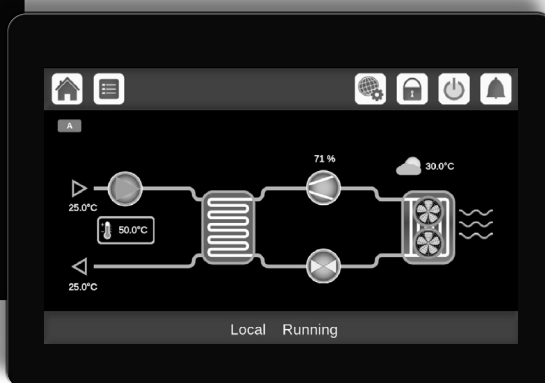
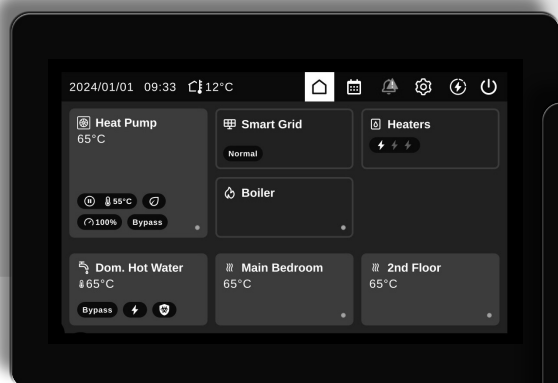




CONTROLS MANUAL



SmartVu™ 2.0 Control

61AQ 040-140
(R290 A3 refrigerant)

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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 Manufacturer 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.

The information provided herein is solely for the purpose of allowing customers to operate and service the equipment and it is not to be reproduced, modified or used for any other purpose without the prior consent of the Manufacturer.

ABBREVIATIONS

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

The following abbreviations are used frequently:

BMS	Building Management System
CCN	Carrier Comfort Network (Manufacturer Network)
CWST	Common Water System Temperature
DACH	German-speaking countries (Germany, Austria, Switzerland, Lichtenstein)
DGT	Discharge Gas Temperature
DHW	Domestic Hot Water
DST	Daylight Saving Time
EHS	Electric Heater Stage
EVSP	External Variable Speed Pump
EWI	Entering Water Temperature
EXV	Electronic Expansion Valve
HHP	Hybrid Heat Pump
LED	Light Emitting Diode
LEN	Sensor Bus (internal communication bus linking the CIOB boards and the SmartVu™ 2.0 controller)
LFL	Lower Flammability Limit
LWT	Leaving Water Temperature
OAT	Outdoor Air Temperature
PEF	Primary Energy Factor
SCT	Saturated Condensing Temperature
SMM	System Management Module
SST	Saturated Suction Temperature
UI	User Interface
VFD	Variable Frequency Drive
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 - CONTROL OVERVIEW

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 Manufacturer 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
- Supports optional Abound 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	✓	
About 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)		✓
Energy meter (Option 294)		✓
Hybrid Heat Pump (not implemented) ***	✓	
System Management Module (156D)		✓

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

** Diverting valve (Option 347A)

*** This option is currently not available.

3 - HARDWARE

3.1 - Control boards

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

These boards communicate via an internal LEN bus.

Variable Frequency Drive(s) are used to control compressor(s) and 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.

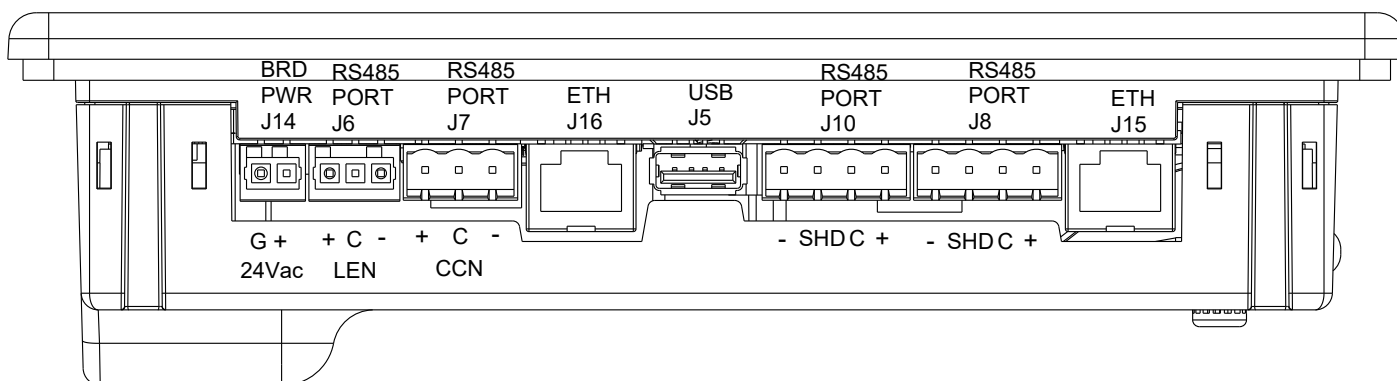
- The red LED flashing for a two-second period indicates correct operation. A different rate indicates a board or a software failure.
- The green LED flashes continuously on all boards to show that the board is communicating correctly over its internal bus (LEN bus). If the green LED is not flashing, 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 (Manufacturer Network), Modbus RTU.
- Two Ethernet ports allow for IP communication (Web server, BACnet/IP, Modbus TCP, etc.) or BMS (Building Management System) connection.

SmartVu™ 2.0 touch screen (view from below)



Connector Additional information

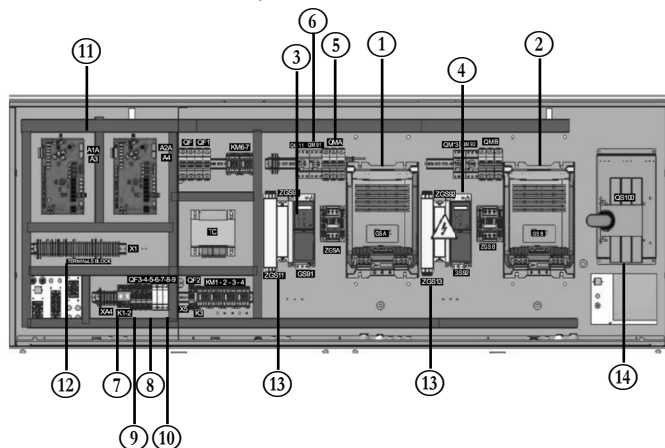
- J14 Power supply
 - J6 RS485: LEN communication
 - J7 RS485: CCN communication
 - J16, J15 Ethernet: Two Ethernet ports allow for TCP/IP communication or BMS connection
 - J5 USB
 - J10 RS485 (customer connection): Modbus communication (Modbus RTU), BMS communication
 - J8 RS485 (internal use only): Pump(s) & compressor(s) VFD; Modbus communication with the Energy Meter (option 294)
- Note: This connector (J8) should not be used by the customer for any other purposes.*

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

3.6 - System Management Module (option 156D)

The System Management Module is a remote electrical box designed to support advanced system control functions.

- The module contains CIOB Boards #3 and #4 which provide management of the boiler, EHS, DHW, and zones.
- The electrical box is mounted in closest proximity to the end-use equipment to reduce wiring distances and improve control responsiveness.

Configuration of this option is required and must be performed by a qualified service technician during commissioning.

3 - HARDWARE

3.7 - 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 3.7.3.
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
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

3 - HARDWARE

Terminal block connections				
Description	Board	Input/Output	Connector	Remarks
Floor Temperature	CIOB #4	AI-11	J45	10k 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

3.7.1 - 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, GENUINIT – General Parameters), the operating mode is selected based on OAT.

3.7.2 - 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

3.7.3 - 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

3.7.4 - 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

3.7.5 - 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

3.7.6 - 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

3.7.7 - Volt-free contact - Smart Grid

Use to manage the four Smart Grid Modes (see section 11).

3.7.8 - 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

3.7.9 - 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 - HARDWARE

3.8 - 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).

3.9 - 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 Common Water Temperature sensor (optional)**
This sensor measures the common leaving water temperature in the cascade/modular 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.

3.10 - 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 circuit (see also section 7.5).
- **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 Valve**
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 - HARDWARE

3.11 - 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)

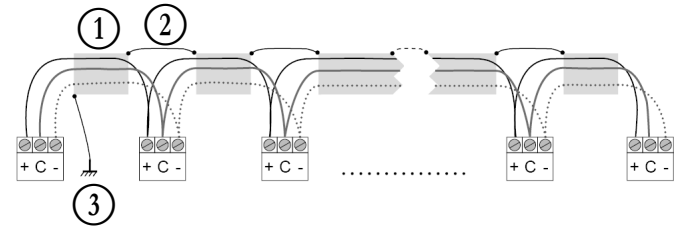
3.11.1 - RS485 wiring: 7-inch controller

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.

3.11.2 - RS485: Daisy chain configuration

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

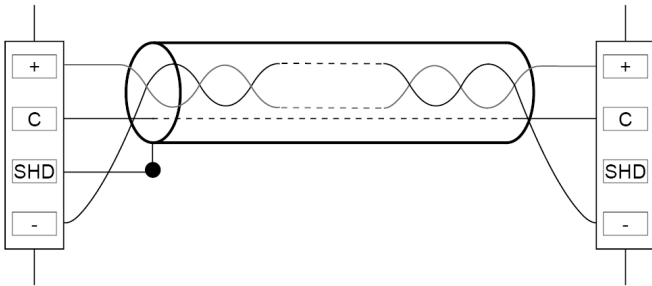


End of Line Resistor: Termination is only needed when running at bus at very high speed over long distances.

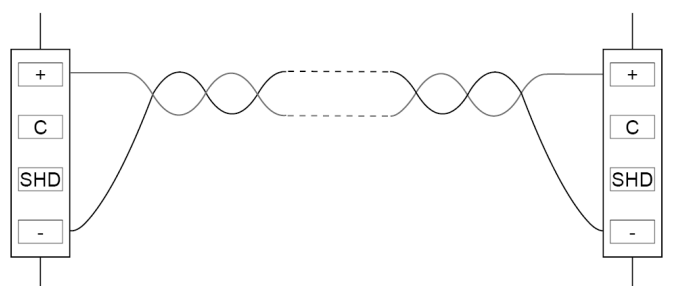
The speed of the bus and the cable distance determines whether termination is needed. It is meant to balance the bus to minimize the ringing that may be caused by fast signals and the inductance of the cabling.

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

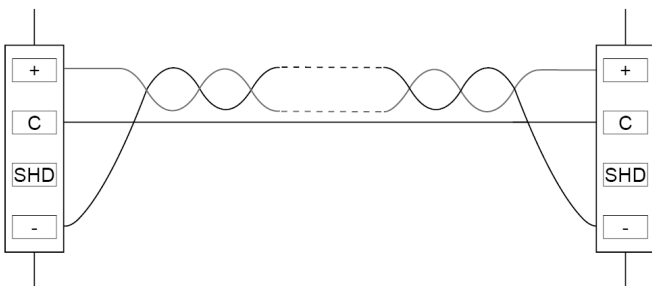
No.1 RS485 wiring diagram (RECOMMENDED)



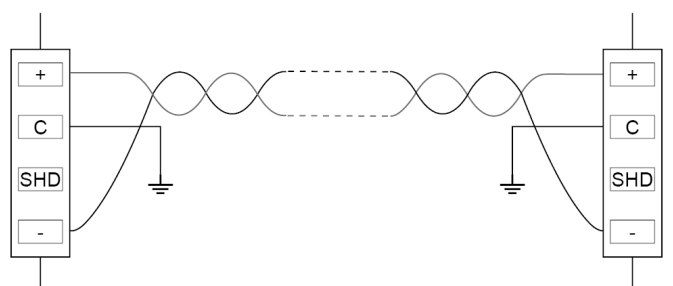
No. 4 RS485 wiring diagram (INCORRECT- Do not use!)



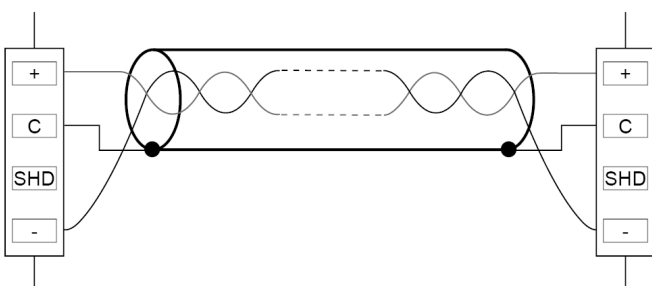
No. 2 RS485 wiring diagram (CORRECT)



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



No. 3 RS485 wiring diagram (CORRECT)



4 - USER INTERFACE: QUICK CONFIGURATION

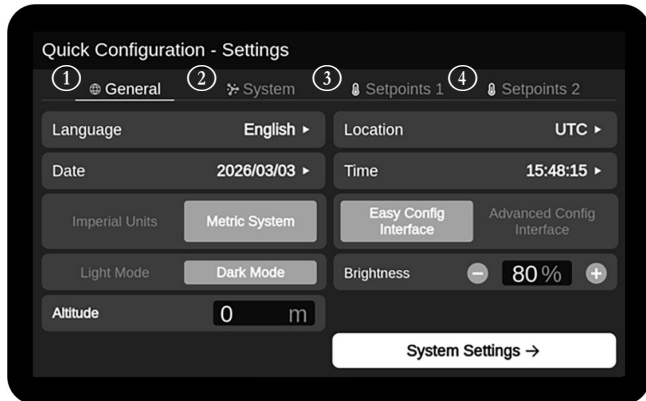
4.1 - SmartVu™ 2.0 touch screen

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 (see section 4.2).

4.2 - Quick Configuration: Initial settings

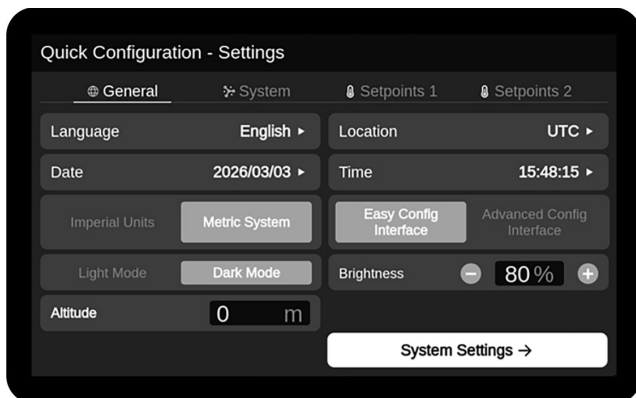
When you start the controller for the first time, the "Quick Configuration - Settings" view opens. All available presets are shown on the screen. To perform a quick initial configuration, please follow steps given in this section.



Legend:

- ① General settings
- ② System settings
- ③ Setpoints 1 settings
- ④ Setpoints 2 settings

4.2.1 - Step 1: General settings



The "General" view is used to set up general display preferences:

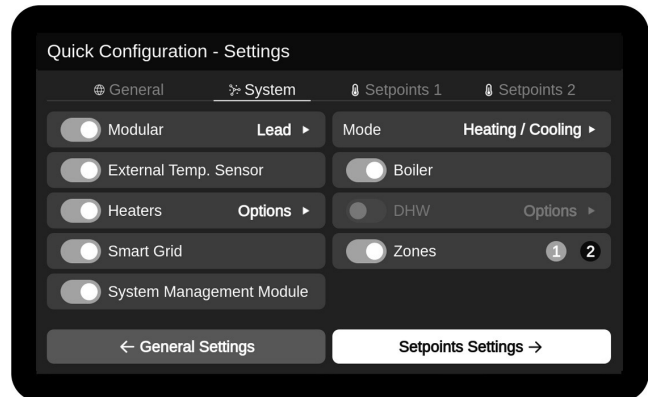
- Language; Location
- Date (YYYY/MM/DD); Time (HH:MM:SS)
- Imperial/Metric system of units
- Type of configuration interface (see section 5):
 - Easy Config Interface ("Smart User Interface")
 - Advanced Config Interface ("Advanced Interface")
- Display theme: Light mode / Dark mode
- Display brightness (%)
- Altitude (m)

Once completed, select "System Settings" to proceed.

IMPORTANT:

- If the "Advanced Config Interface" is selected, the system will automatically open the advanced interface homepage.
- Select the "Home" button  to return to the "Quick Configuration - Settings" view.

4.2.2 - Step 2: System settings



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

- **Modular**
This function enables plant control for 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 three customer heaters or Option 307 D/E (buffer tank with heaters). User-level access is required.
- **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).
- **System Management Module**
Used to enable the control of the System Management Module (option 156D).
- **Heating/Cooling**
AWHP004 is a reversible heat pump.
 - Selecting "Cooling Only" will disable the heating functionality.
 - Selecting "Heating Only" will disable the cooling functionality.
- **Boiler**
Allows the heat pump to control a boiler as backup heating.

4 - USER INTERFACE: QUICK CONFIGURATION

■ 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.

By default, the thermal switch is considered as normally closed:

- Closed = DHW tank in heating demand
- Opened = No heating demand or demand satisfied

If necessary, this input can be configured as Normally Closed. Refer to the DHW_CONF setting in the Advanced Configuration screen.

■ 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.

4.2.3 - Step 3: Setpoints 1 settings

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

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

Depending on the configured unit size, the "Full Load Efficiency" setting (option 119 - Ultra Low Noise) reduces the fan speed to 65% in Cooling mode and 76% in Heating mode. The compressor speed shall be limited depending on the unit configuration.

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

4.2.4 - Step 4: Setpoints 2 settings

The "Setpoints 2" view 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.

4.2.5 - Step 5: Validation

Once the initial settings have been made, the configuration is complete, and the unit can be restarted by selecting 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 (section 4.2.2). All configuration changes must be made through the advanced configuration screens. User password is required.

