



30RA/RH 005÷013

Air cooled water chillers

PRO-DIALOG *Plus* Control
Service interface

PRO-DIALOG *Plus*



SERVICE INTERFACE MANUAL

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1 - SAFETY CONSIDERATIONS

1.1 - General

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.

- 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 - Avoid electrocution

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

RISK OF BURNS: Electrical currents cause components to get hot either temporarily or permanently. Handle power cable, electrical cables and conduits, terminal box covers and motor frames with great care.

2 - GENERAL DESCRIPTION

2.1 - Service interface

Service interface is a command for exclusively use by service and installers personnel.

The purpose of this control are:

- Diagnostic
- Parameters' configuration

Note: ON/OFF, COOL/HEAT and dual set-point functions are not available on the service interface.

2.2 - Pro-Dialog

Pro-Dialog is a system for controlling single circuit 30RA air-cooled liquid chillers or air-to-water 30RH heat pumps. Pro-Dialog controls compressor start-up needed to maintain the desired heat exchanger entering or leaving water temperature. In cooling mode it controls the operation of the fans to maintain the correct condensing pressure. For heat pump units it controls and optimises the defrost cycles in order to minimize the heating capacity reduction. Safety devices are constantly monitored by Pro-Dialog to ensure their safe operation. Pro-Dialog also gives access to a Quick Test program covering all inputs and outputs.

All PRO-DIALOG Plus control can work in accordance with two independent modes:

- Remote mode: the machine is controlled by remote contacts volt-free contacts (available simplified control AJRC).
- CCN mode: the machine is controlled by commands from the Carrier Comfort Network (CCN). In this case, a data communication cable is used to connect the unit to the CCN communication bus.

The operating mode must be chosen with the Start/Stop button described in sections 3 and 4.2.1. When the PRO-DIALOG Plus system operates autonomously (Remote mode) it retains all of its own control capabilities but does not offer any of the features of the CCN network.

2.3 - Abbreviations used

The following abbreviations are used frequently:

CCN : Carrier Comfort Network

CCn : Operating type: CCN

LED : Light Emitting Diode

LOFF : Operating type: Local Off

L-On : Operating type: Local On mode

L-Sc : Operating type: Local On following a time schedule

rEM : Operating type: by remote contacts

SCT : Saturated Condensing Temperature

SIO : Sensor Bus (internal communication bus linking the basic board)

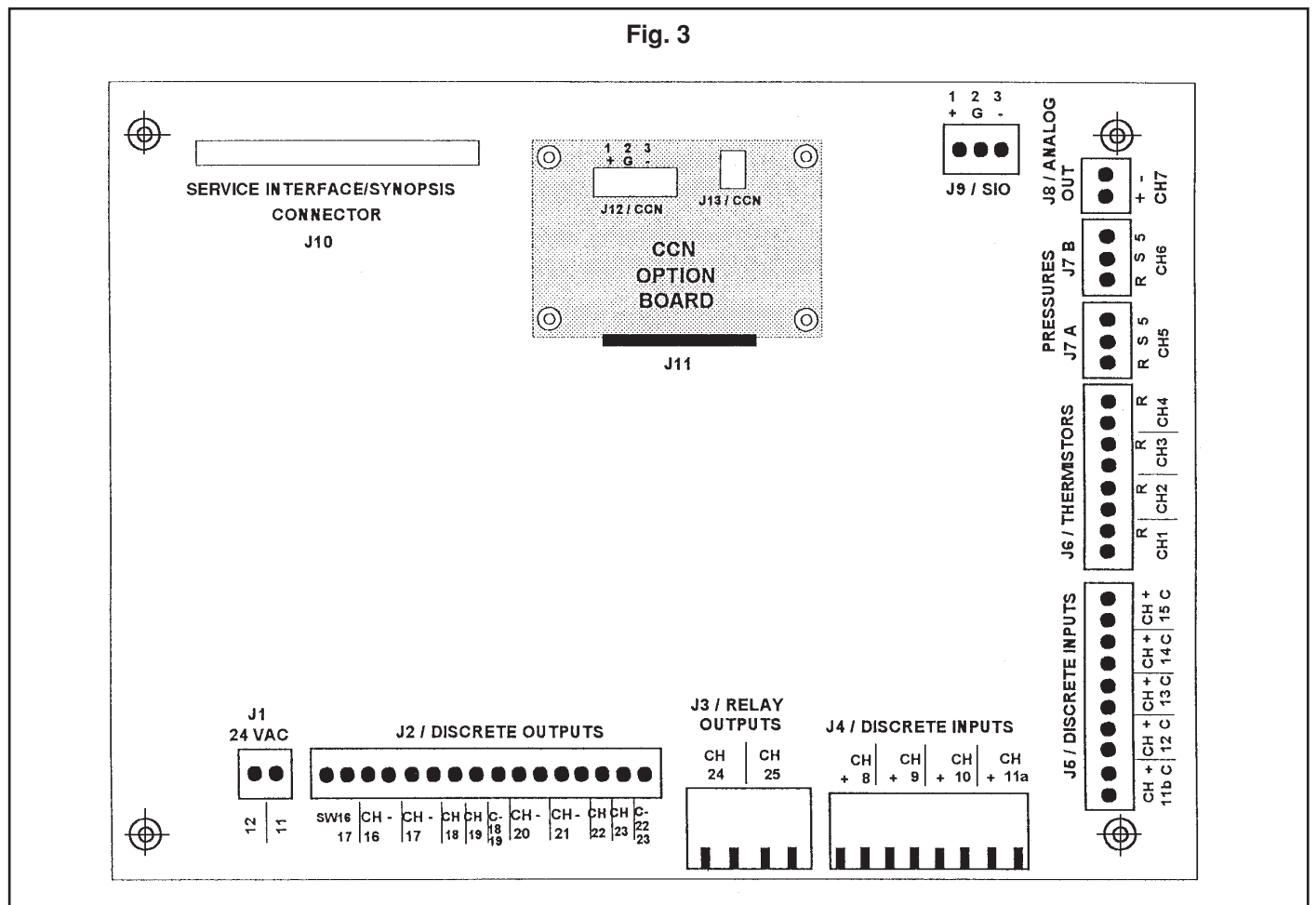
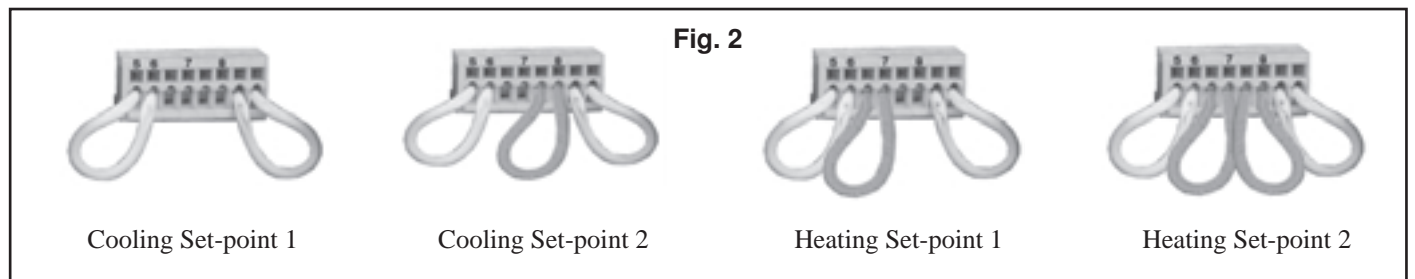
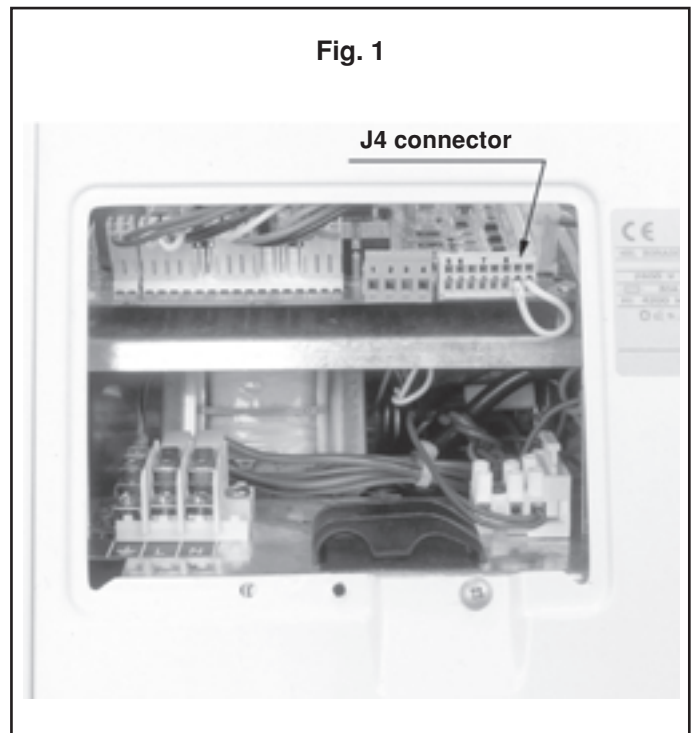
SST : Saturated Suction Temperature

3 - INTERFACE CONNECTION

- Disconnect the unit from power supply.
- Remove the electrical panel access door and the top unit cover.
- Replace the J4 connector (see fig. 1) with the one supplied ref ③.
- Connect the service interface to the J10 connector onto Pro-Dialog basic board (see fig. 3) using the flat cable extension (ref ②) supplied.
- Refit the unit top cover, the electrical panel access door and reconnect the unit power supply.

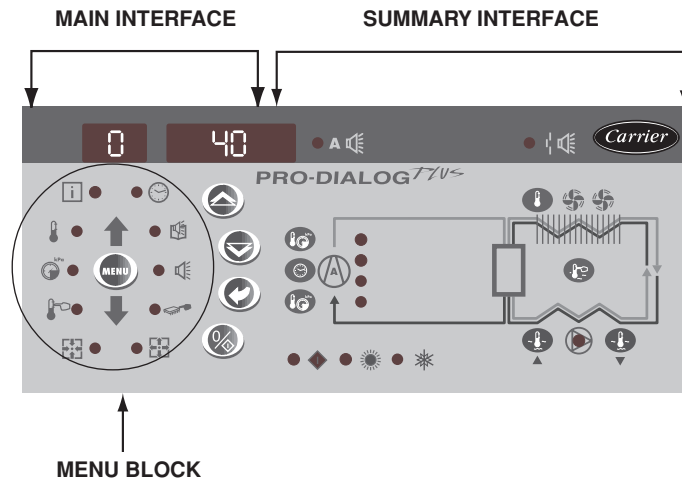
3.1 Functions ON/OFF, cooling/heating and dual set-point

- By connecting the J4 connector (ref. ③), the unit operates (in cooling mode); disconnecting the J4 connector the unit stops.
- To select COOL/HEAT mode or dual set-point, fit J4 connector like a connector shown in fig. 2.



