Regulation Manual
Manuel de régulation
Regelungshandbuch
Manuale di regolazione
Manual de regulación

Aqu@Scop Advance DCI

6 ÷ 16

V1.0 software
V2.0 software

English | Français | Deutsch | Italiano | Español

Air-water Heat Pump
Pompe à Chaleur air-eau
Wärmepumpe Luft-Wasser
Pompa di Calore aria-acqua
Bomba de Calor aire-agua

3.5 ↓ 18 kW

HFC 407C

UM ADVANCE 01-N-2GB
Part number / Code / Teil Nummer / Codice / Código : **3990659GB**
Supersedes / Annule et remplace / Annulliert und ersetzt /
Annulla e sostituisce / Anula y sustituye : **UM ADVANCE 01-N-1GB**

CE

REGULATION MANUAL English

MANUEL DE RÉGULATION Français

REGELUNGSHANDBUCH Deutsch

MANUALE DI REGOLAZIONE Italiano

MANUAL DE REGULACIÓN Español

English

CONTENTS

IN ORDER TO ENSURE THAT APPLIANCE SAFETY PROTECTION SYSTEMS REMAIN ACTIVE (COMPRESSOR, ANTI-FREEZE PROTECTION, WATER PUMP ANTI-SEIZE PROTECTION), WE STRONGLY ADVISE AGAINST SWITCHING OFF THE POWER SUPPLY TO THE PAC WHEN IT IS NOT IN USE FOR HEATING.

1. MANUAL USER GUIDE

The purpose of this manual is to explain the various functions and possibilities offered by the Aqu@Scop Advance DCI regulation system. The manual also provides a detailed description of all the parameters accessible via the graphic display integrated in the appliance, as well as a few parameters to be set at the time of start-up.

1.1. ICONS

Several different icons are present throughout the document:

WARNING: Warns of a risk to proper operation of the **Aqu@Scop Advance DCI**, of a strong recommendation associated with occupant comfort or energy savings, or of important points of which a good understanding is necessary.

TIP: Highlights how a simple parameter setting can offer improved installation performance or make start-up easier.

NOTE Attracts the reader's attention to a special point.

1.2. MODIFIABLE PARAMETERS

In this document, all the parameters that can be modified via the **Aqu@Scop Advance DCI** display are highlighted in ***bold italic***.

All the menus, screens and associated parameters are listed at the end of this manual with the reference screen, the unit of measurement, and with minimum, maximum and default values.

2. DISPLAY

2.1. DEFAULT DISPLAY

It is possible to reach the default display by either waiting for 10 minutes or by going up in the menu by pressing both buttons "  and  ".

The default display is the leaving water temperature unless the following occurs:

- ➢ Deice "dEg" is displayed.
- ➢ Unit is off "Off" is displayed, see below for off mode definition.
- ➢ EJP input "EJP" is displayed.

2.2. INDICATOR LIGHT

On = heating by electric heater or boiler operating

Flashing = back-up heating

On = compressor operating

Flashing = compressor waiting to start

On = alarm active, check the alarm codes

Flashing = back-up heating

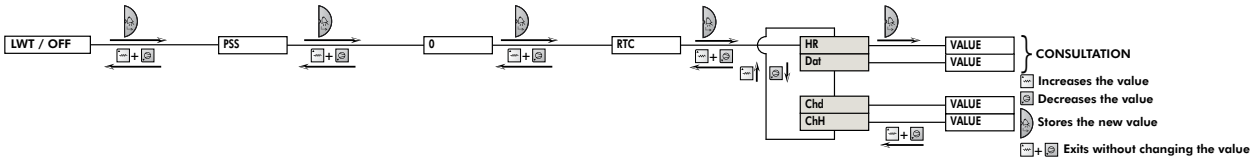
2.3. CLOCK

The main controller keeps the time and date even during a power cut. However when a room terminal is connected the time displayed on the room terminal is used to adjust the main controller time. This means that if the room controller time is incorrect after a long power cut or installation the main controller time will be incorrect.

The controller date can be check and adjusted in the menu PSS -> rtC. The "Hr" and "dAt" parameters are used to see the actual values and the "ChH" and "Chd" are used to modify the values.

The date and time are used for alarm monitoring. The time is used for alarm and domestic hot water (DHW) scheduling.

Note: Neither the room controller nor the main controller will automatically adjust the time between winter and summer time.



3. MODES

3.1. ON/OFF

When the heating is in off mode the pump can still start either for freeze protection or for the anti-seize cycles.

If any of the off inputs are switch off then the unit will be in off mode as described below.

	No hot water heating	With domestic hot water
Display OFF	Heating Off	Heating & DHW OFF
On/Off input DI9	Heating Off	Heating & DHW OFF
Room terminal Off	Heating Off	Heating OFF DHW On

The display will show "off" if the heating is off

Note that if domestic hot water is active the unit will automatically switch back on when water heating is required if off mode is selected on the room terminal.

3.2. DRY CONTACT INPUTS

Note that the state of the inputs can be monitored using the I-O menu and DI sub menu. The condition is 0 = input open and 1= input closed.

3.2.1. ON/OFF DRY CONTACT INPUTS DI9

The default setting uses this input as a global Off mode when the input is closed.

It is possible to inverse the input logic using the parameter H30.

- If H30 = "inv" (default) then when the input is closed the unit is Off
- If H30 = "dir" then when the input is open the unit is off.

