



CONTROLS MANUAL



SmartVu Control

50/48 UC-(V)/UP-(V) 025-220

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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 48/50 UC(V)-UP(V) Rooftop air-air units with 25 to 220 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.

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

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

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

Please read all instructions prior to proceeding with any work. Pay attention to all safety warnings. The information provided herein is solely for the purpose of allowing customers to operate and service Carrier manufactured equipment and it is not to be reproduced, modified or used for any other purpose without the prior consent of Carrier Corporation.

ABBREVIATIONS

In this manual, the refrigeration circuits are called circuit A and circuit B. Compressors in circuit A are labelled A1, A2, A3, A4, whereas compressors in circuit B are labelled B1, B2, B3, B4. Same for THR circuit which will be called circuit C.

The following abbreviations are used frequently:

RTU	Rooftop unit
CCN	Carrier Comfort Network
EXV	Electronic Expansion Valve
EHS	Electric Heater Stage
OAT	Outdoor Air Temperature
LED	Light Emitting Diode
LEN	Sensor Bus (internal communication bus linking the basic board to slave boards)
SCT	Saturated Condensing Temperature
SST	Saturated Suction Temperature
VFD	Variable Frequency Drive
VAV	Variable Air Volume
SIOB	StarFire Input Output Board
AUX	Auxiliary Board
THR	Thermodynamic Energy Recovery
Network mode/Net	Operating type: Network
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
Master mode/Mast	Operating type: Master unit (master/slave assembly)
Remote mode/Rem	Operating type: Remote contacts
Thermostat control/Tstat	Operating type: Thermostat mode

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

Rooftop units are equipped with SmartVu Control that serves as the user interface and configuration tool for Carrier communicating devices. The advanced SmartVu Control comes with web connectivity.

The units typically have fixed speed compressor but also variable speed compressors as an option. They have one or two refrigerant circuits.

Smartvu is an electronic control system to regulate units of the following types :

- 48UC-: Gas heating, cooling only, air cooled packaged rooftop unit
- 48UP-: Gas heating, heat pump, air cooled packaged rooftop unit
- 48UCV: Gas heating, cooling only, air cooled packaged rooftop unit with inverter compressor
- 48UPV: Gas heating, heat pump, air cooled packaged rooftop unit with inverter compressor
- 50UC-: Cooling only, air cooled packaged rooftop unit
- 50UP-: Heat pump, air cooled packaged rooftop unit
- 50UCV: Cooling only, air cooled packaged rooftop unit with inverter compressor
- 50UPV: Heat pump, air cooled packaged rooftop unit with inverter compressor

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

2.2 - System functionalities

The system controls the start-up of the compressors 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.

2.3 - SmartVu control system:

- Allows users to control the unit via the SmartVu user interface
- Provides web connectivity technology
- Includes the trending functionality
- Supports Carrier Connect Services (Remote connectivity, alarm notification, remote access, performance and operation automatic reporting, technical advice)
- Supports Carrier Advanced Plant System Manager for multiple chillers/heat pumps configuration
- Provides direct BMS integration capabilities (CCN RS485, ModBus RS485 option, LON option, BACnet IP option)

2.4 - Operating modes

The control can operate in three independent modes:

- **Local mode:** The unit is controlled by commands from the user interface.
- **Remote mode:** The unit is controlled by dry contacts.
- **Network mode:** The unit is controlled by network commands (CCN or BACnet). Data communication cable is used to connect the unit to the CCN communication bus.
- **Thermostat mode:** The unit is controlled by the start/stop and setpoint contacts.

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

Feature	48/50 UC-UP Rooftop	
	Standard	Option
4.3" touch screen (SmartVu)	✓	
Web connectivity	✓	
E-mail transmission	✓	
Carrier Connect Services	✓	
Language packs	✓	
Language pack customization	✓	
Metric / Imperial unit display	✓	
History trends	✓	
CCN communication	✓	
BACnet IP communication	✓	
ModBus RTU / ModBus TCP communication	✓	
Fix speed scroll compressor	✓	
Variable speed scroll compressor		✓
Indoor supply fan control	✓	
Indoor return fan control		✓
Hot water coil		✓
Heating / Cooling control	✓	
Economizer		✓
Heat recovery (circuit THR)		✓
Heat recovery (circuit ERM)		✓
Electrical stage control		✓
Gas modulate heater control		✓
Coil control		✓
Space temperature average		✓
Purge control		✓

Fire damper output	✓	
Defrost mechanism (reversible HP)	✓	
Refrigerant leak detection		✓
Diagnostics	✓	

3 - HARDWARE

3.1 - Control boards

Each circuit is by default fitted with one SIOB board used to manage all major inputs and outputs of the controller. Options, such as IAQ or economizer, require the installation of a second SIOB and even a third one for pre-heaters for example. Also, with humidity or variable speed compressors option for example, an AUX board will be needed. All boards communicate via an internal LEN bus.

3.2 - Electrical box

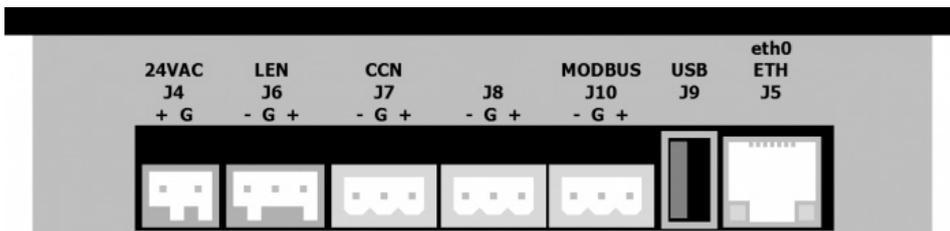
The electrical box includes all boards controlling the unit and the user interface (SmartVu). The main board continuously monitors the information received from various pressure and temperature probes and accordingly starts the program that controls the unit. The unit is equipped with the SmartVu user interface. The number of boards available in the electrical box depends on the number of selected options.

3.3 - Touch panel connections

Connections are located on the bottom and the right side of the controller.

- The control offers communication protocols such as LEN, CCN (Carrier Comfort Network), Modbus, or BACnet.
- It is possible to enable and disable end of line resistors via the System menu (see section 5.6).
- One Ethernet ports allow for TCP/IP communication connection.

Connections on the bottom side of the controller



3.4 - Power supply to boards

All 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.

3.5 - Terminal block connections

3.5.1 - General description

The contacts below are available at the user terminal block on the SIOB board. Depending on the user configuration, some contacts can only be used if the unit operates in remote operating type (Remote) or thermostat operating type (TSTAT).

IMPORTANT: Rooftop inputs are voltage-free dry contacts. Connecting other than voltage-free outputs to the rooftop inputs will cause electrical damage.

Unit without thermostat input configuration				
Description	Board	Input/Output	Connector	Remarks
Contact 1: Start/stop	SIOB1, circuit A	DI-01	J1	Used with the remote operating mode (Remote). The Room-mate comfort controller option should be connected to this channel to be able to start and stop the unit.

3.5 HARDWARE				
Contact 2: Demand limit selection	SIOB1, circuit A	DI-02	J1	Used with the remote operating mode (Remote)
Contact 3: Setpoint selection 1	SIOB1, circuit A	DI-03	J1	
Contact 4: Setpoint selection 2	SIOB1, circuit A	DI-04	J1	
Enthalpy contact	SIOB2, circuit B	DI-04	J1	
Supply fan status contact	SIOB1, circuit A	DI-07	J1	Indoor air flow verification input
Fire contact	SIOB1, circuit A	DI-05	J1	Fire safety input
Alarm relay output	SIOB1, circuit A	DO-05	J25	
CCN network connection	SIOB1, circuit B		J4	RS-485 series connection - Pin 1: signal + - Pin 2: ground - Pin 3: signal -

Cooling only single or dual circuit unit or heat pump dual circuit unit with thermostat input configuration

Description	Board	Input/Output	Connector	Remarks
Contact 1: G contact	SIOB1, circuit A	DI-01	J1	Used with the thermostat operating mode (TSTAT).
Contact 2: Y1_W2 contact	SIOB1, circuit A	DI-02	J1	
Contact 3: Y_Y2 contact	SIOB1, circuit A	DI-03	J1	
Contact 1: W_W1 contact	SIOB2, circuit B	DI-01	J1	SIOB2 board is used for dual-circuit unit OR unit with additional heating stages
Contact 2: O_W2 contact	SIOB2, circuit B	DI-02	J1	
Enthalpy contact	SIOB2, circuit B	DI-04	J1	
Supply fan status contact	SIOB1, circuit A	DI-07	J1	Indoor air flow verification input
Fire contact	SIOB1, circuit A	DI-05		Fire safety input
Alarm relay output	SIOB1, circuit A	DO-05	J25	
CCN network connection	SIOB1, circuit B		J4	RS-485 series connection - Pin 1: signal + - Pin 2: ground - Pin 3: signal -

Heat pump dual compressor single circuit unit with thermostat input configuration

Description	Board	Input/Output	Connector	Remarks
Contact 1: G contact	SIOB1, circuit A	DI-01	J1	Used with the thermostat operating mode (TSTAT).
Contact 2: Y1_W2 contact	SIOB1, circuit A	DI-02	J1	
Contact 3: Y_Y2 contact	SIOB1, circuit A	DI-03	J1	
Contact 1: W_W1 contact	SIOB2, circuit B	DI-01	J1	SIOB2 board is used for dual-circuit unit OR unit with additional heating stages
Contact 4: O_W2 contact	SIOB1, circuit A	DI-04	J1	
Enthalpy contact	SIOB2, circuit B	DI-04	J1	
Supply fan status contact	SIOB1, circuit A	DI-07	J1	Indoor air flow verification input
Fire contact	SIOB1, circuit A	DI-05		Fire safety input
Alarm relay output	SIOB1, circuit A	DO-05	J25	
CCN network connection	SIOB1, circuit B		J4	RS-485 series connection - Pin 1: signal + - Pin 2: ground - Pin 3: signal -

Heat pump single compressor single circuit unit with thermostat input configuration

Description	Board	Input/Output	Connector	Remarks
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Contact 1: G contact	SIOB1, circuit A	DI-01	J1	Used with the thermostat operating mode (TSTAT).
Contact 2: Y_Y2 contact	SIOB1, circuit A	DI-02	J1	
Contact 3: O_W2 contact	SIOB1, circuit A	DI-03	J1	
Contact 1: W_W1 contact	SIOB2, circuit B	DI-01	J1	SIOB2 board is used for dual-circuit unit OR unit with additional heating stages
Contact 2: Y1_W2 contact	SIOB2, circuit B	DI-02	J1	
Enthalpy contact	SIOB2, circuit B	DI-04	J1	
Supply fan status contact	SIOB1, circuit A	DI-07	J1	Indoor air flow verification input
Fire contact	SIOB1, circuit A	DI-05		Fire safety input
Alarm relay output	SIOB1, circuit A	DO-05	J25	
CCN network connection	SIOB1, circuit B		J4	RS-485 series connection - Pin 1: signal + - Pin 2: ground - Pin 3: signal -

The following table shows the thermostat output functions depending on the unit type used.

- G:** indoor fan on/off.
- Y:** compressor 1 on/off (single-circuit unit)
- Y1:** compressor 1 on/off
- Y2:** compressor 2 on/off
- W:** additional heating stage 1 on/off
- W2:** additional heating stage 2 on/off
- O:** cycle reversing valve on/off (heat pump units)

TSTAT Types	TSTAT for single-circuit cooling only unit		TSTAT for dual-circuit cooling only unit		TSTAT for single-circuit heat pump unit		TSTAT for dual-circuit heat pump unit		
	Rooftop inputs	Thermostat output name	Thermostat output function	Thermostat output name	Thermostat output function	Thermostat output name	Thermostat output function	Thermostat output name	Thermostat output function
G	G	G	G	G	G	G	G	G	G
Y1_W2	Y1_W2	Y1	Y1_W2	Y1	Y1_W2	W2	Y1_W2	Y1	
Y_Y2	Y_Y2	Y2	Y_Y2	Y2	Y_Y2	Y	Y_Y2	Y2	
W_W1	W_W1	W	W_W1	W	W_W1	W	W_W1	W	
O_W2	O_W2	W2	O_W2	W2	O_W2	O	O_W2	O	

3.5.2 - Volt-free setpoint selection contact

Setpoint Selection	Occupancy type		Heating: frost protection Cooling: unoccupied	Schedule
	Occupied	Unoccupied		
Contact 1	Open	Closed	Open	Closed
Contact 2	Open	Open	Closed	Closed

3.5.3 -Volt-free demand limit selection contact

Demand limit	100%	Limit
		open

3.6 - Pressure transducers

Three types of transducers (high pressure, low pressure, air differential pressure) are used to measure various pressures in each circuit. These transducers deliver 0 to 5 VDC. They are connected to the SIOB 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.
- **Air differential pressure transducers**
These transducers are used to estimate the airflow or to control the building pressure by measuring the differential pressure.

3.7 - Temperature sensors

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

- **Space temperature sensors**
Up to two sensors may be used. They take into account either an average space temperature or minimum and maximum space temperatures, depending on the configuration.
 - Sensor T-55: This is a 10K sensor
 - Optional sensor T-56: This 10K sensor is fitted with:
 - an offset slider to adjust the temperature setpoint. Moving the slider to the left (cold) allows the temperature setpoint to be reduced by as much as 3K and moving it to the right (warm) allows it to be increased by up to 3K (in steps of ± 1 K). When the slider is in its central position there is no offset.
 - a button for extending the occupied period from one to four hours depending on the occupied period extension value entered in the configuration menu (see GENCONF menu).
 - Optional sensor T-55: This 10K sensor is fitted with a button for extending the occupied period.
 - Optional room-mate comfort controller (sensor T-59): This 10K sensor is fitted with:
 - a customised liquid crystal display (LLCD) that indicates space temperature and setpoint offset.
 - an on/off function to start and stop the unit using remote contacts.
 - temperature offset adjustment which allows the temperature setpoint to be reduced by as much as 3K and to be increased by as much as 3K.
 - a button to extend the occupied period extension value entered in the configuration menu (see GENCONF menu).
- **Supply air temperature sensor**
The control system uses this to maintain a constant space temperature. This is a Carrier 10K sensor.
- **Return air temperature sensor**
The control system uses this to calculate the fresh air rate when using economizer with VAV option. This is a Carrier 10K sensor.

