REV	**00**
Date	**02-2024**
Supersedes	

Operating Manual
D-EOMHP01702-23_00EN

Water to water chiller & heat pump R32 units with scroll compressors

EWWT~Q/ EWLT~Q/ EWYT~Q

Original Instructions

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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 up structures). Only properly qualified installation engineers and highly qualified installers and technicians, fully trained for the product, are authorized 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.

The emergency stop causes all motors to stop but does not switch off power to the unit.
Do not service or operate on the unit without having switched off the main switch.

1.2. Before switching the unit

Before switching on the unit read the following recommendations:

- When all the operations and all the settings have been carried out, close all the switchbox panels.
- The switchbox panels can only be opened by trained personnel.
- When the UC requires to be accessed frequently the installation of a remote interface is strongly recommended
- LCD display of the unit controller may be damaged by extremely low temperatures (see chapter 2.3). For this reason, it is strongly recommended to never power off the unit during winter, especially in cold climates.

1.3. 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 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.

Direct intervention on the power supply can cause electrocution, burns or even death. This action must be performed only by trained persons.

RISK OF ELECTROCUTION: Even when the main circuit breaker or isolator is switched off, certain circuits may still be energized, since they may be connected to a separate power source.

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.

In accordance with the operating conditions the fans can be cleaned periodically. A fan can start at any time, even if the unit has been shut down.

2. GENERAL DESCRIPTION

2.1. Basic Information

POL468.85/MCQ/MCQ is a system for controlling single or dual-circuit air/water cooled chillers. POL468.85/MCQ/MCQ controls compressor start-up necessary to maintain the desired heat exchanger leaving water temperature. In each unit mode, by installing proper bypass options, it can control the operation of the condensers to maintain the proper condensation process in each circuit.
Safety devices are constantly monitored by POL468.85/MCQ/MCQ to ensure their safe operation.
Abbreviations used
In this manual, the refrigeration circuits are called circuit #1 and circuit #2. The compressor in circuit #1 is labelled Cmp1. The other in circuit #2 is labelled Cmp2. The following abbreviations are used:

W/C	Water Cooled	**ESRT**	Evaporating Saturated Refrigerant Temperature
CP	Condensing Pressure	**EXV**	Electronic Expansion Valve
CSRT	Condensing Saturated Refrigerant Temperature	**HMI**	Human Machine Interface
DSH	Discharge Superheat	**MOP**	Maximum operating pressure
DT	Discharge Temperature	**SSH**	Suction Super-Heat
EEWT	Evaporator Entering Water Temperature	**ST**	Suction Temperature
ELWT	Evaporator Leaving Water Temperature	**UC**	Unit controller (POL468.85/MCQ/MCQ)
EP	Evaporating Pressure	**R/W**	Readable/Writable
CWT	Cooling Water Temperature	**HWT**	Heating Water Temperature

2.2. Controller Operating Limits

Operation (IEC 721-3-3):
- Temperature -40...+70 °C
- Humidity < 95 % r.h (no condensation)
- Air pressure min. 700 hPa, corresponding to max. 3,000 m above sea level

Transport (IEC 721-3-2):
- Temperature -40...+70 °C
- Humidity < 95 % r.h (no condensation)
- Air pressure min. 260 hPa, corresponding to max. 10,000 m above sea level.

2.3. Controller Architecture

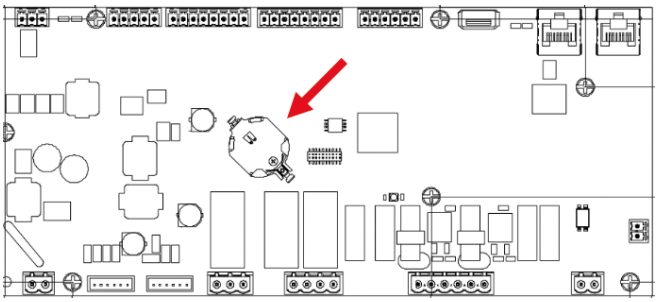
The overall controller architecture is the following:
- One POL468.85/MCQ main controller
- Peripheral Bus is used to connect I/O extensions to the main controller.

2.4. Controller maintenance

The controller requires to maintain the installed battery. Every two years it's required to replace the battery. Battery model is: BR2032 and it is produced by many different vendors.

To replace the battery, it is important to remove the power supply to all unit.

Refer to picture below for battery installation.



2.5. Embedded Web Interface (Optional)

The POL468.85/MCQ/MCQ controller has an embedded web interface, available with accessory EKRSCBMS (Connectivity for external BMS communication), that can be used to monitor the unit when connected to a TCP-IP network. It is possible to configure the IP addressing of the POL468.85/MCQ as a fixed IP of DHCP depending on the network configuration.
With a common web browser, a PC can connect with the unit controller entering the IP address.
When connected, it will be required to enter a username and a password. Enter the following credential to get access to the web interface:

```
Username: Daikin
Password: Daikin@Web
```

2.6. Application Save and Reset

Every variation of the HMI parameters will be lost after a power loss and it's necessary to execute a saving command to make them permanent. This action can be done via the Application Save command.

The controller automatically makes an Application Save after a change of value of one of following parameters:

Parameters	Name
1.00	Unit Enable
1.01	Compressor 1 Enable
1.02	Compressor 2 Enable
2.00	Available Modes
4.00	Control Source
5.00	Cool Setpoint 1
5.01	Cool Setpoint 2
5.02	Heat Setpoint 1
5.03	Heat Setpoint 2
13.00	DHCP Enable
14.00	Unit Type
14.04	Pump Skid Enable
15.02	Bas Protocol
15.03	HMI type
15.12	BEG Enable
18.00	Setpoint Reset Type

Some parameters present in the interface require a restart of the UC to become effective after a change of value. This operation can be done using the Apply Changes command.

These commands can be found in menu 20:

Menu	Parameter	R/W
20 (PLC)	00 (Application Save)	W
	01(Apply Changes)	W

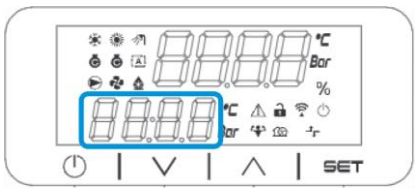
The path in the Web HMI interface for Application Save is "Main Menu".
The path in the Web HMI interface for Apply Changes is "Main Menu → View/Set Unit → Controller IP Setup → Settings".

3. UNIT INTERFACE

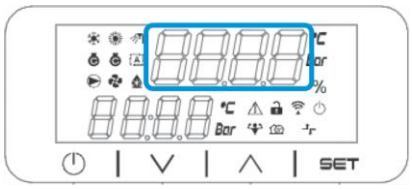
3.1. Description and navigation

The user interface installed in the unit is divided into **4 functional groups**:

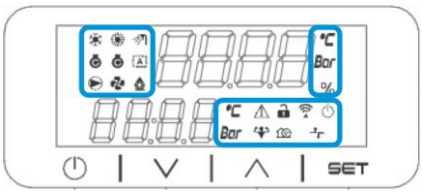
1. Numeric value Display (f.g.1)



2. Actual Parameter/Sub-Parameter group (f.g.2)

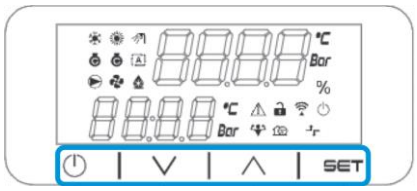


3. Icon indicators (f.g.3)



ICON	LED Description	LED ON	LED OFF	LED BLINKING
❄	Functioning mode Chiller	Running in cooling mode	-	-
☀	Functioning mode Heat Pump	-	Running in heat mode	-
	Compressor ON	Compressor ON	Compressor OFF	Compressor performing preopen or pump-down procedure
	Circulation Pump ON	Pump ON	Pump OFF	-
°C	Temperature	Temperature Value displayed	-	-
Bar	Pressure	Pressure Value displayed	-	-
%	Percentage	Percentage Value displayed	-	-
⚠	Alarm	-	No Alarm	Alarm Presence
	Setting mode	Customer parameter unlocked	-	-
	Connection status on Daikin on site	Connected	No Connection	Requesting Connection
⏻	On/stand-by	Unit Enabled	Unit Disabled	-
	BMS control (Network)	BMS control ON	BMS control OFF	-

4. Menu/Navigation keys (f.g.4)



The interface has a multi-level structure divided as follows:

Main Menu	Parameters	Sub-Parameters
Page [1]	Parameter [1.00]	Sub-Parameter [1.0.0]
		…
		Sub-Parameter [1.0.XX]
	…	…
	Parameter [1.XX]	Sub-Parameter [1.XX.0]
		…
		Sub-Parameter [1.XX.YY]
Page [2]	Parameter [2.00]	Sub-Parameter [2.0.0]
		…
		Sub-Parameter [2.0.XX]
	…	…
	Parameter [2.XX]	Sub-Parameter [2.XX.0]
		…
		Sub-Parameter [2.XX.YY]
…	…	…
Page [N]	Parameter [N.00]	Sub-Parameter [N.00.0]
		…
		Sub-Parameter [N.XX.YY]
	..	…
	Parameter [N.XX]	Sub-Parameter [N.00.0]
		…
		Sub-Parameter [N..XX.YY]

Parameters can be writable, only readable or give access to other sub-parameters (see table in 3.22 chapter).
The list of actions for browsing through the menu is:

1. Press [▲] [▼], in the navigation keys, to browse through the parameter groups, that is shown in (f.g.2) by its number, and in (f.g.1) by its name.
2. Press [SET] to select a parameter group.
3. Press [▲] [▼] to browse through the parameters in the specific group or menu.
4. Press [SET] to start value setting phase.
    a. During this phase, the value string (f.g.1) of the HMI will start to blink
5. Press [▲] [▼] to set/change the parameter value, that is shown in the numeric display (f.g.1).
6. Press [SET] to accept the value.
    a. After exiting the setting phase, the value string of the HMI will stop to blink. If an unavailable value is selected the value will continue to blink and value won't be set.

In order to go back through the pages, press the On/Stand-by button ⏻.
Icons provide an indication about current unit status.