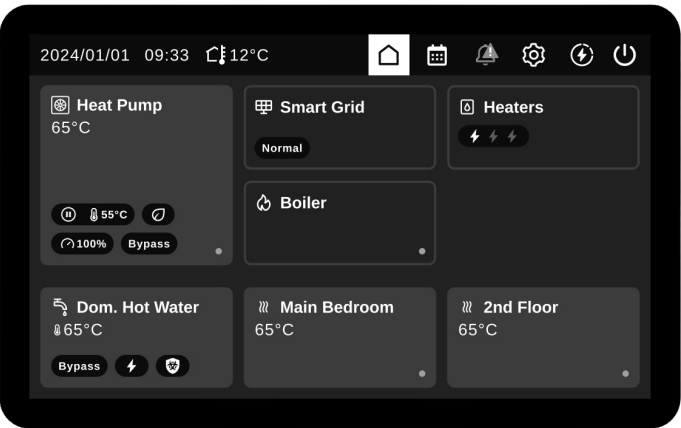
5 - SMART USER INTERFACE & ADVANCED INTERFACE

5.1 - General information

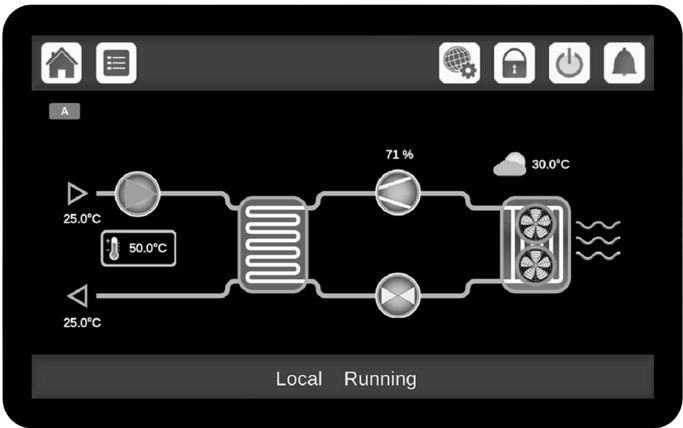
Depending on the selected interface, users can adjust heat pump parameters through either the "Easy Config Interface" (Smart User Interface) or the "Advanced Config Interface" (Advanced Interface).

- The interface can be switched at any time.
- Use the Easy Config Interface for quick adjustments or switch to the Advanced Config Interface for more detailed control.

SMART USER INTERFACE
(Easy Config Interface)

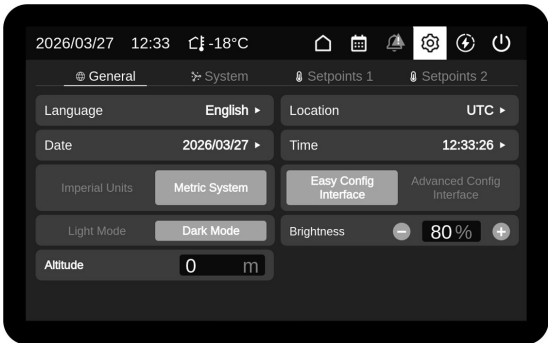


ADVANCED INTERFACE
(Advanced Config Interface)

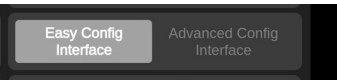


To switch to the Advanced Interface

1. Tap  to open the General view.



2. In the General section, select "Advanced Config Interface".



The Advanced Interface will be displayed.

To switch to the Smart User Interface

1. Tap .
- The Smart User Interface will be displayed.

Note: If initial settings were not validated, the "Quick Configuration - Settings" view will open (see section 4.2).

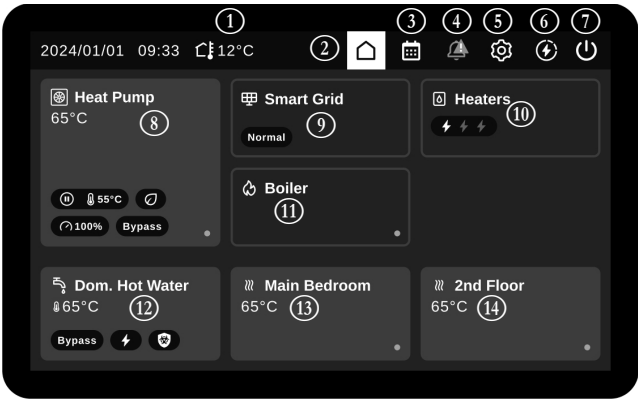
5 - SMART USER INTERFACE & ADVANCED INTERFACE

5.2 - Smart User Interface

The **Smart User Interface** is available when the Easy Config Interface is selected (see section 5.1).

5.2.1 - Smart UI: 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.

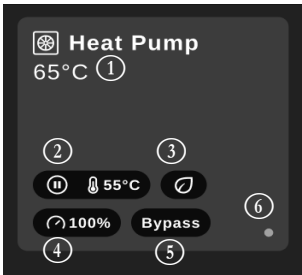


Legend:

- | | |
|-----------------------------|-----------------------------|
| ① OAT | ⑧ Heat Pump status |
| ② Home icon | ⑨ Smart Grid status |
| ③ Schedule icon | ⑩ Heaters status |
| ④ Alarm icon | ⑪ Boiler status |
| ⑤ Configuration icon | ⑫ Domestic Hot Water status |
| ⑥ Energy Consumption status | ⑬ Zone 1 status |
| ⑦ Unit start/stop | ⑭ Zone 2 status |

5.2.2 - Heat Pump tile

This tile displays the current heat pump status.



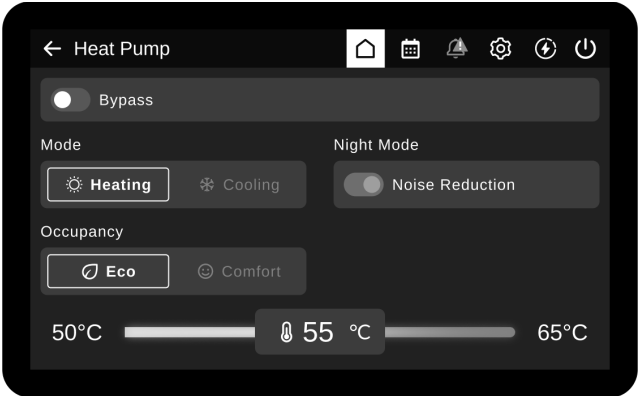
Legend:

- | |
|--|
| 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 the user to activate the Bypass mode, set the operating mode (Heating/Cooling), choose the unit occupancy (Eco/Comfort), activate Night Mode (Noise Reduction).

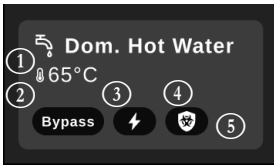
Heat Pump Bypass

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.



5.2.3 - Domestic Hot Water tile

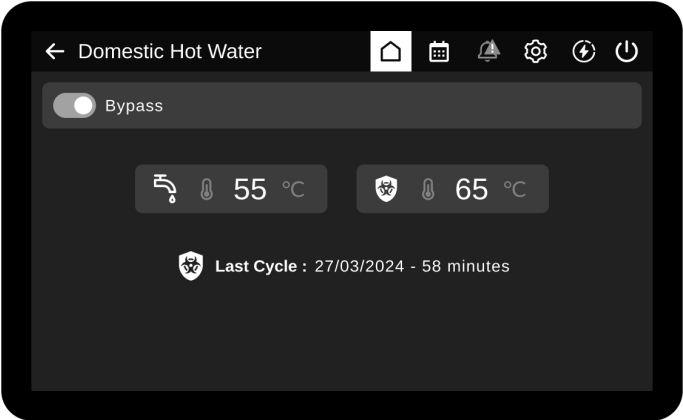
This tile displays the current DHW status.



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:

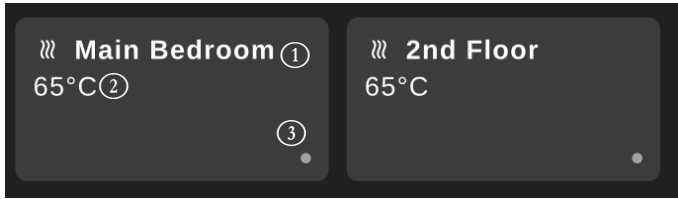


DHW Bypass: If the Bypass selector is on, the heat pump will heat the DHW tank for 3 hours (displayed setpoints are read-only values).

5 - SMART USER INTERFACE & ADVANCED INTERFACE

5.2.4 - Zone(s) tile

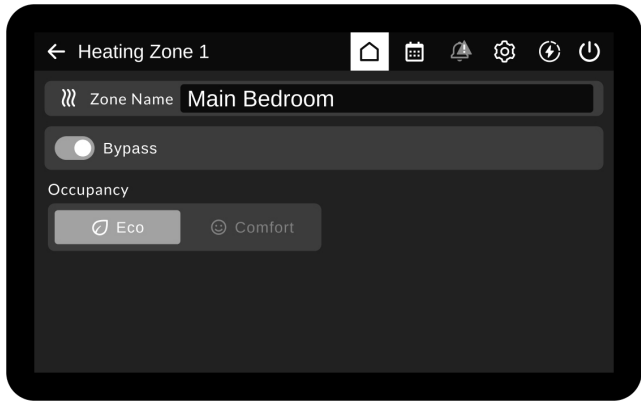
These tiles display the current Zone(s) status.



Legend:

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

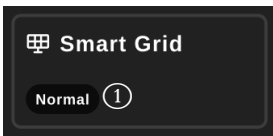
Selecting the "Zone #1" or "Zone #2" tile opens a view as shown below. The Zone name can be modified in this view.



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.

5.2.5 - Smart Grid tile

Allows for reading the status of the Smart Grid.

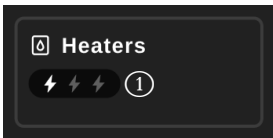


Legend:

- ① Smart Grid Status

5.2.6 - Heaters tile

Allows for reading the status of the Electric Heaters.

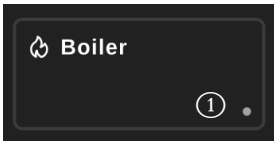


Legend:

- ① Electric Heaters on/off

5.2.7 - Boiler tile

Allows for reading the status of the boiler.

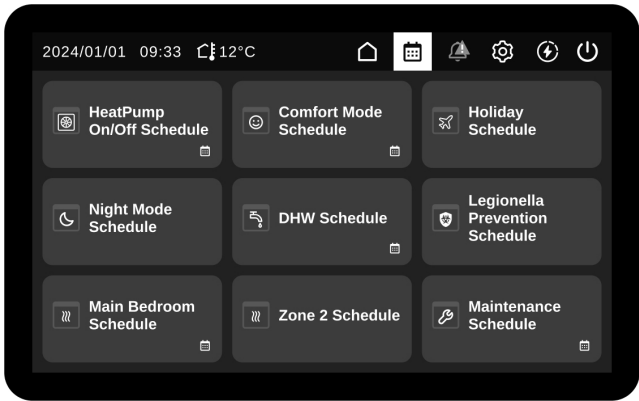


Legend:

- ① Boiler on/off

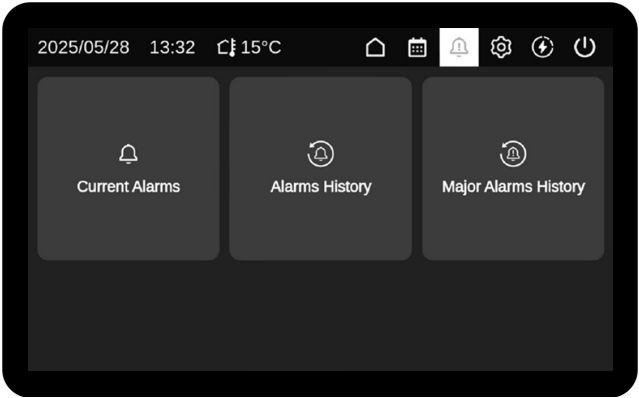
5.2.8 - Schedule view

This page is used to configure nine heat pump operating schedules (see also section 7.22).



5.2.9 - Alarms view

This page is used to verify active alarms and access alarm records.

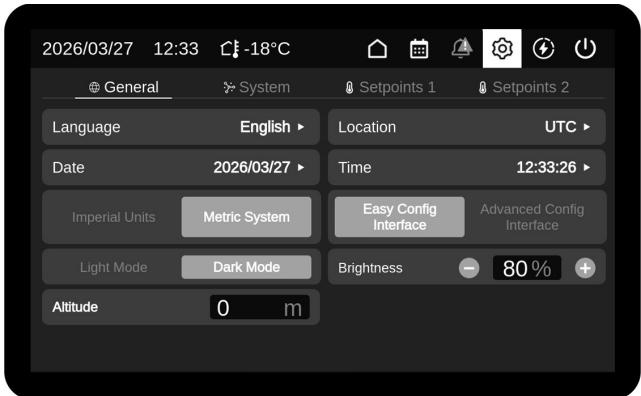


Please note that alarm reset cannot be performed from the Smart User Interface. This function is available only through the Advanced Interface.

5 - SMART USER INTERFACE & ADVANCED INTERFACE

5.2.10 - Configuration view

If the initial setup has been completed and the user selected "Don't show Quick Configuration next time" (see section 4.2.5), then the following view will be displayed.*



This page is used to set up basic heat pump parameters and adjust display options:

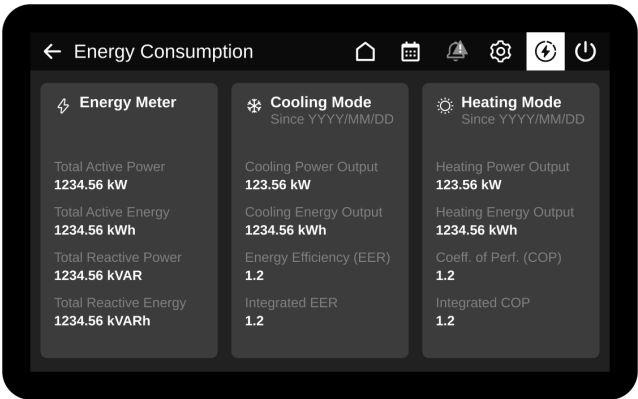
- General settings (more details in section 4.2.1)
- Setpoints 1 settings (more details in section 4.2.3)
- Setpoint 2 settings (more details in section 4.2.4)

* If the initial setup has not been completed, or if the user did not select "Don't show Quick Configuration next time", the "Quick Configuration - Settings" view will be displayed (see section 4.2).

IMPORTANT: After the initial setup, the "System" view settings will be disabled on Smart User Interface. These parameters can be configured only from the Advanced Interface.

5.2.11 - Energy Monitoring view

This page provides insights into the system's energy consumption and performance in both Heating and Cooling modes.



Cooling mode: Cooling Energy consumption (kWh) and instantaneous output power (kW). Instantaneous and integrated Energy Efficiency Ratio (EER).

Heating mode: Heating Energy consumption (kWh) and instantaneous output power (kW). Instantaneous and integrated Coefficient Of performance (COP).

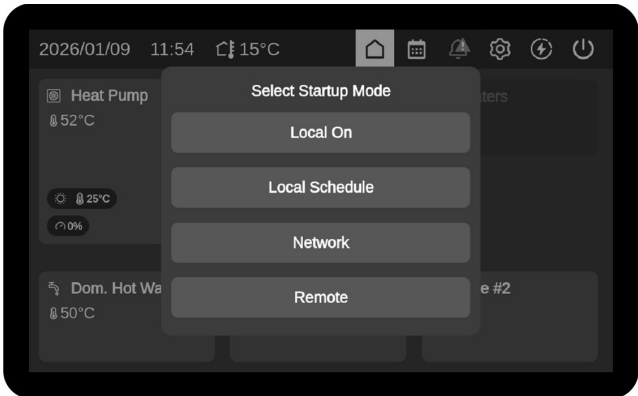
"Since YYYY/MM/DD" is the last Heating and Cooling Energy user action to reset integrated EER/COP and Cooling/Heating energy (see 6.1 ENERGY table).

With the Energy meter (option 294), the total active and reactive energy (kWh) and power (kW) are also available.

For more information see section 7.18.

5.2.12 - Unit Start/Stop view

This page is used to select the operating mode of the unit or stop the heat pump (see also section 6.7).



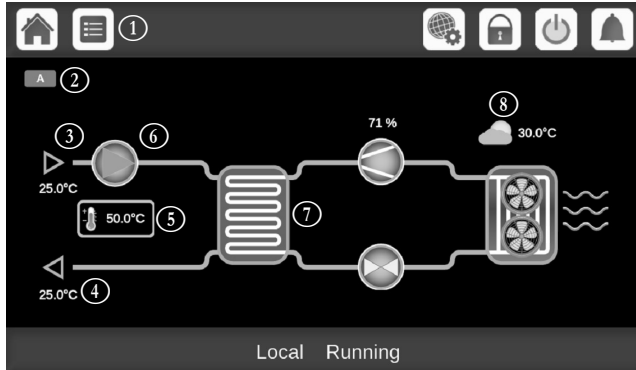
5 - SMART USER INTERFACE & ADVANCED INTERFACE

5.3 - Advanced Interface

The **Advanced Interface** is available when the Advanced Config Interface is selected (see section 5.1).

5.3.1 - Advanced UI: Home Screen

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



Legend:

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

■ Circuit

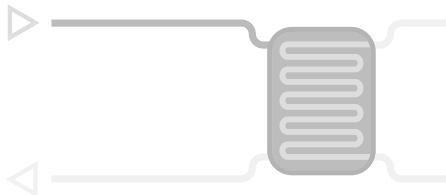
For single-circuit heat pump, there is only one circuit icon displayed (A for circuit A).