- **Outdoor air temperature sensor**
This Carrier 5K system controls the economizer, allows the gas heating stages to be used on the heat pumps and offsets the space temperature setpoint where this is appropriate.
- **Water coil frost protection sensor**
This Carrier 5K sensor is used on units fitted with hot-water systems.
- **Defrost termination sensor**
This sensor measures the common water temperature in the master/slave system capacity control. It is installed only in the case of master/slave units.
- **Defrost temperature sensors (heat pumps)**
This Carrier 5K sensor is used by the defrost function on heat pump units.
- **Air quality sensor**
This sensor controls room air quality. It is an optional sensor of the 0-10V d.c type.

3.8 – The controls

- **Electronic expansion valve (EXV)**
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.
- **Indoor supply fan**
The controller can start or stop the indoor fan thanks to the time schedule. With VAV option, the indoor supply fan speed is adjusted to fit the ventilation needs.
Two types of fan are compatible with the unit, standard fan or high static fan. They can be chosen upon the field environment.
- **Return fan**
In some applications with high return duct ESP, a return fan may be applied to help supply fan to maintain the airflow and the building pressure.
- **Heaters**
The controller can control additional heaters for cooling only or heat pump unit. The additional heater can be electrical; hot water coil or gas heater.
- **Pre-heaters**
With the option, the unit can control 2 electrical pre-heaters, if unit size < 125 and 3 if unit size ≥ 125 .
- **Energy recovery module (ERM)**
SmartVu can control an optional energy recovery module for optimised energy management of the exhaust air.
- **High ambient fresh air option**
With this option, the unit can control supply airflow% or Fresh Air% according to OAT or SST values. It is working in cooling mode, with economizer and without ERM.

4 – SMARTVU USER INTERFACE

Icon	Description
	Setpoint: This parameter is used to display the currently selected setpoint. Press the icon to modify the setpoint (possible only when logged in!, see section 5.8).
	Outdoor Air Temperature (OAT): This parameter is displayed only in case of units fitted with OAT sensor.
	Unit capacity: The gauge shows current unit capacity.
	Thermodynamic Energy Recovery (THR): Will be printed if THR is configured. By clicking on this button, the THR page will appear (See section 4.3)
	Circuits A, B and C: Will be printed depending on the configured circuits

4.1 - Touch screen display

SmartVu is a 4.3 in. colour touch screen with quick display of alarms, current unit operating status, etc. It allows for web connectivity and custom language support (control parameters displayed in the language selected by the user).

- **If the touch screen is not used for a while, the screen will go black. The control system is always active and the operating mode remains unchanged. Press anywhere on the screen and the Home screen will be displayed.**
- **It is recommended to use a stylus for the navigation via the touch screen.**

4.2 - Home screen (synoptic view)

The home screen is the starting point of the controller. It is also the first screen shown after starting the user interface.



Please note that the picture of the rooftop is for illustration only and it may differ from the actual look of the chiller that is available on field. The image displayed on the home screen represents the whole series of 48UC(V) / 50UC(V).

Legend:

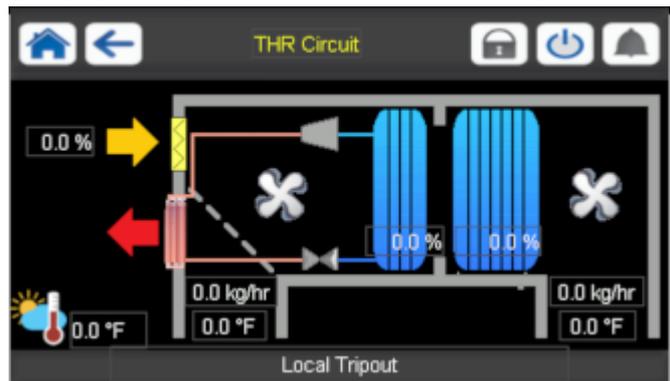
1. Header buttons and subheader buttons
2. Equipment view
3. Information message box (see section 4.4)

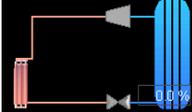
The home screen allows you to monitor basic information about the operation of the chiller and its working conditions.

MESSAGE	STATUS
SUCCESS	Displayed when the requested action is executed.
INTERNAL COMMUNICATION FAILURE!	Displayed when the main application is not running.
HIGH FORCE IN EFFECT!	Displayed when the controller rejects the "Force" command (applicable only to status menus).

4.3 – THR page

THR page is only available if THR circuit is configured.

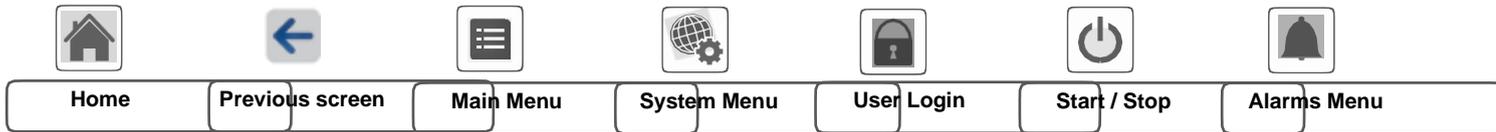


Icon	Description
	Fan: the image is animated when the fan is running. The fan on the right is the supply fan and the values below are the current supply airflow and SAT. The fan on the left is return fan and the values below are return airflow and RAT.
	Outdoor Air Temperature (OAT): This parameter is displayed only in case of units fitted with OAT sensor.
	Current freshair supply fan
	RTU: It shows the total unit capacity. The image will be in blue if the capacity is > 0 and in grey otherwise.
	Circuit THR: It shows the circuit THR capacity. The image will be in blue if the capacity is > 0 and in grey otherwise.
	Economizer damper: This image will appear if economizer position is equal to 0.
	Economizer damper: This image will appear if economizer position is higher than 0.

4.4 - Information message box

The information displayed in the status bar at the bottom of the screen includes relevant messages related to actions taken by the user.

4.5 - Header buttons



Button	Description						
	Home screen: Press the button to go to the Home screen.						
	Previous screen: Press the button to go 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.						
	User Login menu: Used to login in to the controller in order to access higher configuration level.						
	<table border="0"> <tr> <td>User is not logged in.</td> <td></td> <td>Service technician access level.</td> </tr> <tr> <td>User access level.</td> <td></td> <td>Factory access level.</td> </tr> </table>	User is not logged in.		Service technician access level.	User access level.		Factory access 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.						

4.6 - Subheader buttons

Butt	Description
	Circuit view: Press the button to go to the circuit view.
	Green lights in the corners of the circuit icon mean the circuit is currently running.
	Grey lights in the corners of the circuit icon mean the circuit

* Please note that the letter inside the circuit icon stands for the circuit, i.e. "A" stands for circuit A, "B" stands for circuit B.

** Please note that the subheader buttons are only displayed from a PC browser.

4 - SMARTVU USER INTERFACE

4.7 - Other buttons

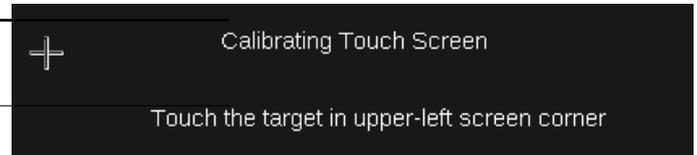
Button	Description
	Save button: Press the button to save the modification.
	Cancel button: Press the button to cancel the modification.
	Log in button: Press the button to log in at specific access level.
	Log off button: Press the button to log off.
	Confirm button: Press the button to confirm the 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.
	Force button: Press the button to force the parameter.
	Remove Force button: Press the button to remove the forced parameter.
	Trending button: Press the button to display trends.
	Refresh button: Press the button to refresh the view.
	Zoom in button: Press the button to magnify the current view.
	Zoom out button: Press the button to expand the current view.
	Left button: Press the button to go to the left.
	Rewind button: Press the button to go to the left faster than normal.
	Right button: Press the button to go to the right.
	Fast-forward button: Press the button to go the right faster than normal.

4.8 - Screen calibration

The purpose of screen calibration is to make sure that the software acts correctly upon pressing icons on the user interface.

To calibrate the screen:

1. Press and hold anywhere on the screen.
2. The calibration process will start.
3. Please follow instructions displayed on the screen:
"Touch the target in (...) screen corner"



4.9 - 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"

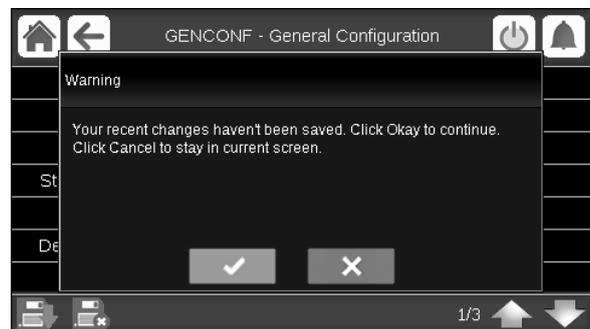


- Press **OK** and type the correct password (see section 5.8).

Saving modifications

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

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



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

5 - SMARTVU CONTROL: MENU STRUCTURE

5.1 - Main menu



Main menu

 General Parameters	 Temperatures	 Pressures
 Inputs	 Outputs	 Run Times
 Modes	 Setpoint	 Quick Test
 Configuration	 Maintenance	 Trendings

Configuration menu

The Configuration menu displays two user profile icons, each consisting of a circle with three dots above it and a gear icon below it. A horizontal bar is positioned below each icon. The text "See section 5.2" is centered between the two icons.

5 - SMARTVU CONTROL: MENU STRUCTURE

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

NOTE: The Trendings menu is displayed in form of a graph. For more information about Trendings, see section 6.26.

- 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 SMART

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

21.6°C
.....
67.2%

General parameters – GENUNIT

Point Name	Status	Default	Unit	Description	Low Limit	High Limit	CCN Force	LEN Force
ctrl_typ	0 to 3	0	-	Local=0. CCN=1. Remote=2	0	3		
blank			-	TSTAT=3				
STATUS	CHARS8	0	-	Run Status	-	-		
ALM	CHARS8	0	-	Alarm state	-	-		
min_left	0 to 0	0	min	Minutes Left for Start	0	0		
HEATCOOL	CHARS8	0	-	Heat/Cool status	-	-		
HC_SEL	0 to 2	0	-	Heat/Cool Select	0	2	X	X
SP_SEL	0 to 2	0	-	Setpoint Select	0	2	X	X
blank			-	0=Auto. 1=Spt1. 2=Spt2				
SP_OCC	NO_YES	1	-	Setpoint Occupied?	0	1	X	
ROOF_S_S	DSABLE_ENABLE	0	-	CCN: Cmd Start/Stop	0	1	X	
ROOF_OCC	NO_YES	0	-	CCN: Cmd Occupied	0	1	X	
SF	OFF_ON	0	-	Supply Fan Relay	0	1		
RF	OFF_ON	0	-	Return Fan Relay	0	1		
SF_ERR	OFF_ON	0	-	Air Flow OK	0	1		
cap_t	0 to 0	0	%	Percent Total Capacity	0	0		
capa_t	0 to 0	0	%	Circuit A Capacity	0	0		
capb_t	0 to 0	0	%	Circuit B Capacity	0	0		
capc_t	0 to 0	0	%	Circuit THR Capacity	0	0		
sp	0 to 0	0	°F	Current Setpoint	0	0		
CTRL_PNT	-4 to 153	0	°F	Control Point	-4	153	X	
EMSTOP	DSABLE_ENABLE	0	-	Emergency Stop	0	1	X	
DEM_LIM	0 to 100	0	%	Active Demand Limit Val	0	100	X	
M_SLAVE	0 to 2	2	-	CCN master slave command	0	2	X	



Temperatures – TEMP

5 - SMARTVU CONTROL: MENU STRUCTURE

Point Name	Status	Default	Unit	Description	Low Limit	High Limit	CCN Force	LEN Force
SPT	0 to 0	0	°F	Space Temperature	0	0		
spt_1	0 to 0	0	°F	Space Temperature 1	0	0		
spt_2	0 to 0	0	°F	Space Temperature 2	0	0		
sto	0 to 0	0	^F	Space Temperature Offset	0	0		
SAT	0 to 0	0	°F	Supply Air Temperature	0	0		
OAT	0 to 0	0	°F	Outside Air Temperature	0	0		
RAT	0 to 0	0	°F	Return Air Temperature	0	0		
XAT	0 to 0	0	°F	Mixed Air Temperature	0	0		
LWT	0 to 0	0	°F	Leaving Water Temp.	0	0		
SCT_A	0 to 0	0	°F	Saturated Condensing T A	0	0		
SST_A	0 to 0	0	°F	Saturated Suction Temp A	0	0		
SUCT_A	0 to 0	0	°F	EXV Suction Temp A	0	0		
DEFRT_A	0 to 0	0	°F	Defrost Temperature A	0	0		
SCT_B	0 to 0	0	°F	Saturated Condensing T B	0	0		
SST_B	0 to 0	0	°F	Saturated Suction Temp B	0	0		
SUCT_B	0 to 0	0	°F	EXV Suction Temp B	0	0		
DEFRT_B	0 to 0	0	°F	Defrost Temperature B	0	0		
SCT_C	0 to 0	0	°F	Saturated Condens T THR	0	0		
SST_C	0 to 0	0	°F	Saturated Suction T THR	0	0		
SUCT_C	0 to 0	0	°F	EXV Suction Temp THR	0	0		
DEFR_C	0 to 0	0	°F	Defrost temperature THR	0	0		
SH_A	0 to 0	0	^F	Superheat Temp A	0	0		
SH_B	0 to 0	0	^F	Superheat Temp B	0	0		
SH_C	0 to 0	0	^F	Superheat Temp THR	0	0		