3.2. Password

In order to unlock customer functionalities, the User has to insert the Password through the HMI menu [0]:

Menu	Parameter	Range	Description	R/W
00	00 (**Insert Password**)	0-9999	To insert all the 4 digits of the password, press "Set" after the insertion of the number to move on the next digit.	W

The password to access the customer' setting pages is: **2526**

3.3. Main menu and submenus

In this table is reported the whole interface structure from main menu to any single parameter including the screen saver pages. Typically, the HMI is composed by pages, containing the parameters, accessible from Main menu. In few cases there is a two-level structure where a page contains other pages instead of parameters; a clear example is the page [17] dedicated to Scheduler management.

Menu	Label	Parameters	Sub-Parameters	R/W	PSW Level
[0] Password	PSen	[00.00] Enter PSW	N/A	W	0
[1] Unit Enable	EnbL	[01.00] Unit Enable	N/A	W	1
		[01.01] Comp1 Enable	N/A	W	1
		[01.02] Comp2 Enable	N/A	W	1
[2] Operating Mode	Mode	[02.00] Mode selection	N/A	W	1
		[02.01] Keypad Cool/Heat switch	N/A	W	1
		[02.02] Muse system mode	N/A	R	0
[3] Capacity	CAPS	[03.00] Unit Capacity	N/A	R	0
		[03.01] Comp 1 Capacity	N/A	R	0
		[03.02] Comp 2 Capacity	N/A	R	0
[4] Network	nEt	[04.00] Source	N/A	W	1
		[04.01] BAS Enable	N/A	R	0
		[04.02] BAS Cool Setpoint	N/A	R	0
		[04.03] BAS Heat Setpoint	N/A	R	0
		[04.04] BAS Operating Mode	N/A	R	0
[5] Setpoints	SEtP	[05.00] Cool setpoint 1	N/A	W	0
		[05.01] Cool setpoint 2	N/A	W	0
		[05.02] Heat setpoint 1	N/A	W	0
		[05.03] Heat setpoint 2	N/A	W	0
[6] Temperatures	tMPS	[06.00] Evap Inlet temperature	N/A	R	0
		[06.01] Evap Outlet temperature	N/A	R	0
		[06.02] Cond Inlet temperature	N/A	R	0
		[06.03] Cond Outlet temperature	N/A	R	0
		[06.04] Cool System Temperature	N/A	R	0
		[06.05] Heat System Temperature	N/A	R	0
[7] Alarms	ALMS	[07.00] Alarm List	N/A	R	0
		[07.01] Alarm Clear	N/A	W	1<
[8] Pumps	PUMP	[08.00] Pump module Evap pump state	N/A	R	0
		[08.01] Pump module Cond pump state	N/A	R	0
		[08.02] Water Recirculation Timer	N/A	W	2
		[08.03] Water Recirculation TimeOut	N/A	W	2
		[08.04] Evaporator Flow Proof	N/A	W	1
		[08.05] Condenser Flow Proof	N/A	W	1
		[08.06] Evap Pump 1 State	N/A	R	0
		[08.05] Evap Pump 1 run hours	N/A	R	0
		[08.06] Evap Pump 2 State	N/A	R	0
		[08.07] Evap Pump 2 run hours	N/A	R	0
		[08.08] Cond Pump 1 State	N/A	R	0
		[08.09] Cond Pump 1 run hours	N/A	R	0
		[08.10] Cond Pump 2 State	N/A	R	0
		[08.11] Cond Pump 2 run hours	N/A	R	0

Menu	Label	Parameters	Sub-Parameters	R/W	PSW Level
[9] Thermostatic control	tHCO	[9.00] Startup DT	N/A	W	0
		[9.01] Shutdown DT	N/A	W	0
		[9.02] Stage up DT	N/A	W	0
		[9.03] Stage down DT	N/A	W	0
		[9.04] Stage up delay	N/A	W	0
		[9.05] Stage dn delay	N/A	W	0
		[9.06] Evap Freeze	N/A	W	2
		[9.07] Cond Freeze	N/A	W	2
		[9.08] Low Press Unload	N/A	W	2
		[9.09] Low Press Hold	N/A	W	2
[10] Date	dAtE	[10.00] Day	N/A	W	0
		[10.01] Month	N/A	W	0
		[10.02] Year	N/A	W	0
[11] Time	tIME	[11.0] Hour	N/A	W	0
		[11.1] Minute	N/A	W	0
[12] DoS	dOS	[12.00] Enable	N/A	W	0
		[12.01] State	N/A	R	0
[13] IP address settings	IPst	[13.00] DHCP	N/A	W	0
		[13.01] Actual IP	N/A	R	0
		[13.02] Actual Mask	N/A	R	0
		[13.03] Manual IP	[13.3.0] IP#1	W	0
			[13.3.1] IP#2	W	0
			[13.3.2] IP#3	W	0
			[13.3.3] IP#4	W	0
		[13.04] Manual Mask	[13.4.0] Msk#1	W	0
			[13.4.1] Msk#2	W	0
			[13.4.2] Msk#3	W	0
			[13.4.3] Msk#4	W	0
[14] Factory settings	FACt	[14.00] Unit Type	N/A	W	2
		[14.01] Expansion Pack Enable	N/A	W	2
		[14.02] Muse Address	N/A	W	2
		[14.03] Number of Units	N/A	W	2
		[14.04] Pump Skid Enable	N/A	W	2
		[14.05] Cond Control Measure	N/A	W	2
		[14.06] Cond Control Device	N/A	W	2
		[14.07] Mode Changeover Source	N/A	W	2
		[14.08] Unit HP Only	N/A	W	2
[15] User settings	COnF	[15.00] Double Setpoint	N/A	W	1
		[15.01] Override/Limit Config	N/A	W	1
		[15.02] BAS Protocol	N/A	W	1
		[15.03] HMI Select	N/A	W	1
		[15.04] External Alarm Enable	N/A	W	1
		[15.05] Leak Detector Enable	N/A	W	1
		[15.06] Liquid Temp sens Enable	N/A	W	1
		[15.07] PVM Enable	N/A	W	1
		[15.08] Evap DP transducer Enable	N/A	W	1
		[15.09] Cond DP transducer Enable	N/A	W	1
		[15.10] Evap ShutOff Vlv Fback En	N/A	W	1

Menu	Label	Parameters	Sub-Parameters	R/W	PSW Level
		[15.11] Cond ShutOff Vlv Fback En	N/A	W	1
		[15.12] SG Enable	N/A	W	1
[16] MUSE	MUSE	[16.00] Start Up DT	N/A	W	1
		[16.01] Shut down DT	N/A	W	1
		[16.02] Stage Up time	N/A	W	1
		[16.03] Stage down time	N/A	W	1
		[16.04] Stage Up Threshold	N/A	W	1
		[16.05] Stage down Threshold	N/A	W	1
		[16.06] Priority Unit #1	N/A	W	1
		[16.07] Priority Unit #2	N/A	W	1
		[16.08] Priority Unit #3	N/A	W	1
		[16.09] Priority Unit #4	N/A	W	1
		[16.10] Enable Unit #1 when MUSE	N/A	W	1
[17] Scheduler	Sched	[17.00] Monday			
			[17.0.0] Time 1	W	1
			[17.0.1] Value 1	W	1
			[17.0.2] Time 2	W	1
			[17.0.3] Value 2	W	1
			[17.0.4] Time 3	W	1
			[17.0.5] Value 3	W	1
			[17.0.6] Time 4	W	1
			[17.0.7] Value 4	W	1
			[17.0.0] Time 1	W	1
		[17.01] Tuesday			
		…	[17.1.0] Time 1	W	1
			[17.1.1] Value 1	W	1
			[17.1.2] Time 2	W	1
			[17.1.3] Value 2	W	1
			[17.1.4] Time 3	W	1
			[17.1.5] Value 3	W	1
			[17.1.6] Time 4	W	1
			[17.1.7] Value 4	W	1
			…	…	…
		[17.06] Sunday			
			[17.6.0] Time 1	W	1
			[17.6.1] Value 1	W	1
			[17.6.2] Time 2	W	1
			[17.6.3] Value 2	W	1
			[17.6.4] Time 3	W	1
			[17.6.5] Value 3	W	1

Menu	Label	Parameters	Sub-Parameters	R/W	PSW Level
			[17.6.6] Time 4	W	1
			[17.6.7] Value 4	W	1
[18] Power conservation	rStS	[18.00] Reset Type	N/A	W	1
		[18.01] Max Reset DT	N/A	W	1
		[18.02] Start Reset DT	N/A	W	1
		[18.03] Demand Limit signal	N/A	R	0
[19] Communication Protocol	PrOt	[19.00] Mb Address	N/A	W	1
		[19.01] Mb BAUD	N/A	W	1
		[19.02] Mb Parity	N/A	W	1
		[19.03] Mb 2StopBit	N/A	W	1
		[19.04] Mb Timeout	N/A	W	1
		[19.05] BN Address	N/A	W	1
		[19.06] BN BAUD	N/A	W	1
		[19.07] BN Device ID (X.XXX.---)	N/A	W	1
		[19.08] BN Device ID (-.---.XXX)	N/A	W	1
		[19.09] BN Port (X-.---)	N/A	W	1
		[19.10] BN Port(-X.XXX)	N/A	W	1
		[19.11] BN Timeout	N/A	W	1
		[19.12] Licence Mngr	N/A	R	1
		[19.13] BacNETOverRS	N/A	W	1
		[19.14] BacNET-IP	N/A	W	1
[20] PLC	PLC	[20.00] AppSave	N/A	W	1
		[20.01] Apply Changes	N/A	W	1
		[20.02] Software Update	N/A	W	2
		[20.03] Save Parameters	N/A	W	2
		[20.04] Restore Parameters	N/A	W	2
		[20.05] Terminal Resistor Enable	N/A	W	2
[21] About	AbOU	[21.00] App Vers	N/A	R	0
		[21.01] BSP	N/A	R	0
[28] BEG Settings	bEG	[28.00] EM Index	N/A	W	1
		[28.01] EM Value	N/A	R	1
		[28.02] EM Reset	N/A	W	1
		[28.03] SG State	N/A	R	1

3.4. Screen Saver

After 5 minutes of waiting the interface is automatically addressed to the Screen Saver menu. This is an only read menu composed of 2 pages switched each other every 5 seconds.