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

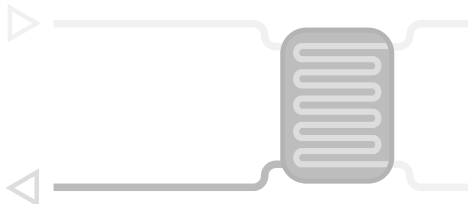
■ Evaporator Entering Water Temperature (EWT)

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").



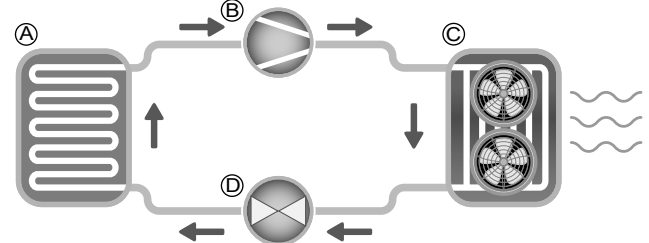
■ Setpoint

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 to open the setpoint configuration menu.

■ Refrigeration cycle (Cooling mode)



A) BPHE

- In Cooling mode, the BPHE (water exchanger) acts as an evaporator. It absorbs heat from the fluid, performing the opposite of the condenser which is rejecting the heat out of the unit. The 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.as.

C) Coils

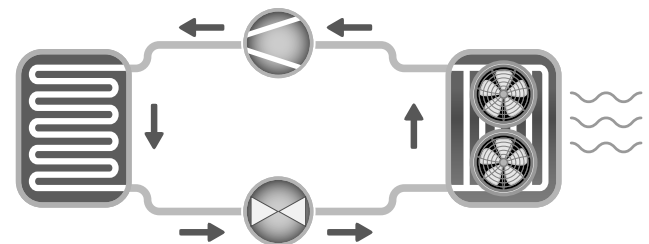
- In Cooling mode, the coils (air exchangers) act as a condenser. They reject heat to the outside by cooling down the high-pressure gases and taking advantage to condense the refrigerant from vapours to liquid.
- The number of fans given in the picture may be different from the actual number of fans installed on the unit.

D) Electronic Expansion Valve (EXV)

- EXV is used to control the flow of refrigerant into the evaporator. The circuit view displays the current position of the electronic expansion valve
- Valve position is given in %, where 0% means closed position and 100% means open position.

■ Refrigeration cycle (Heating mode)

In heating mode, the cycle is reversed. The evaporator acts as a condenser and the coils as an evaporator.



■ 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.

5 - SMART USER INTERFACE & ADVANCED INTERFACE

5.3.2 - Header buttons

						
Home	Previous screen	Main Menu	System Menu	Login Menu	Start / Stop	Alarms Menu

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.		Service technician access level.
	User 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.		

5 - SMART USER INTERFACE & ADVANCED INTERFACE

5.3.3 - 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.

5.3.4 - Warning messages

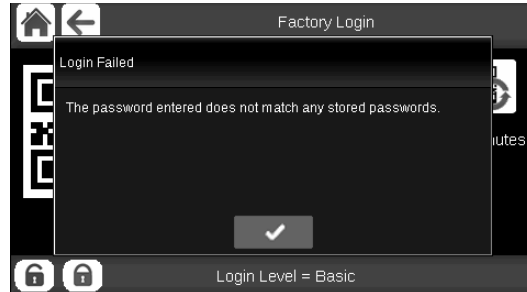
Warning messages are used to inform the user that a problem occurred and the requested action cannot be completed successfully.

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)

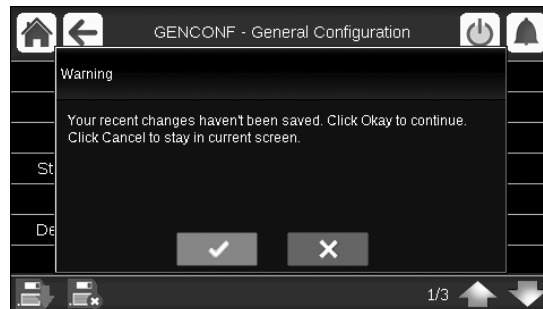


- Press the **Confirm** button and type the correct password (see section 6.6).

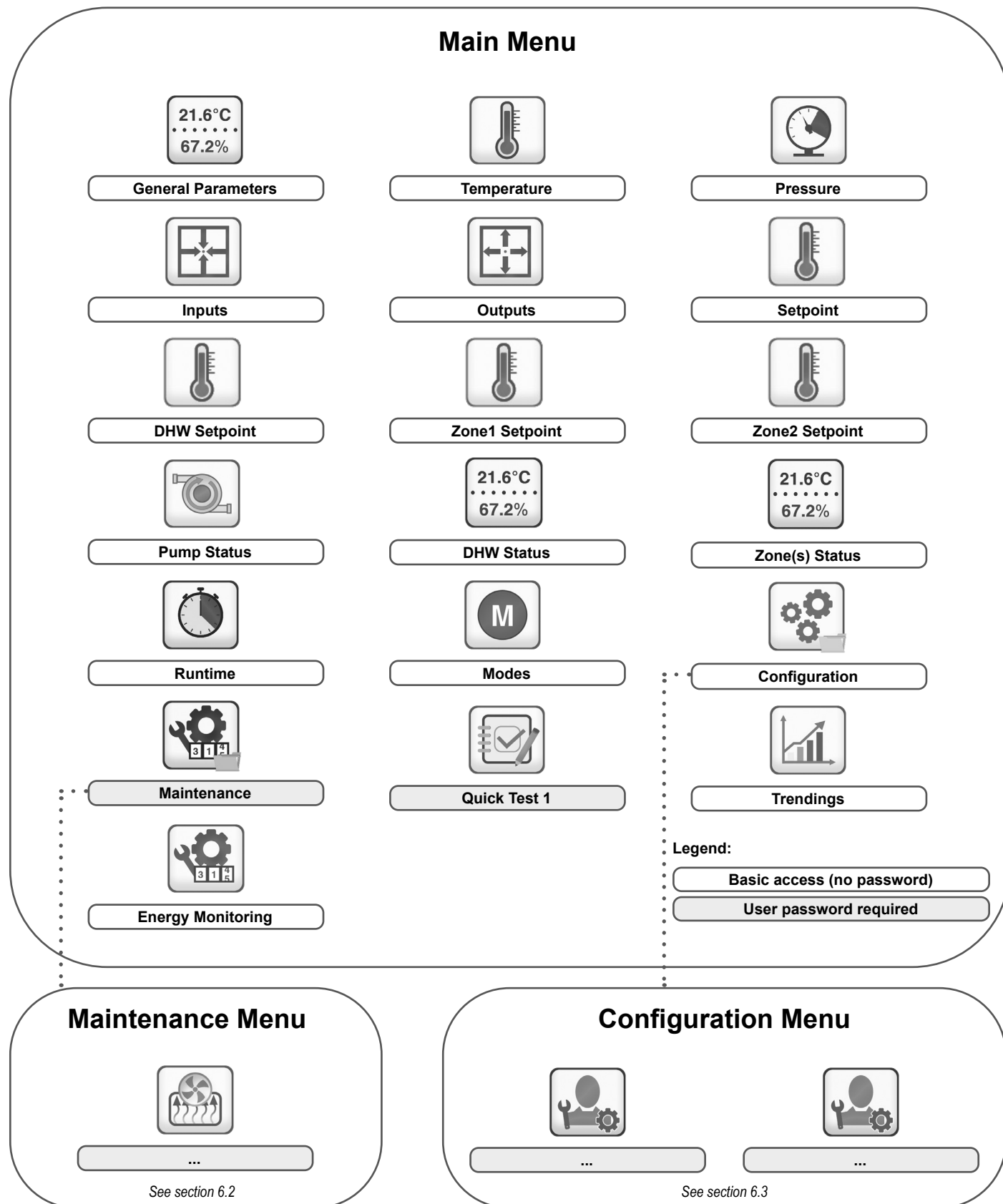
Saving modifications

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.



6 - 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 7.21.

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=Comfort 2=Eco	0 = Automatic setpoint selection 1 = Comfort setpoint / Setpoint 1 (active during occupied period) 2 = Eco setpoint / 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)

6 - ADVANCED INTERFACE: MENU STRUCTURE



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, 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
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 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 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	20 68	°C °F	Cool Away Setpoint	Cool away setpoint
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
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

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

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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_SW	open/close	-	DHW Request Switch	Domestic Hot Water request 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
DEFRINF A	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
DEFRINF B	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).

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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
VPMPCMDDB	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
hr_boil	-	hour	HHP Boiler Hours	Operating hours, Hybrid Heat Pump (HHP) boiler
st_boil	-	-	HHP Boiler Starts	Number of starts, Hybrid Heat Pump (HHP) boiler

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

NOTE: The Hybrid Heat Pump option is currently unavailable and will be implemented in a future release.



Modes – MODES

Name	Status	Unit	Displayed text*	Description
m_delay	no/yes	-	Delay Active	Delay Active
m_2ndstpt	no/yes	-	Eco Setpoint Active	Second setpoint in use (Eco setpoint active): 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

6 - ADVANCED INTERFACE: MENU STRUCTURE



Modes – MODES (continued)

Name	Status	Unit	Displayed text*	Description
m_night	no/yes	-	Night Low Noise Active	Night low noise active
m_leadla	no/yes	-	Cascade Active	Cascade mode active (Lead/Lag mode active)
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

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Quick Test 1 – QCK_TST1 (continued)

Name	Status	Unit	Displayed text*	Description
Q_STFLWB	off/on	-	Set Flow Switch Config B	Set Flow Switch Configuration B
Q_BOXFAN	off/on	-	Quick Test Elect Box Fan	Quick test electric box fan
QDIV_REQ	0 to 2	-	DHW Valve 1=DHW, 2=Zone	Domestic Hot Water valve 1=DHW 2=Zone
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_VLPOS1	0 to 100	-	Zone 1 Valve position	Zone 1 Valve position
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_VLPOS2	0 to 100	-	Zone 2 Valve position	Zone 2 Valve position
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 Refrigerant ValveA	4-way refrigerant 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 Refrigerant ValveB	4-way refrigerant 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_B	-	%	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.

6 - ADVANCED INTERFACE: MENU STRUCTURE



Energy Monitoring – ENERGY

Name	Status	Unit	Displayed text*	Description
			ENERGY METER	ENERGY METER
p_total	-	kW	Total active power	Total active power
e_total	-	KWH	Total active energy	Total active energy
rp_total	-	kW	Tot. reactive power Kvar	Total reactive power Kvar
re_total	-	KWH	Tot. react. ener. Kvarh	Total reactive energy Kvarh
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 distortion	Total harmonic distortion
pow_fact	-	-	Power factor	Power factor
			COOLING MODE	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)
cEnergyOu	-	KWH	Cooling Energy Output	Cooling energy output
cEnergyIn	-	KWH	Electrical Energy Input	Electrical energy input
energEer	-	-	Integrated EER	Intergated EER
			HEATING MODE	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
hEnergyOu	-	KWH	Heating Energy Output	Heating energy output
hEnergyIn	-	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	HEATERS
tnk_hpow	-	kW	Water Tank EHS power	Water tank EHS power

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



Zone(s) Status – ZONE_STA

Name	Status**	Default	Unit	Displayed text*	Description
zon_nam1	-	0	-	Zone#1 Name	Zone #1 name
OCC_Z1	no/yes	no	no	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
WT_Z1	-	-17.8	°C	Zone #1 Water Temperature	Zone #1 water temperature
	-	0	°F		
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 0 = no operation ("hold" position) 1 = open command 2 = close command
WV_Z1	0 to 100	-	%	Zone#1 Valve Position	Zone #1 3 way valve position
WV_Z1_FD	0 to 100	%	-	Zone #1 Valve Feedback	Zone #1 Valve feedback
zon_nam2	-	-	-	Zone#2 Name	Zone #2 name
OCC_Z2	no/yes	-	-	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
WT_Z2	-	-17.8	°C	Zone #2 Water Temp	Zone #2 water temperature
	-	0	°F		
PUMP_Z2	off/on	off	-	Zone #2 Water Pump	Zone#2 water pump
WVREQ_Z2	0 to 2	0	-	Zone#2 Valve Command	Zone#2 3 way valve command 0 = no operation ("hold" position) 1 = open command 2 = close command

6 - ADVANCED INTERFACE: MENU STRUCTURE



Zone(s) Status – ZONE_STA (continued)

Name	Status**	Default	Unit	Displayed text*	Description
WV_Z2	0 to 100	0	%	Zone#2 Valve Position	Zone #2 3 way valve position
WV_Z2_FD	0 to 100	0	%	Zone #2 Valve Feedback	Zone #2 Valve feedback
FLOOR_T	-	-17.8	°C	Floor Temperature	Floor temperature
	-	0	°F		

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

**The range may vary depending on the unit configuration.



DHW Setpoint – DHW_STP

Name	Status**	Default	Unit	Displayed text*	Description
dhw_stp	20 to 75	50	°C	DHW Setpoint	Domestic Hot Water setpoint
	77 to 167	77	°F		
alg_stp	50 to 75	60	°C	Anti-Legionella Setpoint	Anti-Legionella setpoint
	122 to 167	140	°F		
alg_hold	0 to 180	60	min	Anti-Leg. holding time	Anti-Legionella holding time
hw_comp	0 to 20	0	°C	Hot Water compensation	Hot water compensation
	0 to 36	3.6	°F		

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

**The range may vary depending on the unit configuration.



Zone1 Setpoint – ZONESTP1

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

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

**The range may vary depending on the unit configuration.



Zone2 Setpoint – ZONESTP2

Name	Status**	Default	Unit	Displayed text*	Description
ccfstp	6.5 to 20	12	°C	Cool Comfort Setpoint	Cool comfort setpoint
	43.7 to 68	53.6	°F		
cecostp	6.5 to 20	15	°C	Cool Economy Setpoint	Cool economy setpoint
	43.7 to 68	59	°F		
cawystp	6.5 to 20	20	°C	Cool Away Setpoint	Cool away setpoint
	43.7 to 68	68	°F		
cw_comp	-7 to 0	0	°C	Cold Water compensation	Cold water compensation
	-12.6 to 0	3.6	°F		
hcfstsp	25 to 75	55	°C	Heat Comfort Setpoint	Heat comfort setpoint
	77 to 167	131	°F		
hecostp	25 to 75	50	°C	Heat Economy Setpoint	Heat economy setpoint
	77 to 149	122	°F		

6 - ADVANCED INTERFACE: MENU STRUCTURE



Zone2 Setpoint – ZONESTP2 (continued)

Name	Status	Default	Unit	Displayed text*	Description
hawystp	25 to 75	45	°C	Heat Away Setpoint	Heat away setpoint
	68 to 131	113	°F		
hw_comp	0 to 7	0	^C	Hot Water compensation	Hot water compensation
	0 to 12.6	3.6	^F		

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

**The range may vary depending on the unit configuration.



DHW Status – DHW_STAT

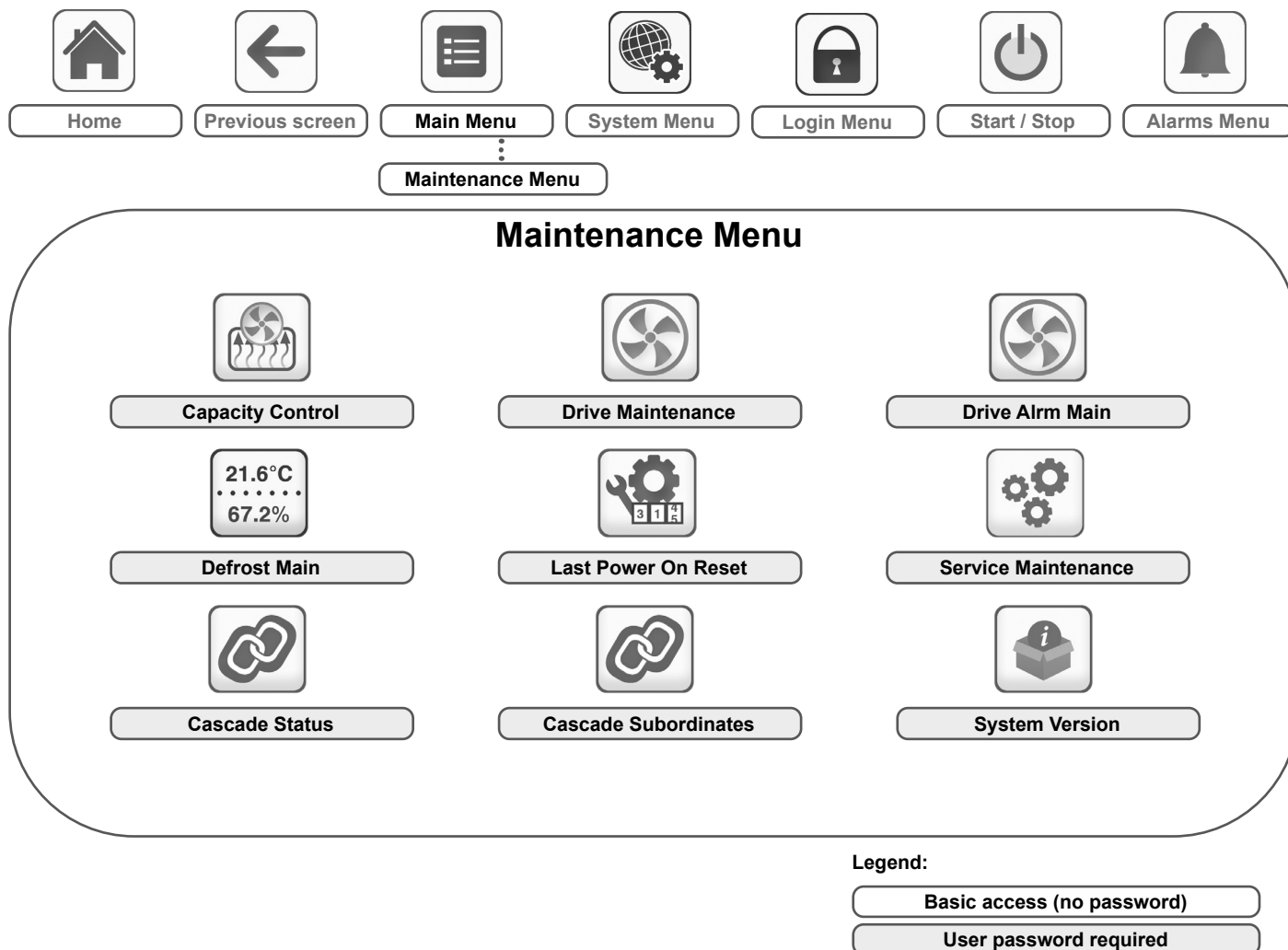
Name	Status**	Default	Unit	Displayed text*	Description
DHW_MODE	0 to 2	0	-	DHW Operating Mode 0 = DHW not active 1 = Regular DHW 2 = Anti-Legionella	Domestic Hot Water operating mode 0 = DHW not active 1 = Regular DHW 2 = Anti-Legionella
dhw_run	no/yes	no	-	DHW Running	Domestic Hot Water running
dhw_ovr	-	-	-	DHW Override	Domestic Hot Water override
DHW_CTLP	25 to 75	50	°C	DHW Control Point	Domestic Hot Water control point
	77 to 167	122	°F		
DHW_T	-	-17.8	°C	DHW Tank Temperature	Domestic Hot Water tank temperature
	-	0	°F		
UNITCTLP	25 to 75	50	°C	Unit Control Point	Unit control point
	77 to 167	122	°F		
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-Legion holding time	Anti-Legionella holding time
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.