4 - SETTING UP PRO-DIALOG PLUS CONTROL

4.1 - Service interface general features



The service interface enables a number of operating parameters to be displayed and modified.

The interface consists of two distinct parts: the main interface (left hand section) and the summary interface (right hand section).

Main interface

It gives access to all PRO-DIALOG PLUS data and operating functions. It consists of:

- A two-digit display showing the number of the item selected.
- A four-digit display showing the contents of the item selected.
- LEDs and buttons for unit start/stop, menu selection, menu item selection and value adjustment.

MAIN INTERFACE








BUTTON	NAME	DESCRIPTION
	Menu	Permits the selection of a main menu. Each main menu is represented by an icon. The icon is lit if active.
	Up arrow	Permits scrolling through the menu items (in the two-digit display). If the modification mode is active this button authorises increase of the value of any parameter.
	Down arrow	Permits scrolling through the menu items (in the two-digit display). If the modification mode is active this button authorises decrease of the value of any parameter.
	Enter	Gives access to the modification mode, validates a modification or displays expanded item description.
	Start/stop	Authorises start or stop of the chiller in local mode or modification of its operating type.

MAIN INTERFACE MENU LED'S




LED	NAME	DESCRIPTION
	INFORMATION menu	Displays the general operating parameters for the unit.
	TEMPERATURES menu	Displays the unit operating temperatures.
	PRESSURES menu	Displays the unit operating pressures.
	SETPOINTS menu	Displays the unit setpoints and enables them to be modified.
	INPUTS menu	Displays the status of the unit digital and analogue inputs.
	OUTPUTS/TESTS menu	Displays the status of the unit outputs and enables them to be tested.
	CONFIGURATIONS menu	Displays the unit configuration and enables it to be modified.
	ALARMS menu	Displays active alarms.
	ALARMS HISTORY menu	Displays the history of the alarms.
	OPERATING LOG menu	Displays the operating times and number of starts for the unit and the compressors.

The summary interface (right hand section) includes a mimic diagram of the unit, together with push-buttons and LEDs. It gives quick access to the main operating parameters of the unit.

SUMMARY INTERFACE LED'S

LED	INDICATION WHEN LIT
	Green LED: The unit is authorised to start or is already running
	Red LED: • Lit: circuit A or unit shut down by alarm • Flashing: circuit A or unit running with alarm present
	Red LED: Water flow switch default or user safety lock open.
	Green LED: The evaporator pump is running.
	First Yellow LED: Start/stop status of compressor. Flashing LED indicates that the circuit is in the protection or defrost mode.
	Green LED: The unit operates in heating mode.
	Green LED: The unit operates in cooling mode.

SUMMARY INTERFACE PUSH BUTTONS

BUTTON	DISPLAY
	Blue button: evaporator leaving or entering water temperature in °C Gray button: outdoor air temperature in °C
	Control point (setpoint + reset) in °C
	Press 1: circuit A discharge pressure in kPa Press 2: circuit A saturated condensing temperature in °C

4.2 - Unit start/stop control

4.2.1 - Description

The unit start/stop can be controlled by one of the following methods:

- By remote control with the aid of user contacts (remote control type)
- By CCN control with the aid of the CCN (CCN control type)

The service interface includes a Start/Stop button which cannot be used to stop or start the unit in the local operating type but to select the remote or CCN operating type.

See CCN clock board instructions kit.

The available operating types are described in the following table.

OPERATING TYPES

4 DIGIT DISPLAY	DESCRIPTION
CCN*	CCN. The unit is controlled by CCN commands. This is displayed if the unit is equipped with an optional CCN clock board. See section 3.1.
rEM*	Remote. The unit is controlled by remote control contacts.

Legend

* Displayed if the configuration requires it.

4.3 - Menus

4.3.1 - Selecting a menu










The MENU button authorises you to select a menu from the 10 main menus that are available. Each time you press this button one of the 10 LEDs lights up in turn alongside each of the icons representing a main menu. The active menu is the one against which the LED is lit. If a menu is empty then its LED is not lit. To scroll quickly through the menus, hold the MENU button down.

4.3.2 - Selecting a menu item

The up and down Arrow buttons let you scroll through the menu items. Menu item numbers are displayed in the two-digit display. The item number increases or decreases every time you press the up or down Arrow button. The menu items that are not in use or incompatible with the configuration are not displayed. The value or status associated with the active item is displayed in the four-digit display. To scroll quickly through the items, hold the up or down Arrow button down.

The following example shows how to access item 3 in the Pressures menu.

SELECTING A MENU ITEM

OPERATION	PRESS BUTTON	MENU LED	ITEM NUMBER 2-DIGIT DISPLAY
Press the MENU button until the LED marked PRESSURE lights.	 ⋮ 	 kPa 	0 0
Press one of the Arrow buttons until the two-digit display shows 3 (item number 3).	  	 kPa 	1 2 3

















4.3.3 - Modifying the value of a parameter/access to a sub-menu

Press the Enter button for more than 2 seconds to enter the modification mode or to select a sub-menu. This lets you correct the value of an item or select a sub-menu with the aid of the up and down Arrow buttons (if you are authorised to overwrite the item concerned). When modification mode is activated, the LED for the main menu to which the item belongs flashes in menu block. Once the required value is obtained, press the Enter button again to validate the change or to access the sub-menu. The LED for the menu to which the item belongs then stops flashing, indicating that modification mode no longer applies.

In modification mode, the value to be modified increases or decreases in steps of 0.1 every time you press the Arrow buttons. Holding one of these buttons down increases the rate of increase or decrease.

NOTE: The access to a sub-menu may require entering a password. This is automatically requested. See section 4.3.11.2.

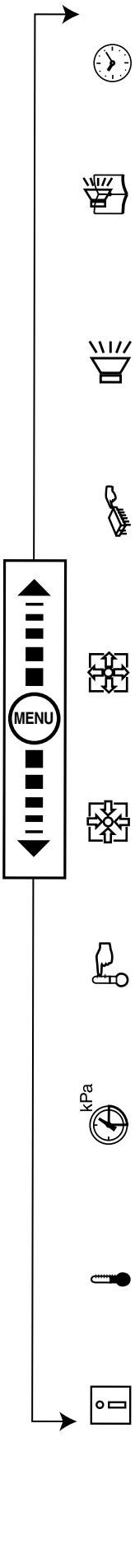
The example below shows how to modify the value of item 1 in the Setpoint menu.

MODIFYING THE VALUE OF A PARAMETER				
OPERATION	PRESS BUTTON	MENU LED	ITEM NUMBER 2-DIGIT DISPLAY	ITEM VALUE 4-DIGIT DISPLAY
Hold on the MENU button until the LED for SETPOINT lights.			0	
			0	
Press one of the Arrow buttons until the two-digit display shows 1 (item number 1- cooling setpoint 2). The value for setpoint 2 is displayed in the four-digit display (6.0°C in this example).			1	
			1	6.0
Press the Enter button for more than 2 seconds to enable the value associated with item 1 to be modified. The Setpoint menu LED flashes indicating that modification mode is active.			1	6.0
Keep pressing the Down Arrow button until the value 5.7 is displayed in the four-digit display. The Setpoint menu LED keeps flashing.			1	5.9
			1	5.8
			1	5.7
Press the Enter button again to validate the change. The new setpoint is 5.7°C. The Setpoint menu LED stops flashing, indicating that modification mode no longer applies.			1	5.7

4.3.4 - Expand display

Pressing the Enter button causes a 23 character text expansion to be scrolled across the four-digit display. All user menus provide an expansion of the current displayed parameters. If the expansion is complete the four-digit display reverts to item value. This function can be inhibited through the User Configuration menu.

Menu tree structure



ITEM	STATUS	TEMP	PRESSURES	SETPOINTS	INPUTS	OUTPUTS	CONFIG	ALARMS	ALARMS HIST	RUNTIMES
0	Default display	Evaporator water entering temp.	Discharge pressure	Cooling setpoint 1	Contact 1: on/off/ dual status	Compressor status	SUB-MENU: User Configuration (USER)	Number of active alarms/resets**	Historic alarm code 1**	SUB-MENU: Runtimes
1	Mode	Evaporator water leaving temp.	Suction pressure	Cooling setpoint 2	Contact 2: on/off/ heating/cooling*	Two-speed fan status	SUB-MENU: Service Configuration (SERVICE)	Active alarm code 1**	Historic alarm code 2**	SUB-MENU: Maintenance
2	Chiller occupied mode*	Outdoor temperature	-	Heating setpoint 1*	Contact 3: dual setpoint status	Water pump 1 status*	SUB-MENU: Factory Configuration (FACTORY)	Active alarm code 2**	Historic alarm code 3**	-
3	Minutes left	Saturated discharge temperature	-	Heating setpoint 2*	Contact 4: CN mode select status	Water heat exchanger + air heat exchanger heater status	-	Active alarm code 3**	Historic alarm code 4**	-
4	Cooling/heating status*	Saturated suction temperature	-	Heating setpoint 3*	Contact 5: interlock status	Alarm relays	-	Active alarm code 4**	Historic alarm code 5**	-
5	Compressor status	Defrost temperature	-	Cooling - zero reset threshold*	Fault contact, compressor, circuit A	Boiler status*	-	Active alarm code 5**	Historic alarm code 6**	-
6	-	-	-	Cooling - full reset threshold*	-	Reversing valve	-	-	Historic alarm code 7**	-
7	-	-	-	Heating - full reset value*	-	Status, heater stages* # 1	-	-	Historic alarm code 8**	-
8	-	-	-	Heating - zero reset threshold*	-	Status, heater stages* # 2	-	-	Historic alarm code 9**	-
9	-	-	-	Heating - full reset threshold*	-	Screen test for local interface	-	-	Historic alarm code 10**	-
10	-	-	-	Heating - full reset value*	-	Automatic quick test	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-

