Carrier

United Technologies

CONTROLS MANUAL

Touch Pilot Control

30KAV

TOUCHPILOT

Original document

CONTENTS

PREFACE

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 30KAV air-cooled chillers using screw compressor technology.

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

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

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

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

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

Abbreviations

In this manual, the refrigerant circuits are called circuit A and circuit B. Compressor in circuit A is labelled A1 and compressor in circuit B is labelled B1. The following abbreviations are used frequently:

BMS	Building Management System
CCN	Carrier Comfort Network
DGT	Discharge Gas Temperature
EMM	Energy Management Module
EXV	Electronic Expansion Valve
LED	Light Emitting Diode
LEN	Sensor Bus (internal communication bus linking the basic board to slave boards)
LON	Local Operating Network
SCT	Saturated Condensing Temperature
SST	Saturated suction Temperature

1 - SAFETY CONSIDERATIONS

1.1 - Safety guidelines

Installation, start-up and servicing of equipment can be hazardous if certain factors particular to the installation are not considered: operating pressures, 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.

1.2 - Safety precautions

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

It is particularly recommended that all sources of electricity to the unit 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.

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

2 - CONTROL OVERVIEW

2.1 - System functionalities

The Touch Pilot system controls the start-up of the compressors needed to maintain the desired heat exchanger entering and leaving water temperature.

The control panel serves as a user interface and a configuration tool for controlling the operation of the unit. Touch Pilot constantly monitors safety devices that protect the unit against failure and guarantee its optimal functioning.

2.2 - Touch Pilot components

The controller manages a number of mechanisms that allow the unit to operate effectively, including the following:

- Compressor start-up to control the water loop (screw compressor technology)
- 7" touch screen as standard (Touch Pilot)
- BMS connection
- Diagnostics, e-mail transmission
- Web connectivity
- Energy Management Module (optional)
- Hydronic module, variable-speed pump control (optional)
- External fixed-speed or variable-speed pump control
- Remote unit management
- Energy optimization, power/energy monitoring
- Maintenance schedule management
- Communication protocols (CCN, BACnet, Jbus, LON)

2.3 - Operating modes

The control system can operate in three independent modes:

- **Local mode:** The unit is controlled by commands from the user interface.
- **Remote mode:** The unit is controlled by dry contacts.
- **Network mode:** The unit is controlled by network commands (CCN or BACnet). Data communication cable is used to connect the unit to the RS485 communication bus or 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.

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

3 - HARDWARE DESCRIPTION

3.1 - Control boards

Each circuit is by default fitted with one SIOB board used to manage all inputs and outputs of the controller. At the same time, Energy Management Module (EMM) requires an additional SIOB board to be installed. The control also includes up to four AUX1 boards used to control refrigerant leak detection option, master/slave assembly control, and internal or external pumps' control.

All boards communicate via an internal LEN bus.

Touch Pilot continuously monitors the information received from various pressure and temperature probes and accordingly starts the program that controls the unit.

The unit is equipped with the Touch Pilot user interface (7- inch colour LCD touch screen).

The electrical box includes all boards controlling the unit and the user interface.

3.2 - 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.

3.3 - Light emitting diodes on boards

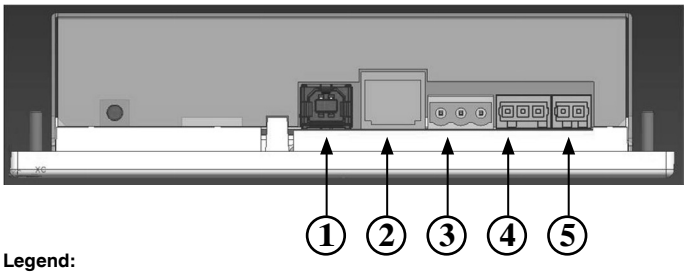
All boards continuously check and indicate the proper operation of their electronic circuits. A light emitting diode (LED) lights on each board when it is operating properly.

- The red LED flashing for a two-second period on the SIOB board 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 a LEN bus wiring problem.

3.4 - Connections of the main controller

Connections are located on the bottom side of the main controller.

The controller comes with two RS485 ports, where the first port is used to connect to CCN (Carrier Comfort Network) and the second RS485 port is used for internal communication (LEN). 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. CCN connector (RS485)
4. LEN internal bus (RS485)
5. Power supply connector (24 VAC)

3.5 - Pressure transducers

Two types of electronic sensors (high and low pressure) are used to measure various pressures in each circuit.

These electronic sensors deliver 0 to 5 VDC. The sensors are connected to the slave boards.

Suction pressure sensors (low pressure type)
These sensors measure the suction pressure in each circuit. They are used for EXV control. Suction pressure sensors are located on the suction piping of each circuit.

Discharge pressure sensors (high pressure type)
These sensors measure the discharge pressure in each circuit. They are used to control head pressure or high pressure load shedding. Discharge pressure sensors are mounted on the discharge line piping of each circuit.

Oil pressure sensors (high pressure type)
These sensors measure the oil pressure of each compressor. Oil pressure sensors are located at the oil port of the compressor. The economizer pressure is subtracted from this value to arrive at the differential oil pressure.

Economizer pressure sensors (high pressure type)
These sensors measure the intermediate pressure between discharge and suction pressure. They are used to control the economizer performance.

3.6 - Temperature sensors

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

Evaporator entering and leaving water temperature sensors
The evaporator entering and leaving water temperature sensors are installed in the entering and leaving side water box. They are used for capacity control and safety purposes.

Suction gas temperature sensor
This sensor is used to control the suction gas temperature. It is located at the suction line of the compressor.

Discharge gas temperature sensor
This sensor is used to control the discharge gas temperature, and permits control of the discharge superheat temperature. It is located at the discharge line of the compressor.

Motor temperature sensor
This sensor is used to control the motor temperature of each compressor.

Temperature setpoint reset sensor (EMM)
This 4-20 mA space temperature sensor can be installed remotely from the unit. It is used to reset the setpoint on the unit.

Master/slave water sensor (optional)
The water temperature sensor is used for master/slave assembly control.

Outdoor air temperature
The outdoor air temperature sensor is used for fan control.

3.7 - Actuators

Evaporator pumps
The controller can regulate one or two evaporator pumps and takes care of the automatic changeover between these pumps.

Electronic Expansion Valve
The electronic expansion valve (EXV) is used to adjust the refrigerant flow to changes in the operating conditions of the machine. To adjust the refrigerant flow, a piston moves constantly up or down to vary the cross-section of the refrigerant path. This piston is driven by an electronically controlled linear stepper motor. The high degree of accuracy with which the piston is positioned provides precise control of the refrigerant flow.

Water flow switch
The water flow switch allows the control to ensure the minimum water flow that is necessary for the proper functioning of the unit. The configuration of its setpoint depends on the unit size and is made automatically at the start-up. If the measured water flow rate in the water loop is lower than the configured flow rate, the alarm condition shuts off the unit.

3.8 - Connections at the customer terminal block

3.8.1 - Terminal block connections

The following table summarizes connections at the user terminal block. Some contacts can be accessed only when the unit operates in Remote mode.

Description	Board	Connector	Remarks
Remote on/off contact	SIOB	J1-DI01; 32-33	Used for the unit on/off control if the unit is in Remote mode: open = Unit is stopped; closed = Unit is allowed to start in Cooling
Remote setpoint contact	SIOB	J1-DI02; 65-66	Used to control the setpoint
Demand limit contact	SIOB	J1-DI03; 63-64	Used to control demand limit
Heat recovery	SIOB	J1-DI04; 73-74	Not available in software version 1.0
Customer interlock	SIOB	J1-DI05; 34-35	Used to control the unit by the customer: open = Unit is stopped and an alarm is triggered (alarm 10028)
Evaporator pump 1	SIOB	J2/J4-IN01/DO01; 90	Used to command the control of evaporator pump 1
Evaporator pump 2	SIOB	J2/J4-IN02/DO02; 90A	Used to command the control of evaporator pump 2
Alarm relay	SIOB	DO-05; 30A-31A	Indicates alarms
Running relay	SIOB	DO-06; 37-38	Indicates if the unit is ready to start or operating
Setpoint reset	SIOB	AI10 (A1A); 71-72	Used for setpoint reset control
Occupancy override	SIOB, EMM	DI-01; 77-78	Enables to switch between occupied (closed contact) and unoccupied mode (open contact), applicable to units operating in Local mode
Demand limit contact 2	SIOB, EMM	DI-02; 73A-74A	Used to control demand limit
Customer interlock (EMM option)	SIOB, EMM	DI-03; 34A-35A	Used to control the unit by the customer: closed = Unit is stopped and an alarm is triggered (alarm 10014)
Ice done contact	SIOB, EMM	DI-04; 75-76	Used for ice storage control
Unit partially shutdown	SIOB, EMM	DO-05; 30B-31B	Indicates the shutdown of one of the circuits
Unit shut down	SIOB, EMM	DO-06; 30-31	Indicates the unit shutdown
Chiller running or ready to start	SIOB, EMM	DO-04; 37A-38A	Output closed when the chiller is ready to start or running
Compressor A running	SIOB, EMM	DO-01; 37A1-38A1	Output closed when the compressor of circuit A is running
Compressor B running	SIOB, EMM	DO-02; 37B1-38B1	Output closed when the compressor of circuit B is running
Chiller capacity	SIOB, EMM	AO-01; 79+ - 79-	Chiller total capacity
Space temperature	SIOB, EMM	AI-01; 71A-72A	Space temperature input for setpoint reset function
Capacity limit (analogue)	SIOB, EMM	AI-10; 67-68	Analogue capacity limit command

3.8.2 - Volt-free on/off contact

When the unit is under remote control, the on/off contact is operating as follows:

Contact	Off	Cooling
On/Off contact	open	closed

Off: Unit is stopped
Cooling: Unit is allowed to start in Cooling

3.8.3 - 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	Active Setpoint	
	SP1	SP2
Setpoint selection contact	open	closed

3.8.4 - Volt-free demand limit selection contact

Up to two dry contacts can be used to limit unit capacity. Note that the second contact is available only for units with the energy management module. Capacity limitation with two contacts is as follows:

Contact	100%	Limit 1	Limit 2	Limit 3
Demand limit 1 contact (LIM_SW1)	open	closed	open	closed
Demand limit 2 contact (LIM_SW2), EMM option	open	open	closed	closed

Please note that limit thresholds can be defined via the user interface in the Setpoint menu.

3.8.5 - Ice storage (EMM)

For units with EMM option, the control includes an additional setpoint ("ice setpoint") used for ice storage control.

Contact	Cooling setpoint		
	Setpoint 1 (CSP1)	Setpoint 2 (CSP2)	Ice setpoint (ICE_STP)
Occupancy schedule	occupied	unoccupied	unoccupied
Ice done switch (EMM option)	open/closed	closed	open

3.8.6 - Customer interlock

The customer interlock available on the SIOB board and connected in serial with the electrical box thermostat can be used by the customer in order to control the state of the unit. When the interlock is open, the unit will be stopped and the alarm will be triggered (alarm 10028).

3.8.7 - Occupancy override (EMM)

The occupancy override contact is available in case of units fitted with the optional Energy Management Module. When the unit is operating in Local mode and the contact is closed, the unit is in occupied mode. At the same time, open occupancy contact means that the unit is in unoccupied mode.

4 - HOW TO USE TOUCH PILOT USER INTERFACE

4.1 - User interface

Touch Pilot is a 7 in. colour touch screen with quick display of alarms, current unit operating status, etc. It allows for web connectivity and custom language support (control parameters displayed in the language selected by the user).

Touch Pilot: Welcome screen for 30KAV units

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.

