![Carrier logo - United Technologies]

C O N T R O L S   M A N U A L

Touch Pilot Control

19PV 550-1600

CONTENTS

CONTENTS

1 - GENERAL DESCRIPTION

1.1 - General

The goal of this manual is to give a broad overview of the main functions of the Touch Pilot control system used to control and monitor the operation of 19PV water-cooled chillers using MagLev compressors with an integrated variable frequency drive.

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 Manufacturer Service Engineer is strongly recommended to ensure optimal operation of the equipment as well as the optimization of all available functionalities.

Note that this document may refer to optional components and certain functions, options or accessories may not be available for the specific unit.

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

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

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

1.2 - Abbreviations

In this manual, the refrigerant circuits are called circuit A and circuit B.

Compressors in circuit A are labelled A1, A2 and compressors in circuit B are labelled B1 and B2.

The following abbreviations are used frequently:

BMS   Building Management System

EWT   Entering Water Temperature

EXV   Electronic Expansion Valve

LED   Light Emitting Diode

LEN   Internal communication bus linking the controller and the boards

LWT   Leaving Water Temperature

MagLev   Magnetic Levitation

OAT   Outdoor Air Temperature

2 - SAFETY CONSIDERATIONS

2.1 - Safety guidelines

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

Only properly qualified installation engineers and highly qualified installers and technicians, fully trained for the product, are authorised to install and start-up the equipment safely. During all servicing operations all instructions and recommendations which appear in the installation and service instructions for the product, as well as on tags and labels fixed to the equipment and components and 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 standard safety codes and practices.*
- ■ *Wear safety glasses and gloves.*
- ■ *Use the proper tools to move heavy objects.*
- ■ *Move units carefully and set them down gently.*

2.2 - 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 be shut off before any work is begun. Shut off the main power supply at the main circuit breaker or isolator.

IMPORTANT: This equipment conforms to all applicable codes regarding 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. MagLev compressors keep running up to 15 minutes after power off.

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.

3 - CONTROL OVERVIEW

3.1 - Control system

19PV units come with the Touch Pilot control that serves as a user interface and a configuration tool for controlling the operation of the chiller.

3.2 - 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 unit to maintain the correct refrigerant pressure in the circuits and monitors safety devices that protect the unit against failure and guarantee its optimal functioning.

Touch Pilot controls:
- compressor start-up to control the water loop
- fixed or variable-speed pumps to optimise water loop operation

3.3 - Touch Pilot components

The controller manages a number of mechanisms that allow the unit to operate effectively, including the following:
- 7-inch touch screen
- BMS connection
- Oil-free centrifugal compressor technology
- Diagnostics
- Web connectivity / e-mail transmission
- Cooling / Heating control
- Dry Cooler Free Cooling control (optional)
- Condenser dry cooler control (optional) – only LEN connector provided (dry cooler installed separately)

3.4 - Operating modes

Touch Pilot control may operate in three independent modes:
- Local: The unit is controlled by commands from the user interface.
- Remote: The unit is controlled by dry contacts.
- Network: The unit is controlled by network commands. Data communication cable is used to connect the unit to IP connection.

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

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

4 - HARDWARE DESCRIPTION

4.1 - Control boards

Touch Pilot is the main controller that constantly monitors the unit and manages the information received from various pressure and temperature probes.

The control system includes the following modules:
- Touch Pilot (controller + 7-inch user interface).
- SIOB boards that manage the major inputs and outputs of the controller (two SIOB boards for single-circuit units and three SIOB boards for dual-circuit units).
- AUX1 board used for controlling options such as refrigerant leak detection, master/slave assembly control or condenser three-way valve.
- Dry Cooler Condenser AUX1 board which is installed in the dry cooler (see section 8.15).
- Dry Cooler Free Cooling AUX1 board which is installed in the dry cooler (see section 8.16).

All boards communicate via an internal bus.

4.2 - Power supply to boards

All boards are supplied from a common 24 VAC supply referred to earth. 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 the unit from restarting.

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

4.3 - Light emitting diodes on boards

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

The red LED flashing for a two-second period indicates correct operation. A different rate indicates a board or a software failure.

The green LED flashes continuously on all boards to show that the board is communicating correctly over its internal bus. If the green LED is not flashing, this indicates the internal bus wiring problem or a configuration issue.

4.4 - Pressure transducers

The control implements two types of pressure transducers (high pressure and low pressure) which are used to measure the suction and discharge pressure in the circuit.

■ **Discharge pressure transducers (high pressure type):** These transducers measure the discharge pressure in the circuit. They are used to control condensing pressure or high pressure load shedding. Discharge pressure sensors are mounted on the discharge line piping of the circuit.

■ **Suction pressure transducers (low pressure type):** These transducers measure the suction pressure in the 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 suction piping of the circuit.

4.5 - Temperature sensors

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

■ **Cooler entering/leaving water temperature sensors:** The cooler entering and leaving water temperature sensors are used for capacity control and safety purposes. The water temperature sensors are installed in the entering and leaving side.

■ **Condenser entering/leaving water temperature sensors:** The condenser entering and leaving water temperature sensors are used for heating capacity control and safety purposes.

■ **Suction temperature sensors:** Suction temperature sensors are used to control temperature at the compressor inlet line in order to ensure correct capacity control management (one sensor per circuit).

■ **Space temperature sensor:** This sensor is used to measure the space temperature.

■ **DCFC option, Leaving Water Temperature sensor:** This sensor measures the dry cooler leaving water temperature. The sensor measurement is used to control the operation of the dry cooler.

■ **DCFC option, Water Loop Temperature sensor:** This sensor is used to measure the water loop temperature and it is mounted before the water valve installed on the dry cooler. The sensor measurement is used to verify if current conditions are suitable for the free cooling process.

■ **Air Condensing Control, Dry Cooler Leaving Water Temperature sensor:** This sensor is used to measure the condenser water loop temperature at the exit of the Dry Cooler. The sensor measurement is used to regulate the air exchange.

■ **Air Condensing Control, Outdoor Air Temperature sensor:** This sensor is used to measure the air temperature around the Dry Cooler. The sensor measurement is used to regulate the air exchange.

■ **Suction gas temperature sensors:** Suction temperature sensors (embedded / one per compressor) are used to control temperature at the compressor inlet line in order to ensure correct capacity control management. This sensor is located at the suction side of each compressor.

■ **Discharge gas temperature sensors:** Discharge temperature sensors (embedded / one per compressor) are used to control the discharge gas temperature, and permit control of the discharge superheat. This sensor is located at the discharge side of each compressor.

■ **Master/Slave water sensor (optional):** 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.

4.6 - Actuators

■ **Electronic Expansion Valve:** The electronic expansion valve (EXV) is used to adjust the refrigerant flow to changes in the operating conditions of the machine. The high degree of accuracy with which the piston is positioned provides precise control of the refrigerant flow and suction superheat.

■ **Staging valve:** The staging valve is used during the start of the compressor to route its flow through a bypass and to enable the compressor start in proper conditions.

■ **Evaporator flow switch:** A flow switch is mounted to ensure that the minimum flow rate required for the correct operation and protection of the system is maintained. If the flow switch fails, the alarm condition shuts off the unit. The flow switch can also be added in the condenser exchanger (not provided with the unit).

■ **Variable-speed water pumps:** The controller provides a command of speed for the evaporator water loop. The water flow control is based on the heat exchanger temperature difference.

■ **Water pumps (optional):** The unit can be fitted with one evaporator and one condenser pump. The controller can independently regulate each water heat exchanger pump.

4.7 - Terminal block connections

The "Terminal block connections" table given below summarizes connections at the user terminal block. Connections available at the user terminal block may vary depending on the selected options.

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

4.7.1 - Volt-free contact (on/off and cool/heat)

Contact	Off	Cooling	Heating
On/Off switch	open	closed	closed
Heat/Cool switch	open	open	closed

4.7.2 - Volt-free setpoint selection contact

When the unit is under remote control, the volt-free contact is used to determine the active setpoint. This dry contact is used to switch between setpoints.

Contact	Setpoint 1	Setpoint 2	Setpoint 3
Setpoint switch	open	closed	closed

* Ice done contact must be open to enable "setpoint 3"

4.7.3 - Volt-free demand limit selection contact

Two dry contacts can be used to limit unit capacity.

Contact	100%	Limit 1 [lim_sp1]	Limit 2 [lim_sp2]	Limit 3 [lim_sp3]
Demand limit switch #1	open	closed	open	closed
Demand limit switch #2	open	open	closed	closed

Terminal block connections

Description	Board	Connector	Remarks
On/Off switch	SIOB #1	DI-01, 32-33	Used for the unit on/off control (Remote mode only): open = unit is Off closed = unit is on
Heat/Cool Switch	SIOB #1	DI-02, 63-64	Used to switch between heating and cooling (Remote mode only)
Demand Limit Switch #1	SIOB #1	DI-03, 73-74	Used to control demand limit: open = 100% capacity can be used, no demand limitation is applied closed = demand limitation applied
Customer interlock	SIOB #1	DI-04, 34-35 - Bypass	Used to control unit start/stop: open = unit shuts down closed = unit is allowed to operate
Setpoint Switch	SIOB #1	DI-05, 65-66	When the unit is under remote control, the volt-free contact is used to determine the active setpoint (see section 8.4.1)
Setpoint reset	SIOB #1	AI-10, 71-72	4-20 mA signal to offset the active setpoint of the unit
Alarm relay *	SIOB #1	DO-05, 30A-31A	Used to signal an alarm: open = inactive (no alarms active) closed = alarm(s) active
Running Relay	SIOB #1	DO-06, 37-38	Used to signal a running status (at least one compressor start)
External Pump Speed Command of the evaporator	SIOB #1	AO-01, 90+ 90 -	Used to control the speed of a pump by a 0-10V signal
3-way valve control	AUX1 #1	Ch 9, 80+ 80-	Used to control a three way valve on the condenser water loop (optional)
Occupied Override Switch	SIOB #3	DI-01, 77-78	In Remote mode closing this switch set occupancy to "yes"
Demand Limit Switch #2	SIOB #3	DI-02, 73A-74A	In remote mode enables the 2nd capacity limit setpoint
Ice setpoint	SIOB #3	DI-03, 75-76	Closing this input disables the ice setpoint
Condenser flow switch	SIOB #3	DI-05, 96-97 - Bypass	Used to detect the flow on the condenser side. It should be closed to authorise the unit to start
Space temperature for reset control	SIOB #3	AI-01, 71A-72A	Space temperature for reset control
Capacity limit control	SIOB #3	AI-10, 67-68	4-20 mA signal to set the demand limit of the unit
Chiller Alert state *	SIOB #3	DO-05, 30B-31B	Closed if an alert is present
Chiller shutdown state *	SIOB #3	DO-06, 30-31	Closed if chiller is shutdown
Chiller capacity running output (0 to 10V)	SIOB #3	AO-01, 79+ 79-	Used to transmit the voltage level corresponding to unit production (10V = production at full capacity)

* These signals can be reversed by setting the parameter al_rever to "yes" in the GEN_CONF table.

5 - HOW TO USE TOUCH PILOT CONTROL

5.1 - User interface

Touch Pilot is a 7" 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).

AquaEdge 19PV
ECG - SR - 20M4E010

This picture is for information only. It may differ from the actual look.

If the touch screen is not used for a long period of time, the Welcome screen is displayed, and then it goes blank. The control is always active and the operating mode remains unchanged. Press anywhere on the screen and the Welcome screen will be displayed.

5.2 - Connections

Connections are located on the bottom side of the controller.