Legend
 * Displayed if the configuration requires it
 ** Displayed if the alarm exists
 - Not in use

4.3.5 - Description of the Information menu

INFORMATION MENU (3)

ITEM	FORMAT	UNITS	DESCRIPTION
0			Automatic display mode. It cycles through the following displays:
	±nn.n	°C	1: Controlled water temperature: temperature of the water that the unit tries to maintain at the control point.
	CCn	-	2: Unit operating type CCN Control. Displayed if the CCN/clock board is installed.
	rEM	-	Remote Control
	OFF	-	3: Unit status Off: Unit is stopped and not authorised to start.
	rEADY	-	Ready: Unit is authorised to start
	dELAY	-	Delay: Unit is in delay at start-up. This delay is active after the unit has been switched on. The delay can be configured in the User Configuration menu.
	StOPPIng	-	Stopping: Unit is currently stopping.
	rUnnIng	-	On: Unit is running or authorised to start.
	trIPout	-	Fault shutdown.
	OvErridE	-	Limit: The operating conditions do not allow total unit operation.
	dEFROSt	-	Defrost: One circuit is in defrost mode.
	OCCUPIEd	-	4. Unit occupied/unoccupied status Occupied: Unit in occupied mode
	UNOCCUPIEd	-	Unoccupied: Unit in unoccupied mode
	COOL	-	5. Heating/cooling operating mode Cooling: Unit operates in cooling mode
	HEAT	-	Heating: Unit operates in heating mode
	Both	-	Both: The unit operates in cooling (compressors) and heating (boiler). Only with HSM operation.
	ALARm	-	6: Alarm mode Alarm: Unit is totally stopped because of failure.
	ALERt	-	Alert: Unit is in failure but not completely stopped.
1 [1]	nn		Active mode codes. Each active mode is displayed in turn. This Item is masked when nil. Pressing the enter button when a mode code is displayed causes a character text expansion to be scrolled across the four-digit display. See the description in the following table
	-		
2 [2]	occu	-	This item indicates the current unit occupied/unoccupied mode. Displayed if the CCN/clock board is installed.
	unoc		Occupied
	Forc		Unoccupied The value is displayed in turn with 'Forc' when the unit is in CCN control and if this variable if forced through CCN.
3	nn.n	minutes	Start-up delay. This item indicates the minutes left before the unit can be started. This delay at start-up is always active after the unit has been switched on. The delay can be configured in the User Configuration 1 menu.
4 [2]	HEAt	-	Heating/cooling mode. This item indicates whether the unit is in cooling or heating. Displayed if the unit controls a boiler.
	COOL	-	Heating
	both	-	Cooling
	Forc	-	Both: The unit operates in cooling (compressors) and heating (boiler). Only with HSM operation. The value is displayed in turn with 'Forc' when the unit is in CCN control and if this variable if forced through CCN.
5 [2]	nnn	-	Compressor status. ON - OFF
6 [2]	occu	-	Setpoint occupied mode. Displayed if the CCN/clock board is installed.
	unoc		Occupied: cooling setpoint 1 is active
	Forc		Unoccupied: cooling setpoint 2 is active The value shall be displayed in turn with 'Forc' when the unit is in CCN control and if this variable if forced through CCN.
7	±nn.n	°C	Active setpoint. This is the current cooling/heating setpoint: it refers to cooling setpoint 1 or cooling/heating setpoint 2. See section 5.4.1.
8	±nn.n	°C	Control point. This is the setpoint used by the controller to adjust the temperature of the leaving or entering water (according to configuration). Control point = active setpoint + reset. See section 5.4 The value is displayed in turn with 'Forc' when the unit is in CCN control and if this variable if forced through CCN.
	Forc		
9	±nn.n	°C	Controlled water temperature. Water temperature that the unit tries to maintain at the control point.

Legend

- 1 This item is masked when nil.
- 2 This item is displayed in certain unit configurations only.
- 3 Access to this menu is read-only except for item 10 that can be forced when the unit is in Local operating type.

DESCRIPTION OF OPERATING MODES (ITEM 1 OF THE INFORMATION MENU)

MODE #	MODE NAME	DESCRIPTION
1	Delay at start-up active	The delay at start-up operates after the unit has been switched on. If the delay has not expired, the mode is active. The delay is configured in the User Configuration 1 menu.
2	2nd cooling/heating setpoint active	The second cooling/heating setpoint is active. See section 5.4.1
3	3rd heating setpoint active	The third heating setpoint is active. See section 5.4.1
4	Setpoint reset active	In this mode, the unit uses the reset function to adjust the leaving water temperature setpoint. See section 5.4.
5	Water or air heat exchanger heater active	The water or air heat exchanger heater is active. See section 5.3.
6	Evaporator pump periodic start	The unit is stopped and the pump is started each day at 14.00 p.m. for two seconds. This function needs to be configured in the User Configuration 1 menu. See section 5.2 & 4.3.11.4.
7	Night condensing mode	The night mode is active. Fan runs at low speed (if permitted by operating conditions) and unit capacity can be limited. See section 4.3.11.4.
8	Low suction temperature protection	Protection for evaporator low suction temperature circuit is active. In this mode, circuit capacity is not authorised to rise and the circuit can be unloaded.
9	High pressure protection	The unit is in cooling mode. The circuit is in high pressure protection mode because the HP protection threshold has been exceeded. Circuit has been unloaded and the circuit capacity is not authorised to rise. See section 5.7.
10	Defrost	The unit is in heating mode, and the defrost sequence is active on the relevant circuit.
11	Low water entering temperature protection in heating mode	The unit is in heating mode and compressor start is not authorised, as the entering water temperature is below 10°C.
12	Hot gas protection in heating mode	The unit is in heating protection mode and hot gas discharge protection is active. In this mode, the circuit capacity cannot increase, and the circuit may be unloaded or go into defrost mode.
13	Low suction temperature protection in heating mode	The unit is in heating mode and low suction temperature protection is active. In this mode, circuit capacity is not authorised to rise and the circuit can be unloaded or go into defrost mode.
14	Boiler active	The unit controls a boiler and this is operating. See section 5.10.
15	Electric heating stages active	The unit controls additional electric heating stages, and these are operating. See section 5.10.
16	Unit in SM control	Unit is in control of a System Manager (FSM, CSM III or HSM).

4.3.6 - Description of the Temperatures menu

TEMPERATURES MENU [2]

ITEM	FORMAT	UNITS	COMMENTS
0	±nn.n	°C	Water heat exchanger entering water temperature
1	±nn.n	°C	Water heat exchanger leaving water temperature
2	±nn.n	°C	Outdoor temperature
3	±nn.n	°C	Saturated discharge temperature, circuit A
4	±nn.n	°C	Saturated suction temperature, circuit A
5 [1]	±nn.n	°C	Defrost temperature, circuit A

Legend

- 1 This item is displayed in certain unit configurations only
2 Access to this menu is read-only.

4.3.7 - Description of the Pressures menu

PRESSURES MENU [1]

ITEM	FORMAT	UNITS	COMMENTS
0 [1]	nnnn	kPa	Discharge pressure. Relative pressure.
1 [1]	nnn	kPa	Suction pressure. Relative pressure.

Legend

- 1 Access to this menu is read-only

4.3.8 - Description of the Setpoints menu

SETPOINTS MENU [2]

ITEM	FORMAT	UNITS	RANGE	COMMENTS
0	±nn.n	°C	See table below	This item lets you display and modify Cooling setpoint 1*
1	±nn.n	°C	See table below	This item lets you display and modify Cooling setpoint 2*
2	nnn	°C	See table below	This item lets you display and modify Heating setpoint 1* , only displayed for heat pumps.
3 [1]	nnn	°C	See table below	This item lets you display and modify Heating setpoint 2* , only displayed for heat pumps.
4 [1]	nn.n	°C	See table below	This item lets you display and modify Heating setpoint 3* , only displayed for heat pumps.
5 [1]	±nn.n	°C	See table below	Zero reset threshold, cooling mode**
6 [1]	±nn.n	°C	See table below	Full reset threshold, cooling mode**
7 [1]	±nn.n	°C	See table below	Full reset value, cooling mode**
8 [1]	±nn.n	°C	See table below	Zero reset threshold, heating mode**
9 [1]	±nn.n	°C	See table below	Full reset threshold, heating mode**
10 [1]	±nn.n	°C	-16 to 16	Full reset value, heating mode**

1 This item is displayed in certain unit configurations only.

2 All points contained in this table can be modified.

* Those setpoints can be used for entering or leaving water temperature control. By default the unit controls the evaporator entering fluid temperature. Leaving fluid temperature control requires a parameter modification in the Service Configuration menu.

** These parameters are only accessible when reset based on OAT or delta T has been selected in the User Configuration 1 menu. See section 4.3.11.3 & 5.6.2.

LEAVING WATER TEMPERATURE CONTROL (LWT_OPT=YES)

SETPOINT - °C	R-410A
Minimum cooling value	
Water	3.9
Maximum cooling value	17.8
Feedback setpoint, cooling	7.0
Minimum heating value	20.6
Maximum heating value	50.0
Default setpoint heating	50.0

ENTERING WATER TEMPERATURE CONTROL (LWT_OPT=NO)

SETPOINT - °C	R-410A
Minimum cooling value	
Water	10.0
Maximum cooling value	23.9
Feedback setpoint, cooling	12.0
Minimum heating value	14.4
Maximum heating value	43.9
Default setpoint heating	45.0

RESET THRESHOLDS IN COOLING OR HEATING MODE

Reset threshold	Zero	Full
Reset based on outdoor air temperature	-10 to 51.7 °C	-10 to 51.7 °C
Reset based on Delta T	0 to 11.1 °C	0 to 11.1 °C

4.3.9 - Description of the Inputs menu

INPUTS MENU [2]

ITEM	FORMAT	UNITS	COMMENTS
0	oPEn/CLoS	-	Remote contact 1 status. If the auto cooling/heating changeover function is not selected (User Configuration 1), this contact is used to start and stop the unit. If the auto cooling/heating changeover function is selected, this contact is multiplexed with contact 2 to permit starting and stopping the unit and the selection of heating/cooling/auto. This contact is only valid, if the unit is in the remote operating control (rEM) mode. See section 3.6 for the description of the connections of this contact.
1 [1]	oPEn/CLoS	-	Remote contact 2 status. If the auto cooling/heating changeover function is not selected (User Configuration 1), this contact is used to select the heating or cooling mode. If the auto cooling/heating changeover function is selected, this contact is multiplexed with contact 1 to permit starting and stopping the unit and the selection of heating/cooling/auto. This contact is only valid, if the unit is in the remote operating control (rEM) mode. See section 3.6 for the description of the connections of this contact.
2	oPEn/CLoS	-	Remote contact 3 status. Dual set point: CSP1=Open; CSP2=Closed
3 [1]	oPEn/CLoS	-	CCN contact status. This contact is only used for dual-circuit units: this contact is multiplexed with contact 6 to permit selection of a setpoint. This contact is only active in the remote operating control mode. See section 3.6.6 for the description of this contact and section 5.6.1 for the description of the setpoint selection function.
4	b ₁	-	Compressor feedback contacts

1: This item is displayed in certain unit configurations only

2: Access to this menu is read-only.