4.2 - Touch Pilot buttons

HOME SCREEN

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

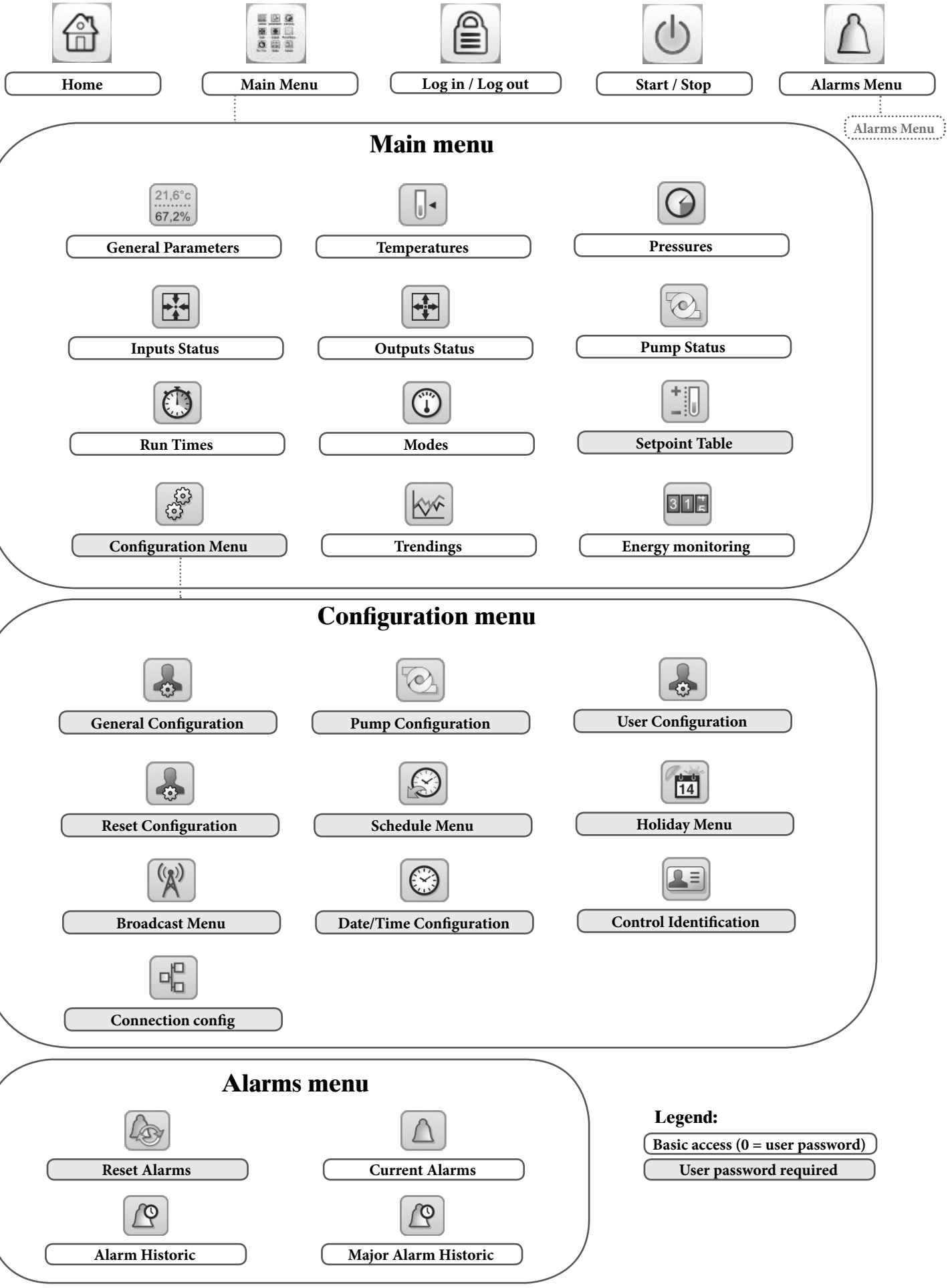
Login button		**Start/Stop button**		**Alarm button**	
	Basic access		Unit is stopped (grey icon)		No alarm active on the unit
	User access		Unit is running (green icon)		Blinking icon: Partial alarm (one circuit affected by the alarm) or Alert (no action taken on the unit), Steady icon: Alarm(s) active on the unit (see also section 9.6)

OTHER SCREENS

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

4.3 - Menu structure



5 - SETTING UP TOUCH PILOT CONTROL

5.1 - 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. It is recommended to use a pen for the navigation via the touch screen.

The navigation menus are the same for both connection methods (Touch Pilot user interface and web browser). Only two web connections are authorised at the same time.

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

Touch Pilot provides access to the following screens:

- Welcome screen (splash screen)
- Synoptic screen
- Operating mode selection screen
- Data/configuration screens
- Password entry and language selection screen
- Alarms screen
- Parameter modification screen
- Time schedule screen
- Trendings

5.2 - 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 5.3), press the **Home** button.

1	Home button
2	Software version number
3	Information message box

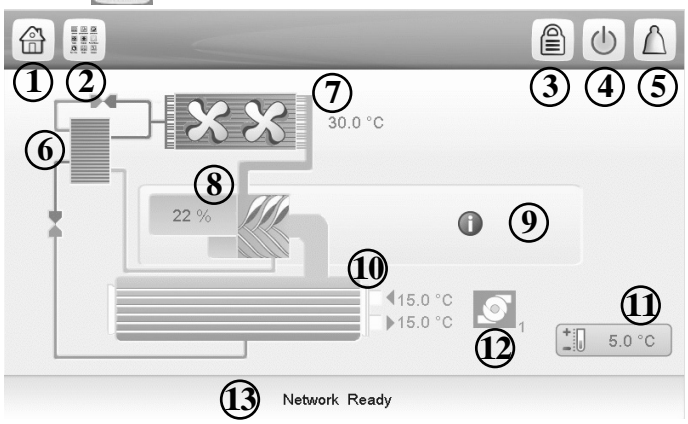
Information message box: The information displayed in the status bar at the bottom of the screen includes relevant messages regarding the current user action.

MESSAGE	STATUS
COMMUNICATION FAILURE!	Equipment controller did not respond while reading the table content.
ACCESS DENIED!	Equipment controller denies access to one of the table data blocks.
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)

5.3 - 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 predefined 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.

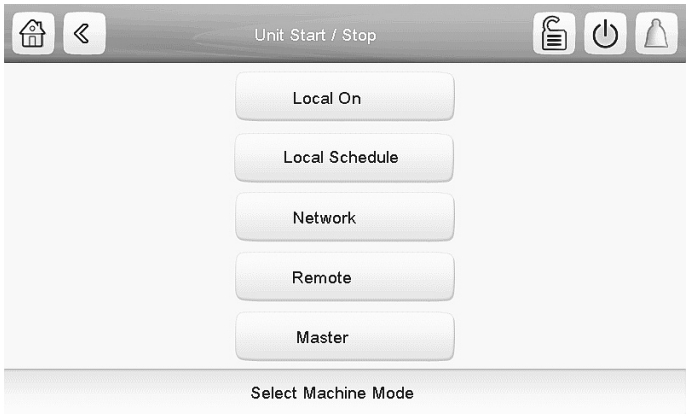
1.	Home button
2.	Main menu button
3.	Login button (restricted access to menus)
4.	Start/Stop button
5.	Alarm button
6.	Economizer
7.	Air Condenser
8.	Unit capacity
9.	Additional information: compressor inlet/outlet temperature and pressure
10.	Evaporator
11.	Setpoint
12.	Pump (optional)
13.	Unit running status

The bell located in the upper-right part of the screen lights when any fault is detected.

5.4 - 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

1. Press the **Start/Stop** button.
2. Select the required Machine Mode.
3. The Welcome screen will be displayed.

To stop the unit

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

Security access settings

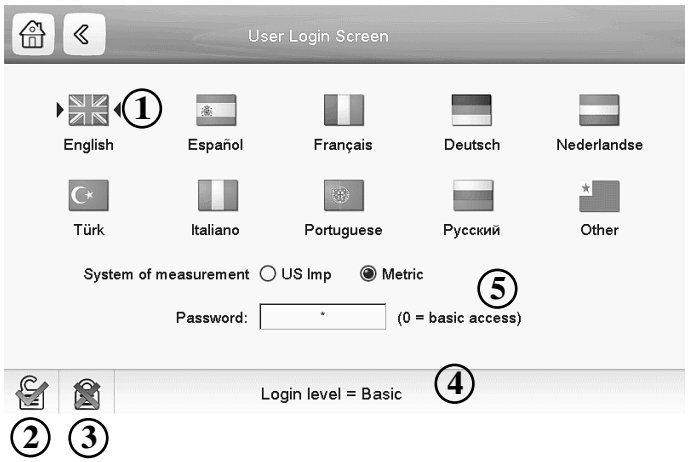
- User-level security ensures that only authorised users are allowed to modify critical unit parameters.
- Only logged-in users are allowed to access the Configuration menu.
- It is strongly recommended to change the default password of the user interface to exclude the possibility of changing any parameters by an unqualified person.
- Only people qualified to manage the unit should be familiarized with the password.

5.5 - Display settings

The User Login screen allows the user to do the following:

- Gain access to more control options.
- Select the language of the controller.
- Change the system of measurement (imperial or metric).

To access the User Login screen, press the **Login** button in the upper-right corner of the Synoptic screen.



1.	Cursor indicating the selected language
2.	Logged-in button
3.	Logged-off button
4.	Password dialogue box
5.	System of measurement: Metric/Imperial

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

5.5.1 - User login

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

To log in as user

1. Press the **Login** button to open User Login Screen.
2. Press the Password box.
3. A dialogue box appears. Provide the password (11) and press OK.
4. The User Login screen appears.
5. Press the **Logged-in** button to save your changes or the **Logged-off** button to exit the screen without making modifications.

5.5.2 - Password change

User password can be modified in the User Configuration menu.

To change your password

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

5.5.3 - Display language

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

To change a display language

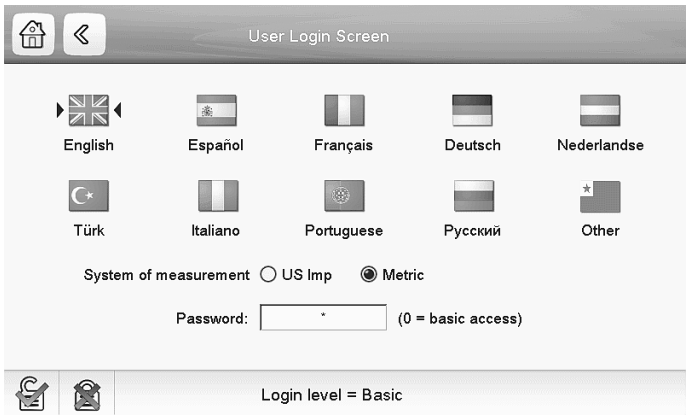
1. Press the **Login** button to open User Login Screen.
2. Select the new language of the display.
3. Press the **Logged-in** button to save your changes or the **Logged-off** button to exit the screen without making modifications.

Language list selection

The control provides two different language lists which means that languages displayed in the User Login screen may vary depending on user preferences ("Language list" parameter in USERCONF - User Configuration).

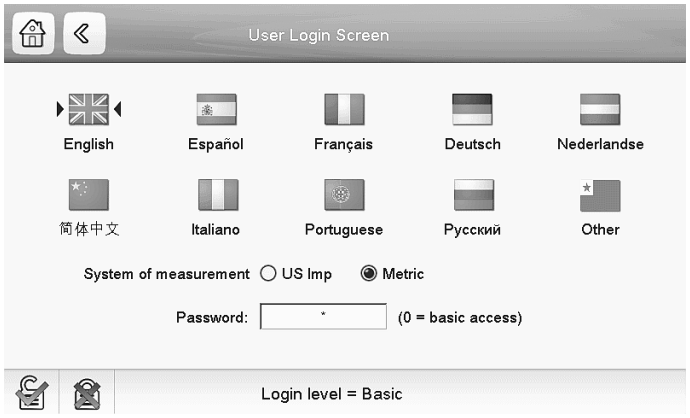
Language list (in USERCONF menu) set to "1":

English, Spanish, French, German, Dutch, Turkish, Italian, Portuguese, Russian and "other" (custom language).



Language list (in USERCONF menu) set to "0":

English, Spanish, French, German, Dutch, Chinese, Italian, Portuguese, Russian and "other" (custom language).



Custom language

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

NOTE: Custom languages can be uploaded only by Carrier service technicians.

5.5.4 - System of measurement

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

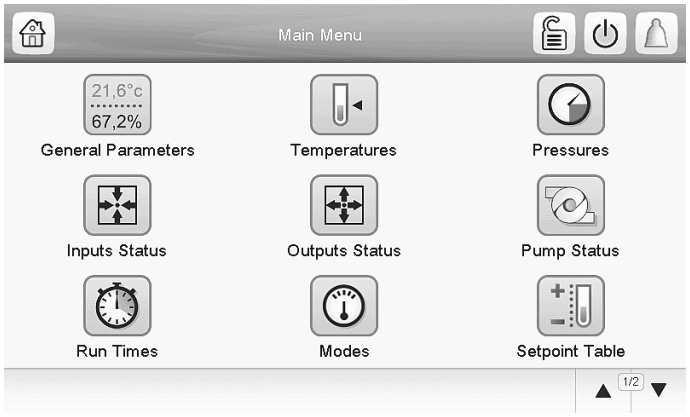
To change a system of measurement

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

5.6 - Main menu

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

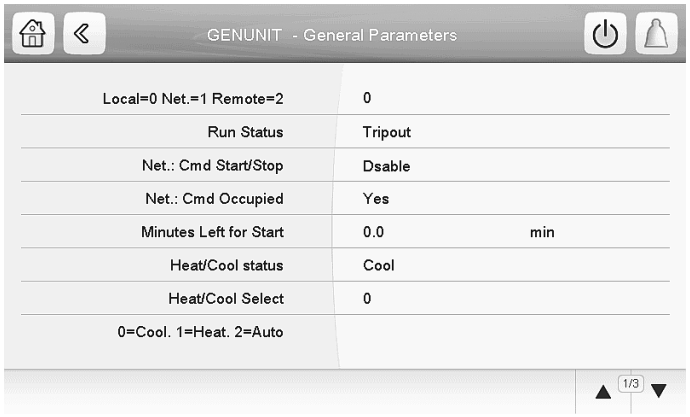
- To access the menu, press the **Main menu** button located in the upper-left part of the Synoptic screen.
- Specific unit parameters can be accessed by pressing the icon corresponding to the desired category.
- To go back to the Synoptic screen, press the **Home** button.