5 - SMARTVU CONTROL: MENU STRUCTURE



Pressures – PRESSURE

Point Name	Status	Default	Unit	Description	Low Limit	High Limit	CCN Force	LEN Force
DP_A	0 to 0	0	PSI	Discharge Pressure A	0	0		
SP_A	0 to 0	0	PSI	Main Suction Pressure A	0	0		
DP_B	0 to 0	0	PSI	Discharge Pressure B	0	0		
SP_B	0 to 0	0	PSI	Main Suction Pressure B	0	0		
DP_C	0 to 0	0	PSI	Discharge Pres THR	0	0		
SP_C	0 to 0	0	PSI	Main Suction Pres THR	0	0		
sf_ec_p	0 to 0	0	"H2O	Supply Fan EC Plug	0	0		
rf_ec_p	0 to 0	0	"H2O	Return Fan EC Plug	0	0		
p_plenum	0 to 0	0	"H2O	Return Plenum Pressure	0	0		
p_bldg	0 to 0	0	"H2O	Building Pressure	0	0		



Inputs – INPUTS

Point Name	Status	Default	Unit	Description	Low Limit	High Limit	CCN Force	LEN Force
onoff_sw	OPEN_CLOSE	0	-	Remote On/Off Switch	0	1		
SP_SW1	OPEN_CLOSE	0	-	Remote Setpoint Switch 1	0	1		
SP_SW2	OPEN_CLOSE	0	-	Remote Setpoint Switch 2	0	1		
lim_sw1	OPEN_CLOSE	0	-	Limit Switch	0	1		
HS_FBK	OPEN_CLOSE	0	-	Heat Stages status	0	1		
PRE_HS	OPEN_CLOSE	0	-	Pre-heat Status	0	1		
sf_err	OPEN_CLOSE	0	-	Supply fan Status	0	1		
rf_err	OPEN_CLOSE	0	-	Return fan Status	0	1		
vspd_err	OPEN_CLOSE	0	-	VSPD Inverter Status	0	1		
FIRE	OPEN_CLOSE	0	-	Fire Status	0	1		
ENT_SW	LOW_HIGH	0	-	Enthalpy Switch	0	1		
REF_LEAK	OPEN_CLOSE	0	-	Refrigerant Leak Status	0	1		
blank			-	Thermostat :				
G	OPEN_CLOSE	0	-	Fan Contact	0	1		
Y1_W2	OPEN_CLOSE	0	-	CP #1 / Heat #2 Contact	0	1		
Y_Y2	OPEN_CLOSE	0	-	CP / CP #2 Contact	0	1		
W_W1	OPEN_CLOSE	0	-	Heat / Heat #1 Contact	0	1		
O_W2	OPEN_CLOSE	0	-	Heatcool / Heat #2 Ctact	0	1		
blank			-	Air Control :				
dirtflt	OPEN_CLOSE	0	-	Dirty Filter	0	1		
iaq	0 to 0	0	ppm	Indoor Air Quality	0	0		
RH	0 to 0	0	V	Relative Humidity	0	0		
hrw_fbk	OPEN_CLOSE	0	-	HR Wheel Feedback	0	1		
hpsw_a	OPEN_CLOSE	0	-	High Pressure Switch A	0	1		

5 - SMARTVU CONTROL: MENU STRUCTURE

hpsw_b	OPEN_CLOSE	0	-	High Pressure Switch B	0	1
hpsw_c	OPEN_CLOSE	0	-	High Pressure Switch THR	0	1
exvA_fbk	0 to 0	0	%	EXV Position Circuit A	0	0
exvB_fbk	0 to 0	0	%	EXV Position Circuit B	0	0
exvC_fbk	0 to 0	0	%	EXV Position Circuit THR	0	0

5 - SMARTVU CONTROL: MENU STRUCTURE



Outputs - OUTPUTS

Point Name	Status	Default	Unit	Description	Low Limit	High Limit	CCN Force	LEN Force
cp_a1	OFF_ON	0	-	Compressor A1	0	1		
cp_a2	OFF_ON	0	-	Compressor A2	0	1		
VSPD_SPD	0 to 100	0.0	%	VSPD speed	0	100	X	X
vspdsafe	OFF_ON	0	-	VSPD safety contact	0	1		
fan_l_a	OFF_ON	0	-	Fan A1 Speed	0	1		
fan_h_a	OFF_ON	0	-	Fan A1 Speed	0	1		
rv_a	OFF_ON	0	-	4Way Refrigerant Valve A	0	1		
heater_a	OFF_ON	0	-	Drain Pan Heater A	0	1		
cp_b1	OFF_ON	0	-	Compressor B1	0	1		
cp_b2	OFF_ON	0	-	Compressor B2	0	1		
fan_l_b	OFF_ON	0	-	Fan B1 Speed	0	1		
fan_h_b	OFF_ON	0	-	Fan B1 Speed	0	1		
rv_b	OFF_ON	0	-	4Way Refrigerant Valve B	0	1		
heater_b	OFF_ON	0	-	Drain Pan Heater B	0	1		
cp_c1	OFF_ON	0	-	THR Compressor 1 Output	0	1		
cp_c2	OFF_ON	0	-	THR Compressor 2 Output	0	1		
rv_c	OFF_ON	0	-	4Way Refrig Valve THR	0	1		
ecopos	0 to 0	0	%	Economizer Position	0	0		
gas_on	OFF_ON	0	-	Modulated Gas Enable	0	1		
gas_v	0 to 0	0	%	Modulated Gas Value	0	0		
WV	0 to 0	0	%	Water Valve	0	0		
humid	OFF_ON	0	-	Humidifier Output	0	1		
dehumid	OFF_ON	0	-	Dehumidifier Output	0	1		
pexhaust	OFF_ON	0	-	Power Exhaust	0	1		
fire_dmp	OFF_ON	0	-	Fire Damper	0	1		
hs_step	0 to 0	0	-	Additional Heat Stage	0	0		
alarm	OFF_ON	0	-	Alarm Relay Status	0	1		
RUNNING	OFF_ON	0	-	Running Relay Status	0	1		
hrw	OFF_ON	0	-	Heat Recovery Wheel	0	1		
vlt_en	OFF_ON	0	-	Supply Fan Enable	0	1		
vlt_rf	OFF_ON	0	-	Return Fan Enable	0	1		
cur_spd	0 to 0	0	%	Current S Fan Speed	0	0		
cur_spd2	0 to 0	0	%	Current R Fan Speed	0	0		
cur_airf	0 to 0	0	KGPH	Current Supply Airflow	0	0		
cur_air2	0 to 0	0	KGPH	Current Return Airflow	0	0		
freshair	0 to 0	0	%	Fresh Air Rate	0	0		
exv_a	0 to 0	0	%	EXV Position Circuit A	0	0		

5 - SMARTVU CONTROL: MENU STRUCTURE

exv_b	0 to 0	0	%	EXV Position Circuit B	0	0
exv_c	0 to 0	0	%	EXV Position Circuit THR	0	0
hs_1	OFF_ON	0	-	Heater Stage 1	0	1
hs_2	OFF_ON	0	-	Heater Stage 2	0	1
hs_3	OFF_ON	0	-	Heater Stage 3	0	1
hs_4	OFF_ON	0	-	Heater Stage 4	0	1
pre_hs_1	OFF_ON	0	-	Pre-heater Stage 1	0	1
pre_hs_2	OFF_ON	0	-	Pre-heater Stage 2	0	1
pre_hs_3	OFF_ON	0	-	Pre-heater Stage 3	0	1

5 - SMARTVU CONTROL: MENU STRUCTURE



Run Times – RUNTIME

Point Name	Status	Default	Unit	Description	Low Limit	High Limit	CCN Force	LEN Force
hr_mach	0 to 0	0	hours	Machine Operating Hours	0	0		
chr_mach	0 to 0	0	hours	Cooling Operating Hours	0	0		
hhr_mach	0 to 0	0	hours	Heating Operating Hours	0	0		
st_mach	0 to 0	0	-	Machine Starts Number	0	0		
hr_sf	0 to 0	0	hours	Supply Fan Oper Hours	0	0		
st_sf	0 to 0	0	-	Supply Fan Starts Number	0	0		
hr_rf	0 to 0	0	hours	Return Fan Oper Hours	0	0		
st_rf	0 to 0	0	-	Return Fan Starts Number	0	0		
hr_cp_a1	0 to 0	0	hours	Compressor A1 Hours	0	0		
st_cp_a1	0 to 0	0	-	Compressor A1 Starts	0	0		
hr_cp_a2	0 to 0	0	hours	Compressor A2 Hours	0	0		
st_cp_a2	0 to 0	0	-	Compressor A2 Starts	0	0		
hr_cp_b1	0 to 0	0	hours	Compressor B1 Hours	0	0		
st_cp_b1	0 to 0	0	-	Compressor B1 Starts	0	0		
hr_cp_b2	0 to 0	0	hours	Compressor B2 Hours	0	0		
st_cp_b2	0 to 0	0	-	Compressor B2 Starts	0	0		
hr_cp_c1	0 to 0	0	hours	Compressor THR1 Hours	0	0		
st_cp_c1	0 to 0	0	-	Compressor THR1 Starts	0	0		
hr_cp_c2	0 to 0	0	hours	Compressor THR2 Hours	0	0		
st_cp_c2	0 to 0	0	-	Compressor THR2 Starts	0	0		
hr_fana1	0 to 0	0	hours	Fan A1 Hours	0	0		
st_fa_a1	0 to 0	0	-	Fan A1 Starts	0	0		
hr_fanb1	0 to 0	0	hours	Fan B1 Hours	0	0		
st_fa_b1	0 to 0	0	-	Fan B1 Starts	0	0		
hr_hs	0 to 0	0	hours	Heating Stages Hours	0	0		
pre_hr	0 to 0	0	hours	Pre-heaters Oper. Hours	0	0		
nb_def_a	0 to 0	0	-	Defrost Number Circuit A	0	0		
nb_def_b	0 to 0	0	-	Defrost Number Circuit B	0	0		
nb_def_c	0 to 0	0	-	Defrost Number Circuit C	0	0		

5 - SMARTVU CONTROL: MENU STRUCTURE



Modes – MODES

Point Name	Status	Default	Unit	Description	Low Limit	High Limit	CCN Force	LEN Force
m_limit	NO_YES	0	-	demand limit active	0	1		
m_ifan	NO_YES	0	-	Indoor Fan Cycling	0	1		
m_night	NO_YES	0	-	Night Condensing Mode	0	1		
m_frostp	NO_YES	0	-	Frost Protection Mode	0	1		
m_master	NO_YES	0	-	Master Slave Active	0	1		
m_reset	NO_YES	0	-	Reset in Effect?	0	1		
m_heater	NO_YES	0	-	Electric Heat Active	0	1		
m_eco	NO_YES	0	-	Economizer Mode	0	1		
m_purge	NO_YES	0	-	Purge Mode	0	1		
m_pwrh	NO_YES	0	-	Power Exhaust Mode	0	1		
m_humid	NO_YES	0	-	Humidification Mode	0	1		
m_dehumi	NO_YES	0	-	Dehumidification Mode	0	1		
m_iaq	NO_YES	0	-	IAQ Mode	0	1		
m_gas	NO_YES	0	-	OAT Gas Threshold	0	1		
m_fire	NO_YES	0	-	Fire Shutdown Active?	0	1		
m_enth	NO_YES	0	-	Enthalpy Lockout	0	1		
m_start	NO_YES	0	-	Optimal Start Mode	0	1		
m_oat_h	NO_YES	0	-	VSPD High Oat Derating	0	1		
m_defr_a	NO_YES	0	-	A:Defrost Active	0	1		
m_defr_b	NO_YES	0	-	B:Defrost Active	0	1		
m_defr_c	NO_YES	0	-	THR:Defrost Active	0	1		
m_sst_a	NO_YES	0	-	A:Low Suction	0	1		
m_sst_b	NO_YES	0	-	B:Low Suction	0	1		
m_sst_c	NO_YES	0	-	THR:Low Suction	0	1		
m_dgt_a	NO_YES	0	-	A:Compressor Envelope	0	1		
m_dgt_b	NO_YES	0	-	B:Compressor Envelope	0	1		
m_dgt_c	NO_YES	0	-	THR:Compressor Envelope	0	1		
m_hp_a	NO_YES	0	-	A:High Pressure Override	0	1		
m_hp_b	NO_YES	0	-	B:High Pressure Override	0	1		
m_hp_c	NO_YES	0	-	THR:High Press Override	0	1		

5 - SMARTVU CONTROL: MENU STRUCTURE



Setpoint – SETPOINT

Point Name	Status	Default	Unit	Description	Low Limit	High Limit
blank			-	Temperature setpoints :		22
occ_cool	50 to 89.6	78.8	°F	Occupied Cooling Stpt	50	89.6
uno_cool	50 to 89.6	82.4	°F	Unocc. Cooling Stpt	50	89.6
occ_heat	50 to 75.2	66.2	°F	Occupied Heating Stpt	50	75.2
uno_heat	50 to 75.2	62.6	°F	Unocc. Heating Stpt	50	75.2
frst_sp	50 to 75.2	59	°F	holiday setpoint	50	75.2
blank			-	Humidity :		
oc_rh_sp	10 to 80	50	%	Occupied Humidity Stpt	10	80
oc_rh_db	10 to 50	10	%	Occupied Humidity DBand	10	50
un_rh_sp	10 to 80	70	%	Unoccupied Humidity Stpt	10	80
un_rh_db	10 to 50	30	%	Unoccupied Humidity Db	10	50
blank			-	Miscellaneous :		
purg_low	45 to 59	50	°F	Purge: OAT Low Limit	45	59
purg_hig	60 to 110	60.8	°F	Purge: OAT High Limit	60	110
purg_du	1 to 5	2	min	Purge Duration	1	5
iaq_sp	50 to 10000	700	-	IAQ Setpoint	50	10000