When the parameter H29 = LS then the DI9 input is used for the load shedding and cannot be used as an on/off input.

3.2.2. LOAD SHEDDING DRY CONTACT INPUT DI9

Only used when H29 = 29 and H10 = 0 (configured for electric heaters)

When the input is on then the electric heaters remain off. Only heating by compressor heat is possible. Note that this input does not disable the domestic hot water electric heater.

The input logic can be reversed using parameter H30 as above.

3.2.3. EJP INPUT DI8

This input is used to stop electricity consumption for customers equipped with peak rate electricity meters. When the input is on then all electric heaters and compressor heat are switched off. DWH Domestic hot water heating is not possible. Heating is done by the boiler when a boiler relief configuration is used.

The parameter H25 can be used to inverse the input.

- If H25 = "dir" (default setting) then when the input is closed the EJP mode is on.
- If H25 = "inv" then when the input is closed EJP is off and normal heating is allowed.

When EJP mode is active "EJP" is displayed as the default display.

3.2.4. DAY/NIGHT INPUT DI10

This input is used with the domestic hot water option only when the parameter L01 is set as "in". When the contact is in night mode then the "comfort" setpoint (parameter o02) is used when the contact is in day mode the "eco" setpoint (parameter o03) is used.

This input can be used with an off peak electricity meter.

The parameter L08 can be used to inverse the input.

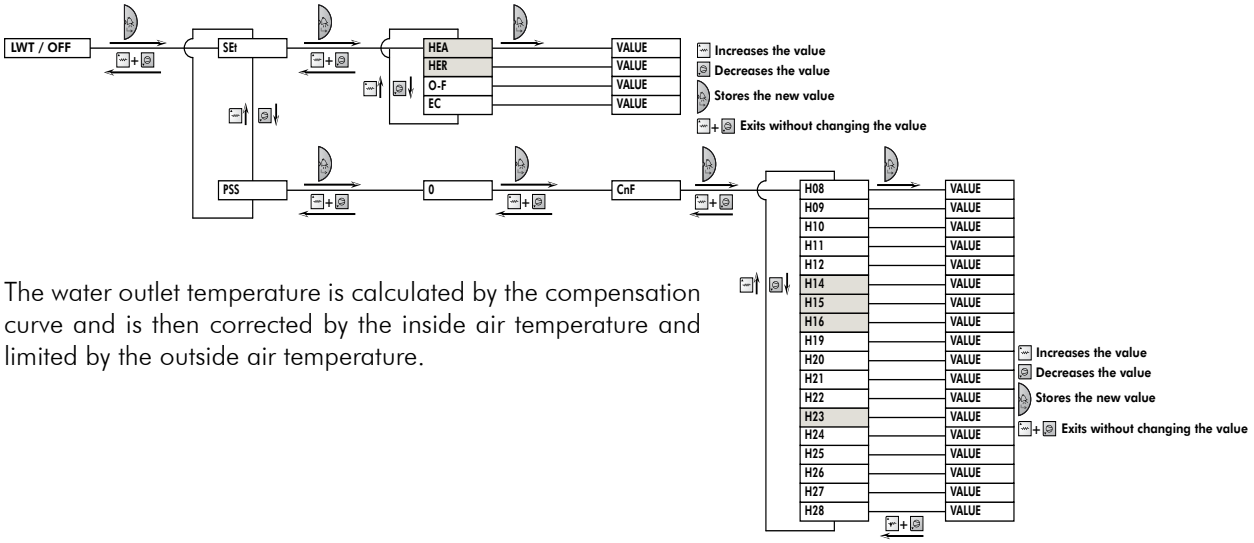
- If L08 = dir (default setting) then when the input is closed the night mode is on.
- If L08 = inv then when the input is closed the daytime "eco" setpoint is used.

4. HEAT CURVE AND HEATING WATER SETPOINT

The water setpoint used at any time is continuously recalculated depending on conditions. The setpoint used is given by the parameter HEr. This parameter cannot be modified.

The water setpoint starting setpoint is HEA. This value is then corrected for the outdoor air temperature depending on the heat curve parameters.