The controller comes with two RS485 ports, where the first port is used to connect to Modbus and the second RS485 port is used for internal communication. The Ethernet port allows for TCP/IP communication or BMS (Building Management System) connection thanks to BACnet/IP communication.
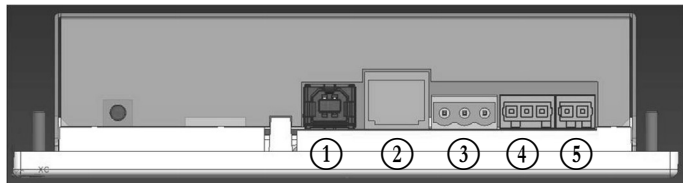
Legend
1. USB connector
2. Ethernet connector
3. Internal bus (RS485)
4. Internal bus (RS485)
5. Power supply connector (24 VAC)

5.3 - Touch Pilot buttons

Home button	Main Menu button	Back button
Home screen displayed	Main Menu displayed	Go back to the previous screen

Login button	Start/Stop button	Alarm button
Basic access	Unit is stopped (grey icon)	No alarm active on the unit
User access	Unit is running (green icon)	*Blinking icon:* Partial alarm (one compressor affected by the existing alarm) or Alert (no action taken on the unit), *Steady icon:* Alarm(s) active on the unit

Login screen	Parameters screen(s)
Login: Confirm advanced access login	Save changes
Logout: Reset the user level access and go to the splash screen	Cancel your modifications

Force screen (override)	Navigation buttons
Set force: Override the current command (if possible)	Displayed when the menu includes more than one page: Go to the previous page
Remove force: Remove the forced command	Displayed when the menu includes more than one page: Go to the next page

5.4 - Menu structure

| Home | Main Menu | Log in / Log out | Start / Stop | Alarms Menu |

Main menu

General Parameters	Temperatures	Pressures
Inputs Status	Outputs Status	Pump Status
Run Times	Modes	Miscellaneous Status
DC Free Cooling Status	Air Condenser Status	Setpoint Table
Configuration Menu		

Configuration menu

General Configuration	Pump Configuration	User Configuration
Reset Configuration	Schedule Menu	Holiday Menu
Date/Time configuration		

Alarms menu

Reset Alarms

Current Alarms

Alarm Historic

Legend

Basic access
(0 = user password)

User password required

6.1 - General description

Touch Pilot includes the 7 in. touch screen allowing for easy system control. Navigation through the Touch Pilot control is either using the touch screen interface or by connecting to the web interface.

The navigation menus are the same for both connection methods (Touch Pilot user interface and web browser). It is recommended to use a stylus pen for the navigation via the touch screen.

NOTE: Some functions are unavailable when using the web browser interface.

The Touch Pilot interface includes the following screens:
- Welcome screen
- Synoptic screen
- Operating mode selection screen
- Data/configuration screens
- Password entry and language selection screen
- Alarms screen
- Parameter modification screen

6.2 - Welcome screen

The Welcome screen is the first screen shown after starting the user interface. It displays the application name as well as the current software version number.

To exit the Welcome screen and go to the Home screen (see section 6.3), press the Home button.
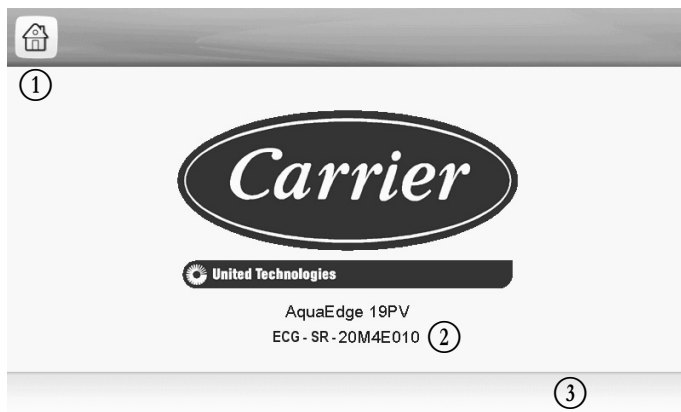
Legend
1. Home button
2. Software version number
3. Information message box

Information message box: The information displayed in the status bar at the bottom of the screen includes relevant messages regarding the current user action.

Message	Status
COMMUNICATION FAILURE!	Equipment controller did not respond while reading the table content.
ACCESS DENIED!	Equipment controller denies access to one of the tables.
LIMIT EXCEEDED!	The value entered exceeds the parameter limit.
Save changes?	Modifications have been made. The exit must be confirmed by pressing "Save" or "Cancel".
HIGHER FORCE IN EFFECT!	Equipment controller rejects Force or Auto command.
Too many users connected ! Please try again later ...	Too many users connected at the same time (WEB INTERFACE ONLY)

6.3 - Synoptic screen

The Synoptic screen allows you to monitor the vapour-refrigeration cycle. The diagram indicates the current status of the unit, giving information on the unit capacity, the status of water heat exchanger pumps, and the pre-defined setpoint parameter.

All unit functions can be accessed by pressing the Main menu button.
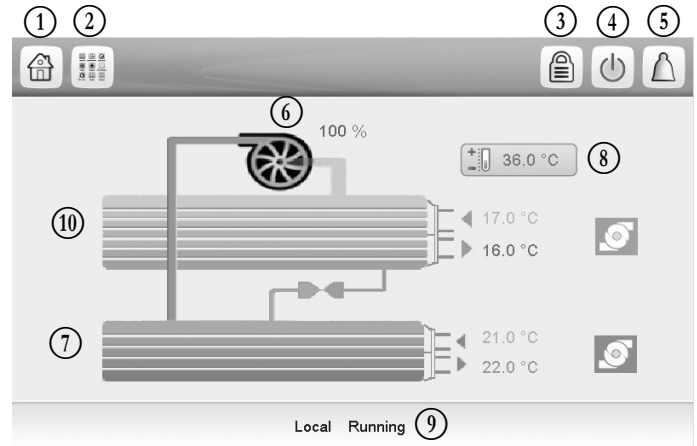
Example: Synoptic view. This picture is for information only.
It may differ from the actual look, depending on pumps and OAT sensor availability.

Legend
1. Home button
2. Main menu button
3. Login button (restricted access to menus)
4. Start/Stop button
5. Alarm button
6. Compressor + unit capacity
7. LWT and EWT (condenser)
8. Setpoint
9. Unit running status
10. LWT and EWT (evaporator)

6.4 - Unit start/stop

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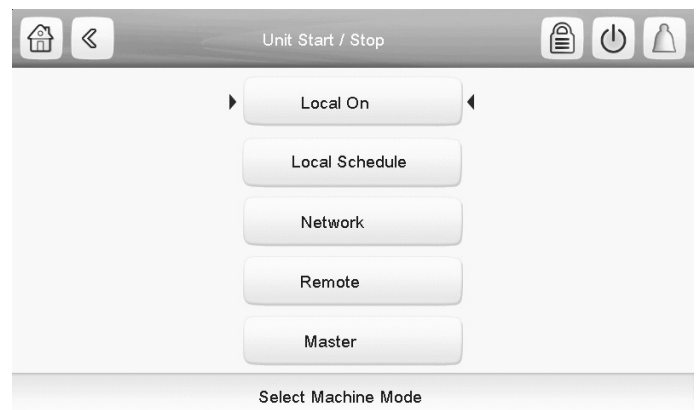
IMPORTANT: When entering the menu, please note that the currently selected item corresponds to the last running operating mode.

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 allowed to start if the period is occupied.

To start the unit
- Press the Start/Stop button.
- Select the required Machine Mode.
- The Welcome screen will be displayed.

To stop the unit
- Press the Start/Stop button.
- Confirm the unit shutdown by pressing Confirm Stop or cancel the unit shutdown by pressing the Back button.

The bell located in the upper-right part of the screen lights when any fault is detected (see section 9.1).

6.5 - Display settings

The User Login screen allows the user to do any of the following:
- Select the language of the controller.
- Change the system of measurement (imperial or metric).
- Gain access to more control options.

To access the User Login screen, press the Login button in the upper-right corner of the Synoptic screen.
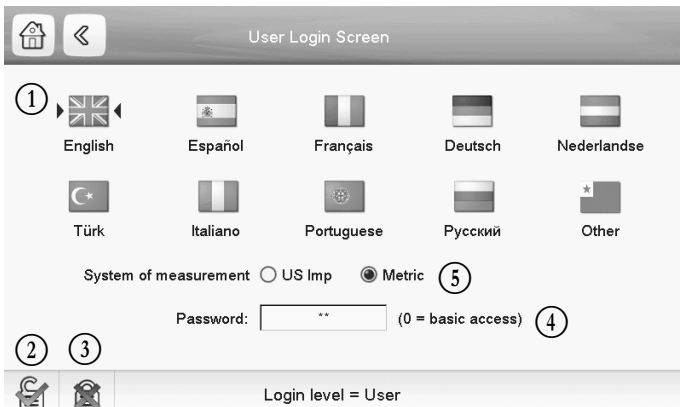
Legend
1. Cursor indicating the selected language
2. Logged-in button
3. Logged-off button
4. Password dialog box
5. System of measurement: Metric/Imperial

6.6 - Display language

Display language can be modified in the User Login Screen on the user interface.

To change a display language
- Press the Login button to open User Login Screen.
- Select the new language of the display.
- Press the Logged-in button to save your changes or the Logged-off button to exit the screen without making modifications.

The control system allows users to add new languages to the control. To learn more about language customization, please contact your local service representative.

6.7 - System of measurement

The control offers the possibility of selecting the system of measurement displayed on the user interface (metric / imperial).

To change a system of measurement
- Press the Login button to open User Login Screen.
- Select the system of measurement (metric or imperial).
- Press the Logged-in button to save your changes or the Logged-off button to exit the screen without making modifications.

6.8 - User login

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

To log in as user
- Press the Login button to open User Login Screen.
- Press the Password box. A dialog box appears.
- Provide the password (11) and press OK.
- The User Login screen appears.
- Press the Logged-in button to save your changes or the Logged-off button to exit the screen without making modifications.

NOTE: You may also leave the User Login screen by pressing the Back button. Your changes will be saved.

Security access settings
- User-level security ensures that only authorised users are allowed to modify critical unit parameters.
- Only logged-in users are allowed to access the Configuration menu.
- 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.
- Only people qualified to manage the unit should be familiarized with the password.

6.9 - Password change

User password can be modified in the User Configuration menu.

To change your password
- Go to the Main Menu.
- Navigate to the Configuration menu (logged-in users only) and select User Configuration (USERCONF).
- Select the User Password box and provide the new password.
- Press OK. The User Configuration screen appears.
- Press the Save button to save your changes or the Cancel button to exit the screen without making modifications.

6.10 - Main menu

The Main menu provides access to the main control parameters, including general parameters, inputs and outputs status, etc.
- To access the menu, press the Main menu button located in the upper-left part of the Synoptic screen.
- Specific unit parameters can be accessed by pressing the icon corresponding to the desired category.
- To go back to the Synoptic screen, press the Home button.
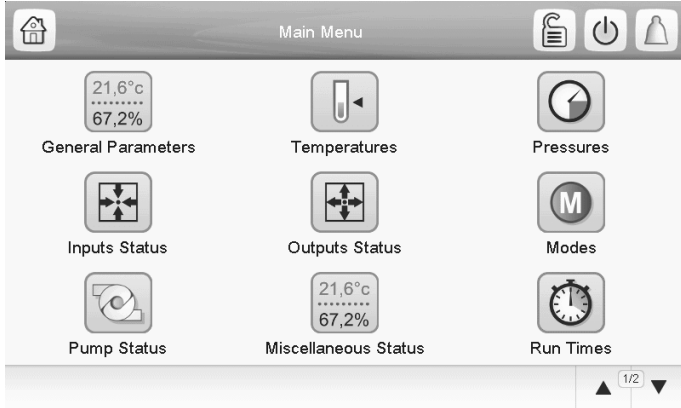
General parameters screen

The General parameters screen provides access to a set of general unit parameters.
- To access the General parameters screen, go to the Main menu and select General Parameters (GENUNIT).
- Press the Up/Down buttons to navigate between the screens.
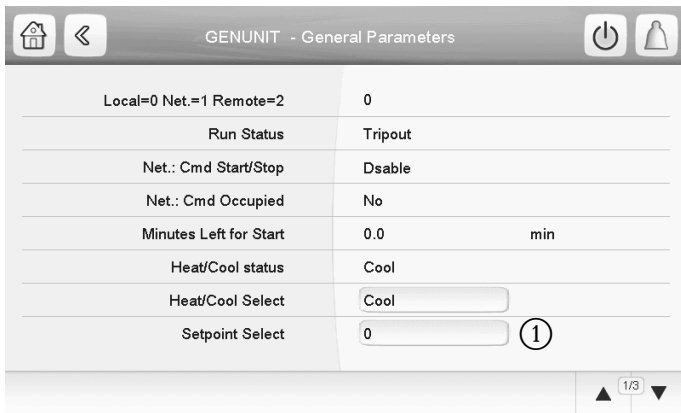
Legend
1. Forceable point (see section 6.12)