Trendings – TRENDING

Name	Status	Unit	Displayed text*	Description**
GENUNIT_cap_t	0 to 100	%	Perercent Total Capacity	Perercent Total Capacity
GENUNIT_CTRL_PN	0 to 100	°C / °F	Control Point	Control point
TEMP_OAT	-	°C / °F	Outdoor Air Temp	Outdoor air temperature
TEMP_SAT	-	°C / °F	Supply Air Temperature	Supply Air Temperature
TEMP_SPT	-	°C / °F	Space Temperature	Space 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 cir A	Saturated suction temperature, circuit A
TEMP_SST_B	-	°C / °F	Saturated Suction Temp cir B	Saturated suction temperature, circuit B

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

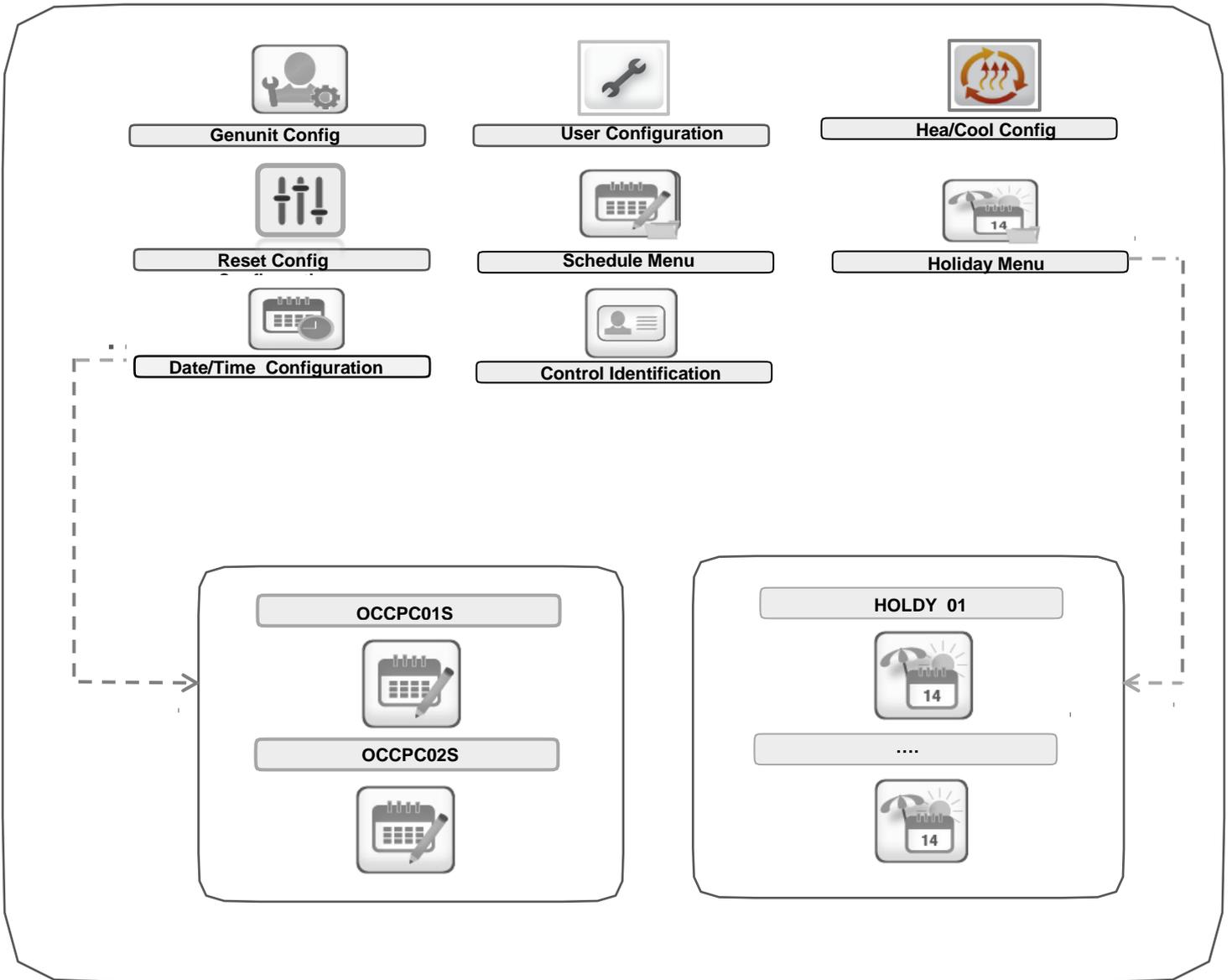
**The list of trending points cannot be modified. Trending points can only be enabled or disabled.

5 - SMARTVU CONTROL: MENU STRUCTURE

5.2 - Configuration menu



Configuration menu



5 - SMARTVU CONTROL: MENU STRUCTURE

The **Configuration** menu gives access to a number of user-modifiable parameters such as pump configuration, schedule menu, etc. The Configuration menu is password-protected.

- 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

Point Name	Status	Default	Unit	Description	Low Limit	High Limit
tst_ctrl	NO_YES	0	-	Thermostat Control	0	1
frst_sel	NO_YES	0	-	Frost Protection Select	0	1
spt_ctrl	0 to 4	0	-	SPT Calculation Select	0	4
blank			-	0 = Average Temp Meth		
blank			-	1 = High Temp Sensor		
blank			-	2 = Low Temp Sensor		
blank			-	3 = Cool LowT, heat HiT		
blank			-	4 = Cool HiT, heat LowT		
blank			-			
ifan_sel	0 to 2	0	-	Indoor Fan Management	0	2
blank			-	0 = Always On		
blank			-	1 = Occ, On		
blank			-	Unocc, Cycling		
blank			-	2 = Occ, Cycling		
blank			-	Unocc, Cycling		
blank			-			
blank			-	Occupied Period Start :		
purg_sel	NO_YES	0	-	Purge Mode Select	0	1
ovrd_hr	0 to 4	0	hours	Timed Override Hours	0	4
start_k	0 to 30	0	-	Optimal Start Factor	0	30
blank			-			
blank			-	Demand Limit :		
c_limit	0 to 100	0	-	Cooling Demand Limit	0	100
h_limit	0 to 100	0	-	Heating Demand Limit	0	100
d_limit	NO_YES	0	-	Defrost Demand Limit	0	1
hr_limit	0 to 100	0	-	Heater Demand Limit	0	100
blank			-			
off_on_d	1 to 15	1	min	Unit Off to On Delay	1	15
nh_start	0.00:0.00 to 0.00:0.00	0.00:0.00	-	Night Mode Start Hour	0.00:0.00	0.00:0.00
nh_end	0.00:0.00 to 0.00:0.00	0.00:0.00	-	Night Mode End Hour	0.00:0.00	0.00:0.00
bas_menu	0 to 3	0	-	Basic Menu Configuration	0	3
blank			-	0 = All Access		
blank			-	1 = no alarm menu		
blank			-	2 = no setpoint menu		
blank			-	3 = 1 + 2		

5 - SMARTVU CONTROL: MENU STRUCTURE

synoptic	NO_YES	0	-	Synoptic Is Displayed?	0	1
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User Configuration –USERCONF

Point Name	Status	Default	Unit	Description	Low Limit	High Limit
use_pass	1 to 9999	11	-	User Password	1	9999

5 - SMARTVU CONTROL: MENU STRUCTURE



Heat Cool Configuration –HCCONFIG

Point Name	Status	Default	Unit	Description	Low Limit	High Limit
cr_sel	NO_YES	0	-	Cooling Reset Select	0	1
ehs_th	23 to 70	41	°F	Elec Stage OAT Threshold	23	70
hs_back	NO_YES	0	-	1 HS For Backup	0	1
hs_pull	0 to 60	0	min	HS Pulldown Time	0	60
hs_defr	NO_YES	0	-	Quick HS For Defrost	0	1



Reset Configuration –RESETCFG

Point Name	Status	Default	Unit	Description	Low Limit	High Limit
blank			-	Cooling :		
oathr_no	14 to 125	14	°F	OAT No Reset Value	14	125
oathr_fu	14 to 125	14	°F	OAT Full Reset Value	14	125
cr_deg	-30 to 30	0	^F	Cooling Reset Deg. Value	-30	30



Date/Time Configuration– DATETIME

Status	Displayed text*	Description
on/off	Daylight Saving Time	Information of setting the clocks forward one hour from standard time during the summer months, and back again in the fall, in order to make better use of natural daylight
Greenwich Mean Time (UTC)	Location	Time zone
YYYY/MM/DD, HH:MM:SS	Date/Time	Current date and time (must be set manually)
no/yes	Today is a Holiday	Information about holidays (read-only). Please note that holidays are set in the Holiday menu (see also section 5.4)
no/yes	Tomorrow is a Holiday	Information about the upcoming holiday period (read-only). Please note that holidays are set in the Holiday menu (see also section 5.4)



Control Identification– CTRL_ID

Status	Default	Displayed text*	Description
0-239	1	CCN Element Number	Element number
0-239	0	CCN Bus Number	Bus number
9600 / 19200 / 38400	9600	CCN Baud Rate	Communication speed
-	50/48 UCUP-V SmartVu	Device Description	Unit description
-	-	Location Description	Location description: The number corresponds to the country
-	ECG-SR-20V4B100	Software Part Number	Software version
-	-	Serial Number	Serial number (MAC address)

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

5 - SMARTVU CONTROL: MENU STRUCTURE

5.3 - Schedule menu

The Schedule menu includes two time schedules, where the first one (OCCPC01S) is used to control the unit start/stop and the second one (OCCPC02S) is used to control the dual setpoint.

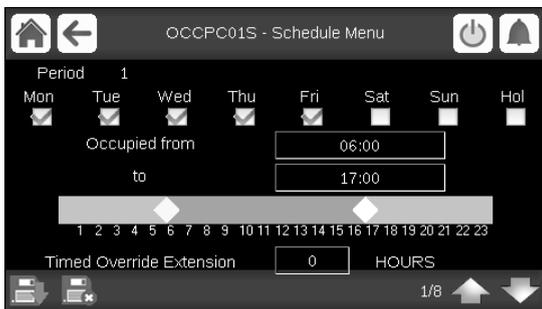


Schedule Menu – SCHEDULE

Icon	Name	Displayed text*	Description
	OCCPC01S	OCCPC01S - Schedule Menu	Unit on/off time schedule
	OCCPC02S	OCCPC02S - Schedule Menu	Unit setpoint selection time schedule

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

Example: Setting occupancy schedule



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

5.4 - Holiday menu

The Holiday menu allows the user to set up to 16 holiday periods, which are defined by the start month, start day, and duration.



Holiday Menu – HOLIDAY

Icon	Name	Displayed text*	Description
	HOLDY_01	HOLIDAY - HOLDY_01	Holiday period No.1 settings

	HOLDY_16	HOLIDAY - HOLDY_16	Holiday period No.16 settings

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



HOLIDAY - HOLDY_01 (...)

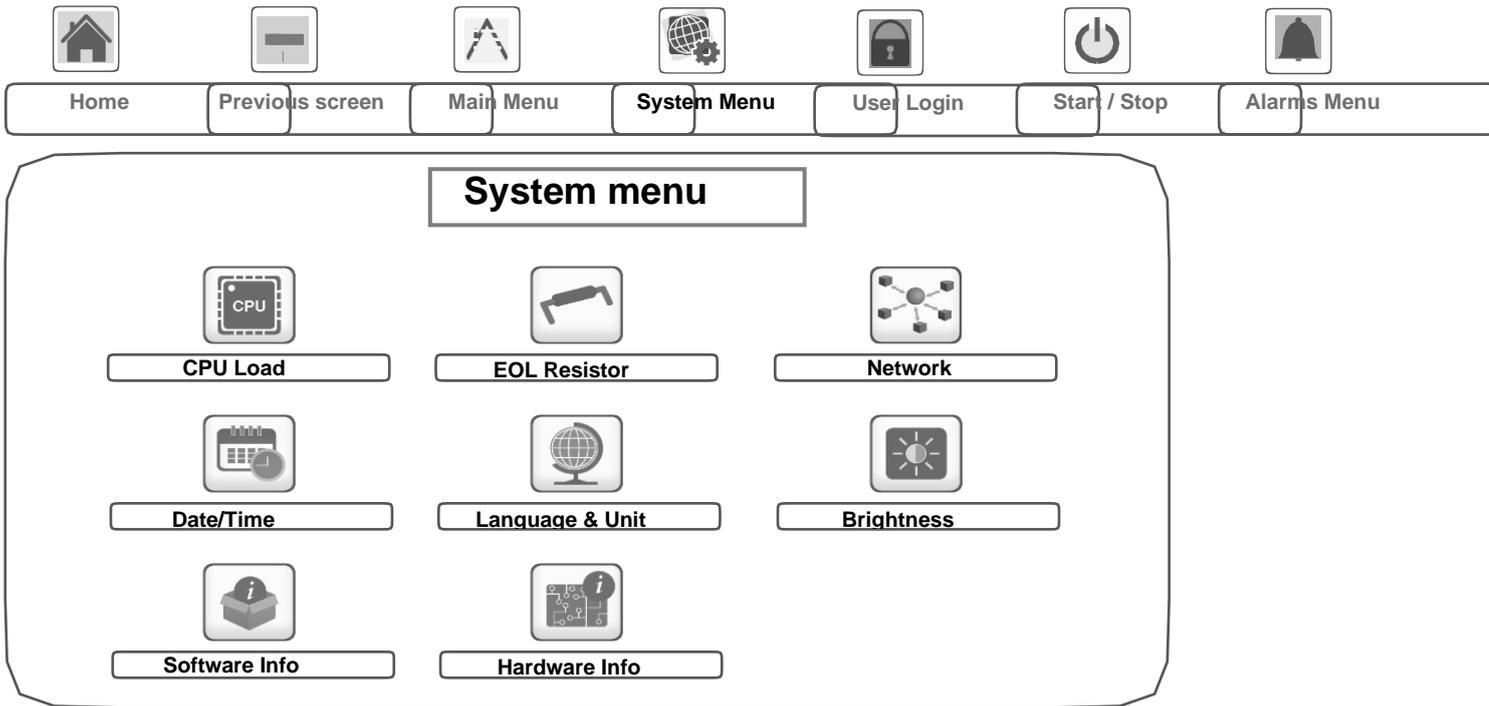
No.	Name	Status	Default	Displayed text*	Description
1	HOL_MON	0-12	0	Holiday Start Month	Holiday start month
2	HOL_DAY	0-31	0	Start Day	Holiday start day
3	HOL_LEN	0-99	0	Duration (days)	Holiday duration (days)

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

IMPORTANT: For more information about holiday setting, please see section 6.25.

