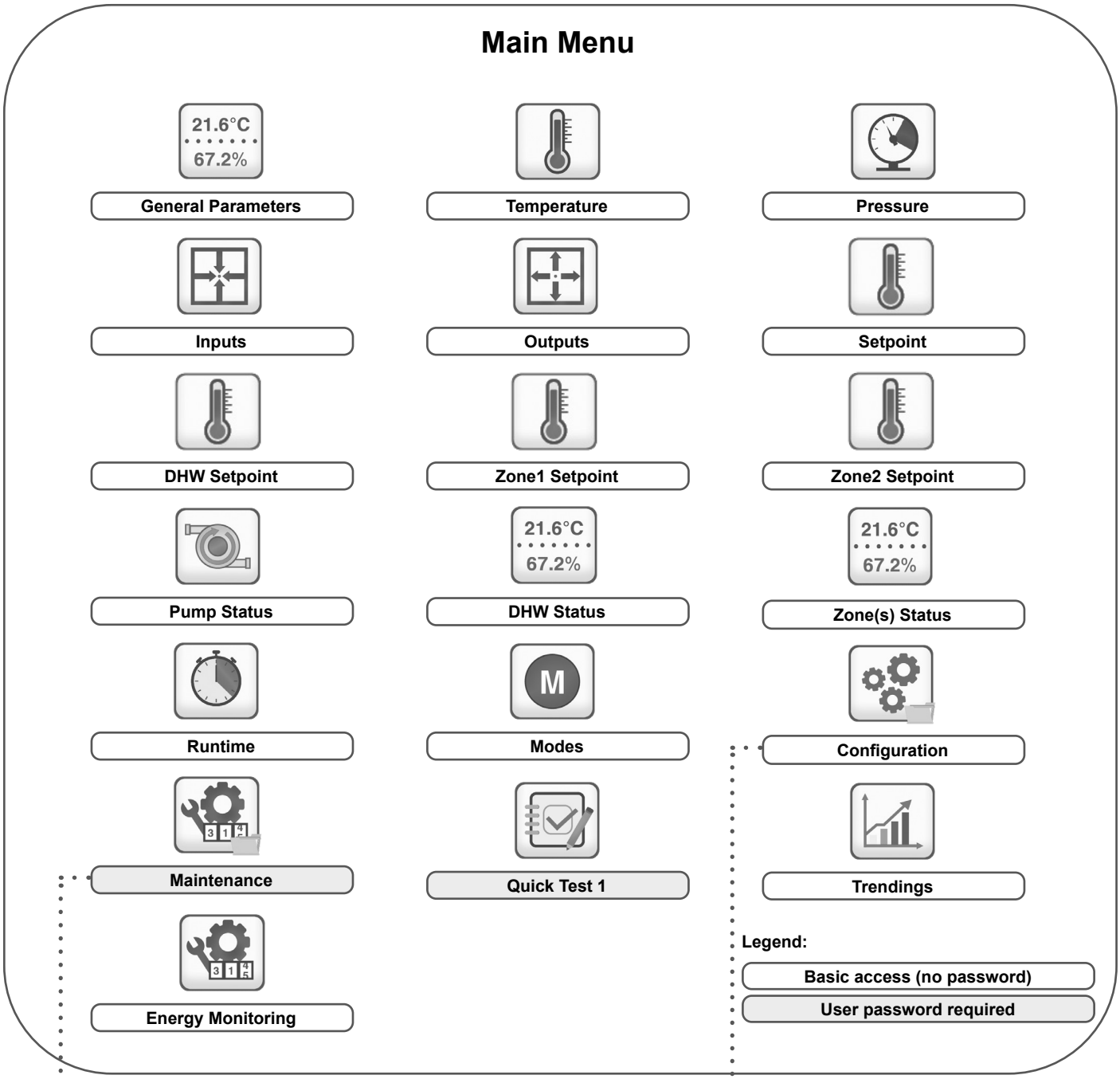
In case a parameter has been changed, but not saved with the **Save** button, the following warning message will be displayed:

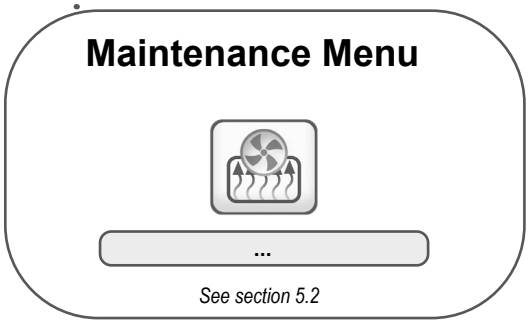
"Your recent changes haven't been saved (...)"



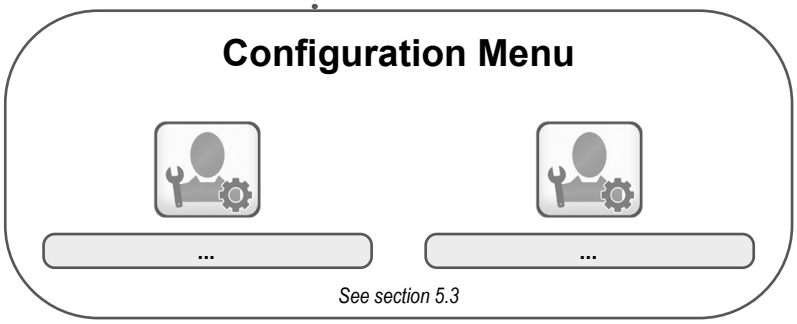
- Press **OK** to continue without saving the modification.
- Press **Cancel** to come back to the current screen and then save the modification with the **Save** button.

5.1 - Main menu





See section 5.2



See section 5.3

5 - ADVANCED INTERFACE: MENU STRUCTURE

The Main menu provides access to the main control parameters, including general parameters, inputs and outputs status, etc.

- To access the menu, press the **Main menu** button located in the upper-left part of the Home screen.
- Specific unit parameters can be accessed by pressing the icon corresponding to the desired category.

NOTE: The Trendings menu is displayed in form of a graph. For more information about Trendings, see section 6.25.

CAUTION: Since specific units may not include additional features, some tables may contain parameters that cannot be configured for a given unit.

General parameters – GENUNIT

Name	Status	Unit	Displayed text*	Description
CTRL_TYP	0 to 2		Local=0 Net.=1 Remote=2	Operating mode: 0 = Local 1 = Network 2 = Remote
STATUS			Running Status	Unit running status: Off, Stopping, Delay, Running, Ready, Override, Tripout, Test, Runtest
STATUS_A			Status Circuit A	Circuit A status
STATUS_B			Status Circuit B	Circuit B status
ALM			Alarm State	Alarm state: Normal = No alarm Partial = There is an alarm, but the unit continues to operate Shutdown = Unit shuts down
min_left	-	min	Minutes Left for Start	Minutes before the unit start-up
HEATCOOL			Heat/Cool status	Heating/cooling status
HC_SEL	0 to 2		Heat/Cool Select	Heating/cooling selection
			0=Cool 1=Heat 2=Auto	0 = Cooling 1 = Heating 2 = Automatic heating/cooling control
SP_SEL	0 to 2		Setpoint Select	Setpoint selection
			0=Auto. 1=Spt1. 2=Spt2	0 = Automatic setpoint selection 1 = Setpoint 1 (active during occupied period) 2 = Setpoint 2 (active during unoccupied period)
SP_OCC	no/yes		Setpoint Occupied?	Setpoint status: 0 (no) = Unoccupied 1 (yes) = Occupied
CHIL_S_S	disable/enable		Net.: Cmd Start/Stop	Unit start/stop via Network: When the unit is in Network mode, start/stop command can be forced
CHIL_OCC	no/yes		Net.: Cmd Occupied	Unit time schedule via Network: When the unit is in Network mode, the forced value can be used instead of the real occupancy state
CAP_T	0 to 100	%	Unit Total Capacity	Unit total capacity
CAPA_T	0 to 100	%	Circuit A Total Capacity	Total capacity, circuit A
CAPB_T	0 to 100	%	Circuit B Total Capacity	Total capacity, circuit B
DEM_LIM	0 to 100	%	Active Demand Limit Val	Active demand limit value: When the unit is Network mode, the minimum value will be used compared to the status of the external limit switch contact and the demand limit switch setpoint
SP		°C / °F	Current Setpoint	Current setpoint
CTRL_PNT	-20 to 67 -4 to 153	°C °F	Control Point	Control point: Water temperature that the unit must produce
EMSTOP	disable/enable		Emergency Stop	Emergency stop: Used to stop the unit regardless of its active operating type
SGR_st	1 to 4	-	Smart Grid Ready Status	Smart Grid Ready status (operating mode): 1 = LOCK 2 = NORMAL 3 = BOOST 4 = FORCED

*Depends on the selected language (English by default)

Temperature – TEMP

Name	Status	Unit	Displayed text*	Description
OAT	-40 to 150 -40 to 302	°C °F	Outdoor Air Temperature	Outdoor air temperature: Used to determine a number of control mechanisms such as heat/cool changeover, water exchanger heater operation, defrost cycle, free cooling option, and more
CWST	-40 to 150 -40 to 302	°C °F	Common Water System Tmp	Common Water System Temperature for multi-unit (Option 58)
EWT	-	°C / °F	Entering Water Temp	Evaporator entering water temperature: Used for capacity control
LWT	-	°C / °F	Leaving Water Temp	Evaporator leaving water temperature: Used for capacity control

Temperature – TEMP (continued)

Name	Status	Unit	Displayed text*	Description
SCT_A	-	°C / °F	Saturated Cond Tmp A	Saturated condensing temperature, circuit A
SST_A	-	°C / °F	Saturated Suction Temp A	Saturated suction temperature, circuit A
SUCT_A	-	°C / °F	Suction Temp Circuit A	Suction temperature, circuit A
DGT_A	-	°C / °F	Discharge Gas Temp A	Discharge gas temperature, circuit A
LIQ_T_A	-	°C / °F	Liquid Temp A	Liquid Temperature A
DEFRT_A	-	°C / °F	Defrost Temp Circuit A	Defrost temperature, circuit A (heat pumps)
SCT_B	-	°C / °F	Saturated Cond Tmp B	Saturated condensing temperature, circuit B
SST_B	-	°C / °F	Saturated Suction Temp B	Saturated suction temperature, circuit B
SUCT_B	-	°C / °F	Suction Temp Circuit B	Suction temperature, circuit B
DGT_B	-	°C / °F	Discharge Gas Temp B	Discharge gas temperature, circuit B
LIQ_T_B	-	°C / °F	Liquid Temp B	Liquid Temperature B
DEFRT_B	-	°C / °F	Defrost Temp Circuit B	Defrost temperature, circuit B (heat pumps)
WTANK_T	-	°C / °F	Water Tank Output Temp	Water Tank Output Temperature (Option 307D/E)
OAT_OPT	-40 to 150 -40 to 302	°C °F	Optional OAT Sensor	Optional OAT Sensor (Option 312)

*Depends on the selected language (English by default).

Pressure – PRESSURE

Name	Status	Unit	Displayed text*	Description
DP_A	-	kPa / PSI	Discharge Pressure A	Compressor discharge pressure, circuit A
SP_A	-	kPa / PSI	Suction Pressure A	Compressor suction pressure, circuit A
DP_B	-	kPa / PSI	Discharge Pressure B	Compressor discharge pressure, circuit B
SP_B	-	kPa / PSI	Suction Pressure B	Compressor suction pressure, circuit B
EWP	-	kPa / PSI	Raw Entering Water Press	Pump entering water pressure
LWP	-	kPa / PSI	Raw Leaving Water Press	Pump leaving water pressure

*Depends on the selected language (English by default).

Setpoint – SETPOINT

Name	Status	Default	Unit	Displayed text*	Description
csp1	6.5 to 20 43.7 to 68	7 44.6	°C °F	Cool Comfort Setpoint	Cool comfort setpoint
csp2	6.5 to 20 43.7 to 68	7 44.6	°C °F	Cool Economy Setpoint	Cool economy setpoint
cawystp	6.5 to 20 43.7 to 68	7 44.6	°C °F	Cool Away Setpoint	Cool away setpoint
cw_comp	-7 to 0 -12.6 to 0	0 0	^C ^F	Cold Water compensation	Cold water compensation
hsp1	25.0 to 75 77.0 to 167	38 100.4	°C °F	Heat Comfort Setpoint	Heat comfort setpoint
hsp2	25.0 to 75 77.0 to 167	38 100.4	°C °F	Heat Economy Setpoint	Heat economy setpoint
hawystp	25 to 75 77 to 167	35 95	°C °F	Heat Away Setpoint	Heat Away Setpoint
hw_comp	0 to 7 0 to 12.6	0 0	^C ^F	Hot Water compensation	Hot water compensation
cauto_sp	3.9 to 50 39.0 to 122.0	23.9 75	°C °F	Cool Changeover Setpt	Cooling changeover setpoint
hauto_sp	0 to 46.1 32.0 to 115.0	17.8 64	°C °F	Heat Changeover Setpt	Heating changeover setpoint
lim_sp1	0 to 100	100	%	Switch Limit Setpoint 1	Switch limit setpoint 1
lim_sp2	0 to 100	100	%	Switch Limit Setpoint 2	Switch limit setpoint 2
lim_sp3	0 to 100	100	%	Switch Limit Setpoint 3	Switch limit setpoint 3
				Smart Grid Ready Option:	Smart Grid Ready Option:
heat_sg3	0 to 22.22 0 to 40	0 0	^C ^F	Boost Heat Offset	Smart Grid Ready: Heating offset (BOOST mode)
heat_sg4	0 to 22.22 0 to 40	0 0	^C ^F	Forced Heat Offset	Smart Grid Ready: Heating offset (FORCED mode)
dhw_sg3	0 to 22.22 0 to 40	0 0	^C ^F	Boost DHW Offset	Boost Domestic Hot Water offset

Setpoint – SETPOINT (continued)

Name	Status	Default	Unit	Displayed text*	Description
dhw_sg4	0 to 22.22 0 to 40	0 0	^C ^F	Forced DHW Offset	Forced Domestic Hot Water offset

*Depends on the selected language (English by default).

Inputs – INPUTS

Name	Status	Unit	Displayed text*	Description
VCP_FD_A	-	%	Compressor Feedback A	Compressor Feedback A
VCP_FD_B	-	%	Compressor Feedback B	Compressor Feedback B
EXV_FD_A	-	%	Exv Feedback A	EXV Feedback A
EXV_FD_B	-	%	Exv Feedback B	EXV Feedback B
ONOFF_SW	open/close	-	Remote On/Off Switch	Remote on/off switch
HC_SW	open/close	-	Remote Heat/Cool Switch	Remote heating/cooling selection switch
on_ctrl	-	-	Current Control	Current control
SETP_SW	open/close	-	Eco Setpoint Switch	Eco setpoint selection switch
LIM_SW1	open/close	-	Limit Switch 1	Demand limit switch 1
LIM_SW2	open/close	-	Limit Switch 2	Demand limit switch 2
SP_RESET	-	mA	Setpoint Reset Signal	Setpoint Reset Signal
G_LEAK	open/close	-	Gas Leak Detect	Gas Leak Detection
HP_SW_A	open/close	-	High Pressure Switch A	High Pressure Switch A
HP_SW_B	open/close	-	High Pressure Switch B	High Pressure Switch B
NIGHT_SW	open/close	-	Night Mode Switch	Night Mode Switch
DHW_THSW	open/close	-	DHW Tank Thermal Switch	Domestic Hot Water Thermal Switch
DIVVLV_O	open/close	-	Diverting Valve Opened	Diverting Valve Opened
DIVVLV_C	open/close	-	Diverting Valve Closed	Diverting Valve Closed
SGR0_BST	open/close	-	SG Ready #0 (Boost)	Smart Grid Ready control input (Boost)
SGR1_LCK	open/close	-	SG Ready #1 (Lock	Smart Grid Ready control input (Lock)
LOCK_SW	open/close	-	Customer Interlock	Customer Interlock

*Depends on the selected language (English by default).

Outputs – OUTPUTS

Name	Status	Unit	Displayed text*	Description
VCP_A	-	%	Compressor Command A	Compressor command A
VFAN_A	-	%	VariaFan Speed A	Variable speed fan A
EXV_A	0 to 100	%	EXV Position Circuit A	EXV position, circuit A
RV_A	off/on	-	4 Way Refrigerant Valve A	4-way refrigerant valve, circuit A: Used to manage cooling/heating/defrost operation (heat pumps)
SETFLOWA	off/on	-	Cooler A Flow Setpnt Out	Cooler A Flow Setpoint Out
DEFRINFA	no/yes	-	Defrost In Progress A	Defrost in progress A
C_HEAT_A	off/on	-	Drain pan heater A	Drain pan heater A
EXCHHTRA	off/on	-	Exchanger Heater A	Exchanger heater A
CP_HTR_A	off/on	-	Comp Crankcase Heater A	Comp crankcase heater A
VCP_B	-	%	Compressor Command B	Compressor command B
VFAN_B	-	%	VariaFan Speed B	Variable speed fan B
EXV_B	0 to 100	%	EXV Position Circuit B	EXV position, circuit B
RV_B	off/on	-	4 Way Refrigerant Valve B	4-way refrigerant valve, circuit B: Used to manage cooling/heating/defrost operation (heat pumps)
SETFLOWB	off/on	-	Cooler B Flow Setpnt Out	Cooler B Flow Setpoint Out
DEFRINFB	no/yes	-	Defrost In Progress B	Defrost in progress B
C_HEAT_B	off/on	-	Drain pan heater B	Drain pan heater B
EXCHHTRB	off/on	-	Exchanger Heater B	Exchanger heater B
CP_HTR_B	off/on	-	Comp Crankcase Heater B	Comp crankcase heater B
BOILER	off/on	-	Boiler Command	Boiler command
EHS_STEP	-	-	Electrical Heat Stage	Electrical heat stage
ALARM	off/on	-	Alarm Relay	Alarm relay status
RUN	off/on	-	Running Relay	Running relay status
BOX_FAN	off/on	-	Electrical Box Fan	Electrical box fan

*Depends on the selected language (English by default).

5 - ADVANCED INTERFACE: MENU STRUCTURE

Pump Status – PUMPSTAT

Name	Status	Unit	Displayed text*	Description
CAPPOWER	-	kW	Actual Power Capacity	Actual power capacity
WAT_FLOW	-	l/s / GPS	Water Flow	Water flow rate
WAT_FL_A	-	l/s / GPS	Water Flow A	Water flow A
WAT_FL_B	-	l/s / GPS	Water Flow B	Water flow B
PUMP_1	off/on	-	Water Pump #1	Water pump 1 control
PUMP_2	off/on	-	Water Pump #2	Water pump 2 control
ROT_PUMP	no/yes	-	Rotate Pumps Now?	Water pumps rotation
VPMPCMDA	0 to 100	%	Variable Pump Command A	Variable speed pump command A
FLOW_SWA	open/close	-	Cooler A Flow Switch	Cooler A flow switch
FS_S_A	-	-	Flow Switch A Cfg status	Flow Switch A configuration status
VPMPCMDB	open/close	-	Variable Pump Command B	Variable speed pump command B
FLOW_SWB	open/close	-	Cooler B Flow Switch	Cooler B flow switch
FS_S_B	-	-	Flow Switch B Cfg status	Flow Switch B configuration status
W_P_IN	-	kPa / PSI	Inlet Water Pressure	Inlet water pressure (corrected by temperature): Applies to units with the hydronic kit option
W_P_OUT	-	kPa / PSI	Outlet Water Pressure	Outlet water pressure (corrected by temperature): Applies to units with the hydronic kit option
WP_CALIB	no/yes	-	Water Pressure Calibrat	Water pressure calibration
WP_OFFST	-	kPa / PSI	Water Pressure Offset	Water pressure offset
DP_FILTR	-	kPa / PSI	Delta Water Press. Filt	Delta water pressure filter
WP_MIN	-	kPa / PSI	Mini Water Pressure	Minimum water pressure
p_dt_spt	-	^C / ^F	Water DT Setpoint	Water delta T setpoint
p_dp_spt	-	kPa / PSI	Water DP Setpoint	Water delta pressure setpoint

*Depends on the selected language (English by default).

Runtimes – RUNTIME

Name	Status	Unit	Displayed text*	Description
hr_mach	-	hour	Machine Operating Hours	Unit operating hours
st_mach	-	-	Machine Starts Number	Number of unit starts
hr_cp_a	-	hour	Compressor A Hours	Operating hours, compressor A
st_cp_a	-	-	Compressor A Starts	Number of starts, compressor A
hr_cp_b	-	hour	Compressor B Hours	Operating hours, compressor B
st_cp_b	-	-	Compressor B Starts	Number of starts, compressor B
hr_pmp_1	-	hour	Water Pump #1 Hours	Operating hours, water pump 1
st_pmp_1	-	-	Water Pump #1 Starts	Water pump 1 starts
hr_pmp_2	-	hour	Water Pump #2 Hours	Operating hours, water pump 2
st_pmp_2	-	-	Water Pump #2 Starts	Water pump 2 starts
hr_fana	-	hour	Fan A Hours	Operating hours, fan A
st_fana	-	-	Fan A Starts	Number of starts, fan A
hr_fanb	-	hour	Fan B Hours	Operating hours, fan B
st_fanb	-	-	Fan B Starts	Number of starts, fan B
nb_defra	-	-	Circuit A Defrost Number	Number of defrost sessions that occurred on circuit A
nb_defrb	-	-	Circuit B Defrost Number	Number of defrost sessions that occurred on circuit B

*Depends on the selected language (English by default).

Modes – MODES

Name	Status	Unit	Displayed text*	Description
m_delay	no/yes	-	Delay Active	Delay Active
m_2ndstpt	no/yes	-	Second Setpoint Active	Second setpoint in use: The setpoint used during unoccupied periods
m_reset	no/yes	-	Reset Active	Setpoint reset active
m_limit	no/yes	-	Demand Limit Active	Demand limit active
m_cooler	no/yes	-	Exchanger Heater Active	Exchanger heater active
m_pmprot	no/yes	-	Pump Rot Active	Pump rotation active
m_pmpper	no/yes	-	Pump Per Active	Pump periodic start active
m_night	no/yes	-	Night Low Noise Active	Night low noise active
m_leadla	no/yes	-	Master Slave Active	Master/slave mode active

Modes – MODES (continued)

Name	Status	Unit	Displayed text*	Description
m_auto	no/yes	-	Auto Changeover Active	Automatic changeover active
m_heater	no/yes	-	Electric Heat Active	Electric heater active
m_lo_ewt	no/yes	-	Heating Low EWT Lockout	Heating low EWT lockout
m_boiler	no/yes	-	Boiler Active	Boiler active
m_defr_a	no/yes	-	Defrost Active On Cir A	Defrost mode active, circuit A (heat pumps)
m_defr_b	no/yes	-	Defrost Active On Cir B	Defrost mode active, circuit B (heat pumps)
m_sst_a	no/yes	-	Low Suction Circuit A	Low suction, circuit A
m_sst_b	no/yes	-	Low Suction Circuit B	Low suction, circuit B
m_dgt_a	no/yes	-	High DGT Circuit A	High DGT, circuit A
m_dgt_b	no/yes	-	High DGT Circuit B	High DGT, circuit B
m_hSct_a	no/yes	-	High SCT Circuit A	High SCT, circuit A
m_hSct_b	no/yes	-	High SCT Circuit B	High SCT, circuit B
m_lSct_a	no/yes	-	Low SCT Circuit A	Low SCT, circuit A
m_lSct_b	no/yes	-	Low SCT Circuit B	Low SCT, circuit B
m_sh_a	no/yes	-	Low SuperHeat Circuit A	Low superheat, circuit A
m_sh_b	no/yes	-	Low SuperHeat Circuit B	Low superheat, circuit B
m_ecopmp	no/yes	-	Eco Pump Mode Active	Eco pump mode active

*Depends on the selected language (English by default).

Quick Test 1 – QCK_TST1

Name	Status	Unit	Displayed text*	Description
QCK_TEST	no/yes	-	Quick test Enable	This parameter is used to enable the Quick Test functionality (Quick test Enable = yes) With Quick Test enabled: Forcing a specific parameter given in this table allows the user to verify if the component behaves correctly
Q_VFANA	0 to 100	%	Variable Speed Fan A	Variable-speed fan A
Q_VFANB	0 to 100	%	Variable Speed Fan B	Variable-speed fan B
MOD_EXVA	manual/auto	-	QuickTest Mode for EXV A	Quick Test mode for EXV A
Q_EXVA	0 to 100	%	EXV position Circuit A	EXV position Circuit A 100% = EXV fully open
MOD_EXVB	manual/auto	-	QuickTest Mode for EXV B	Quick Test mode for EXV B
Q_EXVB	0 to 100	%	EXV position Circuit B	EXV position Circuit B 100% = EXV fully open
Q_RV_A	off/on	-	4 Way Refrigerant ValveA	4-way refrigerant valve A
Q_RV_B	off/on	-	4 Way Refrigerant ValveB	4-way refrigerant valve B
Q_PUMP_1	0 to 2	-	Pump 1. 1=ON 2=FORCED	Pump 1 test: 1 = [ON] Pump shall run for 16 sec 2 = [FORCED] Pump shall run all the time (set the value to “0” to stop the pump test)
Q_PUMP_2	0 to 2	-	Pump 2. 1=ON 2=FORCED	Pump 2 test: 1 = [ON] Pump shall run for 16 sec 2 = [FORCED] Pump shall run all the time (set the value to “0” to stop the pump test)
Q_VPUMP1	0 to 100	%	Variable pump 1	Variable-speed pump 1
Q_VPUMP2	0 to 100	%	Variable pump 2	Variable-speed pump 2
Q_ALARM	off/on	-	Alarm relay Status	Alarm relay status
Q_RUN	off/on	-	Running Status	Running status
Q_BOILER	off/on	-	Boiler Command	Boiler command
Q_EHS_ST	0 to 3	-	Electrical Heat Stage	Electrical heat stage
QEXCHTRA	off/on	-	Exchanger Heater A	Exchanger Heater A
QEXCHTRB	off/on	-	Exchanger Heater B	Exchanger Heater B
Q_CHEATA	off/on	-	Drain pan heater A	Drain pan heater A
Q_CHEATB	off/on	-	Drain pan heater B	Drain pan heater B
Q_CPHTRA	off/on	-	Comp Crankcase Heater A	Comp Crankcase Heater A
Q_CPHTRB	off/on	-	Comp Crankcase Heater B	Comp Crankcase Heater B
QDEFINFA	off/on	-	Defrost Info A	Defrost information A
QDEFINFB	off/on	-	Defrost Info B	Defrost information B
Q_STFLWA	off/on	-	Set Flow Switch Config A	Set Flow Switch Configuration A
Q_STFLWB	off/on	-	Set Flow Switch Config B	Set Flow Switch Configuration B

Quick Test 1 – QCK_TST1 (continued)

Name	Status	Unit	Displayed text*	Description
Q_BOXFAN	off/on	-	Quick Test Elect Box Fan	Quick test electric box fan
QDIV_REQ	0 to 2	-	DHW Valve 1=DHW, 2=ZHC	Domestic Hot Water valve 1=DHW 2=ZHC
QDHW_HTR	off/on	-	DHW Heater	Domestic Hot Water heater
Q_VLV_Z1	0 to 2	-	Z1 Valve 1=Open, 2=Close	Z1 Valve 1 = open 2 = close
Q_PMP_Z1	off/on	-	Zone#1 Pump Cmd	Zone #1 Pump command
Q_VLV_Z2	0 to 2	-	Z2 Valve 1=Open, 2=Close	Z2 Valve 1 = open 2 = close
Q_PMP_Z2	off/on	-	Zone#2 Pump Cmd	Zone #2 Pump command
HP_TEST	0 to 4	-	High Pressure Test	High Pressure test: When activated, the unit will run until the High Pressure Safety Switch is open
-	-	-	1: HP test on cir A 2: HP test on cir B 3: N/A 4: HP test on both cir	1 = High Pressure test, circuit A 2= High Pressure test, circuit B 3= N/A 4= High Pressure test, both circuits

*Depends on the selected language (English by default).