4.1. HEAT CURVE

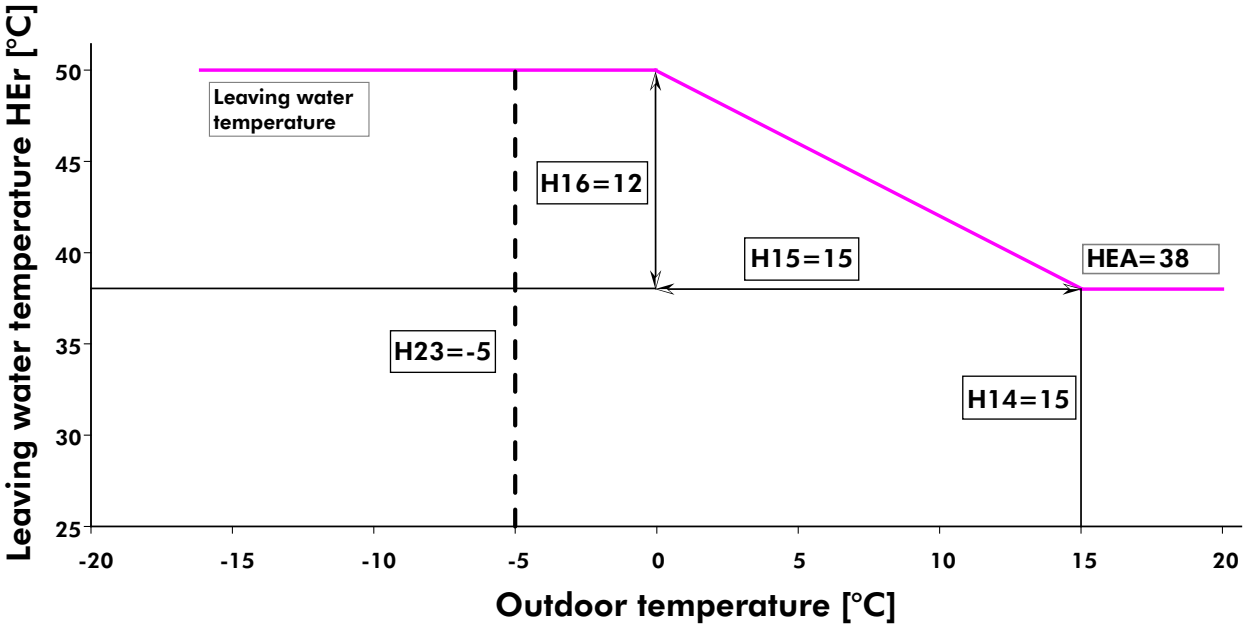


The water outlet temperature is calculated by the compensation curve and is then corrected by the inside air temperature and limited by the outside air temperature.

4.1.1. COMPENSATION FOR RADIATOR OPERATION

FACTORY SETTINGS

HEA	Set point before correction	38°C
H16	Maximum HEA correction	Δ = 12°C
H14	Foot of temperature slope	15°C
H15	Proportional correction band	Δ = 15°C



The HEA dynamic set temperature point is equal to 38°C.

With this mode of regulation, the leaving water temperature is capped as a function of the outside air temperature.

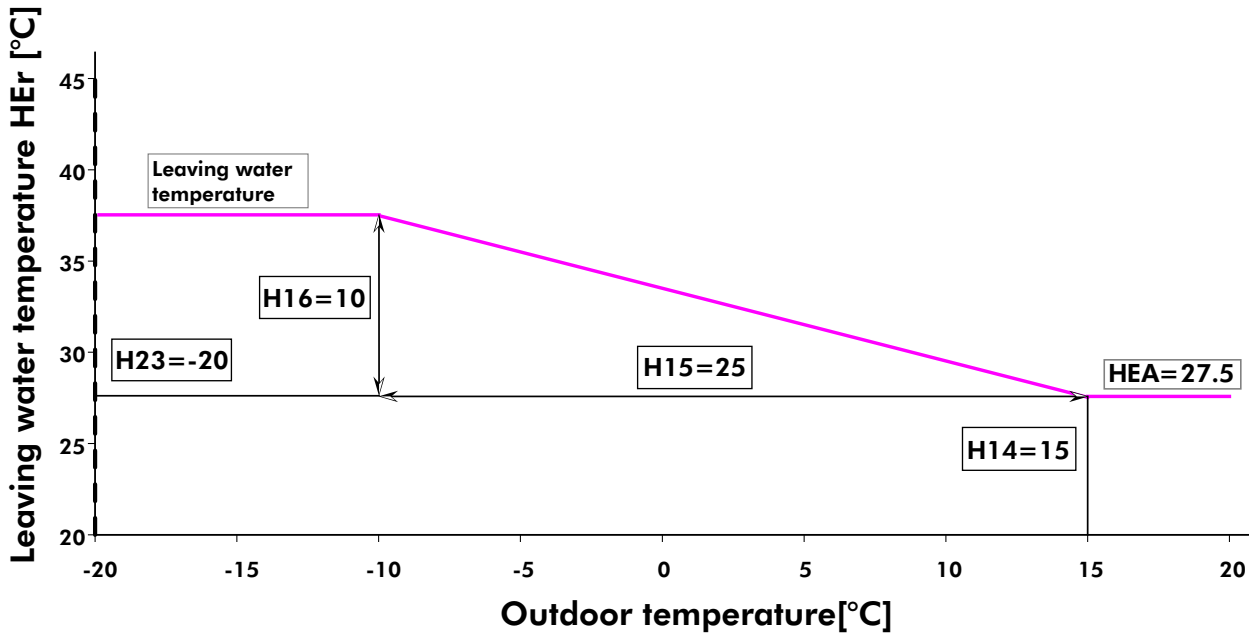
If the HEA is set at 38°C, the leaving water temperature is at the maximum of 50°C, and the entering water temperature is 47°C, being the maximum operating limit for the **Aqu@Scop Advance DCI** for this application.

The **Aqu@Scop Advance DCI** must be sized to have a balance point within 4°C and 0°C of the outdoor temperature.

4.1.2. COMPENSATION FOR UNDER-FLOOR HEATING OPERATION

FACTORY SETTINGS

HEA	Set point before correction	27.5°C
H16	Maximum HEA correction	Δ = 10°C
H14	Foot of temperature slope	15°C
H15	Proportional correction band	Δ = 25°C



The minimum operating temperature for the **Aqu@Scop Advance DCI** for this application is limited by the parameter H23 to -20°C. The leaving water temperature is always below the limit and the appliance can operate with the boiler down to temperatures of -20°C. The boiler start-up temperature is determined by **Aqu@Scop Advance DCI**'s capacity (balance point).