4.3.10 - Description of the Outputs/Tests menu

4.3.10.1 - General

This menu displays the status of the controller outputs. Moreover, when the machine is fully stopped (LOFF) the outputs can be activated for manual or automatic tests (the access to the tests is password controlled).

4.3.10.2 - Menu description

OUTPUTS STATUS & TESTS MENU [2] [3]			
ITEM	FORMAT	UNITS	DESCRIPTION
0	b ₁ tESt FAIL Good	-	Compressor , command status b ₁ = compressor In test mode , the Arrow buttons display ON/OFF in succession, so as to force the status of the compressor outputs in turn. During the test phase, power to the compressor is switched on for 10 seconds only. It is then not possible to restart the compressor for a further 30 seconds. When the test is completed the following is displayed: - Fail: displayed if the test has failed because the compressor was not started or run in reverse rotation. - Good: displayed if test was successful
1	StoP LOW HIGH tESt	-	Two-speed fan status Stop = fan is stopped Low = fan is in low speed High = fan is in high speed
2 [1]	On OFF tESt FAIL Good Forc	-	Evaporator water pump command status. Not displayed if the unit does not control a pump. On: pump is running Stop: pump is stopped Forc: this item is displayed only when the unit is stopped locally (LOFF). selecting this item authorises turning on the pump with no delay and for an unlimited length of time. The pump will remain on until any button of the user interface is pressed: it is then immediately stopped. If the unit is in CCN control, then the pump status is displayed in turn with "Forc" if the pump status is forced through CCN. During the test phase , power to the pump is switched on for 10 seconds only. When the test is completed the following is displayed: - Fail: displayed if the test has failed because the pump was not started - Good: displayed if the test was successful
3	On OFF tESt	-	Water heat exchanger heater command status See sections 5.3
4	b ₁ tESt	-	Alarm output command status b ₁ = alarm In test mode , the Arrow buttons display ON and OFF in succession, so as to force each alarm output status in turn.
5 [1]	On OFF tESt	-	Boiler command status. Displayed if the unit controls a boiler. See section 5.11.
6 [1]	nnn tESt	%	Variable fan speed . Displayed if the unit controls a variable-speed fan.
7 [1]	b ₁ tESt	-	4-way reversing cycle valve status . In test mode, the arrow keys successively display 01 and 10, in order to authorise the test for each valve in turn. b ₁ = valve This item is only displayed for heat pump units.
8 [1]	b ₁ b ₂ tESt	-	Additional heating stage status . b ₁ = stage 1 b ₂ = stage 2 In test mode the arrow keys successively display 0001, 0010, 0100 and 1000 to force the status of each electric heating stage in turn. This item is only displayed for heat pump units controlling additional electric heater stages. See section 5.10.
9 [1]	YES no tESt	- - %	Used for local interface test only. Lights or flashes all LEDs and blocks, so as to check that they are working properly.
10	Auto tESt	-	Automatic test . Selecting this item activates the automatic test function.

1 : This item is displayed in certain unit configurations only.

2 : Testing authorised only if the unit is in Local Off and all compressors are off.

3 : Password needed only for testing.

"Test": displayed in turn with the item value during tests.

4.3.10.3 - Manual tests

This function allows the user to test the outputs individually, if the machine is completely shut down (LOFF). To carry out a manual test use the arrow keys to access the output to be tested and press the Enter key (longer than 2 seconds) to activate the modification mode. The password is automatically requested, if it has not previously been verified. The Outputs/Test LED on the user interface begins to flash. Enter the desired test value and again press Enter to start the test. 'tESt' is displayed on the 4-digit display alternately with the value tested. The Outputs/Test LED stops flashing. Press the Enter key or an arrow key to stop the test.

4.3.10.4 - Automatic tests

The automatic test function verifies the integrity of the analogue entries and activates the outputs in sequence. For each test 't XX' is displayed on the user interface. 'xx' indicates the number of the test in progress. When a test has been completed, the following test is automatically activated.

A message may appear, asking the operator for a validation with the Enter key, if the control cannot automatically verify a sensor value or an output status. If the value read or the output status is incorrect, the operator must press a different key (not the Enter key) to cancel the automatic test procedure.

If a test fails, an error message and an error code are displayed. The automatic test procedure is interrupted.

When all tests have been completed, an end-of-test message appears.

The table below describes the messages shown on the user interface during the automatic test sequence.

TEXT	DESCRIPTION
Thermistor test failed [XX]	Test number XX of the thermistor has failed
Pressure test failed [XX]	Test number XX of the pressure sensor has failed
Output test failed [XX]	Output test number XX has failed
Input test failed [XX]	Input test number XX has failed
Press enter if test [XX] correct	Request for the operator to validate test XX
OAT [value] press enter if test [XX] correct	Request for the operator to validate the outdoor air temperature value displayed. Test number XX
Auto test completed	Automatic test completed

The table below describes the different sequences of the automatic test.

TEST NUMBER	DESCRIPTION	CONFIRMATION
0	Outdoor temperature sensor test	yes
1	Pressure sensor test	no
2	Defrost sensor test (heat pumps only)	no
3, 4	Water flow switch test and primary pump test	no
5, 6	Entering and leaving water temperature sensor test	no
7	Entering and leaving water temperature sensor delta test	no
8	Water flow switch test	no
9	Test compressor	no
10	4-way reversing valve test (heat pumps only)	no
11	Low-speed test, fan (units not equipped with Varifan)	yes
12	High-speed test, fan (units not equipped with Varifan)	yes
13	Air heat exchanger condensate heater test (dual-circuit heat pumps only)	yes
14	Boiler output activation (if unit controls a boiler)	yes
15	Additional electric heating stage 1 activation (if unit controls electric heating stages)	yes
16	Additional electric heating stage 2 activation (if unit controls electric heating stages)	yes
17	Alarm output A activation	yes
18	Automatic test completed	-

The table below describes the faults that can be displayed during the automatic test.

TEST FAULT	DESCRIPTION
1	Outdoor air thermistor outside range
2	Outdoor air value read not validated by operator
3	Low pressure transducer, outside range
4	High pressure transducer, outside range
5	Defrost thermistor, outside range
6	Water flow switch not open
7	Primary pump not started or water flow switch not closed
8, 9, 10, 11, 12	Water entering temperature sensor outside range
13, 14, 15, 16, 17	Water leaving temperature sensor outside range
18	Temperature difference between entering and leaving water sensors too high
19	Water flow switch not opened or primary pump not stopped
20	Compressor start fault; pressure difference (delta P) between head and suction low
21	Command fault, 4-way reversing valve
22	Low-speed test, fan not validated by the operator
23	High-speed test, fan not validated by the operator
24	Air heat exchanger condensate heater, not validated by the operator
25	Boiler activation test not validated by the operator
26	Electric heating stage 1 activation test not validated by the operator
27	Electric heating stage 2 activation test not validated by the operator
28	Alarm relay output activation test, not validated by the operator

4.3.11- Description of the configuration menu

4.3.11.1- General

This menu can be used to display and modify all configurations: Factory, Service and User. Only the User Configuration can be modified by the end-user. The Factory, Service and master/slave configurations are not described in this document. A configuration can only be modified if the unit is fully stopped (LOFF).

The menus User 1 [USer 1] and User 2 [USer 2] are password-protected. The other menus are directly accessible, except if item 6 of the User 1 menu (password for all configurations) has been validated.

4.3.11.2 - Password

A password must be entered in order to access the test function or to modify a configuration. It is automatically requested, if necessary: 'EntEr PASS' is displayed on the 4-digit display and the configuration menu LED flashes, indicating that the modification mode is active. Press the arrow keys until the value '11' is displayed on the 4-digit display. Press Enter to validate this. The configuration menu LED stops flashing. If the password is correct, 'Good' is displayed. If the password is incorrect, 'PASS incorrEct' is displayed. The User password has a default value of 11.

This value can be modified through the Service configuration. The password can be entered if the unit is fully stopped, otherwise 'ACCES dEniEd' (access denied) will be displayed on the 4-digit display. The controller automatically deactivates the password after 5 minutes without activity (i.e. no buttons pressed) or after powering up.