6.11 - Configuration menu

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 Synoptic screen, and then find and press Configuration Menu.
- Press the field corresponding to the parameter to be modified and introduce all the necessary changes.
- Press the Up/Down buttons to navigate between the screens.
- Once all the necessary modifications have been made, press the Save button to save your changes or the Cancel button to exit the screen without making modifications.
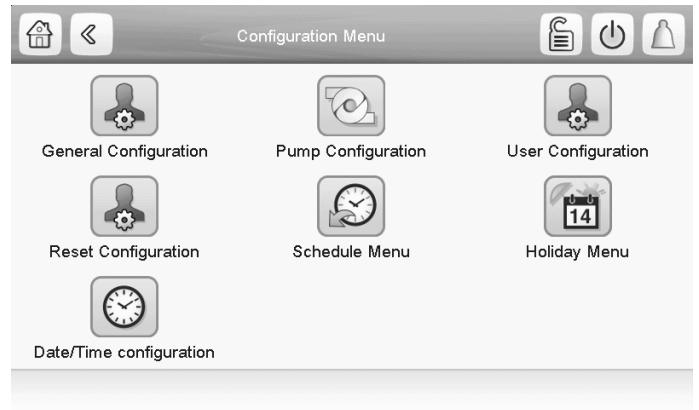
6.12 - System configuration override

In some cases it is possible to override system configuration. The override screen provides the option to issue the command overriding the current operation of the unit.
- To access the override screen, press the forceable point of the data screen. Note that not all parameters can be overridden by the control.
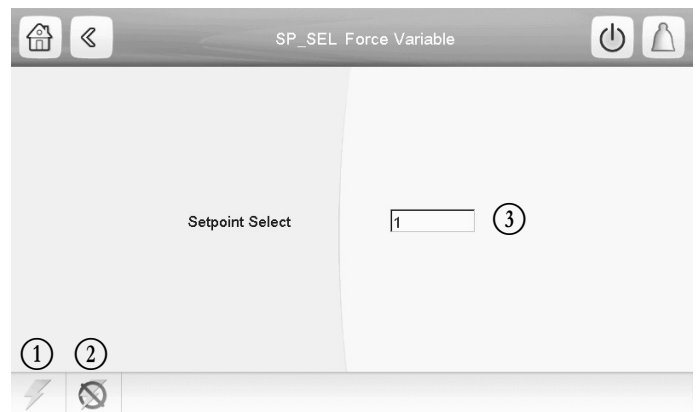
Legend
1. Set force
2. Auto (force removed)
3. Forced value

6.13 - Schedule setting

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/heating setpoint 1 is used during occupied periods and cooling/heating 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 (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. Then 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.
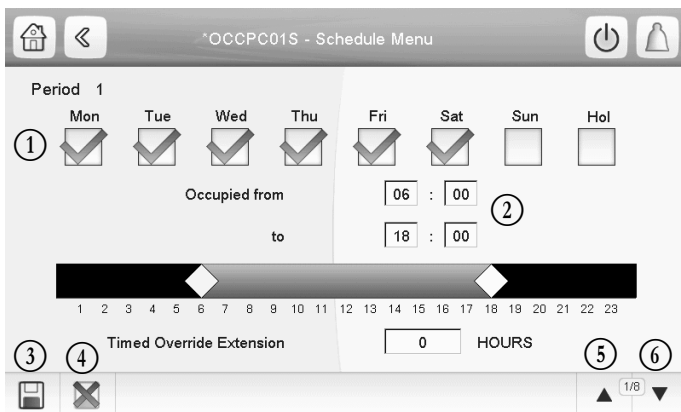
Legend
1. Selection of days for the time schedule
2. Start/end of the schedule
3. Save
4. Cancel
5. Previous time period
6. Next time period

■ *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
00:00	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		

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 section 7.2).

6.14 - Web connection

The Touch Pilot control can be accessed via a web browser (Internet Explorer, Mozilla Firefox, etc.).

Connection is from a PC using a web browser with Java.

CAUTION: Use firewalls and VPN for secure connection.

6.14.1 - Web interface

To access the control, provide the IP address of the unit in the address bar of the web browser.

Legend
1. Technical documentation button
2. Help button

Unit default address: 169.254.0.1. This address can be changed.

IMPORTANT: Only two web connections can be authorised at the same time.

6.14.2 - Web browser settings

Minimum web browser configuration:
- Internet Explorer (version 8 or higher) or Mozilla Firefox (version 26 or higher). In the advanced connection options add the unit IP address to the exceptions list. Do not use a proxy server.
- Java platform (version 6 or higher). In the control panel, clear the Keep temporary files on my computer check box and use a direct connection.

IMPORTANT: Two users can be connected simultaneously with no priority between them.

Note that the last modification is always taken into account.

6.14.3 - Technical documentation

When the Touch Pilot control is used via a pc web browser, the controller allows the user to access the technical documentation for the product.

■ Once you connect to the Touch Pilot control, click the Technical documentation button in order to see a list of documents related to the unit.

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

■ Click the Help button to get access to BACnet user guide.

7 - DETAILED MENU STRUCTURE

7.1 - Main menu (MAINMEN1)

Icon	Displayed text*	Description	Name
21,6°c / 67,2%	General Parameters	General parameters	GENUNIT
	Temperatures	Temperatures	TEMP
	Pressures	Pressures	PRESSURE
	Inputs Status	Inputs status	INPUTS
	Outputs Status	Outputs status	OUTPUTS
	Modes	Modes	MODES
	Pump Status	Pump status	PUMPSTAT
21,6°c / 67,2%	Miscellaneous Status	Miscellaneous parameters status	MSC_STAT
	Run Times	Run times	RUNTIME
	DC Free Cooling Status	Dry Cooler Free Cooling status	DCFC_STA
	Air Condenser Status	Air Condenser status	AIR_COND
	Setpoint Table	Setpoint settings	SETPOINT
	Configuration Menu	Configuration menu	CONFIG1

*Displayed in English by default.

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

7 - DETAILED MENU STRUCTURE

General Parameters Menu – GENUNIT

No.	Name	Status	Default	Unit	Displayed text *	Description
1	CTRL_TYP	0 to 2	0	-	Local=0 Net.=1 Remote=2	Operating mode: 0 = Local; 1 = Network; 2 = Remote
2	STATUS	-	-	-	Run Status	Off, Running, Stopping, Delay, Trip out, Ready, Override, etc.
3	CHIL_S_S	disable/enable	disable	-	Net.: Cmd Start/Stop	Unit start/stop via Network: When the unit is in Network mode, start/stop command can be forced
4	CHIL_OCC	no/yes	no	-	Net.: Cmd Occupied	Unit time schedule via Network: When the unit is in Network mode, the forced value can be used instead of the real occupancy state
5	min_left	-	-	min	Minutes Left for Start	Minutes before the unit start-up
6	HEATCOOL	-	-	-	Heat/Cool status	Heating/cooling status: Heat/Cool
7	HC_SEL	cool/heat	-	-	Heat/Cool Select	Heating/cooling selection
8	SP_SEL	0 to 2	0	-	Setpoint Select	Setpoint selection
9					0=Auto. 1=Spt1. 2=Spt2	0 = Auto (schedule control) 1 = Setpoint 1 2 = Setpoint 2
10	SP_OCC	no/yes	yes	-	Setpoint Occupied?	Setpoint occupancy status
11	CAP_T	0 to 100	0	%	Percent Total Capacity	Total unit capacity
12	CAPA_T	0 to 100	0	%	Circuit A Total Capacity	Total capacity, circuit A
13	CAPB_T	0 to 100	0	%	Circuit B Total Capacity	Total capacity, circuit B
14	SP	-	-	°C / °F	Current Setpoint	Current setpoint
15	CTRL_PNT	-	-	°C / °F	Control Point	Control point: Water temperature that the unit must produce
16	TOT_CURR	-	-	A	Actual Chiller Current	Actual chiller current
17	CURR_LIM	0 to 2000	0	A	Chiller Current Limit	Chiller current limit
18	EMSTOP	disable/enable	disable	-	Emergency Stop	Emergency stop: Used to stop the unit regardless of its active operating type
19	DEM_LIM	0 to 100	0	%	Active Demand Limit Val	Active demand limit value: When the unit is in Network mode, the minimum value will be used compared to the status of the external limit switch contact and the demand limit switch setpoint

*Displayed in English by default.

Temperatures Menu – TEMP

No.	Name	Status	Default	Unit	Displayed text *	Description
1	COOL_EWT	-	-	°C / °F	Cooler Entering Fluid	Evaporator entering water temperature: Used for capacity control
2	COOL_LWT	-	-	°C / °F	Cooler Leaving Fluid	Evaporator leaving water temperature: Used for capacity control
3	COND_EWT	-	-	°C / °F	Condenser Entering Fluid	Condenser entering water temperature: Used for capacity control
4	COND_LWT	-	-	°C / °F	Condenser Leaving Fluid	Condenser leaving water temperature: Used for capacity control
5	SPACETMP	-	-	°C / °F	Optional Space Temp	Optional space temperature
6	CHWSTEMP	-	-	°C / °F	CHWS Temperature	Master/slave temperature
7	CHWSHEAT	-	-	°C / °F	CHWS Heat Temp	Master/slave heating temperature
8	DGT_A	-	-	°C / °F	Discharge Gas Temp cir A	Discharge gas temperature, circuit A
9	SCT_A	-	-	°C / °F	Saturated Cond Tmp cir A	Saturated condensing temperature, circuit A
10	LIQT_A	-	-	°C / °F	SubCooling Temp cir A	Subcooling temperature, circuit A
11	SLT_A	-	-	°C / °F	Saturated Liquid temp A	Saturated liquid temperature, circuit A
12	SST_A	-	-	°C / °F	Saturated Suction Temp A	Saturated suction temperature, circuit A
13	SUCT_A	-	-	°C / °F	Compressor Suction Tmp A	Compressor suction temperature, circuit A
14	DGT_B	-	-	°C / °F	Discharge Gas Temp cir B	Discharge gas temperature, circuit B
15	SCT_B	-	-	°C / °F	Saturated Cond Tmp cir B	Saturated condensing temperature, circuit B
16	LIQT_B	-	-	°C / °F	SubCooling Temp cir B	Subcooling temperature, circuit B
17	SLT_B	-	-	°C / °F	Saturated Liquid temp B	Saturated liquid temperature, circuit B
18	SST_B	-	-	°C / °F	Saturated Suction Temp B	Saturated suction temperature, circuit B
19	SUCT_B	-	-	°C / °F	Compressor Suction Tmp B	Compressor suction temperature, circuit B

*Displayed in English by default.

7 - DETAILED MENU STRUCTURE

Pressures Menu – PRESSURE

No.	Name	Status	Default	Unit	Displayed text *	Description
1	DP_A	-	-	kPa / PSI	Discharge Pressure A	Discharge gas pressure, circuit A
2	LIQP_A	-	-	kPa / PSI	SubCooling Pressure A	Subcooling pressure, circuit A
3	SP_A	-	-	kPa / PSI	Main Suction Pressure A	Main suction pressure, circuit A
4	DP_B	-	-	kPa / PSI	Discharge Pressure B	Discharge gas pressure, circuit B
5	LIQP_B	-	-	kPa / PSI	SubCooling Pressure B	Subcooling pressure, circuit B
6	SP_B	-	-	kPa / PSI	Main Suction Pressure B	Main suction pressure, circuit B

*Displayed in English by default.