IMPORTANT: To enable the Quick Test functionality, the unit must be stopped (Local off mode).

Trendings – TRENDING

Name	Status	Unit	Displayed text*	Description**
GENUNIT_CAPA_T	0 to 100	%	Cir A Total Capacity	Total capacity, circuit A
GENUNIT_CAPB_T	0 to 100	%	Cir B Total Capacity	Total capacity, circuit B
GENUNIT_CTRL_PNT	-	°C / °F	Control Point	Control point
OUTPUTS_RV_A	off/on	-	4 Way Refigerant ValveA	4-way refigerant valve, circuit A: Used to manage cooling/ heating/defrost operation (heat pumps)
OUTPUTS_VCP_A	-	%	Compressor Command A	Compressor command A
OUTPUTS_VFAN_A	-	%	VariaFan Speed A	Variable speed fan A
OUTPUTS_EXV_A	-	%	EXV Position Circuit A	EXV position, circuit A
OUTPUTS_RV_B	off/on	-	4 Way Refigerant ValveB	4-way refigerant valve, circuit B: Used to manage cooling/ heating/defrost operation (heat pumps)
OUTPUTS_VCP_B	-	%	Compressor Command B	Compressor command B
OUTPUTS_VFAN_B	-	%	VariaFan Speed B	Variable speed fan B
OUTPUTS_EXV_A	-	%	EXV Position Circuit B	EXV position, circuit B
PUMPSTAT_WAT_FLOW	-	l/s / GPS	Water Flow	Water flow rate
PUMPSTAT_W_P_OUT	-	kPa / PSI	Outlet Water Pressure	Outlet water pressure (corrected by temperature): Applies to units with the hydronic kit option
PUMPSTAT_W_P_IN	-	kPa / PSI	Inlet Water Pressure	Inlet water pressure (corrected by temperature): Applies to units with the hydronic kit option
DEFROST_frost_a	-	%	Exchanger Frost FactorA	Exchanger frost factor A
DEFROST_frost_b	-	%	Exchanger Frost FactorB	Exchanger frost factor B
LOADFACT_SH_A	-	^C / ^F	Suction Superheat A	Suction Superheat A
LOADFACT_SH_B	-	^C / ^F	Suction Superheat B	Suction Superheat B
LOADFACT_over_cap	-	-	Active Capacity Override	Active capacity override
ALARMRST_alarm_1c	-	-	Current Alarm 1	Current alarm 1
TEMP_OAT	-	°C / °F	Outdoor Air Temp	Outdoor air temperature
TEMP_EWT	-	°C / °F	Cooler Entering Fluid	Evaporator entering water temperature
TEMP_LWT	-	°C / °F	Cooler Leaving Fluid	Evaporator leaving water temperature
TEMP_SCT_A	-	°C / °F	Saturated Cond Tmp cir A	Saturated condensing temperature, circuit A
TEMP_SCT_B	-	°C / °F	Saturated Cond Tmp cir B	Saturated condensing temperature, circuit B
TEMP_SST_A	-	°C / °F	Saturated Suction Temp A	Saturated suction temperature, circuit A
TEMP_SST_B	-	°C / °F	Saturated Suction Temp B	Saturated suction temperature, circuit B

*Depends on the selected language (English by default).

**The list of trending points cannot be modified. Trending points can only be enabled or disabled.

5 - ADVANCED INTERFACE: MENU STRUCTURE

Energy Monitoring – ENERGY

Name	Status	Unit	Displayed text*	Description**
			ENERGY METER	
p_total	-	kW	Total active power	Total active power
e_total	-	KWH	Total active energy	Total active energy
e_reset	-	KWH	Partial active energy	Partial active energy
p_max	-	kW	Max active power	Max active power
sglPhs_I	-	A	Single phase current	Single phase current
volt_L12	-	V	Voltage L1-L2	Voltage L1-L2
THD	-	%	Total harmonic distortio	Total harmonic distortio
pow_fact	-	-	Power factor	Power factor
			COOLING MODE	
cPwrOut	-	kW	Cooling Power Output	Cooling power output
cPwrIn	-	kW	Electrical Power Input	Electrical power input
eer	-	-	Energy Efficiency (EER)	Energy efficiency (EER)
cEnergOu	-	KWH	Cooling Energy Output	Cooling energy output
cEnergIn	-	KWH	Electrical Energy Input	Electrical energy input
energEer	-	-	Integrated EER	Intergated EER
			HEATING MODE	
hPwrOut	-	kW	Heating Power Output	Heating power output
hPwrIn	-	kW	Electrical Power Input	Electrical power input
cop	-	-	Coef. Of Perf. (COP)	Coefficient of performance
hEnergOu	-	KWH	Heating Energy Output	Heating energy output
hEnergIn	-	KWH	Electrical Energy Input	Electrical energy input
energCop	-	-	Integrated COP	Intergated COP
reset_en	no/yes	-	Reset of Energy Counter	Reset of energy counter
reset_da	-	-	Last Reset Date	Last reset date
reset_ti	-	-	Last Reset Time	Last reset time
			HEATERS	
tnk_hpow	-	kW	Water Tank EHS power	Water tank EHS power

*Depends on the selected language (English by default).
**The list of trending points cannot be modified. Trending points can only be enabled or disabled.

Zone(s) Status – ZONE_STA

Name	Status**	Unit	Default	Displayed text*	Description
zon_nam1	-	0	-	Zone#1 Name	Zone #1 name
OCC_Z1	no/yes	0	-	Zone#1 Occupied ?	Zone #1 occupied
CTLP_Z1	6.5 to 75 43.7 to 167	7 44.6	°C °F	Zone #1 Control Point	Zone #1 control point
SP_Z1	- -	-17.8 0	°C °F	Zone #1 Current Setpoint	Zone #1 current setpoint
WT_Z1	- -	-17.8 0	°C °F	Zone #1 Water Temperature	Zone #1 water temperature
PUMP_Z1	off/on	-	-	Zone #1 Water Pump	Zone #1 water pump
WVREQ_Z1	0 to 2	-	-	Zone#1 Valve Command	Zone #1 3 way valve command
WV_Z1	0 to 100	-	%	Zone#1 Valve Position	Zone #1 3 way valve position
zon_nam2	-	-	-	Zone#2 Name	Zone #2 name
OCC_Z2	no/yes	0	-	Zone#2 Occupied ?	Zone #2 occupied
CTLP_Z2	6.5 to 75 43.7 to 167	7 44.6	°C °F	Zone #2 Control Point	Zone#2 control point
SP_Z2	- -	-17.8 0	°C °F	Zone #2 Current Setpoint	Zone#2 current setpoint
WT_Z2	- -	-17.8 0	°C °F	Zone #2 Water Temp	Zone #2 water temperature
PUMP_Z2	off/on	-	-	Zone #2 Water Pump	Zone#2 water pump
WVREQ_Z2	0 to 2	-	-	Zone#2 Valve Command	Zone#2 3 way valve command

Zone(s) Status – ZONE_STA (continued)

Name	Status	Unit	Default	Displayed text*	Description
WV_Z2	0 to 100	-	%	Zone#2 Valve Position	Zone #2 3 way valve position
FLOOR_T	- -	-17.8 0	°C °F	Floor Temperature	Floor temperature

*Depends on the selected language (English by default).
**The range may vary depending on the unit configuration.

DHW Setpoint – DHW_STP

Name	Status**	Unit	Default	Displayed text*	Description
dhw_stp	20 to 75 77 to 167	50 77	°C °F	DHW Setpoint	Domestic Hot Water setpoint
alg_stp	50 to 75 122 to 167	60 140	°C °F	Anti-Legionella Setpoint	Anti-Legionella setpoint
alg_hold	0 to 180	60	min	Anti-Leg. holding time	Anti-Legionella holding time
hw_comp	0 to 7 0 to 12.6	0 0	^C ^F	Hot Water compensation	Hot water compensation

*Depends on the selected language (English by default).
**The range may vary depending on the unit configuration.

Zone1 Setpoint – ZONESTP1

Name	Status**	Unit	Default	Displayed text*	Description
ccftstp	6.5 to 20 43.7 to 68	12 53.6	°C °F	Cool Comfort Setpoint	Cool comfort setpoint
cecostp	6.5 to 20 43.7 to 68	15 59	°C °F	Cool Economy Setpoint	Cool economy setpoint
cawystp	6.5 to 20 43.7 to 68	20 68	°C °F	Cool Away Setpoint	Cool away setpoint
cw_comp	-7 to 0 -12.6 to 0	0 0	^C ^F	Cold Water compensation	Cold water compensation
hcftstp	25 to 75 77 to 167	55 131	°C °F	Heat Comfort Setpoint	Heat comfort setpoint
hecostp	25 to 75 77 to 149	50 122	°C °F	Heat Economy Setpoint	Heat economy setpoint
hawystp	25 to 75 68 to 131	45 113	°C °F	Heat Away Setpoint	Heat away setpoint
hw_comp	0 to 7 0 to 12.6	0 0	^C °F	Hot Water compensation	Hot water compensation

*Depends on the selected language (English by default).
**The range may vary depending on the unit configuration.

Zone2 Setpoint – ZONESTP2

Name	Status**	Unit	Default	Displayed text*	Description
ccftstp	6.5 to 20 43.7 to 68	12 53.6	°C °F	Cool Comfort Setpoint	Cool comfort setpoint
cecostp	6.5 to 20 43.7 to 68	15 59	°C °F	Cool Economy Setpoint	Cool economy setpoint
cawystp	6.5 to 20 43.7 to 68	20 68	°C °F	Cool Away Setpoint	Cool away setpoint
cw_comp	-7 to 0 -12.6 to 0	0 0	^C ^F	Cold Water compensation	Cold water compensation
hcftstp	25 to 75 77 to 167	55 131	°C °F	Heat Comfort Setpoint	Heat comfort setpoint

Zone2 Setpoint – ZONE_STP2 (continued)

Name	Status	Unit	Default	Displayed text*	Description
hecostp	25 to 75 77 to 149	50 122	°C °F	Heat Economy Setpoint	Heat economy setpoint
hawystp	25 to 75 68 to 131	45 113	°C °F	Heat Away Setpoint	Heat away setpoint
hw_comp	0 to 7 0 to 12.6	0 0	^C °F	Hot Water compensation	Hot water compensation

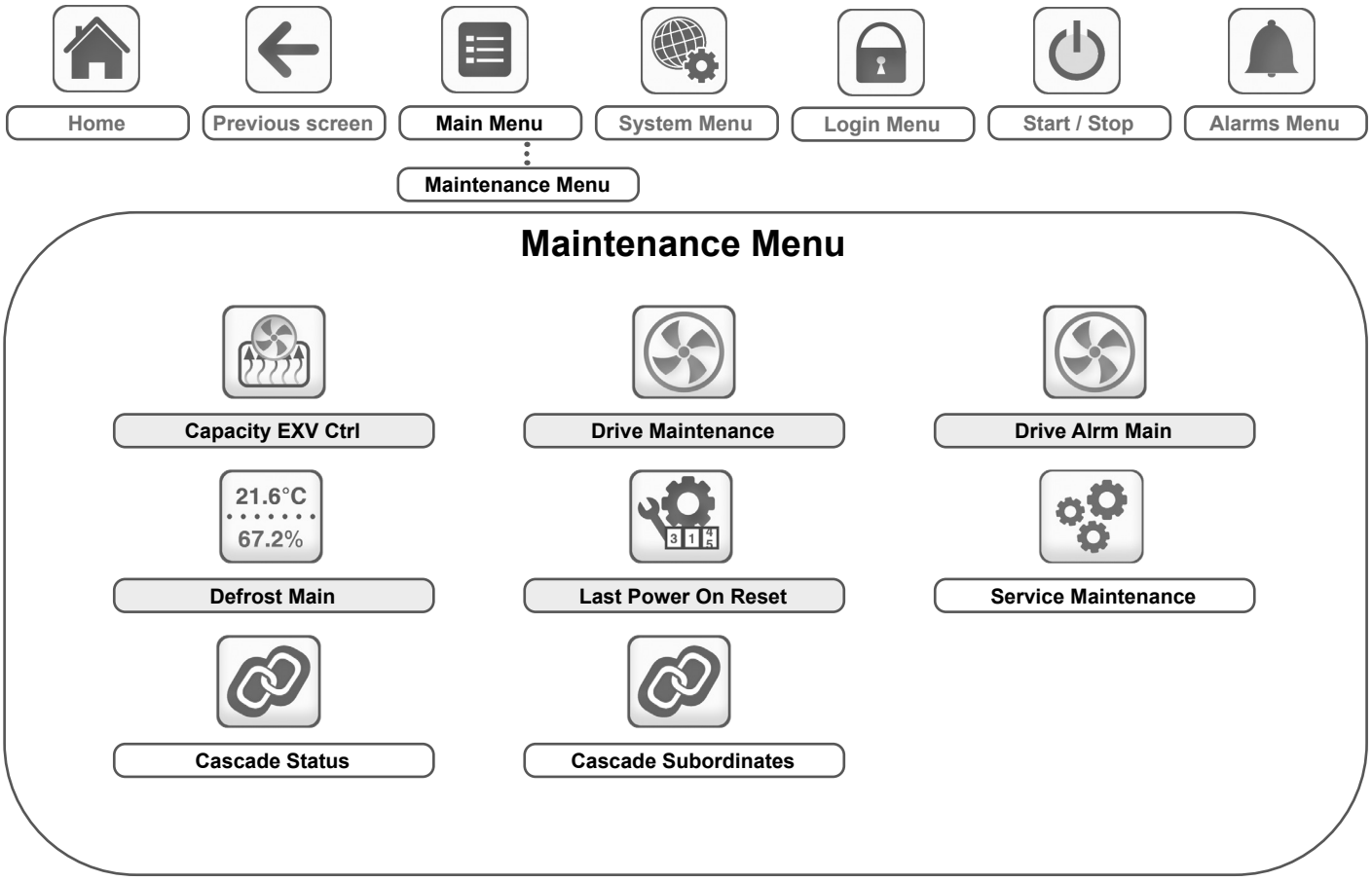
*Depends on the selected language (English by default).
**The range may vary depending on the unit configuration.

DHW Status – DHW_STAT

Name	Status**	Unit	Default	Displayed text*	Description
DHW_MODE	0 to 2	0	-	DHW Operating Mode 0 = DHW not active 1 = Regular DHW 2 = Anti-Legionella	Domestic Hot Water operating mode 0 = DHW not active 1 = Regular DHW 2 = Anti-Legionella
dhw_run	no/yes	no	-	DHW Running	Domestic Hot Water running
dhw_ovr	-	-	-	DHW Override	Domestic Hot Water override
DHW_CTLP	25 to 75 77 to 167	50 122	°C °F	DHW Control Point	Domestic Hot Water control point
DHW_T	- -	-17.8 0	°C °F	DHW Tank Temperature	Domestic Hot Water tank temperature
DIV_REQ	0 to 2	-	-	DHWr Valve Command 0 = no command 1 = move toward DHW pos. 2 = move toward ZHC pos.	Domestic Hot Water valve command 0 = no command 1 = move toward DHW pos. 2 = move toward ZHC pos.
div_pos	0 to 100	-	%	DHW Valve Position	Domestic Hot Water valve position
DHW_HTR	off/on	off	-	DHW Electric Heater	Domestic Hot Water electric heater
leg_time	-	-	min	Anti-Legionella Runtime	Anti-Legionella runtime
leg_strt	-	-	-	Anti-Legionella last	Anti-Legionella last
DHW_BPSS	no/yes	no	-	DHW Bypass	Domestic Hot Water bypass

*Depends on the selected language (English by default).
**The range may vary depending on the unit configuration.

5.2 - Maintenance menu



Capacity EXV Ctrl – LOADFACT

Name	Status	Default	Unit	Displayed text*	Description
delta_t	-	-	^C ^F	Water Delta T	Water Delta T
CTRL_PNT	-	-17.78 0	°C °F	Control Point	Control point
oat_ctlp	-40 to 150 -40 to 302	-17.78 0	°C °F	OAT For Control Point	OAT for Control point
reset	-	-	^C ^F	Reset Amount	Reset amount
tp_error	-55.56 to 55.56 -100 to 100	0 0	^C ^F	Controlled Temp Error	Controlled temperature error
capReq	-	-	%	Unit Capacity Request	Unit capacity request
cap_t	0 to 100	-	%	Unit Total Capacity	Unit total capacity
cap_lim	-	-	%	Actual Capacity Limit	Actual capacity limit
over_cap	-	-	-	Active Capacity Override	Active capacity override
cir_st_A	-	-	-	State Circuit A	State circuit A
capReq_A	-	-	%	Capacity Request Cir A	Capacity request circuit A
ov_cmp_a	-	-	-	Compressor override A	Compressor override A
SH_A	-	-	^C ^F	Suction Superheat A	Suction superheat A
sh_sp_a	-	-	^C ^F	SH Setpoint Circuit A	SH setpoint circuit A
ov_exv_a	-	-	-	EXV Override Circuit A	EXV override circuit A
frqmin_a	-	-	Hz	Min Compr Freq Cir A	Minimum compressor frequency circuit A

Capacity EXV Ctrl – LOADFACT (continued)

Name	Status		Unit	Displayed text*	Description
frq_a	-	-	Hz	Actual Compr Freq Cir A	Actual compressor frequency circuit A
frqmax_a	-	-	Hz	Max Compr Freq Cir A	Maximum compressor frequency circuit A
minSdt_a	-	-17.78 0	°C °F	Min SDT Limit Cir A	Minimum SDT limit circuit A
maxSdt_a	-	-17.78 0	°C °F	Max SDT Limit Cir A	Maximum SDT limit circuit A
condsp_a	-	-17.78 0	°C °F	Computed Cond Setpoint	Computed cond setpoint
fan_ov_a	-	-	-	Fan Override A	Fan override A
cir_st_B	-	-	-	State Circuit B	State circuit B
capReq_B	-	-	%	Capacity Request Cir B	Capacity request circuit B
ov_cmp_b	-	-	-	Compressor override B	Compressor override B
SH_B	-	-	^C ^F	Suction Superheat B	Suction superheat B
sh_sp_b	-	-	^C ^F	SH Setpoint Circuit B	SH setpoint circuit B
ov_exv_b	-	-	-	EXV Override Circuit B	EXV override circuit B
frqmin_b	-	-	Hz	Min Compr Freq Cir B	Minimum compressor frequency circuit B
frq_b	-	-	Hz	Actual Compr Freq Cir B	Actual compressor frequency circuit B
frqmax_b	-	-	Hz	Max Compr Freq Cir B	Maximum compressor frequency circuit B
minSdt_b	-	-17.78 0	°C °F	Min SDT Limit Cir B	Minimum SDT limit circuit B
maxSdt_b	-	-17.78 0	°C °F	Max SDT Limit Cir B	Maximum SDT limit circuit B
condsp_b	-	-17.78 0	°C °F	Computed Cond Setpoint	Computed cond setpoint
fan_ov_b	-	-	-	Fan Override B	Fan override B
over_ehs	-	-	-	EHS Ctrl Override	EHS control override
eh_stage	-	-	-	Requested Electric Stage	Requested electric stage
ehspulld	false/true	false	-	Electrical Pulldown?	Electrical pulldown

*Depends on the selected language (English by default).

Drive Maintenance – DRV_CTRL

Name	Status	Default	Unit	Displayed text*	Description
				COMP DRIVE A	COMP DRIVE A
cmd_w_1	-	-	-	Comp Drive A Cmd word	Control point
ctrl_w_1	-	-	-	Comp Drive A Ctrl Word	OAT for Control point
stat_w_1	-	0	-	Comp Drive A Status Word	Reset amount
drvCmd_1	-	0	%	Comp Drive A Command	Controlled temperature error
drv_CL_1	0 to 0	0	A	Comp Drive A Cur. Limit	Comp Drive A Cur. Limit
drv_V_1	0 to 0	0	V	Comp Drive A Voltage	Comp Drive A Voltage
drv_F_1	0 to 0	0	Hz	Comp Drive A Frequency	Comp Drive A Frequency
drv_I_1	0 to 0	0	A	Comp Drive A Current	Comp Drive A Current
drvpwr_1	0 to 0	0	kW	Comp Drive A Power	Comp Drive A Power
drv_T_1	0 to 0	17.78 0	°C °F	Comp Drive A HtSk Temp	Comp Drive A HtSk temperature
				COMP DRIVE B	COMP DRIVE B
cmd_w_2	0 to 0	0	-	Comp Drive B Cmd word	Comp Drive B Cmd word
ctrl_w_2	0 to 0	0	-	Comp Drive B Ctrl Word	Comp Drive B Ctrl Word
stat_w_2	0 to 0	0	-	Comp Drive B Status Word	Comp Drive B Status Word
drvCmd_2	0 to 0	0	%	Comp Drive B Command	Comp Drive B Command
drv_CL_2	0 to 0	0	A	Comp Drive B Cur. Limit	Comp Drive B Cur. Limit
drv_V_2	0 to 0	0	V	Comp Drive B Voltage	Comp Drive B Voltage
drv_F_2	0 to 0	0	Hz	Comp Drive B Frequency	Comp Drive B Frequency
drv_I_2	0 to 0	0	A	Comp Drive B Current	Comp Drive B Current
drvpwr_2	0 to 0	0	kW	Comp Drive B Power	Comp Drive B Power
drv_T_2	0 to 0	17.78 0	°C °F	Comp Drive B HtSk Temp	Comp Drive B HtSk temperature
				PUMP DRIVE A	PUMP DRIVE A
cmd_w_3	0 to 0	0	-	Pump Drive A Cmd word	Pump Drive A Cmd word

Drive Maintenance – DRV_CTRL (continued)

Name	Status	Default	Unit	Displayed text*	Description
ctrl_w_3	0 to 0	0	-	Pump Drive A Ctrl Word	Pump Drive A Ctrl Word
stat_w_3	0 to 0	0	-	Pump Drive A Status Word	Pump Drive A Status Word
drvCmd_3	0 to 0	0	%	Pump Drive A Command	Pump Drive A Command
drv_CL_3	0 to 0	0	A	Pump Drive A Cur. Limit	Pump Drive A Cur. Limit
drv_V_3	0 to 0	0	V	Pump Drive A Voltage	Pump Drive A Voltage
drv_F_3	0 to 0	0	Hz	Pump Drive A Frequency	Pump Drive A Frequency
drv_I_3	0 to 0	0	A	Pump Drive A Current	Pump Drive A Current
drvpwr_3	0 to 0	0	kW	Pump Drive A Power	Pump Drive A Power
drv_T_3	0 to 0	17.78 0	°C °F	Pump Drive A HtSk Temp	Pump Drive A HtSk Temp
				PUMP DRIVE B	PUMP DRIVE B
cmd_w_4	0 to 0	0	-	Pump Drive B Cmd word	Pump Drive B Cmd word
ctrl_w_4	0 to 0	0	-	Pump Drive B Ctrl Word	Pump Drive B Ctrl Word
stat_w_4	0 to 0	0	-	Pump Drive B Status Word	Pump Drive B Status Word
drvCmd_4	0 to 0	0	%	Pump Drive B Command	Pump Drive B Command
drv_CL_4	0 to 0	0	A	Pump Drive B Cur. Limit	Pump Drive B Cur. Limit
drv_V_4	0 to 0	0	V	Pump Drive B Voltage	Pump Drive B Voltage
drv_F_4	0 to 0	0	Hz	Pump Drive B Frequency	Pump Drive B Frequency
drv_I_4	0 to 0	0	A	Pump Drive B Current	Pump Drive B Current
drvpwr_4	0 to 0	0	kW	Pump Drive B Power	Pump Drive B Power
drv_T_4	0 to 0	17.78 0	°C °F	Pump Drive B HtSk Temp	Pump Drive B HtSk temperature
				SET DRIVE ADDRESS	SET DRIVE ADDRESS
SET_DRV	0 to 255	0	-	Attach MODBUS Drive	Attach MODBUS drive
				1=Drv Comp A 2=Drv Comp B 3=Drv Pump A 4=Drv Pump B	1=Drv Comp A 2=Drv Comp B 3=Drv Pump A 4=Drv Pump B

*Depends on the selected language (English by default).