General parameters screen

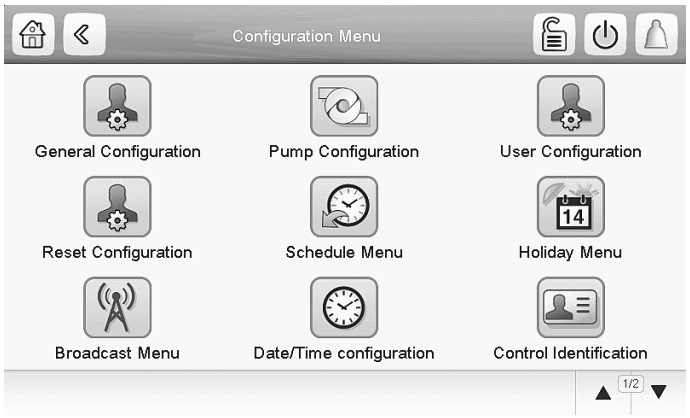
The General parameters screen provides access to a set of general unit parameters.

- 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.



5.7 - 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.

5.8 - 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.

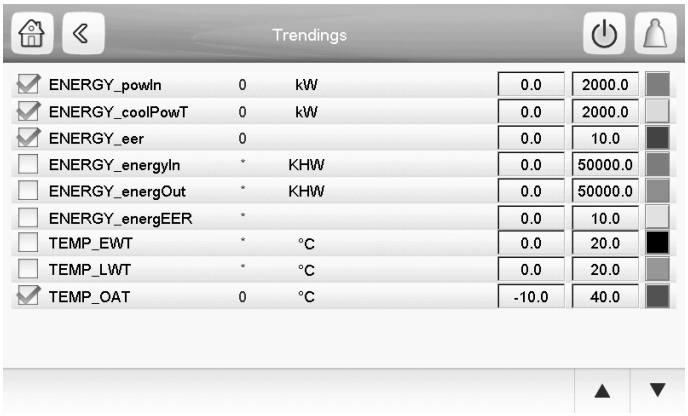
1.	Forced value
2.	Set force
3.	Auto (force removed)

Press  to set or  to remove the forced point.

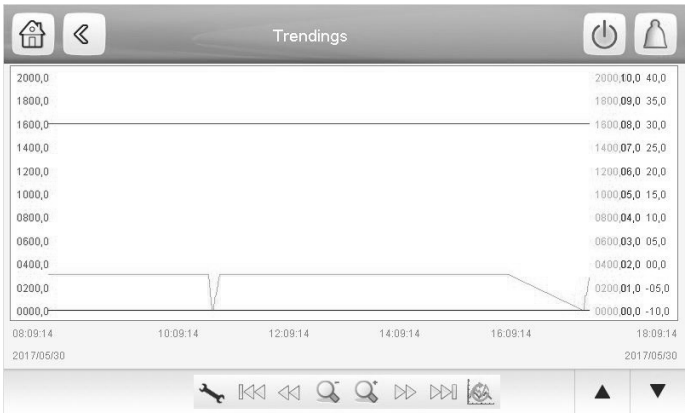
5.9 - Trending

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

- To access the Trendings screen, go to the Main menu and select **Trendings** (TRENDING).
- Select the parameters to be displayed and press the **Save** button in the lower-left part of the screen.



- Press the **Up/Down** buttons to navigate between the screens and see the graph showing the performance of the unit within a selected period of time.



Press the **Settings** button  to adjust time and date settings for the Trendings display.

Press  to navigate across the timeline

or press  to go to the beginning or the end of the selected period.

Press the **Zoom in** button  to magnify the view or the **Zoom out** button  to expand the viewed area.

Press the **Refresh** button  to reload data.

5.10 - Schedule setting

The control incorporates two time schedules, where the first one (OCCPC01S) is used for controlling the unit start/stop, whereas the second one (OCCPC02S) is used for controlling the dual setpoint.

- **The first timer program (schedule 1, OCCPC01S)** provides a means to automatically switch the unit from an occupied mode to an unoccupied mode. The unit is started during occupied periods.
- **The second timer program (schedule 2, OCCPC02S)** provides a means to automatically switch the active setpoint from an occupied setpoint to an unoccupied setpoint. Cooling setpoint 1 is used during occupied periods and cooling setpoint 2 during unoccupied periods.

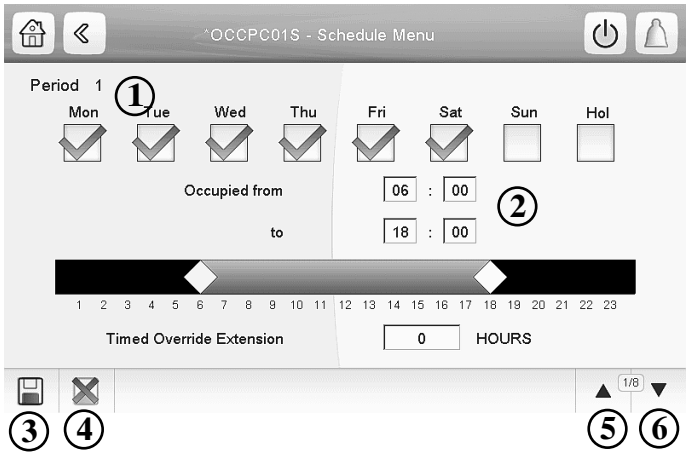
Occupancy periods

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

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

To set the unit start/stop schedule

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



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
0:00	P1							
1:00	P1							
2:00	P1							
3:00								
4:00								
5:00								
6:00								
7:00	P2	P2	P3	P4	P4	P5		
8:00	P2	P2	P3	P4	P4	P5		
9:00	P2	P2	P3	P4	P4	P5		
10:00	P2	P2	P3	P4	P4	P5		
11:00	P2	P2	P3	P4	P4	P5		
12:00	P2	P2	P3	P4	P4			
13:00	P2	P2	P3	P4	P4			
14:00	P2	P2	P3	P4	P4			
15:00	P2	P2	P3	P4	P4			
16:00	P2	P2	P3	P4	P4			
17:00	P2	P2	P3					
18:00			P3					
19:00			P3					
20:00			P3					P6
21:00								
22:00								
23:00								

Occupied

Unoccupied

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

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

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.

6 - WEB CONNECTION

6.1 - Web server connection

The Touch Pilot control can be accessed via a web browser (Internet Explorer, Mozilla Firefox, etc.) provided that HTTP server connection is enabled by the user. Connection is from a PC using a web browser with Java.

To enable web connection

1. Navigate to the Configuration menu.
2. Select *Connection config* (CONNECT).
3. Set *Enable HTTP server* [http_en].

Enable HTTP server [http_en]
disable / enable

Once the HTTP server connection is enabled, it is also possible to set the timeout for HTTP server connectivity. Web connectivity will be disabled as soon as the pre-defined timeout is reached. The HTTP timeout is by default set to 60 minutes.

To set web connection timeout

1. Navigate to the Configuration menu.
2. Select *Connection config* (CONNECT).
3. Set *HTTP server timeout(min)* [http_to].

HTTP server timeout(min) [http_to]	
0 to 1440 min	60 min

IMPORTANT: Use firewalls and VPN for secure connection. The best practice is to connect on a segregated "air-gapped" network.

6.2 - Web interface

To access the Touch Pilot control, enter the IP address of the unit in the address bar of the web browser.

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

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

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

Web connection features

- Technical documentation
- Two users controlling the unit simultaneously

The web server connection is disabled by default for security reasons. Before enabling the HTTP access on Carrier devices, make sure that your network is protected from malicious attacks and any other security threats. Do not provide open access without proper network security safeguards.

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

6.3 - 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. The last modification is always taken into account.

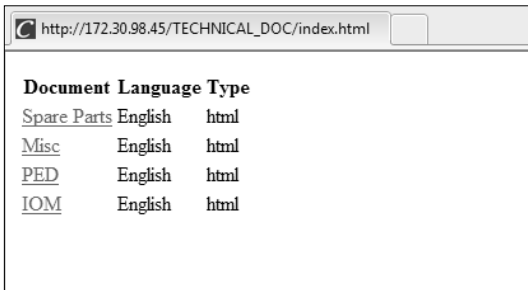
6.4 - Technical documentation

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

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.

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

7 - TOUCH PILOT CONTROL: DETAILED MENU STRUCTURE

7.1 - Main menu

Icon	Displayed text*	Description	Associated table
	General Parameters	General parameters	GENUNIT
	Temperatures	Temperatures	TEMP
	Pressures	Pressures	PRESSURE
	Inputs Status	Inputs status	INPUTS
	Outputs Status	Outputs status	OUTPUTS
	Pump Status	Pump status	PUMPSTAT
	Run Times	Run times	RUNTIME
	Modes	Modes	MODES
	Setpoint Table	Setpoints	SETPOINT
	Energy monitoring	Energy monitoring	ENERGY
	Configuration Menu	Configuration menu (see section 7.2)	CONFIG
	Trendings	Trendings **	TRENDING

* Depends on the selected language (English by default).
** The Trendings menu is displayed in form of a graph. For more information about Trendings, see section 5.9.

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

General Parameters Menu – GENUNIT

No.	Name	Status	Unit	Displayed text*	Description
1	CTRL_TYP	0 to 2	-	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	-	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	-	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	Cool		Heat/Cool status	Heating/cooling status: 30KAV are cooling-only chillers ("heating" is NOT available)
7	HC_SEL	0 to 2	-	Heat/Cool Select	Heating/cooling selection (only cooling mode is allowed)
8				0=Cool. 1=Heat. 2=Auto	0 = Cooling mode 1,2 = not applicable to this unit

General Parameters Menu – GENUNIT (continued)

No.	Name	Status	Unit	Displayed text*	Description
9	SP_SEL	0 to 2	-	Setpoint Select	Setpoint selection
10				0=Auto. 1=Spt1. 2=Spt2	0 = Auto (schedule control) 1 = Setpoint 1 (active during occupied period) 2 = Setpoint 2 (active during unoccupied period)
11	SP_OCC	no/yes	-	Setpoint Occupied?	Current setpoint
12	CAP_T	-	%	Percent Total Capacity	Total unit capacity
13	CAPA_T	-	%	Cir A Total Capacity	Circuit A capacity
14	CAPB_T	-	%	Cir B Total Capacity	Circuit B capacity
15	SP	-	°C	Current Setpoint	Current setpoint
16	CTRL_PNT	-20 to 67.2	°C	Control Point	Control point: Water temperature that the unit must produce (active setpoint + reset)
17	TOT_CURR	-	A	Actual Chiller Current	Actual chiller current
18	POW_LIM	0 to 2000	kW	Chiller Power Limit	Chiller power limit
19	COOL_POW	-	kW	Cool. Power (kit hydro)	Cooling power (optional hydronic kit)
20	EMSTOP	disable/enable	-	Emergency Stop	Emergency stop: Used to stop the unit regardless of its active operating type
21	DEM_LIM	0 to 100	%	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

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

Temperatures Menu – TEMP

No.	Name	Status	Unit	Displayed text*	Description
1	COOL_EWT	-	°C	Cooler Entering Fluid	Evaporator entering fluid temperature: Used for capacity control
2	COOL_LWT	-	°C	Cooler Leaving Fluid	Evaporator leaving fluid temperature: Used for capacity control
3	OAT	-	°C	Outdoor Air Temperature	Outdoor air temperature
4	SCT_A	-	°C	Saturated Cond Tmp cir A	Saturated condensing temperature, circuit A
5	SST_A	-	°C	Saturated Suction Temp A	Saturated suction temperature, circuit A
6	SLT_A	-	°C	Saturated Liquid Temp A	Saturated liquid temperature, circuit A
7	SUCT_A	-	°C	Compressor Suction Tmp A	Compressor suction temperature, circuit A
8	DGT_A	-	°C	Discharge Gas Temp cir A	Discharge gas temperature, circuit A
9	CP_TMP_A	-	°C	Motor Temperature cir A	Motor temperature, circuit A
10	ECO_T_A	-	°C	EXV Eco. Tmp cir A	EXV economizer temperature, circuit A
11	LIQ_T_A	-	°C	Liquid Temperature A	Liquid temperature, circuit A
12	SCT_B	-	°C	Saturated Cond Tmp cir B	Saturated condensing temperature, circuit B
13	SST_B	-	°C	Saturated Suction Temp B	Saturated suction temperature, circuit B
14	SLT_B	-	°C	Saturated Liquid Temp B	Saturated liquid temperature, circuit B
15	SUCT_B	-	°C	Compressor Suction Tmp B	Compressor suction temperature, circuit B
16	DGT_B	-	°C	Discharge Gas Temp cir B	Discharge gas temperature, circuit B
17	CP_TMP_B	-	°C	Motor Temperature cir B	Motor temperature, circuit B
18	ECO_T_B	-	°C	EXV Eco. Tmp cir B	EXV economizer temperature, circuit B
19	LIQ_T_B	-	°C	Liquid Temperature B	Liquid temperature, circuit B
20	SPACETMP	-	°C	Optional Space Temp	Optional space temperature (EMM option)
21	CHWSTEMP	-	°C	CHWS Temperature	Master/Slave common water temperature
22	T_HEATER	-	°C	Cooler Heater Temp	Evaporator heater temperature