During this phase the following parameters are displayed:

Parameter	Description
Page 1	**String Up** = Leaving Water Temperature
	String Dn = Actual Water Setpoint
Page 2	**String Up** = Unit Capacity
	String Dn = Unit Mode

To exit the Screen Saver menu, it's necessary to press any of four HMI button. The interface will come back to Page [0].

4. UNIT OPERATION

4.1. Chiller Enable

Unit controller provides several features to manage unit start/stop:

1. Keypad On/Off
2. Scheduler (Time programmed On/Off)
3. Network On/Off (optional with Accessory EKRSCBMS)
4. Unit On/Off Switch

4.1.1. Keypad On/Off

Keypad On/Off allows to enable or disable the unit from local controller. If needed, single refrigerant circuit can be also enabled or disabled. By default, all refrigerant circuits are enabled.

Menu	Parameter	Range	Description	R/W
01	00 (Unit Enable)	0-2	0 = Unit disabled	W
			1 = Unit enabled	W
			2 = Unit enabled by scheduler	W
	01 (Compressor 1 Enable)	0-1	0 = Compressor 1 disabled	W
			1 = Compressor 1 enabled	W
	02 (Compressor 2 Enable)	0-1	0 = Compressor 2 disabled	W
			1 = Compressor 2 enabled	W

The path in the Web HMI interface is "Main Menu → Unit Enable".

4.1.2. Scheduler

The activation / deactivation of the unit can be managed automatically through the Schedule function, activated when the Unit Enable parameter is set to Schedule.

The operating modes during the different daily time bands are managed through the interface page [17] containing the following registers to be set:

Menu	Page	Parameter	R/W
[17] = Scheduler (Scheduler)	[17.00] = Monday (Monday)	[17.0.0] Time 1	W
		[17.0.1] Value 1	W
		[17.0.2] Time 2	W
		[17.0.3] Value 2	W
		[17.0.4] Time 3	W
		[17.0.5] Value 3	W
		[17.0.6] Time 4	W
		[17.0.7] Value 4	W
	[17.01] = Tuesday (Tuesday)	[17.1.0] Time 1	W
		[17.1.1] Value 1	W
		[17.1.2] Time 2	W
		[17.1.3] Value 2	W
		[17.1.4] Time 3	W
		[17.1.5] Value 3	W
		[17.1.6] Time 4	W
		[17.1.7] Value 4	W
	[17.02] = Wednesday (Wednesday)	[17.2.0] Time 1	W
		[17.2.1] Value 1	W
		[17.2.2] Time 2	W
		[17.2.3] Value 2	W
		[17.2.4] Time 3	W
		[17.2.5] Value 3	W
		[17.2.6] Time 4	W
		[17.2.7] Value 4	W
	[17.03] = Thursday (Thursday)	[17.3.0] Time 1	W
		[17.3.1] Value 1	W
		[17.3.2] Time 2	W
		[17.3.3] Value 2	W
		[17.3.4] Time 3	W
		[17.3.5] Value 3	W
		[17.3.6] Time 4	W

		[17.3.7] Value 4	W
	[17.04] = Friday (Friday)	[17.4.0] Time 1	W
		[17.4.1] Value 1	W
		[17.4.2] Time 2	W
		[17.4.3] Value 2	W
		[17.4.4] Time 3	W
		[17.4.5] Value 3	W
		[17.4.6] Time 4	W
		[17.4.7] Value 4	W
	[17.05] = Saturday (Saturday)	[17.5.0] Time 1	W
		[17.5.1] Value 1	W
		[17.5.2] Time 2	W
		[17.5.3] Value 2	W
		[17.5.4] Time 3	W
		[17.5.5] Value 3	W
		[17.5.6] Time 4	W
		[17.5.7] Value 4	W
	[17.06] = Sunday (Sunday)	[17.6.0] Time 1	W
		[17.6.1] Value 1	W
		[17.6.2] Time 2	W
		[17.6.3] Value 2	W
		[17.6.4] Time 3	W
		[17.6.5] Value 3	W
		[17.6.6] Time 4	W
		[17.6.7] Value 4	W

The path in the Web HMI interface is "**Main Menu → View/Set Unit → Scheduler**".

The user can indicate four time slots for each day of the week and set one of the following modes for each of them:

Parameter	Range	Description
Value [17.x.x]	0 = Off	Unit disabled
	1 = On	Unit enabled

The Time slots can be set from in "Hour:Minute":

Parameter	Range	Description
Time [17.x.x]	"00:00-23:59"	Time of the day can vary from 00:00 to 23:59. If Hour = 24 the HMI will display "An:Minute" as string and the Value# related to Time# is set for all hours of the associated day. If Minute = 60 the HMI will display "Hour:An" as string and the Value# related to Time# is set for all minutes of the selected hours of the day.

4.1.3. Network On/Off

Chiller On/Off can be managed also with BACnet or Modbus RTU communication protocol.
To control the unit over the network, follow below instructions:

1. Unit On/Off switch = Closed if present
2. Keypad On/Off = Enable
3. Control Source = Network

The HMI menu is:

Menu	Parameter	Range	R/W
04	00 (Control Source)	Off = Local	W
		On = Network	W

Modbus RTU is available as default protocol on RS485 port. The HMI page [22] is used to change between Modbus and BACnet protocol and set parameters for both MSTP and TCP-IP communication, as shown in chapter 3.22.

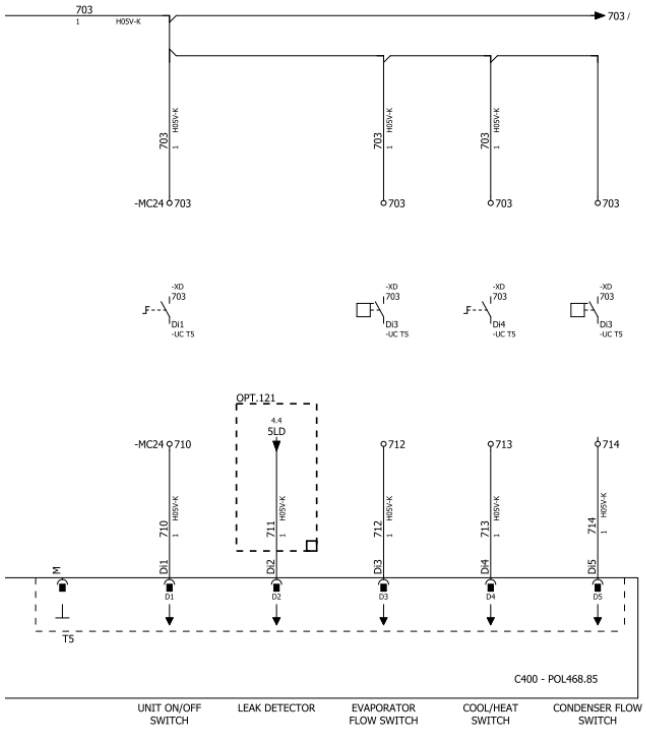
The path in the Web HMI interface for Network Control Source is "**Main Menu View/Set → Unit → Network Control**".

4.1.4. Unit On/Off Switch

For unit start up is mandatory to close the electrical contact between terminals: XD-703 → UC-D1 (UNIT ON/OFF SWITCH).

This short circuit can be realized through:

- External electrical switch
- Cable



4.2. Water Temperatures

Water temperatures probes readings are available in Menu 06 according the table below:

Menu	Parameter	Description	R/W
06	00 (Evap EWT)	Evaporator Entering Water Temperature	R
	01 (Evap LWT)	Evaporator Leaving Water Temperature	R
	02 (Cond EWT)	Condenser Entering Water Temperature	R
	03 (Cond LWT)	Condenser Leaving Water Temperature	R
	04 (System CWT)	System Cool Water Temperature (MUSE)	R
	05 (System HWT)	System Heat Water Temperature (MUSE)	R

4.3. Water Setpoints

Purpose of this unit is to cool or to heat (in case of heat mode) the water, to the setpoint value defined by the user and displayed in the main page:

The unit can work with a primary or a secondary setpoint, that can be managed as indicated below:

1. Keypad selection + Double Setpoint digital contact
2. Keypad selection + Scheduler Configuration
3. Network
4. Setpoint Reset function

As first step the primary and secondary setpoints need to be defined.

Menu	Parameter	Description	R/W
05	00 (Cool LWT 1)	Primary cooling setpoint.	W
	01 (Cool LWT 2)	Secondary cooling setpoint.	W
	02 (Heat LWT 1)	Primary heating setpoint.	W

	03 (**Heat LWT 2**)	Secondary heating setpoint.	W

The change between primary and secondary setpoint can be performed using the **Double setpoint** contact.

Double setpoint contact works as below:
- Contact opened, the primary setpoint is selected
- Contact closed, the secondary setpoint is selected

In order to change between primary and secondary setpoint with the Scheduler function, refer to the section 4.1.2.

When the scheduler function is enabled, the Double setpoint contact is ignored.

To modify the active setpoint through network connection, refer to "Network control" section 4.4.2.

The active setpoint can be further modified using the "Setpoint Reset" function as explained in section 4.8.1.

4.4. Unit mode

The Unit Mode is used to define if the chiller is configured to produce chilled or heated water. This parameter is related to the unit type and is set in factory or during commissioning operation.
Current mode is reported in the main page.
The path in the Web HMI interface for Unit mode configuration is "**Main Menu → Unit Mode → Mode**".