5 - SMARTVU CONTROL: MENU STRUCTURE

5.5 - System menu



Legend:

- Basic access (no password)
- User password required

The **System menu** allows the user to verify software, hardware, or network information and change some display settings, including language, date/time, or brightness.

- 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 Menu – 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).



EOL Resistor Menu – EOLRES

Status	Default	Displayed text*	Description
disable/enable	disable	End of Line Res. J6(LEN)	End of line resistor J6 (LEN bus)
disable/enable	disable	End of Line Res. J7(CCN)	End of line resistor J7 (CCN bus)
disable/enable	disable	End of Line Resistor J8	End of line resistor J8
disable/enable	disable	End of Line Resistor J10	End of line resistor J10 (Modbus)

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

5 - SMARTVU CONTROL: MENU STRUCTURE



Network Menu – NETWORK

Status	Default	Displayed text*	Description
		IP Network Interface J5 (eth0):	IP Network Interface J5 (Ethernet 0):
	xx:xx:xx:xx:xx:xx	MAC Address	MAC Address
-	169.254.1.1	TCP/IP Address	TCP/IP Address
-	255.255.255.0	Subnet Mask	Subnet Mask
-	169.254.1.3	Default Gateway	Default Gateway
-	255.255.0.0	Gateway Mask	Gateway Mask
-	169.254.1.3	Domain Name Server (DNS)	Domain Name Server (DNS)
-	169.254.1.4		

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



Date/Time Configuration – DATETIME

Status	Displayed text*	Description
on/off	Daylight Saving Time	Information of setting the clocks forward one hour from standard time during the summer months, and back again in the fall, in order to make better use of natural daylight
Greenwich Mean Time (UTC)	Location	Time zone
YYYY/MM/DD, HH:MM:SS	Date/Time	Current date and time (must be set manually)
no/yes	Today is a Holiday	Information about holidays (read-only). Please note that holidays are set in the Holiday menu (see also section 5.4)
no/yes	Tomorrow is a Holiday	Information about the upcoming holiday period (read-only). Please note that holidays are set in the Holiday menu (see also section 5.4)

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

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



Language & Unit System Menu – LANGUNIT

Displayed text*	Description
(Languages)	Language list: English, Spanish, French, German, Italian, Türkçe
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).



Brightness Menu – BRIGHTNS

Status	Displayed text*	Description
0 to 100%	Brightness	Screen brightness

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

5 - SMARTVU CONTROL: MENU STRUCTURE



Software Info Menu – SWINFO

Status	Displayed text*	Description
ECG-SR-20V4B100	Software Version	Software version number
N.NNN.N	SDK Version	SDK version number
NN	UI Version	User interface version
CARRIER	Brand	Brand name

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



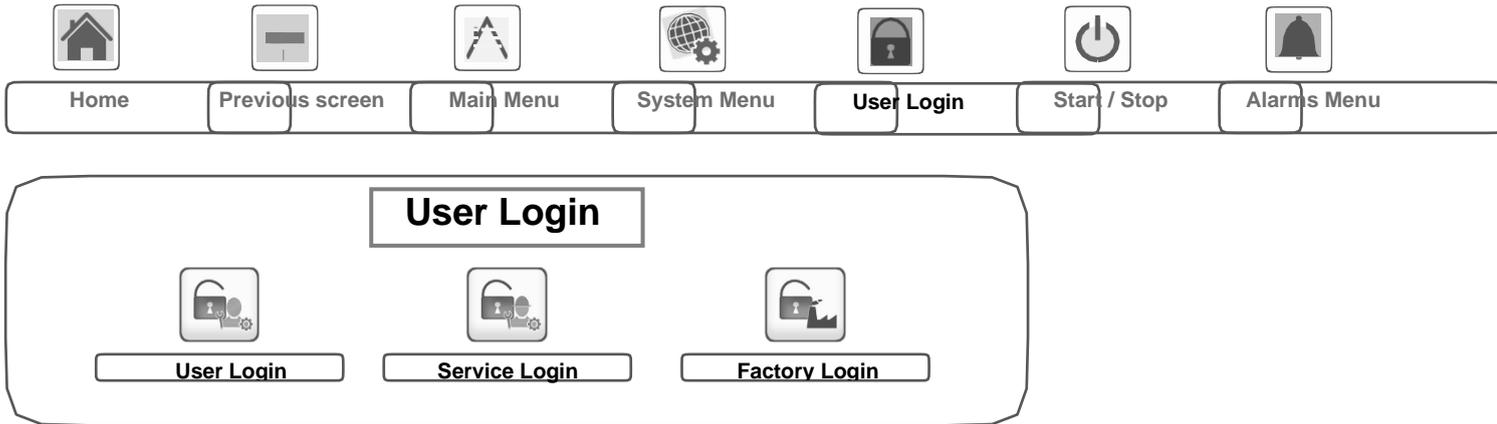
Hardware Info Menu – HWINFO

Status	Displayed text*	Description
-	Board Variant	Board variant
-	Board Revision	Board revision
43	Screen size	Screen size in inches

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

5 - SMARTVU CONTROL: MENU STRUCTURE

5.6 - User Login menu



Legend:



5.6.1 - Access control

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

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

5.6.2 - User login

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

To log in

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



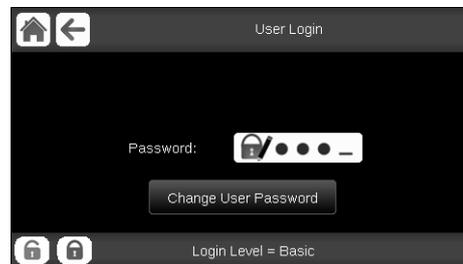
4. The User Login screen appears.

5.6.3 - User password

User password can be modified in the User Login menu.

To change your password

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



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

5.6.4 - Service & Factory login

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

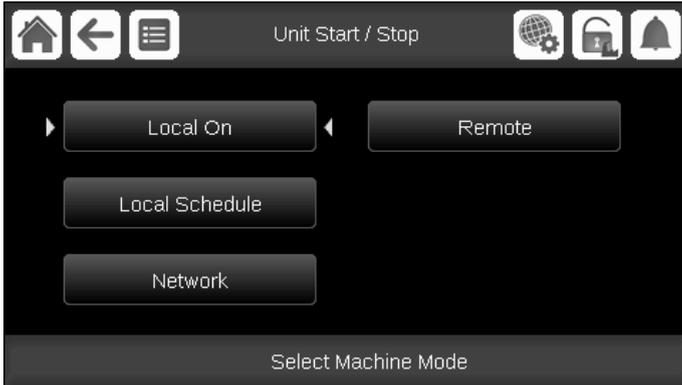
5 - SMARTVU CONTROL: MENU STRUCTURE

5.7 - Start / Stop menu



5.7.1 - 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.
Master	Master: The unit operates as the master in the master/slave assembly and it is allowed to start if the period is occupied.

5.7.2 - Unit start

To start the unit

1. Press the **Start/Stop** button.
2. Select the required Machine Mode.
 - Local On
 - Local Schedule
 - Network
 - Remote
 - Master (*Master button is displayed if Master/Slave Enable*)
3. The Home screen will be displayed.

5.7.3 - Unit stop

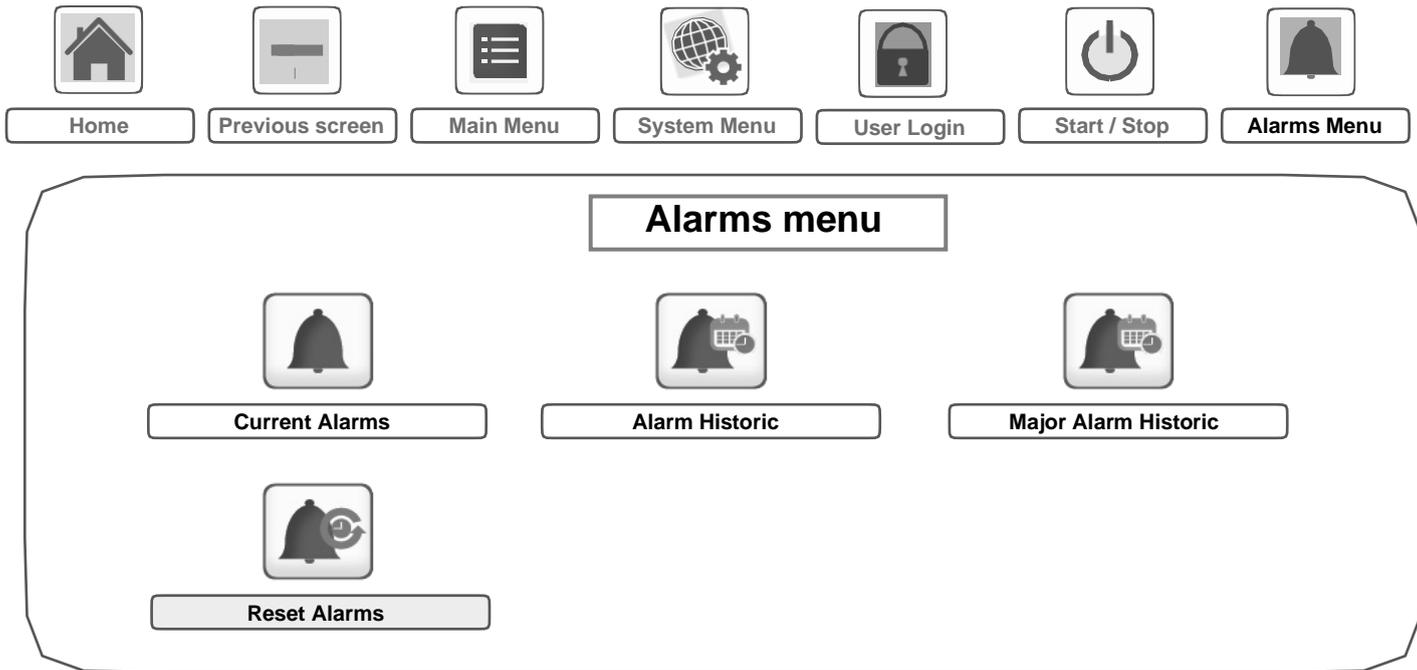
To stop the unit

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.

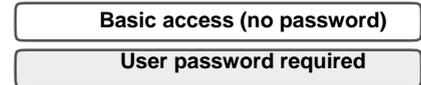


5 - SMARTVU CONTROL: MENU STRUCTURE

5.9 - Alarms menu



Legend:



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

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



Current Alarms Menu – CUR_ALM

No.	Name	Date	Hour	Alarm text
1	Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)
...	Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)
10	Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)

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



Alarm History Menu – ALMHIST1

No.	Name	Date	Hour	Alarm text
1	Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)
...	Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)
50	Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)

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

5 - SMARTVU CONTROL: MENU STRUCTURE



Major Alarm History Menu – ALMHIST2

No.	Name	Date	Hour	Alarm text
1	Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)
...	Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)
50	Alarm	YYYY/MM/DD	HH:MM	Alarm text (see section 8.6)

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



Reset Alarms – ALARMRST (continued)

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

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

IMPORTANT:

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

6- STANDARD CONTROL OPERATIONS AND OPTIONS

6.1 External thermostat control

In appropriate cases the unit may be controlled by an external thermostat approved by Carrier. This function requires the use of a thermostat with volt-free contacts (contacts without potential), as well as a specific configuration of the SmartVu control. The function is only active when operating type Thermostat (TSTAT) is selected in the GENCONF menu.

In this operating type, the thermostat controls the following functions:

- Stopping/starting the internal fan
- Determining the space temperature control point,
- Selecting heating/cooling
- Controlling compressor capacity, gas or electric
- Controlling the economizer (fully open position or minimum closed position only).

The SmartVu system continues to control the following functions:

- Defrosting related to the heat pumps
- Head pressure control
- Power exhaust control
- Minimum stop/start times on the compressors
- Unit diagnostics.

The following functions are disabled:

- Humidification
- Controlling a hot-water system
- Timer programming
- Purge.

The description of the thermostat outputs, based on the unit type, is given in the chapter 3.6 - "Connections at the user terminal block".

6.2 Cooling only unit

- Contact G open: The internal fan is stopped and the economizer is closed.
- Contact G closed: The internal fan is activated and the economizer is opened to its minimum position.
- Contact Y1 closed and Y2 open: If the unit is fitted with an economizer, it is opened to its maximum position, if external conditions permit (see chapter 5.16 - "Economizer").
- Otherwise the economizer is set to its minimum position and the first compressor is started up. If the unit has no economizer, the first compressor is started up.

Contacts Y1 and Y2 closed: The economizer is held fully open if external conditions are still acceptable. A compressor is started up. If external conditions no longer permit the economizer to be used, it is set to its minimum position and the second compressor is started up. If the outdoor temperature is lower than 15°C, the compressors will not be authorised to start up and only the economizer will be used. If the unit has no economizer, the second compressor is started up.

- Contact W1 closed and W2 open: The first gas or electric stage is started.
- Contacts W1 and W2 closed: The second gas or electric stage is started.

6.3 Single-circuit heat pump unit

- Contact G open: The internal fan is stopped and the economizer is closed.
- Contact G closed: The internal fan is activated and the economizer is opened to its minimum position.
- Contact O closed and Y closed: If the unit is fitted with an economizer, it is modulated to maintain the minimum supply air temperature setpoint at +2.8°C, if external conditions permit (see chapter 5.16 - "Economizer"). Otherwise the economizer is set to its minimum position and the compressor is started up in cooling mode. If the unit has no economizer, the compressor is started up in cooling mode.
- Contacts O open and Y closed: If the unit is fitted with an economizer, it is set to its minimum position and the first compressor is started up in heating mode.
- Contact W1 closed and W2 open: The first gas or electric stage is started.
- Contacts W1 and W2 closed: The second gas or electric stage is started.