Drive Alrm Main – DRV_ALRM

Name	Status	Default	Unit	Displayed text*	Description
				COMP DRIVE A	COMP DRIVE A
alarm1_1	-	0	-	Comp Drive A Alarm 1	Comp Drive A Alarm 1
alarm2_1	-	0	-	Comp Drive A Alarm 2	Comp Drive A Alarm 2
warn1_1	-	0	-	Comp Drive A Warning 1	Comp Drive A Warning 1
warn2_1	-	0	-	Comp Drive A Warning 2	Comp Drive A Warning 2
				PUMP DRIVE A	PUMP DRIVE A
alarm1_2	-	0	-	Comp Drive B Alarm 1	Comp Drive B Alarm 1
alarm2_2	-	0	-	Comp Drive B Alarm 2	Comp Drive B Alarm 2
warn1_2	-	0	-	Comp Drive B Warning 1	Comp Drive B Warning 1
warn2_2	-	0	-	Comp Drive B Warning 2	Comp Drive B Warning 2
blank	-	-	-	COMP DRIVE B	COMP DRIVE B
alarm1_3	-	0	-	Pump Drive A Alarm 1	Pump Drive A Alarm 1
alarm2_3	-	0	-	Pump Drive A Alarm 2	Pump Drive A Alarm 2
warn1_3	-	0	-	Pump Drive A Warning 1	Pump Drive A Warning 1
warn2_3	-	0	-	Pump Drive A Warning 2	Pump Drive A Warning 2
				PUMP DRIVE B	PUMP DRIVE B
alarm1_4	-	0	-	Pump Drive B Alarm 1	Pump Drive B Alarm 1
alarm2_4	-	0	-	Pump Drive B Alarm 2	Pump Drive B Alarm 2
warn1_4	-	0	-	Pump Drive B Warning 1	Pump Drive B Warning 1
warn2_4	-	0	-	Pump Drive B Warning 2	Pump Drive B Warning 2

*Depends on the selected language (English by default).

Defrost Main – DEFROST

Name	Status	Default	Unit	Displayed text*	Description
				CIR A DEFROST CONTROL	CIR A DEFROST CONTROL
frost_a	-	-	%	Exchanger Frost FactorA	Exchanger frost factorA
def_se_a	-	-	min	Next Sequence Allowed in	Next sequence allowed in
def_ac_a	false/true	false	-	Defrost Active?	Defrost active
DEFRT_A	-	-17.78 0	°C °F	Defrost Temperature A	Defrost temperature A
defr_dua	-	-	min	Defrost Duration A	Defrost duration A
frst_dua	-	-	min	Frost Duration A	Frost duration A
over_d_a	-	-	-	Override State A	Override state A
overFrsA	-	-	-	Frost Override A	Frost override A
heatCapA	-	-	kPa / PSI	Heating Cap A	Heating Cap A
capRefA	-	-	kPa / PSI	Heating Cap Ref A	Heating Cap Ref A
delt_a	-	-	^C ^F	Filter Delta OAT - SST A	Filter Delta OAT - SST A
delt_r_a	-	-	^C ^F	Reference Delta A	Reference Delta A
fr_int_a	-	-	-	Frost Integrator A	Frost integrator A
				CIR B DEFROST CONTROL	CIR B DEFROST CONTROL
frost_b	-	-	%	Exchanger Frost FactorB	Exchanger frost factor B
def_se_b	-	-	min	Next Sequence Allowed in	Next sequence allowed in
def_ac_b	false/true	false	-	Defrost Active?	Defrost active
DEFRT_B	-	-17.78 0	°C °F	Defrost Temperature B	Defrost temperature B
defr_dub	-	-	min	Defrost Duration B	Defrost duration B
frst_dub	-	-	min	Frost Duration B	Frost duration B
over_d_b	-	-	-	Override State B	Override state B
overFrsB	-	-	-	Frost Override B	Frost override B
heatCapB	-	-	kPa / PSI	Heating Cap B	Heating Cap B
capRefB	-	-	kPa / PSI	Heating Cap Ref B	Heating Cap Ref B
delt_b	-	-	^C ^F	Filter Delta OAT - SST A	Filter Delta OAT - SST A
delt_r_b	-	-	^C ^F	Reference Delta B	Reference Delta B
fr_int_b	-	-	-	Frost Integrator B	Frost integrator B

*Depends on the selected language (English by default).

Last Power On Reset – LAST_POR

Name	Status	Default	Unit	Displayed text*	Description
date_on1	-	-	-	PowerOn1: day-mon-year	PowerOn1: day-mon-year
time_on1	-	-	-	PowerOn1: hour-minute	PowerOn1: hour-minute
date_of1	-	-	-	PowerDown1: day-mon-year	PowerDown1: day-mon-year
time_of1	-	-	-	PowerDown1: hour-minute	PowerDown1: hour-minute
rebreas1	-	-	-	PowerDown1: reason	PowerDown1: reason
date_on2	-	-	-	PowerOn2: day-mon-year	PowerOn2: day-mon-year
time_on2	-	-	-	PowerOn2: hour-minute	PowerOn2: hour-minute
date_of2	-	-	-	PowerDown2: day-mon-year	PowerDown2: day-mon-year
time_of2	-	-	-	PowerDown2: hour-minute	PowerDown2: hour-minute
rebreas2	-	-	-	PowerDown2: reason	PowerDown2: reason
date_on3	-	-	-	PowerOn3: day-mon-year	PowerOn3: day-mon-year
time_on3	-	-	-	PowerOn3: hour-minute	PowerOn3: hour-minute
date_of3	-	-	-	PowerDown3: day-mon-year	PowerDown3: day-mon-year
time_of3	-	-	-	PowerDown3: hour-minute	PowerDown3: hour-minute
rebreas3	-	-	-	PowerDown3: reason	PowerDown3: reason
date_on4	-	-	-	PowerOn4: day-mon-year	PowerOn4: day-mon-year
time_on4	-	-	-	PowerOn4: hour-minute	PowerOn4: hour-minute
date_of4	-	-	-	PowerDown4: day-mon-year	PowerDown4: day-mon-year

Last Power On Reset – LAST_POR (continued)

Name	Status		Unit	Displayed text*	Description
time_of4	-	-	-	PowerDown4: hour-minute	PowerDown4: hour-minute
rebreas4	-	-	-	PowerDown4: reason	PowerDown4: reason
date_on5	-	-	-	PowerOn5: day-mon-year	PowerOn5: day-mon-year
time_on5	-	-	-	PowerOn5:hour-minute	PowerOn5:hour-minute
date_of5	-	-	-	PowerDown5: day-mon-year	PowerDown5: day-mon-year
time_of5	-	-	-	PowerDown5: hour-minute	PowerDown5: hour-minute
rebreas5	-	-	-	PowerDown5: reason	PowerDown5: reason

*Depends on the selected language (English by default).

Service Maintenance – SERMAINT

Name	Status	Default	Unit	Displayed text*	Description
				Maintenance Period:	Maintenance Period
M_RESET	no/yes	no	-	Reset Alert	Reset alert
m_date	-	-	-	Next Visit	Next visit
blank	-	-	-	Refrig. charge period:	Refrig. charge period:
R_RESET	no/yes	no	-	Reset Alert	Reset alert
r_date	-	-	-	Next Visit	Next visit

*Depends on the selected language (English by default).

Cascade Status – CASC_STA

Name	Status	Default	Unit	Displayed text*	Description
mode	no/yes	no	-	Cascade Control Active	Cascade Control Active
is_mgr	no/yes	no	-	Is Manager ?	Is Manager
man_err	-	-	-	Manager Error	Manager error
CAP_REQ	0 to 100	0	%	Capacity Request	Capacity request
LAG_LIM	0 to 100	0	%	Cascade Lag Limit	Cascade Lag limit
ctrl_tmp	-	-17.78	°C °F	Controlled Temperature	Controlled temperature
casc_cap	0 to 0		%	Cascade Capacity	Cascade capacity
wtr_smpl	no/yes	no	-	Water Sampling Active	Water sampling active
u1_cap	-	-	%	Unit 1 Current Capacity	Unit 1 current capacity
u1_err	-	-	-	Unit 1 Error	Unit 1 error
u2_cap	-	-	%	Unit 2 Current Capacity	Unit 2 current capacity
u2_err	-	-	-	Unit 2 Error	Unit 2 error
u3_cap	-	-	%	Unit 3 Current Capacity	Unit 3 current capacity
u3_err	-	-	-	Unit 3 Error	Unit 3 error
u4_cap	-	-	%	Unit 4 Current Capacity	Unit 4 current capacity
u4_err	-	-	-	Unit 4 Error	Unit 4 error
prio_seq	-	-	-	Priority Sequence	Priority sequence
nxt_strt	-	-	-	Next Unit to Start	Next unit to start
starting	-	-	-	Unit Start in Progress	Unit start in progress
nxt_stop	-	-	-	Next Unit to Stop	Next unit to stop
stopping	-	-	-	Unit Stop in Progress	Unit stop in progress
start_th	-	-	%	Next Start Threshold	Next start threshold
start_d	-	-	sec	Next Start Delay	Next start delay
stop_d	-	-	sec	Next Stop Delay	Next stop delay

*Depends on the selected language (English by default).

5 - ADVANCED INTERFACE: MENU STRUCTURE

The Cascade Subordinates (CASCADE) is a submenu of the Maintenance Menu. To display four subordinates (UNIT1 to UNIT4) consistently, click "Cascade Subordinates." Select "UNIT1" to display the corresponding information.

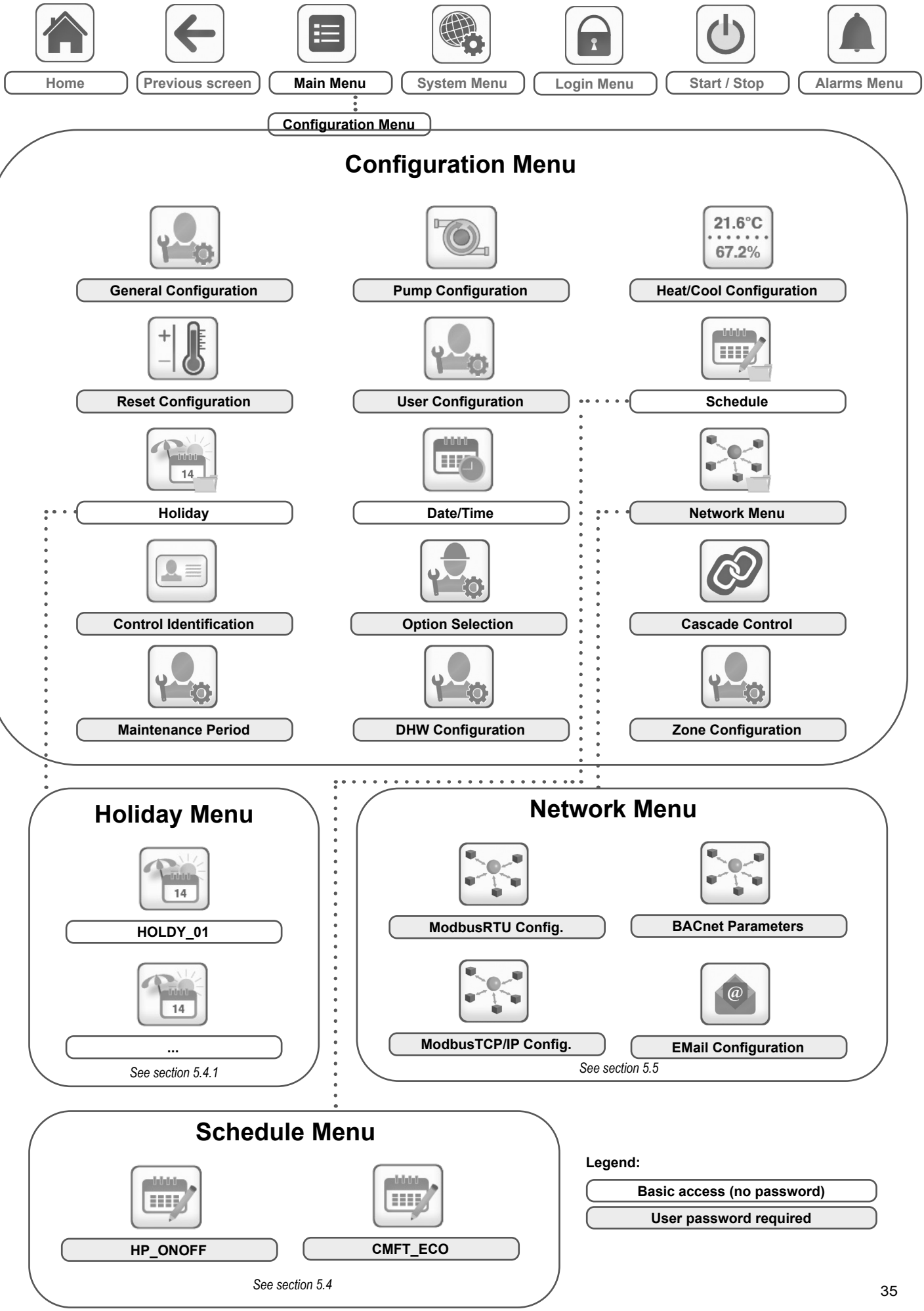
Cascade Subordinates - CASCADE

Name	Status	Unit	Displayed text*	Description
version	2	-	M/S ProtocolVersion	M/S ProtocolVersion
config1	-	-	Config Flags Register1	Config Flags Register1
config2	-	-	Config Flags Register2	Config Flags Register2
runstate	-	-	Unit State	Unit state
heatcool	-	-	Heat/Cool	Heat/Cool
status1	-	-	Status Flags Register1	Status Flags Register1
status2	-	-	Status Flags Register2	Status Flags Register2
cap_a_kw	80	kW	Nominal Cap Available	Nominal Cap Available
cap_t	-	%	Current Capacity	Current Capacity
pump_spd	-	%	Pump Speed	Pump Speed
ewt	25	°C	EWT	EWT
lwt	25	°C	LWT	LWT
cwst	25	°C	CWST	CWST
oat	15	°C	OAT	OAT
wear_f	-	-	Wear Factor	Holiday duration (days)

*Depends on the selected language (English by default).

IMPORTANT: The above table applies similarly to UNIT2, UNIT3 and UNIT4.

5.3 - Configuration menu



5 - ADVANCED INTERFACE: MENU STRUCTURE

The **Configuration menu** gives access to a number of user-modifiable parameters such as pump configuration, schedule menu, etc. Certain items in the configuration menu are protected by a password.

- To access the Configuration menu, press the **Main menu** button located in the upper-left part of the Home screen, and then select **Configuration Menu**.
- Once all the necessary modifications have been made, press the **Save** button to confirm your changes or the **Cancel** button to exit the screen without making modifications.

System configuration override: In some cases it is possible to override system configuration. Note that not all parameters can be overridden by the control.

CAUTION: Since specific units may not include additional features, some tables may contain parameters that cannot be configured for a given unit.

General Configuration – GENCONF

Name	Status	Default	Unit	Displayed text*	Description
off_on_d	1 to 15	1	min	Unit Off to On Delay	Unit off to on delay
nh_limit	0 to 100	100	%	Night Capacity Limit	Night capacity limit
med_typ	0 to 2	0	-	Water Medium 0=Water 1=Propyl 2=Ethyl	Circuit priority 0 = Water 1 = Propyl 2 = Ethyl
med_pct	0 to 50	0	%	Medium Percentage	Medium percentage
ewt_opt	no/yes	yes	-	Entering Fluid Control	Entering fluid control option (if selected, the system controls unit capacity based on the entering fluid temperature; otherwise the control is based on the leaving fluid temperature)
defrosAB	no/yes	yes	-	Defrost A B simultaneous	Defrost AB simultaneous

*Depends on the selected language (English by default).

Pump Configuration – PUMPCONF

Name	Status	Default	Unit	Displayed text*	Description
pump_seq	0 to 4	0	-	Cooler Pumps Sequence 0 = No Pump 1 = One Pump Only 2 = Two Pumps Auto 3 = Pump#1 Manual 4 = Pump#2 Manual	Cooler pumps sequence 0 = No pump 1 = One pump only (units with one pump) 2 = Two pumps automatic control 3 = Pump 1 selected (units with two pumps) 4 = Pump 2 selected (units with two pumps)
pump_del	24 to 3000	48	hour	Pump Auto Rotation Delay	Pump automatic rotation delay
pump_per	no/yes	no	-	Pump Sticking Protection	Pump sticking protection
pump_sby	no/yes	no	-	Stop Pump During Standby	Pump stop when the unit is in standby
pump_loc	no/yes	yes	-	Flow Checked if Pump Off	Flow checked if pump is off
water_ct	1 to 4	1	-	Water Flow Ctrl Method	Water flow control method
				1=Constatnt Speed, 2= Delta Temperature, 3= Delta Pressure 4= Output Pressure	1 = Constant speed 2 = water flow control based on delta temperature 3 = water flow control based on pressure 4 = water flow control based on output pressure
w_dtCspt	3.0 to 9.0 5.4 to 16.02	5.0 9.0	^C ^F	Cooling Water Delta T SP	Cooling: Delta temperature setpoint
w_dpCspt	50.0 to 300.0 7.25 to 43.51	200.0 29.0	kPa PSI	Cooling Water Delta P SP	Cooling: Delta pressure setpoint
w_dtHspt	3.0 to 9.0 5.4 to 16.02	5.0 9.0	^C ^F	Heating Water Delta T SP	Heating: Delta temperature setpoint
w_dpHspt	50.0 to 300.0 7.25 to 43.51	200.0 29.0	kPa PSI	Heating Water Delta P SP	Heating: Delta pressure setpoint
w_oPspt	150 to 520.8 21.75 to 75.5	300 43.5	kPa PSI	Water Output P SP	Water Output P SP
wpmp_min	25 to 100	50	%	Pump Minimum Speed	Minimum pump speed
wpmp_max	25 to 100	100	%	Pump Maximum Speed	Maximum pump speed

Pump Configuration – PUMPCONF (continued)

Name	Status	Default	Unit	Displayed text*	Description
pump_sav	25 to 100	25	%	Pump Min Speed Cap=0%	Minimum pump speed Cap=0%
w_z_val	-99.0 to 10.0 -14.4 to 1.45	-99.0 -14.4	kPa PSI	Water Press Zero P2-P1	Water pressure zero (P2 - P1)
MinWpThr	70.0 to 1000.05 10.15 to 145.04	100.0 14.5	kPa PSIG	Min Water Press Thres	Minimum water pressure threshold
pg_vsp_t	-20 to 20	1.2	-	Prop PID gain VSP Ctrl T	Proportional PID gain VSP temperature control
ig_vsp_t	-5 to 5	0.2	-	Int PID gain VSP Ctrl T	Integral PID gain VSP temperature control
dg_vsp_t	-20 to 20	0.4	-	Deri PID gain VSP Ctrl T	Derivative PID gain VSP temperature control
pg_vsp_p	-20 to 20	1.2	-	Prop PID gain VSP Ctrl P	Proportional PID gain VSP pressure control
ig_vsp_p	-5 to 5	0.2	-	Int PID gain VSP Ctrl P	Integral PID gain VSP pressure control
dg_vsp_p	-20 to 20	0.4	-	Deri PID gain VSP Ctrl P	Derivative PID gain VSP pressure control
eco_pmp	no/yes	yes	-	Eco Pump Enable	Eco pump enable
ecop_off	2 to 60	5	min	Eco Pump Mode Off Delay	Eco pump mode off delay
ecop_on	2 to 60	2	min	Eco Pump Mode On Delay	Eco pump mode on delay

*Depends on the selected language (English by default).

Heat/Cool Configuration – HCCONFIG

Name	Status	Default	Unit	Displayed text*	Description
auto_sel	no/yes	no	-	Auto Changeover Select	Auto changeover select
cr_sel	0 to 3	0	-	Cooling Reset Select	Cooling reset select
hr_sel	0 to 3	0	-	Heating Reset Select	Heating reset select
				1=OAT, 0=None	1=OAT, 0=none
				2=Delta T, 3=4-20mA	2=delta T, 3=4-20mA
heat_th	-20.0 to 0 -4.0 to 32.0	-15.0 5.0	°C °F	Heating OAT Threshold	Heating OAT threshold
boil_th	-15.0 to 15.0 5.0 to 59.0	-9.9 14.2	°C °F	Boiler OAT Threshold	Boiler OAT threshold
ehs_th	-5.0 to 21.1 23.0 to 70.0	5.0 41.0	°C °F	Elec Stage OAT Threshold	Elec stage OAT threshold
both_sel	no/yes	no	-	HSM Both Command Select	HSM both command select
ehs_back	no/yes	no	-	1 Elec Stage For Backup	1 electric heating stage for backup
ehs_pull	0 to 60	0	min	Electrical Pulldown Time	Electrical pulldown time
ehs_defr	no/yes	no	-	Quick EHS For Defrost	Quick EHS for defrost
tnk_plim	-	100	kW	Tank EHS Power Limit	Tank EHS power limit
tnk_alrt	no/yes	no	-	Tank EHS Efficiency Alrt	Tank EHS efficiency alert
ht_sgr	-20 to 0 -4 to 32	-15.0 5.0	°C °F	SGR Boiler OAT Thres	Smart Grid Ready option: Boiler OAT threshold

*Depends on the selected language (English by default).

Reset Configuration – RESETCFG

Name	Status	Default	Unit	Displayed text*	Description
				COOLING RESET	COOLING RESET
oat_crno	-10.0 to 51.7 14.0 to 125.0	-10.0 14.0	°C °F	OAT No Reset Value	OAT no reset value
oat_crfu	-10.0 to 51.7 14.0 to 125.0	-10.0 14.0	°C °F	OAT Full Reset Value	OAT full reset value
dt_cr_no	0 to 13.9 0 to 25.0	0 0	^C ^F	Delta T No Reset Value	Delta T no reset value
dt_cr_fu	0 to 13.9 0 to 25.0	0 0	^C ^F	Delta T Full Reset Value	Delta T full reset value
I_cr_no	0 to 20	0	mA	Current No Reset Value	Current no reset value
I_cr_fu	0 to 20	0	mA	Current Full Reset Value	Current full reset value
cr_deg	-16.7 to 16.7 -30 to 30.0	0 0	^C ^F	Cooling Reset Deg. Value	Cooling reset deg. value
				HEATING RESET	HEATING RESET
oat_hrno	-10.0 to 51.7 14.0 to 125.0	-10.0 14.0	°C °F	OAT No Reset Value	OAT no reset value
oat_hrfu	-10.0 to 51.7 14.0 to 125.0	-10.0 14.0	°C °F	OAT Full Reset Value	OAT full reset value

Reset Configuration – RESETCFG (continued)

Name	Status	Default	Unit	Displayed text*	Description
dt_hr_no	0 to 13.9 0 to 25.0	0 0	^C ^F	Delta T No Reset Value	Delta T no reset value
dt_hr_fu	0 to 13.9 0 to 25.0	0 0	^C ^F	Delta T Full Reset Value	Delta T full reset value
I_hr_no	0 to 20	0	mA	Current No Reset Value	Current no reset value
I_hr_fu	0 to 20	0	mA	Current Full Reset Value	Current full reset value
hr_deg	-16.7 to 16.7 -30 to 30.0	0 0	^C ^F	Heating Reset Deg. Value	Heating reset deg. value
				Smart Grid Ready Option	Smart Grid Ready option
heat_sg3	0 to 22.22 0 to 40	0 0	^C ^F	Boost Heat Offset	Boost Smart Grid Ready offset
heat_sg4	0 to 22.22 0 to 40	0 0	^C ^F	Forced Heat Offset	Forced Smart Grid Ready offset
dhw_sg3	0 to 22.22 0 to 40	0 0	^C ^F	Boost DHW Offset	Boost Domestic Hot Water offset
dhw_sg4	0 to 22.22 0 to 40	0 0	^C ^F	Forced DHW Offset	Forced Domestic Hot Water offset

*Depends on the selected language (English by default).

User Configuration – USERCONF

Name	Status	Default	Unit	Displayed text*	Description
alert_r	no/yes	no	-	Alarm Relay for Alerts?	Alarm relay for alerts
al_rever	0 to 1	0	-	Reversed Alarm Relay)	Reversed alarm relay

*Depends on the selected language (English by default).

Option Selection – OPT_SEL

Name	Status	Default	Unit	Displayed text*	Description
boil_en	no/yes	no	-	Boiler Enable	Boiler enable
ehs_sel	0 to 5	0	-	Electrical Heater Select	Electrical heater select
				0=No Heater, 1= Customer -1 heater 2= Customer -2 heaters 3= Customer -3 heaters 4= Opt. 307D 5= Opt. 307E	0=No Heater, 1= Customer -1 heater 2= Customer -2 heaters 3= Customer -3 heaters 4= Option 307D 5= Option 307E
leak_alm	no/yes	yes	-	Leakage alarm? (159C)	Leakage alarm
oat_sel	no/yes	no	-	Enable Opt OAT Sensor?	Enable Opt OAT sensor
smrtGrid	no/yes	no	-	Enable Smart Grid Ready	Enable Smart Grid Ready

*Depends on the selected language (English by default).

Date/Time – DATETIME

Displayed text*		Status	Description
SmartVu™ touch screen	SmartVu™ 2.0 touch screen		
Daylight Saving Time	-	on/off	Summer/winter time activation
Location	Location	UTC	Time zone (SmartVu™ 2.0: Time zone setting includes DST control)
Date/Time	Date/Time	YYYY/MM/DD, HH:MM:SS	Current date and time (must be set manually)
Today is a Holiday	Today is a Holiday	no/yes	Information about holidays (read-only). Please note that holidays are set in the Holiday menu (see also section 5.4)
Tomorrow is a Holiday	Tomorrow is a Holiday	no/yes	Information about the upcoming holiday period (read-only). Please note that holidays are set in the Holiday menu (see also section 5.4)

*Depends on the selected language (English by default).

NOTE: The Date/Time Configuration menu appears also in the System menu (see also section 5.6).

5 - ADVANCED INTERFACE: MENU STRUCTURE

Control Identification – CTRLID

Status	Default	Displayed text*	Description
1-239	1	CCN Element Number	CCN element number
0-239	0	CCN Bus Number	CCN bus number
9600 / 19200 / 38400	9600	CCN Baud Rate	Communication speed
-	AWHP004	Device Description	Device description
-	-	Location Description	Location description
-	ECG-SR-20ZF3010	Software Version	Software version
-	-	Serial Number	Serial number (MAC address)

*Depends on the selected language (English by default).