Menu	Parameter	Range	Description	RW
02	00 (**Unit Mode**)	**0 = Cool**	Set if chilled water temperature up to 4°C is required. No glycol is generally needed in the water circuit unless ambient temperature may reach low values. In case of water greater than 4°C, but water circuit with glycol, set mode "Cool with glycol".	RW
		1 = Cool with glycol	Set if chilled water temperature below 4°C is required. This operation requires proper glycol/water mixture in the plate heat exchanger water circuit.	
		2 = Cool / Heat	Set in case a dual cool/heat mode is required. This setting implies an operation with double functioning which is activated through the physical switch or BMS control. • COOL: The unit will work in cooling mode with the Cool LWT as the Active Setpoint. • HEAT: The unit will work in heat pump mode with the Heat LWT as the Active Setpoint.	
		3 = Cool / Heat with glycol	Same behavior of "Cool / Heat" mode but Chilled water temperature below 4°C is required or glycol is present in the water circuit.	
		4 = Test	Set for unit manual control.	

4.4.1. Heat/Cool Mode

Heat/Cool operating mode can be set using a Digital Input or setting the parameter Keypad Cool/Heat switch to 1, following the configuration of the parameter 14.08:
- 14.08 = 0 → Cool/Heat Changeover from keypad parameter
- 14.08 = 1 → Cool/Heat changeover from Digital Input

All settings related to Cooling-Heating operation will produce a real mode change only if Unit Mode parameter (refer to menu 01) is set to:
- Heat/Cool
- Heat/Cool w/Glycol

In all other cases no mode switch will be allowed

Menu	Parameter	Range	Description	RW
02	01 **Keypad Cool/Heat switch**	0 = Cool 1 = Heat	Use this setpoint to set unit mode at HMI level if the Input Source option is on HMI level.	RW

Menu	Parameter	Range	Description	RW
02	02 **Muse system mode**	0 = Cool 1 = Heat	If present, Muse defines the system operating mode.	R

Note that it is mandatory to set the same unit mode on all the single modular units.

4.4.2. Heating only

It is possible to set the unit heat pump only mode, this mode enables the unit to work only as a heat pump without the Heat Switch. The parameter to activate the heating only mode is:

Menu	Parameter	Range	Description	RW
14	07 **Unit HP Only**	0 = Disable 1 = Enable	Heating only mode activation.	W

4.4.3. Network Control

To allow unit's control from BMS system the Control Source parameter [4.00] needs to be set in Network. All settings related to BSM control communication can be visualized in Page [4]:

Menu	Parameter	Range	Description		R/W
04	00 (**Control Source**)	0-1	0 = Local control 1 = Network control	Source of unit control	W
	01 (**BAS Enable**)	Off-On	Off = Unit is Enable On = Unit is Disabled	On/Off command from network visualization	R
	02 (**BAS Cool LWT**)	0..30°C	-	Cooling water temperature setpoint from network	R
	03 (**BAS Heat LWT**)	30..60°C	-	Heating water temperature setpoint from network	R
	04 (**BAS Mode**)	0-3	0 = Cool 1 = Cool with glycol 2 = Cool / Heat 3 = Cool / Heat with glycol	Operating mode from network	R

Refer to communication protocol documentation for specific registers addresses and the related read/write access level.

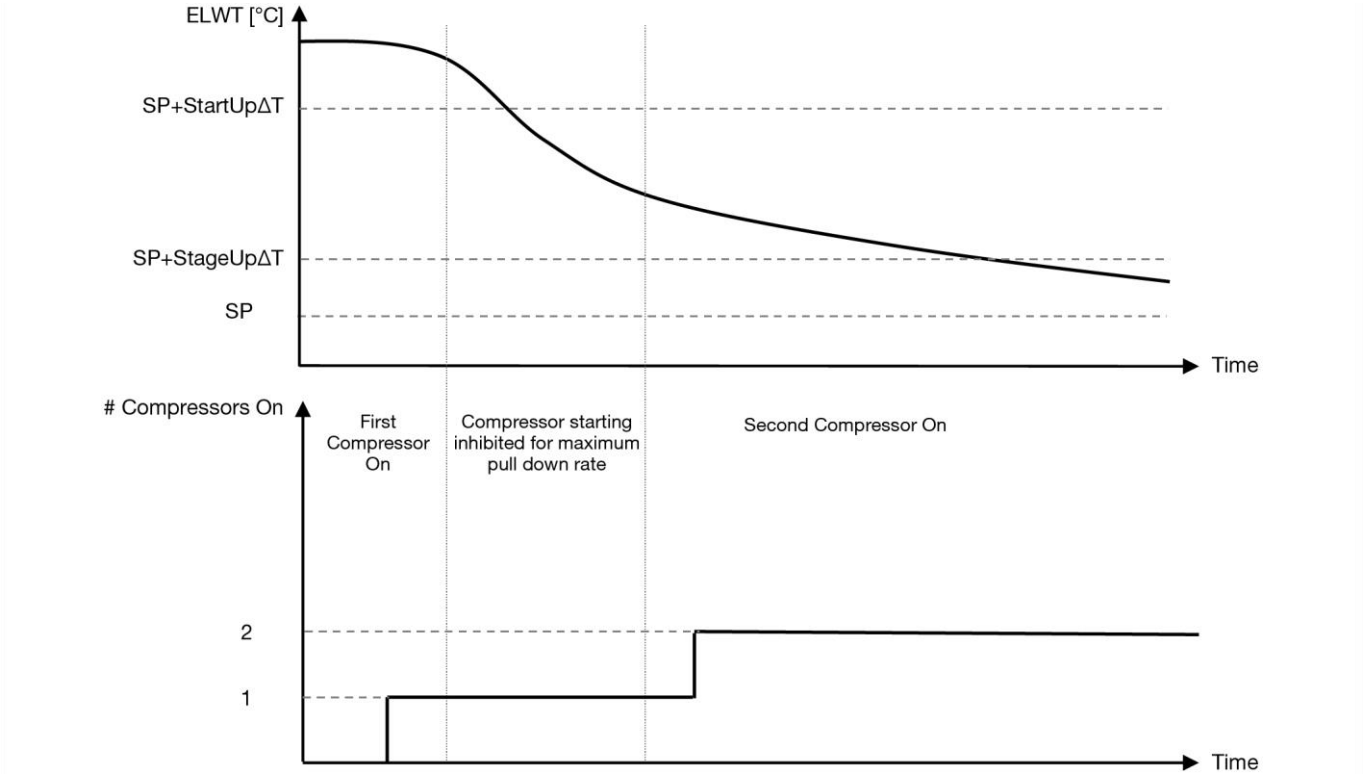
The path in the Web HMI interface is "**Main Menu → View/Set Unit → Network Control**".

4.5. Thermostatic Control

Thermostatic control settings allow to set up the response to temperature variations. Default settings are valid for most application, however plant specific conditions may require adjustments to have a smooth control or a quicker response of the unit.
The unit controller will start the first compressor if the controlled temperature is higher (Cool Mode) or lower (Heat Mode) than the active setpoint of at least a Start Up DT value, whereas second compressor when available is started if the controlled temperature is higher (Cool Mode) or lower (Heat Mode) than the active setpoint (AS) of at least a Stage Up DT (SU) value. Compressors stop if performed following same procedure looking to the parameters Stage Down DT and Shut Down DT.

	Cool Mode	Heat Mode
First compressor start	Controlled Temperature > Setpoint + **Start Up DT**	Controlled Temperature < Setpoint - **Start Up DT**
Other compressors start	Controlled Temperature > Setpoint + **Stage Up DT**	Controlled Temperature < Setpoint - **Stage Up DT**
Last compressor stop	Controlled Temperature < Setpoint - **Shut Dn DT**	Controlled Temperature > Setpoint + **Shut Dn DT**
Other compressors stop	Controlled Temperature < Setpoint - **Stage Dn DT**	Controlled Temperature > Setpoint + **Stage Dn DT**

A qualitative example of compressors start-up sequence in cool mode operation is shown in the graph below.



Graph 1 – Compressors start-up sequence - Cool mode

Thermostatic control settings are accessible from menu [9]:

Menu	Parameter	Range	Description	R/W
09	00 (**Start Up DT**)	0.6 – 8.3	Delta temperature respect the active setpoint to start the unit (startup of first compressor)	W
	01 (**Shut Down DT**)	0.5 – 3.1	Delta temperature respect the active setpoint to stop the unit (shutdown of latest compressor)	W
	02 (**Stage Up DT**)	0.5 - StartUpDT	Delta temperature respect the active setpoint to start second compressor	W
	03 (**Stage Down DT**)	0.5 – ShutDnDT	Delta temperature respect the active setpoint second compressor	W
	04 (**Stage Up Delay**)	1÷60 [min]	Minimum time between the compressor startup	W
	05 (**Stage Down Delay**)	0÷30 [min]	Minimum time between the compressor shutdown	W
	06 (**Evaporator Freeze**)	if Unit mode = 1 or 3 -20 ÷ 5.6 [°C] if Unit mode = 0 or 2 +2 ÷ 5.6 [°C]	Defines the minimum water temperature before the unit alarm for evaporator freezing in triggered	W
	07 (**Condenser Freeze**)	if Unit mode = 1 or 3 -20 ÷ 5.6 [°C] if Unit mode = 0 or 2 +2 ÷ 5.6 [°C]	Defines the minimum water temperature before the unit alarm for condenser freezing in triggered	W
	08 (**Low Pressure Unload**)	if Unit mode = 1 or 3 170÷800 [kPa] if Unit mode = 0 or 2 600÷800 [kPa]	Minimum pressure before compressor starts unload action in order to increase evaporating pressure	W
	09 (**Low Pressure Hold**)	if Unit mode = 1 or 3 170÷800 [kPa] if Unit mode = 0 or 2 630÷800 [kPa]	Minimum pressure before compressor starts unload action in order to increase evaporating pressure	W

The path in the Web HMI interface is "**Main Menu → View/Set Unit → Thermostatic Control**".