4.2. ROOM SETPOINT CORRECTION

The water setpoint is set for an indoor air temperature of 20°C. If the room setpoint is changed then the water setpoint is corrected 3° for a radiator configuration and 2° for an underfloor heating configuration per 1 degree of difference. The correction can be changed using parameter S10, set the parameter to 0 for no correction.

This correction is not used if no room terminal is present.

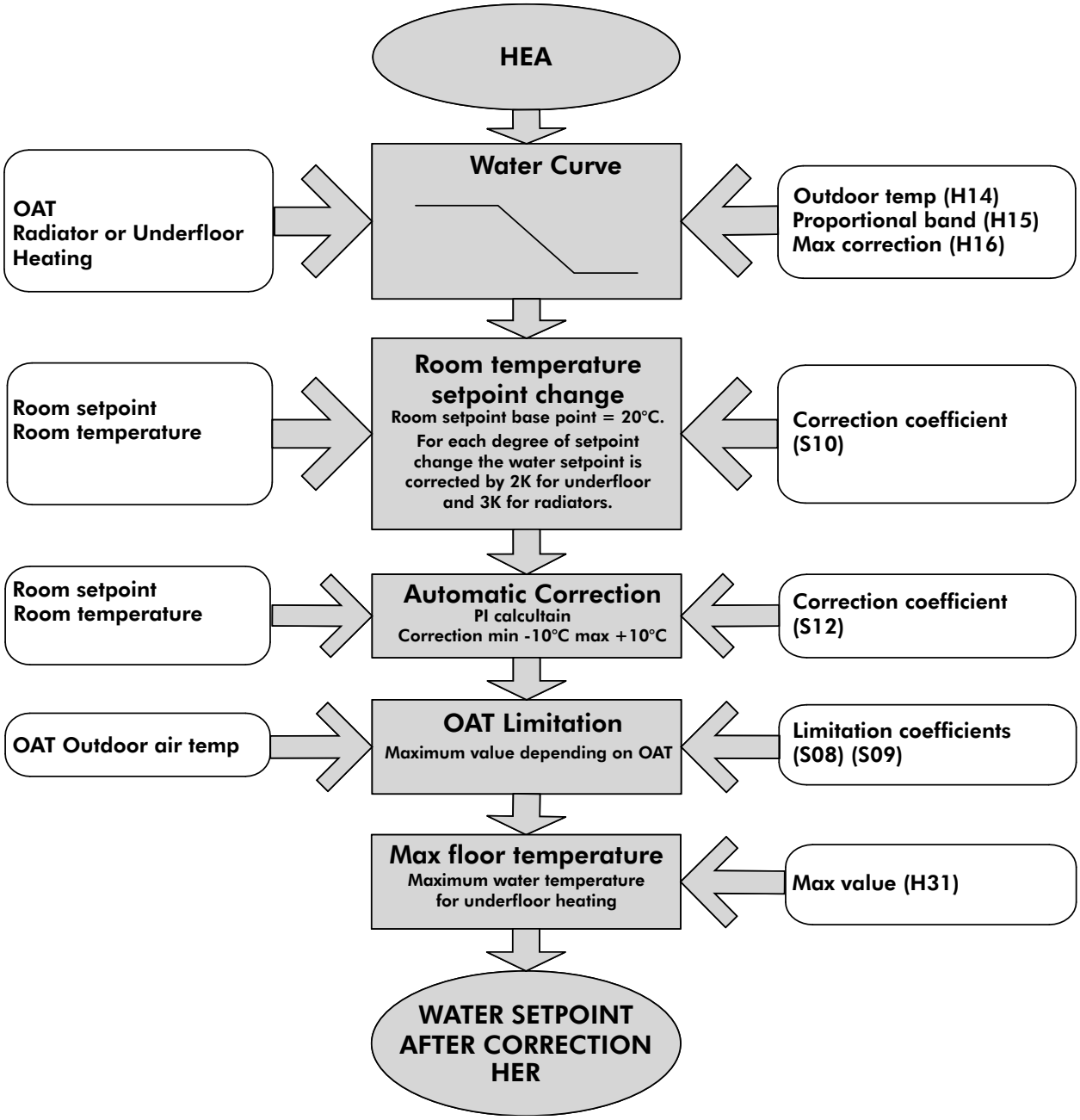
4.3. ROOM AIR TEMPERATURE AUTOMATIC CORRECTION

The difference between the room temperature and the room setpoint is continuously monitored and used to correct the heat curve. A correction factor is calculated using a PI algorithm. The maximum and minimum possible values are +10° and -10°. The possible correction factors can be adjusted using parameter S12. The default value is 1, 0 is no correction and 2 corresponds to a correction of +20° /-20°.

4.4. LIMITING FOR UNDERFLOOR HEATING APPLICATIONS

The temperature calculated by the above heat curve is limited according to the outdoor air temperature to prevent the compressor working outside acceptable operating conditions.

A separate limiting parameter (H12) is used only when the unit is configured (H09=1) for underfloor heating. The default value is 45°C maximum.



5. COMPRESSOR MANAGEMENT

Compressor is allowed to operate depending on water temperature and room air temperature.

5.1. ROOM AIR TEMPERATURE

The compressor will stop when RT - HSPT > H28

The compressor can start when RT- HSPT < H27

HSPT : room heating setpoint given by the room terminal

RT : room temperature measured by the room terminal

H28 : stop differential (0.6°C default)

H27 : start differential (0.2°C default)

5.2. WATER TEMPERATURE

5.2.1. COMPRESSOR START

The entering water temperature (EWT) is compared to the water setpoint (HEr). When the difference is less than the last value memorised for any given condition then the compressor can start. This value is typically 5°C but will depend on the waterflow and outdoor air temperature.