Cascade Control – CASC_CFG

Name	Status	Default	Unit	Displayed text*	Description
role	0 to 2	0	-	Cascade Role	Cascade role
				0=No Cascade, 1= Subordinate 2= Manager	0=No Cascade, 1= Subordinate 2= Manager
u1_addr	0 to 239	0	-	Unit 1 CCN addr (M)	Unit 1 CCN addr (M)
u2_addr	0 to 239	0	-	Unit 2 CCN addr (S)	Unit 2 CCN addr (S)
u3_addr	0 to 239	0	-	Unit 3 CCN addr (S)	Unit 3 CCN addr (S)
u4_addr	0 to 239	0	-	Unit 4 CCN addr (S)	Unit 4 CCN addr (S)
start_d	1 to 900	360	sec	Next Unit Start Delay	Next unit start delay
stop_d	1 to 900	360	sec	Next Unit Stop Delay	Next unit stop delay
hold_on	no/yes	no	-	Continue on Comm Lost	Continue on comm lost
timeout	1 to 60	2	min	Comm Lost Time Out	Comm lost time out

*Depends on the selected language (English by default)

Maintenance Period – MAINTCFG

Name	Status	Default	Unit	Displayed text*	Description
mtn_per	0 to 10000	12	-	Maintenance Period	Maintenance period
mtn_typ	0 to 2	1	-	Frequency	Frequency
				0: None 1: Frequency in Months 2: Running Hours	0: None 1: Frequency in Months 2: Running Hours
rfg_per	0 to 4	3	-	Refrig. Charge Period	Refrig. charge period
				0: None 1: 3 Months 2: 6 Months 3: 12 Months 4: 24 Months	0: None 1: 3 Months 2: 6 Months 3: 12 Months 4: 24 Months

*Depends on the selected language (English by default).

DHW Configuration – DHW_CONF

Name	Status	Default	Unit	Displayed text*	Description
dhw_type	0 to 3	0	-	Domestic Hot Water Type	Domestic Hot Water type
				0: No DHW management 1: Valve with switches 2: Valve w/o switch 3: DHW without valve	0: No DHW management 1: Valve with switches 2: Valve w/o switch 3: DHW without valve
dhw_oat	-20 to 15 -4 to 59	-20 -4	°C °F	DHW Backup OAT Threshold	Domestic Hot Water backup OAT threshold
dhw_bckt	0 to 120	30	min	DHW Backup recover time	Domestic Hot Water recover time
div_vlvr	0 to 600	180	sec	DHW Valve running time	Domestic Hot Water running time
dhw_htr	no/yes	no	-	DHW Electric Heater	Domestic Hot Water electric heater
dhw_sens	0 to 1	0	-	DHW Tank sensor type	Domestic Hot Water sensor type
				0: Thermal Switch 1: Thermistor Sensor	0: Thermal Switch 1: Thermistor Senso

*Depends on the selected language (English by default)

Zone Configuration – ZONE_CFG

Name	Status	Default	Unit	Displayed text*	Description
zone_nb	0 to 2	0	-	Zone To Control	Zone to control
zon_nam1	-	0	-	Zone#1 Name	Zone#1 name
zon_nam2	-	0	-	Zone#2 Name	Zone#2 name
emitr_z1	0 to 3	2	-	Zone #1 Emitter Type	Zone #1 emitter type
emitr_z2	0 to 3	2	-	Zone #2 Emitter Type	Zone #2 emitter type
				1= Cooling Only 2= Cooling & Heating 3= Heating Only	1= Cooling Only 2= Cooling & Heating 3= Heating Only
floorzon	0 to 2	0	-	Floor Temp Zone Nb	Floor temperature zone Nb
floorthd	20 to 50 68 to 122	28 82.4	°C °F	Floor Temp Safety thres.	Floor temperature safety threshold
vlvrt_z1	0 to 360	180	sec	Zone#1 Valve runtime	Zone#1 valve runtime
vlvrt_z2	0 to 360	180	sec	Zone#2 Valve runtime	Zone#2 valve runtime
vlvkp_z1	-20 to 20	0.8	-	Zone#1 Valve prop. gain	Zone#1 valve proportional gain
vlvti_z1	-20 to 20	10	sec	Zone#1 Valve integ. time	Zone#1 valve integral time
vlvtd_z1	-20 to 20	0	sec	Zone#1 Valve deriv. time	Zone#1 valve derivative time
vlvkp_z2	-20 to 20	0.8	-	Zone#2 Valve prop. gain	Zone#2 valve proportional gain
vlvti_z2	-20 to 20	10	sec	Zone#2 Valve integ. time	Zone#2 valve integral time
vlvtd_z2	-20 to 20	0	sec	Zone#2 Valve deriv. time	Zone#2 valve derivative time

*Depends on the selected language (English by default)

5.4 - Schedule menu

The Schedule menu includes nine time schedules, as below:

- **Heat Pump On/Off Schedule (HP_ONOFF)**
  Enables the adjustment of Heat Pump operation.
  Setting the weekly schedule from 00:00 to 23:59 enables continuous operation of the unit. During the "off" period, the unit's operation is unaffected by other time schedule configurations.
- **Comfort Mode Schedule (CMFT_ECO)**
  Enables the adjustment of Comfort Mode operation.
  If no zones are configured, this weekly schedule defines the periods for controlling the water loop temperature based on the Comfort or Eco setpoint.
- **Holiday Schedule (HOLDY)**
  Enables the adjustment of operation during Holiday periods.
- **Night Mode Schedule (NIGHT)**
  Enables the adjustment of Night Mode operation.
  This weekly schedule defines the periods during which the unit operates with reduced capacity (Night Mode Limit capacity).
- **DHW Schedule (DHW_SCH)**
  Enables the adjustment of Domestic Hot Water operation.
  If DHW is configured, the weekly schedule defines the periods for heating the Domestic Hot Water tank to the configured DHW setpoint.
- **Legionella Prevention Schedule (LEGIONEL)**
  Enables the adjustment of Legionella Prevention operation.
  If DHW is configured, the weekly schedule defines the periods for heating the Domestic Hot Water tank to the configured Legionella prevention setpoint.
- **Zone #1 Schedule (ZONE_01)**
  Enables the adjustment of Zone#1 operation.
  If one or two Zone(s) are configured, the weekly schedule defines the Comfort and Economy periods for the Zone#1 heating and cooling modes.
- **Zone #2 Schedule (ZONE_02)**
  Enables the adjustment of Zone#2 operation.
  If two Zones are configured, the weekly schedule defines the Comfort and Economy periods for the Zone#2 heating and cooling modes.
- **Maintenance Schedule (MAINTCFG)**
  Enables the adjustment of Maintenance operation.
  To configure and reset the general maintenance period and the refrigerant leakage detection verification period.

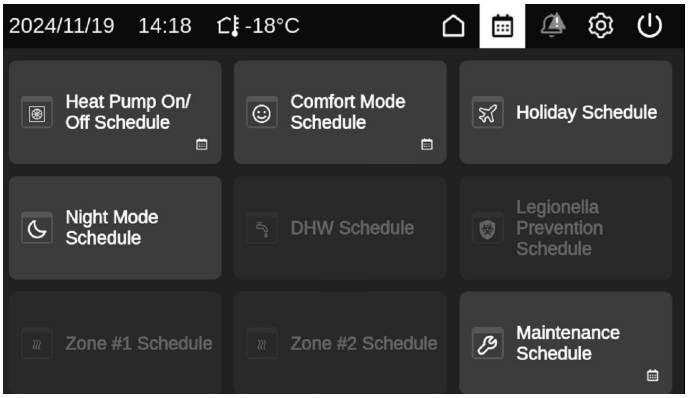
Occupancy periods

The control offers to the user the possibility of setting eight occupancy periods where each occupancy period includes the following elements to be defined:

- **Day of the week:** Select the days when the period is occupied.
- **Occupancy time** ("occupied from" to "occupied to"): Set occupancy hours for the selected days.
- **Timed Override Extension (in Advanced interface):** Extend the schedule if necessary. This parameter can be used in the case of some unplanned events. Example: If the unit is normally scheduled to run between 8:00 to 18:00, but one day you want the air-conditioning system to operate longer, then set this timed override extension. If you set the parameter to "2", then the occupancy will end at 20:00.

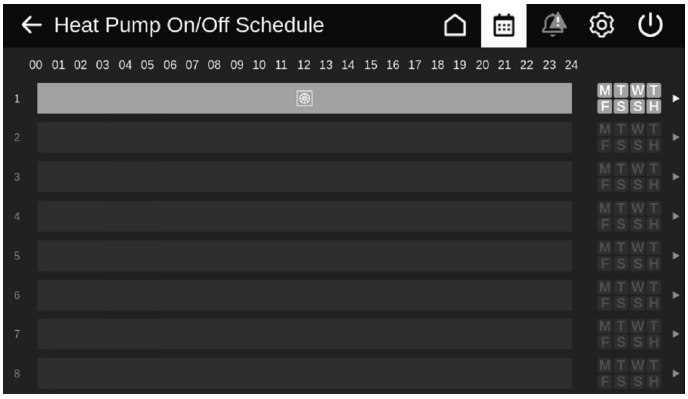
To set the unit schedule (from SmartUse Home Screen)

1. Go to the Schedule menu.



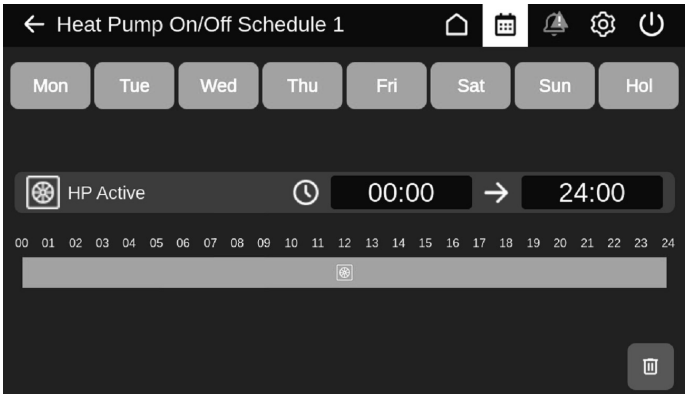
2. Navigate to the selected schedule to adjust. To configure a period (1-8), select the corresponding period.

Example: Status of the Heat Pump On/Off Schedule (analogously for all periods 1-8)



3. Select appropriate check boxes to set the unit occupancy on specific days.

Example: Setting Heat Pump On/Off Schedule



4. Define the time of occupancy.
5. When the time schedule is set, the selected period will be presented in the form of the green band on the timeline.
6. Press the **Back** button to validate or **Trash** button to delete the changes.

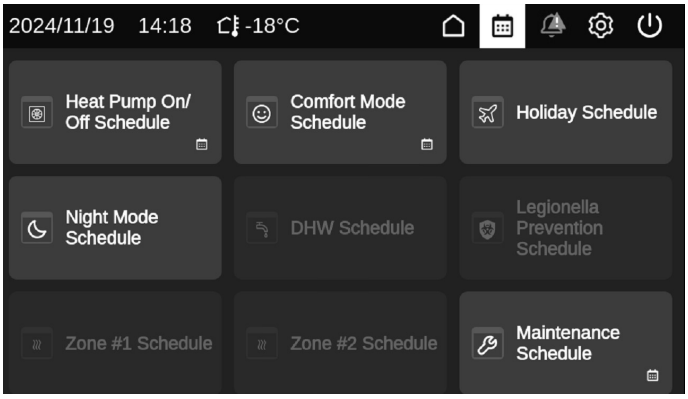
IMPORTANT: The method for setting the schedule is the same for all other time schedules, except for the Holiday Schedule (see section 5.3.1) and Maintenance Schedule (see section 5.3.2)

5.4.1 - Schedule menu - Holiday Schedule

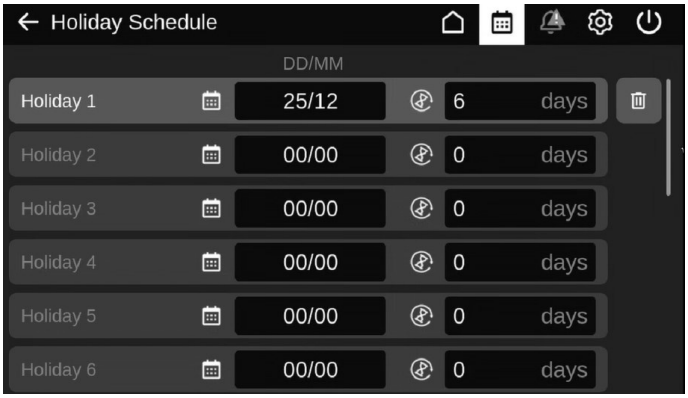
The Holiday Schedule is one of nine Schedule Menu setting options.

To set the unit Holiday Schedule (from SmartUse Home Screen):

1. Go to the Schedule menu.



2. Select the Holiday Schedule for adjustment. There is 16 Holiday Schedules available. To view all content, use the scroll bar on the right side of the page.



4. Define the Start Day (DD), the Start Month (MM) and the holiday duration in days.
5. Press the **Back** button to validate or **Trash** button to delete the changes.

HOLIDAY - HOLDY_01 (...)

Name	Status	Default	Displayed text*	Description
HOL_MON	0-12	0	Holiday Start Month	Holiday start month
HOL_DAY	0-31	0	Start Day	Holiday start day
HOL_LEN	0-99	0	Duration (days)	Holiday duration (days)

*Depends on the selected language (English by default).

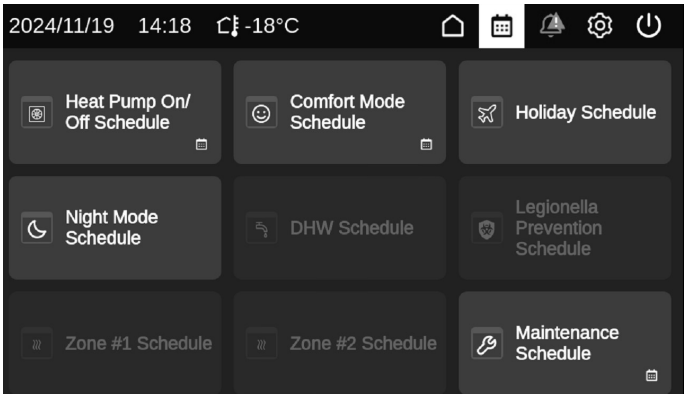
IMPORTANT: For more information about holiday setting, please see section 6.24.

5.4.2 - Schedule menu - Maintenance Schedule

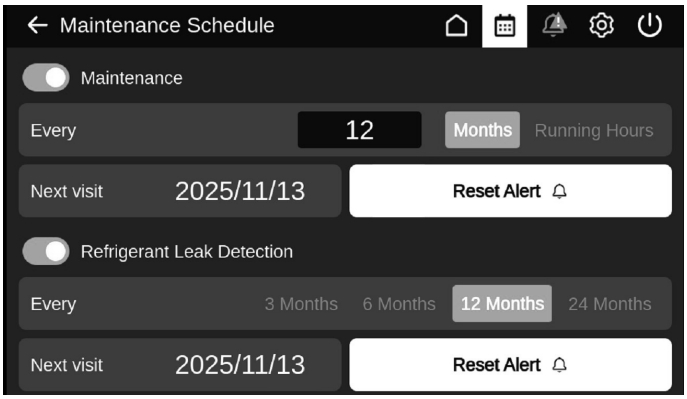
The Maintenance Schedule is one of nine Schedule Menu setting options.

To set the unit Maintenance Schedule (from SmartUse Home Screen):

1. Go to the Schedule menu.



2. Select the Maintenance Schedule for adjustment.



3. To set a maintenance, set the selector to On and define a period in Months or in Running hours. To set a Refrigerant Leak Detection period, set the selector to On and define a period in Months.
3. Press the **Back** button to validate. An alert will be triggered when the period has elapsed.

5.5 - Network menu

The Network menu allows the user to change network setting for BACnet/Modbus and define e-mail accounts used for alarm notifications (see section 8.3).

Network Menu – NETWORK

Icon	Name	Displayed text*	Description
	MODBUSRS	ModbusRTU Config.	Modbus RTU configuration
	MODBUSIP	ModbusTCP/IP Config.	Modbus TCP/IP configuration
	BACnet	BACnet Parameters	BACnet standard configuration
	EMAILCFG	EMail Configuration	Email settings

*Depends on the selected language (English by default).

ModbusRTU Configuration – MODBUSRS

Name	Status	Default	Unit	Displayed text*	Description
modrt_en	no/yes	no	-	RTU Server Enable	RTU server enable
ser_UID	1 to 247	1	-	Server UID	Server UID
metric	no/yes	yes	-	Metric Unit	Metric unit
swap_b	0 to 1	0	-	Swap Bytes	Swap bytes
				0 = Big Endian	0 = big endian
				1 = Little Endian	1 = little endian
baudrate	0 to 2	0	-	Baudrate	Baudrate
				0 = 9600	0 = 9600
				1 = 19200	1 = 19200
				2 = 38400	2 = 38400
parity	0 to 2	0	-	Parity	Parity
				0 = No parity	0 = no parity
				1 = Odd parity	1 = odd parity
				2 = Even parity	2 = even parity
stop_bit	0 to 1	0	-	Stop bit	Stop bit
				0 = One stop bit	0 = one stop bit
				1 = Two stop bit	1 = two stop bit
real_typ	0 to 1	1	-	Real type management	Real type management
				0 = Float X10	0 = float X10
				1 = IEE 754	1 = IEE 754
reg32bit	0 to 1	1	-	Enable 32 bits registers	Enable 32 bits registers
				0 = IR/HR in 16 bit mode	0 = IR/HR in 16 bit mode
				1 = IR/HR in 32 bit mode	1 = IR/HR in 32 bit mode

*Depends on the selected language (English by default).

ModbusTCP/IP Configuration – MODBUSIP

Name	Status	Default	Unit	Displayed text*	Description
modip_en	no/yes	no	-	TCP/IP Server Enable	TCP/IP server enable
ser_UID	1 to 247	1	-	Server UID	Server UID
port_nbr	0 to 65535	502	-	Port Number	Port number
metric	no/yes	yes	-	Metric Unit	Metric unit
swap_b	0 to 1	0	-	Swap Bytes	Swap bytes
				0 = Big Endian	0 = big endian
				1 = Little Endian	1 = little endian
real_typ	0 to 1	1	-	Real type management	Real type management
				0 = Float X10	0 = float X10
				1 = IEE 754	1 = IEE 754
reg32bit	0 to 1	1	-	Enable 32 bits registers	Enable 32 bits registers
				0 = IR/HR in 16 bit mode	0 = IR/HR in 16 bit mode
				1 = IR/HR in 32 bit mode	1 = IR/HR in 32 bit mode
conifnam	0 to 1	0	-	IP port interface name	IP port interface name
				0 = J15	0 = J15
				1 = J16	1 = J16
timeout	60 to 600	120	sec	Com. timeout (s)	Com. timeout (s)
idle	0 to 30	10	sec	Keepalive idle delay(s)	Keepalive idle delay(s)
intrvl	0 to 2	1	sec	Keepalive interval(s)	Keepalive interval(s)
probes	0 to 10	10	-	Keepalive probes nb	Keepalive probes number

*Depends on the selected language (English by default).

BACnet Parameters – BACNET

Name	Status	Default	Unit	Displayed text*	Description
bacena	disable/enable	disable	-	BACnet Enable	BACnet enable
bacunit	no/yes	yes	-	Metric Unit?	Metric unit?
network	1 to 40000	1600	-	Network	Network
udpport	47808 to 47823	47808	-	UDP Port Number	UDP port number
bac_id	1 to 4194302	1600001	-	Device Id manual	Device id manual
auid_opt	disable/enable	disable	-	Device Id Auto Option	Device id auto option
balmena	disable/enable	enable	-	Alarm reporting	Alarm reporting
mng_occ	no/yes	no	-	BACnet Manage Occupancy	BACnet manage occupancy
conifnam	0 to 1	0	-	IP port interface name	IP port interface name
				0 = J5 / J15	0 = J5 / J15
				1 = J16	1 = J16

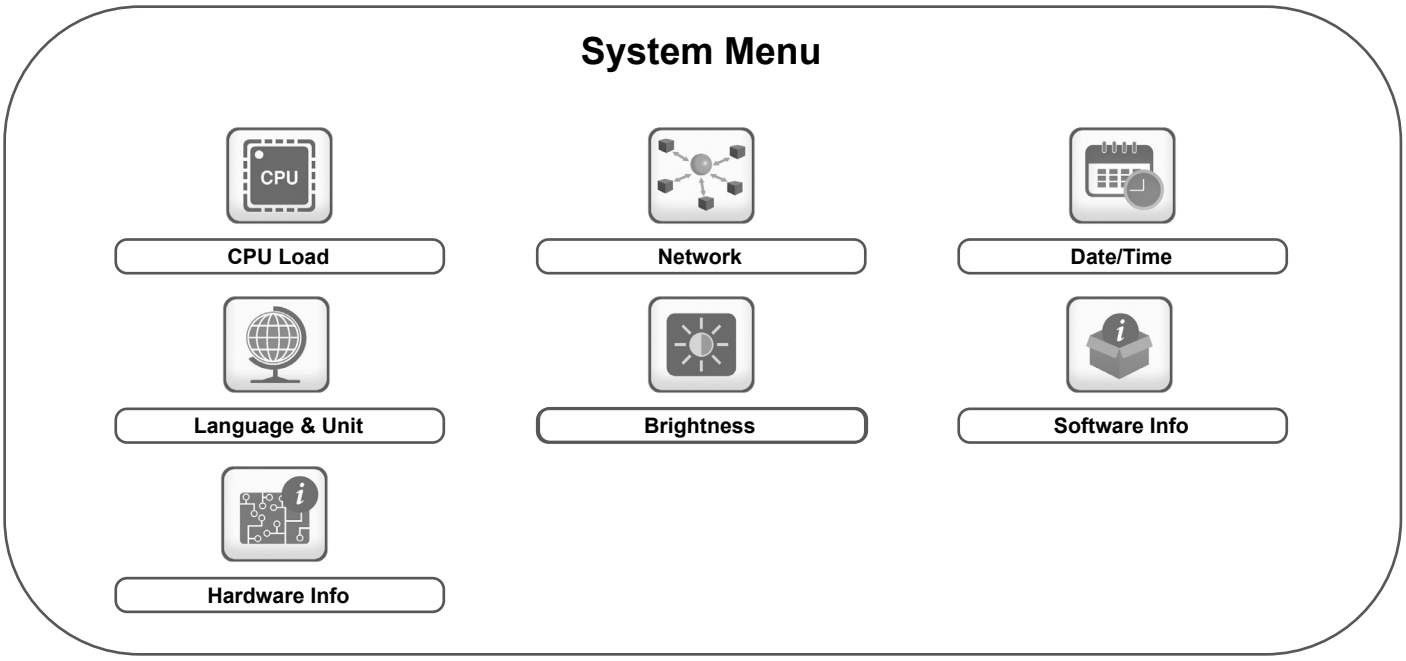
*Depends on the selected language (English by default).

EMail Configuration – EMAILCFG

Name	Status	Default	Unit	Displayed text*	Description
senderP1			-	Sender Email Part1	Sender e-mail, identifier part
				@	@
senderP2			-	Sender Email Part2	Sender e-mail, domain part
recip1P1			-	Recip1 Email Part1	Recipient 1,identifier part
				@	@
recip1P2			-	Recip1 Email Part2	Recipient 1,domain part
recip2P1			-	Recip2 Email Part1	Recipient 2,identifier part
				@	@
recip2P2			-	Recip2 Email Part2	Recipient 2,domain part
smtpP1	0 to 255	0	-	SMTP IP Addr Part 1	SMTP IP address part 1
smtpP2	0 to 255	0	-	SMTP IP Addr Part 2	SMTP IP address part 2
smtpP3	0 to 255	0	-	SMTP IP Addr Part 3	SMTP IP address part 3
smtpP4	0 to 255	0	-	SMTP IP Addr Part 4	SMTP IP address part 4
accP1			-	Account Email Part1	Account e-mail, identifier part
				@	@
accP2			-	Account Email Part2	Account e-mail, domain part
accPass			-	Account Password	Account password
portNbr	0 to 65535	25	-	Port Number	Port number
srvTim	0 to 255	30	sec	Server Timeout	Server timeout
srvAut	0 to 1	0	-	Server Authentication	Server authentication

*Depends on the selected language (English by default).

5.6 - System menu



Legend:

Basic access (no password)

User password required

The **System menu** allows the user to verify software, hardware, or network information and change some display settings, including language, date/time, or brightness. The list of configuration parameters may vary depending on the model of the touch screen.

- To access the System menu, press the **System menu** button located in the upper-right part of the Home screen.

CAUTION: Since specific units may not include additional features, some tables may contain parameters that cannot be configured for a given unit.

CPU Load – CPULOAD

Status	Default	Unit	Displayed text*	Description
0 to 100	-	%	CPU load	CPU utilization
0 to 100	-	%	RAM Memory utilization	RAM usage
0 to 100	-	%	FLASH Memory utilization	Flash memory usage

*Depends on the selected language (English by default).

Network – NETWORK

No.	Default	Displayed text*	Description
Ethernet 0 (J15)			**IP Network Interface J15 (Ethernet 0):**
1	xx:xx:xx:xx:xx:xx	MAC Address	MAC address
2	Disabled	DHCP	DHCP server configuration
3	169.254.1.1	IP Address	IP Address: To change the IP address, tap the IP settings button in the lower right corner of the screen. Reboot the controller to make changes effective.
4	255.255.255.0	Subnet Mask	Subnet mask
5	169.254.1.3	Default Gateway	Default gateway

Network – NETWORK (continued)

No.	Default	Displayed text*	Description
6	169.254.0.0/16	Gateway Dest/Mask	Gateway mask in CIDR format ("xxx" refers to the Gateway IP address) Gateway IP address / CIDR notation / Gateway in CIDR format 169.254.1.3 / xxx.xxx.xxx.0/24 / 169.254.1.0/24 169.254.1.3 / xxx.xxx.0.0/16 / 169.254.0.0/16 169.254.1.3 / xxx.0.0.0/8 / 169.0.0.0/8 0.0.0.0 / 0.0.0.0/0 / 0.0.0.0/0
Ethernet 1 (J16)			**IP Network Interface J16 (Ethernet 1):**
1	xx:xx:xx:xx:xx:xx	MAC Address	MAC address
2	Disabled	DHCP	DHCP server configuration
3	192.168.100.100	IP Address	IP Address (see above)
4	255.255.255.0	Subnet Mask	Subnet Mask
5	192.168.100.1	Default Gateway	Default Gateway
6	192.0.0.0/8	Gateway Dest/Mask	Gateway mask in CIDR format (see above)
DNS			**Domain Name Server (DNS)**
1	169.254.1.3	Primary DNS	Primary DNS (preferred DNS)
2	169.254.1.4	Alternate DNS	Secondary DNS (alternate DNS)

*Depends on the selected language (English by default).