6 - ADVANCED INTERFACE: MENU STRUCTURE

6.2 - Maintenance menu



Capacity Control – CAPACTRL

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
compOat	-	0 0	^C ^F	Compensated OAT	Compensated OAT
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
cap_max	no/yes	no	-	Max Capacity Reached	Maximum capacity reached
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

6 - ADVANCED INTERFACE: MENU STRUCTURE



Capacity Control – CAPACTRL (continued)

Name	Status	Default	Unit	Displayed text*	Description
ov_exv_a	-	-	-	EXV Override Circuit A	EXV override circuit A
frqmin_a	30 to 140	30	Hz	Min Compr Freq Cir A	Minimum compressor frequency circuit A
frq_a	-	-	Hz	Actual Compr Freq Cir A	Actual compressor frequency circuit A
frqmax_a	30 to 140	140	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
mop_a	-	-17.78 0	°C °F	MOP Threshold A	Maximum Operating Pressure threshold circuit A
fanSp_a	-20 to 85 -4 to 185	40 104	°C °F	Fan Setpoint A	Fan setpoint A
fan_ov_a	-	-	-	Fan Override A	Fan override A
spOff_a	-30.0 to 30.0 -4.35 to 4.35	0 0	kPa PSIG	SP Compensation Offset A	Setpoint compensation offset circuit A
spComp_a	-	-	kPa/PSIG	SP Compensated A	Compensated setpoint circuit 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	30 to 140	30	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	30 to 140	140	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
mop_b	-	-17.78 0	°C °F	MOP Threshold B	Maximum Operating Pressure threshold circuit B
fanSp_b	-20 to 85 -4 to 185	40 104	°C °F	Fan Setpoint B	Fan setpoint B
fan_ov_b	-	-	-	Fan Override B	Fan override B
spOff_b	-30.0 to 30.0 -4.35 to 4.35	0 0	kPa PSIG	SP Compensation Offset B	Setpoint compensation offset circuit B
spComp_b	-	-	kPa/PSIG	SP Compensated B	Compensated setpoint circuit 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	Compressor drive, circuit A
cmd_w_1	-	-	-	Comp Drive A Cmd word	Compressor drive A command word
ctrl_w_1	-	-	-	Comp Drive A Ctrl Word	Compressor drive A control word
stat_w_1	-	-	-	Comp Drive A Status Word	Compressor drive A status word
drvCmd_1	-	-	%	Comp Drive A Command	Compressor drive A command
drv_CL_1	-	-	A	Comp Drive A Cur. Limit	Compressor Drive A Current Limit
drv_V_1	-	-	V	Comp Drive A Voltage	Compressor Drive A Voltage
drv_F_1	-	-	Hz	Comp Drive A Frequency	Compressor Drive A Frequency
drv_I_1	-	-	A	Comp Drive A Current	Compressor Drive A Current
drvpwr_1	-	-	kW	Comp Drive A Power	Compressor Drive A Power
drv_T_1	-	17.78 0	°C °F	Comp Drive A HtSk Temp	Compressor Drive A heat sink temperature
				COMP DRIVE B	Compressor drive, circuit B
cmd_w_2	-	-	-	Comp Drive B Cmd word	Compressor Drive B command word
ctrl_w_2	-	-	-	Comp Drive B Ctrl Word	Compressor Drive B control word

6 - ADVANCED INTERFACE: MENU STRUCTURE



Drive Maintenance – DRV_CTRL (continued)

Name	Status	Default	Unit	Displayed text*	Description
stat_w_2	-	-	-	Comp Drive B Status Word	Compressor Drive B Status Word
drvCmd_2	-	-	%	Comp Drive B Command	Compressor Drive B Command
drv_CL_2	-	-	A	Comp Drive B Cur. Limit	Compressor Drive B Cur. Limit
drv_V_2	-	-	V	Comp Drive B Voltage	Compressor Drive B Voltage
drv_F_2	-	-	Hz	Comp Drive B Frequency	Compressor Drive B Frequency
drv_I_2	-	-	A	Comp Drive B Current	Compressor Drive B Current
drvpwr_2	-	-	kW	Comp Drive B Power	Compressor Drive B Power
drv_T_2	-	17.78 0	°C °F	Comp Drive B HtSk Temp	Compressor Drive B heat sink temperature
				PUMP DRIVE A	PUMP DRIVE A
cmd_w_3	-	-	-	Pump Drive A Cmd word	Pump Drive A Cmd word
ctrl_w_3	-	-	-	Pump Drive A Ctrl Word	Pump Drive A Ctrl Word
stat_w_3	-	-	-	Pump Drive A Status Word	Pump Drive A Status Word
drvCmd_3	-	-	%	Pump Drive A Command	Pump Drive A Command
drv_CL_3	-	-	A	Pump Drive A Cur. Limit	Pump Drive A Cur. Limit
drv_V_3	-	-	V	Pump Drive A Voltage	Pump Drive A Voltage
drv_F_3	-	-	Hz	Pump Drive A Frequency	Pump Drive A Frequency
drv_I_3	-	-	A	Pump Drive A Current	Pump Drive A Current
drvpwr_3	-	-	kW	Pump Drive A Power	Pump Drive A Power
drv_T_3	-	17.78 0	°C °F	Pump Drive A HtSk Temp	Pump Drive A heat sink Temp
				PUMP DRIVE B	PUMP DRIVE B
cmd_w_4	-	-	-	Pump Drive B Cmd word	Pump Drive B Cmd word
ctrl_w_4	-	-	-	Pump Drive B Ctrl Word	Pump Drive B Ctrl Word
stat_w_4	-	-	-	Pump Drive B Status Word	Pump Drive B Status Word
drvCmd_4	-	-	%	Pump Drive B Command	Pump Drive B Command
drv_CL_4	-	-	A	Pump Drive B Cur. Limit	Pump Drive B Cur. Limit
drv_V_4	-	-	V	Pump Drive B Voltage	Pump Drive B Voltage
drv_F_4	-	-	Hz	Pump Drive B Frequency	Pump Drive B Frequency
drv_I_4	-	-	A	Pump Drive B Current	Pump Drive B Current
drvpwr_4	-	-	kW	Pump Drive B Power	Pump Drive B Power
drv_T_4	-	17.78 0	°C °F	Pump Drive B HtSk Temp	Pump Drive B heat sink 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 255=Failed to attach the drive	1=Drv Comp A 2=Drv Comp B 3=Drv Pump A 4=Drv Pump B 255=Failed to attach the drive (Return code)

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



Drive Alarm Main – DRV_ALARM

Name	Status	Default	Unit	Displayed text*	Description
				COMP DRIVE A	Compressor drive, circuit A
alarm1_1	-	0	-	Comp Drive A Alarm 1	Compressor Drive A Alarm 1
alarm2_1	-	0	-	Comp Drive A Alarm 2	Compressor Drive A Alarm 2
warn1_1	-	0	-	Comp Drive A Warning 1	Compressor Drive A Warning 1
warn2_1	-	0	-	Comp Drive A Warning 2	Compressor Drive A Warning 2
				COMP DRIVE B	Compressor drive, circuit B
alarm1_2	-	0	-	Comp Drive B Alarm 1	Compressor Drive B Alarm 1
alarm2_2	-	0	-	Comp Drive B Alarm 2	Compressor Drive B Alarm 2
warn1_2	-	0	-	Comp Drive B Warning 1	Compressor Drive B Warning 1
warn2_2	-	0	-	Comp Drive B Warning 2	Compressor Drive B Warning 2
				PUMP DRIVE A	PUMP DRIVE A
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

6 - ADVANCED INTERFACE: MENU STRUCTURE



Drive Alrm Main – DRV_ALARM (continued)

Name	Status	Default	Unit	Displayed text*	Description
				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	CIRCUIT 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	-	-	kW	Heating Cap A	Heating Cap A
capRefA	-	-	kW	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	CIRCUIT 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	-	-	kW	Heating Cap B	Heating Cap B
capRefB	-	-	kW	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

6 - ADVANCED INTERFACE: MENU STRUCTURE



Last Power On Reset – LAST_POR (continued)

Name	Status		Unit	Displayed text*	Description
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
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	Resetting the alert after maintenance will result in an update on the next visit
m_date	-	-	-	Next Visit	Next visit
				Refrig. charge period:	Refrig. charge period
R_RESET	no/yes	no	-	Reset Alert	Resetting the alert after maintenance will result in an update on the next visit
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	-	-	°C /°F	Controlled Temperature	Controlled temperature
casc_cap	0 to 100		%	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).

6 - ADVANCED INTERFACE: MENU STRUCTURE



System Version – SYSVER

Name	Status	Default	Unit	Displayed text*	Description
sr_cioba	-	-	-	CIOB A CESR Number	CIOB A CESR Number
sr_ciobb	-	-	-	CIOB B CESR Number	CIOB B CESR Number
sr_ciob3	-	-	-	CIOB 3 CESR Number	CIOB 3 CESR Number
sr_ciob4	-	-	-	CIOB 4 CESR Number	CIOB 4 CESR Number
sr_ciob5	-	-	-	CIOB 5 CESR Number	CIOB 5 CESR Number
sv_compa	-	-	-	Comp Drive A Soft Ver	Comp Drive A Software Version
sn_compa	-	-	-	Comp Drive A Ser Number	Comp Drive A Serial Number
sv_compb	-	-	-	Comp Drive B Soft Ver	Comp Drive B Software Version
sn_compb	-	-	-	Comp Drive B Ser Number	Comp Drive B Serial Number
sv_pumpa	-	-	-	Pump Drive A Soft Ver	Pump Drive A Software Version
sn_pumpa	-	-	-	Pump Drive A Ser Number	Pump Drive A Serial Number
sv_pumpb	-	-	-	Pump Drive B Soft Ver	Pump Drive B Software Version
sn_pumpb	-	-	-	Pump Drive B Ser Number	Pump Drive B Serial Number
sv_enmtr	-	-	-	Energy Meter Soft Ver	Energy Meter Software Version
sn_enmtr	-	-	-	Energy Meter Ser Number	Energy Meter Serial Number

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

The Cascade Subordinates (CASCADE) is a submenu of the Maintenance Menu.

To display four subordinates (UNIT1 to UNIT4), click "Cascade Subordinates". Select "UNIT1" to display the corresponding information.



Cascade Subordinates - CASCADE

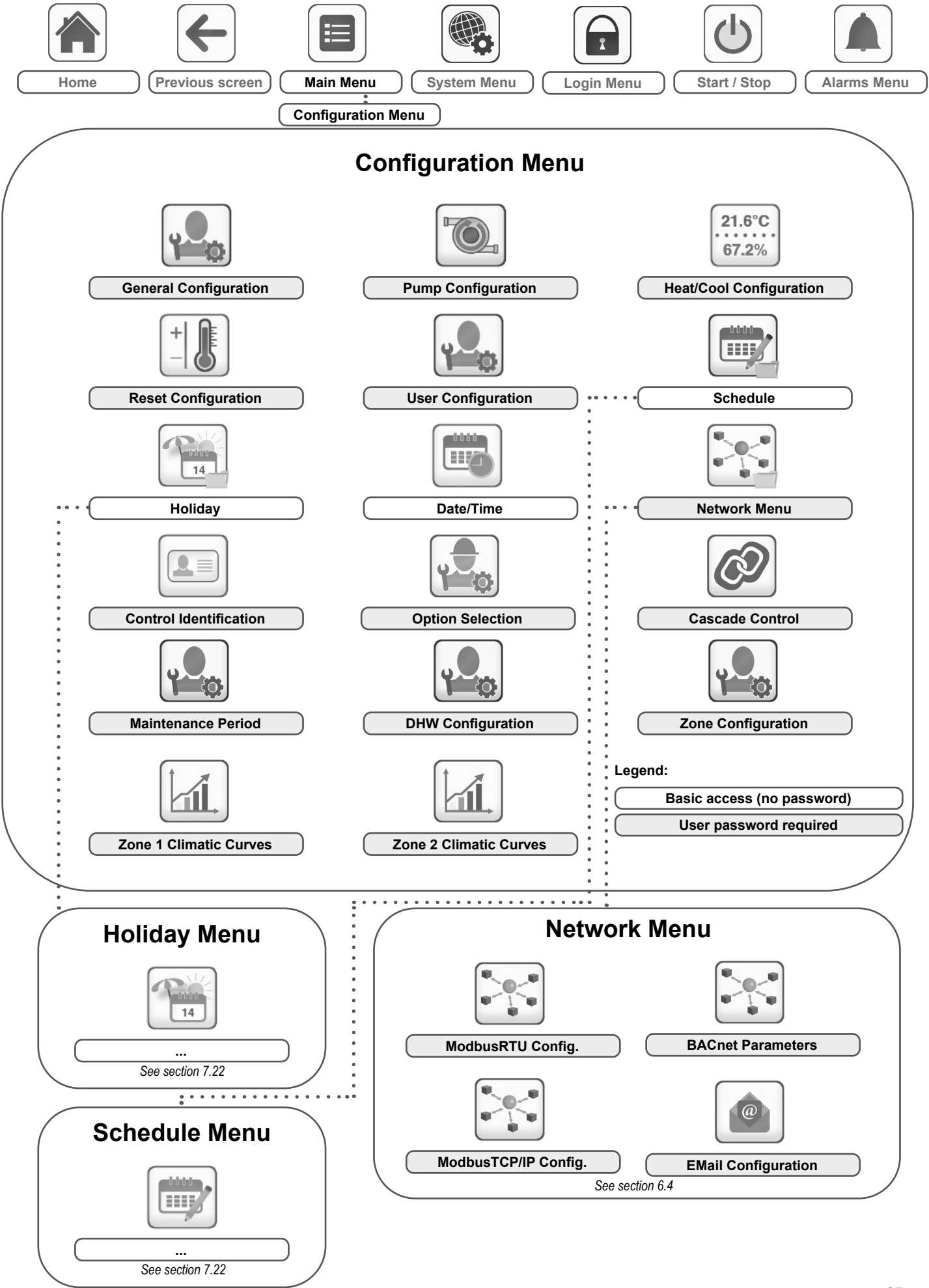
Name	Status	Unit	Displayed text*	Description
version	2	-	M/S ProtocolVersion	M/S Protocol Version
config1	-	-	Config Flags Register1	Config Flags Register1
config2	-	-	Config Flags Register2	Config Flags Register2
runstate	-	-	Unit State	Unit state
heatcool	-	-	Heat/Cool	Heat/Cool
status1	-	-	Status Flags Register1	Status Flags Register1
status2	-	-	Status Flags Register2	Status Flags Register2
cap_a_kw	80	kW	Nominal Cap Available	Nominal Capacity 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	Wear factor

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

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

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6.3 - Configuration menu



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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
max_fan	76 to 100	76	%	Maximum fan speed	Maximum fan speed
lowNoise	no/yes	no	-	Ultra Low Noise	Ultra low noise (referred to as "Full Load efficiency" in Quick Configuration - Settings)

*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	2	-	Water Flow Ctrl Method	Water flow control method
				1=Constant 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 16.2	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 20.0 5.4 to 36.0	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_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)

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Pump Configuration – PUMPCONF (continued)

Name	Status	Default	Unit	Displayed text*	Description
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 10	5	min	Eco Pump Mode Off Delay	Eco pump mode off delay
ecop_on	2 to 5	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	-	Both Command Select	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	-	EHS For Defrost	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
boil_pwr	0 to 65535	50	kW	HHP Boiler Maximum Power	Hybrid Heat Pump: Boiler maximum power
elec_PEF	1 to 5	2.3	-	Elec Prim Energy Factor	Primary Energy Factor for electricity
kwh_elec	0 to 1000	0.25	kWh	1 kWh Electricity Cost	Electricity cost per 1 kWh
kwh_boil	0 to 1000	0.15	kWh	1 kWh HHP Boiler Cost	HHP Boiler cost per 1 kWh
boil_eff	0 to 100	90	%	HHP Boiler efficiency	HHP boiler efficiency
boilOnT	1 to 10	5	min	HHP Boiler Min On Time	HHP boiler minimum on time
HybrSwch	0 to 1	0	-	Switch Mode Hybrid HP	Switch mode for hybrid heat pump: 0 = Switching according to Primary Energy Factor 1 = Switching according to energy cost (boiler vs electricity)

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

NOTE: The Hybrid Heat Pump option is currently unavailable and will be implemented in a future release.