SUB-MENU USER CONFIGURATION

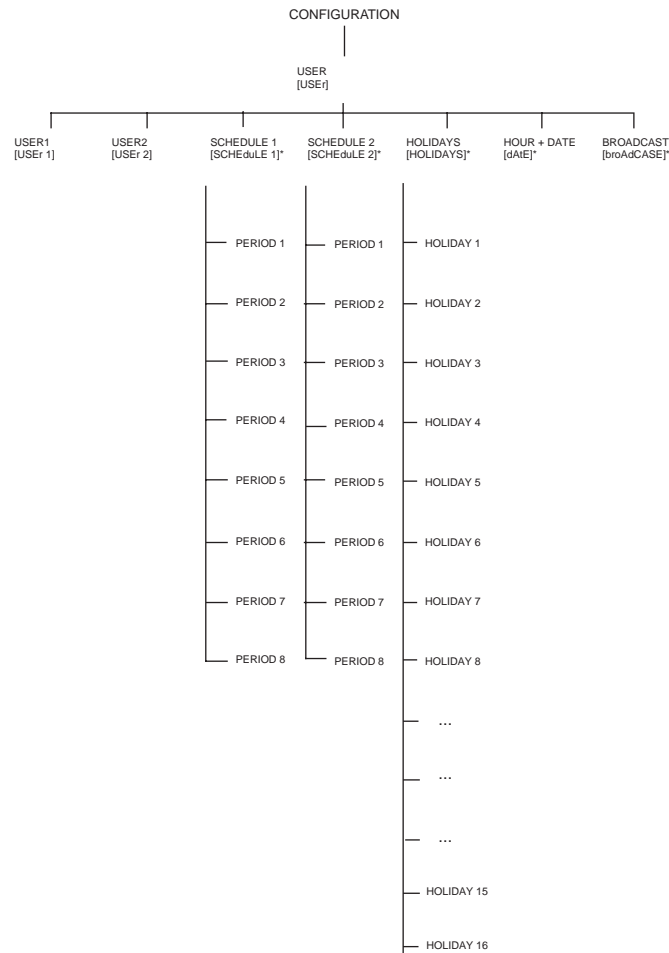
ITEM	USER 1 [USER1]	USER 2 [USER2]*	DATE [dAtE]*	SCHEDULE 1 [SchEduLE 1 MEnu]*	SCHEDULE 2 [SchEduLE 2 MEnu]*	HOLIDAYS [HOLiDAy MEnu]*	BROADCAST [BroDcASt]*
0	Return to previous menu	Return to previous menu*	Return to previous menu	Return to previous menu	Return to previous menu	Return to previous menu	Return to previous menu
1	Start-up delay*	Periodic pump start-up*	Hour*	SUB-MENU: Period 1 [PERlod 1]	SUB-MENU: Start period hrs	SUB-MENU: Holidays 1 [HOLiDAy 1] ▲	Broadcast acknowledge selection
2	Set point selected on remote control	Night mode - start hour*	Day of the week*	SUB-MENU: Period 2 [PERlod 2]	SUB-MENU: End period hrs	SUB-MENU: Holidays 2 [HOLiDAy 2] ▲	Broadcast activation
3	Set point reset selection; cooling mode	Night mode - end hour*	Day and month*	SUB-MENU: Period 3 [PERlod 3]	SUB-MENU: Period 1 [PERlod 1]	SUB-MENU: Holidays 3 [HOLiDAy 3] ▲	Outdoor temperature broadcast bus
4	Set point reset selection; heating mode	-	Year*	SUB-MENU: Period 4 [PERlod 4]	SUB-MENU: Period 2 [PERlod 2]	SUB-MENU: Holidays 4 [HOLiDAy 4] ▲	Outdoor temperature broadcast element
5	Boiler selection	Number clock 1*	-	SUB-MENU: Period 5 [PERlod 5]	SUB-MENU: Period 3 [PERlod 3]	SUB-MENU: Holidays 5 [HOLiDAy 5] ▲	Start month daylight saving time
6	Boiler selection threshold	Number clock 2*	-	SUB-MENU: Period 6 [PERlod 6]	SUB-MENU: Period 4 [PERlod 4]	SUB-MENU: Holidays 6 [HOLiDAy 6] ▲	Start day daylight saving time
7	Electric heating stage operating threshold	CCN address *	-	SUB-MENU: Period 7 [PERlod 7]	SUB-MENU: Period 5 [PERlod 5]	SUB-MENU: Holidays 7 [HOLiDAy 7] ▲	Start hour daylight saving time
8	Electric heating safety stage + threshold	CCN bus*	-	SUB-MENU: Period 8 [PERlod 8]	SUB-MENU: Period 6 [PERlod 6]	SUB-MENU: Holidays 8 [HOLiDAy 8] ▲	Minutes to add
9	Electric heating stage operation schedule	-	-	-	SUB-MENU: Period 7 [PERlod 7]	SUB-MENU: Holidays 9 [HOLiDAy 9] ▲	End month daylight saving time
10	Extended display selection	-	-	-	SUB-MENU: Period 8 [PERlod 8]	SUB-MENU: Holidays 10 [HOLiDAy 10] ▲	End day daylight saving time
11	Password for all user configuration	-	-	-	-	SUB-MENU: Holidays 11 [HOLiDAy 11] ▲	End hour daylight saving time
12	Software version number	-	-	-	-	SUB-MENU: Holidays 12 [HOLiDAy 12] ▲	Minutes to subtract
13	-	-	-	-	-	SUB-MENU: Holidays 13 [HOLiDAy 13] ▲	-
14	-	-	-	-	-	SUB-MENU: Holidays 14 [HOLiDAy 14] ▲	-
15	-	-	-	-	-	SUB-MENU: Holidays 15 [HOLiDAy 15]	-
16	-	-	-	-	-	SUB-MENU: Holidays 16 [HOLiDAy 16]	-
17	-	-	-	-	-	-	-

Legend:

*: only displayed if configuration requires.

▲: The holiday function is not activated if no holiday is configured.

NOTE: The items in brackets show what is displayed on the user interface.



SUB-MENU PERIOD CONFIGURATION*

Item	PERIOD 1 to 8 [PERiod X MEnu]*
0	Return to previous menu
1	Start of occupied period
2	End of occupied period
3	Selection Monday
4	Selection Tuesday
5	Selection Wednesday
6	Selection Thursday
7	Selection Friday
8	Selection Saturday
9	Selection Sunday
10	Selection holidays

SUB-MENU HOLIDAY CONFIGURATION*

Item	HOLIDAYS 1 to 16 [HoLidAy X MEnu]*
0	Return to previous menu
1	Start month holidays
3	Start day holidays
4	Number of days, holidays

Legend

*: only displayed if configuration requires.

NOTE: The items in brackets show what is displayed on the user interface.

4.3.11.3 - Description of the User 1 Configuration sub-menu

USER 1 CONFIGURATION SUB-MENU [2]

ITEM	FORMAT	UNITS	DEFAULT	COMMENTS
0	USER MEnu	-	-	When selected this item authorises return to the previous menu.
1	1 to 15	min	1	Delay at start-up. This value is reinitialised after power-up or when both circuits are halted by local, remote or CCN command. No compressor will be started up until this pause has expired. However, the evaporator pump command will be activated immediately. The safety lockout loop will not be checked until the pause has expired.
2 [1]	0/1	-	0	Contact 3 select 0 = dual setpoint is activated through remote control 1 = dual setpoint is activated through programming operating time via CCN Determines whether contact 3 is used for remote demand limit or dual setpoint control. For single-circuit units only.
3	0/1/2	-	0	Cooling setpoint reset select. See section 5.4.2. 0 = reset not selected 1 = reset based on outdoor temperature 2 = reset based on return water temperature
4 [1]	0/1/2	-	0	Heating setpoint reset select. See section 5.4.2 0 = reset not selected 1 = reset based on outdoor temperature 2 = reset based on return water temperature
5	«YES/no»	-	no	Boiler control select Yes = boiler controlled by the unit No = boiler not controlled
6 [1]	-15 to 0	°C	-10	Boiler threshold. Outdoor air temperature limit; if the temperature is lower, the heat pump is stopped or only the boiler is used for hot water production. Only for heat pumps controlling an additional boiler.
7 [1]	-5 to 21	°C	5	Electric heating stage threshold. Maximum outdoor air temperature threshold for the use of electric heating stages. Only for heat pumps, equipped with optional additional electric heating stages.
8 [1]	«YES/no»	-	no	Electric heating safety stage. In this configuration the last electric heating stage is only activated in the safety mode (in case of a unit fault that prevents unit operation in heat pump mode). The other electric heating stages operate normally. See section 5.10.
9 [1]	0 to 60	minutes		Electric heating stage operation schedule. Permits configuration of a start-up delay after unit start-up during which the electric heater stages are not allowed to start.
10	«YES/no»	-	yes	Extended menu select Yes = menu description available No = menu description not available This item authorises activating or inhibiting the menu item expanded display.
11	«YES/no»	-	no	Password for all User Configurations Yes = password required for all User Configurations (Date, Time Schedule, Broadcast) No = password require for User menu only When this item is validated, the User Password will be required for all configurations accessible by the User.
12	nn.n	-	-	Software version number This item shows the number of the software version used by this controller. Access is read only.

Legend

- 1 This item shall be masked when not used.
2 Access to menu is read/write.

4.3.11.4 - Description of the User 2 Configuration sub-menu

This menu is only accessible if the unit is equipped with an optional CCN/clock board

USER 1 CONFIGURATION SUB-MENU

ITEM	FORMAT	UNITS	DEFAULT	COMMENTS
0	USER 2 Menu			When selected this item authorises return to the previous menu.
1[1]	YES/no	-	no	Periodic pump quick-start of the water pump(s) Yes = the pump is started periodically when the unit is manually stopped. No = periodic pump start is disabled When the unit is manually stopped (e.g. during the winter season) the pump is started each day at 14.00 hours for 2 seconds. If two pumps are available, pump #1 is started on odd days and pump #2 on even days.
2	n ₁ n ₂ n ₃ n ₄ 00:00 to 23:59	-	00:00	Night control mode - start time* Authorises entering the time of day at which the night control mode starts. During this period the fan runs at low speed (to reduce fan noise) if permitted by operating conditions, and unit capacity is limited to the maximum night values.
3	n ₁ n ₂ n ₃ n ₄ 00:00 to 23:59	-	00:00	Night control mode - end time* Authorises entering the time of day at which the night control mode ends.
4 [1]	0 or 65 to 99	-	0	Schedule 1 clock number (for unit on/off schedule, see section 4.3.11.6). 0 = schedule in local operating mode 65 to 99 = schedule in CCN operating mode
5 [1]	0 or 65 to 99	-	0	Schedule 2 clock number (schedule for setpoint selection, see section 4.3.11.6). 0 = schedule in local operating mode 65 to 99 = schedule in CCN operating mode
6 [1]	1 to 239	-	1	CCN element address. No two network elements can have the same element number and bus number at the same time.
7 [1]	0 to 239	-	0	CCN bus number. No two network elements can have the same element number and bus number at the same time.

Legend

- * n₁n₂: hours (00 to 23). The first time the Enter button is continuously pressed, the first two characters in the 4-digit display flash so that hours can be adjusted.
n₃n₄: minutes (00 to 59). Continuous pressing of the Enter key again causes the last two characters to flash so that minutes can be adjusted.

4.3.11.5 - Description of Date and Time configuration sub-menu

This menu is only accessible, if the unit is equipped with an optional CCN/clock board.