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

Pressures Menu – PRESSURE

No.	Name	Status	Unit	Displayed text*	Description
1	DP_A	-	kPa	Discharge Pressure A	Discharge pressure, circuit A
2	SP_A	-	kPa	Main Suction Pressure A	Main suction pressure, circuit A
3	OP_A	-	kPa	Oil Pressure A	Oil pressure, circuit A
4	DOP_A	-	kPa	Oil Pressure DifferenceA	Oil Pressure difference, circuit A
5	ECO_P_A	-	kPa	Economizer Pressure A	Economizer pressure, circuit A
6	LIQ_P_A	-	kPa	Liquid Pressure A	Liquid pressure, circuit A
7	DP_B	-	kPa	Discharge Pressure B	Discharge pressure, circuit B
8	SP_B	-	kPa	Main Suction Pressure B	Main suction pressure, circuit B
9	OP_B	-	kPa	Oil Pressure B	Oil pressure, circuit B
10	DOP_B	-	kPa	Oil Pressure DifferenceB	Oil Pressure difference, circuit B
11	ECO_P_B	-	kPa	Economizer Pressure B	Economizer pressure, circuit B
12	LIQ_P_B	-	kPa	Liquid Pressure B	Liquid pressure, circuit B
13	EWATPRES	-	kPa	Entering water pressure	Entering water pressure
14	LWATPRES	-	kPa	Leaving water pressure	Leaving water pressure
15	WATPRES3	-	kPa	Water pressure 3	Not applicable to this unit
16	WATPRES4	-	kPa	Water pressure 4	Not applicable to this unit

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

Inputs Status Menu – INPUTS

No.	Name	Status	Unit	Displayed text*	Description
1	ONOFF_SW	open/close	-	Remote On/Off Switch	Remote on/off switch
2	SETP_SW	open/close	-	Remote Setpoint Switch	Remote cooling setpoint selection switch
3	LIM_SW1	open/close	-	Limit Switch 1	Demand limit switch 1
4	LIM_SW2	open/close	-	Limit Switch 2	Demand limit switch 2 (EMM option)
5	OIL_L_A	open/close	-	Oil Level Input A	Oil level input, circuit A
6	OIL_L_B	open/close	-	Oil Level Input B	Oil level input, circuit B
7	SP_RESET	-	mA	Reset/Setpnt4-20mA Sgnl	4-20 mA signal, setpoint reset
8	LIM_ANAL	-	mA	Limit 4-20mA Signal	4-20 mA signal, capacity limit
9	leak_v	-	V	Leakage detector 1 val	Refrigerant leakage detection (optional)
10	leak_2_v	-	V	Leakage detector 2 val	Refrigerant leakage detection (optional)
11	REM_LOCK	open/close	-	Customer Interlock	Customer interlock: When the contact is closed, the unit will be stopped with no delay. The switch is provided on the customer's terminal block of the optional EMM.
12	ICE_SW	open/close	-	Ice Done Storage Switch	Ice storage end switch
13	OCC_OVSW	open/close	-	Occupied Override Switch	Occupied override switch
14	RECL_SW	open/close	-	Remote Reclaim switch	Remote reclaim switch
15	ELEC_BOX	open/close	-	Electrical box Interlock	Electrical box interlock
16	HEATR_SW	open/close	-	Cooler Heater Detector	Evaporator heater
17	bacdongl	no/yes	-	BACnet dongle	BACnet dongle: Used when the unit is incorporated into the BACnet network

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

Outputs Status Menu – OUTPUTS

No.	Name	Status	Unit	Displayed text*	Description
1	CP_A	off/on	-	Compressor A	Compressor A status
2	OIL_SL_A	off/on	-	Oil Solenoid Output A	Oil solenoid output, circuit A
3	CAPT010A	0 to 10	V	Capacity Signal Cir A	0-10V capacity signal, circuit A
4	VFAN_A	0 to 100	%	VariFan Speed A	Variable speed fan, circuit A
5	ISO_CL_A	off/on	-	Ref Iso Valve Close A	Refrigerant isolation valve closed, circuit A

Outputs Status Menu – OUTPUTS (continued)

No.	Name	Status	Unit	Displayed text*	Description
6	ISO_OP_A	off/on	-	Ref Iso Valve Open A	Refrigerant isolation valve open, circuit A
7	ISO_POSA	close/open	-	Ref Iso Valve pos. A	Refrigerant isolation valve position, circuit A
8	OIL_HT_A	off/on	-	Oil Heater Output A	Oil heater output, circuit A
9	CP_B	off/on	-	Compressor B	Compressor B status
10	OIL_SL_B	off/on	-	Oil Solenoid Output B	Oil solenoid output, circuit B
11	CAPT010B	0 to 10	V	Capacity Signal Cir B	0-10V capacity signal, circuit B
12	VFAN_B	0 to 100	%	VariFan Speed B	Variable speed fan, circuit B
13	ISO_CL_B	off/on	-	Ref Iso Valve Close B	Refrigerant isolation valve closed, circuit B
14	ISO_OP_B	off/on	-	Ref Iso Valve Open B	Refrigerant isolation valve open, circuit B
15	ISO_POSB	close/open	-	Ref Iso Valve pos. B	Refrigerant isolation valve position, circuit B
16	OIL_HT_B	off/on	-	Oil Heater Output B	Oil heater output, circuit B
17	CAPT_010	0 to 10	V	Chiller Capacity signal	Chiller capacity signal
18	ALARM	off/on	-	Alarm Relay Status	Alarm relay status on = at least one circuit is stopped because of the existing alarm(s)
19	RUNNING	off/on	-	Running Relay Status	Running relay status on = chiller (or at least one pump) is running
20	ALERT	off/on	-	Alert Relay State	Alert relay status on = alarm that does not stop the circuit or the unit is triggered
21	SHUTDOWN	off/on	-	Shutdown Indicator State	Shutdown indicator state on = unit shuts down because of the existing alarm(s)
22	C_HEATER	off/on	-	Cooler Heater Output	Cooler heater output
23	ELECBFAN	off/on	-	Electrical box fan	Electrical box fan
24	ELEBFAN2	off/on	-	Electrical box fan 2	Electrical box fan 2
25	VI_CMP_A	off/on	-	VI compressor command A	Vi compressor control command A
26	VI_CMP_B	off/on	-	VI compressor command B	Vi compressor control command B
27	READY	off/on	-	Ready or Running Status	Ready or Running Status on = chiller is running off = chiller is stopped
28	WTANK_HT	off/on	-	Water Tank heater	Water Tank heater

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

Pump Status Menu – PUMPSTAT

No.	Name	Status	Unit	Displayed text*	Description
1	SET_FLOW	no/yes	-	Cooler Flow Setpoint Out	Evaporator flow setpoint output
2	CPUMP_1	off/on	-	Cooler Pump #1 Command	Evaporator pump 1 control enabled
3	CPUMP_2	off/on	-	Cooler Pump #2 Command	Evaporator pump 2 control enabled
4	ROTCPUMP	no/yes	-	Rotate Cooler Pumps ?	Evaporator pumps rotation
5	FLOW_SW	open/close	-	Cooler Flow Switch	Evaporator flow switch
6	VPMP_CMD	0 to 100	%	Variable speed pump cmd	Variable speed pump command
7	WAT_FLOW	-	l/s	Water flow (kit hydro)	Water flow (hydronic kit)
8	pmpStat	0 to 14	-	Pump Control Status	0 = Pump stopped 1 = Temp. delta control 2 = Pressure delta control 3 = Constant pressure control 4 = Fixed speed control Override: 11 = Low water temperature 12 = Freeze protection 13 = Prevention of max flow 14 = Protection against max flow

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

Run Times Menu – RUNTIME

No.	Name	Status	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_cp_a1	-	hour	Compressor A1 Hours	Operating hours, compressor A1
4	st_cp_a1	-	-	Compressor A1 Starts	Number of starts, compressor A1
5	hr_cp_b1	-	hour	Compressor B1 Hours	Operating hours, compressor B1
6	st_cp_b1	-	-	Compressor B1 Starts	Number of starts, compressor B1
7	hr_cpum1	-	hour	Cooler Pump #1 Hours	Operating hours, evaporator pump 1
8	hr_cpum2	-	hour	Cooler Pump #2 Hours	Operating hours, evaporator pump 2
9	hrfana1	-	hour	Circuit A Fan #1 Hours	Operating hours, fan A1
10	hrfana2	-	hour	Circuit A Fan #2 Hours	Operating hours, fan A2
11	hrfana3	-	hour	Circuit A Fan #3 Hours	Operating hours, fan A3
12	hrfana4	-	hour	Circuit A Fan #4 Hours	Operating hours, fan A4
13	hrfana5	-	hour	Circuit A Fan #5 Hours	Operating hours, fan A5
14	hrfana6	-	hour	Circuit A Fan #6 Hours	Operating hours, fan A6
15	hrfana7	-	hour	Circuit A Fan #7 Hours	Operating hours, fan A7
16	hrfana8	-	hour	Circuit A Fan #8 Hours	Operating hours, fan A8
17	hrfana9	-	hour	Circuit A Fan #9 Hours	Operating hours, fan A9
18	hrfana10	-	hour	Circuit A Fan #10 Hours	Operating hours, fan A10
19	hrfana11	-	hour	Circuit A Fan #11 Hours	Operating hours, fan A11
20	hrfana12	-	hour	Circuit A Fan #12 Hours	Operating hours, fan A12
21	hrfana13	-	hour	Circuit A Fan #13 Hours	Operating hours, fan A13
22	hrfana14	-	hour	Circuit A Fan #14 Hours	Operating hours, fan A14
23	hrfanb1	-	hour	Circuit B Fan #1 Hours	Operating hours, fan B1
24	hrfanb2	-	hour	Circuit B Fan #2 Hours	Operating hours, fan B2
25	hrfanb3	-	hour	Circuit B Fan #3 Hours	Operating hours, fan B3
26	hrfanb4	-	hour	Circuit B Fan #4 Hours	Operating hours, fan B4
27	hrfanb5	-	hour	Circuit B Fan #5 Hours	Operating hours, fan B5
28	hrfanb6	-	hour	Circuit B Fan #6 Hours	Operating hours, fan B6
29	hrfanb7	-	hour	Circuit B Fan #7 Hours	Operating hours, fan B7
30	hrfanb8	-	hour	Circuit B Fan #8 Hours	Operating hours, fan B8
31	hrfanb9	-	hour	Circuit B Fan #9 Hours	Operating hours, fan B9
32	hrfanb10	-	hour	Circuit B Fan #10 Hours	Operating hours, fan B10
33	hrfanb11	-	hour	Circuit B Fan #11 Hours	Operating hours, fan B11
34	hrfanb12	-	hour	Circuit B Fan #12 Hours	Operating hours, fan B12
35	hrfanb13	-	hour	Circuit B Fan #13 Hours	Operating hours, fan B13
36	hrfanb14	-	hour	Circuit B Fan #14 Hours	Operating hours, fan B14

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

Modes Menu – MODES

No.	Name	Status	Unit	Displayed text*	Description
1	m_delay	no/yes	-	Start Up Delay In Effect	Start-up delay in effect
2	m_2stpt	no/yes	-	Second Setpoint In Use	Second setpoint in use
3	m_reset	no/yes	-	Reset In Effect	Setpoint reset active
4	m_demlim	no/yes	-	Demand limit active	Demand limit active
5	m_pmprot	no/yes	-	Cooler Pump Rotation	Evaporator pump rotation
6	m_pmpper	no/yes	-	Pump Periodic Start	Pump periodic start active
7	m_night	no/yes	-	Night Low Noise Active	Night low noise active
8	m_slave	no/yes	-	Master Slave Active	Master/Slave mode active
9	m_autoch	no/yes	-	Auto Changeover Active	Not applicable to this unit
10	m_cpmpro	no/yes	-	Condenser Pump Rotation	Not applicable to this unit
11	m_cpmppr	no/yes	-	Cond Pump Periodic Start	Not applicable to this unit
12	m_ice	no/yes	-	Ice Mode In Effect	Ice mode active

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

Energy Monitoring Menu – ENERGY

No.	Name	Status	Unit	Displayed text*	Description
1	coolPowT	-	kW	Cooling Power Total	Cooling power (circuit A + circuit B)
2	powIn	-	kW	Electrical Power input	Electrical power input of compressors and fans (estimated if EC fans are selected)
3	eer	-	-	Energy Efficiency	Energy efficiency (circuit A + circuit B)
4					
5	energOut	-	kWh	Cooling Energy output	Cooling energy output
6	energyIn	-	kWh	Electrical Energy input	Electrical energy input of compressors and fans (estimated if EC fans are selected)
7	energEER	-	-	Integrated EER	Integrated EER (Energy Efficiency Ratio)
8	reset_en	no/yes	-	Reset energy counter	Used to reset energy counter
9	reset_da	-	-	Last Reset Date	Last reset date
10	reset_ti	-	-	Last Reset time	Last reset time
11					
12	powPmp	-	kW	Pump Elec Power Input	Pump electric power input
13	energyP	-	kWh	Pump Elec Energy Input	Pump electric energy input
14	resetpmp	no/yes	-	Reset pump energy	Used to reset pump energy counter
15	pmp_date	-	-	Pump Last Reset Date	Last reset date (pump)
16	pmp_time	-	-	Pump Last Reset time	Last reset time (pump)