IMPORTANT: It is NOT allowed for Ethernet 0 and Eth1 ports to have their IP addresses in the same network. This may cause confusion and affect the controller routing functionality.

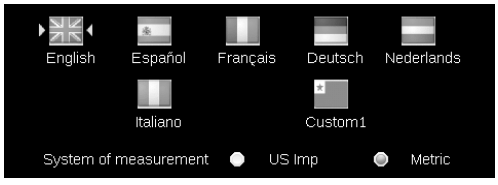
Date/Time – DATETIME

Displayed text* SmartVu™ 2.0 touch screen	Status	Description
-	on/off	Summer/winter time activation
Location	UTC	Time zone (SmartVu™ 2.0: Time zone setting includes DST control)
Date/Time	YYYY/MM/DD, HH:MM:SS	Current date and time (must be set manually)
Today is a Holiday	no/yes	Information about holidays (read-only). Please note that holidays are set in the Holiday menu (see also section 5.4)
Tomorrow is a Holiday	no/yes	Information about the upcoming holiday period (read-only). Please note that holidays are set in the Holiday menu (see also section 5.4)

*Depends on the selected language (English by default).

NOTE: The Date/Time Configuration menu appears also in the Configuration menu (see also section 5.2).

Language & Unit – LANGUNIT

Displayed text*	Description
(Languages) Example: SmartVu™ touch screen  	**Language selection:** English, Spanish, French, German, Dutch, Italian and Custom1 **Custom language (Custom1):** The control system allows users to add new languages to the control. To learn more about language customization, please contact your local Service representative. Custom languages can be uploaded only by Carrier Service representative.
System of measurement: US Imp/Metric	US Imp = Parameters displayed in US Imperial units Metric = Parameters displayed in metric units

*Depends on the selected language (English by default).

5 - ADVANCED INTERFACE: MENU STRUCTURE

Brightness – BRIGHTNS

Displayed text* SmartVu™ 2.0 touch screen	Status	Description
Brightness	0 to 100%	Screen brightness
Theme Selection	Dark/Light	Theme selection (Dark theme / Light theme)

*Depends on the selected language (English by default).

Software Info – SWINFO

Displayed text* SmartVu™ 2.0 touch screen	Status	Description
Software Version	ECG-SR-20V4H010	Software version number
SDK Version	N.NNN.N	SDK version number
App version	NN.N	Application version
UI Version	NN	User interface version
Brand	CARRIER	Brand name

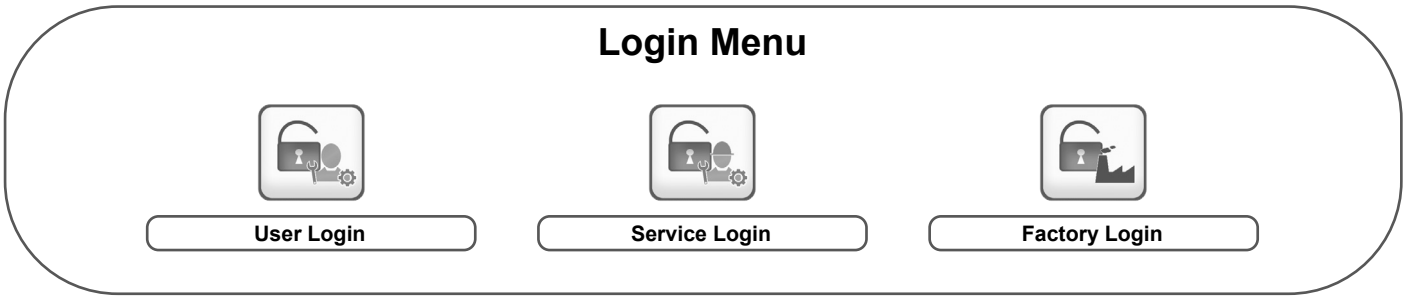
*Depends on the selected language (English by default).

Hardware Info – HWINFO

Status	Displayed text*	Description
-	Board Variant	Board variant
-	Board Revision	Board revision
70	Screen size	Screen size in inches (7.0")

*Depends on the selected language (English by default).

5.7 - Login menu



Legend:

Basic access (no password)

User password required

5.7.1 - Access control

- Login menu provides access to three different access levels, i.e. user configuration, service configuration, and factory configuration.
- Multilevel security ensures that only authorised users are allowed to modify critical unit parameters.
- Only people qualified to manage the unit should be familiarized with the password.
- Configuration menu can be accessed only by logged-in users (user configuration level or higher).

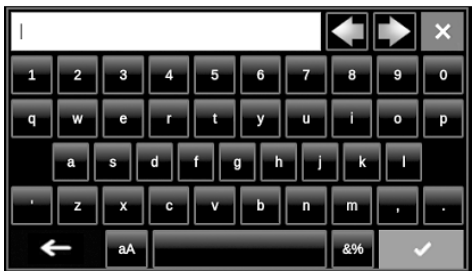
IMPORTANT: It is strongly recommended to change the default password of the user interface to exclude the possibility of changing any parameters by an unqualified person.

5.7.2 - User login

Only logged-in users can access configurable unit parameters. By default, user password is “11”.

To log in

1. Press the **Login** button, and then select *User Login*.
2. Press the Password box.
3. Provide the password (11) and press the **Confirm** button.



4. The User Login screen appears.

5.7.3 - User password

User password can be modified in the User Login menu.

To change your password

1. Press the **Login** button, and then select *User Login*.

2. Press the **Change User Password** button.
3. The **Change User Password** screen will be displayed.
4. Please provide the current password, and then type the new password twice.
5. Press the **Save** button to confirm password update or the **Cancel** button to exit the screen without making modifications.

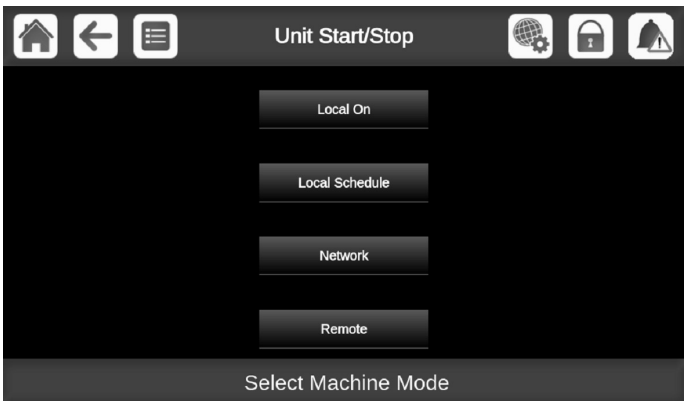
5.7.4 - Service & Factory login

Service and factory login menus are dedicated to Carrier Service technicians and factory line. To learn more about advanced access control, please refer to the Control Service Guide (service technicians only).

5.8 - Start / Stop menu

5.8.1 - Unit operating mode

With the unit in the Local off mode: To display the list of operating modes and select the required mode, press the **Start/ Stop** button in the upper-right corner of the Synoptic screen.



IMPORTANT: When entering the menu, please note that the currently selected item corresponds to the last running operating mode.

Unit start/stop screen (operating modes)	
Local On	Local On: The unit is in the local control mode and allowed to start.
Local Schedule	Local Schedule: The unit is in the local control mode and allowed to start if the period is occupied.
Network	Network: The unit is controlled by network commands and allowed to start if the period is occupied.
Remote	Remote: The unit is controlled by external commands and allowed to start if the period is occupied.

5.8.2 - Unit start

To start the unit

1. Press the **Start/Stop** button.
2. Select the required Machine Mode.
   - Local On
   - Local Schedule
   - Network
   - Remote
3. The Home screen will be displayed.

5.8.3 - Unit stop

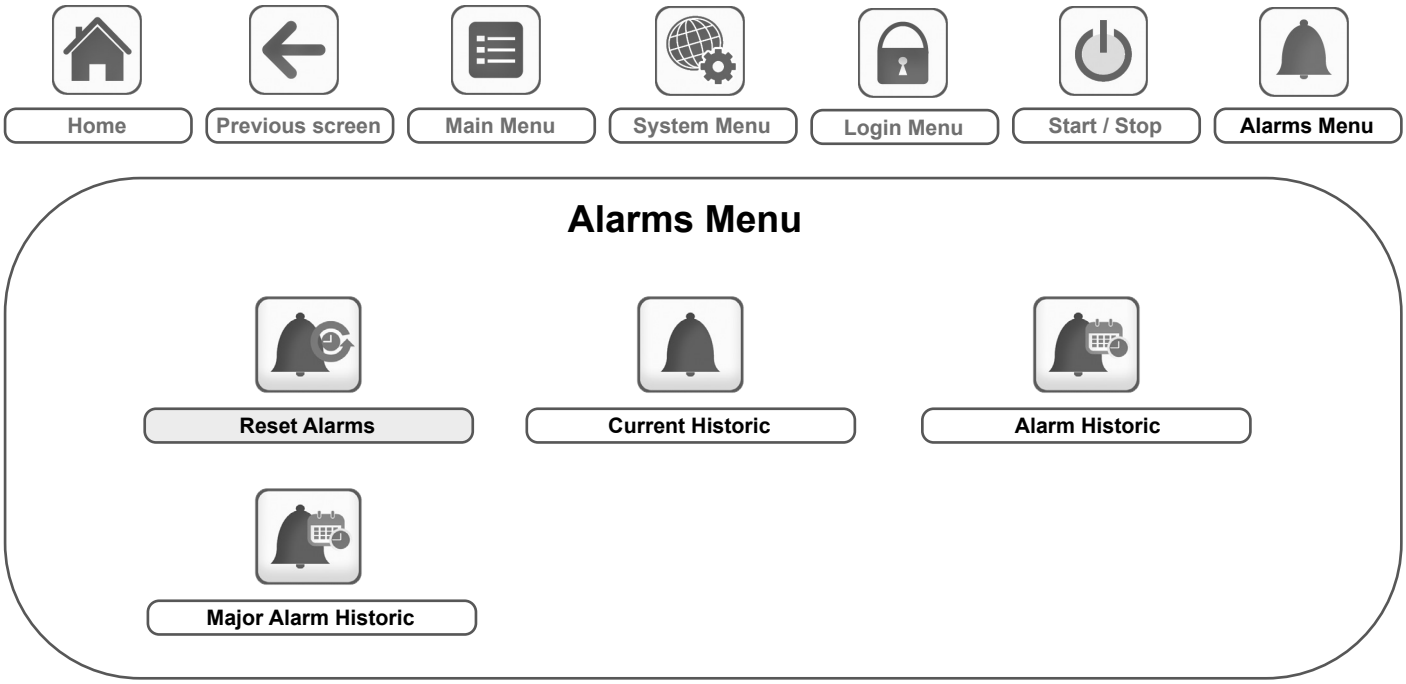
To stop the unit

1. Press the **Start/Stop** button.
2. Confirm the unit shutdown by pressing **Confirm Stop** or cancel the unit shutdown by pressing the **Back** button.

Operating Type	Control						
	On/Off	Comfort/Eco(1) (No Zone)	Away Setpoints(2)	DHW Production(3)	Legionella Prevention(3)	Zone Comfort/ Eco(1)	Night Mode(4)
LOCAL-OFF	(*)	(*)	(*)	(*)	(*)	(*)	(*)
LOCAL-ON	(*)	Upon SP_SEL or Bypass	(*)	DHW Schedule or Bypass	Legionella Schedule	Zone Schedule or Bypass	Night Schedule or Bypass or NIGHT_SW
LOCAL-SCHEDULE	On/Off Schedule	CMFT_ECO Schedule or SP_SEL or Bypass	Holiday Schedule	DHW Schedule or Bypass	Legionella Schedule	Zone Schedule or Bypass	Night Schedule or Bypass or NIGHT_SW
NETWORK	CHIL_S_S	CTRL_PNT	(*)	DHW Schedule or DHW_ MODE=1	Legionella Schedule or DHW_MODE=2	CTLP_Zx	DEM_LIM
REMOTE	ONOFF_SW	SETP_SW or Bypass	Holiday Schedule	DHW Schedule or Bypass	Legionella Schedule	Zone Schedule or Bypass	Night Schedule or Bypass or NIGHT_SW

(*) Not Applicable
(1) If no zone is configured, the schedule shall default to a transition from Comfort to Eco setpoints.
(2) Away Setpoints are considered during holiday periods.
(3) DHW Production and Legionella Prevention are enabled if DHW is activated.
(4) Night Mode allows to reduce the unit noise.

5.9 - Alarms menu



The **Alarms menu** allows the user to monitor alarms that occurred on the unit as well as reset alarms that require manual reset.

- To access the Alarms menu, press the **Alarms menu** button located in the upper-right part of the Home screen.

The Alarm history is divided into two parts:

- Alarm Historic that displays up to 50 recent general alarms.
- Major Alarm Historic that displays up to 50 recent alarms, including alarms connected with process failure and VFD drives.

IMPORTANT: For more information about alarms, please go to section 8.6.

Reset Alarms – ALARMRST

Name	Status	Displayed text*	Description
RST_ALM	no/yes	Alarm Reset	Used to reset active alarms
ALM	-	Alarm State	Alarm state: Normal = No alarm Partial = There is an alarm, but the unit continues to operate Shutdown = Unit shuts down
alarm_1c	-	Current Alarm 1	Alarm code (see section 8.6)
alarm_2c	-	Current Alarm 2	Alarm code (see section 8.6)
alarm_3c	-	Current Alarm 3	Alarm code (see section 8.6)
alarm_4c	-	Current Alarm 4	Alarm code (see section 8.6)
alarm_5c	-	Current Alarm 5	Alarm code (see section 8.6)
alarm_1	-	Current Alarm 1 index	Alarm code (see section 8.6)
alarm_2	-	Current Alarm 2 index	Alarm code (see section 8.6)
alarm_3	-	Current Alarm 3 index	Alarm code (see section 8.6)
alarm_4	-	Current Alarm 4 index	Alarm code (see section 8.6)
alarm_5	-	Current Alarm 5 index	Alarm code (see section 8.6)

*Depends on the selected language (English by default).

Current Alarms – ALAM_CUR

Name	Date	Hour	Alarm text
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)

*Depends on the selected language (English by default).

Alarm Historic – ALARHIST

Name	Date	Hour	Alarm text
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)

*Depends on the selected language (English by default).

Major Alarm Historic – ALARHIS2

Name	Date	Hour	Alarm text
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)

*Depends on the selected language (English by default).

IMPORTANT:

- ***JBus vs. Modbus: Data exchange services offered by Modbus and JBus protocols are the same and therefore these terms can be used interchangeably.***

6.1 - Unit start/stop control

The unit state is determined based on a number of factors, including its operating type, active overrides, open contacts, lead/lag configuration, or alarms triggered due to operating conditions.

The table given below summarises the unit control type [ctrl_typ] and its running status with regard to the following parameters:

- **Operating type:** This operating type is selected using the Start/Stop button on the user interface.

LOFF	Local off
L-C	Local on
L-SC	Local schedule
REM	Remote
Net.	Network

- **Start/stop force command [CHIL_S_S]:** Heat pump start/stop force command can be used to control the heat pump state in the Network mode.
  - Command set to stop: The unit is halted.
  - Command set to start: The unit runs in accordance with schedule 1.
- **Remote start/stop contact status [Onoff_sw]:** Start/stop contact status can be used to control the heat pump state in the Remote operating type.
- **Start/stop schedule [chil_occ]:** Occupied or unoccupied status of the unit.
- **Network emergency stop command [EMSTOP]:** If activated, the unit shuts down regardless of the active operating type.
- **General alarm:** The unit shuts down due to failure.

Active operating type					Parameters status					Result	
LOFF	**L-C**	**L-SC**	**Rem**	**Net**	**Start/stop force command**	**Remote start/stop contact**	**Start/stop time schedule**	**Network emergency shutdown**	**General alarm**	**Control type**	**Unit state**
-	-	-	-	-	-	-	-	enabled	-	-	off
-	-	-	-	-	-	-	-	-	yes	-	off
active	-	-	-	-	-	-	-	-	-	local	off
active	-	-	-	-	-	-	-	-	-	local	on
-	-	active	-	-	-	-	unoccupied	-	-	local	off
-	-	-	active	-	-	open	-	-	-	remote	off
-	-	-	active	-	-	-	unoccupied	-	-	remote	off
-	-	-	-	active	disable	-	-	-	-	network	off
-	-	-	-	active	-	-	unoccupied	-	-	network	off
-	active	-	-	-	-	-	-	disabled	no	local	on
-	-	active	-	-	-	-	occupied	disabled	no	local	on
-	-	-	active	-	-	closed	occupied	disabled	no	remote	on
-	-	-	-	active	enable	-	occupied	disabled	no	network	on

IMPORTANT: When the unit is stopping or there is a demand to stop the unit, compressors are stopped smoothly.

In case of emergency stop, all compressors are stopped at the same time.

6.2 - Smart Grid Ready

The Smart Grid Ready ("SG Ready") label of the heat pump allows the energy supplier to access the heat pump and manage its four energy usage control states:

- Lockout state (LOCK)
- Normal operating state (NORMAL)
- Low current surplus state (BOOST)
- High current surplus state (FORCED)

NOTE: The Smart Grid Ready label is valid only in the DACH region (Germany, Austria, Switzerland).

To learn more about the Smart Grid Ready option and Smart Grid operating modes, please refer to Smart Grid Installation Instructions (see Appendix 1).

6.3 - Heating/Cooling/Standby

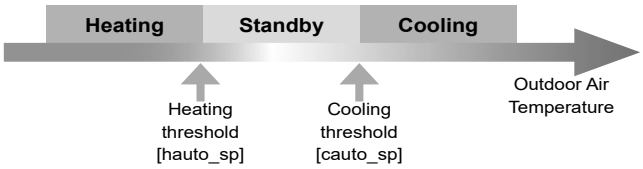
The control determines the heat/cool state of the unit. Heat pumps may operate in cooling or heating mode.

When the unit is in **Heating mode**, the control may utilise the boiler to satisfy the heating demand. The boiler is used when mechanical heating is impossible or insufficient. Additionally, when the outside air temperature is very low, electric heaters can be used as a form of supplemental heating.

When **Cooling mode** is selected, the unit will operate in the Cooling mode and, as a result, the boiler or electric heating will not be activated.

If the unit is in **Standby mode**, it does not cool or heat and compressors are stopped. The pump is running with no mechanical cooling or heating unless configured otherwise. The pump may be stopped depending on pumps configuration (PUMPCONF – Pump Configuration).

Heating/Cooling changeover for heat pumps



Operating mode control

The operating mode, i.e. cooling or heating, is determined based on the following parameters:

- Unit on/off status [STATUS]: Unit running status.
- Control type [CTRL_TYP]: Local, Remote or Network.
- Local heat/cool selection [HC_SEL]: Heat/Cool selection when the unit is running in Local mode.
- Remote heat/cool selection [HC_SW; ONOFF_SW]: Heat/Cool selection when the unit is running in Remote mode.
- Network heat/cool selection [CHIL_S_S; HC_SEL]: Heat/Cool selection when the unit is running in Network mode.
- Outdoor air temperature [OAT]: Heat/Cool setpoint selection when the automatic changeover has been enabled.

Control type	Heat / Cool (Local)	Heat / Cool (Remote)	Heat / Cool (Network)	Outdoor Air Temperature	Operating mode
local	cool	-	-	-	cooling
local	heat	-	-	-	heating
local	auto*	-	-	> cauto_sp + 1	cooling
local	auto*	-	-	< hauto_sp -1	heating
local	auto*	-	-	hauto_sp + 1 < oat < cauto_sp -1	standby
remote	-	on_cool	-	-	cooling
remote	-	on_heat	-	-	heating
remote	-	on_auto	-	> cauto_sp + 1	cooling
remote	-	on_auto	-	< hauto_sp - 1	heating
remote	-	on_auto	-	hauto_sp + 1< oat < cauto_sp - 1	standby
network	-	-	cool	-	cooling
network	-	-	heat	-	heating
network	-	-	auto*	> cauto_sp + 1	cooling
network	-	-	auto*	< hauto_sp - 1	heating
network	-	-	auto*	hauto_sp + 1 < oat < cauto_sp - 1	standby

* If auto changeover has been selected through user configuration; otherwise, by default set to “cooling”.

Legend
cauto_sp = cooling changeover setpoint (SETPOINT menu)
hauto_sp = heating changeover setpoint (SETPOINT menu)
oat = outdoor air temperature

6.4 - Heating/Cooling selection

Heating/Cooling selection applies to heat pumps only. Heating/cooling selection can be controlled in various ways, depending on the active operating type. By default, the heating mode is selected.

Heating/Cooling selection can be determined:

- Locally at the unit using the HC_SEL item in the GENUNIT menu
- Remotely via the heating/cooling selection contact, if the unit is in the Remote mode
- Via a network command if the unit is in the Network mode

Heating/Cooling mode can be set manually by the user or automatically by the control. When heating/cooling is automatic, the outdoor air temperature determines the heat/cool/standby changeover (see the SETPOINT menu for cooling and heating mode changeover thresholds). The automatic changeover is optional and requires user configuration (GENUNIT – General Parameters).

To set cooling / heating / auto changeover
1. Navigate to the *Main menu*.
2. Select *General Parameters* (GENUNIT).
3. Set *Heat/Cool Select* [HC_SEL].

Heat/Cool Select [HC_SEL]	
0	Cooling
1	Heating
2	Automatic changeover

To set cool / heat changeover setpoint
1. Navigate to the *Main menu*.
2. Select *Setpoint Configuration* (SETPOINT).
3. Set *Cool Changeover Setpt* [cauto_sp] or *Heat Changeover Setpt* [hauto_sp].

Cool Changeover Setpt [cauto_sp]	
3.9 to 50°C	23.9°C
39 to 122°F	75°F
Heat Changeover Setpt [hauto_sp]	
0 to 46.1°C	17.8°C
32 to 115°F	64°F

6.4.1 - Boiler control

Boiler is activated when the outside air temperature is below the user-configured boiler outdoor temperature threshold which is by default set to -10°C (14°F).

To set boiler OAT threshold
1. Navigate to the *Configuration menu*.
2. Select *Heat/Cool Configuration* (HCCONFIG).
3. Set *Boiler OAT Threshold* [boil_th].

Boiler OAT Threshold [boil_th]	
-15 to 15°C	-10°C
5 to 59°F	14°F

6.4.2 - Electric heating control

Electric heating stages can be activated as additional heating when OAT is below the user-configured electric heating OAT threshold which is by default set to 5°C (41°F).

Electric heating is allowed when:

- Unit is running at 100% capacity.
- Electric pull-down time elapsed [ehs_pull].
- OAT is below the OAT threshold [ehs_th].

There are three electric heating stages, where the last electric heating stage is used for back-up when the unit is down due to a detected fault.

To set electric heating OAT threshold
1. Navigate to the *Configuration menu*.
2. Select *Heat/Cool Configuration* (HCCONFIG).

3. Set *Elec Stage OAT Threshold* [ehs_th].

Elec Stage OAT Threshold [ehs_th]	
-5 to 21°C	5°C
23 to 70°F	41°F

IMPORTANT: Electric heating is not allowed when the demand limit is active on the unit.

6.5 - Customer pumps control

The control system can manage a customer pump. It can be single or dual water exchanger pump, determining each pump's motor on/off state and its speed.The motors of the dual pump cannot function at the same time. The pump is turned on and control by a 0.10V signal (Terminal block X1-112/X1-113) when the unit is running.

The pump is turned off when the unit is shut down due to an alarm. The pump can be started to protect the unit against frost or in particular operating conditions when the water exchanger heater is active.

If the pump has failed the unit's circuit is stopped and started again with the second pump's motor. If a single pump is configured, the unit shuts down.

Water flow management methods are as follows:

- Water flow control based on configurable constant speed
- Water flow control based on constant delta T on the water exchanger.

6.5.1 - Variable speed pumps control (Option 116V)

AWHP004 heat pumps may be fitted with one single variable speed pump per circuit. Variable speed pumps give the possibility of saving the pumping energy cost, providing precise water flow control and improving the overall performance of the system. The frequency inverter(s)continuously regulates the flow rate to minimise the pump power consumption at full load and part load.

Water flow management methods are as follows:

- Water flow control based on constant water delta pressure (the control continuously acts on the pump speed to ensure a constant delta pressure) - Option 116V only.
- Water flow control based on constant delta T on the water exchanger.
- Water flow control based on configurable constant speed
- Water flow control based on output pressure
- The hydronic kit option allows for continuous monitoring of the water flow rate (PUMPSTAT - Pump Status) and Drive Maintenance (DRV_CTRL)

Note: Variable speed pumps are always high pressure pumps.

To verify or modify the Pump water flow control method (from the Advanced Configuration Interface)

1. Navigate to the *Main Menu.*
2. Navigate to the *Configuration Menu.*
3. Select *Pump Configuration (PUMPCONF).*
4. Set the *Water Flow Ctrl Method [water_ct].*

NOTE: To enable Constant Speed Control, set the Pump Minimum Speed to the desired constant speed value.

6.5.2 - Pumps configuration

The control can command internal variable speed pumps as well as customer pumps.

Basic pump configuration can be performed via the Configuration menu (PUMPCONF – Pump Configuration). Only logged-in users can access the menu. The unit must be stopped.

IMPORTANT: Pump speed configuration can be performed only by experienced installer.

To set pumps sequence

1. Navigate to the Configuration menu.
2. Select *Pump Configuration* (PUMPCONF).
3. Set *Pumps Sequence* [pump_seq].

Pumps Sequence [pump_seq]	
0	No Pump
1	One Pump Only
2	Two Pumps Auto
3	Pump#1 Manual
4	Pump#2 Manual

6.5.3 - Automatic pump selection

If two pump motors (dual pump) are controlled and the reversing function has been selected (PUMPCONF – Pump Configuration), the control balances the pump run time to match the configured pump changeover delay.

If this delay has elapsed, the pump reversing function is activated.

For dual pumps, to set pump automatic rotation delay

1. Navigate to the Configuration menu.
2. Select *Pump Configuration* (PUMPCONF).
3. Set *Pump Auto Rotation Delay* [pump_del].