Inputs Status Menu – INPUTS

No.	Name	Status	Default	Unit	Displayed text *	Description
1	ONOFF_SW	open/close	open	-	Remote On/Off Switch	Remote On/Off Switch
2	HC_SW	open/close	open	-	Remote HeatCool Switch	Heating/cooling selection switch
3	SETP_SW	open/close	open	-	Remote Setpoint Switch	Setpoint selection switch
4	LIM_SW1	open/close	open	-	Limit Switch 1	Capacity limitation switch 1
5	SP_RESET	-	-	mA	Reset/Setpnt4-20mA Sgnl	4-20 mA signal, setpoint reset
6	LIM_ANAL	-	-	mA	Limit 4-20mA Signal	4-20 mA signal, capacity limitation
7	leak_v	-	-	V	Leakage detector 1 val	Leak detection input 1
8	leak_2_v	-	-	V	Leakage detector 2 val	Leak detection input 2
9	REM_LOCK	open/close	open	-	Customer Interlock	Customer interlock status
10	ICE_SW	open/close	open	-	Ice Done Storage Switch	Ice storage end switch
11	OCC_OVSW	open/close	open	-	Occupied Override Switch	Occupied override switch
12	CB_Tmst	open/close	open	-	Control Box Thermostat	Control box thermostat (if "open", the unit will be stopped in order to limit heat in the control box)
13	bacdongl	no/yes	no	-	BACnet Dongle	BACnet dongle
14	HP_SW_A	open/close	open	-	High Pressure Switch A	High pressure switch, circuit A
15	HP_SW_B	open/close	open	-	High Pressure Switch B	High pressure switch, circuit B
16	OFA_Fb	open/close	open	-	Contactor State Cir A	Circuit Contactor state, circuit A
17	OFB_Fb	open/close	open	-	Contactor State Cir B	Circuit Contactor state, circuit B

*Displayed in English by default.

Outputs Status Menu – OUTPUTS

No.	Name	Status	Default	Unit	Displayed text *	Description
1	CP_A1_PW	0 to 100	0	%	Compressor A1 Load	Compressor A1 load, circuit A
2	CP_A2_PW	0 to 100	0	%	Compressor A2 Load	Compressor A2 load, circuit A
3	EXVPosA	0 to 100	0	%	EXV Position Circuit A	EXV position, circuit A
4	CP_B1_PW	0 to 100	0	%	Compressor B1 Load	Compressor B1 load, circuit B
5	CP_B2_PW	0 to 100	0	%	Compressor B2 Load	Compressor B2 load, circuit B
6	EXVPosB	0 to 100	0	%	EXV Position Circuit B	EXV position, circuit B
7	CAPT_010	0 to 10	0	V	Chiller Capacity signal	Chiller capacity signal
8	ALARM	off/on	off	-	Alarm Relay Status	Alarm relay status
9	RUNNING	off/on	off	-	Running Relay Status	Running relay status
10	ALERT	off/on	off	-	Alert Relay State	Alert relay status
11	SHUTDOWN	off/on	off	-	Shutdown Indicator State	Shutdown indicator status
12	pos_3wv	0 to 100	0	%	Cond 3 Way Valve Pos	Condenser 3-way valve position
13	OFA_Cmd	open/close	open	-	Contactor Control Cir A	Contactor Command, circuit A
14	OFB_Cmd	open/close	open	-	Contactor Control Cir B	Contactor Command, circuit B
15	dcfc_vfn	0 to 100	0	%	Dcfc varifan speed	Dry Cooler Free Cooling, variable speed
16	dcfc_2wv	open/close	close	-	Dcfc 2 ways valve	Dry Cooler Free Cooling, 2-way valve
17	dcfc_3wv	0 to 100	0	%	Dcfc 3 ways valve	Dry Cooler Free Cooling, 3-way valve
18	dcfc_f1	off/on	off	-	Dcfc fan stage 1	Dry Cooler Free Cooling, fan stage 1
19	dcfc_f2	off/on	off	-	Dcfc fan stage 2	Dry Cooler Free Cooling, fan stage 2
20	dcfc_f3	off/on	off	-	Dcfc fan stage 3	Dry Cooler Free Cooling, fan stage 3
21	dcfc_f4	off/on	off	-	Dcfc fan stage 4	Dry Cooler Free Cooling, fan stage 4
22	dcfc_f5	off/on	off	-	Dcfc fan stage 5	Dry Cooler Free Cooling, fan stage 5
23	dcfc_f6	off/on	off	-	Dcfc fan stage 6	Dry Cooler Free Cooling, fan stage 6
24	dcfc_f7	off/on	off	-	Dcfc fan stage 7	Dry Cooler Free Cooling, fan stage 7

*Displayed in English by default.

7 - DETAILED MENU STRUCTURE

M **Modes Menu – MODES**

No.	Name	Status	Default	Unit	Displayed text *	Description
1	m_delay	no/yes	no	-	Start Up Delay In Effect	Start-up delay in effect
2	m_2stpt	no/yes	no	-	Second Setpoint In Use	Second setpoint in use
3	m_reset	no/yes	no	-	Reset In Effect	Setpoint reset active
4	m_demlim	no/yes	no	-	Demand limit active	Demand limit active
5	m_MaxCon	no/yes	no	-	Maximum Condens. Limit	Maximum condensing limitation active
6	m_MinCoo	no/yes	no	-	Minimum Cooling Limit	Maximum cooling limitation active
7	m_ramp_l	no/yes	no	-	Ramp Limit reached	Capacity is limited by ramp logic
8	m_pmpper	no/yes	no	-	Pump Periodic Start	Periodic cooler pump start-up
9	m_night	no/yes	no	-	Night Low Noise Active	Night mode active
10	m_slave	no/yes	no	-	Master Slave Active	Master/slave active
11	m_cpmppr	no/yes	no	-	Cond Pump Periodic Start	Periodic condenser pump start-up
12	m_ice	no/yes	no	-	Ice Mode In Effect	Ice storage mode active

*Displayed in English by default.

Pump Status Menu – PUMPSTAT

No.	Name	Status	Default	Unit	Displayed text *	Description
1	SET_FLOW	no/yes	no	-	Cooler Flow Setpoint Out	Evaporator flow setpoint output
2	CPUMP_1	off/on	off	-	Cooler Pump #1 Command	Evaporator pump control command
3	FLOW_SW	open/close	open	-	Cooler Flow Switch	Cooler flow switch
4	HPUMP_1	off/on	off	-	Condenser Pump Command1	Condenser pump control command
5	CONDFLOW	open/close	open	-	Condenser Flow Status	Condenser flow switch

*Displayed in English by default.

`21,6°c` `67,2%` **Miscellaneous Status Menu – MSC_STAT**

No.	Name	Status	Default	Unit	Displayed text *	Description
1	m_ecopmp	no/yes	no	-	Eco Pump Mode Active	Eco pump mode active (see section 8.8.3)

*Displayed in English by default.

Run Times Menu – RUNTIME

No.	Name	Status	Default	Unit	Displayed text *	Description
1	HR_MACH	-	-	hour	Machine Operating Hours	Unit operating hours
2	st_mach	-	-	-	Machine Starts Number	Number of unit starts
3	hr_cpa1	-	-	hour	Compressor A1 Hours	Operating hours, compressor A1
4	st_cpa1	-	-	-	Compressor A1 Starts	Number of starts, compressor A1
5	hr_cpa2	-	-	hour	Compressor A2 Hours	Operating hours, compressor A2
6	st_cpa2	-	-	-	Compressor A2 Starts	Number of starts, compressor A2
7	hr_cpb1	-	-	hour	Compressor B1 Hours	Operating hours, compressor B1
8	st_cpb1	-	-	-	Compressor B1 Starts	Number of starts, compressor B1
9	hr_cpb2	-	-	hour	Compressor B2 Hours	Operating hours, compressor B2
10	st_cpb2	-	-	-	Compressor B2 Starts	Number of starts, compressor B2
11	hr_cpum1	-	-	hour	Cooler Pump #1 Hours	Operating hours, evaporator pump
12	hr_hpum1	-	-	hour	Condenser Pump #1 Hours	Operating hours, condenser pump

*Displayed in English by default.

DC Free Cooling Status Menu – DCFC_STA

No.	Name	Status	Default	Unit	Displayed text *	Description
1	oat	-	-	°C / °F	OAT Free Cooling	Free Cooling / Dry cooler: OAT
2	lwt	-	-	°C / °F	FC Leaving Water Temp	Free Cooling / Dry Cooler: Leaving water temperature
3	wloop	-	-	°C / °F	FC Water Loop Temp	Free Cooling / Dry Cooler: Water loop temperature
4	m_dcfc	no / yes	no	-	Free Cooling Mode Active	Free Cooling mode active
5	dcfc_cap	0 to 100	0	%	FC Capacity	Free Cooling / Dry Cooler capacity
6	dcfc_al	normal / alarm	normal	-	DCFC process is in alarm	Dry Cooler Free Cooling process failure
7	f_stage	0 to 10	0	-	Fans Stage	Free Cooling / Dry Cooler fan stage (fix-speed fans)
8	vf_speed	0 to 100	0	%	Varifan Speed	Free Cooling / Dry Cooler: Fan speed (variable-speed fans)
9	pid_out	0 to 100	0	%	PID Output	Status of PID output
10	FC_HOUR	0 to 999999	0	hour	DCFC Operating Hours	Free Cooling / Dry cooler: Operating hours
11	FC_FAN1S	0 to 999999	0	-	DCFC Fan Stage 1 Start	DCFC / Fan stage 1: Number of starts
12	FC_FAN1H	0 to 999999	0	hour	DCFC Fan Stage 1 Hours	DCFC / Fan stage 1: Operating hours
13	FC_FAN2S	0 to 999999	0	-	DCFC Fan Stage 2 Start	DCFC / Fan stage 2: Number of starts
14	FC_FAN2H	0 to 999999	0	hour	DCFC Fan Stage 2 Hours	DCFC / Fan stage 2: Operating hours
15	FC_FAN3S	0 to 999999	0	-	DCFC Fan Stage 3 Start	DCFC / Fan stage 3: Number of starts
16	FC_FAN3H	0 to 999999	0	hour	DCFC Fan Stage 3 Hours	DCFC / Fan stage 3: Operating hours
17	FC_FAN4S	0 to 999999	0	-	DCFC Fan Stage 4 Start	DCFC / Fan stage 4: Number of starts
18	FC_FAN4H	0 to 999999	0	hour	DCFC Fan Stage 4 Hours	DCFC / Fan stage 4: Operating hours
19	FC_FAN5S	0 to 999999	0	-	DCFC Fan Stage 5 Start	DCFC / Fan stage 5: Number of starts
20	FC_FAN5H	0 to 999999	0	hour	DCFC Fan Stage 5 Hours	DCFC / Fan stage 5: Operating hours
21	FC_FAN6S	0 to 999999	0	-	DCFC Fan Stage 6 Start	DCFC / Fan stage 6: Number of starts
22	FC_FAN6H	0 to 999999	0	hour	DCFC Fan Stage 6 Hours	DCFC / Fan stage 6: Operating hours
23	FC_FAN7S	0 to 999999	0	-	DCFC Fan Stage 7 Start	DCFC / Fan stage 7: Number of starts
24	FC_FAN7H	0 to 999999	0	hour	DCFC Fan Stage 7 Hours	DCFC / Fan stage 7: Operating hours
25	FC_VFANS	0 to 999999	0	-	DCFC Variable Fan Start	DCFC / Variable-speed fan: Number of starts
26	FC_VFANH	0 to 999999	0	hour	DCFC Variable Fan Hours	DCFC / Variable-speed fan: Operating hours

*Displayed in English by default.