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

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Reset Configuration – RESETCFG (continued)

Name	Status	Default	Unit	Displayed text*	Description
l_cr_no	0 to 20	0	mA	Current No Reset Value	Current no reset value
l_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
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
l_hr_no	0 to 20	0	mA	Current No Reset Value	Current no reset value
l_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 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	no/yes	no	-	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	0 to 2	0	-	Heating control	Heating control
				0=Heat Pump only	0 = Heat Pump only
				1=Heat Pump or Boiler	1 = Heat Pump or Boiler
				2=Hybrid Heat Pump	2 = Hybrid Heat Pump
					<i>Note: This option is currently not available.</i>
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
ext_iob	no/yes	no	-	Extern IO board? (156D)	External I/O Board (Option 156D)
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
enyMeter	no/yes	no	-	Enable Energy Meter	Enable Energy Meter
sms_ena	disable/enable	disable	-	SM Sequencer Control	SM Sequencer Control

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

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Date/Time – DATETIME

Displayed text*	Status	Description
Location	UTC	Time zone
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 7.22)
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 7.22)

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

NOTE: The Date/Time Configuration menu appears also in the System menu (see also section 6.5).



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-20ZF3040	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 address (M)
u2_addr	0 to 239	0	-	Unit 2 CCN addr (S)	Unit 2 CCN address (S)
u3_addr	0 to 239	0	-	Unit 3 CCN addr (S)	Unit 3 CCN address (S)
u4_addr	0 to 239	0	-	Unit 4 CCN addr (S)	Unit 4 CCN address (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 communication lost yes = if communication is lost, the Subordinate unit continues to operate using its own locally configured values no = if communication is lost, the Subordinate unit shuts down
timeout	1 to 60	2	min	Comm Lost Time Out	Communication lost timeout

*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	Refrigerant 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).

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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	100	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 0: Thermal Switch 1: Thermistor Sensor	Domestic Hot Water sensor type 0: Thermal Switch 1: Thermistor Sensor
dhw_kp	0 to 100	2	-	Compressor prop. gain	Compressor proportional gain
dhw_ti	0 to 100	10	sec	Compressor integ. time	Compressor integral time
dhw_td	0 to 100	0	sec	Compressor deriv. time	Compressor derivative time

*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	1= Cooling Only
				2 = Cooling & Heating	2= Cooling & Heating
				3 = Heating Only	3= Heating Only
floorzon	0 to 2	0	-	Floor Temp Zone Nb	Floor temperature zone Nb
floorHe	20 to 35 68 to 95	28 82.4	°C °F	Floor Temp Safety Heat	The safety temperature threshold to prevent the floor from overheating
floorCo	15 to 20 59 to 68	20 68	°C °F	Floor Temp Safety Cool	The safety temperature threshold to prevent the floor from overcooling
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
kp_ht_z1	0 to 100	0.4	-	Zone #1 PID Kp Heating	Proportional gain for heating in zone #1
ti_ht_z1	0 to 100	20	sec	Zone #1 PID Ti Heating	Integral time for heating in zone #1
td_ht_z1	-100 to 100	0.02	sec	Zone #1 PID Td Heating	Derivative time for heating in zone #1
kp_cl_z1	-100 to 0	-0.4	-	Zone #1 PID Kp Cooling	Proportional gain for cooling in zone #1
ti_cl_z1	0 to 100	20	sec	Zone #1 PID Ti Cooling	Integral time for cooling in zone #1
td_cl_z1	-100 to 100	0.02	sec	Zone #1 PID Td Cooling	Derivative time for cooling in zone #1
kp_ht_z2	0 to 100	0.4	-	Zone #2 PID Kp Heating	Proportional gain for heating in zone #2
ti_ht_z2	0 to 100	20	sec	Zone #2 PID Ti Heating	Integral time for heating in zone #2
td_ht_z2	-100 to 100	0.02	sec	Zone #2 PID Td Heating	Derivative time for heating in zone #2
kp_cl_z2	-100 to 0	-0.4	-	Zone #2 PID Kp Cooling	Proportional gain for cooling in zone #2
ti_cl_z2	0 to 100	20	sec	Zone #2 PID Ti Cooling	Integral time for cooling in zone #2
td_cl_z2	-100 to 100	0.02	sec	Zone #2 PID Td Cooling	Derivative time for cooling in zone #2

*Depends on the selected language (English by default)



Zone 1 Climatic Curves – CURV_Z1

Name	Status	Default	Unit	Displayed text*	Description
ht_curv	-1 to 2	1	-	Heating Climatic Curve -1= Fixed Setpoints 0= Custom curve (OAT) 1= K1 Curve (OAT) 2= K2 Curve (OAT)	Heating Climatic Curve -1= Fixed Setpoints 0= Custom curve (OAT) 1= K1 Curve (OAT) 2= K2 Curve (OAT)
ht_min_a	-30 to 10 -22 to 50	-7 19.4	°C °F	Heat Minimum OAT	Minimum heat outdoor air temperature

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Zone 1 Climatic Curves – CURV_Z1 (continued)

Name	Status	Default	Unit	Displayed text*	Description
ht_max_a	10 to 30 50 to 86	20 68	°C °F	Heat Maximum OAT	Maximum heat outdoor air temperature
ht_min_w	25 to 75 77 to 167	25 77	°C °F	Heat Min Water Setpoint	Minimum heat water setpoint
ht_max_w	25 to 75 77 to 167	38 100.4	°C °F	Heat Max Water Setpoint	Maximum heat water setpoint
cl_curv	-1 to 1	1	-	Cooling Climatic Curve -1= Fixed Setpoints 0= Custom curve (OAT) 1= K1 Curve (OAT)	Cooling climatic curve -1 = Fixed Setpoints 0 = Custom curve (OAT) 1 = K1 Curve (OAT)
cl_min_a	0 to 30 32 to 86	20 68	°C °F	Cool Minimum OAT	Minimum cool outdoor air temperature
cl_max_a	24 to 46 75.2 to 114.8	35 95	°C °F	Cool Maximum OAT	Maximum cool outdoor air temperature
cl_min_w	6.5 to 20 43.7 to 68	10 50	°C °F	Cool Min Water Setpoint	Minimum cool water setpoint
cl_max_w	6.5 to 20 43.7 to 68	18 64.4	°C °F	Cool Max Water Setpoint	Maximum cool water setpoint

*Depends on the selected language (English by default)



Zone 2 Climatic Curves – CURV_Z2

Name	Status	Default	Unit	Displayed text*	Description
ht_curv	-1 to 2	1	-	Heating Climatic Curve -1= Fixed Setpoints 0= Custom curve (OAT) 1= K1 Curve (OAT) 2= K2 Curve (OAT)	Heating Climatic Curve -1= Fixed Setpoints 0= Custom curve (OAT) 1= K1 Curve (OAT) 2= K2 Curve (OAT)
ht_min_a	-30 to 10 -22 to 50	-7 19.4	°C °F	Heat Minimum OAT	Minimum heat outdoor air temperature
ht_max_a	10 to 30 50 to 86	20 68	°C °F	Heat Maximum OAT	Maximum heat outdoor air temperature
ht_min_w	25 to 75 77 to 167	25 77	°C °F	Heat Min Water Setpoint	Minimum heat water setpoint
ht_max_w	25 to 75 77 to 167	38 100.4	°C °F	Heat Max Water Setpoint	Maximum heat water setpoint
cl_curv	-1 to 1	1	-	Cooling Climatic Curve -1= Fixed Setpoints 0= Custom curve (OAT) 1= K1 Curve (OAT)	Cooling climatic curve -1= Fixed Setpoints 0= Custom curve (OAT) 1= K1 Curve (OAT)
cl_min_a	0 to 30 32 to 86	20 68	°C °F	Cool Minimum OAT	Minimum cool outdoor air temperature
cl_max_a	24 to 46 75.2 to 114.8	35 95	°C °F	Cool Maximum OAT	Maximum cool outdoor air temperature
cl_min_w	6.5 to 20 43.7 to 68	10 50	°C °F	Cool Min Water Setpoint	Minimum cool water setpoint
cl_max_w	6.5 to 20 43.7 to 68	18 64.4	°C °F	Cool Max Water Setpoint	Maximum cool water setpoint

*Depends on the selected language (English by default)

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6.4 - 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 9.3).



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

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ModbusTCP/IP Configuration – MODBUSIP

Name	Status	Default	Unit	Displayed text*	Description
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).

6 - ADVANCED INTERFACE: MENU STRUCTURE

6.5 - System menu



Home



Previous screen



Main Menu



System Menu



Login Menu

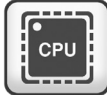


Start / Stop



Alarms Menu

System Menu



CPU Load



Network



Date/Time



Language & Unit



Brightness



Software Info



Hardware Info

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.

- 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

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6 - ADVANCED INTERFACE: MENU STRUCTURE



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

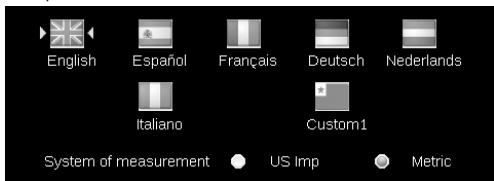
Displayed text*	Status	Description
Location	UTC	Time zone
Date/Time	YYYY/MM/DD, HH:MM:SS	Current date and time (must be set manually)
Today is a Holiday	no/yes	Information about holidays (read-only). Please note that holidays are set in the Holiday menu (see also section 7.22)
Tomorrow is a Holiday	no/yes	Information about the upcoming holiday period (read-only). Please note that holidays are set in the Holiday menu (see also section 7.22)

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

NOTE: The Date/Time Configuration menu appears also in the Configuration menu (see also section 6.3).



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 Manufacturer 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).

6 - ADVANCED INTERFACE: MENU STRUCTURE



Brightness – BRIGHTNS

Displayed text*	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*	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	-	Brand name

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



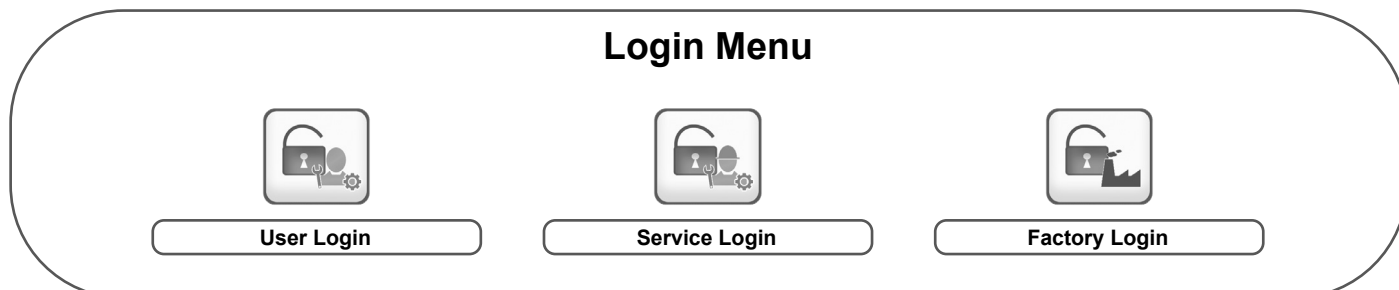
Hardware Info – HWINFO

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

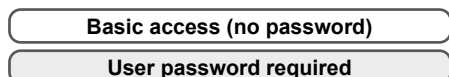
*Depends on the selected language (English by default).

6 - ADVANCED INTERFACE: MENU STRUCTURE

6.6 - Login menu



Legend:



6.6.1 - 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).

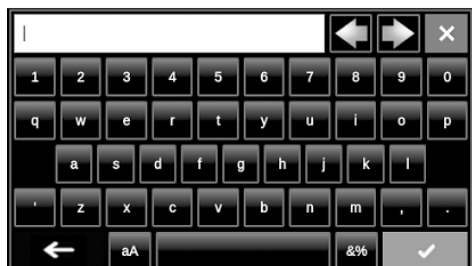
IMPORTANT: It is strongly recommended to change the default password of the user interface to exclude the possibility of changing any parameters by an unqualified person.

6.6.2 - 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.

6.6.3 - 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.

6.6.4 - Service & Factory login

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

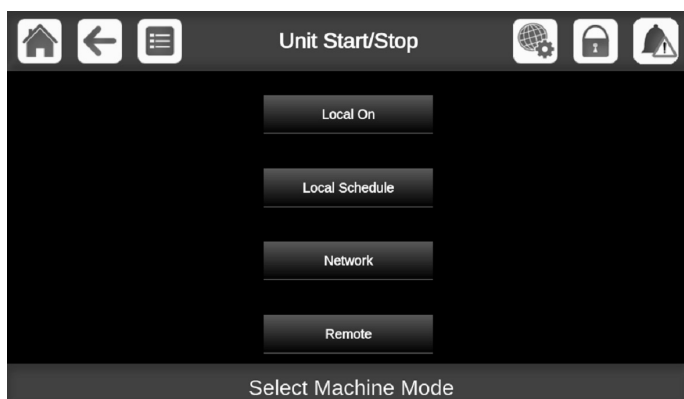
6 - ADVANCED INTERFACE: MENU STRUCTURE

6.7 - Start / Stop menu



6.7.1 - 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.

6.7.2 - 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.

6.7.3 - 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.

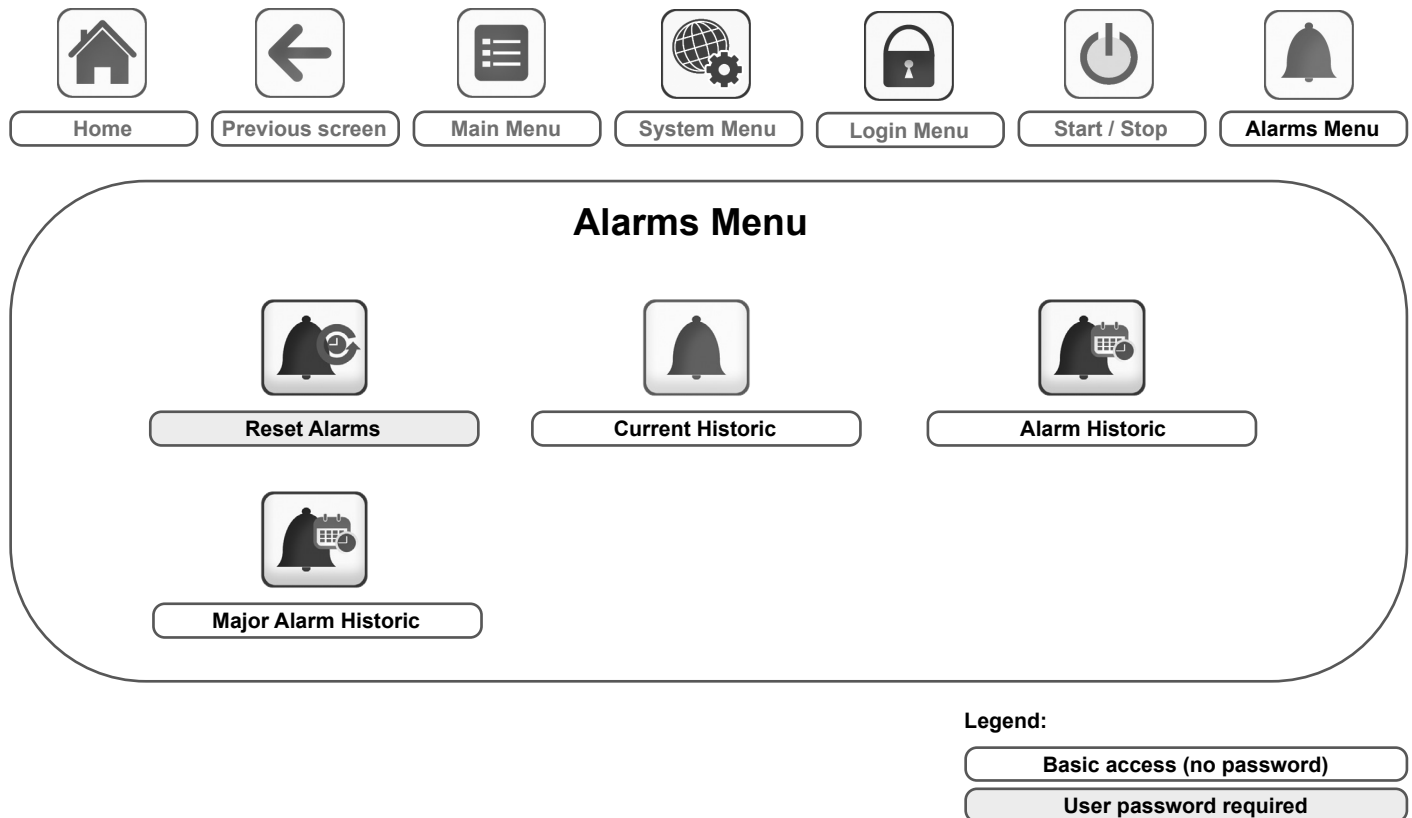
(2) Away Setpoints are considered during holiday periods.

(3) DHW Production and Legionella Prevention are enabled if DHW is activated.

(4) Night Mode is used to reduce the unit noise.

6 - ADVANCED INTERFACE: MENU STRUCTURE

6.8 - 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 9.6.



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 9.6)
alarm_2c	-	Current Alarm 2	Alarm code (see section 9.6)
alarm_3c	-	Current Alarm 3	Alarm code (see section 9.6)
alarm_4c	-	Current Alarm 4	Alarm code (see section 9.6)
alarm_5c	-	Current Alarm 5	Alarm code (see section 9.6)

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

6 - ADVANCED INTERFACE: MENU STRUCTURE



Current Alarms – ALAM_CUR

Name	Date	Hour	Alarm text
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 9.6)
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 9.6)
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 9.6)

*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 9.6)
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 9.6)
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 9.6)

*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 9.6)
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 9.6)
Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 9.6)

*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.***

7 - CONTROL SYSTEM OPERATION

7.1 - 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.