4.5.1. Thermostatic Source Control

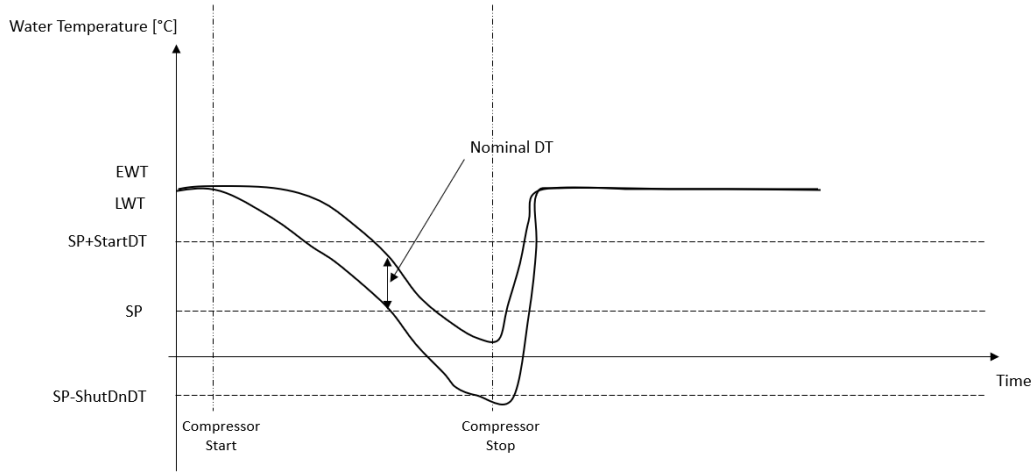
The unit allows water control based on leaving water temperature.

Thermostatic Control Parameters **(Page 9)** must be set according to customer requirements in order to fit as much as possible the Water Plant conditions.

Compressor starts/stops depend on Leaving Water Temperature value with respect to the thermostatic control parameters. Depending on setting of StartupDT, thermoregulation control could lead to:

1. More accurate Thermostatic control → Frequent compressor starts/stops. (Default Configuration)
   Note: UC always ensures amount of compressor start and stop does not exceed safety limit

Parameter	Description/Value
Control Temperature	Leaving Water Temperature
SP	Based on Leaving Water Temperature
Startup DT	2.7 dK (default value as described in previous chapter)
Shutdown DT	1.7 dK (default value as described in previous chapter)

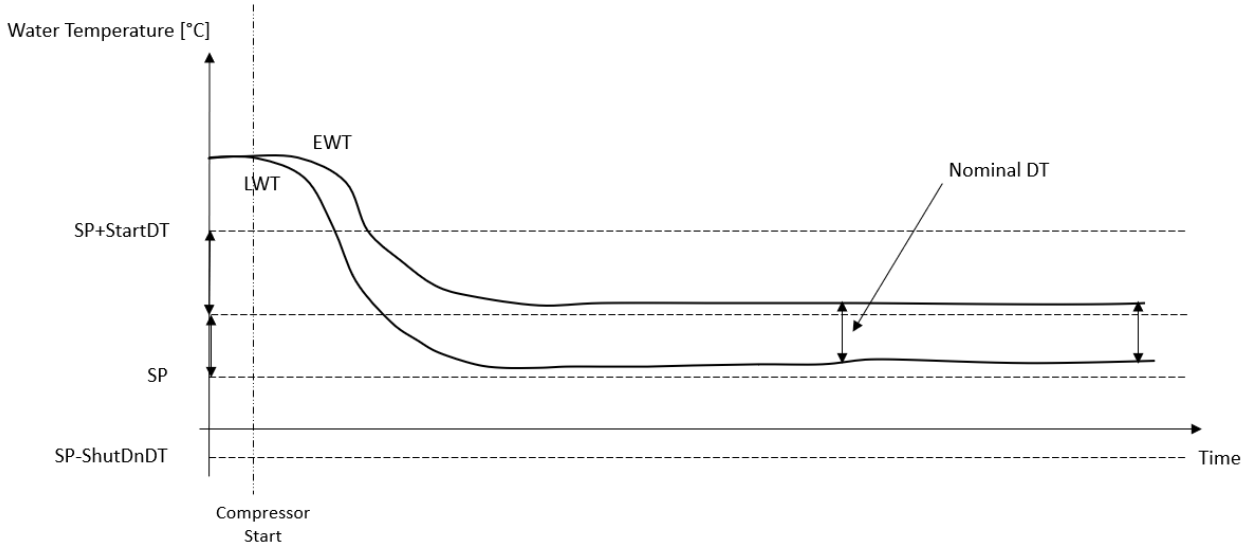


2. Reduced amount of compressor Start/Stop → Less accurate Thermostatic Control.
   To reduce amount of compressor start/stop, customer can modify the StartupDT parameter according to following indication:

$$StartUpDT > \frac{Nominal\ DT^{*}}{Number\ of\ Unit\ Compressors}$$

*Nominal DT is the difference between entering and leaving water temperature when the unit is operating at full capacity with nominal plant water flow rate.

Parameter	Description/Value
Control Temperature	Leaving Water Temperature
SP	Based on Leaving Water Temperature
Startup DT	7.7 dK (example with 5 °C of nominal flow rate and unit with 1 compressor)
Shutdown DT	1.7 dK (default value as described in previous chapter)
Nominal DT	Depends on Unit Mode, set it in 15.13, 15.14 parameters (Nominal Evap DT, Nominal Cond DT)



4.6. External Alarm

The External Alarm is a digital contact that can be used to communicate to the UC an abnormal condition, coming from an external device connected to the unit. This contact is in the customer terminal box and depending on the configuration can causes a simple event in the alarm log or also the unit stop. The alarm logic associated to the contact is the following:

Contact state	Alarm State	Note
Opened	Alarm	The alarm is generated if the contact remains opened for at least 5 seconds
Closed	No Alarm	The alarm is reset just the contact is closed

The configuration is performed from Page [15] as shown below:

Menu	Parameter	Range	Description
15	09 (Ext Alarm)	0 = No	External Alarm disabled
		1 = Event	Event configuration generates an alarm in the controller but takes the unit running
		2 = Rapid Stop	Rapid Stop configuration generates an alarm in the controller and performs a rapid stop of the unit

The web HMI path for the External Alarm configuration is **Commissioning → Configuration.**

4.7. Unit Capacity

Information about the unit's current and individual compressors capacities can be accessed from menu Page [3].

Menu	Parameter	Range	Description	R/W
03	00 (Unit Capacity)	0-100%	Unit capacity in percentage	R
	01 (Comp 1 Capacity)	0-100%	Compressor 1 capacity in percentage	R
	02 (Comp 2 Capacity)	0-100%	Compressor 2 capacity in percentage	R

In the HMI Web Interface, some of this information is available in the paths:

- **Main Menu**
- **Main Menu → View/Set Circuit → View/Set Cmp 1**
- **Main Menu → View/Set Circuit → View/Set Cmp 2**

4.8. Power Conservation

In this chapters will be explained the functions used to reduce the unit power consumption.
These functions must be enabled by mean of parameter [15.01] **Override/Limit En.**
The path in the HMI Web interface to set the desired strategy is "**Main Menu → Commission Unit → Configuration → Override/Limit.**
Once enabled, present value for Demand Limit and settings for setpoint override will be available in group numer [18].

Menu	Parameter	Range	Description	R/W
18	00 **Reset Type**	None 0-10V DT	Define reset source	W
	01 (**Max Reset**)	0..10 [°C]	Max Reset setpoint. It represents the maximum temperature variation that the selection of the Setpoint Reset logic can cause on the LWT.	W
	02 (**Start Reset DT**)	0..10 [°C]	It represents the "threshold temperature" of the DT to activate the LWT setpoint reset, i.e. the LWT setpoint is overwritten only if the DT reaches/overpasses the SRΔT.	W
	03 (**Demand Limit**)	0..10V	It represents the limitation for Unit load expressed in Volts.	R

4.8.1. Setpoint Override

The "Setpoint Reset" function can override the chiller water temperature active setpoint when certain circumstances occur. The aim of this function is to reduce the unit energy consumption whilst maintaining the same comfort level. To this purpose, three different control strategies are available:

- Setpoint Reset – override by an external signal (0-10V)
- Setpoint Reset – override by Evaporator/Condenser ΔT (EEWT/CEWT)

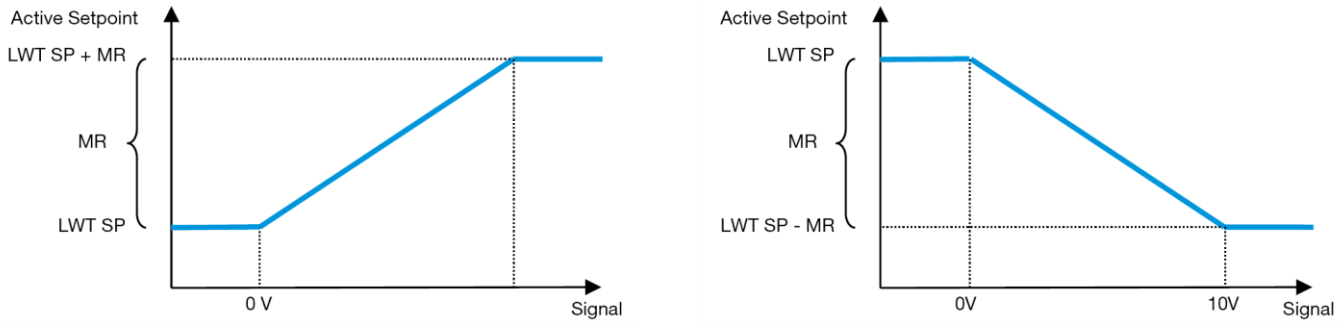
To set the desired setpoint-reset strategy, go to the parameter group number [18] "Override/Limit", according to the above table.
The controlled Delta T is set in accord of actual unit mode: if unit is operating in Cool Mode, Evaporator Delta T will be considered to activate Setpoint Reset, otherwise if it is operating in Heat Mode, Condenser Delta T will be considered to activate Setpoint Reset.

Each strategy needs to be configured (although a default configuration is available) and its parameters can be set navigating to "**Main Menu → View/Set Unit → Power Conservation → Setpoint Reset**" in the HMI Web interface**.**

Note that the parameters corresponding to a specific strategy will be available only once the Setpoint Reset has been set to a specific value and the UC has been restarted.