Air Condenser Status Menu – AIR_COND

No.	Name	Status	Default	Unit	Displayed text *	Description
1	oat	-	-	°C / °F	Outdoor Air Temperature	Outdoor air temperature
2					Dry Cooler Status	Status of the Dry Cooler connected on the condenser side
3	DC_LWT	-	-	°C / °F	Leaving Water Temp	Leaving water temperature
4	DC_FanSt	-	-	-	Runing Fan Stages	Running fan stages
5	DC_FanSp	-	-	%	Variable Speed	Variable Speed
6					Air Condensing	Status of the air condenser connected to the refrigerant circuits
7	FanSt_A	-	-	-	Circuit A Fan Stages	Circuit A Fan Stages
8	FanSp_A	-	-	%	Variable Speed Fan A	Variable-speed Fan, circuit A
9	FanSt_B	-	-	-	Circuit B Fan Stages	Circuit B Fan Stages
10	FanSp_B	-	-	%	Variable Speed Fan B	Variable-speed Fan, circuit B
11					Runtime	Runtime
12	COND_F1S	-	-	-	Condensing Fan 1 Start	Condensing fan 1: Number of starts
13	COND_F1H	-	-	hour	Condensing Fan 1 Hours	Condensing fan 1: Operating hours
14	COND_F2S	-	-	-	Condensing Fan 2 Start	Condensing fan 2: Number of starts
15	COND_F2H	-	-	hour	Condensing Fan 2 Hours	Condensing fan 2: Operating hours
16	COND_F3S	-	-	-	Condensing Fan 3 Start	Condensing fan 3: Number of starts
17	COND_F3H	-	-	hour	Condensing Fan 3 Hours	Condensing fan 3: Operating hours
18	COND_F4S	-	-	-	Condensing Fan 4 Start	Condensing fan 4: Number of starts
19	COND_F4H	-	-	hour	Condensing Fan 4 Hours	Condensing fan 4: Operating hours
20	COND_F5S	-	-	-	Condensing Fan 5 Start	Condensing fan 5: Number of starts
21	COND_F5H	-	-	hour	Condensing Fan 5 Hours	Condensing fan 5: Operating hours
22	COND_F6S	-	-	-	Condensing Fan 6 Start	Condensing fan 6: Number of starts
23	COND_F6H	-	-	hour	Condensing Fan 6 Hours	Condensing fan 6: Operating hours
24	COND_F7S	-	-	-	Condensing Fan 7 Start	Condensing fan 7: Number of starts
25	COND_F7H	-	-	hour	Condensing Fan 7 Hours	Condensing fan 7: Operating hours
26	COND_F8S	-	-	-	Condensing Fan 8 Start	Condensing fan 8: Number of starts
27	COND_F8H	-	-	hour	Condensing Fan 8 Hours	Condensing fan 8: Operating hours
28	CirA_VFS	-	-	-	Cond VariFan CirA Start	Condensing variable-speed fan (circuit A): Number of starts
29	CirA_VFH	-	-	hour	Cond VariFan CirA Hour	Condensing variable-speed fan (circuit A): Operating hours
30	CirB_VFS	-	-	-	Cond VariFan CirB Start	Condensing variable-speed fan (circuit B): Number of starts
31	CirB_VFH	-	-	hour	Cond VariFan CirB Hour	Condensing variable-speed fan (circuit B): Operating hours

*Displayed in English by default.

7 - DETAILED MENU STRUCTURE

Setpoint Table Menu – SETPOINT

No.	Name	Status	Default	Unit	Displayed text *	Description
1	csp1	-28.9 to 26.0 -20 to 78.8	6.7 44	°C °F	Cooling Setpoint 1	Cooling setpoint 1 (used during occupied periods)
2	csp2	-28.9 to 26.0 -20 to 78.8	6.7 44	°C °F	Cooling Setpoint 2	Cooling setpoint 2 (used during unoccupied periods)
3	ice_sp	-28.9 to 26.0 -20 to 78.8	6.7 44	°C °F	Cooling Ice Setpoint	Cooling ice setpoint
4	cramp_sp	0.11 to 11.11 0.2 to 20	0.6 1	^C ^F	Cooling Ramp Loading	Cooling ramp loading setpoint (rate at which the water temperature may change within one minute)
5	hsp1	26.7 to 63.0 80 to 145.4	37.8 100	°C °F	Heating Setpoint 1	Heating setpoint 1 (used during occupied periods)
6	hsp2	26.7 to 63.0 80 to 145.4	37.8 100	°C °F	Heating Setpoint 2	Heating setpoint 2 (used during unoccupied periods)
7	hramp_sp	0.11 to 11.11 0.2 to 20	0.6 1	^C ^F	Heating Ramp Loading	Heating ramp loading setpoint (rate at which the water temperature may change within one minute)
8	w_sct_sp	26.67 to 48.89 80 to 120	35 95	°C °F	Water Val Condensing Stp	Condensing setpoint
9	lim_sp1	0 to 100	100	%	Switch Limit Setpoint 1	Demand limit setpoint 1
10	lim_sp2	0 to 100	100	%	Switch Limit Setpoint 2	Demand limit setpoint 2
11	lim_sp3	0 to 100	100	%	Switch Limit Setpoint 3	Demand limit setpoint 3

*Displayed in English by default.

7 - DETAILED MENU STRUCTURE

7.2 - Configuration menu (CONFIG1)

Icon	Displayed text*	Description	Name
	General Configuration	General configuration parameters	GEN_CONF
	Pump Configuration	Pump configuration	PUMPCONF
	User Configuration	User configuration	USERCONF
	Reset Configuration	Reset configuration	RESETCFG
	Schedule Menu	Schedule settings	SCHEDULE
	Holiday Menu	Holiday settings	HOLIDAY
	Date/Time configuration	Date/Time settings	DATETIME

*Displayed in English by default.

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

General Configuration Menu – GEN_CONF

No.	Name	Status	Default	Unit	Displayed text *	Description
1	prio_cir	0 to 2	0	-	Cir Priority Sequence	Circuit priority
2					0=Auto, 1=A Prio	0 = Automatic circuit selection 1 = Circuit A priority
3					2=B Prio	2 = Circuit B priority
4	ramp_sel	no/yes	no	-	Ramp Loading Select	Ramp loading selection
5	off_on_d	1 to 15	1	min	Unit Off to On Delay	Unit Off to On delay
6	lim_sel	0 to 2	0	-	Demand Limit Type Select	Demand limit type
7					0 = None	0 = None
8					1 = Switch Control	1 = Switch control
9					2 = 4-20mA Control	2 = 4-20mA control
10	nh_start	00:00	00:00	-	Night Mode Start Hour	Night mode start hour
11	nh_end	00:00	00:00	-	Night Mode End Hour	Night mode end hour
12	nh_limit	0 to 100	100	%	Night Capacity Limit	Night capacity limit
13	curr_sel	no/yes	no	-	Current Limit select	Current limitation select
14	ice_cnfg	no/yes	no	-	Ice Mode Enable	Ice mode
15	curr_max	0 to 4000	2000	A	Maximum Current Limit	Maximum current limitation
16	shortcyc	no/yes	no	-	short cycle management	Short cycle management
17	al_rever	no/yes	no	-	Reverse Alarms Relay	Reverse alarm/alert signals
18	capre_en	no/yes	no	-	Enable capacity recovery	Capacity recovery in case of power outage
19	capre_t	0 to 10	0	min	Capa rec max off time	Maximum time with power off for capacity recovery

*Displayed in English by default.

22

7 - DETAILED MENU STRUCTURE

Pump Configuration Menu – PUMPCONF

No.	Name	Status	Default	Unit	Displayed text *	Description
1	hpumpseq	0 to 1	0	-	Condenser Pumps Sequence	Condenser pumps sequence
2	cpumpseq	0 to 1	0	-	Cooler Pumps Sequence	Cooler pumps sequence
3					0 = No Pump	0 = no pump
4					1 = One Pump Only	1 = one pump only
5	pump_per	no/yes	no	-	Pump Sticking Protection	Pump anti-sticking protection
6	pump_sby	no/yes	no	-	Stop Pump During Standby	Pump stopped during standby
7	pump_loc	no/yes	yes	-	Flow Checked If Pump Off	Water flow is checked when the pump is off
8	stopheat	no/yes	no	-	Cooler Pump Off In Heat	Cooler pump is off when the unit is in Heating
9	stopcool	no/yes	no	-	Cond Pump Off In Cool	Condenser pump is off when the unit is in Cooling

*Displayed in English by default.

Reset Configuration Menu – RESETCFG

No.	Name	Status	Default	Unit	Displayed text *	Description
1	cr_sel	0 to 4	0	-	Cooling Reset Select	Reset source in Cooling
2	hr_sel	0 to 4	0	-	Heating Reset Select	Reset source in Heating
3					0=None, 1=OAT	0 = None 1 = OAT
4					2=Delta T, 4=Space Temp	2 = Delta T 4 = Space temperature
5					3=4-20mA control	3 = 4-20 mA signal
6						
7					Cooling	Cooling
8	oat_crno	-10 to 51.7 14 to 125	-10 14	°C °F	OAT No Reset Value	OAT, no reset value (applies to units with a Dry Cooler at the condenser)
9	oat_crfu	-10 to 51.7 14 to 125	-10 14	°C °F	OAT Full Reset Value	OAT, max. reset value (applies to units with a Dry Cooler at the condenser)
10	dt_cr_no	0 to 13.9 0 to 25	0 0	^C ^F	Delta T No Reset Value	Delta T, no reset value
11	dt_cr_fu	0 to 13.9 0 to 25	0 0	^C ^F	Delta T Full Reset Value	Delta T, max. reset value
12	v_cr_no	0 to 20	0	mA	Current No Reset Value	Current, no reset value
13	v_cr_fu	0 to 20	0	mA	Current Full Reset Value	Current, max. reset value
14	spacr_no	-10 to 51.7 14 to 125	-10 14	°C °F	Space T No Reset Value	Space temperature, no reset value
15	spacr_fu	-10 to 51.7 14 to 125	-10 14	°C °F	Space T Full Reset Value	Space temperature, max. reset value
16	cr_deg	-16.7 to 16.7 -30 to 30	0 0	^C ^F	Cooling Reset Deg. Value	Cooling reset value
17						
18					Heating	Heating
19	oat_hrno	-10 to 51.7 14 to 125	-10 14	°C °F	OAT No Reset Value	OAT, no reset value (applies to units with a DryCooler at the condenser)
20	oat_hrfu	-10 to 51.7 14 to 125	-10 14	°C °F	OAT Full Reset Value	OAT, max. reset value (applies to units with a DryCooler at the condenser)
21	dt_hr_no	0 to 13.9 0 to 25	0 0	^C ^F	Delta T No Reset Value	Delta T, no reset value
22	dt_hr_fu	0 to 13.9 0 to 25	0 0	^C ^F	Delta T Full Reset Value	Delta T, max. reset value
23	v_hr_no	0 to 20	0	mA	Current No Reset Value	Current, no reset value
24	v_hr_fu	0 to 20	0	mA	Current Full Reset Value	Current, max. reset value
25	spahr_no	-10 to 51.7 14 to 125	-10 14	°C °F	Space T No Reset Value	Space temperature, no reset value
26	spahr_fu	-10 to 51.7 14 to 125	-10 14	°C °F	Space T Full Reset Value	Space temperature, max. reset value
27	hr_deg	-16.7 to 16.7 -30 to 30	0 0	^C ^F	Heating Reset Deg. Value	Heating reset value

*Displayed in English by default.

7 - DETAILED MENU STRUCTURE

User Configuration Menu – USERCONF

No.	Name	Status	Default	Unit	Displayed text *	Description
1	use_pass	0 to 9999	11	-	User Password	User password: The user password can be modified by changing the value in this line

*Displayed in English by default.

Schedule Menu – SCHEDULE

No.	Name	Status	Default	Unit	Displayed text *	Description
1	OCCPC01S	-	-	-	OCCPC01S - Schedule Menu	Unit on/off time schedule
2	OCCPC02S	-	-	-	OCCPC02S - Schedule Menu	Unit setpoint selection time schedule

*Displayed in English by default.

Holiday Menu – HOLIDAY

No.	Name	Status	Default	Unit	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)

*Displayed in English by default.

Date/Time Configuration Menu – DATETIME

No.	Name	Status	Default	Unit	Displayed text *	Description
Date (DD/MM/YYYY)						
1	d_of_m	1 to 31	-	-	Day of month	Day of the month
2	month	1 to 12	-	-	Month of year	Month
3	year	20nn	-	-	Year	Year
4	dow	Monday-Sunday	-	-	Day of Week	Day of the week
Time (HH:MM)						
5	hour	0 to 24	-	h	Hour	Hour
6	minute	0 to 59		min	Minute	Minutes
Daylight Saving Time						
7	dlig_on	no/yes	-	-	Daylight sav. time on	Daylight saving time active
8	dlig_off	no/yes	-	-	Daylight sav. time off	Daylight saving time inactive
9	tom_hol	no/yes	-	-	Tomorrow is a holiday	The following day is a holiday
10	tod_hol	no/yes	-	-	Today is a holiday	The present day is a holiday

*Displayed in English by default.