Pump Auto Rotation Delay [pump_del]	
24 to 3000h	48h

6.5.4 - Customer pumps configuration

Customer pumps may be configured as follows:

Pump available	Pumps sequence (PUMPCONF)
No pump	0 (no pump)
One single speed pump	1 (one pump only)
Two single speed pumps	2 (two pumps auto) 3 (pump#1 manual) 4 (pump#2 manual)
One variable speed pump	1 (one pump only)

For more information about actuators, see Water flow switch in section 3.9.

IMPORTANT: The variable speed pump can be set only by experienced installer.

6.5.5 - Pumps protection

The control provides the option to automatically start the pump each day at 14:00 for 2 seconds when the unit is off.

If the unit is fitted with a dual pump, the first pump motor is started on even days and the second pump motor is started on odd days. Starting the pump periodically for a few seconds extends the lifetime of the pump bearings and the tightness of the pump seal.

Periodical pump quick start can be selected via the Configuration menu (Pump Sticking Protection, PUMPCONF – Pump Configuration).

To set periodical pump quick start

1. Navigate to the Configuration menu.
2. Select *Pump Configuration* (PUMPCONF).
3. Set *Pump Sticking Protection* [pump_per].

Pump Sticking Protection [pump_per]	
No/Yes	Yes

6.5.6 - ECO pump mode

When the unit is in Standby mode (heating or cooling demand is satisfied), by default the SmartVu™2.0 control stops the pump periodically in order to save energy.

To verify or modify the Eco Pump configuration

1. Navigate to the Main menu.
2. Select *MODES [MODES]*.
3. Verify *Eco Pump Mode Active* [m_ecopmp].

Eco Pump Mode Active [m_ecopmp]	
No/Yes	Yes

To set the Eco Pump

1. Navigate to the Configuration menu.
2. Select *Pump Configuration [PUMPCONF]*.
3. Set *Eco Pump Enable [eco_pmp].*

Eco Pump Enable [eco_pmp]	
No/Yes	Yes

4. Set On/Off period [ecop_off] and [ecop_on]

Eco Pump Mode delay	
Eco Pump Mode Off [ecop_off]	5 mn
Eco Pump Mode On [ecop_on]	2 mn

6.6 - Control point

The control point represents the water temperature that the unit must produce. The required capacity can be decreased depending on the unit load operating conditions.

Control point = Active setpoint + Reset

The control point is calculated based on the active setpoint and the reset calculation. The forced value can be used instead of any other setpoint calculation only when the unit is in the Network operating type.

6.6.1 - Active setpoint

If Domestic Hot Water (DHW) mode is selected, the DHW setpoint or the Legionella setpoint will be applied when the unit is operating in this mode.

If one or more zones are enabled, the highest control point will be used in heating mode, while the lowest control point will be used in cooling mode.

Two setpoints (Comfort/Eco) can be selected. Depending on the current operation type, the active setpoint can be selected manually via the Main menu (GENUNIT – General Parameters), with the volt-free user contacts, with network commands (CCN, BACnet or Modbus) or automatically with the setpoint time schedule (schedule 2).

The following tables summarise possible selections depending on the control operating type (Local, Remote or Network) and the following parameters:

- **Heating or Cooling operating mode [hc_sel]:** Heat/Cool select (GENUNIT menu).
- **Setpoint selection [sp_sel]:** Setpoint select permits selection of the active setpoint if the unit is in the Local operating type (GENUNIT menu).
- **Setpoint switch status [SETP_SW]:** Remote Setpoint Switch (INPUTS menu).
- **Schedule 2 status [SP_OCC]:** Schedule for setpoint selection.

LOCAL OPERATING TYPE

Parameter status				Active setpoint
Heating/ cooling	Setpoint selection	Setpoint switch	Schedule 2 status	
cooling	sp-1	*	*	Cool Comfort Setpoint
cooling	sp-2	*	*	Cool Economy Setpoint
cooling	auto	*	occupied	Cool Comfort Setpoint
cooling	auto	*	unoccupied	Cool Economy Setpoint
heating	sp-1	*	*	Heat Comfort Setpoint
heating	sp-2	*	*	Heat Economy Setpoint
heating	auto	*	occupied	Heat Comfort Setpoint
heating	auto	*	unoccupied	Heat Economy Setpoint

*Any configuration.

REMOTE OPERATING TYPE

Parameter status				Active setpoint
Heating/ cooling	Setpoint selection	Setpoint switch	Schedule 2 status	
cooling	*	sp1 (open)	*	Cool Comfort Setpoint
cooling	*	sp2 (closed)	*	Cool Economy Setpoint
heating	*	sp1 (open)	*	Heat Comfort Setpoint
heating	*	sp2 (closed)	*	Heat Economy Setpoint

*Any configuration.

NETWORK OPERATING TYPE

Parameter status				Active setpoint
Heating/ cooling	Setpoint selection	Setpoint switch	Schedule 2 status	
cooling	sp-1	*	*	Cool Comfort Setpoint
cooling	sp-2	*	*	Cool Economy Setpoint
cooling	auto	*	occupied	Cool Comfort Setpoint
cooling	auto	*	unoccupied	Cool Economy Setpoint
heating	sp-1	*	*	Heat Comfort Setpoint
heating	sp-2	*	*	Heat Economy Setpoint
heating	auto	*	occupied	Heat Comfort Setpoint
heating	auto	*	unoccupied	Heat Economy Setpoint

*Any configuration.

6.6.2 - Reset

Reset means the active setpoint is modified so that less machine capacity is required. In the cooling mode the setpoint is increased, whereas in the heating mode it is decreased.

The reset can be based on the following possibilities:

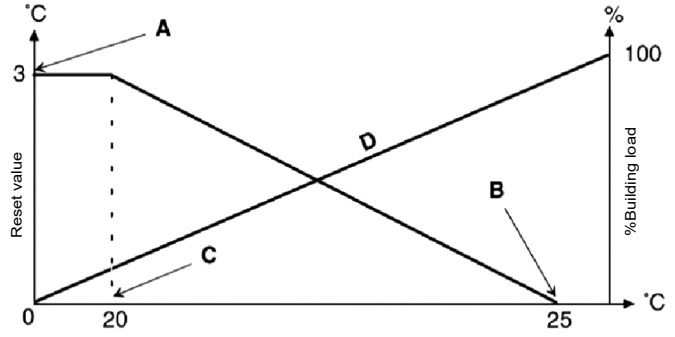
- OAT that gives the measure of the load trends for the building.
- Return water temperature (ΔT provides the average building load).
- Dedicated 4-20 mA input.

The reset source and the reset parameters can be configured in the Main menu (RESETCFG – Reset Configuration). In response to a drop in the reset source (e.g. OAT), the cooling setpoint is normally reset upwards to optimise unit performance.

The amount of reset is determined by linear interpolation based on the following parameters:

- A reference at which reset is zero (no reset value).
- A reference at which reset is maximum (full reset value).
- The maximum reset value.

Reset example in Cooling mode:



20	Reset based on OAT	25
0	Reset based on delta T	3
4	Reset based on analog input	20
no_reset	**Selection**	**full_reset**

Legend
A: Maximum reset value
B: Reference for zero reset
C: Reference for maximum reset
D: Building load

6.7 - Capacity limitation

SmartVu™2.0 allows for the constant control of the unit capacity by setting its maximum allowable capacity.

Capacity limitation is expressed in percentage, where a limit value of 100% means that the unit may run with its full capacity (no limitation is implemented).

The unit capacity can be limited:

- By means of user-controlled volt-free contacts. The unit capacity can never exceed the limit setpoint activated by this contact. The limit setpoints can be modified in the SETPOINT menu (See section 3.6.3).
- By lag limit set by the lead unit (lead/lag assembly). If the unit is not in the Lead/Lag assembly, the lag limit value is equal to 100%.
- By night mode limitation control. The demand limit value in the night mode is selectable if the value is below the selected limit.

To set limit setpoints
1. Navigate to the Main menu from the Advanced User Interface.
2. Select Setpoint (SETPOINT)
3. Set *Switch Limit Setpoint 1 / 2 / 3* [lim_sp1 / 2 / 3].

Switch Limit Setpoint 1 / 2 / 3 [lim_sp1 / 2 / 3]	
0 to 100%	100%

To set the night mode limit
1a. From the SmartUse Interface, navigate to the Setpoint 1 screen.
1b. Navigate to the Configuration menu from the Advanced User Interface.
2. Select *General Configuration* (GENCONF).
3. Set *Night Capacity Limit* [nh_limit].

Night Capacity Limit [nh_limit]	
0 to 100%	100%

Based on the limit source, the active **demand limit** value (DEM_LIM) is set to the lowest possible value.

DEM_LIM can be forced by Network.

To verify active demand limit value
1. Navigate to the Main menu.
2. Select *General Parameters* (GENUNIT).
3. Verify *Active Demand Limit Val* [DEM_LIM].

Active Demand Limit Val [DEM_LIM]	
0 to 100%	-

6.8 - Capacity control

The control adjusts the capacity to keep the water exchanger temperature at its setpoint. Compressors are started and stopped in a sequence designed to obtain the best unit performance.

The circuit initiates at low capacity for one minute, after which the capacity increases based on the user's load and external conditions.

For bi-module units, both circuits start simultaneously as the capacity increases.

6.9 - Night mode

Night mode enables the reduction of the unit's noise level by limiting the heat pump's capacity. This power limitation can be activated based on a weekly schedule (NIGHT).

To set the night mode
1. Navigate to the Schedule Menu.
2. Select *Night Mode Schedule*
3. From the Smart UI: Set Night Mode Limit capacity into Setpoint1 screen.
From the Advanced UI: Select *General Configuration* (GENCONF) and *Night Capacity Limit parameter* (nh_limit)

6.10 - Coil pressure control

AWHP004 units are fitted with variable speed fans providing higher part load efficiency and reduced acoustic levels. The coil pressure of each circuit is managed by one fan.

In cooling mode, the condensing pressure is controlled independently in each circuit based on the saturated condensing temperature. The control permanently adjusts its setpoint to guarantee optimal performance and ensure anti-short-cycle protection of the fans.

In heating mode, the evaporating pressure is controlled independently on each circuit based on the saturated suction temperature. The control permanently adjusts its setpoint to guarantee optimal performance, delay and limit frost accumulation on coils.

6.11 - Refrigerant leakage detection

The unit can be fitted with one R290 leakage detection sensor. In case the refrigerant leakage is detected, an alarm will be triggered and the compressor will be stopped (alarm 10227). Please note that the unit will be stopped only if the leakage alarm is enabled (USERCONF, leak_alm = "yes").

The refrigerant leak detection sensor helps to reduce the environmental impact in case of gas leakage. The leakage detector is NOT a life safety device.

To set the leakage detection warning (alert/alarm)
1. Navigate to the Configuration menu.
2. Select *User Configuration* (OPT_SEL).
3. Set *Leakage alarm? (159C)* [leak_alm].

Leakage alarm? (159C) [leak_alm]	
no	Circuit will NOT shut down when the refrigerant leakage is detected ("ALERT")
yes	Circuit will shut down when the refrigerant leakage is detected ("ALARM")

Regardless of leakage alarm configuration (OPT_SEL, leak_alm), whenever the refrigerant leakage is detected, the fan(s) will start when the unit is in Local OFF or running.

NOTE: Fans are running when the leakage detection alarm/ alert is present and 30 seconds after the alarm/alert condition has been resolved.

6.12 - Defrost control

When the outside air temperature is low and the ambient humidity is high, the probability of frost forming on the surface of the outdoor coil increases. The frost covering the outdoor coil may decrease the air flow across the coil and lead to lower performance of the unit. To remove the frost from the coil, the control initiates the defrost cycle when necessary.

During the defrost cycle, the circuit is forced into the cooling mode. To prevent the water loop from cooling down, optional electric heating may be started. The defrost cycle lasts until the end of defrost temperature is achieved.

To configure simultaneous or non simultaneous defrost on both circuit:
1. Navigate to the Configuration Menu.
2. Select *General Configuration (*GENCONF).
3. Set *Defrost A B simultaneous* [defrosAB].

Set Defrost A B simultaneous [defrosAB]	
Defrost A B simultaneous	Yes

To verify that a circuit is defrosting:
1. Navigate to the Main Menu.
2. Select *Outputs (*OUTPUTS).
3. Check *Defrost In progress A*.
4. Check *Defrost In progress B* (for bi-module unit).

NOTE: Defrost A and B output are wired to the X1 terminal block.

6.13 - Lead/Lag assembly (Option 58)

The control system allows for lead/lag control of two units and up to four linked by the CCN network. The lead unit can be controlled locally, remotely or by network commands (CCN), while the lag(s) unit remains in Network mode.

All control commands to the lead/lag assembly (start/stop, setpoint selection, heating/cooling operation, load shedding, etc.) are handled by the unit which is configured as the lead. The commands are transmitted automatically to the lag(s) unit.

If the lead heat pump is turned off, while the lead/lag function is active, then the lag heat pump will be stopped. Under certain circumstances, the lag unit may be started first to ensure that the run times of the two units are equalised.

In the event of a communication failure between the lead and the lag(s) units, each unit will return to an autonomous operating mode until the fault is cleared. If the lead unit is stopped due to an alarm, upon configuration (CASC_CFG hold_on parameter set) the lag unit is authorised to continue running.

The Subordinate (Lag) can be authorized to continue working in an autonomous mode, if the parameter CASC_CFG/hold_on is set, otherwise it is stopped when the communication timeout is reached.

To verify or modify the Lead/Lag configuration (from the Advanced Configuration Interface) - to do on the Lead unit
1. Navigate to the *Main Menu.*
2. Navigate to the *Configuration Menu.*
3. Select *Cascade Control (CASC_CFG).*
4. Set the *Cascade Role [role].*

Cascade Role [role]	
0	No Cascade
1	Subordinate (Lag)
2	**Manager (Lead)**

5. Set *Unit CCN address*.

Unit 1 CCN Address [u1_addr]	
Unit 1 CCN Addr (M)	Recommended: 1 (Lead)

Unit 2..4 CCN Address [u2..4_addr]	
Unit 2..4 CCN Addr (M)	Recommended: 2 (First Lag) 3 (Second Lag) 4 (Third Lag)

To verify or modify the Lead/Lag configuration (from the Advanced Configuration Interface) - for each Lag unit(s)
1. Navigate to the *Main Menu.*
2. Navigate to the *Configuration Menu.*
3. Select *Cascade Control (CASC_CFG).*
4. Set the *Cascade Role [role] to "1" (Lag).*

Cascade Role [role]	
0	No Cascade
1	**Subordinate (Lag)**
2	Manager (Lead)

NOTE: The Unit 1..4 CCN Address for Lag unit(s) does not need to be configured.

To verify or modify the Lead/Lag configuration (from the Advanced Configuration Interface) - for each unit (Lead/Lag)
1. Navigate to the *Main Menu.*
2. Navigate to the *Configuration Menu.*
3. Select *Control Identification (CTRL_ID).*
4. Set *CCN Element* number.

Control Identification (CTRL_ID)	
CCN Element number	Set the Element Number according to the Lead/Lag CCN Address configured in the Lead unit

NOTE: To verify or modify the Lead/Lag configuration from the SmartUse home screen, see section 4.1.3.

6.14 - Domestic Hot Water

According to DHW Schedule or the required Bypass, AWHP0004 heat pumps provide the ability to heat the Domestic Hot Water thanks to a water tank, a 3-way diverting valve (Option 347A) and a tank temperature sensor or a tank thermal switch.

The hot water produced by the heat pump will be diverted from the main heating loop to a coil located inside the hot water tank.

A tank temperature thermistor or a tank thermal switch will determine whether or not heating of the tank is required.

According to Legionella Prevention Schedule, Legionella prevention function is provided. Its goal is to kill the bacteria that could grow in the tank.

6.15 - Heating/Cooling Zones

The AWHP004 heat pump provide the ability to manage no zone, one zone or two zones.

Each zone(s) is equipped with a water temperature sensor, a water (fixed speed) pump and has its own independents setpoints (Comfort/Eco/Away).

Floor Heating sensor can be added and configured for a given zone.

In two zones configuration, each zone shall be equipped with a 3-way mixing valve.

Depending on the type of zone emitters (underfloor heating, fan coils, radiator), they can be configured with different water temperature setpoints.

6.16 - BACnet IP Communication protocol

The BACnet/IP communication protocol is used by a BMS or the programmable controllers to communicate with the SmartVu™2.0 control.

6.17 - ModBus RTU or TCP Communication protocol

The Modbus communication protocol is used by the BMS or the programmable controllers to communicate with the SmartVu™2.0 control.

6.18 - Trendings

This function enables to visualise the operations of the unit and monitor a set of selected parameters.

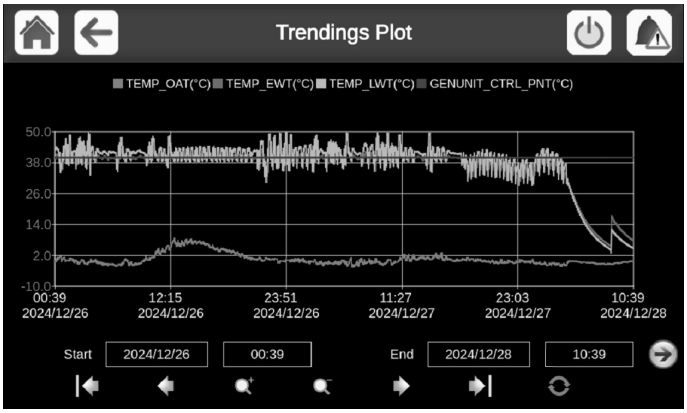
To display trends

1. Go to the *Main menu*.
2. Select *Trendings* (TRENDING).
3. Select parameters to be displayed and press the **Save** button in the lower-left part of the screen.
   - A maximum of 10 trending points can be selected.
   - On SmartVu™ 2.0 touch screen: Swipe up or swipe down to display other trending points.

Example: Trendings (SmartVu™ 2.0 touch screen)

4. Press the **Trending** button to display the graph showing trends for the set of selected parameters.

Example: Trendings plot (SmartVu™ 2.0 touch screen)



- Press to navigate across the timeline.
- Press the **Zoom in** button to magnify the view or the **Zoom out** button to expand the viewed area.
- Press the **Refresh** button (on SmartVu™ touch screen or on SmartVu™ 2.0 touch screen) to reload data.

7 - WEB CONNECTION

7.1 - General information

The SmartVu™ 2.0 control provides the functionality to access and control unit parameters from a web interface.

Pre-requisites:
- Ethernet cable

Minimum web browser configuration:
- Internet Explorer (version 11 or later)
- Mozilla Firefox (version 60 or later)
- Google Chrome (version 65 or later)

Three users can be connected simultaneously with no priority between them. The last modification is always taken into account.

7.2 - Connect to the web interface

To connect to the controller via the web interface, it is necessary to know the IP address of the unit. This can be verified on the touch screen (System Menu > Network > IP Network Interface).

- Unit default address: 169.254.1.1 (J15, eth0) or 192.168.100.100 (J16, eth1).
- The unit IP address can be changed from the System Menu.

To connect to the web interface

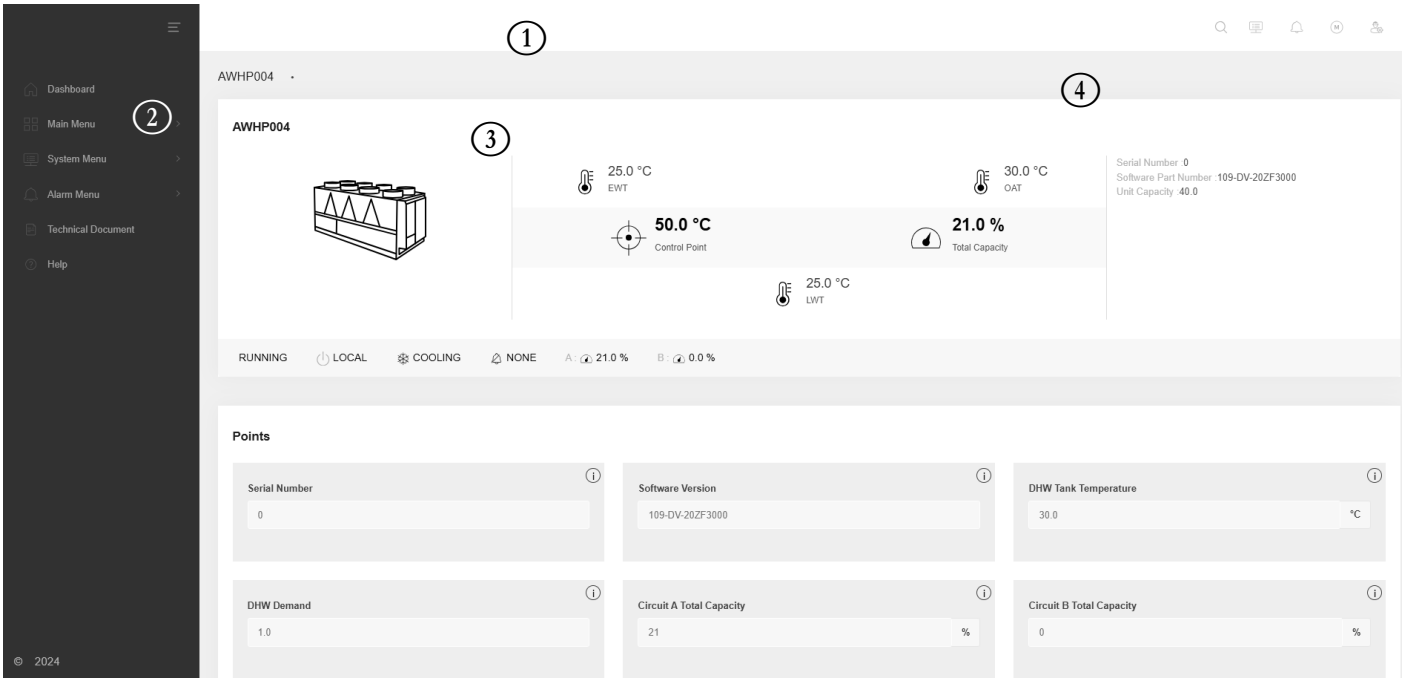
1. Open the web browser.
2. Enter the IP address of the unit in the address bar of the web browser. Start with ***https://*** followed by the unit IP address.

   Example: https://169.254.1.1
3. Press Enter.
4. The web interface will be loaded.

For security reasons the unit cannot be started / stopped via the web interface. All other operations, including monitoring unit parameters or unit configuration, can be performed via the web browser interface.

NOTE: Make sure that your network is protected from malicious attacks and any other security threats. Do not provide open access without proper network security safeguards. Carrier does not hold any responsibility or liability for damage caused by security breach.

7.3 - SmartVu™ 2.0 web interface



AWHP004 web interface (home screen)

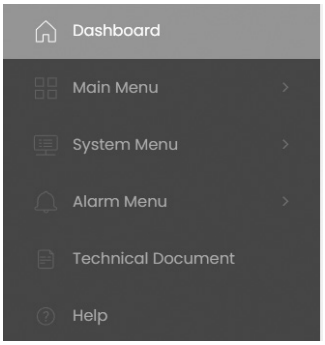
Web interface sections

① Address bar: Enter the IP address of the unit.

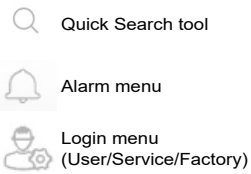
② The navigation pane on the left is used to switch between menus. Click/tap to expand/collapse the Navigation pane.

③ Main application window: Used to display the content of the selected menu.

Click/tap the menu icon in the navigation pane:



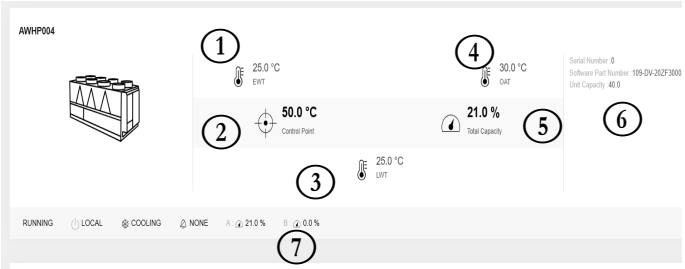
④ Quick access to Search, System menu, Alarm menu, Login and Start/Stop (read-only).



Dashboard

The Dashboard is the first view displayed when connecting to the web interface. It gives a clear and comprehensive view of the current operations of the heat pump. This view is made up of several tiles that are snapshots of data presented in textual or graphical form.

Example: AWHP004 status board



① Cooler EWT (Entering Water Temperature)

② Control point

③ Cooler LWT (Leaving Water Temperature))

④ Outside air temperature

⑤ Total capacity

⑥ Additional information:
- Serial number
- Software version
- Unit capacity

⑦ Status bar

- Unit status: OFF / RUNNING / STOPPING / DELAY / TRIPOUT / READY / OVERRIDE / RUN TEST / TEST
- Heat/Cool selection: COOLING / HEATING
- Alarm status: ALARM / NO ALARM
- Circuit A and Circuit B capacity

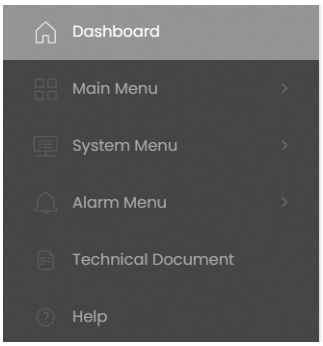
TIP: Hover over the image (or value) to see its description.

7.4 - Technical documentation

When using the SmartVu™2.0 control via a PC web browser, you may easily access all technical documents related to the product and its components.

Click “Technical Document”  in the navigation pane.

Click/tap the menu icon in the navigation pane:



Technical documentation includes the following documents:

- Spare parts documentation: The list of spare parts included in the unit with reference, description and drafting.
- Misc: Documents such as electrical plans, dimension plans, unit certificates.
- PED: Pressure Equipment Directive.
- IOM: Installation operation and maintenance manual, controls installation/maintenance manual.

Click “Help”  in the navigation pane.

Document	Language	Type
FC101 - Danfoss (Pump) Drive Troubleshooting	English	PDF
CDS203 - Danfoss (Compressor) Drive Troubleshooting	English	PDF
BACnet User's guide	English	PDF
BACnet Guide utilisateur	French	PDF
ModBus User's guide	English	PDF
ModBus Guide utilisateur	French	PDF
License information	English	PDF

IMPORTANT: Please save all data (documents, drawings, diagrams, etc.), for example, on your computer. If the display is replaced, all documents will be lost. Make sure that all documents are stored and may be accessed at any time.