6.4 Dual-circuit/dual-compressor heat pump unit

- Contact G open: The internal fan is stopped and the economizer is closed.
- Contact G closed: The internal fan is activated and the economizer is opened to its minimum position.
- Contact O closed, Y1 closed and Y2 open: If the unit is fitted with an economizer, it is opened to its maximum position, if external conditions permit (see chapter 5.16 - "Economizer"). Otherwise the economizer is set to its minimum position and the first compressor is started up in cooling mode. If the unit has no economizer, the first compressor is started up in cooling mode.
- Contacts O, Y1 and Y2 closed: The economizer is held fully open, if external conditions are still acceptable. A compressor is started up in cooling mode. If external conditions no longer permit the economizer to be used, it is set to its minimum position and the second compressor is started up in cooling mode. If the outdoor temperature is lower than 15°C, the compressors will not be authorised to start up and only the economizer will be used. If the unit has no economizer, the second compressor is started up in cooling mode.
- Contact O open, Y1 closed and Y2 open: If the unit is fitted with an economizer, it is set to its minimum position and the first compressor is started up in heating mode. If the unit has no economizer, the first compressor is started up in heating mode.
- Contact O open, Y1 and Y2 closed: The economizer is held in its minimum position. The second compressor is started up in heating mode.
- Contact W1 closed: The first gas or electric stage is started.

NOTE: All compressor anti-short cycles remain activated

6.5 - Unit start/stop control

The unit state is determined based on a number of factors, including its operating type, active overrides, open contacts, , 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
CCN	Network
TSTAT	Thermostat

IMPORTANT: When the unit is stopping or there is a demand to stop the unit, compressors are stopped consecutively. In case of emergency stop, all compressors are stopped at the same time

Start/stop force command [ROOF_S_S]: Rooftop start/stop force command can be used to control the unit 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 unit state in the Remote operating type.
- **G:** This contact is used when unit is in thermostat operating type
- **Start/stop schedule [roof_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-ON	L-SC	Rem	CCN	TSTAT	Start/stop force command	Remote start/stop contact	G	Start/stop time schedule	Network emergency shutdown	General alarm	Control type	Unit state
-	-	-	-	-	-	-	-	-	-	enabled	-	-	off
-	-	-	-	-	-	-	-	-	-	-	yes	-	off
active	-	-	-	-	-	-	-	-	-	-	-	local	off
-	-	active	-	-	-	-	-	-	unoccupied	-	-	local	off
-	-	-	active	-	-	-	OFF	-	-	-	-	remote	off
-	-	-	active	-	-	-	-	-	unoccupied	-	-	remote	off
-	-	-	-	active	-	disable	-	-	-	-	-	CCN	off
-	-	-	-	active	-	-	-	-	unoccupied	-	-	CCN	off
-	-	-	-	-	active	-	-	OFF	-	-	-	tstat	off
-	active	-	-	-	-	-	-	-	-	disabled	no	local	on
-	-	active	-	-	-	-	-	-	occupied	disabled	no	local	on
-	-	-	active	-	-	-	On cooling	-	occupied	disabled	no	remote	on
-	-	-	active	-	-	-	On heating	-	occupied	disabled	no	remote	on
-	-	-	active	-	-	-	On auto	-	occupied	disabled	no	remote	on
-	-	-	-	active	-	enable	-	-	occupied	disabled	no	CCN	on
-	-	-	-	-	active	-	-	ON	-	-	-	tstat	on

6.6 - Calculating the space temperature

Up to two sensors (one of which is optional) may be used to calculate the space temperature. Depending on the configuration (see see GENCONF menu), space temperature is either calculated as the average of all readings, or is taken from the minimum or maximum reading.

6.7 - Space temperature control point

Depending on the current operating type, the active setpoint can be selected:

- By choosing the item in the GENUNIT menu
- Via the user's volt-free contacts
- Via network commands
- Via the setpoint timer program (schedule 2).
- The following tables summarise the possible selections depending on the control types (local, remote or network) and the following parameters:
- Setpoint select in local control: item LSP_SEL in the GENUNIT menu permits selection of the active setpoint, if the unit is in local operating type.
- Heating/cooling operating mode.
- Setpoint selection contacts: Setpoint selection contact status.
- Schedule 2 status: Schedule for setpoint selection

LOCAL OPERATING MODE			
PARAMETER STATUS			
Heating/cooling operating mode	Local setpoint selection	Time schedule 2 status	Active setpoint
Cooling	sp 1	-	occ_cool
Cooling	sp 2	-	uno_cool
Cooling	auto	occupied	occ_cool
Cooling	auto	unoccupied	uno_cool
Heating	sp1	-	occ_cool
Heating	sp 2	-	uno_cool
Heating	auto	occupied	occ_cool
Heating	auto	unoccupied	uno_cool

PARAMETER STATUS		
Heating/cooling operating mode	Setpoint selection contact	Active setpoint
Cooling	sp 1 (open)	occ_cool
Cooling	sp 2 (closed)	uno_cool
Heating	sp 1 (open)	occ_heat
Heating	sp 2 (closed)	uno_heat

6.8 - Offset

An offset means that the active space temperature setpoint is altered in line with external parameters. This may be carried out in one of the following ways:

- By the user with the aid of an adjustment slider located on the main T-56 space temperature sensor (optional). The offset range is ± 3 K in increments of 1 K.

- By the user with the aid of buttons located on the T-59 space temperature sensor (optional). The offset range is ± 3 K in increments of 0.5 K.
- Automatically in cooling mode, by reference to the outdoor temperature (if the function has been validated in the HCCONFIG menu). In this case, the function is generally used to limit the difference between the indoor and outdoor temperatures in order to prevent thermal shock.

IMPORTANT: It is not possible to use both types of offset at the same time. If the offset from the T-56 or T-59 sensor is non-zero, offset based on the outdoor temperature is ignored.

6.9 – Smart Start

This mode permits heating or cooling the room before it is occupied so that the space temperature has reached its setpoint at the beginning of the occupied period. The control calculates an anticipated start-up value in minutes, based on a user configurable factor (anticipated start-up factor expressed in minutes/degrees that must be adjusted for the installation) and the difference between the setpoint and

the space temperature. The higher the anticipated start-up factor or the higher the setpoint difference, the earlier the change-over to occupied mode is anticipated. However, the start-up cannot be anticipated by more than 60 minutes.

6.10–Heating/cooling mode

Units with heat pumps or additional heating stages may operate in either heating or cooling mode.

- Cooling mode is active when:
Space temperature is above: occ_cool (occupied mode) or uno_cool (unoccupied mode)
- Heating mode is active when:
Space temperature is below: occ_heat (occupied mode) or uno_heat (unoccupied mode)
- Units remains in ventilation mode (without cooling or heating) when the space temperature is between occ_heat and occ_cool (occupied mode) or uno_heat and uno_cool (unoccupied mode).

6.11- Heat Cool changeover

Cooling/Heating changeover can be forced through SmartVu or CCN. The machine will be forced to do only heating or cooling upon the changeover parameter. When the unit is forced to heating but it needs to do cooling based on sensor, the unit will switch to standby. Same in reverse case.

6.12- Frost protection mode

The unit may be configured to be in frost protection mode when in unoccupied mode (GENCONF menu). In this case the fan is shut down and is only authorised to restart if the space temperature falls below the frost protection setpoint. It shuts down again when space temperature is 1.5 K above the frost protection setpoint. Selecting frost protection does not affect how the unit operates in occupied mode. The frost protection mode for unoccupied periods has to be selected in the GENCONF menu.

6.13- Controlling space temperature

The controller uses two loops in tandem to control space temperature. The purpose of the first loop (called the external loop) is to calculate the blower temperature required to maintain space temperature at space setpoint. This blower temperature, which is called the blower setpoint or forced air setpoint, is transmitted to a second loop (called the internal loop). This second loop determines the cooling or heating capacity needed to maintain blower temperature

at the setpoint transmitted to it by the external loop. This enables it to actuate the compressors and if necessary the additional heating stages or a valve on the hot water system. The precision of the controller depends on the load and the number of stages available on the unit.

On high inertia systems such as these, tandem control has the advantage of allowing space temperature to be finely controlled whilst guaranteeing a good response to disturbing elements associated with non-linear systems.

NOTE: In some cases Carrier Service may adjust the loop gains to suit the installed configurations.

6.14– Capacity limitation

Capacity limitation is generally used by an energy management system to restrict the amount of electricity consumed by the unit. The SmartVu control system enables the capacity of the unit to be limited by means of a user-controlled voltfree contact (active when closed).

The action of this contact depends on the type of unit and the configuration (see GENCONF configuration):

- Heat Pump unit with gas heater: All compressors are stopped and only gas is used.
- Heat Pump unit with hot water system: The compressor heater authorised to operate are limited to the value configured and the hot water system is used.
- Electric stages: The electric stages authorised to operate are limited to the value configured.
- Compressor stages: The compressor stages authorized to operate are limited to the value configured.
- Unit in defrosting mode: The electric stages are authorised to operate if authorised by the configuration.

6.15– Capacity control

In heating or cooling mode the capacity control regulates the compressor start-up and shut-down sequence. The control determines the compressor start-up in a way that equalises the start-up number for each compressor (value weighted by the operating time). This means, the compressor with the least number of start-ups is always the first to start up and the first to shut down.

For VSPD unit with dual circuits, when capacity need to be loaded, one fixed speed compressor shall be firstly turned ON. Then VSPD compressor shall be added to control more precisely the capacity. Its capacity can vary between 25% with step of 5%. If capacity is not enough, then another fixed speed compressor shall start. Moreover, the VSPD speed will be equal to the circuit A capacity. It means maximum SIOB output will be $vspd_max/10$ Volts.

6.16– Head pressure control

Condensing pressure control is automatically ensured by a two-speed fan (no adjustment).

6.17– Defrost function

Defrost is activated, when the unit is in heating mode, in order to reduce frost build-up on the air heat exchanger. The defrost cycle can only be applied to one circuit at a time. During the defrost cycle the fans of that circuit are stopped, and the four-way refrigerant valve is reversed, forcing the circuit to cooling mode. The fan can temporarily be restarted during the defrost cycle. The defrost cycle is fully automatic and does not require any setting. A condensate heater prevents ice formation at the

bottom of the heat exchangers, if the defrost cycles are taking place at low outdoor temperature.

NOTE: The indoor fans run during the defrost cycle except in single-circuit units without additional heat option (electric heat stage or hot-water coil).

6.18– Additional heater

Additional heater can be used on both cooling only and heat pump unit. There are three types of additional heaters: electrical heater, hot water coil and gas heater. On heat pump unit, electrical and hot water coil can only be used as backup heater, but modulated type gas heater can be used both as primary or backup heater.

6.19– Electrical heater

Electrical heater is staged type. Up to 4 staged electrical heaters can be controlled independently by the unit. On cooling only unit, electrical heaters may be switched on when unit need to do heating. On heat pump unit, electrical heaters may only be switched on when the unit is at 100% of its available compressor capacity and when outside temperature is below OAT threshold (default value is 5 °C with 1°C hysteresis to be switched off). When a circuit is in defrost mode, electric heaters are authorized to start up regardless of the compressor capacity.

6.19.1– Gas heater

Gas heater is modulated type. On cooling only unit, the modulated type gas heaters will be switched on when unit need to do heating.

On heatpump unit, modulated type gas heater can be used as primary heater(default) or backup heater. If used as primary heater, gas will be the first heating source to satisfy the load. The compressors can be added after the gas capacity is 100%. In reverse, compressor will be the first to satisfy the load and modulated type gas heater may only be switched on when the unit is at 100% of available compressor capacity and when outside temperature is below OAT threshold (default value is 1.6 °C with 1.6°C hysteresis to be switched off).

For only 190-220 heat pump sizes, gas heater cannot be used at the same time with the compressors. It will be used when the outside temperature is below OAT threshold (default value is 1.6 °C with 1.6°C hysteresis to be switched off). Above that temperature, the compressors are used again and the gas heater is halte

6.19.2– Hot water coil

Hot water coil is modulated type. Units may control the heating capacity by adjusting a valve on a hot water system. It is always used as backup heater. When the unit is operating in heating mode and

compressor capacity is 100%, the valve is continually adjusted to maintain the supply air temperature to heatcool submaster reference. In cooling mode this valve is kept fully opened (completely bypass the hot-water system). If the unit is heat pump, the valve is kept closed during defrost sequences (hot-water system feed).

6.20–Pre-heating Option Control

This option is used to maintain mixed air temperature between 10 and 11°C.

First the pre-heater option has to be selected and an economizer is needed. This option is also working with a thermistor before air filter to measure mixed air temperature. The electrical pre-heaters shall be turned ON when unit needs to do heating or standby providing that the economizer is at its minimum configured position and shall be turned OFF when the unit needs to do cooling.

6.21– Economizer

The unit may control an economizer which is activated to enable fresh air to be fed in from outside when conditions permit (this is called free cooling). The controller uses two loops in tandem to control space temperature with the aid of the economizer. The external loop calculates the supply air temperature required to maintain space temperature at space control point. The internal loop determines the economizer position needed to maintain this supply air temperature.

For unit with THR option, when THR compressor is running, economizer damper shall be modulated to guarantee enough fresh air pass through the THR exchanger for safe function of THR.

Special conditions:

- The economizer shall be kept closed when the unit is stopped.
- The economizer shall be held at its minimum position of 15% (this value may be configured by Carrier Service) when:
 - The unit is in heating mode
 - Space temperature is below space control point
 - The difference between space temperature and outdoor temperature is less than the economizer utilisation threshold (i.e. a value of 7 K which may be configured by Carrier Service)
 - Blower temperature is below 10°C
 - The unit is fitted with an outside air enthalpy sensor and this is indicating a high enthalpy which is incompatible with feeding in air from outside.
- The economizer shall be kept fully open when purge mode is active.
- The minimum position of the economizer shall be altered in order to meet air quality requirements (see section 5.18 - "Controlling air quality").
- If the system embeds the VAV option, the fresh air rate is calculated as a function of the economizer damper position. Thus the minimum position of economizer depends on the minimum authorized value for fresh air ratio.
- The minimum position of the economizer shall not exceed 25% if the outdoor temperature is below 6°C. i.e. when OAT < 6°C
 - If the configured economizer minimum position >25%, the economizer minimum position is 25%.
 - If the configured economizer minimum position is <25% (e.g. 5%), the economizer minimum position is 5%.
- If the outdoor temperature is below 15°C, all compressors shall be stopped and only free cooling shall be authorised.