5.2.2. COMPRESSOR SPEED

The leaving water temperature (LWT) is compared to the water setpoint (HEr). The compressor speed is adjusted according to a fuzzy logic algorithm to keep the LWT as close to HEr as possible. When the two values are close then the compressor will change speed slowly, however when the two values are more than 2°C apart then the compressor can change speed up to 8Hz per 15s.

The minimum speed is 25Hz and the maximum speed is 80Hz. These actual min and max speed is automatically adjusted according to outdoor air temperature. When the outdoor temperature is greater than 25°C then the maximum speed is reduced and if it is less than 0°C then the minimum speed is increased.

The actual compressor speed status is available in the "I-O" menu in Hz.

5.2.2.1. COMPRESSOR STOP

The compressor will reduce speed if the LWT value remains above the setpoint until it reaches minimum speed. If the compressor remains at minimum speed for more than 3 minutes with the water temperature above setpoint then it will stop.

If the compressor speed is less than 30Hz for more than 50 minutes, it will stop.

5.3. COMPRESSOR PROTECTION

ALARM LEVEL	ACTION
Above level 1	Compressor speed increase not allowed
Above level 1 and increasing or above level 2	Small speed decrease
Above level 2 and increasing	Big speed decrease
Above level 3	Compressor Off

5.3.1. LIMITS

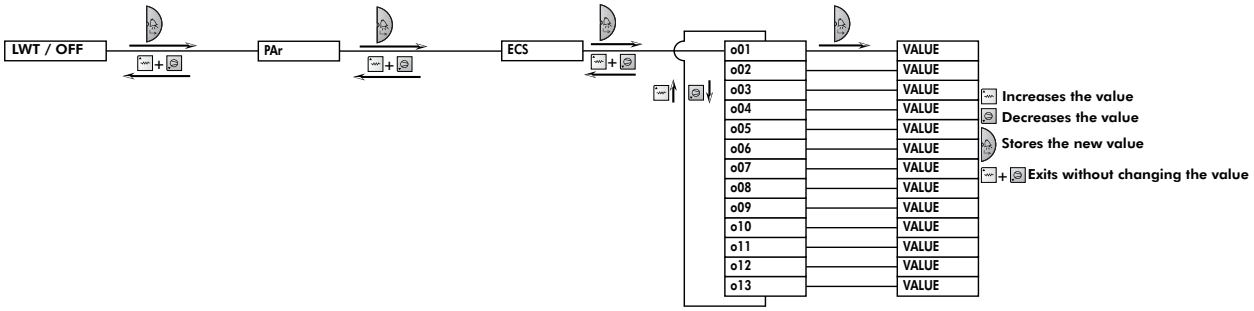
	COMPRESSOR DISCHARGE T			DRIVER AMPS		
Model	level 1	level 2	level 3	level 1	level 3	level 3
6	105°C	110°C	115°C	14A	15A	17A
12	110°C	115°C	120°C	21A	22A	28A
16	110°C	115°C	120°C	24A	22A	28A

6. DOMESTIC HOT WATER

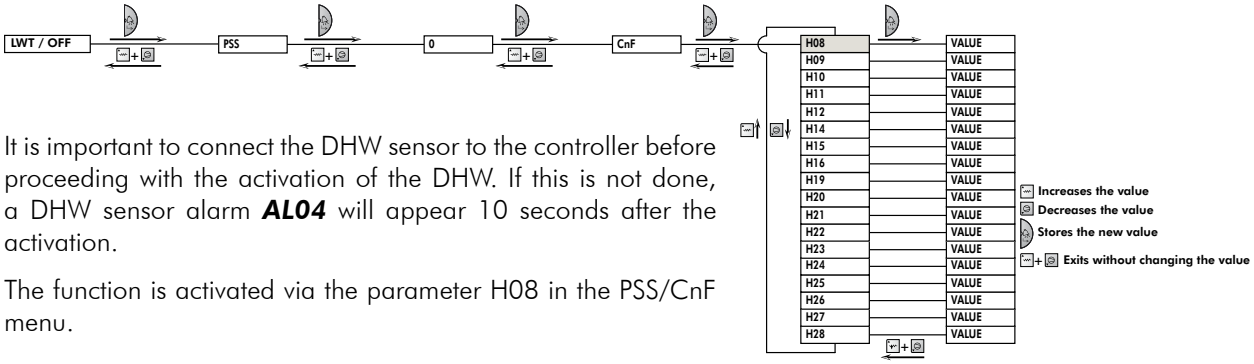
This function requires the installation of a DHW tank or a heat exchange system to supply the DHW tank (plate exchanger type) compatible with the capacity and the water temperatures of a **Aqu@Scop Advance DCI**. The DHW tank available as a kit guarantees effective operation of the DHW option as it includes an internal heat exchanger with a sufficient surface area (over 3m²) and a back-up electric heater. In the case of the use of a different system, some functions (e.g. Legionnaires' Disease Protection) will be inoperative and there is no guarantee that the satisfactory DHW temperature will be reached.

It is also necessary to connect a specific DHW temperature sensor to the appliance's regulation system (Refer to the Installation Manual).