4.8.1.1. Setpoint Reset - override by 0-10V signal

When the **0-10V** is selected as **Setpoint Reset** option, the LWT active setpoint(AS) is calculated applying a correction based on an external 0-10V signal: 0 V corresponds to 0°C correction, i.e. AS = LWT setpoint, whereas 10 V corresponds to a correction of the Max Reset (MR) quantity, i.e. AS = LWT setpoint + MR(-MR) as shown in the following picture:

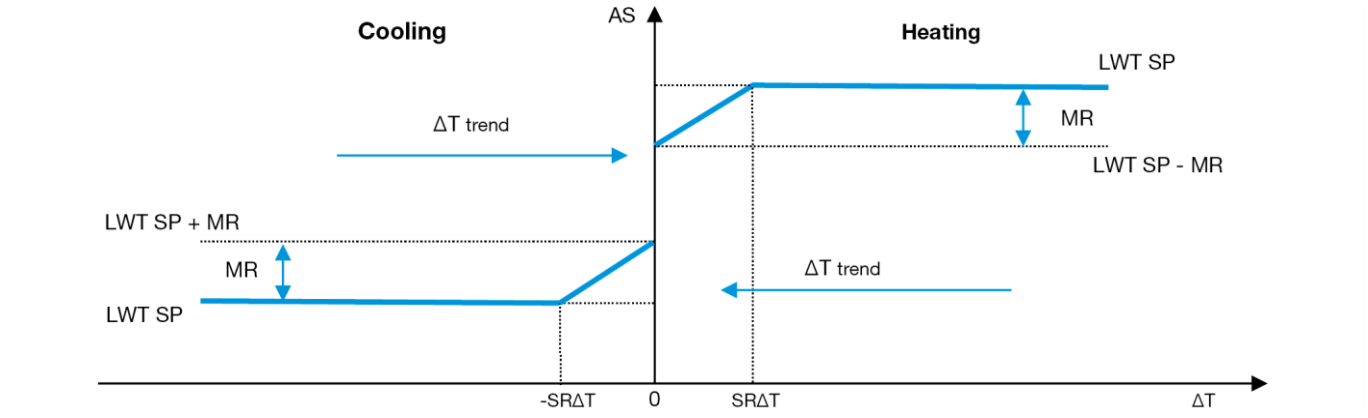


Graph 2 – External signal 0-10V vs Active Setpoint - Cooling mode(left)/ Heating mode(right)

Several parameters can be configured, and they are accessible from the **Setpoint Reset** menu, go to the parameter group number [18] "Setpoint Reset.

4.8.1.2. Setpoint Reset - override by DT

When the **DT** is selected as **Setpoint Reset** option, the LWT active setpoint(AS) is calculated applying a correction based on the temperature difference ΔT between the leaving water temperature(LWT) and the evaporator entering(returning) water temperature (EWT). When the |ΔT| becomes smaller than the Start Reset ΔT setpoint(SRΔT), the LWT active setpoint is proportionally increased (if Cooling mode set) or decreased (if Heating mode is set) of a maximum value equal to the Max Reset(MR) parameter.



Graph 3– Evap ΔT vs Active Setpoint - Cooling mode(left)/ Heating mode(right)

4.9. Controller IP Setup

The Controller IP Setup can be accessed from menu [13] where is possible to choose between the static or dynamic IP and manually set IP and network Mask.

Menu	Parameter	Sub-Parameter	Description	R/W
13	00 (**DHCP**)	N/A	Off = DHCP Off The DHCP option is disabled.	W
			On = DHCP On The DHCP option is enabled.	
	01 (**IP**)	N/A	"xxx.xxx.xxx.xxx" Represent the current IP address. Once entered [13.01] parameter, the HMI will automatically switch between all four IP-Address fields.	R
	02 (**Mask**)	N/A	"xxx.xxx.xxx.xxx" Represent the current Subnet Mask address. Once entered [13.02] parameter, the HMI will automatically switch between all four Mask fields.	R
	03 (**Manual IP**)	00 IP#1	Defines the first field of IP-Address	W
		01 IP#2	Defines the second field of IP-Address	W
		02 IP#3	Defines the third field of IP-Address	W
		03 IP#4	Defines the fourth field of IP-Address	W
	04 (**Manual Mask**)	00 Msk#1	Defines the first field of Mask	W
		01 Msk#2	Defines the second field of Mask	W
		02 Msk#3	Defines the third field of Mask	W
		03 Msk#4	Defines the fourth field of Mask	W

In order to modify the Controller IP Network configuration, do the following operations:

- access the **Settings** menu
- set the DHCP option to Off
- modify the IP, Mask, Gateway, PrimDNS and ScndDNS addresses, if needed, taking care of the current network settings
- set **Apply changes** parameter to **Yes** to save the configuration and restart the MTIV controller.

The default internet configuration is:

Parameter	Default Value
IP	192.168.1.42
Mask	255.255.255.0
Gateway	192.168.1.1
PrimDNS	0.0.0.0
ScndDNS	0.0.0.0

Note that if the DHCP is set to On and the MTIV internet configurations shows the following parameter values then an internet connection problem has occurred (probably due to a physical problem, like the Ethernet cable breaking).

Parameter	Value
IP	169.254.252.246
Mask	255.255.0.0

Gateway	0.0.0.0
PrimDNS	0.0.0.0
ScndDNS	0.0.0.0

4.10. Daikin On Site

Daikin on site connection can be enabled and monitored through menu [12]:

Menu	Parameter	Range	Description	R/W
12	00 (Enable)	Off = Connection Off	DoS connection is disabled	W
		On = Connection On	DoS connection is enabled	
	01 (State)	0-6 = Not connected 7 = Connected	DoS actual connection state	R

In order to use the DoS utility, the customer has to communicate the **Serial Number** to Daikin company and subscribe to the DoS service. Then, from this page, it is possible to:

- Start/Stop the DoS connectivity
- Check the connection status to DoS service
- Enable/Disable the remote update option

In the unlikely event of UC replacement, the DoS connectivity can be switched from the old PLC to the new one just communicating the current **Activation Key** to Daikin company.

The Daikin on Site (DoS) page can be accessed navigating through the HMI Web Interface, with path Main Menu → View/Set Unit → Daikin On Site.

4.11. Date/Time

The unit controller can take stored the actual date and time, that are used for Scheduler, and can be modified going in [10] and [11] menu:

Menu	Parameter	Range	Description	R/W
10	00 (Day)	0…7	Defines actual day stored in UC	W
	01 (Month)	0…12	Defines actual month stored in UC	W
	02 (Year)	0..9999	Defines actual year stored in UC	W
11	00 (Hour)	0…24	Defines actual hour stored in UC	W
	(Minute) 01	0…60	Defines actual minute stored in UC	W

The Date/Time information can be found at path "Main Menu → View/Set Unit → Date/Time".

Remember to check periodically the controller battery in order to maintain updated date and time even when there is no electrical power. Refer to controller maintenance section.

4.12. Service unit configuration

Menu	Parameter	Description	R/W
14 (Factory Settings)	00 (Unit Type)	0) Not Configured 1) Water Inversion - 15+15 HP 2) Water Inversion - 15+25 HP 3) Water Inversion - 25+25 HP 4) Water Inversion - 15+15 HP - Condenserless 5) Water Inversion - 15+25 HP - Condenserless 6) Water Inversion - 25+25 HP - Condenserless 7) Refr. Inversion - 15+15 HP	W
	01 (Expansion Pack Enable)	Off On	

	02 (MUSE address)	0 = None 1 = MU1 2 = MU2 3 = MU3 4 = MU4 5 = MU1+MUSE	W
	03 (Number of Muse Units)	0-4	W
	04 (Pump Skid Enable)	Off On	W
	05 (Cond Ctrl Measure)	0=None 1=Pressure 2=Cond EWT 3=Cond LWT	W
	06 (Cond Ctrl Device)	0=None 1=Valve 2=VFD	W
	07 (Mode Changeover Source)	0 = Keypad 1 = DIN	W
	08 (Unit HP Only)	Off On	W

The above parameters can be also set in the Web HMI path "Main Menu → Commission Unit → Configuration.

4.13. Customer Unit Configuration

Except for factory configurations, the client can customize the unit depending on his needs and options acquired. The allowed modifications regard parameter listed below.

All these customer configurations for the unit can be set in page [15].

Menu	Parameter	Range	R/W
[15] Customer Settings	00 (Double Setpoint)	FALSE=No TRUE=Yes	W
	01 (Override/Limit Config)	0=None 1=Setpoint Override 2=Demand Limit	W
	02 (BAS Protocol)	0=None 1=Modbus 2=Bacnet	W
	03 (HMI Select)	0=Siemens 1=Evco	W
	04 (External Alarm Enable)	0=No 1=Event 2=Alarm	W
	05 (Leak Detector Enable)	0=No 1=Yes	W
	06 (Liquid Temp sens Enable)	0=No 1=Yes	W
	07 (PVM Enable)	0=No 1=Yes	W
	08 (Evap DP transducer Enable)	0=No 1=Yes	W
	09 (Cond DP transducer Enable)	0=No 1=Yes	W
	10 (Evap ShutOff Vlv Fback En)	0=No 1=Yes	W
	11 (Cond ShutOff Vlv Fback En)	0=No 1=Yes	W
	12 (SG Enable)	0=No 1=Yes	W

The above parameters can be also set in the Web HMI path "Main Menu → Commission Unit → Configuration.