DATE & TIME CONFIGURATION SUB-MENU		
ITEM	FORMAT	COMMENTS
0	dAtE MEnu	When selected this item authorises return to the previous menu.
1	n ₁ n ₂ n ₃ n ₄ 00:00 to 23:59	Current time setting. n ₁ n ₂ : hours (00 to 23). The first time the Enter button is continuously pressed, the first two characters in the 4-digit display flash so that hours can be adjusted. n ₃ n ₄ : minutes (00 to 59). Continuous pressing of the Enter key again causes the last two characters to flash and minutes can be adjusted.
2	«Mon» «Tue» «Wed» «Thu» «Fri» «Sat» «Sun»	Current day of week setting. Monday Tuesday Wednesday Thursday Friday Saturday Sunday
3	n ₁ n ₂ n ₃ n ₄ 01:01 to 31:12	Current day and month setting. n ₁ n ₂ :day (01 to 31). The first time the Enter button is continuously pressed, the first two characters in the 4-digit display flash so that day can be adjusted. n ₃ n ₄ :month (01 to 12). Continuous pressing of the Enter key again causes the last two characters to flash so that month can be adjusted.
4	nnnn	Current year setting.

4.3.11.6 - Description of the Time Schedules sub-menus

The control provides two timer programs: schedule 1 and schedule 2 that can be activated if the unit is equipped with an optional CCN/clock board (if the CCN/clock board is not installed, the two schedules are permanently in occupied mode).

The first timer program (schedule #1) 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) 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, cooling or heating setpoint 2 during unoccupied periods. Heating setpoint 3 is activated during holiday periods. For additional information on set-point activation see section 5.4.1.

Each schedule consists of eight time periods set by the operator. These time periods can be flagged to be in effect or not in effect on each day of the week plus a holiday period (see section 4.3.11.7 on public holidays). The day begins at 00.00 hours and ends at 24.00 hours.

Program is in unoccupied mode unless a schedule time period is in effect. If two periods overlap and are both active on the same day, the occupied mode takes priority over the period.

Each of the eight periods can be displayed and changed with the aid of a sub-sub-menu. The table below shows how to access the period configuration. Method is the same for the time schedule #1 or the time schedule #2.

PERIOD X CONFIGURATION SUB-MENUS (X = 1 TO 8)

ITEM #	FORMAT	COMMENTS
0	Period X Menu	Indicates the period (X) you are going to configure. When selected this item authorises a return to the main menu.
1	n ₁ n ₂ n ₃ n ₄ 00:00 to 24:00	Occupied period - Start time* . Authorises entering the time of day at which the occupied period starts.
2	n ₁ n ₂ n ₃ n ₄ 00:00 to 24:00	Occupied period - End time* . Authorises entering the time of day at which the occupied period ends.
3	Mo- 0 or Mo- 1	1 = the period is in effect on Monday . 0 = period not in effect on Monday
4	tu- 0 or tu- 1	1 = the period is in effect on Tuesday . 0 = period not in effect on Tuesday.
5	UE-0 or UE- 1	1 = the period is in effect on Wednesday . 0 = period not in effect on Wednesday.
6	tH- 0 or tH- 1	1 = the period is in effect on Thursday . 0 = period not in effect on Thursday.
7	Fr-0 or Fr- 1	1 = the period is in effect on Friday . 0 = period not in effect on Friday.
8	SA- 0 or SA- 1	1 = the period is in effect on Saturday . 0 = period not in effect on Saturday.
9	Su- 0 or Su- 1	1 = the period is in effect on Sunday . 0 = period not in effect on Sunday.
10	Ho- 0 or Ho- 1	1 = the period is in effect on public holidays . 0 = period not in effect on public holidays.

Legend

* n₁n₂: hours (00 to 24). The first time the Enter button is continuously pressed, the first two characters in the 4-digit display flash so that hours can be adjusted.
n₃n₄: minutes (00 to 59). Continuous pressing of the Enter key again causes the last two characters to flash so that minutes can be adjusted.

Typical timer program:

Time	MON	TUE	WES	THU	FRI	SAT	SUN	HOL
0	P1							
1	P1							
2	P1							
3								
4								
5								
6								
7	P2	P2	P3	P4	P4	P5		
8	P2	P2	P3	P4	P4	P5		
9	P2	P2	P3	P4	P4	P5		
10	P2	P2	P3	P4	P4	P5		
11	P2	P2	P3	P4	P4	P5		
12	P2	P2	P3	P4	P4			
13	P2	P2	P3	P4	P4			
14	P2	P2	P3	P4	P4			
15	P2	P2	P3	P4	P4			
16	P2	P2	P3	P4	P4			
17	P2	P2	P3					
18			P3					
19			P3					
20			P3					P6
21								
22								
23								
24								

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

 Occupied
 Unoccupied

	Starts at	Ends at	Active on
P1 : period 1,	0h00,	3h00,	Monday
P2 : period 2,	7h00,	18h00,	Monday and Tuesday
P3 : period 3,	7h00,	21h00,	Wednesday
P4 : period 4,	7h00,	17h00,	Thursday and Friday
P5 : period 5,	7h00,	12h00,	Saturday
P6 : period 6,	20h00,	21h00,	Public holidays
P7 : period 7,	<i>Not used in this example</i>		
P8 : period 8,	<i>Not used in this example</i>		

4.3.11.7 - Description of the Holidays sub-menus

This function is used to define 16 public holiday periods. Each period is defined with the aid of three parameters: the month, starting day and duration of the public holiday period. During these public holidays the controller will be in occupied or unoccupied mode, depending on the programmed periods validated for public holidays (see section 4.3.11.6).

Each of these public holiday periods can be displayed and changed with the aid of a sub-menu. These menus are only accessible, if the unit is equipped with an optional CCN/clock board.

ATTENTION: The broadcast function must be activated to utilise the holiday schedule, even if the unit is running in standalone mode (not connected to CCN). See section 4.3.11.8.

HOLIDAY PERIOD X CONFIGURATION SUB-MENUS (X = 1 TO 16)

ITEM #	FORMAT	COMMENTS
0	HoLidAy X Sub-menu	When selected this item authorises a return to the configuration menu.
1	0 to 12	Start month of public holiday period 0 = period not in use 1 = January, 2 = February, etc.
2	0 to 31	Start day of public holiday period. 0 period not in use.
3	0 to 99 days	Duration of the public holiday period in days.

Typical programming for public holidays:

A public holiday period lasting 1 day on 20th May, for instance, is configured as follows: start month = 5, start day = 20, duration = 1
A public holiday period lasting 2 day on 25th May, for instance, is configured as follows: start month = 5, start day = 25, duration = 2

4.3.11.8 - Description of the Broadcast sub-menu

The controller provides a broadcast configuration menu which you can use to configure the unit to be the CCN's broadcaster, responsible for transmitting the time, outdoor temperature, and holiday flags to all system elements.

This menu also authorises setting the date of the daylight saving time. There should be **only one** broadcaster in a CCN, so this table should not be configured if any other system element is acting as broadcaster. These menus are only accessible, if the unit is equipped with an optional CCN/clock board.

ATTENTION: If the unit operates in standalone mode (not CCN connected) this menu can also must be used if the holiday function is used or to correct for daylight saving time.

BROADCAST CONFIGURATION SUB-MENU

ITEM #	FORMAT	COMMENTS
0	broAdCASt MEnu	When selected this item authorises a return to the main menu.
1	YES/no	Determines whether or not the unit is a broadcast acknowledger when the unit is connected on a CCN network. There must be only one broadcast acknowledger in a CCN. Warning: if the unit operates in standalone mode (not CCN connected) this choice must be set to Yes if the holiday function is used (see section 4.3.11.6) or if you want to configure the daylight saving time function.
2	YES/no	This item authorises enabling or disabling the Broadcast function . When it is set to Yes, the control will make a periodic broadcast on the CCN. When it is set to No, the control is not the broadcaster and there is no need to configure the other choice in this table. There must be only one broadcaster in a CCN and this item should not be configured if any other system element is acting as broadcaster. Warning: if the unit operates in standalone (not CCN connected) this choice must be set to Yes if the holiday function is used (see section 4.3.11.6) or if you want to configure the daylight saving time function.
3	nnn 0 to 239	OAT Broadcaster bus number: it is the bus number of the system that has the outside air temperature sensor connected to it. Used for CCN network function only.
4	nnn 0 to 230	OAT Broadcaster element number: it is the element number of the system element that has the outside air temperature sensor connected to it. Used for CCN network function only.
5	nn 1 to 12	Daylight saving start month. In this mode you enter the month in which the broadcaster will adjust its time for the start of daylight saving time.
6	nn 1 to 31	Daylight saving start day. In this mode you enter the day on which the broadcaster will adjust its time for the start of daylight saving time.
7	n ₁ n ₂ n ₃ n ₄ 00:00 to 24:00	Authorises entering the hours and minutes for saving start. In this mode you enter the time of day when the broadcaster will adjust its time for the start of daylight saving time. n ₁ n ₂ : hours (00 to 24). The first time the Enter button is continuously pressed, the first two characters in the 4-digit display flash so that hours can be adjusted. n ₃ n ₄ : minutes (00 to 59). Continuous pressing of the Enter key again causes the last two characters to flash so that minutes can be adjusted.
8	nnnn 1 to 1440 minutes	Daylight saving start minutes to add: number of minutes by which the broadcaster will adjust its time for the start of daylight saving time.
9	nn 1 to 12	Daylight saving stop month. In this mode you enter the month in which the broadcaster will adjust its time for the end of daylight saving time.
10	nn 1 to 31	Daylight saving stop day. In this mode you enter the day on which the broadcaster will adjust its time for the end of daylight saving time.
11	n ₁ n ₂ n ₃ n ₄ 00:00 to 24:00	Authorises entering the hours and minutes for saving stop. In this mode you enter the time of day when the broadcaster will adjust its time for the end of daylight saving time. n ₁ n ₂ : hours (00 to 24). The first time the Enter button is continuously pressed, the first two characters in the 4-digit display flash so that hours can be adjusted. n ₃ n ₄ : minutes (00 to 59). Continuous pressing of the Enter key again causes the last two characters to flash so that minutes can be adjusted.
12	nnnn 1 to 1440 minutes	Daylight saving start minutes to subtract: number of minutes by which the broadcaster will adjust its time for the end of daylight saving time.

4.3.12 - Description of the Alarms menu

This menu is used to display and reset up to 5 active alarms. It also permits alarm reset. If no alarm is active this menu is not accessible. See section 6 for a complete description of the alarm codes and alarm reset.