Two separate menus on the display are used for setting DHW parameters. In the main menu PAr/ECS, the DHW screens provide simple everyday user access (temperature setpoint, timer programming …) while the Installation menu covers the configuration choices possible at the time of **Aqu@Scop Advance DCI** installation (DHW activation, setting off-peak hours operation, Legionnaires' Disease Protection, room temperature management, water pump management …).



6.1. DHW FUNCTION ACTIVATION



It is important to connect the DHW sensor to the controller before proceeding with the activation of the DHW. If this is not done, a DHW sensor alarm ***AL04*** will appear 10 seconds after the activation.

The function is activated via the parameter H08 in the PSS/CnF menu.

6.2. DHW DEMAND AND ROOM TEMPERATURE MANAGEMENT

6.2.1. DHW DEMAND

The **Aqu@Scop Advance DCI** considers that there is a demand for DHW production when the temperature read by the DHW sensor falls 2° C below the setpoint. For example, if the setpoint is 50°C, there will be a demand for DHW for a temperature measured below 48°C.

The demand for DHW is considered as satisfied when the DHW temperature exceeds the setpoint by 2°C. For a setpoint at 50°C, this means that the DHW temperature is going to oscillate between 48°C and 52°C.

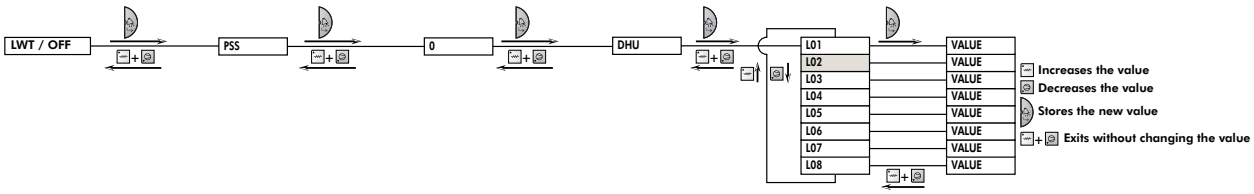
6.2.2. DHW MANAGEMENT RELATIVE TO ROOM TEMPERATURE

When the room terminal is connected, the **Aqu@Scop Advance DCI** can decide whether to give priority to Heating or DHW production.

The DHW or Heating priority can be configured by the parameter L02:

- If the room temperature is lower than the room setpoint minus 2°C, the **Aqu@Scop Advance DCI** remains in Heating mode until the room temperature returns above this limit. For example, for a room setpoint of 20°C, the switchover to DHW will only occur if the room temperature is above 18°C (during 5 consecutive minutes).

- Beyond a certain time of demand for DHW production, the **Aqu@Scop Advance DCI** will automatically switch to DHW mode, irrespective of the room temperature. This time period, L02 set at 60 minutes, is a good compromise between heating comfort and readily available domestic hot water. Moreover, if the timer has been programmed or if an off-peak hours electricity relay has been connected to the **Aqu@Scop Advance DCI**, this set-up ensures that the optimum time period for DHW production is not missed.



To afford greater priority to Heating for example, the L02 value can just be increased (up to 4 hours). In this case, the **Aqu@Scop Advance DCI** will be able to remain in Heating mode for 4 hours or until the room temperature has reached the room setpoint. However, there is a risk of not having DHW at the desired temperature at the end of the off-peak period, for example.

On the other hand, priority can be given to DHW by changing the L02 value to 0 minute.

6.2.3. AQU@SCOP ADVANCE DCI IN HEATING OFF MODE

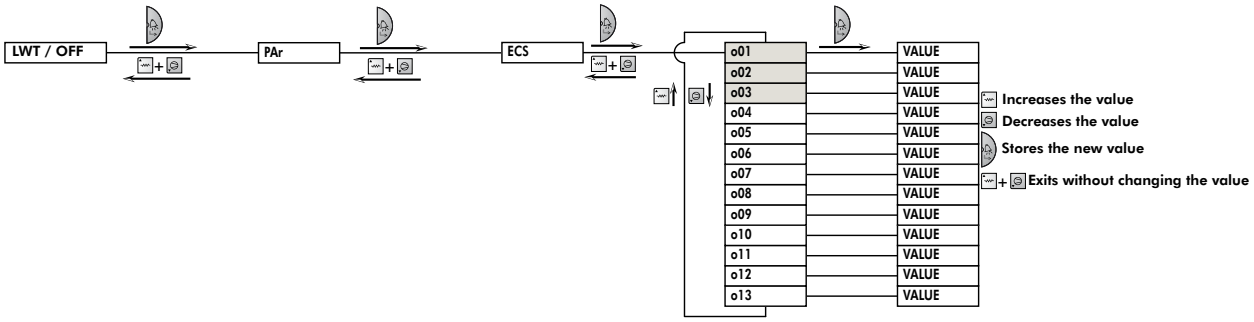
When the **Aqu@Scop Advance DCI** is in off mode (Refer to the § **ON/OFF**, page 5), the room temperature is no longer taken into account and the changeover to DHW mode is instantaneous during a demand for DHW production.

6.2.3.1. ROOM TERMINAL NOT CONNECTED

When the room terminal is not connected to the **Aqu@Scop Advance DCI**, the changeover to DHW mode is identical to operation in off mode.