7.2 - 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).

7 - CONTROL SYSTEM OPERATION

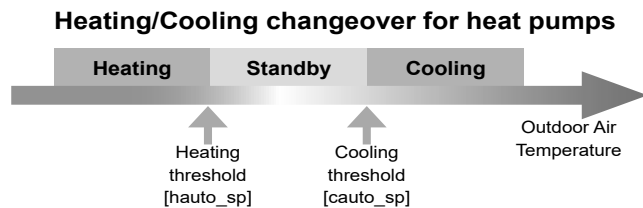
7.3 - Heating/Cooling/Standby

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).



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

7.4 - 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

7.4.1 - 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

7.4.2 - 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).

7 - CONTROL SYSTEM OPERATION

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.

7.5 - 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 controlled 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.

7.5.1 - Variable speed pumps control (Option 116V)

AWHP004 heat pumps may be fitted with one 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.

7.5.2 - 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

7.5.3 - 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

7.5.4 - 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 3.10.

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

7.5.5 - 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

7 - CONTROL SYSTEM OPERATION

7.5.6 - 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

7.6 - 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.

7.6.1 - 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.

7 - CONTROL SYSTEM OPERATION

7.6.2 - 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:

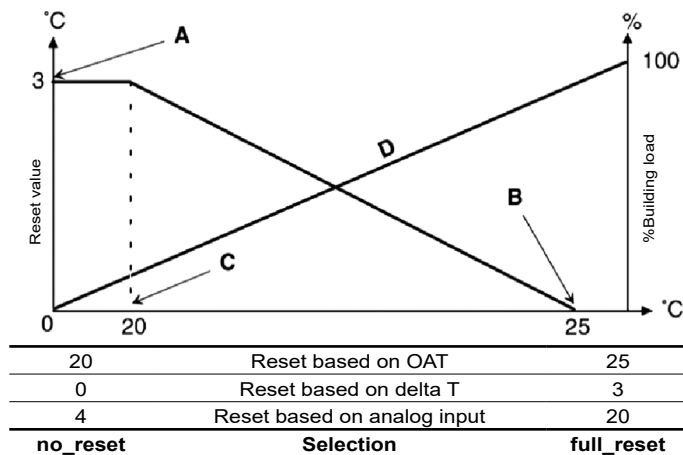
- OAT that gives the measure of the load trends for the building.
- Return water temperature (ΔT provides the average building load).
- Dedicated 4-20 mA input.

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:



Legend

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

7.7 - 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 3.7.3).
- 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 Smart User 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% -

7.8 - 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.

7.9 - 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).

7 - CONTROL SYSTEM OPERATION

7.10 - 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.

7.11 - 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.

7.12 - 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.

7.13 - Lead/Lag assembly (Option 58)

The control system allows for lead/lag control of two, three, or four units linked by the CCN network.

Modular system		Modular / 2 units					
AquaSnap 61AQ	Sizes	160P	180P	200P	240P	260P	280P
Base unit							
060P		1	1	1			
070P							
100P		1					
120P			1		2	1	
140P				1		1	2

Modular system		Modular / 3 units				
AquaSnap 61AQ	Sizes	300P	320P	350P	380P	420P
Base unit						
060P		1	1			
070P				1		
100P						
120P		2	1		2	
140P			1	2	1	3

Modular system		Modular / 4 units				
AquaSnap 61AQ	Sizes	440P	470P	490P	520P	560P
Base unit						
060P		1				
070P			1	1		
100P						
120P		2	1		2	
140P		1	2	3	2	4

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 ("MANAGER"). The commands are transmitted automatically to the lag unit ("SUBORDINATES").

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 units are equalised.

- In the event of a communication failure between the lead and lag units, the lag unit is authorised to continue running only if the "Continue on Communication Lost" configuration parameter (CASC_CFG, hold_on = yes) is enabled.

The lag unit will operate with the last command received from the lead unit until the communication is re-established. The subordinate (lag) unit cannot operate in stand-alone mode if communication with the manager (lead) unit is lost.

- If the "Continue on Communication Lost" configuration parameter is disabled (CASC_CFG, hold_on = no), the lag unit will shut down.

If the lead unit stops due to an alarm, the lag unit will continue to operate under the supervision of the lead unit.

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)

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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

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	Set the Element Number according to the Lead/Lag number
	CCN Address configured in the Lead unit

NOTE: To verify or modify the Lead/Lag configuration from the Smart User Interface home screen, see section 4.2.2.

7.14 - 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. Only one Legionella prevention session is permitted within a 24-hour period.

IMPORTANT: If a customer pump is configured it must be controlled by the controller (see PUMPCONF table Cooler pump sequence configuration) as the DHW valve remains closed during the opening/closing process. Otherwise, an alarm titled "DHW Illegal Configuration" will be triggered.

7.15 - 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.

7.16 - 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.

7.17 - 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.

7.18 - Energy monitoring & Energy metering

■ Energy Monitoring (Standard feature)

The Energy Monitoring function provides users with essential information, including the estimated power consumption and energy usage of the unit, as well as its efficiency in both cooling and heating modes, among other details. For further information regarding energy monitoring, please refer to the Energy page on the Smart User Interface (see section 5.2.11), and see section 6 on the Advanced User Interface.

■ Energy Meter with Current Transformer (Option 294)

An Energy Meter, integrated with a current transformer on the main power supply (Option 294), enables users to measure the actual electricity consumption of the unit.

The "MID" (Measuring Instruments Directive) certified energy meter complies with European Union (EU) standards. MID-certified energy meters are typically used for utility billing purposes

To check if Energy Meter is configured (Option 294)

1. Navigate to the *Configuration menu*.
2. Select *Option Selection (OPT_SEL)*.
3. Set *Energy Meter Option [enyMeter]*.

Energy Meter Option [enyMeter]	
no	Energy Meter Option not available
yes	Energy Meter Option available

Every 15 seconds, the SmartVu™ 2.0 controller reads the energy consumption from the Energy Meter using the Modbus RTU protocol as Lead (SmartVu™ 2.0 controller - J8 connector).

The Energy Meter provides the following measurements:

Name	Point name	Unit
Current per phase	sglPhs_I	A
Active power	p_total	kW
Total reactive power	rp_total	kVAR
Power factor	pow_fact	-
Total active energy	e_total	kWh
Tot. reactive power Kvar	rp_total	kvar
Tot. react. ener. Kvarh	re_total	kvarh
Partial active energy	e_reset	kWh
Maximum active power demand	p_max	kW
Total reactive energy	re_total	kVARh
Total harmonic distortion	THD	%
Voltage L1-L2	Volt L12	V

The values measured by the Energy Meter are displayed in the Energy Monitoring menu (ENERGY) which also contains smart energy monitoring data (standard "Smart Energy" functionality).

For units equipped with the optional Energy Meter, all "Smart Energy" monitoring data (ENERGY table) related to the electrical power of the unit will be updated with the data coming from the Energy Meter.

If the communication between the controller and the Energy Meter is lost, then an alert will be triggered (alert 59001).

The user can reset the energy consumption readings if needed.

To reset the energy readings

1. Navigate to the *Main menu* (logged-in users only).

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2. Select *Energy Monitoring* (ENERGY).
3. Set *Reset of Energy Counter* [reset_en] to "yes".

Reset of Energy Counter [reset_en]

No/Yes	Yes
--------	-----

7.19 - Multi-Heating/Cooling Zones

The SmartVu™ 2.0 controller lets you configure and manage one or two zones, with the option of naming the zones and changing their operating mode (Comfort/Economy).

It also provides the ability to control zones temperature through a 3-way and 3 points mixing valves, water temperature sensors and On/Off pumps (not supplied by the Manufacturer).

Depending on zone emitters (heating floor / Radiator / Fan Coil), each zone can be configured for Heating/Cooling, Cooling Only or Heating only modes.

A floor sensor can be installed to prevent the floor from overheating.

For each zone, the occupancy mode can be managed using a schedule (see section 7.22), Comfort/Economy/Away setpoints are configurable and can be automatically adapted to outside air temperature thanks to climatic curves (customizable).

The control point is determined in each zone, according to fixed setpoints, pre-defined climatic curves and custom climatic curves.

The heat pump control point is the highest zone control point in heating mode and the lowest in cooling mode.

Additionally, the SmartVu controller provides a status on the equipment used in each zone, such as water pumps and temperature sensors.

7.20 - Hybrid Heat Pump - not implemented

A hybrid system integrates a heat pump and a boiler connected in series, enabling flexible operation strategies. The hybrid functionality allows for coordinated or independent control of the heat pump and boiler to efficiently meet space heating and domestic hot water (DHW) demands based on prevailing climatic conditions (please refer to the Option Selection table in section 6).

Heating operation modes

The system supports three operating modes based on outdoor air temperature (OAT) and system performance parameters:

- **Boiler only:** Active when the OAT is below the switching temperature. At this stage, the boiler operates exclusively, as its thermal efficiency surpasses the coefficient of performance (COP) of the heat pump.
- **Heat Pump + Boiler (Hybrid Mode):** Active between the switching temperature and the bivalence point. In this range, the heat pump alone cannot meet the full heating demand, so the boiler operates in conjunction to supplement capacity.
- **Heat Pump only:** Active when the OAT exceeds the bivalence point. In this scenario, the heat pump alone can meet the building's heating load efficiently.

Heat pump/Boiler selection can be determined by:

- Primary energy consumption
- Cost per kWh of energy

Please refer to the Heat/Cool Configuration (HCCONFIG) table in section 6 for configuration parameters.

The primary energy Coefficient of Performance (COP), boiler efficiency, and the cost per kWh of energy for both the boiler and heat pump are configurable parameters within the HCCONFIG table.

To set the Hybrid Heat Pump

1. Navigate to the *Main Menu* in *Advanced User Interface*.
2. Navigate to the *Configuration Menu*.
3. Select *User Configuration* (OPT_SEL).
4. Set the *Heating control* [boil_en].

Heating control [boil_en]

0	Heat Pump Only
1	Heat Pump or Boiler
2	Hybrid Heat Pump

NOTE: The Hybrid Heat Pump option is currently unavailable and will be implemented in a future release.

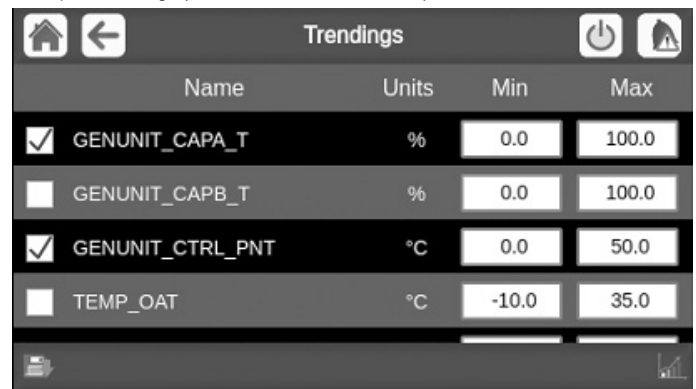
7.21 - Trendings

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

To display trends

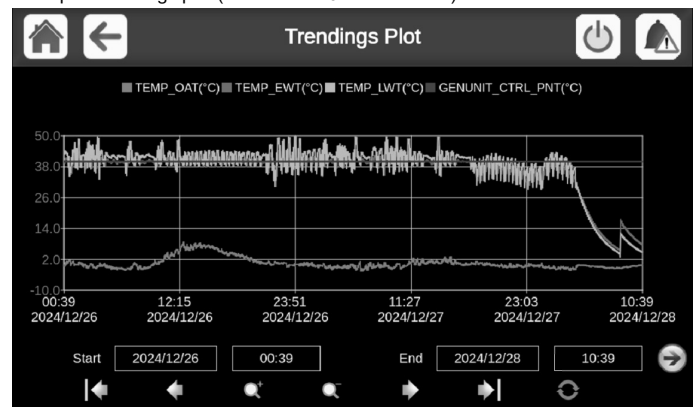
1. Go to the *Main menu*.
2. Select *Trendings* (TRENDING).
3. Select parameters to be displayed and press the **Save** button in the lower-left part of the screen.
 - A maximum of 10 trending points can be selected.
 - Swipe up or swipe down to display other trending points.

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  to reload data.

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7.22 - Schedule setting

The Schedule menu includes nine time schedules:

- **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.

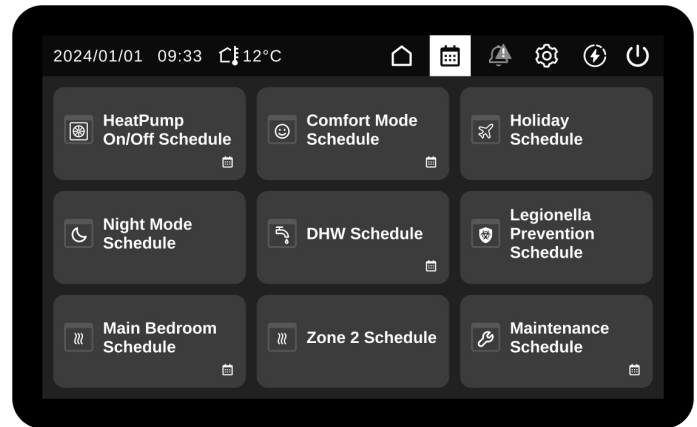
Occupancy periods

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.

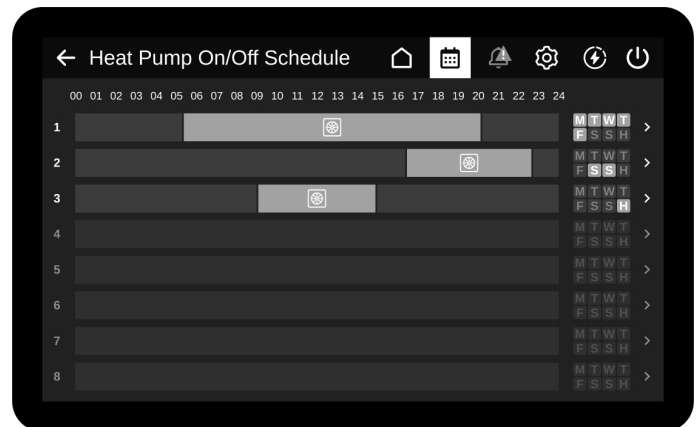
To set the unit schedule (from Smart UI home screen)

1. Go to the Schedule menu.



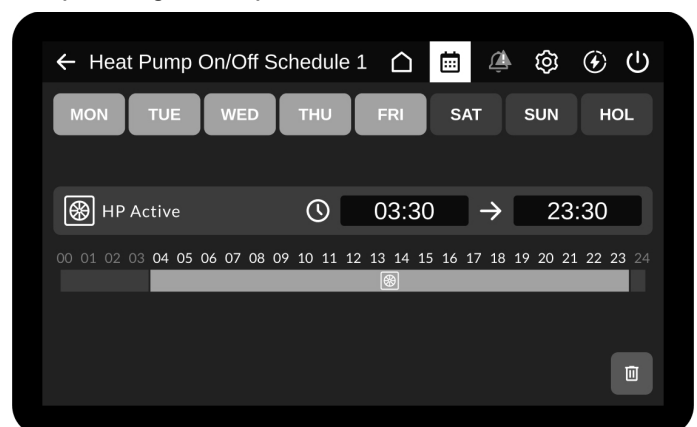
2. Navigate to the selected schedule to adjust. To configure a period (1-8), select the corresponding period.

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 cancel changes.

IMPORTANT: The method for setting the schedule is the same for all other time schedules, except for the Holiday Schedule (see section 7.22.1) and Maintenance Schedule (see section 7.22.2).

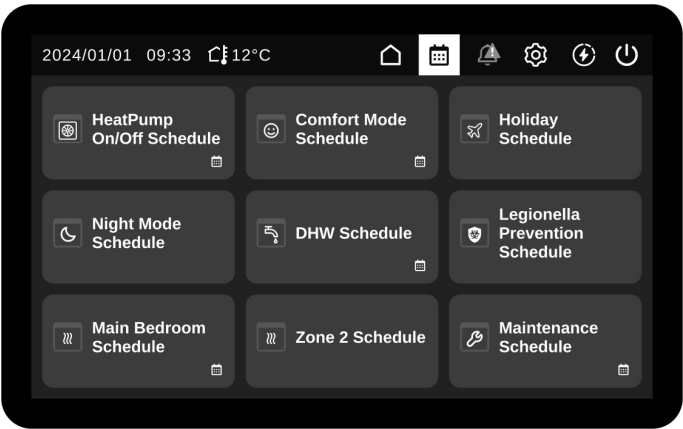
7 - CONTROL SYSTEM OPERATION

7.22.1 - Schedule menu - Holiday Schedule

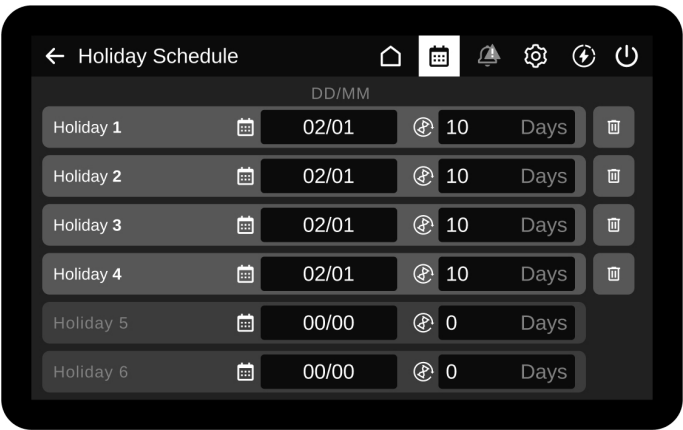
The Holiday Schedule is one of nine Schedule Menu setting options.