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

Setpoint Menu – SETPOINT

No.	Name	Status	Default	Unit	Displayed text*	Description
1	csp1	-28.9 to 26	6.7	°C	Cooling Setpoint 1	Cooling setpoint 1 (used during occupied periods)
2	csp2	-28.9 to 26	6.7	°C	Cooling Setpoint 2	Cooling setpoint 2 (used during unoccupied periods)
3	ice_sp	-28.9 to 26	6.7	°C	Cooling Ice Setpoint	Ice storage setpoint
4	cramp_sp	0.1 to 11.1	0.5	K	Cooling Ramp Loading	Cooling ramp loading setpoint (rate at which the water temperature may change within one minute in Cooling mode)
5	hsp1	26.7 to 63	37.8	°C	Heating Setpoint 1	Not applicable to this unit
6	hsp2	26.7 to 63	37.8	°C	Heating Setpoint 2	Not applicable to this unit
7	hramp_sp	0.1 to 11.1	0.5	K	Heating Ramp Loading	Not applicable to this unit
8	cauto_sp	3.9 to 50	23.9	°C	Cool Changeover Setpt	Not applicable to this unit
9	hauto_sp	0 to 46	17.8	°C	Heat Changeover Setpt	Not applicable to this unit
10	vpmpdtsp	1 to 29	5	K	Varipump Delta Temp Stp	Variable speed pump, water flow based on delta T control
11	vpmpdpsp	50 to 620	200	kPa	Varipump Pressure Stp	Variable speed pump pressure setpoint
12	lim_sp1	0 to 100	100	%	Switch Limit Setpoint 1	Demand limit setpoint 1
13	lim_sp2	0 to 100	100	%	Switch Limit Setpoint 2	Demand limit setpoint 2
14	lim_sp3	0 to 100	100	%	Switch Limit Setpoint 3	Demand limit setpoint 3

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

7.2 - Configuration menu

Icon	Displayed text*	Description	Associated table
	General Configuration	General configuration	GEN_CONF
	Pump Configuration	Pump configuration	PUMPCONF
	User Configuration	User configuration	USERCONF
	Reset Configuration	Reset configuration	RESETCFG
	Schedule Menu	Schedule menu	SCHEDULE
	Holiday Menu	Holiday menu	HOLIDAY
	Broadcast Menu	Broadcast menu	BROCASTS
	Date/Time Configuration	Date/Time configuration	DATETIME
	Control Identification	Control identification	CTRL_ID
	Connection config	Web connection configuration	CONNECT

*Depends on the selected language (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	seq_typ	no/yes	no	-	Staged Loading Sequence	Loading sequence: no = Equal loading sequence yes = Staged loading sequence
5	ramp_sel	no/yes	no	-	Ramp Loading Select	Ramp loading selection
6	transcap	30 to 80	50	%	Cap. to start 2nd cir	Capacity required in order to start the second circuit
7	off_on_d	1 to 15	1	min	Unit Off to On Delay	Unit Off to On delay
8	lim_sel	0 to 2	0	-	Demand Limit Type Select	Demand limit selection
9					0 = None	0 = None
10					1 = Switch Control	1 = Switch Control
11					2 = 4-20mA Control	2 = 4-20mA Control
12	nh_start	00:00	00:00	-	Night Mode Start Hour	Night mode start hour (compressor capacity is reduced during the night mode)
13	nh_end	00:00	00:00	-	Night Mode End Hour	Night mode end hour
14	nh_limit	0 to 100	100	%	Night Capacity Limit	Night capacity limit
15	pow_sel	no/yes	no	-	Power Limit select	Not applicable to this unit
16	ice_cnfg	no/yes	no	-	Ice Mode Enable	Ice mode enabled
17	pow_max	0 to 2000	2000	kW	Maximum Power Limit	Not applicable to this unit
18	shortcyc	no/yes	no	-	short cycle management	Short cycle management

General Configuration Menu – GEN_CONF(continued)

No.	Name	Status	Default	Unit	Displayed text*	Description
19	ln_start	00:00	00:00	-	Low Noise Start Hour	Low noise option / Fan speed limitation (beginning of Low Noise mode)
20	ln_end	00:00	00:00	-	Low Noise End Hour	Low noise option / Fan speed limitation (end of Low Noise mode)
21	ln_limit	60 to 100	75	%	Low Noise Fan freq limit	Fan speed during the time when the Low Noise option is enabled

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

Pump Configuration Menu – PUMPCONF

No.	Name	Status	Default	Unit	Displayed text*	Description
1	cpumpseq	0 to 4	0	-	Cooler Pumps Sequence	Evaporator pumps' sequence
2					0 = No Pump	0 = No Pump
3					1 = One Pump Only	1 = One Pump Only
4					2 = Two Pumps Auto	2 = Two Pumps Auto (units with two pumps)
5					3 = Pump#1 Manual	3 = Pump#1 Manual
6					4 = Pump#2 Manual	4 = Pump#2 Manual
7	pump_del	24 to 3000	48	hour	Pump Auto Rotation Delay	Pump auto rotation delay (units with two pumps and 'auto control' enabled)
8	pump_per	no/yes	no	-	Pump Sticking Protection	Pump anti-sticking protection
9	pump_sby	no/yes	no	-	Stop Pump During Standby	Pump stopped during standby
10	pump_loc	no/yes	yes	-	Flow Checked If Pump Off	Water flow is checked when the pump is off
11	stopheat	no/yes	no	-	Cooler Pump Off In Heat	Not applicable to this unit
12	stopcool	no/yes	no	-	Cond Pump Off In Cool	Not applicable to this unit
13	varipump	1 to 4	1	-	VSPump regulation config	Variable speed pump regulation configuration: 1 = Control variable speed pump on delta temperature 2 = Control variable speed pump on delta pressure (applicable to internal pumps only) 3 = Control variable speed pump on constant output pressure 4 = Variable speed pump fixed speed control

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

User Configuration Menu – USERCONF

No.	Name	Status	Default	Unit	Displayed text*	Description
1	use_pass	1 to 9999	11	-	User Password	User password (provides access to basic configuration parameters)
2	lng_list	0 to 1	1	-	Language List	Language list selection
3					0 = eng/spa/fre/ger/dut	Languages available on the user interface when "Language list" is set to "0"
4					chi/ita/por/rus/und	
5					1 = eng/spa/fre/ger/dut	Languages available on the user interface when "Language list" is set to "1"
6					tur/ita/por/rus/und	

*Depends on the selected language (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	Cooling reset selection
2	hr_sel	0 to 4	0	-	Heating Reset Select	Not applicable to this unit
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 = 4-20mA control
6						
7					Cooling	Cooling
8	oat_crno	-10 to 51.7	-10	°C	OAT No Reset Value	OAT, no reset value
9	oat_crfu	-10 to 51.7	-10	°C	OAT Full Reset Value	OAT, full reset value
10	dt_cr_no	0 to 14	0	K	Delta T No Reset Value	Delta T, no reset value
11	dt_cr_fu	0 to 14	0	K	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	-10	°C	Space T No Reset Value	Space temperature, no reset value
15	spacr_fu	-10 to 51.7	-10	°C	Space T Full Reset Value	Space temperature, max. reset value
16	cr_deg	-16.7 to 16.7	0	K	Cooling Reset Deg. Value	Maximum cooling reset value
17						
18					Heating	Not applicable to this unit
19	oat_hrno	-10 to 51.7	-10	°C	OAT No Reset Value	Not applicable to this unit
20	oat_hrfu	-10 to 51.7	-10	°C	OAT Full Reset Value	Not applicable to this unit
21	dt_hr_no	0 to 14	0	K	Delta T No Reset Value	Not applicable to this unit
22	dt_hr_fu	0 to 14	0	K	Delta T Full Reset Value	Not applicable to this unit
23	v_hr_no	0 to 20	0	mA	Current No Reset Value	Not applicable to this unit
24	v_hr_fu	0 to 20	0	mA	Current Full Reset Value	Not applicable to this unit
25	spahr_no	-10 to 51.7	-10	°C	Space T No Reset Value	Not applicable to this unit
26	spahr_fu	-10 to 51.7	-10	°C	Space T Full Reset Value	Not applicable to this unit
27	hr_deg	-16.7 to 16.7	0	K	Heating Reset Deg. Value	Not applicable to this unit

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

Schedule Menu – SCHEDULE

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

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

Holiday Menu – HOLIDAY

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

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

Broadcast Menu – BROCASTS

No.	Name	Status	Default	Displayed text*	Description
1	ccnbroad	0/1/2	2	Activate	Not applicable to this unit
2					
3				OAT Broadcast	
4	oatbusnm	0 to 239	0	Bus #	Bus number of the unit with the outdoor temperature sensor
5	oatlocad	0 to 239	0	Element #	Element number of the unit with the outdoor temperature sensor
6					
7	dayl_sel	Disable/Enable	Disable	DAYLIGHT SAVING SELECT	Summer/winter time activation (daylight saving selection)
8				ENTERING	
9	startmon	1 to 12	3	Month	Month
10	startdow	1 to 7	7	Day of week (1=Monday)	Day of the week **
11	startwom	1 to 5	5	Week Number of Month	Week of the month
12				LEAVING	
13	stopmon	1 to 12	10	Month	Month
14	stoptdow	1 to 7	7	Day of week (1=Monday)	Day of the week **
15	stopwom	1 to 5	5	Week Number of Month	Week of the month

* Depends on the selected language (English by default).
** Daylight Saving Time (DST) usually starts/ends on Sunday morning (7). The clock goes 1 hour forward when entering and 1 hour backward when leaving DST. The change normally occurs at 2:00 A.M.

Date/Time Configuration Menu – DATETIME

No.	Name	Status	Unit	Displayed text*	Description
Date (DD/MM/YY)					
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	hour	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

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

Control Identification Menu – CTRL_ID

No.	Status	Default	Displayed text*	Description
1	0-239	0	CCN Element Number	Element number
2	0-239	1	CCN Bus Number	Bus number
3	9600 / 19200 / 38400	9600	CCN Baud Rate	Communication speed
4				
5	-	30KAV	Device Description	Unit description
6	-	-	Location Description	Location description: The number corresponds to the country
7	-	ECG-SR-20MF2010	Software Part Number	Software version
8	-	-	Serial Number	Serial number (MAC address)

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

Connection config Menu – CONNECT

No.	Name	Status	Default	Unit	Displayed text*	Description
1	http_en	disable/enable	0	-	Enable HTTP server	Used to enable the http port for HMI web connection
2	http_to	0 to 1440	60	-	HTTP server timeout(min)	Used to enable http port timeout. Once this timeout period has elapsed, the http port is disabled again (0 = always enabled)

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

7.3 - Alarms menu

Icon	Displayed text*	Description	Associated table
	Reset Alarms	Alarms reset	ALARMRST
	Current Alarms	Current alarms	CUR_ALM
	Alarm Historic	Alarms history	ALMHIST1
	Major Alarm Historic	Major alarms history	ALMHIST2

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

8 - TOUCH PILOT CONTROL OPERATION

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 triggered due to operating conditions.

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

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

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

- **Start/stop force command [CHIL_S_S]:** Unit start/stop force command can be used to control the unit state in the Network operating type.
  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 can be used to control the unit state in the Remote operating type.
- **Master control type [ms_ctrl]:** When the unit is the master unit in a two-unit 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 [EMMSTOP]:** If activated, the unit shuts down regardless of the active operating type.
- **General alarm:** The unit shuts down due to failure.

Active operating type						Parameters status						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		
-	-	-	-	-	-	-	-	-	-	enabled	-	-	off
-	-	-	-	-	-	-	-	-	-	-	yes	-	off
active	-	-	-	-	-	-	-	-	-	-	-	local	off
-	-	active	-	-	-	-	-	-	unoccupied	-	-	local	off
-	-	-	active	-	-	-	open	-	-	-	-	remote	off
-	-	-	active	-	-	-	-	-	unoccupied	-	-	remote	off
-	-	-	-	active	-	disabled	-	-	-	-	-	network	off
-	-	-	-	active	-	-	-	-	unoccupied	-	-	network	off
-	-	-	-	-	active	-	-	local	unoccupied	-	-	local	off
-	-	-	-	-	active	-	open	remote	-	-	-	remote	off
-	-	-	-	-	active	-	-	remote	unoccupied	-	-	remote	off
-	-	-	-	-	active	disabled	-	network	-	-	-	network	off
-	-	-	-	-	active	-	-	network	unoccupied	-	-	network	off
-	active	-	-	-	-	-	-	-	-	disabled	no	local	on
-	-	active	-	-	-	-	-	-	occupied	disabled	no	local	on
-	-	-	active	-	-	-	closed	-	occupied	disabled	no	remote	on
-	-	-	-	active	-	enabled	-	-	occupied	disabled	no	network	on
-	-	-	-	-	active	-	-	local	occupied	disabled	no	local	on
-	-	-	-	-	active	-	closed	remote	occupied	disabled	no	remote	on
-	-	-	-	-	active	enabled	-	network	occupied	disabled	no	network	on

Start-up delay

When changing the operating type (Local/Remote/Network), the control normally undergoes the transition stage during which the unit is stopped, and then allowed to start again (start-up delay is applied).

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.

Unit stop function

This function controls the unit compressor capacity reduction. If there is an alarm or a demand to stop, it forces the compressors to the minimum capacity before stopping them.

8.2 - Pumps control

The Touch Pilot control can manage one or two water exchanger pumps, i.e. either two internal variable speed pumps or up to two customer pumps. Both pumps cannot run together. The pump is turned on when this option is configured and when the unit is running.

The pump is turned off when 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 the water exchanger heater is active. If the pump has failed and another pump is available, the unit is stopped and started again with the second pump. If there is no pump available, the unit shuts down.