4.14. MUSE

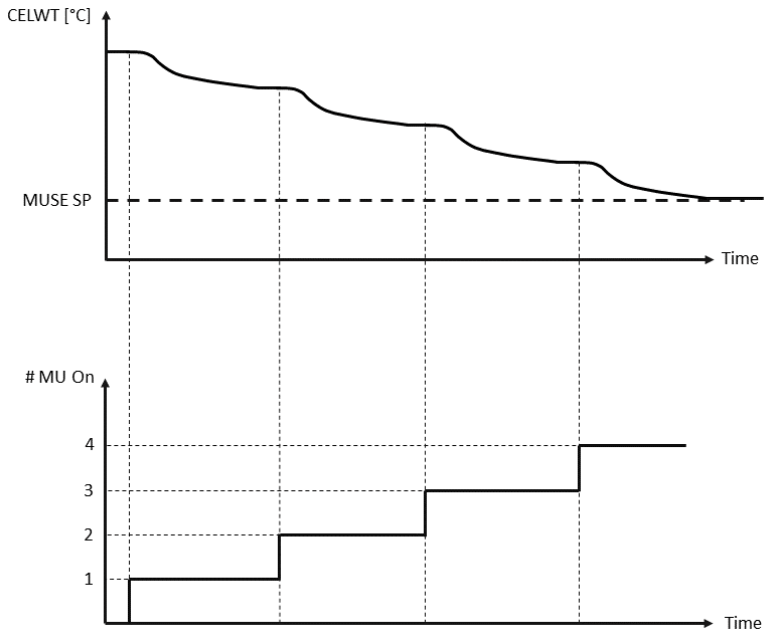
4.14.1. What is MUSE

MUSE is an embedded system control logic providing management of up to 4 Modular units, assuring efficiency and plant-room load demand satisfaction.

4.14.2. Modular Units management

Embedded system control option provides certain functions to manage efficiently the Units and simultaneously to satisfy plant-room load demand. One modular unit will be elected as MUSE (where the system management logic will run); the other modular units will be dependent by decision of MUSE unit.
The main features are:

1. Unit Sequencing
2. Unit Staging based on temperature
3. Unit Staging based on capacity range
4. Unit Capacity Control



Graph 4 - Modular Units start-up sequence - Cool mode

4.14.3. MUSE parameters

MUSE parameter can be set in Menu [16] and are available only in MUSE Unit:

Menu	Parameter	Range	R/W
[16] **MUSE** (Available only if Unit #1 is MUSE)	[16.00] Start Up DT	0-5	W
	[16.01] Shut down DT	0-5	W
	[16.02] Stage Up time	0-20 min	W
	[16.03] Stage down time	0-20 min	W
	[16.04] Stage Up Threshold	30-100	W
	[16.05] Stage down Threshold	30-100	W
	[16.06] Priority Unit #1	1-4	W
	[16.07] Priority Unit #2	1-4	W
	[16.08] Priority Unit #3	1-4	W
	[16.09] Priority Unit #4	1-4	W
	[16.10] Enable Unit #1 when MUSE	Off-On	W

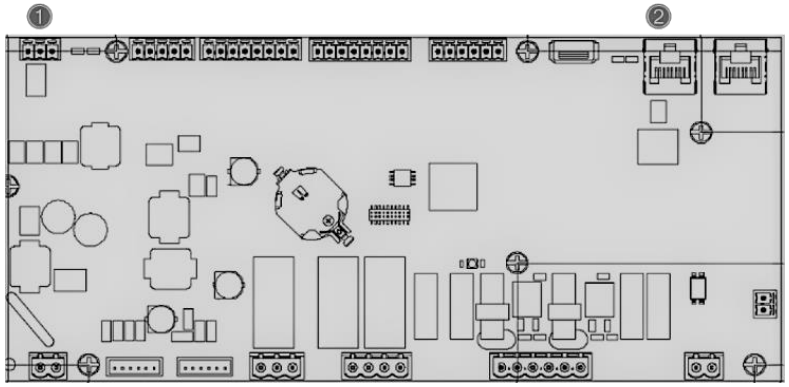
The path in the Web HMI interface for Master/Slave configuration is "**Main Menu → MUSE.** Please refer to specific documentation for more information about of this topic.

4.15. Connectivity Kit & BMS Connection

The UC has two access ports for communications via Modbus RTU / BACnet MSTP or Modbus / BACnet TCP-IP protocol: RS485 port and Ethernet port. While the RS485 port is exclusive, on TCP-IP port it's possible to communicate simultaneously in both Modbus and BACnet.

The Modbus protocol is set as default on the RS485 port while access to all the other functions of BACnet MSTP/TCP-IP and Modbus TCP-IP are unlocked through *EKRSCBMS* activation.

Please refer to the Databook for protocols incompatibility with other unit functionality.



	RS485		TCP-IP
1	• Modbus RTU OR • BACnet MSTP	2	• Modbus TCP-IP AND • BACnet TCP-IP

You can choose which protocol to use and set the communication parameters for both ports in Page [19].

Page	Parameter	Range	Description	R/W
19 (Protocol Communication)	00 (Mb Address)	1-255	Defines UC address in Modbus network.	W
	01 (Mb BAUD)	0-1000	Defines Modbus communication rate in Bps/100 and must be identical for all nodes of the bus.	W
	02 (Mb Parity)	0 = Even 1 = Odd 2 = None	Defines the parity used in Modbus communication and must be identical for all nodes of the bus.	W
	03 (Mb 2StopBit)	Off = 1 Stop-Bit On = 2 Stop Bits	Defines whether 2 stop bits should be used.	W
	04 (Mb Timeout)	0-10	Defines the timeout in second for the response of the slave before a communication error is reported.	W
	05 (BN Address)	1-255	Defines UC address in BacNET network.	W
	06 (BN BAUD)	0-1000 Bps/100	Defines BacNET communication rate in Bps/100 and must be identical for all nodes of the bus.	W
	07 BN (Device ID)	0-4.194.302 0-(X.XXX.---)	Defines the four most significant digits of Device ID, used in a BACnet network as the unique identifier of a specific device. The Device ID for each device must be unique on the entire BACnet network.	W
	08 BN (Device ID)	0-4.194.302 0-(-.---.XXX)	Defines the three less significant digits of Device ID, used in a BACnet network as	W

			the unique identifier of a specific device. The Device ID for each device must be unique on the entire BACnet network.	
	09 **(BN Port)**	0-65535 0-(X-.---)	Defines the most significant digit of BacNET UDP Port.	W
	10 **(BN Port)**	0-65535 0-(-X.XXX)	Defines four less significant digits of BacNET UDP Port.	W
	11 **(BN Timeout)**	0-10	Defines the timeout in second for the response before a communication error is reported.	W
	12 **(License Manager)**	Off = Passive On = Active	Represent the actual state of *EKRSCBMS.*	R
	13 **(BacNETOverRS)**	Off = Passive On = Active	Defines whether to use the bacnet protocol instead of modbus on the RS485 port.	W
	14 **(BacNET-IP)**	Off = Passive On = Active	Defines the activation of BacNET TCP-IP protocol once *EKRSCBMS* is unlocked.	W
	15 **(BasProtocol)**	0 = None 1 = Modbus 2 = Bacnet	Defines which protocol's data the UC considers in its logic.	W

The path in the HMI Web interface to access this information is:

- **Main Menu → View/Set Unit → Protocols**

4.16. Smart Grid Box and Energy Monitoring

4.16.1. Additional customer configuration

Except for factory configurations, the client can custom the unit depending on his needs and options acquired.

In the HMI Web Interface, all these parameters can be set at the following path:

- **"Main → Commission Unit → Configuration → Options"**

Page	Parameter	Range	Description	R/W
[15] **Customer Configuration**	00 **(Double Setpoint)**	0-1 (Off-On)	Off = Disabled On = Enabled	W
	01 **(Override/Limit Config)**	0-1 (Off-On)	Off = Disabled On = Enabled	W
	02 **(BAS Protocol)**	0-1-2 (None- Modbus-Bacnet)	Defines the protocol used for communication.	W
	03 **(HMI Select)**	0-1 (Siemens – EvCO)	Defines the HMI device to use.	W
	04 (**External Alarm Enable**)	0-1-2 (No – Event – Alarm)	Defines the type of the external alarm.	W
	05 **(Leak Detector Enable)**	0-1 (No-Yes)	Defines if the gas leakage detector is enabled or not.	W
	06 (**Liquid Temp Sens Enable**)	0 – 1 (Disable – Enable)	Defines if the Liquid temperature sensor is present on the unit.	W
	07 **(PVM Enable)**	0 – 1 (No – Yes)	Enables Phase Voltage Monitor Alarm contact.	W
	08 **(Evap DP transducer Enable)**	0 – 1 (No – Yes)	Defines if a differential pressure transducer is present for the evaporator	W
	09 **(Cond DP transducer Enable)**	0 – 1 (No – Yes)	Defines if a differential pressure transducer is present for the condenser	W

	10 **(Evap ShutOff Vlv Fback En)**	0 – 1 (No – Yes)	Defines if the shut off valve feedback is present on the unit for the evaporator	W
	11 **(Cond ShutOff Vlv Fback En)**	0 – 1 (No – Yes)	Defines if the shut off valve feedback is present on the unit for the condenser	W
	10 (**SG Enable**)	0-1 (Off-On)	Off = Smart Grid Disabled On = Smart Grid Enabled	W

4.16.2. BEG – SG Ready & Energy Monitoring

At page [28], as described above, it's possible to navigate and reset the internal database storing monitored energies of last 24 month.
In case of Smart Grid operations (SG Box connected and smart grid functionalities enabled) the actual state read by the gateway is available too, otherwise [28.03] value is fixed at zero.

Page	Parameter	Range	Description	R/W
[28] (**BEG**)	00 (**EM Index**)	0..72	The index selected defines the actual value displayed I "[28.01] (EM Value)" parameter. Cool Energy, Heat Energy and Power Input values are continuously added to actual month value. Last 24 energies value are available. In particular: 1-8 = CoolEnergy [month 1-8] 9-16 = ElectEnergy [month 1-8] 17-24 = CoolEnergy [month 9-16] 25-32 = ElectEnergy [month 9-16] 33-40 = CoolEnergy [month 17-24] 41-48 = ElectEnergy [month 17-24] 49-64 =HeatEnergy [month 1-16] 65-72 = HeatEnergy [month 17-24]	W
	01 (**EM Value**)	0.0…9999 (MWh)	The value displayed matches with the description of value associated to parameter "[28.00] (EM Index)".	R
	02 (**EM Reset**)	Off = Passive On = Active	Command reset for energy monitoring database. It resets all stored values to zero and sets actual date as reference for "month 1" values. After a reset month 1's CoolEnergy, HeatEnergy and ElectEnergy will start to be updated depending on actual unite operations.	W
	03 (**SG State**)	0…4	The value represents the actual state sent by SG Gateway: 0 = SG Disabled/SG Box Communication Error 1 = (Bypass scheduler to force off) 2 = (Normal Operation) 3 = (Force Setpoint2) 4 = (Bypass scheduler to enable) & (Force setpoint2)	R

In the HMI Web Interface, all the above parameters can be set at the following path:

- "Main → View/Set Unit → Smart Grid"

Date reference
A reset command set the reference date for database. Changing data backward will cause and invalid state and database won't be updated until reference date it reached again. Changing data forward will cause a non-reversible shift of reference date and every database's cell from old reference date to actual one will be filled with a 0-value.