To set the unit Holiday Schedule (from Smart UI home screen):

- 1. Go to the Schedule menu.



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



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

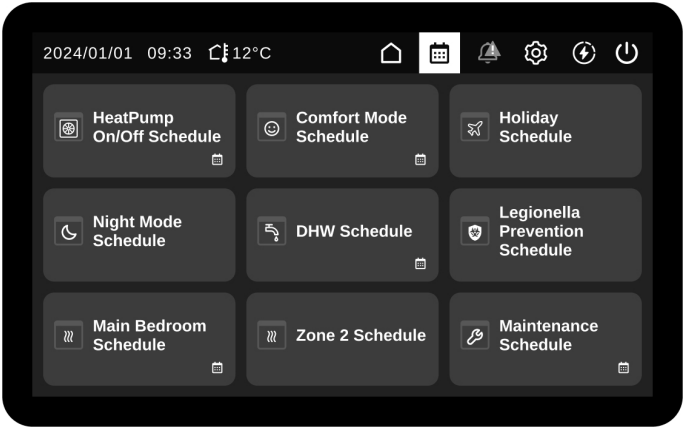
*Depends on the selected language (English by default).

7.22.2 - Schedule menu - Maintenance Schedule

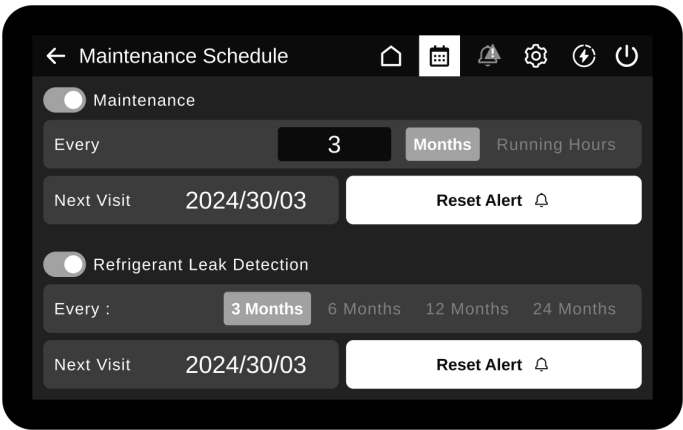
The Maintenance Schedule is one of nine Schedule Menu setting options.

To set the unit Maintenance Schedule (from Smart UI home screen):

- 1. Go to the Schedule menu.



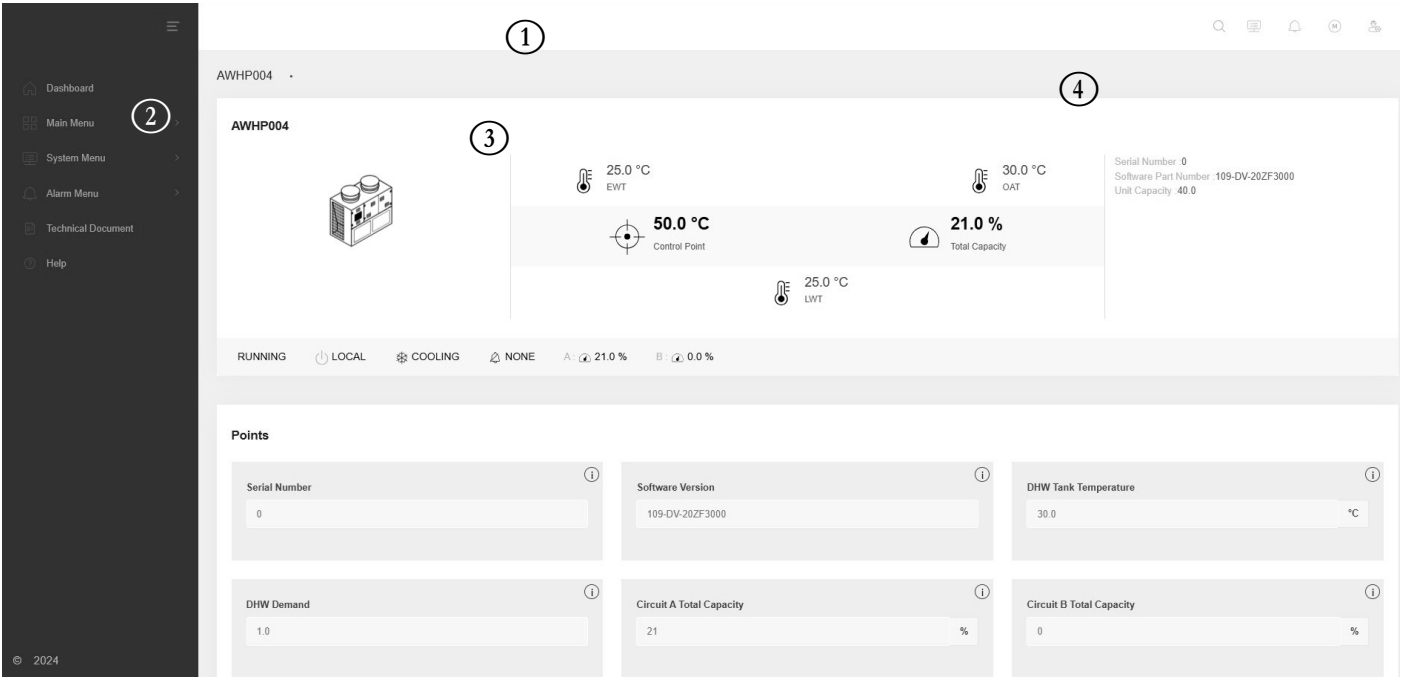
- 2. Select the Maintenance Schedule for adjustment.



- 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.
- 4. Press the **Back** button to validate. An alert will be triggered when the period has elapsed.

8 - WEB CONNECTION

8.1 - SmartVu™ 2.0 web interface

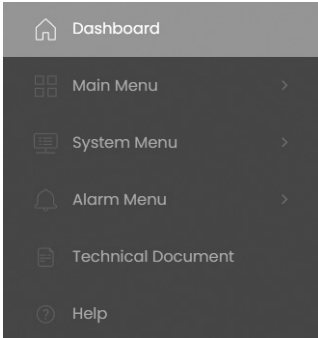


AWHP004 web interface (home screen)

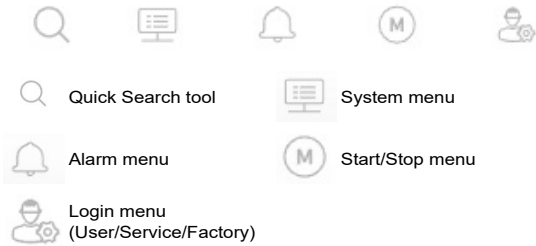
Web interface sections

- 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:



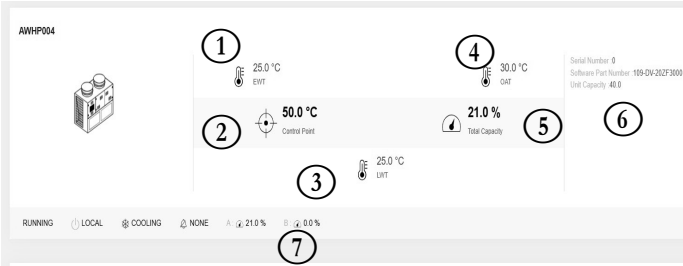
- ④ Quick access to Search, System menu, Alarm menu, Login and Start/Stop (read-only).



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
- Control type: LOCAL, REMOTE, NETWORK
- Heat/Cool selection: COOLING / HEATING
- Alarm status: ALARM / NONE / ALERT
- Circuit A and Circuit B capacity

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

8 - WEB CONNECTION

8.2 - 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:

- Microsoft Edge (version 131 or later)
- Mozilla Firefox (version 60 or later)
- Google Chrome (version 65 or later)

A maximum of 10 logged-in users can be connected simultaneously with no priority between them. The last modification is always taken into account.

- Closing the web browser will close the web session.
- The web session is closed automatically after 3 minutes of inactivity.

8.3 - 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 (Enter USER password > navigate to 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 safety 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.

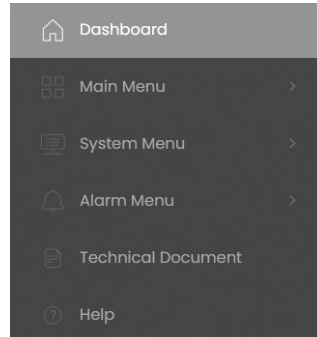
NOTE: Make sure that your network is protected from malicious attacks and any other security threats. Do not provide open access without proper network security safeguards. The manufacturer does not hold any responsibility or liability for damage caused by security breach.

8.4 - 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
Energy Meter	English	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.

9 - DIAGNOSTICS

9.1 - 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 (Smart User Interface) 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 6.8).

9.2 - 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.

Current Alarms			
1	Alarm AWWHP004 VFD Drive Pump B Failure	04/01/2025	07:34:00
2	Alarm AWWHP004 Circuit B Suction Pressure Transducer Failure	04/01/2025	07:34:00
3	Alarm AWWHP004 Circuit A Suction Pressure Transducer Failure	04/01/2025	07:34:00
4	Alarm AWWHP004 Circuit B Suction Pressure Transducer Failure	04/01/2025	07:34:00

9.3 - 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).

9 - DIAGNOSTICS

9.4 - 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.

9.5 - 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.

← Alarms History				🏠	📅	🔔	⚙️	🔌
1	Alarm AWP004 Loss of communication with CIOB Board Number 3	23/01/2025	07:12:00					
2	Alarm AWP004 Loss of communication with CIOB Board Number 4	23/01/2025	07:12:00					
3	Alarm AWP004 Loss of communication with CIOB Board Number 3	23/01/2025	07:08:00					
4	Alarm AWP004 Loss of communication with CIOB Board Number A	23/01/2025	07:03:00					

9 - DIAGNOSTICS

9.6 - Alarm description

9.6.1 - Alarms

Database name*	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_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_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_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
Input failure					
ALM_DHW_ALG_UNFINISHED	15083	Domestic Hot Water Anti-Legionella session not completed	Automatic, when the next Anti-Legionella session is completed	The unit shall continue to run	Anti-Legionella session lasts longer than one minute
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

9 - DIAGNOSTICS

Database name*	Code	Alarm description	Reset type	Action taken	Possible cause
ALM_WP_IN_F	12024	Water Exchanger : Entering Fluid Transducer Failure	Automatic, if sensor voltage reading returns to normal	Circuit shuts down	Defective transducer or connection
ALM_WP_OUT_F	12025	Water Exchanger : Leaving Fluid Transducer Failure	As above	Circuit shuts down	As above
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.	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
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, fan circuit breaker in OFF position
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					
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

9 - DIAGNOSTICS

Database name*	Code	Alarm description	Reset type	Action taken	Possible cause
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
ALM_ILL_CONF_F	71nn	DHW Illegal configuration 01: DHW on Cooling Only unit 02: DHW with Diverting Valve but customer pump not controlled by the unit	Automatic, if configuration is corrected	DHW cannot be started	7101: Illegal configuration 7102: Customer pump not controlled by the unit
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 (when High SDT mode is OFF) or manual if the alarm occurred more than 6 times in the last 24 hours	Compressor stops	Repetitive capacity decreases, fan circuit breaker in OFF position
ALM_HIGH_SDT_B_F	10038	Circuit B High Saturated Discharge Temperature	As above	Compressor stops	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 occurrences per day (when the circuit is running)	Circuit A shuts down	Flow switch problem or pump not started
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	Automatic or manual if more than 6 occurrences per day (when the circuit is running)	Circuit A shuts down	The High pressure switch is connected to the Compressor Drive, fan circuit breaker in OFF position
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
ALM_DGT_SENSOR_A_F	10098	Circuit A Wrong Discharge Gas Temperature Sensor	Manual	None (alert)	If DGT sensor detected is 5k and DGT exceed 130°C (266°F)

9 - DIAGNOSTICS

Database name*	Code	Alarm description	Reset type	Action taken	Possible cause
ALM_DGT_SENSOR_B_F	10099	Circuit B Wrong Discharge Gas Temperature Sensor	Manual	None (alert)	As above
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
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
ALM_G_LEAK	10227	Gas Leak detected	Automatic, when the sensor returns to normal	For units with leakage alarm enabled (OPT_SEL, leak_alm = "yes"): Circuit A shuts down when the refrigerant leakage is detected ("alarm") For units with leakage alarm disabled (OPT_SEL, leak_alm = "no"): No action ("alert" only) Note: Regardless of leakage alarm configuration (OPT_SEL, 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)
ALM_HIGH_SUCTION_A_F	10401	Circuit A High Saturated Suction Temperature	Automatic, if SST returns to normal and the alarm occurred not more than 6 times in the last 24 hours (otherwise manual)	Circuit A shuts down	Defective Sensor, Saturated Suction Temperature outside the EXV MOP (maximum operating pressure)
ALM_HIGH_SUCTION_B_F	10402	Circuit B High Saturated Suction Temperature	As above	Circuit B shuts down	As above
Service maintenance warning					
ALM_SERVICE_MAINT_ALERT	13nnn	Service maintenance alert 004: Maintenance Servicing Required 007: Refrigerant check needed	Manual	Unit shall continue to run	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 9.6.2)
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	As above
ALM_PUMP_DRIVE_B_F	20nnn	VFD Pump Drive 2 Failure	Manual	Unit shuts down	As above
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	57005	CIOB#5 Low Voltage Failure	As above	Unit shuts down	As above

9 - DIAGNOSTICS

Database name*	Code	Alarm description	Reset type	Action taken	Possible cause
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_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
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. Incorrect configuration of DHW type parameter (see DHW_CONF table)
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
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.

*Note: The alarm name refers to ModBus register list document (parameter column) and BACnet Object documentation (Object name column).

9 - DIAGNOSTICS

9.6.2 - 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.	Trip classification*	Action to be taken
0	No Fault or No Trip	<i>no-Flt</i>	-	Please contact your local Service representative if more information is needed
3	Instantaneous over current	<i>O-I</i>	A	As above
4	Motor Thermal Overload	<i>I.t-trP</i>	B	As above
5	Power stage trip	<i>PS-trP</i>	A	As above
6	Over voltage on DC bus	<i>O-Volt</i>	A	As above
7	Under voltage on DC bus	<i>U-Uolt</i>	A	As above
8	Over Temperature trip	<i>O-T</i>	B	As above
9	Under Temperature trip	<i>U-T</i>	B	As above
10	Factory Default parameters have	<i>P-DEF</i>	A	As above
11	External trip	<i>E-Trip</i>	A	As above
12	Optibus comms loss	<i>SC-OBS</i>	A	As above
13	DC bus ripple too high	<i>Flt-DC</i>	A	As above
14	Input phase loss trip	<i>P-Loss</i>	A	As above
15	Instantaneous over current on drive output	<i>h-O-I</i>	A	As above
16	Thermistor Fault	<i>Th-Flt</i>	B	As above
17	Internal memory fault (IO)	<i>DATA-F</i>	A	As above
18	4-20mA Signal Lost	<i>4-20F</i>	A	As above
19	Internal memory fault (DSP)	<i>DATA-E</i>	A	As above
20	User Default Parameters Loaded	<i>U-DEF</i>	A	As above
21	Motor PTC thermistor trip	<i>F-PTC</i>	A	As above
22	Cooling Fan Fault	<i>FAN-F</i>	A	As above
23	Environmental temperature too high	<i>O-HEAT</i>	A	As above
26	Drive output fault	<i>OUT-F</i>	A	As above
-	Safety circuit momentarily opened during drive running	<i>E-trP</i>	B	As above
29	Slow rising edge on 24V supply Safety input circuit error	<i>STO-F</i>	A	As above
40	Measured motor stator resistance varies between phases	<i>AtF-01</i>	A	As above
41	Measured motor stator resistance is too large	<i>AtF-02</i>	A	As above
42	Measured motor inductance is too low	<i>AtF-03</i>	A	As above
43	Measured motor inductance is too large	<i>AtF-04</i>	A	As above
44	Measured motor parameters are not convergent	<i>AtF-05</i>	A	As above
49	Motor output phase loss	<i>OUT-Ph</i>	A	As above
50	Modbus comms loss fault	<i>SCF_01</i>	A	As above
81	Over current in U phase	<i>01-U</i>	A	As above
82	Over current in V phase	<i>01-V</i>	A	As above
83	Over current in W phase	<i>01-W</i>	A	As above
85	Output Phase U missing	<i>Outph-U</i>	B	As above
86	Output Phase V missing	<i>Outph-V</i>	B	As above
87	Output Phase W missing	<i>Outph-W</i>	B	As above
88	U Phase PWM output Loss	<i>OUT-U</i>	A	As above
89	V Phase PWM output Loss	<i>OUT-V</i>	A	As above
90	W Phase PWM output Loss	<i>OUT-W</i>	A	As above
92	L1 input phase loss	<i>Ph-L1</i>	B	As above
93	L2 input phase loss	<i>Ph-L2</i>	B	As above
94	L3 input phase loss	<i>Ph-L3</i>	B	As above
97	Communication lost between IO processor and PS (DSP) processor	<i>SC Loss</i>	A	As above
98	Internal memory fault	<i>DATA-03</i>	A	As above
101	STO Input opens while drive is running	<i>STO-R</i>	A	As above

9 - DIAGNOSTICS

Code	Description	Code Ref.	Trip classification*	Action to be taken
102	3 Phase input loss whilst running	<i>ML-Run</i>	A	As above
103	PS software not programmed through CoolSetting	<i>FW-Err</i>	A	As above
104	Locked rotor has been detected	<i>Rotor-L</i>	B	As above
105	Class B software lockout	<i>CLB-LK</i>	B	As above
253	Incorrect Hardware identification	<i>HW-ID</i>	A	As above
254	Incorrect drive identification	<i>Type-E</i>	A	As above

* The drive safety system uses trip classification to determine the action required when a fault occurs:

- Class "A" trip: The alarm can be reset manually or automatically by the system when conditions return to normal.
- Class "B" trip: If 10 consecutive trips of any class B alarm occur, the system will generate a class "B" lockout trip. Once this lockout trip is active, the drive must be power cycled to clear the fault (or it can be reset after a 2-minute delay).