7.3 - Alarms menu

Icon	Displayed text*	Description	Name
	Reset Alarms	Reset Alarm(s)	ALARMRST
	Current Alarms	Current Alarm(s)	CUR_ALRM
	Alarm Historic	Alarms History	ALMHIST1

*Displayed in English by default.

8.1 - Start/stop control

The unit state is determined based on a number of factors, including its operating type, active overrides, open contacts, master/slave configuration, or alarms.

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

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

LOFF	Local off
L-C	Local on
L-SC	Local schedule
Rem	Remote
Net	Network
Mast	Master unit

■ **Start/stop force command [CHIL_S_S]:** Start/stop force command can be used to control the chiller state in the Network mode.
- Command set to stop: The unit is halted.
- Command set to start: The unit runs according to schedule 1.

■ **Remote start/stop contact status [Onoff_sw]:** Start/stop contact status can be used to control the chiller state in the Remote operating type.

■ **Master control type [ms_ctrl]:** When the unit is the master unit in a two-chiller master/slave arrangement, the master unit may be set to be controlled locally, remotely or via network.

■ **Start/stop schedule [chil_occ]:** Occupied or unoccupied status of the unit.

■ **Network emergency stop command [EMSTOP]:** If activated, the unit shuts down regardless of the active operating type.

■ **General alarm:** The unit shuts down due to failure.

8.2 - Cooling / Heating

The table below summarises the unit operation based on the following parameters:

■ Unit On/Off status: This parameter indicates whether the unit is shut down (not authorised to start) or in operation (authorised to start).

■ Control type: Indicates whether the unit operates in Local, Remote or Network mode.

■ Heating/Cooling selection in Local mode: The operating mode is selected via the user interface (GENUNIT menu).

■ Heat/Cool switch status in Remote mode: This contact is active only when the unit is under remote control.

■ Heat/Cool selection in Network mode: The network command [HC_SEL] permits heating/cooling control if the unit is in Network operating mode.

Status	Control type	Heat/Cool in Local	Heat/Cool in Remote	Heat/Cool in Network	Current unit operating mode
Off	-	-	-	-	-
On	local	cool	-	-	cooling
On	local	heat	-	-	heating
On	remote	-	on_cool	-	cooling
On	remote	-	on_heat	-	heating
On	network	-	-	cool	cooling
On	network	-	-	heat	heating

8.3 - Control interlock contact

This contact checks the status of a loop (customer safety loop). It prevents the unit from starting if it is open when the delay at start-up has expired. This open contact leads to an alarm shut-down, if the unit is running (alarm 10014).

Active operating type						Parameters' status						Control type	Unit state
LOFF	L-C	L-Sc	Rem	Net	Mast	Start/ Stop force command	Remote start/ stop contact	Master control type	Start/Stop schedule	Network Emergency Shutdown	Alarm shutdown		
										enable			off
											yes		off
active												local	off
		active							unoccupied			local	off
			active				open					remote	off
			active						unoccupied			remote	off
				active		disable						network	off
				active					unoccupied			network	off
					active			local	unoccupied			local	off
					active		open	remote				remote	off
					active			remote	unoccupied			remote	off
					active	disable		network				network	off
					active			network	unoccupied			network	off
	active									disable	no	local	on
		active							occupied	disable	no	local	on
			active				closed		occupied	disable	no	remote	on
				active		enable			occupied	disable	no	network	on
					active			local	occupied	disable	no	local	on
					active		closed	remote	occupied	disable	no	remote	on
					active	enable		network	occupied	disable	no	network	on

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.

8.4 - Control point

The control point represents the water temperature that the unit must produce. The control point calculation is based on the active setpoint and its reset.

control point = active setpoint + reset

The heat exchanger entering water temperature is controlled by default, but the heat exchanger leaving water temperature can also be controlled (service configuration is required).

8.4.1 - Active setpoint

Three setpoints can be selected as active in Cooling mode and two setpoints in Heating mode.

	Setpoint 1	Setpoint 2	Setpoint 3
Cooling	Occupied period	Unoccupied period	Ice storage cooling setpoint
Heating	Occupied period	Unoccupied period	-

The first cooling/heating setpoint is normally used during occupied periods, whereas the second cooling/heating setpoint is used during unoccupied periods. The third cooling setpoint is used for ice storage.

Depending on the current operating type, the active setpoint can be selected:
- By choosing the active setpoint in the General Parameters menu (Setpoint Select, GENUNIT).
- Via the volt-free contacts (see section 4.7).
- Via network commands [SP_SEL].
- Via the schedule setting – schedule 2 (OCCPC02S).

Mode	Setpoint control
Local	Regardless of the current setpoint schedule, the user can select the setpoint manually via the control interface (Setpoint Select, GENUNIT).
Remote	If the setpoint switch is used once, the setpoint schedule control will be cancelled (setpoint control will be based on setpoint switch only).
Network	Regardless of the current setpoint schedule, the user can select the setpoint manually via the control interface (Setpoint Select, GENUNIT) or the service tool. Once the forced selection is deactivated, the setpoint schedule will be used again.

The following tables summarise the possible setpoint selections based on the control type (local, remote, network) and the following parameters:
- Heating/Cooling operating mode.
- Setpoint select.
- Setpoint selection contact status.
- Schedule 2 status for setpoint selection.

Local operating mode

Parameters status						Active setpoint
Heat/Cool [hc_sel]	Setpoint [sp_sel]	Ice mode enabled [Ice_cnfg]	Ice done switch [Ice_sw]	Setpoint switch [setp_sw]	Setpoint occupancy [sp_occ]	
cool	sp-1	-	*	*	-	cooling setpoint 1
cool	sp-2	no	*	*	-	cooling setpoint 2
cool	sp-2	yes	close	*		cooling setpoint 2
cool	sp-2	yes	open	*		ice setpoint
cool	auto	-	*	*	occupied	cooling setpoint 1
cool	auto	no	*	*	unoccupied	cooling setpoint 2
cool	auto	yes	close	*	unoccupied	cooling setpoint 2
cool	auto	yes	open	*	unoccupied	ice setpoint
heat	sp-1	-	*	*	-	heating setpoint 1
heat	sp-2	-	*	*	-	heating setpoint 2
heat	auto	-	*	*	occupied	heating setpoint 1
heat	auto	-	*	*	unoccupied	heating setpoint 2

(*) any configuration, (-) default configuration

Remote operating mode

Parameters status						Active setpoint
Heat/Cool [hc_sel]	Setpoint [sp_sel]	Ice mode enabled [Ice_cnfg]	Ice done switch [Ice_sw]	Setpoint switch [setp_sw]	Setpoint occupancy [sp_occ]	
cool	-	-	*	open	-	cooling setpoint 1
cool	-	no	*	close	-	cooling setpoint 2
cool		yes	close	close		cooling setpoint 2
cool	-	yes	open	close	-	ice setpoint
heat	-	-	*	open	-	heating setpoint 1
heat	-	-	*	close	-	heating setpoint 2

(*) any configuration, (-) default configuration

Network operating mode

Parameters status						Active setpoint
Heat/Cool [hc_sel]	Setpoint [sp_sel]	Ice mode enabled [Ice_cnfg]	Ice done switch [Ice_sw]	Setpoint switch [setp_sw]	Setpoint occupancy [sp_occ]	
cool	-	-	*	*	occupied	cooling setpoint 1
cool	-	-	*	*	unoccupied	cooling setpoint 2
heat	-	-	*	*	occupied	heating setpoint 1
heat	-	-	*	*	unoccupied	heating setpoint 2

(*) any configuration, (-) default configuration

8.4.2 - Reset

Reset means that the active control point is modified so that the machine capacity required is adjusted to be as close as possible to the demand.

The reset source can be provided by one of the following:

■ **Outdoor air temperature** that gives a measure of the load trends for the building. This reset source is applicable only to units with option 154 (see section 8.15).

■ **Return water temperature** (heat exchanger ΔT gives an average building load). Delta T (ΔT) is the difference between leaving and entering fluid temperatures (LWT minus EWT). When the load is light, temperature difference across the exchanger will be relatively small. The reset value should be configured by the user and its configuration may differ depending on the size of the water exchanger.

■ **4-20 mA reset signal** provided by an active sensor connected to the input: If the reading of the 4-20 mA signal/external temperature value increases (load is lighter), then the current setpoint will be lowered.

■ **Space temperature** reset based on the space temperature sensor reading.

The source of the reset can be configured in the Reset Configuration menu (RESETCFG). In response to a change in delta T, 4-20 mA reset signal reading, or space temperature, the control point is reset to optimise unit performance.

To set the source of the reset
1. Navigate to the Configuration menu.
2. Select *Reset Configuration* (RESETCFG).
3. Set *Cooling Reset Select* [cr_sel] or *Heating Reset Select* [hr_sel].

Cooling Reset Select [cr_sel] Heating Reset Select [hr_sel]
0 = none
1 = OAT *
2 = delta T
3 = 4-20 mA
4 = Space Temp

* OAT reset applies to units with option 154 (see section 8.15).

The unit normally uses two control point reset types, cooling control point reset or heating control point reset.

Dry cooler condenser option has condensing setpoint reset which can be applied if the condensing setpoint control depends on outdoor air temperature reading (reset source = OAT). See also section 8.15.

Reset is a linear interpolation function based on the following three parameters:

■ A reference at which reset is zero (OAT / delta T / 4-20 mA signal / space temp. – no reset value).

■ A reference at which reset is maximum (OAT / delta T / 4-20 mA signal / space temp. – full reset value).

■ The maximum possible reset value: The difference between the lowest reset value (no reset value) and the highest possible reset value (full reset value). Cooling / Heating Reset Deg. Value represents the maximum possible reset.

Reset parameters, i.e. slope, reset, and maximum value, are configurable in the Reset Configuration menu (RESETCFG).

Cooling mode: Cooling control point reset is used to control the evaporator water temperature reset.

Heating mode: Heating control point reset is used to control the condenser water temperature reset.

Heating reset may be used to reset the condensing setpoint for optimised condenser operation. This is only possible on the outside temperature. Delta T is not used.

Reset example in Cooling mode for the space temperature
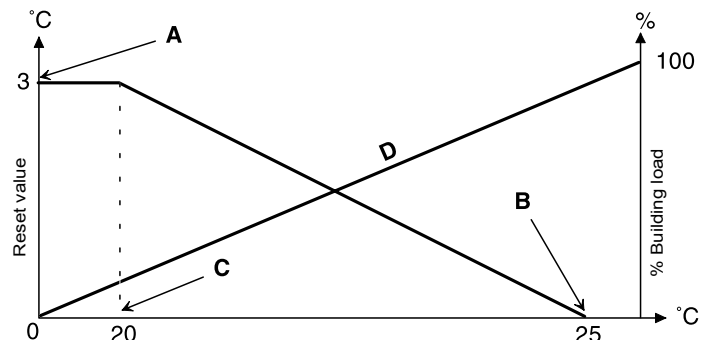
Legend
A: Maximum reset value
B: Space temperature for zero reset
C: Space temperature for maximum reset
D: Building load

8.5 - Ramp loading

The control provides the ramp loading function used to minimise the rate at which the water temperature changes. The minimum speed is calculated based on saturated condensing temperature and saturated suction temperature. Ramp loading sequence can be enabled by the user (Ramp Loading Select, GEN_CONF – General Configuration).

8.6 - Capacity control

The unit is fitted with oil-free centrifugal compressors with magnetic bearings. Each circuit may have one or two compressors installed. Compressors are controlled in such a way in order to provide the best possible COP. Variable-speed centrifugal compressors exhibit better performance at part load conditions; therefore, the control system would normally start both circuits as soon as needed. The Touch Pilot control adjusts the compressor capacity to keep the heat exchanger water temperature at its setpoint.