ALARMS MENU

ITEM #	FORMAT	COMMENTS
0 [1]	X ALArM rESEt ALArM	X alarms are active Reset of alarms is requested

To reset all active alarms, continuously press the Enter key. 'rESEt ALArM' is then displayed. Press the select key again: all alarms are reset.

ITEM #	FORMAT	COMMENTS
1 [1]	1 to 55	Current alarm code 1*
2 [1]	1 to 55	Current alarm code 2*
3 [1]	1 to 55	Current alarm code 3*
4 [1]	1 to 55	Current alarm code 4*
5 [1]	1 to 55	Current alarm code 5*

1 This item is masked when nil

NOTE

* Pressing the Enter key when alarm code is displayed causes the following message to be scrolled:
 "time of alarm" "date of alarm" "full CCN alarm message"
 - "time of alarm": hh-mm
 - "date": dd-mm
 - "full CCN alarm message": up to 64 characters
 Time and date are displayed if the unit is equipped with an optional CCN/clock board.

4.3.13 - Description of the Alarms History menu

ALARMS HISTORY MENU

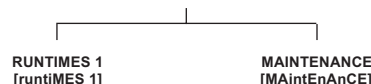
ITEM #	FORMAT	COMMENTS
1 [1]	1 to 55	Alarm history code 1*
2 [1]	1 to 55	Alarm history code 2*
3 [1]	1 to 55	Alarm history code 3*
4 [1]	1 to 55	Alarm history code 4*
5 [1]	1 to 55	Alarm history code 5*
6 [1]	1 to 55	Alarm history code 6*
7 [1]	1 to 55	Alarm history code 7*
8 [1]	1 to 55	Alarm history code 8*
9 [1]	1 to 55	Alarm history code 9*
10 [1]	1 to 55	Alarm history code 10*

1 This item is masked when nil

NOTE

* Pressing the Enter key when alarm code is displayed causes the following message to be scrolled:
 "time of alarm" "date of alarm" "full CCN alarm message"
 - "time of alarm": hh-mm
 - "date": dd-mm
 - "full CCN alarm message": up to 64 characters
 Time and date are displayed if the unit is equipped with an optional CCN/clock board.

4.3.14 - Runtime menu description



NOTE: The items in brackets show what is displayed on the user interface.

4.3.14.1 - Description of the Runtimes menu

RUNTIMES MENU [2]

ITEM #	FORMAT	UNITS	COMMENTS
0	-	-	When selected this item authorises return to the previous menu
1	nnnn M 10 M100	hrs/10 or 100	Unit operating hours*
2 [1]	nnnn M 10 M100	hrs/10 or 100	Unit operating hour in cooling mode
3 [1]	nnnn M 10 M100	hrs/10 or 100	Unit operating hours in heating mode
4	nnnn M 10 M100	hrs/10 or 100	Compressor operating hours*
5	nnnn M 10 M100	hrs/10 or 100	Machine starts*
6	nnnn M 10 M100	-/10 or 100	Compressor starts*
7	nnnn M 10 M100	-/10 or 100	Pump #1 operating hours*
8	nn	-	Compressor cycle during last hour
9	nn	-	Compressor average cycle during last 24 hours
10	nn	-	Compressor runtime in hours
11	nn	-	Compressor runtime during last 24 hours
12 [1]	nnnn M 10 M100	hrs/10 or 100	Boiler operating hours
13 [1]	nnnn M 10 M100	hrs/10 or 100	Electric heating operating hours
14 [1]	nnnn M 10 M100	hrs/10 or 100	Number of defrost cycles

1 This item is masked when not used

NOTES

* Certain values are divided by 10 or by 100, so that number of hours or start-ups of less than 10 are displayed as 0.

When the value is divided by 10 or by 100 it is displayed in turn with "M 10" or "M100".

4.3.14.2 - Maintenance menu description

To be active, the maintenance function must be preset in the Service configuration.

ITEM #	FORMAT	DESCRIPTION
0	MAIntEnAnCE MEnu	When selected this item authorises return to the previous menu.
1[1]	0 to 6,10	Reset maintenance alert.
2[1]	ALErT	Water flow rate to low.
3[1]	nnn/ALErT	Next primary pump maintenance operation in nnn days. 'ALErT' is displayed, when the delay before maintenance has elapsed.
4[1]	nnn/ALErT	Next water filter maintenance operation in nnn days. 'ALErT' is displayed, when the delay before maintenance has elapsed.

Legend

1 This item is masked when not used.

5 - USE OF THE PRO-DIALOG CONTROL SYSTEM

The table below, summarizes the unit ON/OFF and control type status with regard to the following:

- ccn_sw: CCN operation switch selector
- onoff_sw: remote START/STOP when the unit is under remote operating mode
- CHIL_S_S: CCN chiller START/STOP forced command
- chil_occ: chiller occupied status. Used when the clock function is enabled (ccnclock = yes) otherwise chil_occ shall be forced occupied all the time
- EMSTOP: CCN emergency stop command
- Alarm shutdown unit totally stopped due to a failure

PARAMETERS STATUS						Active control type	Unit state
ccn_sw	CHIL_S_S	onoff_sw	chil_occ state	EMSTOP	Alarm shutdown		
-	-	-	-	Enabled	-	-	Off
-	-	-	-	-	Yes	-	Off
Open	-	Open	-	-	-	Remote	Off
Open	-	-	Unoccupied	-	-	Remote	Off
Closed	Disabled	-	-	-	-	CCN	Off
Closed	-	-	Unoccupied	-	-	CCN	Off
Open	-	Closed	Occupied	Disabled	No	Remote	On
Open	-	Closed	Occupied	Disabled	No	Remote	On
Open	-	Closed	Occupied	Disabled	No	Remote	On
Closed	Enabled	-	Occupied	Disabled	No	CCN	On

Note: When switching from one control type (Remote or CCN) to another control type or switching from heating to cooling or vice-versa then, the unit shall do a transition through the OFF state before being allowed to start again. At this time, the On to OFF delay is always applied.

5.1 - Heating/cooling operation

5.1.1 - General

The heating/cooling selection applies to 30RA (liquid chillers) units, controlling a boiler and to 30RH (heat pumps) units. Heating/cooling control can be automatic or manual.

If the unit is in standby it does not cool or heat, and no compressor can be activated.

The table below, summarizes the unit HEAT/COOL mode with regard to the following parameters:

- status: unit ON/OFF status
- ctrl_typ: unit control type
- hc_sw: switch control status when the unit is under remote operating mode
- HC_SEL: HEAT/COOL select while running in CCN control type

Unit status and control type		Parameters status		Operating mode
status	ctrl_typ	hc_sw	HC_SEL	
Off	-	-	-	Cooling
On	Remote	Open	-	Cooling
On	Remote	Closed	-	Heating
On	CCN	-	Cooling	Cooling
On	CCN	-	Heating	Heating
On	CCN	-	Both	Both

Note: A cooling only unit (A/C) with no boiler option, operates always in cooling mode.

When an heat pump unit (HP) operates in cooling mode or it is in defrost cycle, the reversing valve will be powered.

The valve will not be powered in heating mode.

Valve position will be modified when unit capacity is 0%.

5.2 - Evaporator water pump control

The unit controls one evaporator water pump. The evaporator water pump is turned on when this option is configured (see User configuration) and when the unit is in one of the on modes described above or in delay mode. Since the minimum value for the delay at start-up is 1 minute (configurable between 1 and 15 minutes), the pump will run for at least one minute before the first compressor starts. The pump is kept running for 20 seconds after the unit goes to stop mode. The pump keeps working when the unit switches from heating to cooling mode or vice-versa. It is turned off if the unit is shut down due to an alarm unless the fault is a frost protection error. The pump can be started in particular operating conditions when the evaporator heater is active (see section 5.3).

The control provides a means to automatically start the pump each day at 14.00 hours for 2 seconds when the unit is off, if configured. Starting the pump periodically for few seconds increases the life-time of the pump bearings and the tightness of the pump seal.

5.3 - Evaporator heater control (Option)

The evaporator heater can be energised to protect an evaporator that can be damaged by freezing, if the unit is shut down for a long time at low outdoor temperature. The evaporator pump can be started, if conditions get worse.

NOTE: *Evaporator heater control parameters can be modified, using the Service configuration.*

5.4 - Control point

The control point represents the water temperature that the unit must produce. The inlet water is controlled by default, but the outlet water can also be controlled (requires a Service configuration modification).

Control point = active setpoint + reset

5.4.1 - Active setpoint

Two setpoints can be selected as active in cooling mode and three in heating mode. Usually, the second cooling setpoint is used for unoccupied periods or for ice storage (brine unit). The second setpoint in heating mode is used for unoccupied periods, and the third heating setpoint is used for holiday periods or public holidays. Depending on the current operations, the active setpoint can be selected by choosing the item in the Information menu, with the user's volt-free contacts, with network commands or with the setpoint timer program (schedule 2).

The following table summarises the possible selections depending on the control types (remote or CCN) and the following parameters:

- **Heating/cooling operating mode**
- **Control contact 3:** status of control contact 3.
- **Control contact 3 selection:** this selection, indicates if contact 3 is used for dual setpoint control or for demand limit control (see User Configuration menu, section 4.3.11).
- **Schedule 2 status:** schedule for setpoint selection. See section 4.3.11.6.