6.3. COMFORT/ECO TEMPERATURE SETPOINTS (SCHEDULING)

The user can set the DHW parameters to fulfil all types of needs. To achieve this, the **Aqu@Scop Advance DCI** proposes two temperature setpoints: Comfort and Eco, as well as two operating modes: Permanent Comfort and Comfort/Economy. Similarly, there are two types of timer programming: via digital input (dry contact) or via daily scheduling (timer programming).



o01 : Comfort permanent selection

o02 : Comfort setpoint (default=48°C)

o03 : Eco setpoint (default=45°C)

➢ ***Comfort permanent selection o01***

The mode determines how the appliance is going to choose the DHW temperature setpoint.

As the default setting in ***Comf./Eco.***, this means that the **Aqu@Scop Advance DCI** is going to switch between the two Comfort and Economy temperature setpoints either in relation to the off-peak hours status (connection to the electricity meter) or in relation to the daily scheduling.

It is possible to configure the mode in ***Perm. Comfort*** (for Permanent Comfort o01 = ON). This will **continuously** force the DHW setpoint to the Comfort setpoint (not recommended).

➢ ***Comfort* and *Eco* setpoints (Default settings: 48°C and 45°C)**

These are the temperature setpoints used in relation to the current mode. These setpoints provide domestic hot water at the right temperature in Comfort mode (e.g. hot water production during off-peak hours at night) and restart production at a lower temperature when the tank has cooled down (e.g. during the day). In this way, comfort is maintained for the user, while ensuring that the **Aqu@Scop Advance DCI** operates under optimum conditions.

To prevent any restart of DHW production during the day time and to produce DHW only during the night, the user just has to set the Eco temperature at 10°C (minimum setting). This setting corresponds to the Anti-freeze protection setting.

These setpoints have been chosen to be compatible with compressor operation. If they are increased to values beyond 50°C, the **Aqu@Scop Advance DCI** will be unlikely to supply DHW at the desired temperature. This will lead to the possible start-up of the electric heater (fitted in the DHW tank as an option) and would considerably increase the system's electricity consumption. In the worst case, and insofar as the system's priority is to always provide DHW at the required temperature, **it is possible that DHW could only be produced by the electric heater.**

WE STRONGLY ADVISE AGAINST INCREASING THE DHW TEMPERATURE SETPOINTS BEYOND 50°C.

6.3.1. COMFORT/ECO CHANGEOVER

To benefit from the dual temperature setpoint function, the DHW mode must be configured in ***Comf./Eco.***. The temperature setpoint point changeover can then be programmed in two different ways.

- ➢ Off-peak hours input (L01 = "In")
- ➢ Daily scheduling (L01 = "Prg")

6.3.1.1. OFF-PEAK HOURS INPUT

If the L01 parameter = "In" the off-peak hours contact (ID10 digital input on the controller) is used to select between the Comfort and Eco setpoints. It is also possible to configure the type of switching of this input to Normally Open (L08="dir", by default) or Normally Closed (L08="Inv"). The L08 = "dir" setting means that the DHW will use the Comfort setpoint (e.g. at night) when the contact is closed. Therefore, as a default, if the off-peak hours contact is not connected, the DHW will remain permanently in Eco mode (as the unwired contact is open).

6.3.1.2. DAILY SCHEDULING

THIS FUNCTION REQUIRES THE TIME TO BE SET.

Two start and stop times can be programmed per day. All days are the same.

It is not necessary to use both timers. The default setting is Timer 2 set to 0.

The default values are:

- ➢ o04 Timer 1 Start 23H
- ➢ o05 Timer 1 Stop 03H
- ➢ o06 Timer 2 Start 00H
- ➢ o07 Timer 2 Stop 00H

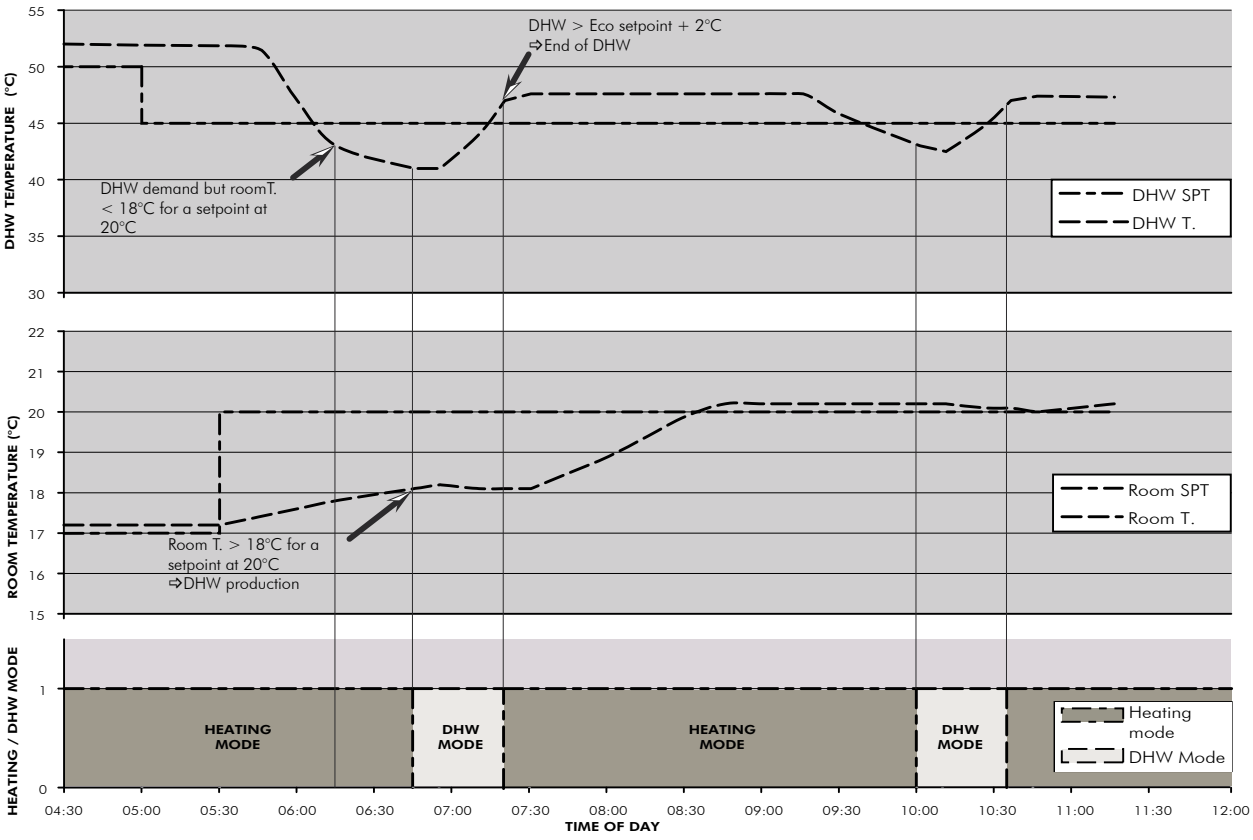
In the above case the "Comfort" setpoint will be used from 23H00 in the evening to 03H00 in the morning and the "Eco" setpoint will be used the from 03H00 in the morning to 23H00 in the evening. The Timer 2 settings are not used.