8.1 - Control diagnostics

The control system has many fault tracing aid functions, protecting the unit against risks that could result in the failure of the unit. The local interface gives quick access to monitor all unit operating conditions. If an operating fault is detected, the alarm is triggered. Depending on the choice of Interface for the unit (Advanced User Interface/Easy User Interface), the appearance of alarm icons differs.

In the event of an alarm:

- The bell on the SmartVu™ 2.0 Advanced User Interface starts ringing.

The ringing yellow bell icon indicates that there is an alarm, but the unit is still running.

The ringing red bell icon indicates that the unit is shut down due to a detected fault.

- The bell on the SmartVu™ 2.0 Easy User Interface (SmartUse) starts ringing.

The orange bell icon indicates that there is an alarm/ alert, but the unit is still running.

The red bell icon indicates that the unit is shut down due to a detected fault.

- The corresponding alarm output(s) is/are activated.
- Error code is displayed.
- If configured, an alarm notification is sent over the network.

SmartVu™ 2.0 control distinguishes between two types of alarms:

- General alarms are used to indicate pumps failure, transducers faults, network connection problems, etc.
- Major alarms are used to indicate process failure.

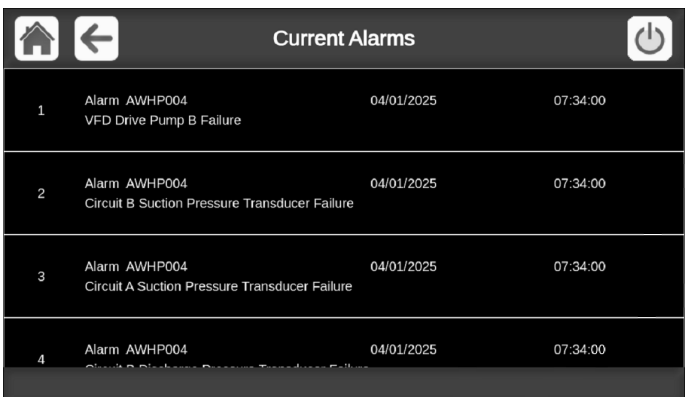
IMPORTANT: All information regarding alarms (current and past alarms) can be found in the Alarms menu (see also section 5.9).

8.2 - Displaying current alarms

The Current alarms menu may display up to 10 current alarms.

To access the list of currently active alarms

1. Press the **Alarms menu** button in the upper-right part of the screen.
2. Select *Current Alarms* (ALAM_CUR).
3. The list of active alarms will be displayed.



8.3 - E-mail notifications

The control provides the option to define one or two recipients who receive e-mail notifications each time the new alarm occurs or all existing alarms have been reset.

To define e-mail recipients

1. Switch to **Advanced config interface.**
2. Press the **Main menu** button and navigate to the Configuration menu.
3. Go to the Network menu.
4. Select *Email Configuration* (EMAILCFG).
5. Define user e-mail(s).

8.4 - Resetting alarms

The alarm can be reset either automatically by the control or manually through the touch panel display or the web interface.

- The Reset alarms menu displays up to 5 alarm codes which are currently active on the unit.
- Alarms can be reset without stopping the machine.
- Only logged-in users can reset the alarms on the unit.

To reset the alarm manually

1. Switch to **Advanced config interface.**
2. Press the **Alarms menu** button in the upper-right part of the screen
3. Select *Reset Alarms* (ALARMRST).
4. Set “Alarm Reset” to “Yes” and press the **Force** button.

In the event of a power supply interrupt, the unit restarts automatically without the need for an external command. However, any faults active when the supply is interrupted are saved and may in certain cases prevent a circuit or a unit from restarting. Once the cause of the alarm has been identified and corrected, it will be displayed in the alarm history.

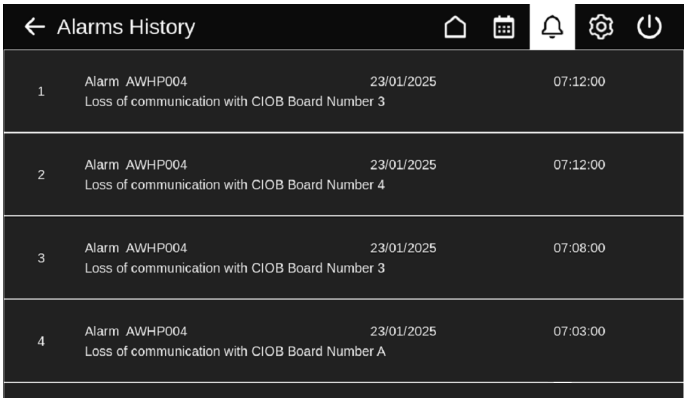
IMPORTANT: Not all alarms can be reset by the user. Some alarms are reset automatically when operating conditions return to normal.

8.5 - Alarm history

Information regarding resolved alarms is stored in the Alarm history menu which is divided into 50 recent alarms and 50 recent major alarms.

To access the alarm history

1. Press the **Alarms menu** button in the upper-right part of the screen.
2. Select *Alarms History* (ALARHIST) or *Major Alarms History* (ALARHIS2).
3. The history of alarms will be displayed.



8.6 - Alarm description

8.6.1 - Alarms

Parameter*	Code	Alarm description	Reset type	Action taken	Possible cause
Thermistor failure					
ALM_EWT_F	15001	Water Exchanger Entering Fluid Thermistor Failure	Automatic, if thermistor reading returns to normal	Unit shuts down	Defective thermistor or connection
ALM_LWT_F	15002	Water Exchanger Leaving Fluid Thermistor Failure	As above	Unit shuts down	As above
ALM_DEFROST_T_A_F	15003	Circuit A Defrost Thermistor Failure	As above	Cooling mode: Unit continues to operate Heating mode: Circuit A shuts down	As above
ALM_DEFROST_T_B_F	15004	Circuit B Defrost Thermistor Failure	As above	Cooling mode: Unit continues to operate Heating mode: Circuit B shuts down	As above
ALM_OAT_F	15010	OAT Thermistor Failure	As above	Unit shuts down	As above
ALM_CWST_F	15011	Lead/Lag Common Fluid Thermistor Failure	As above	Lead/Lag operation is disabled and the unit returns to the stand-alone mode	As above
ALM_WTANK_T_F	15053	Water Tank Output Thermistor Failure	As above	The alert shall be raised depending on "Tank Efficiency Alert" setting [tnk_alrt] in the Heat/Cool Configuration menu (HCCONFIG). The relay shall be energized depending on "Alarm Relay for Alerts?" setting [alert_r] in the User Configuration menu (USERCONF).	As above
ALM_SUCTION_T_A_F	15012	Circuit A Suction Gas Thermistor Failure	As above	Circuit A shuts down	As above
ALM_SUCTION_T_B_F	15013	Circuit B Suction Gas Thermistor Failure	As above	Circuit B shuts down	As above
ALM_DICHARGE_T_A_F	15015	Circuit A Discharge Gas Thermistor Failure	As above	Unit shuts down	As above
ALM_DICHARGE_T_B_F	15016	Circuit B Discharge Gas Thermistor Failure	As above	Unit shuts down	As above
ALM_LIQUID_T_A_F	15018	Circuit A Condenser Subcooling Liquid Thermistor Failure	As above	This alarm is only a warning	As above
ALM_LIQUID_T_B_F	15019	Circuit B Condenser Subcooling Liquid Thermistor Failure	As above	This alarm is only a warning	As above
ALM_OAT_OPT_F	15021	Optional OAT Thermistor Failure	As above	The unit shall continue to run	As above
ALM_WT_Z1_F	15065	Zone #1 Water Loop Thermistor Failure	As above	The unit shall continue to run	As above
ALM_WT_Z2_F	15066	Zone #2 Water Loop Thermistor Failure	As above	The unit shall continue to run	As above
ALM_FLOOR_T_F	15067	Zone #1 Floor Temperature Thermistor Failure	As above	The unit shall continue to run	As above
ALM_DHWT_F	15068	Domestic Hot Water Thermistor Failure	As above	The unit shall continue to run	As above
Transducer failure					
ALM_DP_A_F	12001	Circuit A Discharge Pressure Transducer Failure	Automatic, if sensor voltage reading returns to normal	Circuit A shuts down	Defective transducer or connection
ALM_DP_B_F	12002	Circuit B Discharge Pressure Transducer Failure	As above	Circuit B shuts down	As above
ALM_SP_A_F	12004	Circuit A Suction Pressure Transducer Failure	Null voltage: Automatic (three alarms in the last 24 hours) or Manual Impossible value: Manual	Circuit A shuts down	As above
ALM_SP_B_F	12005	Circuit B Suction Pressure Transducer Failure	As above	Circuit B shuts down	As above
ALM_WP_IN_F	12024	Water Exchanger : Entering Fluid Transducer Failure	Automatic, if sensor voltage reading returns to normal	Circuit shuts down	As above
ALM_WP_OUT_F	12025	Water Exchanger : Leaving Fluid Transducer Failure	As above	Circuit shuts down	As above

Parameter*	Code	Alarm description	Reset type	Action taken	Possible cause
Communication failure					
ALM_CIOB_CIR_A_ COM_F	4951	Loss of communication with CIOB Board Number A	Automatic, if communication is re-established	Unit shuts down	Bus installation fault, communication error
ALM_CIOB_CIR_B_ COM_F	4952	Loss of communication with CIOB Board Number B	As above	Unit shuts down	As above
ALM_CIOB_3_COM_F	4953	Loss of communication with CIOB Board Number 3	As above	Unit shuts down	As above
ALM_CIOB_4_COM_F	4954	Loss of communication with CIOB Board Number 4	As above	Unit shuts down	As above
ALM_CIOB_5_COM_F	4955	Loss of communication with CIOB Board Number 5	As above	Unit shuts down	As above
ALM_COMP_DRIVE_A_ COM_F	4701	Loss of communication with VFD Comp Drive Circuit A	As above	Units with one drive on the circuit: Circuit A shuts down Units with two drives on the circuit: Circuit A continues to run as long as one of two drives is communicating with the controller *Note: Circuit A shuts down if communication with both drives is lost.*	As above
ALM_COMP_DRIVE_B_ COM_F	4702	Loss of communication with VFD Comp Drive Circuit B	As above	As above	As above
ALM_PUMP_DRIVE_A_ COM_F	4703	Loss of communication with VFD Pump Drive Circuit A	As above	Circuit A shuts down	As above
ALM_PUMP_DRIVE_B_ COM_F	4704	Loss of communication with VFD Pump Drive Circuit B	As above	Circuit B shuts down	As above
CTRLID_DEV_NAME	5001	Loss of communication with Leak detector A	As above	Regardless of leakage alarm configuration (USERCONF, leak_alm = "yes" or "no"), the fan(s) will start when the unit is in Local OFF or running. Note: Fans are running when this alert is present and 30 seconds after the alert condition has been resolved.	As above
Process failure					
ALM_COOLER_ FREEZE_F	10001	Water Exchanger Freeze Protection	Automatic (the first alarm in the last 24 hours) or Manual	Unit shuts down, but the pump continues to run	No water flow, defective thermistor
ALM_LOW_ SUCTION_A_F	10005	Circuit A Low Saturated Suction Temperature	As above	Circuit A shuts down	Pressure transducer defective, EXV blocked or lack of refrigerant
ALM_LOW_ SUCTION_B_F	10006	Circuit B Low Saturated Suction Temperature	As above	Circuit B shuts down	As above
ALM_HIGH_SH_A_F	10008	Circuit A High Superheat	Manual	Circuit A shuts down	Pressure transducer defective, temperature sensor defective, EXV blocked or lack of refrigerant
ALM_HIGH_SH_B_F	10009	Circuit B High Superheat	Manual	Circuit B shuts down	As above
ALM_LOW_SH_A_F	10011	Circuit A Low Superheat	Manual	Circuit A shuts down	As above
ALM_LOW_SH_B_F	10012	Circuit B Low Superheat	Manual	Circuit B shuts down	As above
ALM_INTER_LOCK_F	10014	Customer Interlock Failure	Automatic (the unit is OFF) or Manual	Unit shuts down	Customer interlock input set on
ALM_CPA1_REVERSE_ ROT_F	10016	Compressor A1 Not Started or Pressure Increase Not Established	Manual	Compressor A shuts down	Compressor breaker or fuse fault, compressor switch open
ALM_CPB1_REVERSE_ ROT_F	10020	Compressor B1 Not Started or Pressure Increase Not Established	Manual	Compressor B shuts down	As above
ALM_CASCADE_COM_F	10030	Cascade Communication Failure	Automatic, if communication is re-established	Lead/Lag operation is disabled and the unit returns to the stand-alone mode	As above
Service and factory					

Parameter*	Code	Alarm description	Reset type	Action taken	Possible cause
ALM_CASC_MAN_ PROCESS_F	90nn	Cascade Manager Process error 01: Sub Unit 1 unreachable or uncontrollable 02: Sub Unit 2 unreachable or uncontrollable 04: Sub Unit 3 unreachable or uncontrollable 08: Sub Unit 4 unreachable or uncontrollable 01-15: One or more Sub Units unreachable or uncontrollable 16: No CWST sensor found in the all declared Sub Units	Automatic, if cascade configuration returns to normal	Lead/Lag operation is disabled and the unit returns to the stand-alone mode	Configuration failure
ALM_INI_FACT_CONF_F	8000	Initial factory configuration required	Automatic, if configuration is provided	Unit cannot be started	No factory configuration
ALM_ILL_FACT_CONF_F	70nn	Illegal configuration 01: Undefined unit size 02: Undefined water pump 03: EHS on Cooling Only unit is forbidden 04: Regarding compressor reference, the mounted drive is not the right one	Automatic, if configuration is corrected	Unit cannot be started	7001: Undefined unit size 7002: Undefined water pump 7003: EHS on Cooling Only unit is forbidden 7004: Regarding compressor reference, the mounted drive is not the right one
Process failure					
ALM_NETWORK_ EMSTOP_F	10031	Unit is in Network Emergency Stop	Automatic, if emergency stop is deactivated	Unit shuts down	Network emergency stop command
ALM_COOL_PUMP1_F	10032	Cooler Pump 1 Default	Automatic, if the alarm was triggered max 20 seconds before low voltage alarm (57001). Otherwise, reset shall be manual	Unit is restarted with another pump running. If no pumps are available, the unit shuts down	Evaporator flow switch or evaporator pump fault
ALM_COOL_PUMP2_F	10033	Cooler Pump 2 Default	As above	As above	As above
ALM_HIGH_SDT_A_F	10037	Circuit A High Saturated Discharge Temperature	Automatic (no discharge gas override within 30 min) or Manual (the counter forced to 0)	None	Repetitive capacity decreases
ALM_HIGH_SDT_B_F	10038	Circuit B High Saturated Discharge Temperature	As above	None	As above
ALM_HEAT_LOW_ EWT_F	10043	Low Entering Water Temperature In Heating	Automatic (EWT returns to normal or Heating mode is disabled)	None	Low entering fluid temperature in Heating mode
ALM_EXCH_A_FLOW_F	10051	Water Exchanger A Flow Switch Failure	Automatic or manual if more than 6 occurences per day (when the circuit is running)	Circut A shuts down	Flow switch problem
ALM_EXCH_B_FLOW_F	10052	Water Exchanger B Flow Switch Failure	As above	Circuit B shuts down	As above
ALM_HP_SWITCH_A_F	10063	Circuit A High Pressure Switch Failure	As above	Circuit A shuts down	The High pressure switch is connected to the Compressor Drive
ALM_HP_SWITCH_B_F	10064	Circuit B High Pressure Switch Failure	As above	Circuit B shuts down	As above
ALM_HIGH_DGT_A_F	10078	Circuit A High Discharge Gas Temperature	Automatic	Circuit A shuts down	As above
ALM_HIGH_DGT_B_F	10079	Circuit B High Discharge Gas Temperature	Automatic	Circuit B shuts down	As above
ALM_FLOW_ CONFIG_A_F	10090	Cooler A Flow Switch Setpoint Configuration Failure	Manual	Unit shuts down	Flow switch communication
ALM_FLOW_ CONFIG_B_F	10390	Cooler B Flow Switch Setpoint Configuration Failure	As above	Unit shuts down	As above
ALM_SENSORS_ SWAP_A_F	10097	Water Exchanger Temperature Sensors Swapped or 4-way-valve not switching	Manual	Unit shuts down	Input and output temperature reversed
Service maintenance warning					

Parameter*	Code	Alarm description	Reset type	Action taken	Possible cause
ALM_SERVICE_MAINT_ ALERT	13nnn	Service maintenance alert 001: Circuit A Loss of Charge 002: Circuit B Loss of Charge 003: Water Loop Size Warning 004: Maintenance Servicing Required 007: Refigerant check needed (ALM_REFRIG_LEAK_DET).	Manual (13001-13003) Automatic (13004), if the new date is set by service technicians	Depending on the severity of the alarm, the unit may continue to operate or the unit shuts down	Servicing action required. Please contact your local Service representative
VFD drive failure					
ALM_COP_DRIVE_A_F	17nnn	Circuit A VFD Compressor Drive 1 Failure	Manual	Circuit A shuts down	Speed controller fault (see also section 8.6.4)
ALM_COP_DRIVE_B_F	18nnn	Circuit A VFD Compressor Drive 2 Failure	Manual	Circuit B shuts down	As above
ALM_PUMP_DRIVE_A_F	19nnn	VFD Pump Drive 1 Failure	Manual	Unit shuts down	
ALM_PUMP_DRIVE_B_F	20nnn	VFD Pump Drive 2 Failure	Manual	Unit shuts down	
CIOB board failure					
ALM_CIOB_A_LOW_ VOLT_F	57001	Circuit A CIOB Low Voltage Failure	Automatic, if the alarm occurred not more than 6 times in the last 24 hours (otherwise manual)	Unit shuts down	Unstable electrical supply or electrical issue
ALM_CIOB_B_LOW_ VOLT_F	57002	Circuit A CIOB Low Voltage Failure	As above	Unit shuts down	As above
ALM_CIOB_3_LOW_ VOLT_F	57003	CIOB#3 Low Voltage Failure	As above	Unit shuts down	As above
ALM_CIOB_4_LOW_ VOLT_F	57004	CIOB#4 Low Voltage Failure	As above	Unit shuts down	As above
ALM_CIOB_5_LOW_ VOLT_F	57004	CIOB#5 Low Voltage Failure	As above	Unit shuts down	As above
Transducer failure					
ALM_WP_IN_F	12024	Water Exchanger Entering Fluid Transducer Failure	Automatic, if sensor voltage reading returns to normal	Unit shuts down, water pressure calibration erased	Defective transducer or connection
ALM_WP_OUT_F	12025	Water Exchanger Leaving Fluid Transducer Failure	As above	As above	As above
Process failure					
ALM_WL_PRESS_Z_ ERROR_F	11202	Cooler Water Loop : Delta Pressure Error	Automatic, if water pressure delta returns to normal	Unit shuts down	Too low or high water pressure reading
ALM_WL_PRESS_TOO_ LOW_F	11203	Cooler Water Loop : Pressure Too Low	Automatic, if water pressure reading returns to normal and the alarm occurred not more than 6 times in the last 24 hours (otherwise manual)	Unit shuts down	Low pump inlet pressure is below 60 kPa
ALM_WL_PUMP_NO_ START_F	11204	Cooler Water Loop : Pump Not Started	Automatic	Pump is stopped	Too low or high water pressure reading
ALM_WL_PRESS_ERR_ RTST_F	11205	Cooler Water Loop : Pressure Error During Runtest	Manual	Unit shuts down	Too low or high water pressure reading
ALM_WL_PUMP_ OVERLOAD_F	11206	Cooler Water Loop : Pump Overload	Automatic	Pump speed shall be reduced by 1%/s	Water flow is above
ALM_WL_PRESS_ CROSS_F	11208	Cooler Water Loop : Pressure Sensors Crossed	Automatic	Unit shuts down	Pressure sensors crossed
ALM_WL_LOW_PRESS_ WARN_F	11209	Cooler Water Loop : Low Pressure Warning	Automatic, if water pressure reading returns to normal	None	Evaporator water pressure is below 100 kPa
ALM_HP_SWITCH_A_F	10063	Circuit A High Pressure Switch Failure	Manual	Circuit A shuts down	Switch fault
ALM_HP_SWITCH_B_F	10064	Circuit B High Pressure Switch Failur	Manual	Circuit B shuts down	As above
Domestic Hot Water failure					
ALM_DHW_DIV_F	11320	Domestic Hot Water Diverting Valve Position Failure	Automatic, when the sensor returns to normal	Unit shall continue to run	If the DHW Diverting Valve is requested to open

Parameter*	Code	Alarm description	Reset type	Action taken	Possible cause
Zone(s) failure					
ALM_WT_Z1_ EXCEEDED_F	11331	Zone 1 Water Temperature Exceeded	Automatic, after alarm condition disappears	Unit shall continue to run	Heat Mode and Zone Water Temperature is above Zone Control Point or Floor Temperature is configured on Zone and is above Floor Temperature Safety Threshold
ALM_WT_Z2_ EXCEEDED_F	11332	Zone 2 Water Temperature Exceeded	As above	Unit shall continue to run	As above
Service maintenance warning					
ALM_TANK_EHS_LOW_ EFF_F	10109	Tank EHS Low Efficiency Alert	Automatic	EHS shall be checked by a technician	The Heat produced by water tank's EHS is too low
Replacement mode: Software Activation Key(s) missing					
ALM_DEMO_SW_ PROT_F	10122	Replacement mode: Please contact your local Service representative to activate options	Automatic, if Software Activation Key is installed Automatic, if Software Activation Key is not provided within 7 days since the first compressor start (the alarm will be reset and software - protected options will be blocked)	Replacement Mode: Please contact your local Service representative to obtain activation key(s) to retrieve (or activate) software options	SmartVu™ controller was replaced, but Software Activation Key is not installed (see section 6.22.2)
Process failure					
ALM_LOW_SCT_A_F	10210	Circuit A Low Saturated Discharge Temperature	Automatic (three alarm occurrences in the last 24 hours), otherwise manual Automatic reset is active when the capacity of the circuit is 0%	Unit shuts down	The compressor is running outside its limits
ALM_LOW_SCT_B_F	10211	Circuit B Low Saturated Discharge Temperature	As above	Unit shuts down	As above
Configuration failure					
ALM_ILL_BRAND	8001	Illegal Brand Identifier	Automatic, if configuration is corrected	Unit not allowed to start	Incorrect unit configuration
Software failure					
ALM_LENSCAN_F	56001	Lenscan module Failure	Automatic	Unit shuts down	Software problem. Contact service technicians.
Leakage detector failure					
ALM_G_LEAK	10227	Gas Leak detected	Automatic, when the sensor returns to normal	For units with leakage alarm enabled (USERCONF, leak_ alm = "yes"): Circuit A shuts down when the refrigerant leakage is detected ("alarm") For units with leakage alarm disabled (USERCONF, leak_alm = "no"): No action ("alert" only) Note: Regardless of leakage alarm configuration (USERCONF, leak_alm = "yes" or "no"), fans are running when this alarm/alert is present and 30 seconds after the alarm/alert condition has been resolved..	Refrigerant leakage detected (LFL is above the preconfigured gas threshold)

Note: The alarm name in parameter column refer to ModBus register list document (parameter column) and BACnet Object documentation (Object name column)

8.6.2 - Compressors and pumps drive alarms

Compressor drive alarms are displayed based on the following formula:

- 17-YYY to 18-YYY (17=A, 18=B) for alarms (YYY stands for the alarm code).

Pump drive alarms are displayed based on the following formula:

- 19-YYY to 20-YYY (19=A pump #1, 20=B pump #2) for alarms (YYY stands for the alarm code).

Compressors drive alarms

Code	Description	Code Ref.	Action to be taken
0	No Fault or No Trip	*no-Flt*	Please contact your local Service representative if more information is needed
3	Instantaneous over current	*0-1*	As above
4	Motor Thermal Overload (I2t)	*1_t-trP*	As above
5	Power stage trip	*PS-trP*	As above
6	Over voltage on DC bus	*0-Uolt*	As above
7	Under voltage on DC bus	*U-Uolt*	As above
8	Heatsink over temperature	*0-t*	As above
9	Under temperature	*U-t*	As above
10	Factory Default parameters have	*P-dEF*	As above
11	External trip	*E-triP*	As above
12	Optibus comms loss	*SC-0b5*	As above
13	DC bus ripple too high	*Flt-dc*	As above
14	Input phase loss trip	*P-L055*	As above
15	Instantaneous over current on drive output	*h 0-1*	As above
16	Faulty thermistor on heatsink	*th-Flt*	As above
17	Internal memory fault (IO)	*dAtA-F*	As above
18	4-20mA Signal Lost	*4-20 F*	As above
19	Internal memory fault (DSP)	*dAtA-E*	As above
20	User Default Parameters Loaded	*U-dEF*	As above
21	Motor PTC thermistor trip	*F-Ptc*	As above
22	Cooling Fan Fault	*FAn-F*	As above
23	Environmental temperature too high	*0-hEAt*	As above
26	Drive output fault	*OUT-F*	As above
-	Safety circuit momentarily opened during drive running	*E-trP*	As above
29	Slow rising edge on 24V supply Safety input circuit error	*Sto-F*	As above
31	Locked Rotor	*LocHEd*	As above
40	Measured motor stator resistance varies between phases	*AtF-01*	As above
41	Measured motor stator resistance is too large	*AtF-02*	As above
42	Measured motor inductance is too low	*AtF-03*	As above
43	Measured motor inductance is too large	*AtF-04*	As above
44	Measured motor parameters are not convergent	*AtF-05*	As above
49	Motor output phase loss	*OUt-Ph*	As above
50	Modbus comms loss fault	*SC-F01*	As above

Pumps drive alarms

Code	Description	Warning.	Alarm	Trip Lock	Action to be taken
2	Live zero error	*(X)*	*(X)*	-	Please contact your local Service representative if more information is needed
3	No motor	*(X)*	-	-	As above
4	Mains phase loss	*(X)*	*(X)*	*(X)*	As above
7	DC over voltage	*X*	*X*	-	As above
8	DC under voltage	*X*	*X*	-	As above
9	Inverter overloaded	*X*	*X*	-	As above
10	Motor ETR overtemperature	*(X)*	*(X)*	-	As above
11	Motor thermistor overtemperature	*(X)*	*(X)*	-	As above
13	Overcurrent	*X*	*X*	*X*	As above
14	Ground fault	*X*	*X*	*X*	As above
16	Short circuit	-	*X*	*X*	As above
17	Control word time-out	*(X)*	*(X)*	-	As above
24	Fan fault (Only on 400 V 30-90kW)	*X*	*X*	-	As above
30	Motor phase U missing	-	*(X)*	*(X)*	As above
31	Motor phase V missing	-	*(X)*	*(X)*	As above
32	Motor phase W missing	-	*(X)*	*(X)*	As above
38	Internal fault	-	*X*	*X*	As above
44	Ground fault 2	-	*X*	*X*	As above
46	Gate drive voltage fault	-	*X*	*X*	As above
47	24 V supply low	-	*X*	*X*	As above
50	AMA calibration failed	-	*X*	-	As above
51	AMA check U_{nom} and I_{nom}	-	*X*	-	As above
52	AMA low I_{nom}	-	*X*	-	As above
53	AMA motor too large	-	*X*	-	As above
54	AMA motor too small	-	*X*	-	As above
55	AMA parameter out of range	-	*X*	-	As above
56	AMA interrupted	-	*X*	-	As above
57	AMA time-out	-	*X*	-	As above
58	AMA internal fault	*X*	*X*	-	As above
59	Current limit	*X*	-	-	As above
60	External interlock	-	*X*	-	As above
66	Heat sink temperature low	*X*	-	-	As above
69	Power card temperature	*X*	*X*	*X*	As above
79	Illegal PS config	*X*	*X*	-	As above
80	Frequency converter initialised to default value	-	*X*	-	As above
84	LCP error	*X*	-	-	As above
87	Auto DC brake	*X*	-	-	As above
92	No-Flow	*(X)*	*(X)*	-	As above
95	Broken belt	*X*	*X*	-	As above
99	Locked rotor	-	*X*	*X*	As above
126	Motor rotating	-	*X*	-	As above
127	Back EMF too high	*X*	-	-	As above
201	Fire mode	*X*	-	-	As above
202	Fire mode limit exceeded	*X*	-	-	As above
250	New spare parts	-	*X*	*X*	As above
251	New type code	-	*X*	*X*	As above

*(X) Dependent on parameter.