8.7 - Demand limit

The demand limit functionality is used to limit the unit power consumption whenever possible.

The control allows limitation of the unit capacity:

■ By means of 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 SETPOINT menu.

■ By setting DEM_LIM when the unit is in Network mode.

■ By lag limit set by the master unit (master/slave assembly). If the unit is not in the Master/Slave assembly, the lag limit value is equal to 100%.

■ By night capacity limitation. The limit can be modified in the GEN_CONF menu.

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

8.8 - Water exchanger pumps

The unit can control one evaporator water pump and one condenser water pump. The pump can be turned on only when this option is configured (PUMPCONF) and when the unit is in one of the "on" modes described in section 8.1 or in "delay" mode.

The Touch Pilot control provides the signal to command the pump, but it does not include the protection of the pump itself (low water pressure, overload, etc.).

8.8.1 - Pump operation

The pump keeps running for about 20 seconds after the unit goes to the stopping mode. The pump is turned off if the unit is shut down due to an alarm unless the fault is a freeze protection error. The pump can be started in particular operating conditions when freeze protection of the heat exchanger is active.

Since the minimum value for the delay at start-up is 1 minute (configurable between 1 and 15 minutes), the pump will run for at least one minute before the first compressor starts.

If configured, the cooler pump can be stopped when the unit is in Heating and the condenser pump can be stopped when the unit is in Cooling mode.

To set cooler pump behaviour in Heating mode OR condenser pump behaviour in Cooling mode
1. Navigate to the Configuration menu.
2. Select *Pump Configuration* (PUMPCONF).
3. Set *Cooler Pump Off In Heat* [stopheat] or *Cond Pump Off In Cool* [stopcool] to "yes".

Cooler Pump Off In Heat [stopheat]	
Cond Pump Off In Cool [stopcool]	
no/yes	yes

NOTE: The water pump can also be stopped when the unit is in Standby mode (see section 8.8.3).

8.8.2 - Pump protection (pump anti-stick function)

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

Starting the pump periodically for a few seconds extends the lifetime of the pump bearings and the tightness of the pump seal.

To set pump sticking protection
1. Navigate to the Configuration menu.
2. Select *Pump Configuration* (PUMPCONF).
3. Set *Pump Sticking Protection* [pump_per] to "yes".

Pump Sticking Protection [pump_per]	
no/yes	yes

8.8.3 - Standby pump (fixed speed pumps only)

The control provides the Eco pump functionality which allows for stopping the pump periodically when the unit is in satisfied mode (no cooling or heating is required).

The Eco pump mode can be applied to the condenser pump when the unit is in Heating mode and the cooler pump when in Cooling mode.

To verify pump behaviour in Standby mode
1. Navigate to the Main menu.
2. Select *Miscellaneous Status* (MSC_STAT).
3. Verify *Eco Pump Mode Active* [m_ecopmp].

Eco Pump Mode Active [m_ecopmp]	
no/yes	yes

IMPORTANT: The Eco pump functionality can be enabled only by service technicians.

8.9 - Customer variable speed pump

As standard the unit provides the functionality to control a variable speed pump. It is possible to control the water flow to keep constant temperature difference on the evaporator water exchanger.

Pump speed control may also be optimised by the installer (service-access level required).

The pump is turned on and off the same way that the fixed speed pump, excluding the situation when the water loop does not require production (the pump will be set to its minimum speed).

8.10 - Condenser water valve (option 152)

Saturated condensing temperature control is assured if the three-way valve option is selected. The saturated condensing temperature is controlled based on a fixed setpoint that can be configured by the user via the SETPOINT table. The three-way valve control can be configured by the service department via the SERVICE table.

8.11 - Unit short cycling protection

The Touch Pilot control constantly monitors the control point which determines the operation of compressor(s). Compressors are turned on and off in order to maintain the required control point and satisfy the current cooling/heating demand.

The control provides a protection that prevents the premature starting of compressors. The service-configured temperature threshold (acting upon the control point) is used for compressor(s) control.

This unit short cycling option can be enabled via the touch screen by setting the "short cycle management" parameter in the General Configuration menu (GEN_CONF) to "yes".

8.12 - Refrigerant leak detection (option 159)

This option permits refrigerant leak detection. Two sensors (not supplied) that detect the refrigerant concentration in the air must be installed on the unit.

If one of the two sensors detects an abnormal refrigerant level for more than one hour, an alarm is triggered (10050), without shutting the unit down. The refrigerant level and the time before triggering an alert are configurable. To modify them, contact Manufacturer Service Agency.

8.13 - 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 unit capacity is limited and the number of operating fans is reduced.

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 or the maximum capacity value can be configured in the General Configuration menu (GEN_CONF).

During the night period the condensing point is increased to limit the number of fans operating (units with dry cooler condensing control option).

To set night mode settings
1. Navigate to the Configuration menu.
2. Select *General Configuration* (GEN_CONF).
3. Set night mode parameters.

Night Mode Start Hour [nh_start], Night Mode End Hour [nh_end]	
00:00	
Night Capacity Limit [nh_limit]	
0 to 100%	100%

8.14 - BACnet (option 149)

The BACnet/IP communication protocol is used by the building management system or the programmable controllers to communicate with the Touch Pilot interface. It is activated if the optional BACnet activation key (dongle) is present on the electronic control board.

This option may be ordered and installed on site. The BACnet profile of the Touch Pilot interface is B-ASC.

For more information about BACnet, please refer to the BACnet document included with the control or contact Manufacturer Service Agency.

8.15 - Dry cooler (option 154)

19PV units have been specially designed to optimise the operation of split installations, using air-cooled condensers as the chiller heat rejection system.

19PV units can control a Carrier dry cooler to cool down the condenser water loop. This air exchanger includes all compatible control electronics.

8.15.1 - Condensing pressure control

The control configuration of this functionality must be done by a specially trained and qualified engineer during the unit installation. The Manufacturer supplies specific documentation for this operation to the trained engineers.

The Touch Pilot control system includes logic to permit the control of different fixed and variable-speed fan variants.

Touch Pilot continuously optimizes system operation to obtain the best system efficiency by controlling the number of fans required for any thermal load and outside temperature conditions.

8.15.2 - Condensing setpoint

The condensing setpoint is adjustable in the Setpoint menu (SETPOINT).

Condensing setpoint	
Minimum value	27°C
Default value	35°C
Maximum value	49°C

The condensing setpoint can be reset by reference to the outside temperature to optimize the operation of the condensing system.

To set the condensing setpoint reset, the following adjustments are necessary:
- hr_sel (Heating Reset Select) set to "1" (OAT) in the Reset Configuration menu (RESETCFG).
- oat_crno (OAT no reset value), oat_crfu (OAT full reset value) and hr_deg (heating reset degree value) must be set in the Reset Configuration menu (RESETCFG). See also section 8.4.2 for more information about reset control.

8.16 - Dry cooler free cooling (option 313)

19PV units may come with the free cooling option that enables the control of a Carrier dry cooler. The chiller and the dry cooler have to be connected through a LEN RS-485.

Units fitted with a dry cooler provide the "free cooling" functionality which means that the chilled water system directly exchanges heat using the air-to-water heat exchanger ("dry cooler"). For chillers with this option, the Touch Pilot control may use low outside air temperature to cool down the water loop and satisfy the cooling demand.

The dry cooler is used not only to assist in producing cooling water to meet the current cooling demand but it also allows for reducing energy consumption.

The dry cooler comes with up to 20 fans, i.e. fixed-speed or variable-speed fans, which can be installed in different configurations. The Touch Pilot control distinguishes between two types of fan control for a dry cooler free cooling option, where the first one embraces the use of fan staging and the second one includes the use of variable-speed fans. Mixed configuration can also be used (fixed and variable-speed fan control at the same time).

8.17 - Master/Slave control

The control system allows for master/slave control of two units linked by the network. The master unit can be controlled locally, remotely or by network commands, while the slave unit remains in Network mode.

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

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

In the event of a communication failure between the two units, each unit will return to an autonomous operating mode until the fault is cleared. If the master unit is stopped due to an alarm, the slave unit is authorised to start.

IMPORTANT: Master/slave assembly can be configured only by service technicians.

9.1 - Control diagnostics

Touch Pilot control system has many fault tracing aid functions, protecting the unit against risks that could result in the failure of the unit.

The user interface enables the quick display of the unit status:
- The blinking bell icon indicates that there is an alarm, but the unit is still running.
- The highlighted bell icon indicates that the unit is shut down due to a detected fault.

The local interface – Touch Pilot – gives the user quick access to monitor all unit operating conditions. If an operating fault is detected, the alarm is triggered.

All information regarding the existing alarms (current and past alarms) can be found in the Alarms menu.

• Press the Alarm button to access the Alarms menu.
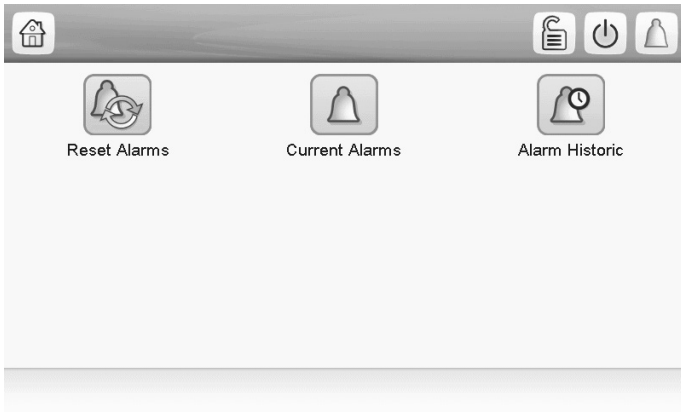
Alarms menu	Access	Viewing alarm information			
		Date	Hour	Code	Description
Current Alarms	Basic	+	+		+
Alarm Historic	Basic	+	+		+
Reset Alarms	User			+	

9.2 - Current alarms

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

To access the list of currently active alarms

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

9.3 - Alarms history

The Alarm Historic menu may display up to 50 alarms that occurred on the unit.

To access the alarm history

1. Press the Alarm button in the upper-right part of the screen.
2. Select *Alarm Historic.*
3. The history of alarms will be displayed.

9.4 - Resetting alarms

The alarm can be reset either automatically by the control or manually through the touch panel display or the web interface (in the Reset Alarms menu).
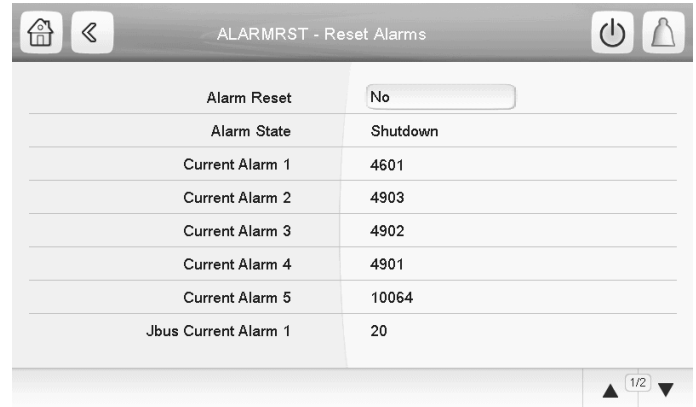
■ *The Reset alarms menu displays up to 5 alarm codes which are currently active on the unit.*

■ *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 Alarm button in the upper-right part of the screen.
2. Select *Reset Alarms.*
3. Set "Alarm Reset" to Yes.
4. Press ⚡ to confirm alarm reset.
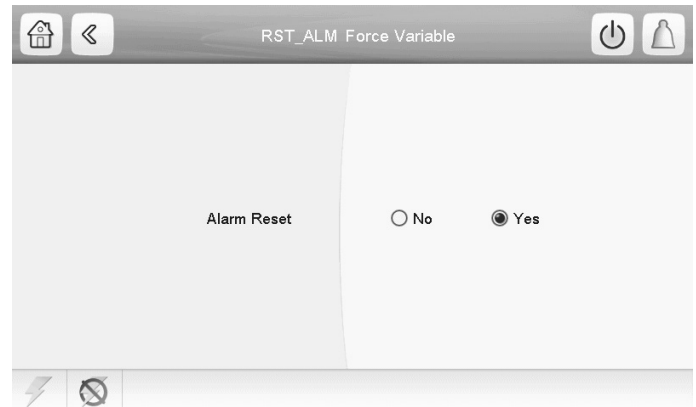
IMPORTANT: Not all alarms can be reset by the user. Some alarms are reset automatically when operating conditions return to normal.