Configuration options may differ depending on the number of pumps available. The status of the pump can be checked via the Main menu (PUMPSTAT – Pump Status).

8.2.1 - Pumps configuration

Basic pump configuration can be performed via the Configuration menu (PUMPCONF – Pump Configuration). Only logged-in users can access the menu. To modify any pump settings, the unit must be stopped. For units with two pumps, these pumps can be controlled automatically or each pump can be started manually.

NOTE: Units are also fitted with the flow switch allowing for the water flow control (see section 3.7).

Internal pumps configuration

30KAV units can be fitted with two internal variable speed pumps controlled by the LEN drive.

To set internal cooler pumps

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

Cooler Pumps Sequence [cpumpseq] *	
0 = No Pump	3 = Pump#1 Manual
1 = One Pump Only *	4 = Pump#2 Manual
2 = Two Pumps Auto	

*It is not possible to set only one variable speed pump control.

Customer pumps configuration

30KAV units can be fitted with up to two customer fixed speed pumps or one customer variable speed pump (0-10V). For units without internal pumps, customer pumps may be configured as follows:

Pump available	**Cooler Pumps Sequence**
No pump	0
One single speed pump	1
One variable speed pump (0-10V)	1 (option 299)
Two single speed pumps	2 = automatic control of two pumps 3 = pump 1 is selected 4 = pump 2 is selected

To set the customer cooler pump(s)

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

Cooler Pumps Sequence [cpumpseq] *	
0 = No Pump	3 = Pump#1 Manual
1 = One Pump Only	4 = Pump#2 Manual
2 = Two Pumps Auto	

*Values between 2 and 4 can be selected only in case of dual pumps control.

8.2.2 - Automatic pump selection

If two pumps are controlled and the automatic pump control has been selected (Cooler Pumps Sequence, PUMPCONF – Pump Configuration), the control determines which pump should be started. The control tries to limit the pump run time to the configured pump changeover delay (Pump Auto Rotation Delay, PUMPCONF – Pump Configuration). If this delay has elapsed, then pump changeover is activated.

To set pump automatic rotation delay

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

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

8.2.3 - Pump protection (pump anti-stick function)

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

The heater for the heat exchanger and the water pump (for units with a pump) can be energised so that it protects the heat exchanger or the water pump against any damage when the unit is shut down for a long time at low outdoor temperature.

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

To set periodical pump quick start

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

8.3 - Control point

The control point represents the water temperature that the unit must produce. It enables to decrease the required capacity depending on the unit load operating conditions.

control point = active setpoint + reset

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

8.3.1 - Active setpoint

Two setpoints can be selected, where the first cooling setpoint is normally used during occupied periods and the second cooling setpoint is used during unoccupied periods. The third cooling setpoint is used for ice storage (ice configuration and EMM SIOB required).

Cooling setpoint 1	Cooling setpoint 2	Cooling setpoint 3
Occupied period	Unoccupied period	Ice storage cooling setpoint

Depending on the current operation type (local/remote/network), the active setpoint can be selected manually via the Main menu in Local mode, with the volt-free user contacts in Remote mode, with network commands in Network mode (CCN or BACnet) or automatically with the setpoint time schedule (schedule 2).

The following tables summarise the possible setpoint selections based on the control operating type (local, remote, network) and the following parameters:

- **Local parameters:**
  - o Cooling operating mode (hc_sel, GENUNIT).
  - o Setpoint selection (sp_sel, GENUNIT).
- **Remote setpoint contacts:**
  - o Ice configuration from the user configuration menu (GEN_CONF, Ice_cnfg must be set to "yes").
  - o Ice done contact from EMM (SIOB EMM board, DI4; ICE_SW, by default set to "closed").
  - o Dual setpoint switch status (setp_sw, INPUTS).
- **Network settings:**
  - o Schedule 2 status for setpoint selection (GENUNIT, SP_OCC set to "yes" or "no").

Local operating type

Parameter status						Active setpoint
hc_sel	sp_sel	ice_cnfg	ice_sw	setp_sw	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

(*): any configuration (-): default configuration

Remote operating type

Parameter status						Active setpoint
hc_sel	sp_sel	ice_cnfg	ice_sw	setp_sw	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

(*): any configuration (-): default configuration

Network operating type

Parameter status						Active setpoint
hc_sel	sp_sel	ice_cnfg	ice_sw	setp_sw	sp_occ	
cool	-	-	*	*	occupied	cooling setpoint 1
cool	-	no	*	*	unoccupied	cooling setpoint 2
cool	-	yes	close	*	unoccupied	cooling setpoint 2
cool	-	yes	open	*	unoccupied	ice setpoint

(*): any configuration (-): default configuration

NOTE: Ice storage configuration [ice_cnfg] and ice done contact [ice_sw] apply only to units with the optional energy management module.

8.3.2 - Reset

Reset means the active setpoint is modified so that less machine capacity is required. In the cooling mode the setpoint is increased and this modification is in general a reaction to a drop in the load.

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. When the outdoor air temperature decreases, the cooling demand decreases as well and the active setpoint will be decreased thanks to the applied reset.
- 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 (EMM option) which provides the reading taken from the space temperature input located on the optional EMM board.

The source of the reset can be configured in the Reset Configuration menu (RESETCFG).

In response to a change in OAT, delta T, 4-20 mA reset signal reading, or space temperature, the control point is reset to optimise unit performance.

In response to a drop in the reset source, the cooling setpoint is normally reset upwards in order to optimise unit performance.

To set Cooling Reset Select

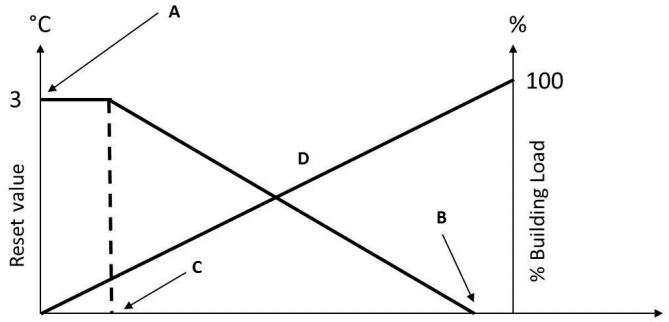
1. Navigate to the Configuration menu.
2. Select *Reset Configuration* (RESETCFG).
3. Set *Cooling Reset Select* [cr_sel].

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

The amount of reset is determined by linear interpolation based on the following 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 reset value.

Reset example in Cooling mode



10°C	OAT	20°C
3	Reset based on delta T	5
4	Reset based on analogue input (4-20 mA)	20
10°C	Reset based on space temperature	20°C
no reset	**selection**	**full reset**

Legend:
A: Maximum reset value
B: OAT / delta T / 4-20 mA / Space temp. for no reset
C: OAT / delta T / 4-20 mA / Space temp. for full reset
D: Building load

8.4 - 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).

8.5 - Capacity limitation

The Touch Pilot control system allows for the constant control of the unit capacity by setting its maximum allowable capacity. Capacity limitation is expressed in percentage, where a limit value of 100% means that the unit may run with its full capacity (no limitation is implemented).

The main control system enables to limit the unit capacity using one of the external orders:

- By means of user-controlled volt-free contacts.
  Units without the energy management module have one contact (lim_sw1). Units with the energy management module have an additional contact (lim_sw2) which permits three capacity limitation levels (see section 3.8.4). The unit capacity should not exceed the limit setpoint activated by these contacts. The limit setpoints can be modified in the SETPOINT menu.
- By lag limit set by the master unit (master/slave assembly).
- By night mode limitation control. The demand limit value in the night mode is selectable if the value is below the selected demand limit.

Demand limit can be forced when the unit is operating in Network mode.

To set Switch Limit Setpoint

1. Navigate to the Main menu.
2. Select *Setpoint Table* (SETPOINT).
3. Set *Switch Limit Setpoint 1 / 2 / 3* [lim_sp1/lim_sp2/lim_sp3].

Switch Limit Setpoint 1 [lim_sp1] Switch Limit Setpoint 2 [lim_sp2] Switch Limit Setpoint 3 [lim_sp3]
0 to 100%

To set Night Capacity limitation

1. Navigate to the Configuration menu.
2. Select *General Configuration* (GEN_CONF).
3. Set *Night Capacity Limit* [nh_limit].

Night Capacity Limit [nh_limit]
0 to 100%

To verify the active demand limit value

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

Active Demand Limit Val [DEM_LIM]
0 to 100%

WARNING: Under specific operating conditions, the unit capacity limit can be exceeded to ensure the safety of the unit.

8.6 - Capacity control

This function adjusts the capacity using the variable speed compressor to keep the water exchanger temperature at its setpoint. The control system continuously takes account of the temperature error with respect to the setpoint, the rate of change in this error and the difference between entering and leaving water temperatures in order to determine the optimal moment at which to add or withdraw capacity.

Compressors are started and stopped in a sequence designed to equalise the number of start-ups (value weighted by their operating time). For more information about compressors sequence, see section 8.14.

8.7 - Night mode

Night mode allows users to configure the unit to operate with specific parameters in a pre-defined time period.

The night period is defined by a start time and an end time that are the same for each day of the week. During the night period the unit capacity is limited.

The Night mode settings or the maximum capacity value can be configured via the Configuration menu (GEN_CONF – General Configuration).

8.8 - Low noise mode

The low noise function is used to reduce the noise level by limiting the speed of the fans during a predefined period of time.

The "low noise" mode is defined by a start time and an end time that are the same for each day of the week. Low noise settings as well as the maximum fan speed can be configured via the Configuration menu (GEN_CONF – General Configuration).

The "low noise" mode is different from the "low noise" option (15LS). Low noise mode and Low noise option are compatible. The configuration needs to be done carefully to avoid problems caused by too low fan speed.

8.9 - Head pressure control

The condensing pressure of each circuit is controlled by variable speed fans. The fan speed is controlled in each circuit based on the outdoor air temperature, water exchanger fluid temperature and circuit capacity.

8.10 - Refrigerant gas leak detection (option 159)

The control permits refrigerant leak detection. Two additional sensors that detect the refrigerant concentration in the air must be installed on the unit.

If one of these sensors detects an abnormal refrigerant level for more than one hour, the alarm will be triggered, but the unit will continue to operate.

8.11 - Automatic refrigerant leak detection

As standard the controller has the functionality allowing for detecting lack of refrigerant. Whenever the system detects the possible refrigerant shortage, the alarm informing about the necessity of service intervention will be triggered (10110 for circuit A and 10111 for circuit B).

The refrigerant leak detection control is based on an algorithm that monitors several operating parameters, including refrigerant pressure and temperature.

The effectiveness of the detection algorithm is not guaranteed when circuit capacity is lower than 50% and when leaving water temperature is below 7°C.

8.12 - 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 control.

NOTE: BACnet option can be installed only by Carrier service technicians.

8.13 - Circuit lead/lag selection

This function determines the lead and lag circuit on dual-circuit units. It controls the start/stop sequence of the refrigeration circuits called circuit A or circuit B.

The circuit authorised to start first is the lead circuit. Lead circuit is used first for capacity increases and at the same time should be decreased last when decreasing capacity.

The lead/lag circuits can be selected manually or automatically according to the unit configuration (GEN_CONF).

- **Automatic lead/lag circuit determination:** The control system determines the lead circuit to equalise the operating time of each circuit (value weighted by the number of start-ups of each circuit). As a result, the circuit with the lowest number of operating hours always starts first.
- **Manual lead/lag circuit determination:** Circuit A or B selected as the lead circuit. The selected circuit is always the leader. It is the first to start and the last to stop.

To set lead/lag circuit

1. Navigate to the Configuration menu.
2. Select *General Configuration* (GEN_CONF).
3. Set *Cir Priority Sequence* [prio_cir].

Cir Priority Sequence [prio_cir]
0 = Automatic lead/lag selection
1 = Circuit A priority
2 = Circuit B priority

8.14 - Circuit capacity loading sequence

This function determines in which order the circuit capacity is changed. Compressor loading is based on compressor control.

Two types of compressor loading sequences are available and can be configured by setting the Loading Sequence parameter [seq_typ] via the Touch Pilot user interface (GEN_CONF).

- **Balanced loading sequence ("seq_typ" set to "no"):** The control maintains equal capacity between both circuits as the machine loads and unloads. The lag circuit can be started when the pre-defined capacity of the lead circuit is reached, i.e. 50% by default.
- **Staged loading sequence ("seq_typ" set to "yes"):** The control loads the lead circuit completely before the lag circuit is started. When the load is decreasing, the lag circuit is unloaded first.

To set loading sequence

1. Navigate to the Configuration menu.
2. Select *General Configuration* (GEN_CONF).
3. Set *Staged Loading Sequence* [seq_typ].

Staged Loading Sequence [seq_typ]
no = Equal loading sequence
yes = Staged loading sequence = Circuit B priority

To set capacity required to start the second circuit

1. Navigate to the Configuration menu.
2. Select *General Configuration* (GEN_CONF).
3. Set *Cap. to start 2nd cir* [transcap].

Cap. to start 2nd cir [transcap]	
30 to 80%	50%

8.15 - Master/Slave assembly (option 58)

Two units can be linked to create the master/slave assembly. The master unit can be controlled locally, remotely or by network commands. Master/slave assembly must be validated in order to start the master/slave chiller operation.