9 - MAINTENANCE

In order to ensure the optimal operation of the equipment as well as the optimisation of all the available functionalities, it is recommended to activate a Maintenance Contract with your local Carrier Service Agency.

The contract will ensure your Carrier equipment is regularly inspected by Carrier Service specialists, so that any malfunction is detected and corrected quickly, and no serious damage can occur to your equipment.

The Carrier Service Maintenance Contract represents not only the best way to ensure the maximum operating life of your equipment, but also, through the expertise of Carrier qualified personnel, the optimal tool to manage your system in a cost-effective manner.

10 - APPENDIX 1: SMART GRID READY INSTALLATION INSTRUCTIONS

10.1 - Introduction

The increase in renewable electricity generation is leading more and more to load fluctuations. These fluctuations can be intelligently compensated by smart grid systems which combined with heat pumps allow an efficient use of energy. Electrical energy can be converted into thermal energy (heat) and the heat can be stored with the use of a water tank.

The Smart Grid Ready ("SG Ready") label of the heat pump allows the energy supplier to access the heat pump and manage its four energy usage control states. These states are activated through two inputs (SGR0_BST and SGR1_LCK).

The Smart Grid Ready label is valid only in the DACH region (Germany, Austria, Switzerland).

This document contains information about four “energy usage” control states supported by the heat pump and gives instructions on how the system should be configured by an installer.

It is strongly recommended to read the whole document prior to starting any installation or maintenance procedures. Please note that screenshots provided in this manual are solely for the purpose of illustration and they may differ from the actual look.

10.2 - Configuration of Smart Grid Ready option

To set Smart Grid Ready

At commissioning from the Quick Configuration System screen (see section 4.1.3).

From Advanced Configuration Interface, with the user access:

1. Navigate to the *Configuration Menu.*
2. Select *Option Selection* (OPT_SEL)
3. Set *Enable Smart Grid Ready* (smrtGrid) to Yes

Smart Grid Ready inputs

Two digital inputs (SGR0_BST and SGR1_LCK) are used to allow the energy supplier to control the heat pump and enhance load management.

After wiring these two digital inputs (SGR0_BST and SGR1_LCK) to the energy supplier module and enabling the “SG Ready” option, the Smart Grid Ready option offers four energy control modes (1 = LOCK, 2 = NORMAL, 3 = BOOST, 4 = FORCED).

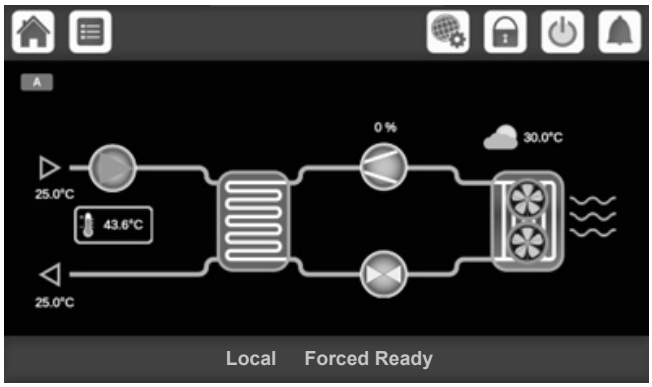
The status of Smart Grid inputs can be verified in the Inputs menu on the local touch screen.

To verify the status of Smart Grid inputs

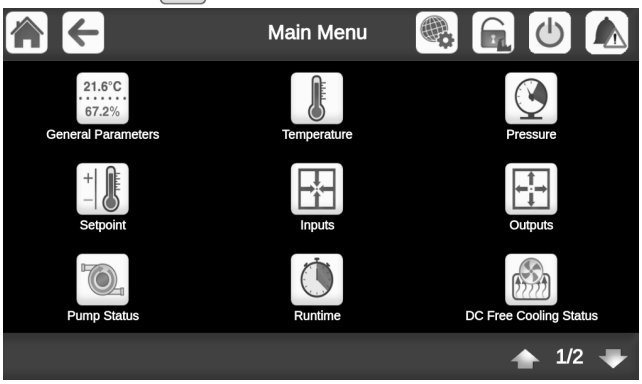
From Smart UI: see section 4.2.4

From Advanced UI: as shown below

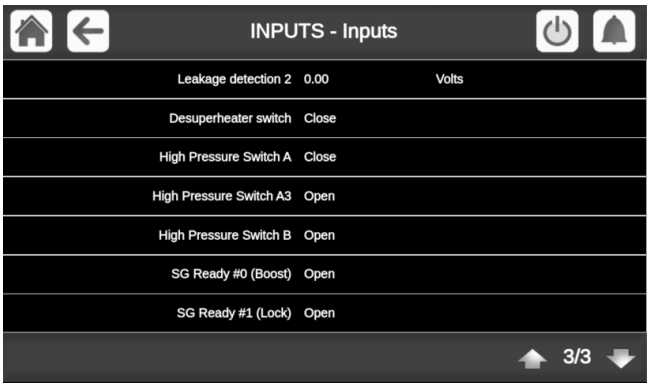
1. Tap  to open the Main Menu.



2. Select "Inputs" 



3. The Inputs menu will be displayed.



4. Go to the third page of the “Inputs” menu to find the status of Smart Grid Ready Inputs:
   - SG Ready #0 (Boost),
   - SG Ready #1 (Lock).

10.3 - Smart Grid Ready operating modes

For heat pumps with Smart Grid enabled, there are four control states ("energy control modes") available.

The active mode depends on SGR1_LCK and SGR0_BST signals:

State	Name	SGR1_LCK	SGR0_BST
1	LOCK	1	0
2	NORMAL	0	0
3	BOOST	0	1
4	FORCED	1	1

Smart Grid operating modes:

- **Lockout state (1 = LOCK):** In this mode, the heat pump occupancy is turned off in order to stop the heat pump. If configured, the boiler output is turned on. The buffer tank will be used to provide heating demand. See also section 10.3.2.
  - The energy supplier can block the operations of the heat pump (activate the LOCK mode) for a maximum of 6 hours a day. One lockout may last 2 hours maximum and there must be at least a two-hour interval between two lockouts. For example, if the lockout starts at 10:00 and ends at 12:00, then the next lockout cannot be activated until 14:00.
  - Smart Grid Mode 1 "LOCKED" = DHW is not allowed, DHW Heater is OFF
- **Normal operating state (2 = NORMAL):** In this mode, the heat pump runs in energy-efficient normal mode with proportional heat storage.
  - Smart Grid Mode 2 "NORMAL" = Normal DHW operation
- **Low current surplus state (3 = BOOST):** In this mode, the energy supplier allows the heat pump to run at its maximum capacity. The heat pump is requested to use the surplus energy to reach the maximum possible temperatures for heating and warm water. A user-defined offset is applied to the desired temperature setpoint (see section 10.3.3).
  - This is not a definite start-up command, but a switch-on recommendation based on the boost in energy supply.
  - Smart Grid Mode 3 "BOOST" = DHW is allowed regardless DHW Schedule or Standby, DHW setpoint is offset (RESETCFG_dhw_sg3). DHW Heater is On.
- **High current surplus state (4 = FORCED):** In this mode, the heat pump is forced run at its maximum capacity.

  In heating mode, the heating setpoint is set to its upper limit. In cooling mode, the heating setpoint is set to its lower limit.

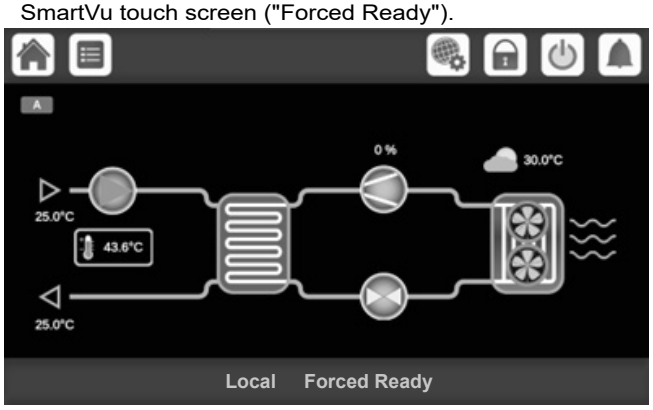
  The heat pump occupancy is turned on independently of any schedule program. This can be for the buffer tank, room heating or domestic hot water production.
  - The heat pump will run in this mode for an undetermined period of time (until the FORCED mode is deactivated).
  - Smart Grid Mode 3 "FORCED" = DHW is allowed regardless DHW Schedule or Standby. DHW setpoint it offset (RESETCFG_dhw_sg4). DHW Heater is On.

10.3.1 - Smart Grid status

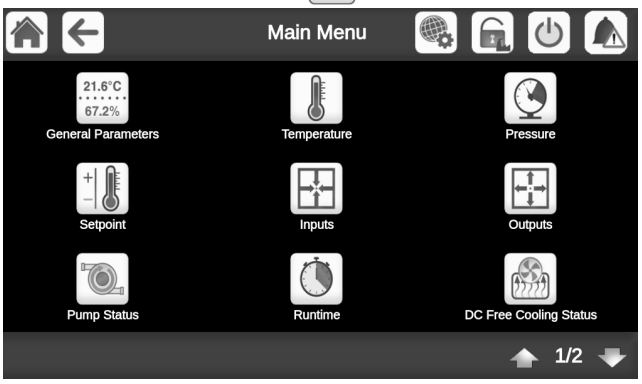
The Smart Grid Status can be found in the General Parameters menu (GENUNIT) or at the bottom of the SmartVu™ touch screen.

To check the Smart Grid mode (from Advanced UI)

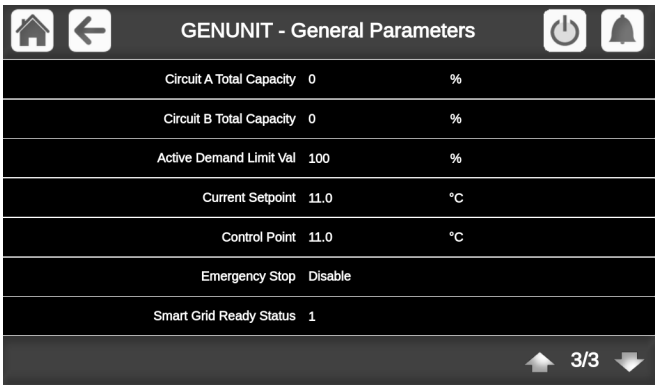
1. Tap  to open the Main Menu.
   - The Smart Grid mode is displayed at the bottom bar on the SmartVu touch screen ("Forced Ready").



2. Select "General Parameters"  .



3. The General Parameters menu will be displayed.
   - In this view, find "Smart Grid Ready Status".
     1 = LOCK
     2 = NORMAL
     3 = BOOST
     4 = FORCED



10.3.2 - LOCK operating mode

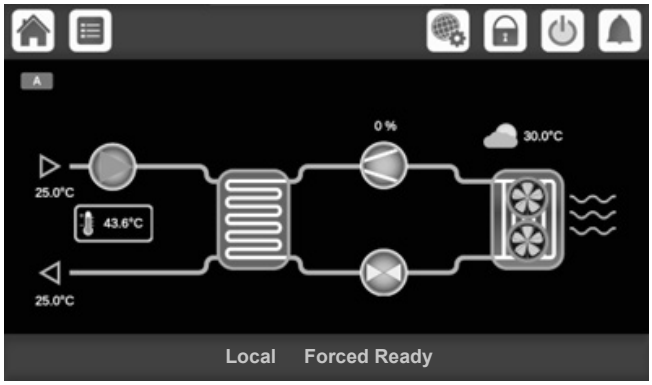
In the LOCK mode, the heat pump is in the OFF state.

For units with a boiler, the boiler can be started during the lock state only when “SGR Threshold” setting allows.

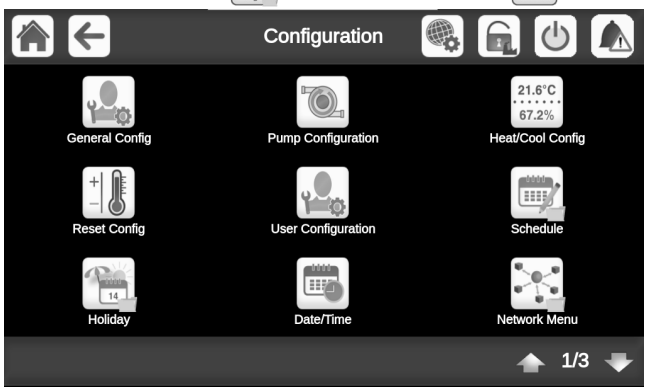
To start the boiler, the Outside Air Temperature (OAT) must be below the SGR Boiler OAT Threshold which is defined by the user.

To change the SGR boiler threshold

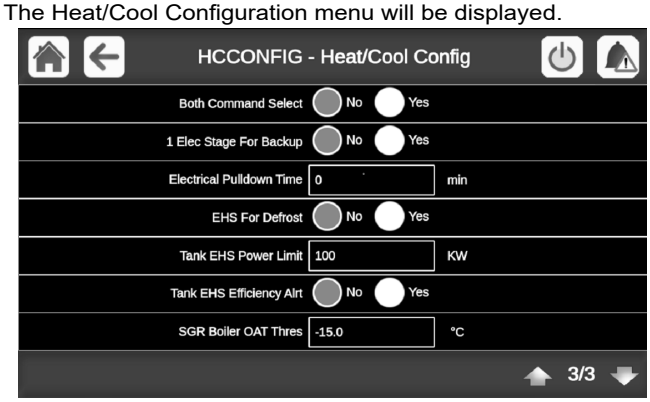
1. Switch to Advanced Configuration UI and log as User. Tap to open the Main Menu.



2. Go to "Configuration" > "Heat/Cool Config" .



3. The Heat/Cool Configuration menu will be displayed.



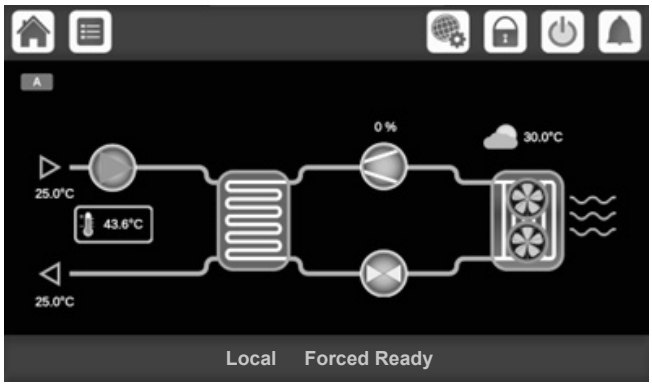
4. Set the Smart Grid threshold to start the boiler.
   - The threshold ("SGR Boiler OAT Thres") is -15°C by default.

10.3.3 - BOOST/FORCED operating mode

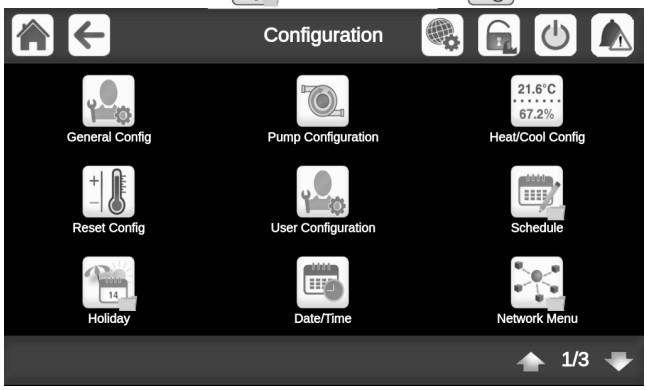
In the BOOST/FORCED mode, it is possible to define an offset used to adjust the water temperature setpoint.

To set the Smart Grid offset

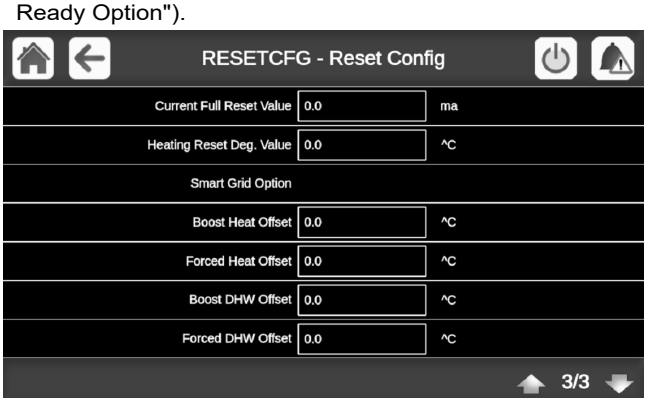
1. Tap to open the Main Menu.



2. Go to "Configuration" > "Reset Config" .



3. The Reset Configuration menu will be displayed.
   - Offset settings are displayed on the third page ("Smart Grid Ready Option").



4. Set the Smart Grid offset value for Heating or Cooling mode.
   - "Boost Heat Offset" (0.0^C by default).
   - "Boost Cool Offset" (0.0^C by default).
   - "Forced Heat Offset" (0.0^C by default).
   - "Forced Cool Offset" (0.0^C by default).

10.4 - Wiring: Smart Grid connections

The Smart Grid Ready module must be connected to “SGR0_BST” and “SGR1_LCK” inputs.

- SGR0_BST is wired to DI-01 on CIOB#4.
- SGR1_LCK is wired to DI-02 on CIOB#4.

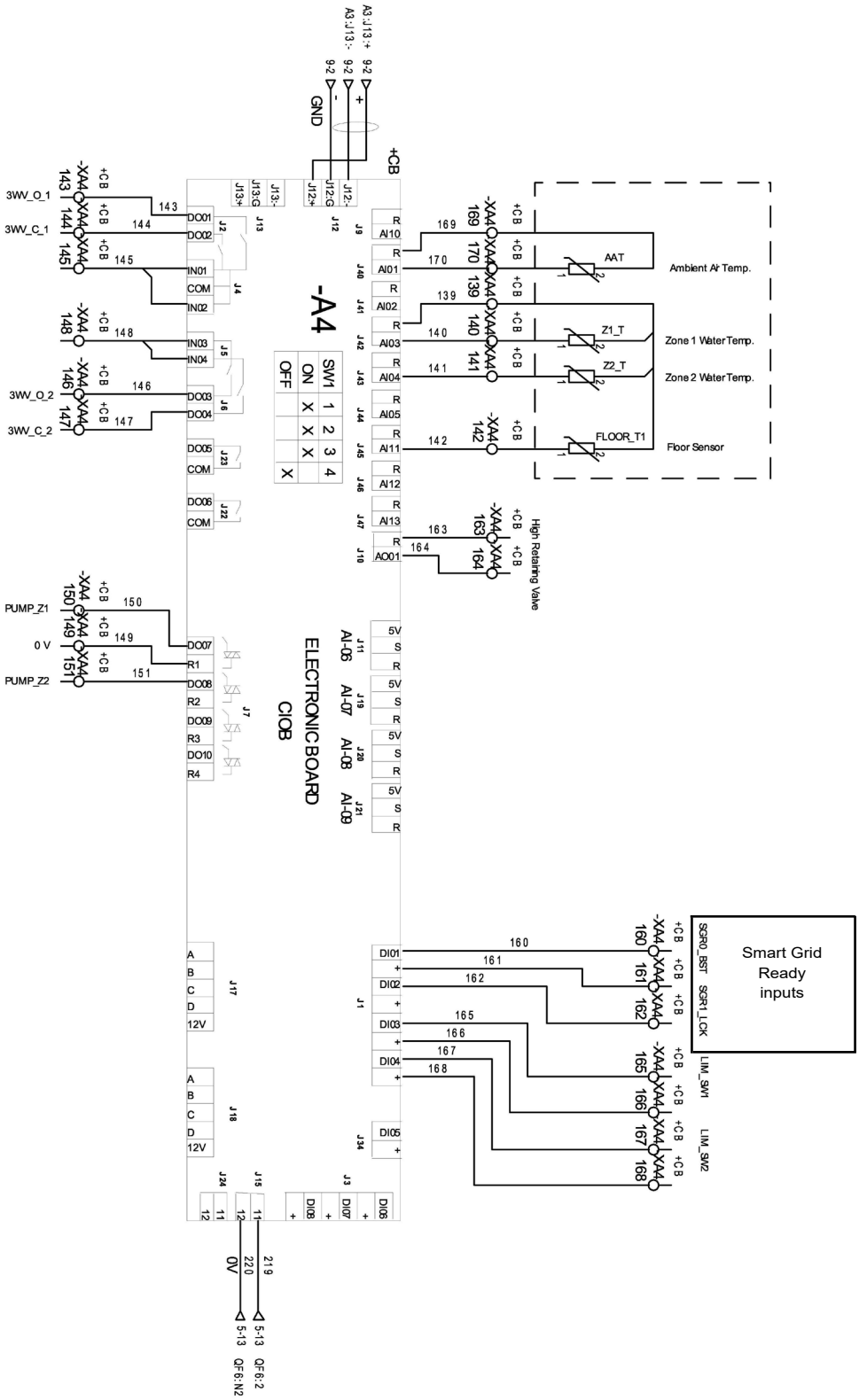
By default, “lim_sp1” and “lim_sp3” are equal to 100%, but they can be set to other values to limit the unit capacity. When the SG Ready option is enabled, these limits are applicable in "Boost" and "Forced" operating modes.

Smart Grid status	1 = LOCK	2 =NORMAL	3 = BOOST	4 = FORCED
Capacity Limit	**lim_sp2***	**100%**	**lim_sp1**	**lim_sp3**
SGR1_LCK	close	open	open	close
SGR0_BST	open	open	close	close

*Lim_sp2 becomes not applicable in the LOCK operating mode.

10.4.1 - Electrical diagram

Customer control connections

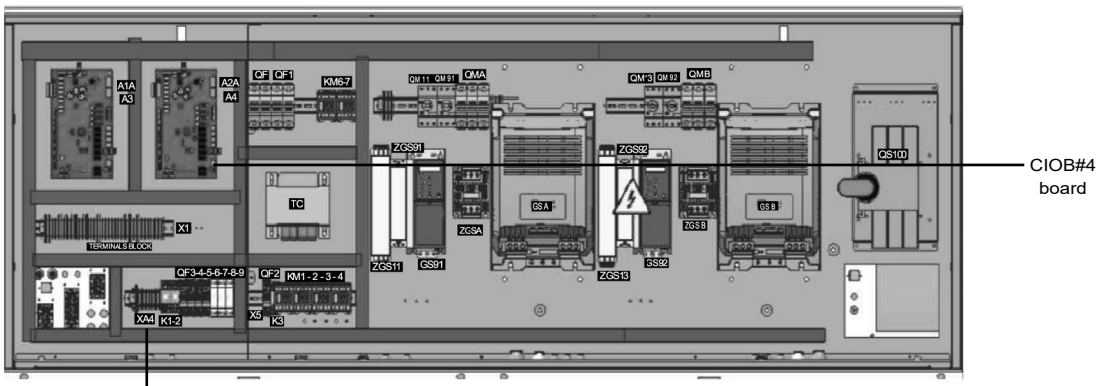


10 - APPENDIX 1: SMART GRID READY INSTALLATION INSTRUCTIONS

10.4.2 - Electrical box: Location

The terminal access for Smart Grid Inputs is located inside the electrical box of the heat pump (on the CIOB#4 board).

Component arrangement: Control box



NOTE: The number of electrical components available on the board may differ depending on the size of the unit.

Smart Grid connections

- XA4-160 Smat Grid input #1 or Off-Peak Input
- XA4-161 Smart Grid input common
- XA4-162 Smart Grid input #2

The quality management system of this product's assembly site has been certified in accordance with the requirements of the ISO 9001 standard (latest current version) after an assessment conducted by an authorized independent third party.
The environmental management system of this product's assembly site has been certified in accordance with the requirements of the ISO 14001 standard (latest current version) after an assessment conducted by an authorized independent third party.
The occupational health and safety management system of this product's assembly site has been certified in accordance with the requirements of the ISO 45001 standard (latest current version) after an assessment conducted by an authorized independent third party.
Please contact your sales representative for more information.

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