CAUTION: 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.

9.5 - E-mail notifications

The control system 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.

IMPORTANT: E-mail notifications can be set only by service technicians.

9 - DIAGNOSTICS

9.6 - Alarms description

The following table includes all alarms/alerts associated with the
operation of the unit.

Code	Description	Possible cause	Action taken	Reset type
Thermistor failure				
15001	Cooler Entering Fluid Thermistor	Defective thermistor	Unit shuts down	Automatic, if thermistor reading returns to normal
15002	Cooler Leaving Fluid Thermistor	As above	Unit shuts down	As above
15006	Condenser Entering Fluid Thermistor	As above	Unit shuts down	As above
15007	Condenser Leaving Fluid Thermistor	As above	Unit shuts down	As above
15011	MASTER/Slave Common Fluid Thermistor	As above	Master/Slave assembly control disabled. Unit returns to the standalone mode	As above
15032	MASTER/Slave Common Heat Fluid Thermistor	As above	As above	As above
15018	Circuit A Condenser Subcooling Liquid Thermistor Failure	As above	Circuit A shuts down	As above
15019	Circuit B Condenser Subcooling Liquid Thermistor Failure	As above	Circuit B shuts down	As above
15021	Space Temperature Thermistor	Defective thermistor while reset by "Space temp." is activated	No action (warning only)	As above
15010	OAT Thermistor Failure	Defective thermistor	No action (warning only)	As above
15046	Free Cooling Water Loop Thermistor Failure	As above	Free cooling is disabled, but the unit continues to operate	As above
15047	Free Cooling Leaving Water Thermistor Failure	As above	As above	As above
15048	Free Cooling OAT Sensor Failure	As above	As above	As above
15036	External Air Cond. Control: Leaving Water Thermistor Failure	As above	Unit shuts down	As above
15099	External Air Cond. Control: Outdoor Air Thermistor Failure	As above	Unit shuts down	As above
Pressure transducer failure				
12001	Circuit A Discharge Transducer Failure	Defective transducer or installation fault	Circuit A shuts down	Automatic, if sensor voltage reading returns to normal
12002	Circuit B Discharge Transducer Failure	As above	Circuit B shuts down	As above
12004	Circuit A Suction Transducer Failure	As above	Circuit A shuts down	As above
12005	Circuit B Suction Transducer Failure	As above	Circuit B shuts down	As above
12031	Circuit A Condenser Subcooling is negative	Defective transducer or installation fault, calculated condenser subcooling is negative	No action (warning only)	As above
12032	Circuit B Condenser Subcooling is negative	As above	No action (warning only)	As above
Communication failure				
4901	Loss of communication with SIOB Board Number 1	Bus installation fault or defective board	Unit shuts down	Automatic, if communication is re-established
4902	Loss of communication with SIOB Board Number 2	As above	Circuit B shuts down	As above
4903	Loss of communication with SIOB Board Number 3	As above	Unit shuts down	As above
4601	Loss of communication with AUX1 Board Number 1	As above	Unit continues to operate, but options related to the board are disabled, e.g. leak detection, master/slave assembly control	As above
4602	Loss of communication with AUX1 FreeCooling board	As above	Free cooling is disabled	As above
4611	Loss of communication with AUX1 Air Condensing Control board	As above	Unit shuts down	As above
Unit protections				
10001	Cooler Freeze Protection	No water flow, defective thermistor	Unit shuts down	Automatic, if water exchanger LWT is 3 K above the setpoint, (the first alarm within 24 hours); otherwise, Manual
10002	Circuit A Condenser Freeze Protection	Discharge pressure transducer defective, refrigerant leak or low condenser water temperature	Unit is "On": Circuit A shuts down, but the condenser pump is turned on Unit is "Off": Condenser pump is turned on, but the unit cannot be started	Automatic, if saturated discharge temperature is more than 4.4°C; otherwise, Manual
10003	Circuit B Condenser Freeze Protection	As above	Unit is "On": Circuit B shuts down, but the condenser pump is turned on Unit is "Off": Condenser pump is turned on, but the unit cannot be started	As above

Code	Description	Possible cause	Action taken	Reset type
10005	Circuit A Low Suction Temperature	Pressure sensor defective, EXV blocked or lack of refrigerant	Circuit A shuts down	Automatic (the first alarm within 24 hours); otherwise, Manual
10006	Circuit B Low Suction Temperature	As above	Circuit B shuts down	As above
10105	Maximum condensing Leaving water temp	Leaving water temperature is above the configured threshold	Unit shuts down	Automatic, if conditions return to normal
10014	Customer Interlock Failure	Customer interlock is open	Unit shuts down	Automatic, if customer interlock is closed (the first alarm within 24 hours); otherwise, Manual
10090	Cooler Flow Switch Setpoint Configuration Failure	Defective flow controller or wiring error	Unit is not allowed to start	Manual
10091	Cooler Flow Switch Failure	Flow switch fails to close within the off to on delay	Cooler pump is stopped	Automatic (the first alarm within 24 hours); otherwise, Manual
		Flow switch is open	Unit shuts down	Manual
10015	Condenser Flow Switch Failure	Flow switch is open	Unit shuts down	Automatic, if flow switch is closed (the first alarm within 24 hours); otherwise, Manual
10028	Electrical Box Thermostat Failure	Electrical box thermostat input is open	Unit shuts down (in order to limit heat in the control box)	Automatic (the first alarm within 24 hours); otherwise, Manual
10030	Master/Slave communication Failure	Connection lost with slave unit	Units are returning to standalone mode	Automatic when communication is recovered
10031	Unit is in Network emergency stop	Network emergency stop command	Unit shuts down	Automatic, if emergency stop is deactivated
10032	Cooler pump #1 fault	Flow switch or water pump fault	Unit shuts down	Manual
10050	Refrigerant Leakage Detection	Refrigerant escape	No action (warning only)	Automatic, if voltage reading returns to normal
10073	Condenser pump #1 fault	Water pump fault	Unit shuts down	Manual
10097	Cooler water exchanger Temperature Sensors Swapped	Water temperature sensors swapped	Unit shuts down	Manual
10102	Condenser water exchanger Temperature Sensors Swapped	Water temperature sensors swapped	Unit shuts down	Manual
10098	Discharge pressure sensors swap	Pressure sensors swapped	Unit shuts down	Manual
10099	Suction pressure sensors swap	Pressure sensors swapped	Unit shuts down	Manual
10063	Circuit A Internal safety chain open (HP, Doors, Power)	One of the high pressure switches is open, electrical wiring issue, door is open, circuit breaker is open, pressure is higher than HP safety (service valve closed or fire)	Unit shuts down	Manual, HP switch must be reset manually as well
10064	Circuit B Internal safety chain open (HP, Doors, Power)	One of the high pressure switches is open, electrical wiring issue, door is open, circuit breaker is open, pressure is higher than HP safety (service valve closed or fire)	Unit shuts down	Manual, HP switch must be reset manually as well
10101	Free Cooling Process Failure	Dry cooler fault	Free Cooling continued to work partially, and compressor stages are allowed to start	Automatic, if operating conditions return to normal
10216	Wrong wiring main switch A	Contactor is closed, but high pressure switch is opened	Circuit A shuts down	Manual
10217	Wrong wiring main switch B	As above	Circuit B shuts down	Manual
10218	Electrical fault A	Contactor is open, but it is commanded to be closed; wiring issue, short circuit; visual check of the electrical cabinet internal state is mandatory	Circuit A shuts down	Manual
10219	Electrical fault B	As above	Circuit B shuts down	Manual
Configuration failure				
8000	No factory configuration	Initial factory configuration required	Unit cannot be started	Automatic, if configuration is provided
7001	Illegal factory configuration Number #1 to nn	Incorrect unit configuration or new version of compressor FW not supported	Unit cannot be started	Automatic, if configuration is corrected
9001	Master chiller configuration error Number #1 to nn	Incorrect master/slave configuration	Master/Slave assembly control is disabled and the unit can operate in standalone mode	Automatic, if configuration is corrected or the unit is not in Master operating type
Service Maintenance				
13001	Service maintenance alert Number # nn	Servicing action required	No action (warning only)	Manual
13005	Fgas check needed, call your maintenance company	Maintenance date passed	No action (warning only)	Manual

9 - DIAGNOSTICS

Code	Description	Possible cause	Action taken	Reset type
Compressor failure XX = 11 (compressor A1); XX = 12 (compressor A2); XX = 21 (compressor B1); XX = 22 (compressor B2)				
xx20	Compressor High Inverter Temperature	Compressor fault	Compressor shuts down	Automatic
xx22	Compressor Low Suction Pressure	As above	Compressor shuts down	Automatic
xx23	Compressor High Discharge Pressure	As above	Compressor shuts down	Automatic
xx24	Compressor 3-Phase Overcurrent	As above	Compressor shuts down	Automatic
xx25	Compressor Cavity Temperature	As above	Compressor shuts down	Automatic
xx27	Compressor Pressure Ratio	As above	Compressor shuts down	Automatic
xx28	Compressor Bearing/Motor Controller Fault	As above	Compressor shuts down	Automatic
xx29	Compressor Sensor Fault	As above	Compressor shuts down	Automatic
xx30	Compressor SCR Temperature	As above	Compressor shuts down	Automatic
xx31	Compressor Lock Out	As above	Compressor shuts down	Automatic
xx32	Compressor Motor Winding Temperature	As above	Compressor shuts down	Automatic
xx33	Compressor High Suction Superheat	As above	Compressor shuts down	Automatic
xx34	Compressor Earth Leakage	As above	Compressor shuts down	Automatic
xx35	Compressor Soft Start Temp.	As above	Compressor shuts down	Automatic
xx36	Compressor Identification register does not match	As above	Compressor shuts down	Manual
xx37	Compressor Starting is taking too much time	As above	Compressor shuts down	Automatic, if the compressor is stopped
xx38	Compressor - Interlock discordance	As above	Compressor shuts down	Manual
xx39	Compressor - Out of map info	As above	No action (warning only)	Automatic
xx90	Compressor Communication lost	As above	Compressor shuts down	Automatic, if communication is re-established
LEN & Database modules failure				
56001	Lenscan module Failure	Software problem. Contact Manufacturer Agency	Unit shuts down	Automatic
55001	Database module Failure	As above	No action (warning only)	Manual
Voltage failure				
57001	SIOB 1 Low Voltage Failure	Unstable electrical supply or electrical issue	Unit shuts down	Automatic, if voltage reading returns to normal (6 alarms within 24 hours); otherwise, Manual
57002	SIOB 2 Low Voltage Failure	As above	Circuit B shuts down	As above
57003	SIOB 3 Low Voltage Failure	As above	Unit shuts down	As above
Stepper motor failure				
57020	Main EXV Stepper Motor Failure - Cir A	Stepper motor failure	Circuit A shuts down	Manual
57021	Main EXV Stepper Motor Failure - Cir B	As above	Circuit B shuts down	Manual
57030	Staging Valve stepper motor failure - Compressor A1	As above	Compressor A1 cannot be started	Manual
57031	Staging Valve stepper motor failure - Compressor A2	As above	Compressor A2 cannot be started	Manual
57040	Staging Valve stepper motor failure - Compressor B1	As above	Compressor B1 cannot be started	Manual
57041	Staging Valve stepper motor failure - Compressor B2	As above	Compressor B2 cannot be started	Manual

10 - MAINTENANCE

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

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

The Manufacturer provides a wide range of service contracts which embrace the assistance of highly qualified HVAC engineering professionals ready to help if needed. The Maintenance contracts represent not only the best way to ensure the maximum operating life of your equipment, but also, through the expertise of qualified personnel, the optimal tool to manage your system in a cost-effective manner.

To find the best type of contract that will meet all of your expectations, please contact your local Manufacturer representatives.