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.

10 - 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 Manufacturer Service Agency.

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

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

11 - APPENDIX 1: SMART GRID READY INSTALLATION INSTRUCTIONS

11.1 - 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.

11.2 - Configuration of Smart Grid Ready option

To set Smart Grid Ready

At commissioning from the Quick Configuration System screen (see section 4.2.2).

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).

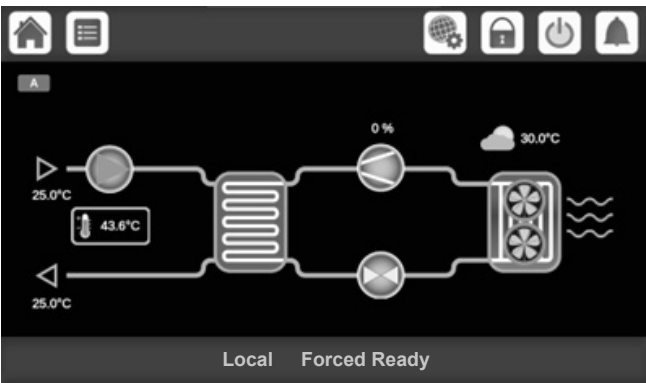
The status of Smart Grid inputs can be verified in the Inputs menu on the local touch screen.

To verify the status of Smart Grid inputs

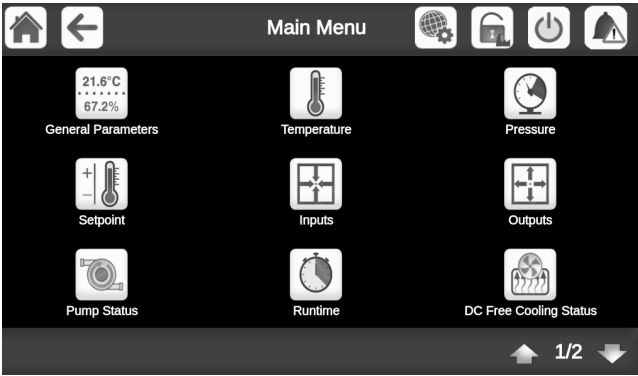
From Smart UI: see section 5.2

From Advanced UI: as shown below

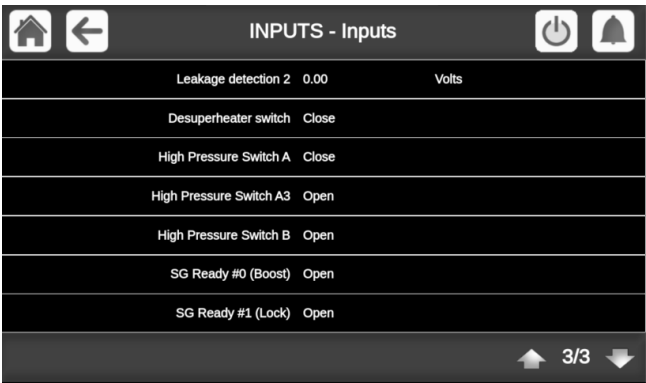
1. Tap to open the Main Menu.



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).

11 - APPENDIX 1: SMART GRID READY INSTALLATION INSTRUCTIONS

11.3 - 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 11.3.2.
 - 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 11.3.3).
 - 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.

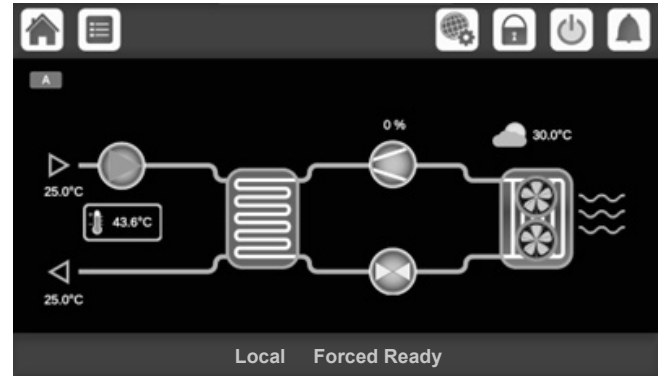
 - The heat pump will run in this mode for an undetermined period of time (until the FORCED mode is deactivated).
 - Smart Grid Mode 3 "FORCED" = DHW is allowed regardless DHW Schedule or Standby. DHW setpoint is offset (RESETCFG_dhw_sg4). DHW Heater is On.

11.3.1 - Smart Grid status

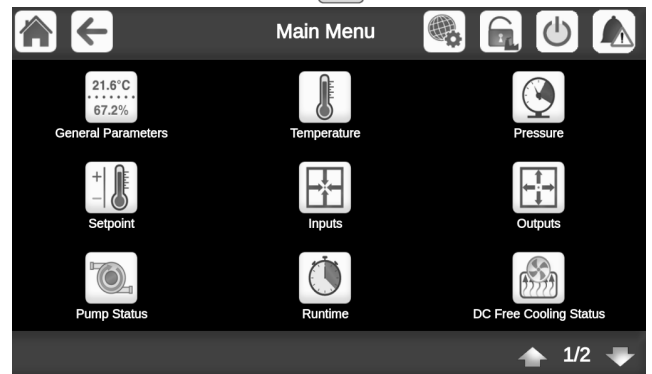
The Smart Grid Status can be found in the General Parameters menu (GENUNIT) or at the bottom of the SmartVu™ touch screen.

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

GENUNIT - General Parameters	
Circuit A Total Capacity	0 %
Circuit B Total Capacity	0 %
Active Demand Limit Val	100 %
Current Setpoint	11.0 °C
Control Point	11.0 °C
Emergency Stop	Disable
Smart Grid Ready Status	1

11 - APPENDIX 1: SMART GRID READY INSTALLATION INSTRUCTIONS

11.3.2 - LOCK operating mode

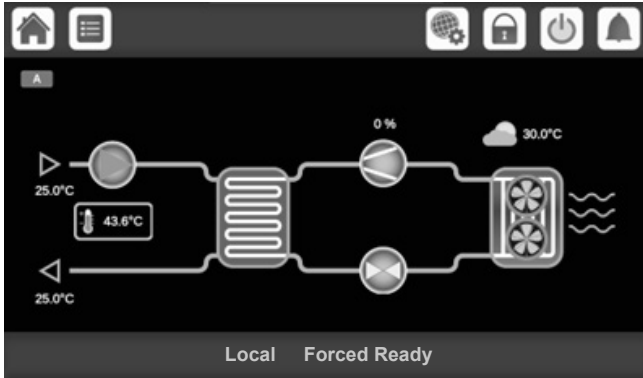
In the LOCK mode, the heat pump is in the OFF state.

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

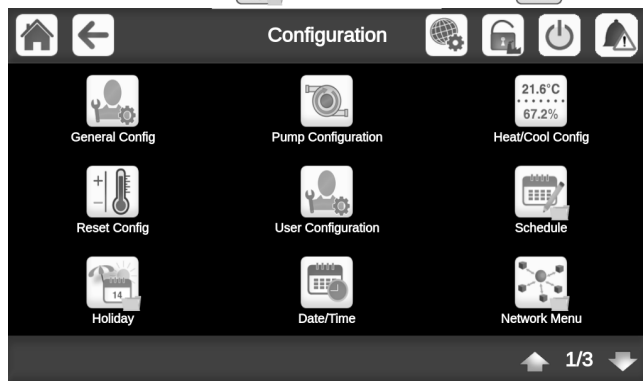
To start the boiler, the Outside Air Temperature (OAT) must be below the SGR Boiler OAT Threshold which is defined by the user.

To change the SGR boiler threshold

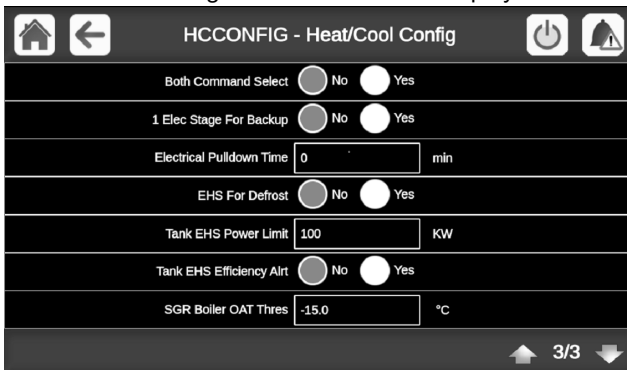
1. Switch to Advanced Configuration UI and log as User. Tap  to open the Main Menu.



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



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



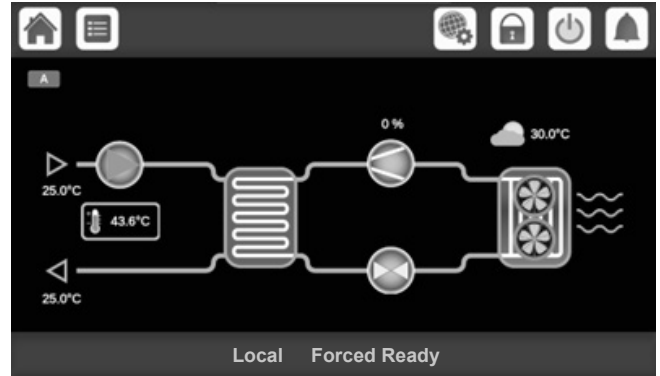
4. Set the Smart Grid threshold to start the boiler.
 - The threshold ("SGR Boiler OAT Thres") is -15°C by default.

11.3.3 - BOOST/FORCED operating mode

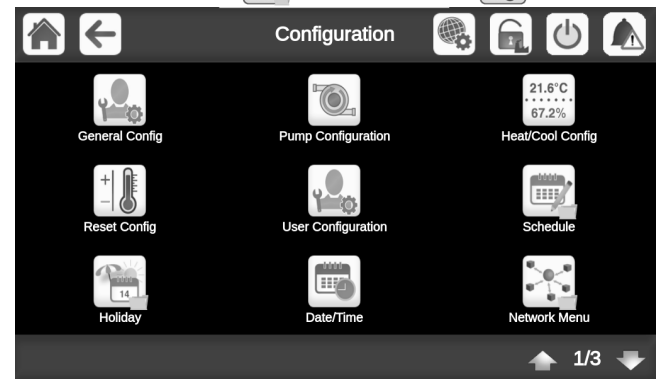
In the BOOST/FORCED mode, it is possible to define an offset used to adjust the water temperature setpoint.

To set the Smart Grid offset

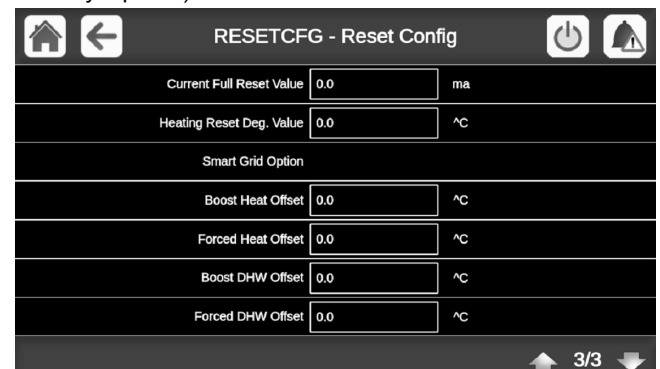
1. Tap  to open the Main Menu.



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).

11 - APPENDIX 1: SMART GRID READY INSTALLATION INSTRUCTIONS

11.4 - 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.

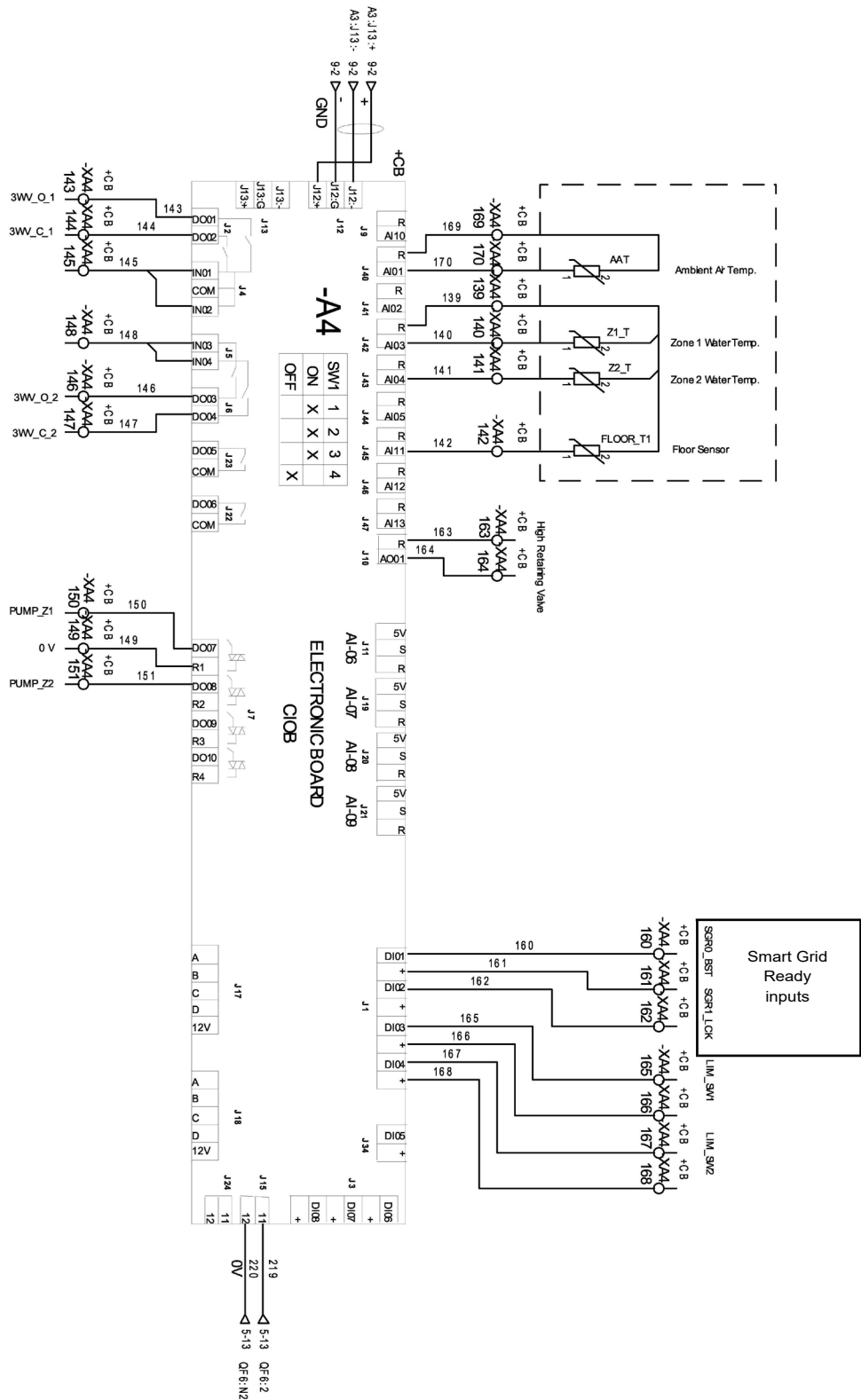
By default, “lim_sp1” and “lim_sp3” are equal to 100%, but they can be set to other values to limit the unit capacity. When the SG Ready option is enabled, these limits are applicable in "Boost" and "Forced" operating modes.

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.

11.4.1 - Electrical diagram

Customer control connections

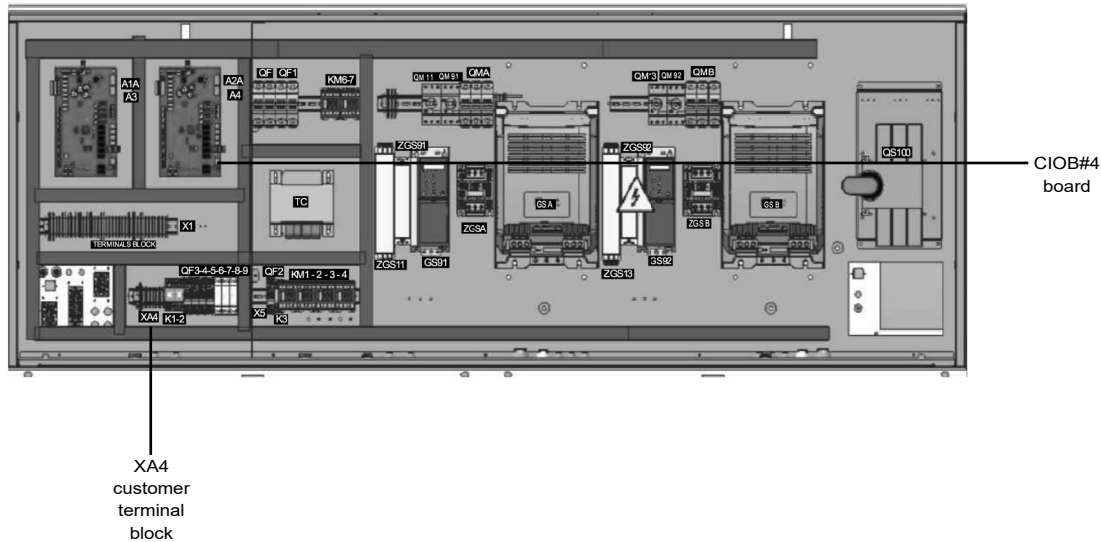


11 - APPENDIX 1: SMART GRID READY INSTALLATION INSTRUCTIONS

11.4.2 - 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 Smart 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.
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