NOTE: For MUSE Multi-Units case configuration notes can be found in Smart Grid Ready Box Installation & Operating Manual D–EIOCP00301-23

4.17. About Chiller

The application version and the BSP version represent the core of software installed on the controller. The [21] is only read page contains these informations.

Page	Parameter	R/W
21 (About)	00 (App Vers)	R
	01 (BSP)	R

The path in the HMI Web interface to access this information is:

- Main Menu → About Chiller

4.18. Generic Controller Operation

The main controller operations available are "Application Save" and "Apply Changes". The first one is used to save the current configuration of parameters in the UC to avoid the possibility to lose it if a power fail happens while the second one is used for some parameters which require an UC reboot to become effective.

These commands can be accessed from menu [20]:

Page	Parameter	Range	Description	R/W
20 (PLC)	00 (AppSave)	Off = Passive On = Active	PLC executes an Application Save command	W
	01 (Apply Changes)	Off = Passive On = Active	PLC executes an Apply Changes command	W
	02 (Software Updates)	Off = Passive On = Active	If Active, PLC executes the Software Update command	W
	03 (Save Parameters)	Off = Passive On = Active	If Active, PLC executes the Save Parameters	W
	04 (Restore Parameters)	0 = No 1 = Partial 2 = Full	0 = No action 1 = PLC restores XXXX 2 = PLC restores all parameters	W
	05 (Terminal Resistor Enable)	Off = Disable On = Enable	Off = Modbus terminal resistor disabled On= Modbus terminal resistor disabled	W

In the HMI Web Interface, Application Save is available at the paths:

- Main Menu → Application Save

While the Apply Changes setpoint can be set at the path:

- Main Menu → View/Set Unit → Controller IP setup → Settings

5. ALARMS AND TROUBLE SHOOTING

The UC protects the unit and the components from damaging in abnormal conditions. Each alarm is activated when the abnormal running conditions require an immediate stop of the whole system or sub-system to prevent potential damages.

When an alarm occurs the proper alert icon will be turned on.

- In case of MUSE or VPF function enabled it's possible to have alert icon blinking with [07.00]'s value equal to zero. In these cases, unit is enabled to run because the alert icon refers to function errors, not unit ones, but registers [08.14] or [16.16] will report value greater than zero. Please refer to specific documentation for Master/Slave or VPF function troubleshooting.

In case of alarm occurrence, it's possible to try an "Alarm Clear" through the [7.01] parameter to allow the unit restart.

Please notice that:

- If alarm persist refer to table in chapter "Alarm List: Overview" for possible solutions.
- If alarm continue to occur after manual reset contact your local dealer.

5.1. Alarms List: Overview

The HMI displays the active alarms in the dedicated page [7]. Once entered this page the number of actual active alarms is displayed. In this page will be possible to scroll the complete list of active alarms and apply the "Alarm Clear" too.

Page	Parameter	Description	R/W
[7]	00 (Alarm List)	Alarm Mapping HMI	R
	01 (Alarm Clear)	Off = Maintain alarms On = Execute alarms reset	W

The table of possible codes for parameter [7.00] is:

Alarm Type	HMI Code	Mapping Alarm	Cause	Solution
Unit	U001	UnitOff ExtEvent	External signal mapped as Event detected by UC	▪ Check customer external signal source
	U002	UnitOff TimeNotValid	PLC time not valid	▪ Contact your local dealer
	U003	UnitOff EvapFlowLoss	Water circuit malfunction	▪ Check that water flow is possible (open all valves in the circuit) ▪ Check wiring connection ▪ Contact your local dealer
	U004	UnitOff EvapFreeze	Water temperature under minimum limit	▪ Contact your local dealer
	U005	UnitOff ExtAlm	External signal mapped as Alarm detected by UC	▪ Check customer external signal source
	U006	UnitOff EvpLvgWTempSen	Temperature sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer
	U007	UnitOff EvpEntWTempSen	Temperature sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer
	U010	UnitOff OptionCtrlrCommFail	Expansion module communication error	▪ Check expansion module connection ▪ Contact your local dealer
	U017	UnitOff Fault	PVM in alarm	▪ Contact your local dealer
	U019	UnitOff CondFlow	Water circuit malfunction	▪ Check that water flow is possible (open all valves in the circuit) ▪ Check wiring connection ▪ Contact your local dealer
	U020	CondPump1Fault	Condenser Pump Error	▪ Check Sensor pump connection ▪ Contact your local dealer
	U021	CondPump2Fault	Condenser Pump Error	▪ Check Sensor pump connection ▪ Contact your local dealer
	U022	UnitOff CondFreeze	Water temperature under minimum limit	▪ Contact your local dealer

Alarm Type	HMI Code	Mapping Alarm	Cause	Solution
	U023	UnitOff CondLwtSenf	Temperature sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer
	U024	UnitOff CondEwtSenf	Temperature sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer
	U025	UnitOff EvapPump1Fault	Evaporator Pump Error	▪ Check Sensor pump connection ▪ Contact your local dealer
	U026	UnitOff EvapPump2Fault	Evaporator Pump Error	▪ Check Sensor pump connection ▪ Contact your local dealer
	U027	DemandLimSenFlt	Demand limit input out of range	▪ Check input wiring connection ▪ Contact your local dealer
	U028	LwtResetFlt	Lwt reset input out of range	▪ Check input wiring connection ▪ Contact your local dealer
	U029	EvapDPSenF	DP sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer
	U030	CondDPSenF	DP sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer
	U031	EvDp4SkidFlt	Water circuit malfunction	▪ Check that water flow is possible (open all valves in the circuit) ▪ Check wiring connection ▪ Contact your local dealer
	U032	CdDp4SkidFlt	Water circuit malfunction	▪ Check that water flow is possible (open all valves in the circuit) ▪ Check wiring connection ▪ Contact your local dealer
	U033	CondShutOffFault	Water circuit malfunction	▪ Contact your local dealer
	U034	EvapShutOffFault	Water circuit malfunction	▪ Contact your local dealer
	U035	LeakSensf	Gas leakage sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer
	U036	LeakSensOOR	Gas leakage sensor malfunction	▪ Check wiring connection ▪ Contact your local dealer
	U037	LeakAlarm	Gas leakage	▪ Contact your local dealer
	U038	ManLowEvPr	Evaporator pressure under minimum limit	▪ Contact your local dealer

Alarm Type	HMI Code	Mapping Alarm	Cause	Solution
Circuit 1	C101	Cir1Off LowPrsRatio	Circuit pressure ratio under the minimum limit	▪ Contact your local dealer
	C102	Cir1Off NoPrChgAtStrt	No pressure delta detected by UC	▪ Contact your local dealer
	C105	Cir1Off LowEvPr	Evaporating pressure under minimum limit	▪ Contact your local dealer
	C106	Cir1Off HighCondPrs	Condenser pressure over the maximum limir	▪ Contact your local dealer
	C107	Cir1Off Comp1HiDishAlm	Compressor 1 discharge temperature over maximum limit	▪ Contact your local dealer
	C110	Cir1Off EvapPSenf	Pressure sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer
	C111	Cir1Off CondPsenf	Pressure sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer

	C113	Cir1Off SuctTsenf	Temperature sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer
	C114	Cir1Off DischTempSenf	Temperature sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer
	C115	Cir1Off PdFail	Failed pumpdown at unit shutdown	▪ Contact your local dealer
	C118	Cir1Off LiquidTsenf	Temperature sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer
	C120	Cir1Off MHP	Mechanical High pressure switch	▪ Contact your local dealer
	C125	Cir1Off Comp2DishTsenf	Temperature sensor not detected	▪ Check sensor wiring connection ▪ Contact your local dealer
	C126	Cir1Off Comp2HiDishAlm	Compressor 2 discharge temperature over maximum limit	▪ Contact your local dealer
	C127	Cir1Off Comp1LowDischAlm	Compressor 1 discharge temperature under minimum limit	▪ Contact your local dealer
	C128	Cir1Off Comp2LowDischAlm	Compressor 2 discharge temperature under minimum limit	▪ Contact your local dealer

In the HMI Web Interface, this information is available in the paths:
Main Menu → Alarms → Alarm List

5.2. Troubleshooting

If one of the following malfunctions occur, take the measures shown below and contact your dealer.

Stop operation and shut off the power if anything unusual occurs (burning smells etc.).

Leaving the unit running under such circumstances may cause breakage, electric shock or fire. Contact your dealer.

The system must be repaired by a qualified service person:

Malfunction	Measure
If a safety device such as a fuse, a breaker or an earth leakage breaker frequently actuates, or the ON/OFF switch does not properly work.	Turn off the main power switch.
If water leaks from the unit.	Stop the operation.
The operation switch does not work well.	Turn off the power.
If the operation lamp flashes and the malfunction code appears on the user interface display.	Notify your installer and report the malfunction code.

If the system does not properly operate except for the abovementioned cases and none of the abovementioned malfunctions is evident, investigate the system according to the following procedures.

Malfunction	Measure
The remote controller display is off.	• Check if there is no power failure. Wait until power is restored. If power failure occurs during operation, the system automatically restarts immediately after power is restored. • Check if no fuse has blown or breaker is activated. Change the fuse or reset the breaker if necessary. • Check if the benefit kWh rate power supply is active.
An error code is displayed on the remote controller.	Consult your local dealer. Refer to "4.1 Alarm List: Overview" for a detailed list of error codes.

Notes

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