If the unit is fitted with a power exhaust fan this shall be open if the position of the economizer is in excess of 50% (this threshold may be modified by Carrier Service).

6.22– Purge

This function can only be used if the unit is fitted with an economizer. When the unit switches from unoccupied to occupied mode, the economizer is kept fully open for two minutes provided the outdoor temperature is between 10°C and 21°C. A purge will not be activated if the occupied period is intended to last less than two hours. This function must be validated by the user in the GENCONF menu. It is also possible to alter the length of the purge and the limiting outdoor temperatures in the Setpoint menu.

6.23– Controlling air quality

This function is used if the unit is fitted with an air quality sensor and an economizer. With the aid of a PI function, it enables the position of the economizer to be continually adjusted in order as far as possible to maintain air quality at its setpoint whilst preventing the space temperature from drifting too greatly (in view of the fact that the heating or cooling stages are not authorised to operate at this point). On the other hand if the error in the heating or cooling space setpoint being maintained exceeds 2.2°C, this function is disabled and the economizer returns to its minimum configured position (30%), and the heating or cooling stages are authorised to operate again. Air quality control cannot then be authorised for another hour. This function is not active in unoccupied mode.

6.24– Master/slave assembly

Up to 6 units can take part in a master/slave assembly. This group then constitutes a zone in which conflicting states of cooling/heating are not allowed between units. The master unit determines the cooling or heating mode for the zone. If one of the slave units is in a different cooling/heating mode from the master unit, the unit concerned is switched to ventilation mode without producing heat or cooling. This function is not active in the frost protection mode. The function operates under all operating types. It requires the use of a communication bus between the units concerned and must be configured by Carrier Service.

6.25– Fire protection

When the normally closed smoke detection contact is open, the unit is shut down and either the fire output is activated or the economizer damper is opened.

6.26– Energy recovery module (ERM)

This function can only be used if the unit is fitted with an economizer and return fan. The ERM option is used to save energy by recovering heat or cool energy air from the exhaust air and supplying that energy to the outside air passing through a metal recovery wheel in the rooftop unit.

The principle is based on exhaust air and outside air passing through a rotating wheel. The exhaust air temperature is about 20°C.

Locally in the exhaust air duct, the wheel temperature changes to the exhaust air temperature. The wheel rotates and outside air passes through the wheel. The wheel supplies the energy recovered from exhaust air back to the inlet air.

The ERM wheel is working according to four situations:

1. Recirculation mode: Economizer is off for air recycling,

the ERM wheel is off

2. Recovery mode in heating: Economizer is opened at the minimum position and the space temperature is higher than the outside temperature. The ERM wheel is on.
3. Recovery mode in cooling: The economizer opened at the minimum position and the space temperature is lower than the outside temperature. The ERM wheel is on.
4. The unit is in free-cooling mode, the economizer is opened, the space temperature is higher than the outside temperature. The ERM wheel is off.

6.27– Thermodynamic energy recovery (THR)

The ERM energy recovery wheel is replaced by a refrigeration circuit in the THR.

THR is considered as additional refrigeration circuit with equal role as regular refrigeration circuit(s). THR's ON/OFF is requested by capacity control logic and compressor load/unload sequence. It is possible to be used as lead or lag refrigeration source depend on user configured minimum fresh air.

THR is always used with return fan option. When THR is ON, supply air flow rate shall be minimum 80% nominal air flow rate, economizer damper shall modulate to guarantee safe function of THR.

6.28– Demand limit

The demand limit is used to restrict the unit power consumption. The SmartVu control system allows limitation of the unit capacity, using user-controlled volt-free contacts.

The unit capacity can never exceed the limit setpoint activated by these contacts. The limit setpoints can be modified in the GENCONF menu.

6.29- VAV option

When this option is equipped, the indoor fan airflow can be managed in three ways:

- Constant air volume: Allows to provide a constant airflow in the product lifetime
- Variable air volume 1: Variable airflow in cooling only mode to fit the ventilation needs as a function of circuit
- Variable air volume 2: Variable airflow for both cooling and heating modes.

The three modes use PID logic to maintain the required airflow. When coupled to the economizer option, the fresh air rate is maintained automatically. The system has to be calibrated by Carrier Service

6.30– Return fan option

In some applications with high return duct ESP, a return fan may be applied to help maintain the air flow rate and the building pressure. Return fan's ON/OFF is in same status with the supply fan and the return fan's speed is 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.

6.35- Schedule setting

The control incorporates two time schedules, where the first one

A manual reset must be run from the touch screen interface or the web via the Reset alarms menu, item RST_ALM. Alarm reset can be protected by a basic user level password.

6.31– Night mode

Night mode allows users to configure the unit to operate with specific parameters in a specific time period. During the night period, the fan runs at low speed, if permitted by the current operating conditions. In addition, the user can reduce the unit capacity.

The night period is defined by a start time and an end time that are the same for each day of the week. The Night mode settings can be configured via the Configuration menu (GEN_CONF – General Configuration). Only logged-in users can modify the night mode settings.

To set the night mode

1. Navigate to the Configuration menu (logged-in users only).
2. Select *General Configuration* (GEN_CONF).
3. Set parameters corresponding to the night mode.

Night Mode Start Hour [nh_start]

00:00 to 24:00

Night Mode End Hour [nh_end]

00:00 to 24:00

6.32 Refrigerant leak detection option

When the normally closed refrigerant leak detection contact is open, the unit is shut down.

6.33 BACnet

The BACnet/IP communication protocol is used by BMS or the programmable controllers to communicate with the control. This protocol is available as a **standard**

To enable/disable BACnet communication option

1. Go to the Main menu.
2. Navigate to the Configuration menu, and then the Network menu.
3. Select the BACnet Parameters menu (BACNET).
4. Set the "BACnet Enable" parameter to "enable".

6.34 Modbus

The modbus protocol is used for communication with the building management (BMS) or the programmable controllers, which is acting as the master, while the multiple units are watched as slaves. This protocol is available as a **standard**

To enable/disable MODBUS communication option

1. Go to the Main menu.
2. Navigate to the Configuration menu, and then the Network menu.
3. Select the MODBUS Parameters menu (MODBUS).
4. Set the "MODBUS Enable" parameter to "enable".

(OCCPC01S) is used for controlling the unit start/stop, whereas the second one (OCCPC02S) is used for controlling the dual setpoint.

The first timer program (schedule 1, OCCPC01S) provides a means to automatically switch the unit from an occupied mode to an unoccupied mode. The unit is started during occupied periods.

The second timer program (schedule 2, OCCPC02S) provides a means to automatically switch the active setpoint from an occupied setpoint to an unoccupied setpoint. Cooling setpoint 1 is used during occupied periods and cooling setpoint 2 during unoccupied periods.

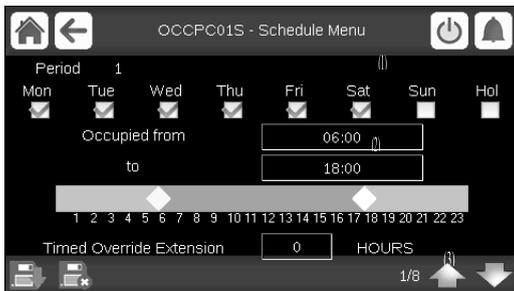
Occupancy periods

The control offers 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:** 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 start/stop schedule

1. Go to the Main menu.
2. Navigate to the Configuration menu (logged-in users only) and select *Schedule Menu* (SCHEDULE).
3. Go to OCCPC01S.
4. Select appropriate check boxes to set the unit occupancy on specific days.
5. Define the time of occupancy.
6. When the time schedule is set, the selected period will be presented in the form of the green band on the timeline.
7. Press the **Save** button to save your changes or the **Cancel** button to exit the screen without making modifications.



- Legend:**
1. Selection of days for the time schedule
 2. Start/end of the schedule
 3. Previous time period
 4. Next time period

Each program is in unoccupied mode unless a schedule time period is active.

If two periods overlap and are both active on the same day, then the occupied mode takes priority over the unoccupied period.

Example: Schedule setting (schedule 1)

Hour	MON	TUE	WED	THU	FRI	SAT	SUN	HOL
0:00	P1							
1:00	P1							
2:00	P1							
3:00								
4:00								
5:00								
6:00								
7:00	P2	P2	P3	P4	P4	P5		
8:00	P2	P2	P3	P4	P4	P5		
9:00	P2	P2	P3	P4	P4	P5		
10:00	P2	P2	P3	P4	P4	P5		
11:00	P2	P2	P3	P4	P4	P5		
12:00	P2	P2	P3	P4	P4			
13:00	P2	P2	P3	P4	P4			
14:00	P2	P2	P3	P4	P4			
15:00	P2	P2	P3	P4	P4			
16:00	P2	P2	P3	P4	P4			
17:00	P2	P2	P3					
18:00			P3					
19:00			P3					
20:00			P3					P6
21:00								
22:00								
23:00								

Occupied
 Unoccupied

- MON:** Monday
- TUE:** Tuesday
- WED:** Wednesday
- THU:** Thursday
- FRI:** Friday
- SAT:** Saturday
- SUN:** Sunday
- HOL:** Holiday

Period/Schedule	Starts at	Stops at	Active on (days)
P1: Period 1	0:00	3:00	Monday
P2: Period 2	7:00	18:00	Monday + Tuesday
P3: Period 3	7:00	21:00	Wednesday
P4: Period 4	7:00	17:00	Thursday + Friday
P5: Period 5	7:00	12:00	Saturday
P6: Period 6	20:00	21:00	Holidays
P7: Period 7	Not used in this example		
P8: Period 8	Not used in this example		

6.36- Holidays

The control allows the user to define 16 holiday periods, where each period is defined by three parameters: the month, the start day and the duration of the holiday period.

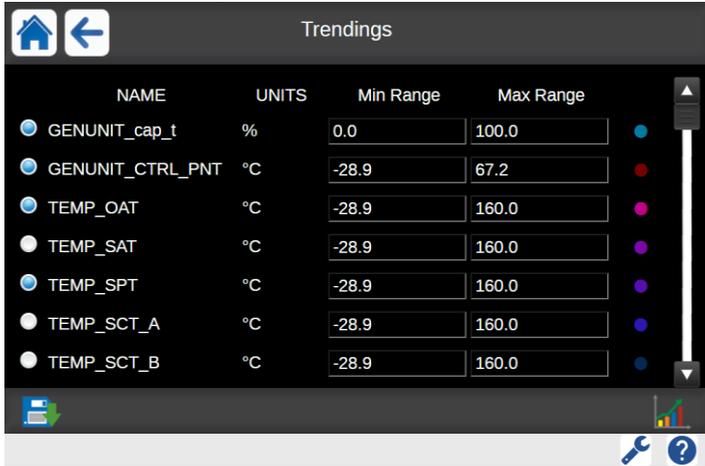
During the holiday periods, the controller will be in occupied or unoccupied mode, depending on the periods validated as holidays. Each holiday period can be modified by the user via the Configuration menu (see also section 5.2).

6.37 Trending

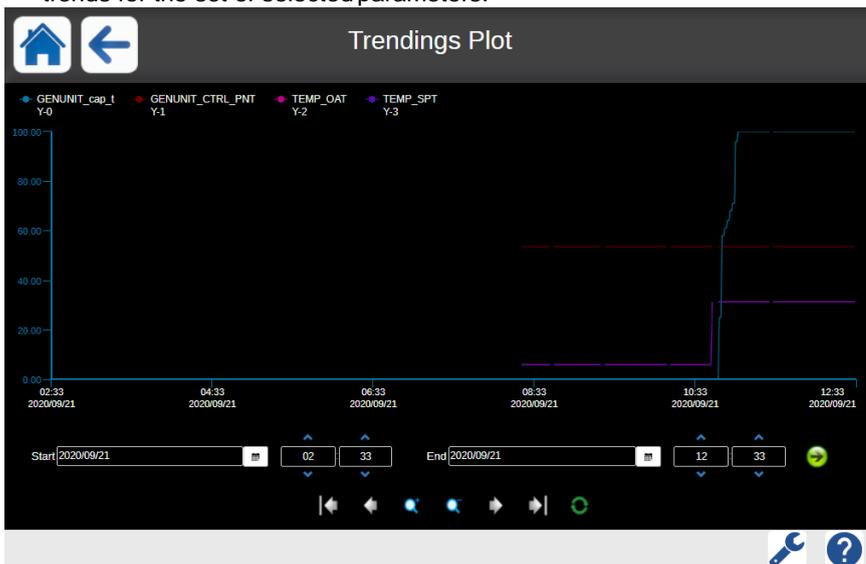
This function enables to visualise the operations of the unit and monitor a set of selected parameters.

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.



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



- Set the time range (start/end dates and time) and press the **Arrow** button  to display the graph showing the performance of the unit within a selected period of time. (*Arrow button only available from a PC browser*)
- Press  to navigate across the timeline or press  to go to the beginning or the end of the selected period.
- 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.

7 - WEB CONNECTION

7.1 - Web interface

The SmartVu control provides the functionality to access and control unit parameters from a web interface. To connect to the controller via the web interface, it is necessary to know the IP address of the unit.