All control commands to the master/slave assembly (start/stop, setpoint selection, 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 balance the run times of the two units.

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.

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

8.16 - Energy Management Module (option 156)

The energy management module (EMM) enables to control the level of energy consumption, providing users with information such as current unit status, compressors operating status, etc.

This option requires the installation of an additional SIOB board.

Description	Connector	Remarks
Occupancy override control	DI-01, 77-78	If the contact is closed in Remote mode, the unit goes into the occupied mode
Demand limit switch 2	DI-02, 73A-74A	If the contact is closed, the second capacity limit switch is active
Customer interlock	DI-03, 34A-35A	Permits immediate unit shutdown (Remote mode only)
Ice storage	DI-04, 75-76	If the contact is closed, the unit enters the ice storage mode
Space temperature	AI-01, 71A-72A	Active setpoint reset via space temperature control
Capacity limit control	AI-10, 67-68	Active setpoint reset via unit capacity control (4-20 mA)
Compressor A	DO-01, 37A1-38A1	Output active if compressor A is operating
Compressor B	DO-02, 37B1-38B1	Output active if compressor B is operating
Chiller shutdown	DO-06, 30-31	Output closed when the unit is stopped due to an alarm
Alert	DO-05, 30B-31B	Output closed when the alert has been tripped
Chiller running or ready to start	DO-04, 37A-38A	Output closed when the chiller is ready to start or running
Unit capacity	AO-01, 78+-79-	Capacity running output (0 to 10 VDC), 0V = 0% capacity and 10V = 100% capacity

DI = Digital Input; DO = Digital Output, AI = Analogue Input; AO = Analogue Output

9 - DIAGNOSTICS

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

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

In the event of an alarm:

- the bell on the Touch Pilot user interface lights
- the corresponding alarm output(s) is/are activated
- error code is displayed
- message is sent over the CCN network

9.1 - E-mail notifications

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

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

9.2 - Control diagnostics

The control allows the quick display of the unit status. When the alarm is activated, the bell on the touch screen lights up.

- 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.

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

		Viewing alarm information			
	Alarms menu	**Date**	**Hour**	**Code**	**Description**
	Current Alarms (basic access)	•	•		•
	Reset Alarms (user access)			•	
	Alarm Historic (basic access)	•	•		•
	Major Alarm Historic (basic access)	•	•		•

9.3 - Displaying current alarms

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

To access the list of currently active alarms

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

9.4 - Resetting alarms

Touch Pilot control distinguishes between two types of alarms:

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

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.

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

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

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 - Alarm history

Information regarding resolved alarms is stored in the Alarm history menu which is divided into 50 recent alarms and 50 recent major alarms. Alarm history can be accessed through the Touch Pilot user interface or the Network Service Tool.

To access the alarm history

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

9.6 - Alarms description

The following tables include all general alarms/alerts associated with the operation of the unit as well as drive alarms.

9.6.1 - General alarms

JBus code	Alarm code	Description	Reset type	Action taken	Possible cause
Thermistor failure					
1	15001	Cooler Entering Fluid Thermistor	Automatic, if thermistor reading returns to normal	Unit shuts down	Defective thermistor
2	15002	Cooler Leaving Fluid Thermistor	As above	Unit shuts down	As above
3	15010	OAT Thermistor Failure	As above	Unit shuts down	As above
4	15023	Cooler heater feedback thermistor Failure	As above	No action (alert)	As above
5	15011	MASTER/Slave Common Fluid Thermistor	As above	Master/Slave control is disabled, the unit returns to the stand-alone mode	As above
6	15012	Circuit A Suction Gas Thermistor	As above	Circuit A shuts down	As above
7	15013	Circuit B Suction Gas Thermistor	As above	Circuit B shuts down	As above
8	15015	Circuit A Discharge Gas Thermistor	As above	Circuit A shuts down	As above
9	15016	Circuit B Discharge Gas Thermistor	As above	Circuit B shuts down	As above
10	15018	Circuit A Condenser Subcooling Liquid Thermistor	As above	Circuit A shuts down	As above
11	15019	Circuit B Condenser Subcooling Liquid Thermistor	As above	Circuit B shuts down	As above
12	15033	Circuit A compressor Motor Thermistor	As above	Circuit A shuts down	As above
13	15034	Circuit B compressor Motor Thermistor	As above	Circuit B shuts down	As above
14	15024	Circuit A Economizer Gas Thermistor	As above	Circuit A shuts down	As above
15	15025	Circuit B Economizer Gas Thermistor	As above	Circuit B shuts down	As above
16	15021	Space Temperature Thermistor	As above	No action (alert)	As above
Transducer failure					
17	12001	Circuit A Discharge Transducer	Automatic, if sensor voltage reading returns to normal	Circuit A shuts down	Defective transducer
18	12002	Circuit B Discharge Transducer	As above	Circuit B shuts down	As above
19	12004	Circuit A Suction Transducer	When compressor is "off": Automatic, if sensor voltage reading returns to normal (3 alarms within 24 hours); otherwise, Manual When compressor is “on”: Manual	Circuit A shuts down	As above
20	12005	Circuit B Suction Transducer	As above	Circuit B shuts down	As above
21	12010	Circuit A Oil Pressure Transducer	Automatic, if sensor voltage reading returns to normal	Circuit A shuts down	As above
22	12011	Circuit B Oil Pressure Transducer	As above	Circuit B shuts down	As above
23	12013	Circuit A Economizer Pressure Transducer	As above	Circuit A shuts down	As above
24	12014	Circuit B Economizer Pressure Transducer	As above	Circuit B shuts down	As above
25	12024	Water Pressure 1 Transducer	As above	No action (alert)	Defective transducer (applicable to units fitted with the hydronic kit)
26	12025	Water Pressure 2 Transducer	As above	No action (alert)	Defective transducer (applicable to units fitted with the hydronic kit or variable speed pumps)
27	12029	Water Pressure too low - Pump cavitation risks	Automatic, if water pressure returns to normal and the minimum pressure threshold supported by pump has not been achieved Manual, if water pressure has dropped below the minimum pressure threshold of pump.	1st scenario (automatic reset): No action (alert) 2nd scenario (manual reset): Unit shuts down	Water loop pressure too low, risk of pump cavitation
28	12031	Circuit A Condenser Subcooling Liquid Pressure Transducer	Automatic, if sensor voltage reading returns to normal	Circuit A shuts down	Defective transducer
29	12032	Circuit B Condenser Subcooling Liquid Pressure Transducer	As above	Circuit B shuts down	As above
Communication failure					
30	4901	Loss of communication with SIOB Board Number 1	Automatic, if communication is re-established	Unit shuts down	Bus installation fault, communication error
31	4902	Loss of communication with SIOB Board Number 2	As above	Circuit B shuts down	As above
32	4501	Loss of Communication with Auxiliary # 1	As above	Unit shuts down	As above
33	4502	Loss of Communication with Auxiliary # 2	As above	Circuit A shuts down	As above

JBus code	Alarm code	Description	Reset type	Action taken	Possible cause
34	4503	Loss of Communication with Auxiliary # 3	As above	Circuit B shuts down	As above
35	4504	Loss of Communication with Auxiliary # 4	As above	No action (alert)	As above
36	4603	Loss of communication with Energy Management Board	As above	No action (alert)	As above
37	4701	Loss of Communication with VLT Drive Board #1	As above	Circuit A shuts down	As above
38	4702	Loss of Communication with VLT Drive Board #2	As above	Circuit B shuts down	As above
39	4704	Loss of Communication with Drive Board #4	As above	Circuit A shuts down	As above
40	4705	Loss of Communication with Drive Board #5	As above	Circuit A shuts down	As above
41	4706	Loss of Communication with Drive Board #6	As above	Circuit A shuts down	As above
42	4707	Loss of Communication with Drive Board #7	As above	Circuit B shuts down	As above
43	4708	Loss of Communication with Drive Board #8	As above	Circuit B shuts down	As above
44	4709	Loss of Communication with Drive Board #9	As above	Circuit B shuts down	As above
45	4710	Loss of Communication with Drive Board #10	As above	No action (alert)	As above
46	4711	Loss of Communication with Drive Board #11	As above	No action (alert)	As above
Configuration failure					
47	70nn	Illegal configuration	Automatic, if configuration is provided	Unit cannot be started	No factory configuration
48	80nn	Initial factory configuration required 02: Defined unit size does not exist 03: Unit type or country incorrect configuration (FACTORY) 04: Unit size is set to 0 (FACTORY) 05: Unit Tier incorrect configuration (FACTORY) 07: Hydronic kit option unavailable for this unit size	Automatic, if configuration is corrected	Unit cannot be started	Incorrect unit configuration
49	90nn	Master/Slave configuration error	Automatic, if master/slave configuration returns to normal or the unit returns to the standalone mode	Master/Slave control cannot be started	Configuration failure, see section 9.6.2
Process failure					
50	10001	Cooler Freeze Protection	Automatic (the first alarm within 24 hours); otherwise, Manual	Unit shuts down	No water flow, defective thermistor
51	10005	Circuit A Low Suction Temperature	When the compressor is “off”: Automatic (the first alarm within 24 hours) When the compressor is “on”: Automatic (two alarms within 24 hours); otherwise, Manual	Circuit A shuts down	Pressure sensor defective, EXV blocked or lack of refrigerant
52	10006	Circuit B Low Suction Temperature	As above	Circuit B shuts down	As above
53, 54	10008, 10009	Circuit A High Superheat	Not applicable	-	-
55, 56	10011, 10012	Circuit B Low Superheat	Not applicable	-	-
57	10014	Customer Interlock failure	Automatic (the first alarm within 24 hours); otherwise, Manual	Unit shuts down	Customer interlock closed when the unit is running
58	10028	Electrical Box Thermostat or Electrical Interlock failure	Automatic, if the unit is not running and the electrical box input is closed	Unit shuts down	Electrical box input is open; This alarm is triggered by the electrical box input linked to two serial inputs in the electrical box (electrical box thermostat input and "customer" interlock); by default, this second input is closed
59	10030	Master/Slave communication Failure	Automatic, if communication is re-established	Master/Slave control is disabled and chillers return to their stand-alone modes	CCN bus installation defective
60	10031	Unit is in Emergency Stop	Automatic, if operating conditions return to normal	Unit shuts down	Network emergency stop command
61	10032	cooler Pump #1 default	Manual	Unit is restarted with another pump running. If no pump is available, the unit shuts down	Pump overheats or poor pump connection
62	10033	cooler Pump #2 default	Manual	As above	As above
63	10037	Circ A - High Condensing temperature out of map compressor	Manual	Circuit shuts down	Defective transducer
64	10038	Circ B - High Condensing temperature out of map compressor	Manual	Circuit shuts down	Defective transducer
65	10050	Refrigerant Leakage Detection	Automatic, if the leakage input voltage returns to normal	No action (alert)	Refrigerant leak or leak detector defective

JBus code	Alarm code	Description	Reset type	Action taken	Possible cause
66	10067	Circuit A Low Oil Pressure	Automatic (3 alarms within 24 hours); otherwise, Manual	Compressor shuts down	Pressure sensor fault, defective wiring or oil filter installation fault
67	10068	Circuit B Low Oil Pressure	As above	Compressor shuts down	As above
68	10070	Circuit A Max Oil Filter Differential Pressure	Manual	Compressor shuts down	As above
69	10071	Circuit B Max Oil Filter Differential Pressure	Manual	Compressor shuts down	As above
70	10073	Condenser Pump #1 default	Not applicable	-	-
71	10074	Condenser Pump #2 default	Not applicable	-	-
72	10075	Circuit A Low Oil Level	When compressor is “off”: Automatic When compressor is “on”: Automatic (3 alarms within 24 hours)	Circuit A shuts down	Oil level too low or oil level detector defective
73	10076	Circuit B Low Oil Level	As above	Circuit B shuts down	As above
74	10078	Circuit A High Discharge Gas Temperature	Manual	Circuit A shuts down	Defective transducer, max. condensing temperature setpoint too low or refrigerant charge too high
75	10079	Circuit B High Discharge Gas Temperature	Manual	Circuit B shuts down	As above
76	10081	Circuit A Suction Valve closed	Manual	Circuit A shuts down	Economizer pressure transducer defective, suction valve fault
77	10082	Circuit B Suction Valve closed	Manual	Circuit B shuts down	As above
78	10084	Circuit A High Oil Filter Drop Pressure	Manual	No action (alert)	Oil filter should be checked
79	10085	Circuit B High Oil Filter Drop Pressure	Manual	No action (alert)	As above
80	10090	Cooler Flow Switch Setpoint Configuration Failure	Manual	Unit is not allowed to start	Defective flow controller or wiring error
81	10091	Cooler Flow Switch Failure	Automatic (the first alarm within 24 hours); otherwise, Manual	Compressors and the evaporator pump are stopped	As above
82	10097	Water Exchanger Temperature Sensors Swap	Manual	Unit shuts down	Leaving water temperature is higher than entering water temperature
83	10106	Circ A - High saturated temperature out of map compressor	Manual	Circuit A shuts down	Coil fouling
84	10107	Circ B - High saturated temperature out of map compressor	Manual	Circuit B shuts down	Coil fouling
85	10110	Lack of Refrigerant suspected on circuit A	Automatic, if fault conditions are no longer present (3 alarms within 24 hours); otherwise, Manual	No action (alert)	Refrigerant leak suspected. Contact Carrier Service
86	10111	Lack of Refrigerant suspected on circuit B	As above	No action (alert)	As above
87	10113	Compressor frequency below min frequency threshold - Circuit A	Automatic (the first alarm within 24 hours); otherwise, Manual	Circuit A shuts down	Check drive alarms and compressor current consumption
88	10114	Compressor frequency below min frequency threshold - Circuit B	As above	Circuit B shuts down	As above
89	10116	Discharge superheat too low - Circuit A	Manual	Circuit A shuts down	EXV wiring swapped
90	10117	Discharge superheat too low - Circuit B	Manual	Circuit B shuts down	As above
91	11208	Cooler Water Loop : Pressure sensor Crossed	Automatic, if flow switch is closed; Manual, if flow switch is open	Unit shuts down	Flow switch open
92	14000	Over flow in cooler hydraulic kit	Automatic, if water flow gets below the maximum flow configured	No action (alert)	Water loop pressure drop too low
Service maintenance					
93	13nnn	Service maintenance alert Number # nnn	Manual	No action (alert)	Preventive maintenance date has passed; servicing action required; contact Carrier Service Agency
VFD failure					
94	17nnn	Circuit A Compressor VFD Failure	Manual	Circuit A shuts down	See section 9.6.4
95	18nnn	Circuit B Compressor VFD Failure	Manual	Circuit B shuts down	See section 9.6.4
96	20nnn	Circuit A Fan VFD 1 Failure	Manual, except for alarm 20027 (Automatic reset)	Circuit A shuts down	See section 9.6.5
97	21nnn	Circuit A Fan VFD 2 Failure	As above	Circuit A shuts down	See section 9.6.5
98	22nnn	Circuit A Fan VFD 3 Failure	Not applicable	-	-
99	23nnn	Circuit B Fan VFD 1 Failure	Manual, except for alarm 23027 (Automatic reset)	Circuit B shuts down	See section 9.6.5
100	24nnn	Circuit B Fan VFD 2 Failure	As above	Circuit B shuts down	See section 9.6.5
101	25nnn	Circuit B Fan VFD 3 Failure	Not applicable	-	-
102	26nnn	Hydronic kit pump 1 VFD Failure	Manual, except for alarm 26027 (Automatic reset)	Unit shuts down	See section 9.6.5
103	27nnn	Hydronic kit pump 2 VFD Failure	As above	Unit shuts down	See section 9.6.5