CCN OPERATING MODE		
PARAMETER STATUS		ACTIVE SETPOINT
HEATING/COOLING OPERATING MODE	SCHEDULE 2 STATUS	
Cooling	Occupied	Cooling setpoint 1
Cooling	Unoccupied	Cooling setpoint 2
Heating	Occupied	Heating setpoint 1
Heating	Unoccupied	Heating setpoint 2
Heating	Holiday	Heating setpoint 3

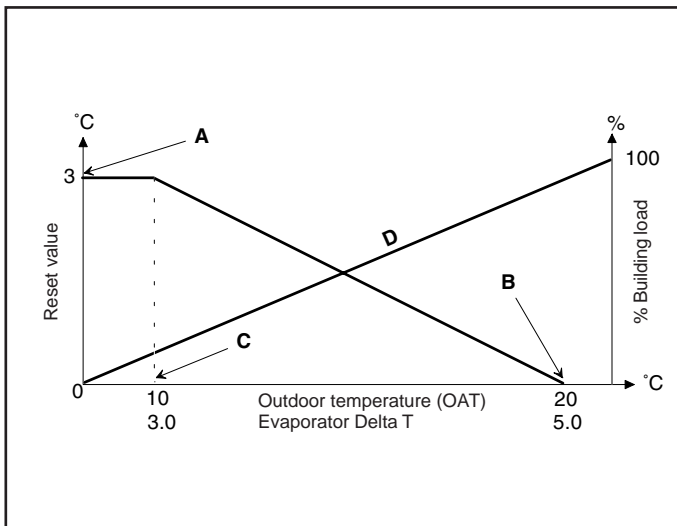
REMOTE OPERATING MODE				
PARAMETER STATUS				ACTIVE SETPOINT
HEATING/COOLING OPERATING MODE	CONTROL CONTACT 3 SELECTION	CONTROL CONTACT 3	SCHEDULE 2 STATUS	
Cooling	Setpoint	Setpoint 1	-	Cooling setpoint 1
Cooling	Setpoint	Setpoint 2	-	Cooling setpoint 2
Cooling	Demand limit	-	Occupied	Cooling setpoint 1
Cooling	Demand limit	-	Unoccupied	Cooling setpoint 2
Heating	Setpoint	Setpoint 1	-	Heating setpoint 1
Heating	Setpoint	Setpoint 2	-	Heating setpoint 2
Heating	Demand limit	-	Occupied	Heating setpoint 1
Heating	Demand limit	-	Unoccupied	Heating setpoint 2
Heating	Demand limit	-	Holiday	Heating setpoint 3

5.4.2 - Reset

Reset means that the active setpoint is modified so that less machine capacity is required (in cooling mode, the setpoint is increased, in heating mode it is decreased). This modification is in general a reaction to a drop in the load. For the PRO-DIALOG control system, the source of the reset can be configured in the User 1 configuration: it can be provided either by the outdoor temperature (that gives a measure of the load trends for the building) or by the return water temperature (delta T that gives an average building load). In response to a drop in the outdoor temperature or to a drop in delta T, the cooling setpoint is normally reset upwards in order to optimise unit performance:

In both cases the reset parameters, i.e. slope, source and maximum value, are configurable in the Setpoints menu (see section 4.3.8). Reset is a linear function based on three parameters.

- A reference at which reset is zero (outdoor temperature or delta T - no reset value).
- A reference at which reset is maximum (outdoor temperature or delta T - full reset value).
- The maximum reset value.



Reset example in cooling mode

Legend

- A Maximum reset value
- B OAT or delta T for no reset
- C OAT or delta T for full reset
- D Building Load

5.5 - Demand limit

Generally, demand limit is used by an energy management system to restrict the unit electricity consumption. The PRO-DIALOG control system enables the capacity of the unit to be limited by means of user-controlled volt-free contacts. The units have one contact (control contact 3), available in the User Configuration function for demand limiting or setpoint selection. The capacity of the unit cannot exceed the demand limit setpoint activated by the position of the contacts. The demand limit setpoints are adjustable via the setpoint menu.

The demand limit is active in all operating types: Local, Remote or CCN. However in CCN operating type, demand limit can be controlled directly with the aid of CCN commands.

A limitation value of 100% means that the unit may call upon the full array of its capacity stages.

5.6 - Night mode

The night period is defined (see User configuration) by a start time and an end time that are the same for each day of the week. During the night period, the fan runs at low speed, if permitted by the current operating conditions. In addition, the user can reduce the unit capacity by the setpoint selection.

5.7 - Water temperature control

This function adjusts the compressor operation to keep the heat exchanger water temperature at its setpoint. The precision with which this is achieved depends on the capacity of the water loop, the flow rate and the load. The control system continuously takes account of the temperature error with respect to the setpoint, as well as the rate of change in this error and the difference between entering and leaving water temperatures, in order to determine the optimum moment at which to add or withdraw a capacity stage. If the compressor undergoes too many starts (per hour) or runs below one minute each time it is started this automatically brings about reduction of compressor starts, which makes leaving water temperature control less precise. In addition, the high pressure, low pressure or defrost unloading functions can also affect the temperature control accuracy. Compressor is started and stopped in a sequence designed to minimize the number of start-ups (value weighted by their operating time).

5.8 - Head pressure control

Condensing pressure control is automatically ensured by a two-speed fan.

5.9 - Defrost function

Defrost is activated, when the unit is in heating mode, in order to reduce frost build-up on the air heat exchanger. During the defrost cycle the fans and the four-way refrigerant valve is reversed, forcing the circuit to cooling mode. The fan can temporarily be restarted during the defrost cycle. The defrost cycle is fully automatic and does not require any setting. A condensate heater prevents ice formation at the bottom of the heat exchangers, if the defrost cycles are taking place at low outdoor temperature.

5.10 - Additional electric heater stage control

The heat pump units can control up to four additional electric heating stages.

The electric heating stages are activated to complement the heating capacity when the following conditions are satisfied:

- The unit uses 100% of the available heating capacity, or the unit is limited in its operation by a protection mode (low suction temperature, hot gas or defrost sequence in progress protection), and in all cases cannot satisfy the heating load.
- The outdoor temperature is below a configured threshold (see User 1 configuration).
- The unit demand limit is not active.

The user may configure the last available electric heating stages as a safety stage. In this case, the safety stage is only activated in addition to the other stages if there is a machine fault, preventing the use of the heating capacity. The other electric heating stages will continue to operate as described above.

5.11 - Control of a boiler

The unit can control the start-up of a boiler, if it is in heating mode. When the boiler is operating, the unit water pump is stopped.

A heat pump unit and a boiler cannot operate together. In this case the boiler output is activated in the following conditions:

- The unit is in heating mode, but a fault prevents the use of the heat pump capacity.
- The unit is in heating mode, but works at a very low outdoor temperature, making the heat pump capacity insufficient. The outdoor air temperature threshold for use of the boiler is fixed at -10°C, but this value can be adjusted in the User 1 menu.

5.12 - Controlling PRO-DIALOG Plus units with a System Manager

Up to eight PRO-DIALOG Plus units (or System Manager compatible units) can be controlled by one control module of the FSM, CSM III or HSM type which can handle multi-tasking of control functions such as starting units in sequence.

6 - DIAGNOSTICS - TROUBLESHOOTING

6.1 - General

The PRO-DIALOG Plus control system has many fault tracing aid functions. The local interface and its various menus give access to all unit operating conditions. The test function makes it possible to run a quick test of all devices on the unit. If an operating fault is detected, an alarm is activated and an alarm code is stored in the Alarm menu.

6.2 - Displaying alarms

The alarm LEDs on the summary interface (see section 4.1) give a quick display of the unit as a whole.

- A flashing LED shows that the circuit is operating but there is an alarm.
- A steady LED shows that the circuit has been shut down due to a fault.









The Alarm menu on the main interface displays up to 5 fault codes that are active on the unit.

6.3 - Resetting alarms

When the cause of the alarm has been corrected the alarm can be reset, depending on the type, either automatically on return to normal, or manually when action has been taken on the unit. Alarms can be reset even if the unit is running.

This means that an 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.

A manual reset must be run from the main interface using the following procedure:

RESET OF ACTIVE ALARMS				
OPERATION	ITEM NUMBER	ITEM VALUE	PRESS MENU	MENU LED
	2-DIGIT DISPLAY	4-DIGIT DISPLAY	BUTTON	LED
Hold down the MENU button until the LED for alarms lights. The 4-digit display shows the number of active alarms (2 in this example).	0			
	0	2 ALArM		
Press the Enter button until "rESEt ALARrM" is shown in the 4-digit display.	0	rESEt ALARrM		
Press the Enter button again to validate the reset. "Good" is displayed for 2 seconds then, "2 ALArM" and then, "no ALArM".	0	Good then, 2 AL then, no ALArM		

6.4 - Alarm codes

The following list gives a complete description of each alarm code and its possible cause.

Alarm code	Description	Control action	Alarm reset method	Probable cause
1	Compressor fault	Compressor stopped	Manual	Compressor overheated
2	Leaving water temperature probe fault	Unit stopped	Automatic	Sensor out of range, probe wire interruption or sensor fault
3	Entering water temperature probe fault	Unit stopped	Automatic	Sensor out of range, probe wire interruption or sensor fault
4	Defrost probe fault	Unit stopped	Automatic	Sensor out of range, probe wire interruption or sensor fault
5	Air temperature probe fault	Unit stopped	Automatic	Sensor out of range, probe wire interruption or sensor fault
6	High pressure transducer fault	Unit stopped	Automatic	Transducer out of range, incorrect transducer voltage transducer wire interrupted or transducer fault
11	Low pressure transducer fault	Unit stopped	Automatic	Transducer out of range, incorrect transducer voltage transducer wire interrupted or transducer fault
12	Additional CCN clock/board fault	Unit stopped	Automatic if the board is recognised again	Board defect
13	Low refrigerant pressure in the circuit	Unit stopped	Automatic/Manual	Lack of refrigerant in the circuit, blocked refrigerant filter or low pressure transducer fault
14	High refrigerant pressure in the circuit	Unit stopped	Manual	Fan fault, coil obstructed, high outdoor air temperature
15	High pressure safety switch / reverse compressor rotation	Unit stopped	Manual	The safety pressure switch has not been reset after the last alarm, incorrect compressor connection
16	Plate exchanger anti-freeze protection	Unit stopped	Automatic/Manual	Low water flow rate entering or leaving water probe fault
21	Repeated attainment of low suction temperature in cooling (more than six times)	Unit stopped	Manual	Low pressure transducer fault, refrigerant filter blocked or lack of refrigerant in the circuit
22	Repeated attainment of high pressure condition in cooling (more than six times)	Unit stopped	Automatic	High pressure transducer fault high air temperature, high entering water temperature
23	Repeated attainment of high discharge temperature in heating	Unit stopped	Automatic	Low water flow rate entering or leaving water probe fault
24	Repeated attainment of low suction temperature in heating	Unit stopped	Automatic	Low pressure transducer fault, refrigerant filter blocked or lack of refrigerant in the circuit
25	Low entering water temperature in heating	Unit stopped	Automatic	Entering water temperature too low, entering or leaving water probe fault
26	Outdoor interblock fault	Unit stopped	Manual	Flowswitch tripped or fault, air in the water circuit
31	CCN emergency shut-down	Unit stopped	Automatic	Network control
32	Loss of communication with the Flotronic or Chiller System Manager	The unit operates in local mode	Automatic	CCN bus wiring defect or fault in the system
33	Maintenance service request	Unit stopped	Manual	-



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The manufacturer reserves the right to change any product specifications without notice.