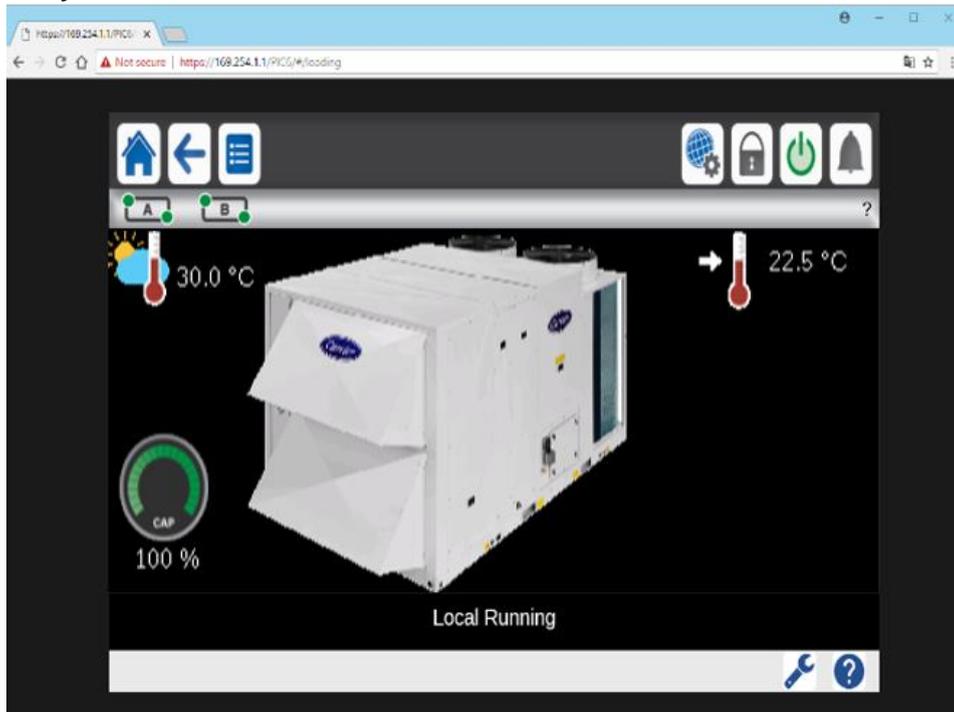
To verify unit IP address:

1. Go to the System menu.
2. Select *Network* (NETWORK).
3. Verify TCP/IP Address for "IP Network Interface J5 (eth0)". See also section 3.3.
 - Unit default address: 169.254.1.1 (J15, eth0)
 - The unit IP address can be changed.

To access SmartVu 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.

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



Minimum web browser configuration:

- Internet Explorer (version 11 or higher)
- Mozilla Firefox (version 60 or higher)
- Google Chrome (version 65 or higher)

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

Make sure that your network is protected from malicious attacks and any other security threats. Do not provide open access without proper network security safeguards.

Carrier does not hold any responsibility or liability for damage caused by security breach.

8 - DIAGNOSTICS

8.1 - Control diagnostics

The control system has many fault tracing aid functions, protecting the unit against risks that could result in the failure of the unit. The local interface gives quick access to monitor all unit operating conditions. If an operating fault is detected, the alarm is triggered.

In the event of an alarm:

- The bell on the SmartVu 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 corresponding alarm output(s) is/are activated.
- Error code is displayed.
- Message is sent over the network.

SmartVu control distinguishes between two types of alarms:

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

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

8.2 - Displaying current alarms

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

To access the list of currently active alarms

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



8.3 - E-mail notifications

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

To define e-mail recipients

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

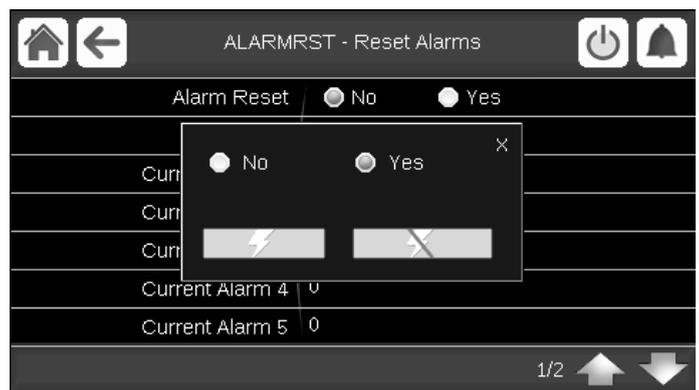
8.4 - Resetting alarms

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

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

To reset the alarm manually

1. Press the **Alarms menu** button in the upper-right part of the screen.
2. Select *Reset Alarms* (ALARMRST).
3. 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.

It is also possible to reset the alarms by CCN, with System Pilot for example.

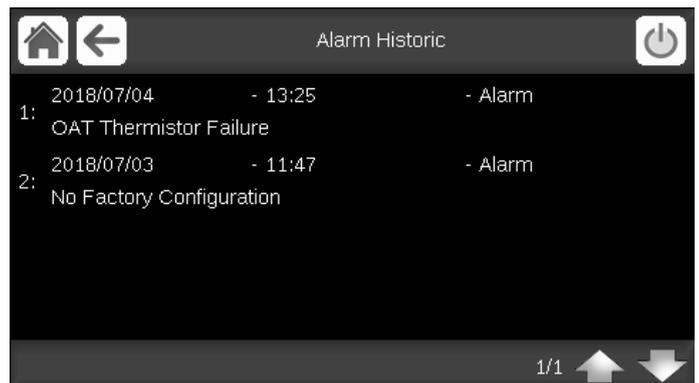
IMPORTANT: Not all alarms can be reset by the user. Some alarms are reset automatically when operating conditions return to normal.

8.5 - Alarm history

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

To access the alarm history

1. Press the **Alarms menu** button in the upper-right part of the screen.
2. Select *Alarm Historic* (ALMHIST1) or *Major Alarm Historic* (ALMHIST2).
3. The history of alarms will be displayed.



8 - DIAGNOSTICS

8.6 - Alarm codes

Alarm No.	ALARMRST Code	Description of the alarm text	Reset type	Probable cause	Action taken by the control
Sensor Failures					
1	Th-204	Indoor air Thermistor #1	Automatic if the temperature measured by the sensor returns to normal	Defective thermistor	Unit is shut down
2	Th-205	Indoor air Thermistor #2	As above	As above	As above
3	Th-202	Supply air Thermistor	As above	As above	As above
4	Th-206	Space Temperature Offset	As above	As above	Space temperature offset function is ignored
5	Th-203	Return Air Thermistor	As above	As above	Unit is shut down
6	Th-02	Water exchanger Leaving Fluid Thermistor	As above	As above	Hot-water coil disabled
7	Th-03	Circuit A Defrost Thermistor	As above	As above	Unit is shut down if heating mode
8	Th-04	Circuit B Defrost Thermistor	As above	As above	As above
9	Th-10	OAT Thermistor	As above	As above	Unit is shut down
10	Th-12	Circuit A EXV Suction Thermistor	As above	As above	As above
11	Th-13	Circuit B EXV Suction Thermistor	As above	As above	As above
12	Th-14	Circuit THR EXV Suction Thermistor	As above	As above	As above
13	Th-11	Mixed Air Thermistor	As above	As above	unit is shut down
14	Pr-01	Circuit A Discharge Transducer	Automatic when the voltage transmitted by the sensor returns to normal	Defective transducer or installation fault	Circuit is shut down
15	Pr-02	Circuit B Discharge Transducer	As above	As above	As above
16	Pr-03	Circuit THR Discharge Transducer	As above	As above	As above
17	Pr-04	Circuit A Suction Transducer	As above	As above	As above
18	Pr-05	Circuit B Suction Transducer	As above	As above	As above
19	Pr-06	Circuit THR Suction Transducer	As above	As above	As above
20	Se-201	Indoor Air Quality sensor	As above	defective sensor	Indoor air quality function is disabled
21	Se-203	Relative Humidity sensor	As above	As above	Humidity control function is disabled
Communication Failures					
22	Co-S1	Loss of communication with SIOB Board Number 1	Automatic if communication is re-established	Installation bus fault or defective board	Circuit A is disabled
23	Co-S2	Loss of communication with SIOB Board Number 2	As above	As above	Circuit B is disabled
24	Co-S3	Loss of communication with SIOB Board Number 3	As above	As above	Circuit C is disabled
25	Co-A1	Loss of communication with AUX1 Board Number 1	As above	As above	Compressor VSPD is disabled
Process Failures and Others					
26	P-01	Water Exchanger Freeze Protection	Manual	Heat exchanger water below 2.5 °C	Indoor fan is off, 3 way valve bypass line is closed to enable hot water pass inside the coil (hot-water system feed).
27	P-05	Circuit A Low Suction Temperature	Automatic when the temperature returns to normal, and if this alarm has not appeared during	Pressure sensor defective, EXV blocked or low refrigerant charge	Circuit is shut down

				the last 24 hours, otherwise manual.		
28	P-06	Circuit B Low Suction Temperature	As above	As above	As above	As above
29	P-07	Circuit THR Low Suction Temperature	As above	As above	As above	As above
30	P-16	Compressor A1 Not Started or Pressure Increase not established	Manual	Connection problem	Compressor is shut down	
31	P-17	Compressor A2 Not Started or Pressure Increase not established	As above	As above	As above	As above
32	P-20	Compressor B1 Not Started or Pressure Increase not established	As above	As above	As above	As above
33	P-21	Compressor B2 Not Started or Pressure Increase not established	As above	As above	As above	As above
34	P-22	Compressor THR1 Not Started or Pressure Increase not established	As above	As above	As above	As above
35	P-23	Compressor THR2 Not Started or Pressure Increase not established (RESERVED)	As above	As above	As above	As above
36	P-31	Unit is in CCN emergency stop	Manual	Network command	Unit is shut down	
37	P-37	Circuit A - Repeated high discharge gas overrides	Automatic	Transducer defective or fan circuit fault	None	
38	P-38	Circuit B – Repeated high discharge gas overrides	Automatic	As above	As above	As above
39	P-39	Circuit THR – Repeated high discharge gas overrides	As above	As above	As above	As above
40	P-40	Circuit A – Repeated low suction temp overrides	Manual	Pressure sensor defective or refrigerant charge too low	Circuit is shut down	
41	P-41	Circuit B – Repeated low suction temp overrides	Manual	As above	As above	As above
42	P-42	Circuit THR – Repeated low suction temp overrides	As above	As above	As above	As above
43	P-99	Refrigerant Leakage Detection	Manual	The refrigerant leak sensor contact is open	Unit is shut down	
44	P-202	Energy Recovery Wheel	Automatic	Wheel is not rotating	ERM option is off	
45	P-203	Return Fan Status Failure	Manual	Air flow fault	Unit is shut down	
46	P-204	Supply Fan Status Failure	Manual	Air flow fault	Unit is shut down	
47	P-205	Pre-heater Failure	Manual	The pre-heater overheat feedback is open	Turn off the pre-heaters immediately, disable pre-heater function. Other parts of machine like compressor and fan remain running	
48	P-209	Fire	As above	The anti-fire contact is open	Unit is shut down	
49	P-210	Heat Stage Failure	As above	the heating stage fault contact is open	Turn off the pre-heaters immediately, disable pre-heater function. Other parts of machine like compressor and fan remain running	
50	P-211	Thermostat Failure	Manual	The unit is controlled by an external thermostat and this simultaneously sends a heating or cooling command	The indoor fan shuts down. All functions are deactivated.	
51	Sr-nn	Service maintenance alert, call your maintenance company	Manual	The preventive maintenance	-	

8 - DIAGNOSTICS

		Number # nn		date has passed	
52	FC-n0	No factory configuration	Automatic when the configuration is entered	The unit size has not been configured	Unit is shut down
53	FC-01	Illegal factory configuration Number #1 to nn	Manual	The unit size has been configured with the wrong value	As above
54	P-30	Master/Slave communication	Automatic when communication is re-established	CCN installation bus defective	Unit goes into autonomous mode
55	P-219	Dirty Filter Alert	Automatic	The airflow filter contact is open	None
56	A1-03	Compressor A High Pressure Switch protection	Manual	-	Circuit A shuts down
57	B1-03	Compressor B High Pressure Switch protection	Manual	-	Circuit B shuts down
58	C1-03	Compressor C High Pressure Switch protection	Manual	-	Circuit C shuts down
59	DB-01	Database module Failure	Automatic	Contact Carrier Service	Software problem. Unit shuts down
60	LS-01	Lenscan module Failure	Automatic	Contact Carrier Service	Software problem. Unit shuts down
61	P-50	EXV stepper motor failure A	Manual	-	Circuit A shuts down
62	P-51	EXV stepper motor failure B	Manual	-	Circuit B shuts down
63	P-52	EXV stepper motor failure THR	As above	As above	Circuit THR shuts down
64	P-08	High Suction Superheat A	Manual	-	Circuit A shuts down
65	P-09	High Suction Superheat B	Manual	-	Circuit B shuts down
66	P-10	High Suction Superheat THR	As above	As above	Circuit THR shuts down
67	P-11	Low Suction Superheat A	Manual	-	Circuit A shuts down
68	P-12	Low Suction Superheat B	Manual	-	Circuit B shuts down
69	P-13	Low Suction Superheat THR	As above	As above	Circuit THR shuts down
70	Sr-05	Fgas check needed, call your maintenance company	Automatic	Contact Carrier Service	Regular FGAS check needed
71	P-213	Possible Excess Building Air Leakage, Check Doors and Windows	Automatic	In some situations or occasions many doors and windows (or Tent like structure) may be open so that no matter what the control does the building pressure will be close to zero.	None, partial alarm.
72	S0-01	Circuit A SIOB Low Voltage Failure	Conditional	SIOB board has a micro power cut	All outputs in SIOB board are cut off, managed by SIOB board itself. SmartVu will take control of SIOB board once the board is successfully reset.
73	S0-02	Circuit B SIOB Low Voltage Failure	Conditional	As above	As above
74	S0-03	Circuit C SIOB Low Voltage Failure	Conditional	As above	As above
75	V1-01	Circuit A Compressor VFD Failure	Automatic	Compressor driver has detected abnormal running status of VSPD compressor. The error relay on the driver is opened	VSPD compressor shuts down. Once driver error relay return back to closed state, then compressor is allowed to start.
76	Ca-01	Return Fan Calibration Not Set	Automatic	Return Fan not calibrated	Unit is shut down

9 - MAINTENANCE

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

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

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



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