JBus code	Alarm code	Description	Reset type	Action taken	Possible cause
VFD warning					
104	35nnn	Circuit A Compressor VFD Warning	Automatic	No action (alert)	See section 9.6.4
105	36nnn	Circuit B Compressor VFD Warning	Automatic	No action (alert)	See section 9.6.4
106	38nnn	Circuit A Fan VFD 1 Warning	Automatic (China only); Manual, if Danfoss drive alarm 13 or 204 is triggered	No action (alert)	See section 9.6.5
107	39nnn	Circuit A Fan VFD 2 Warning	As above	No action (alert)	See section 9.6.5
108	40nnn	Circuit A Fan VFD 3 Warning	Not applicable	-	-
109	41nnn	Circuit B Fan VFD 1 Warning	Automatic (China only); Manual, if Danfoss drive alarm 13 or 204 is triggered	No action (alert)	See section 9.6.5
110	42nnn	Circuit B Fan VFD 2 Warning	As above	No action (alert)	See section 9.6.5
111	43nnn	Circuit B Fan VFD 3 Warning	Not applicable	-	-
Compressor failure					
114	1101	Motor Temperature too high	Manual	Circuit A shuts down	Motor/wiring fault
115	2101	Motor Temperature too high	Manual	Circuit B shuts down	As above
116	1103	High Pressure Switch	Manual	Circuit A shuts down	Coil fouled, lack of condenser flow, condenser valve blocked, fan circuit fault, high entering air or condenser water temperature
117	2103	High Pressure Switch	Manual	Circuit B shuts down	As above
Software failure					
118	55001	Database module failure	Automatic	No action (alert); it is highly recommended to power cycle the Display panel	Software problem. Contact Carrier Service
119	56001	Lenscan module failure	Automatic	As above	As above
EXV failure					
120	57020	Main EXV stepper Motor failure – cir A	Manual	Circuit A shuts down	EXV motor fault
121	57021	Main EXV stepper Motor failure – cir B	Manual	Circuit B shuts down	EXV motor fault
122	57023	Main Eco stepper Motor failure – cir A	Manual	Circuit A shuts down	EXV motor fault
123	57024	Main Eco stepper Motor failure – cir B	Manual	Circuit B shuts down	EXV motor fault

9.6.2 - Master/Slave configuration alarms

Alarm code	Description
9001	Lag pump control is selected while pump configuration is missing
9002	Master unit and Slave unit have the same address
9003	No Slave unit configured
9004	Slave lag pump is selected while slave pump configuration is missing
9005	Master unit and Slave unit should have the same water control type (control based on EWT)
9006	Master unit and Slave unit have the same water control type (control based on LWT)
9007	Master lag pump control is configured while the slave lag pump control is not configured
9008	Master lag pump control is not configured while the slave lag pump control is configured
9009	Slave unit is not in Network mode
9010	Slave unit failure due to a detected alarm
9011	Master unit is not in Network mode
9012	Communication between Master unit and Slave lost
9013	Master/Slave units heat/cool selection conflict
9014	Master and Slave parallel/series selection conflict
9015	Master unit has EWT option configured in conflict with chiller in series setting
9016	Slave unit has EWT option configured in conflict with chiller in series setting

9.6.3 - Service maintenance alarms

Alarm code	Description
13001	001: Oil filter
13002	002: Liquid line filter
13003	003: Check and replace fuses
13004	004: Check and clean the water filter
13005	005: Periodic leakage check
13006	006: Routine service visit as per IOM level 2
13007	007: Oil analysis
13008	008: Glycol level check
13009	009: Check the anti-vibration mounts

9.6.4 - Compressor drive alarms/alerts

Compressor drive alarms or alerts are displayed based on the following formula: 17+X-YYY for alarms and 35+X-YYY for alerts (X stands for the number of the circuit and YYY is the alarm/alert code).

The tables below present the most common alarms associated with the variator malfunction. Please refer to the applicable Danfoss documentation for more information on other alarms.

Code	Description	Action to be taken
Drive alarms		
4	Mains phase loss	Check the VFD supply voltage and the phase balance (±3%)
7	Over voltage	Contact Carrier Service
8	Under voltage	Contact Carrier Service
9	Inverter overloaded	Check the VFD output current/compressor current
12	Torque limit exceeded	Check the VFD output current/compressor current
13	Overcurrent	Check the VFD output current/compressor current
14	Earth fault	Check if an earth fault exists
16	Motor short-circuit	Check if there is a short-circuit at the VFD terminals
23*	Internal fan fault	Check the internal fan rotation
29	VFD temperature too high	Space temperature too high or VFD ventilation obstructed or damaged
30	Motor phase U missing	Check wiring of phase U
31	Motor phase V missing	Check wiring of phase V
32	Motor phase W missing	Check wiring of phase W
33	Inrush fault	Current demand too high: Let the VFD cool down for 20 minutes before starting it again
34	Fieldbus communication fault	Check the connections and the shielding of the serial communication cable
36	Mains failure	Check the VFD supply voltage and the phase balance (±3%)
38	Internal fault	Contact Carrier Service
47	24 V supply low	Contact Carrier Service
48	1.8 V supply low	Contact Carrier Service
65	Control board over temperature	Check the space temperature and the VFD fan
67	Option configuration has changed	Contact Carrier Service
68	Emergency stop	Contact Carrier Service
80	Drive initialized to default value	Contact Carrier Service
95	Torque loss	Contact Carrier Service
243	IGBT defective	Contact Carrier Service
251**	New parts detached	Contact Carrier Service
Drive alerts		
3	No motor	Check the motor connections
4	Mains phase loss	Check the VFD supply voltage and the phase balance (±3%)
5	DC link voltage high	Check the VFD supply voltage and the phase balance (±3%)
6	DC link voltage low	Check the VFD supply voltage and the phase balance (±3%)
7	DC over voltage	Contact Carrier Service
8	DC under voltage	Contact Carrier Service
9	Inverter overloaded	Check the VFD output current/compressor current
12	Torque limit exceeded	Check the VFD output current/compressor current
13	Overcurrent	Check the VFD output current/compressor current
14	Earth fault	Check if an earth fault exists
23*	Internal fan fault: Compressor drive: The drive will be stopped immediately. Fan drive: The drive continues to operate.	Check the internal fan rotation
34	Fieldbus communication fault	Check the connections and the shielding of the serial communication cable
36	Mains failure	Check the VFD supply voltage and the phase balance (±3%)
47	24 V supply low	Contact Carrier Service
49	Motor speed limit exceeded	Contact Carrier Service
59	Current limit exceeded	Check the VFD output current/compressor current
62	Output frequency at maximum limit	Check the VFD output current/compressor current
64	Voltage limit	Supply voltage too low
65	Control board overtemperature	Check the space temperature and the VFD fan
66	Heat sink temperature low	Space temperature too low
90†	Encoder loss	Contact Carrier Service
95	Torque loss	Contact Carrier Service
96	Start delayed	Contact Carrier Service
97	Stop delayed	Contact Carrier Service
98	Clock fault	Contact Carrier Service
243	IGBT defective	Contact Carrier Service
247	Capacity board temperature	Contact Carrier Service

* Error 24 and 104 possible
** Error 70 or 250 possible
† Not applicable to variator size 102

9.6.5 - Fans and pumps drive alarms/alerts

Fan drive alarms or alerts are displayed based on the following formula:

- 20-YYY to 25-YYY (20=A1, 21=A2, 22=A3 and 23=B1, 24=B2, 25=B3) for alarms
  (YYY stands for the alarm code)
- 38-YYY to 43-YYY (38=A1, 39=A2, 40=A3, 41=B1, 42=B2, 43=B3) for alerts
  (YYY stands for the alert code)

Pump drive alarms are displayed as 26-YYY for pump 1 and 27-YYY for pump 2 (YYY stands for the alarm code).

Pump drive alerts are displayed as 44-YYY for pump 1 and 45-YYY for pump 2 (YYY stands for the alert code).

Subcode	Description	Code	Action to be taken
Drive alarms			
0	No error	NErr	Contact Carrier Service if more information is needed
1	Over-current during acceleration	OC1	As above
2	Over-current during deceleration	OC2	As above
3	Over-current during constant speed operation	OC3	As above
4	Over-current in load at startup	OCL	As above
5	Short circuit in arm	OCA	As above
8	Input phase failure	EPHI	As above
9	Output phase failure	EPHO	As above
10	Overvoltage during acceleration	OP1	As above
11	Overvoltage during deceleration	OP2	As above
12	Overvoltage during constant speed operation	OP3	As above
13	Over-LOAD in inverter	OL1	As above
14	Over-LOAD in motor	OL2	As above
16	Overheat trip	OH	As above
17	Emergency stop	E	As above
18	EEPROM fault 1 (writing operation)	EEP1	As above
19	EEPROM fault 2 (reading operation)	EEP2	As above
20	EEPROM fault 3 (other)	EEP3	As above
-	Speed ref alarm	Err1	As above
21	RAM fault	Err2	As above
22	ROM fault	Err3	As above
23	CPU fault	Err4	As above
24	Communication error trip	Err5	As above
26	Current detector fault	Err7	As above
27	Optional circuit board type error	Err8	As above
28	Graphic keypad communication error	Err9	As above
29	Small-current trip	UC	As above
30	Trip due to under voltage in main circuit	UP1	As above
32	Over-torque trip	Ot	As above
34	Ground fault trip (hardware detection)	EF2	As above
37	Overcurrent flowing in element during acceleration	OC1P	As above
38	Overcurrent flowing in element during deceleration	OC2P	As above
39	Overcurrent flowing in element during operation	OC3P	As above
41	Inverter type error	EtYP	As above
46	External thermal input	OH2	As above
47	VIA cable break	SOUt	As above
50	Break in an analogue signal cable	E-18	As above
51	CPU fault	E-19	As above
52	Excess torque boost	E-20	As above
53	CPU fault	E-21	As above
84	Auto-tuning error	Etn1	As above
72	Closed damper 1 fault	Fd1	As above
73	Closed damper 2 fault	Fd2	As above
-	Download transfer fault	CFI2	As above

Subcode	Description	Action to be taken
Drive alerts		
1	Overcurrent	Contact Carrier Service if more information is needed
2	Drive overload	As above
3	Motor overload	As above
4	Overheat	As above
5	Overvoltage	As above
6	Main circuit undervoltage	As above
7	Reserved	As above
8	Undercurrent	As above
9	Over-torque	As above
10	Reserved	As above

Subcode	Description	Action to be taken
Drive alerts		
11	Cumulative operation hours reached	As above
12	Reserved	As above
13	Reserved	As above
14	Main circuit undervoltage alarm the same as MS-relay status	As above
15	At the time of the instant blackout, Forced deceleration/stop	As above
16	An automatic stop during the lower limit frequency continuance	As above
17	PTC thermistor alarm	As above
22	Overload alarm	As above
23	Underload alarm	As above

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 Carrier Service Agency.

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

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

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Manufacturer reserves the right to change any product specifications without notice.

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