The timer settings are changed in hours. It is not possible to use minutes.

6.3.1.3. EXAMPLES OF DIFFERENT DHW OPERATING PATTERNS

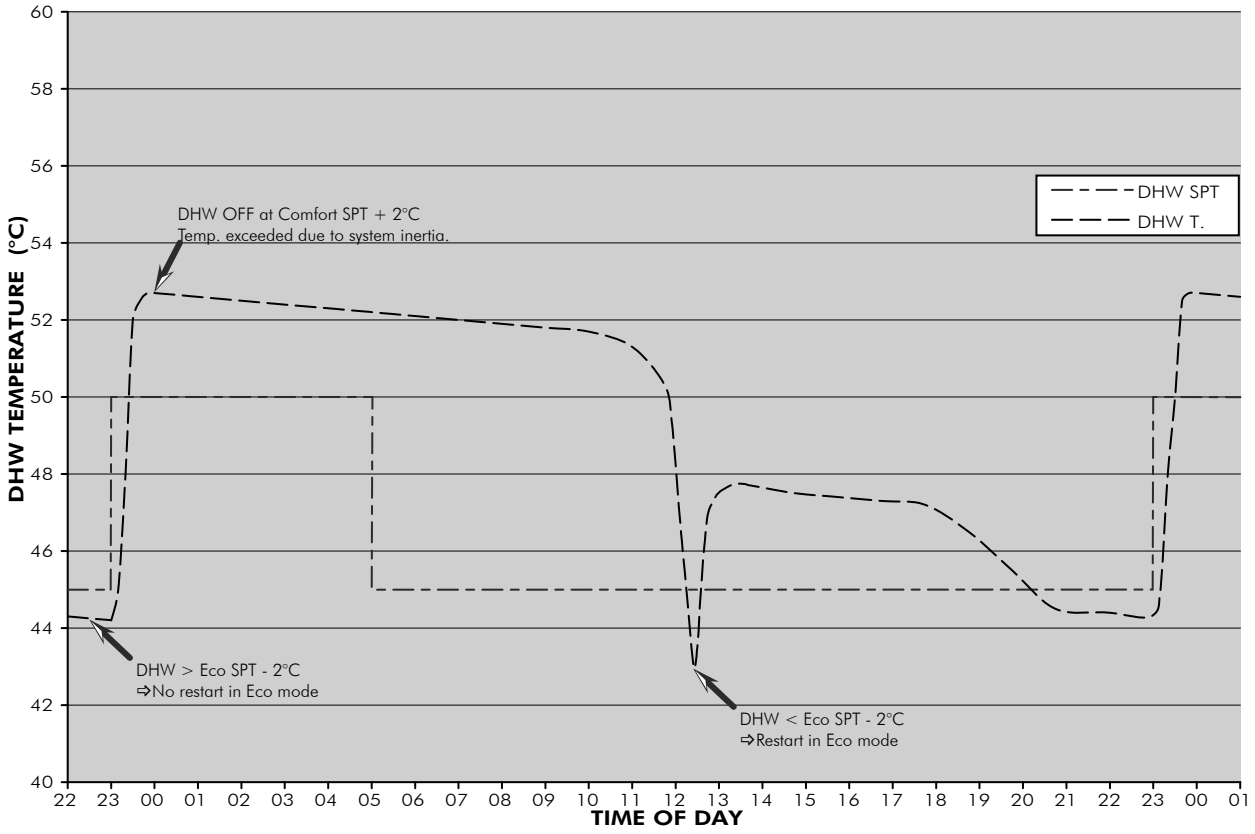
These examples are provided for information purposes only. The different heating or DHW production timeframes are not necessarily representative of all possible installations. These heating times are closely linked to the Aqu@Scop Advance DCI's operating conditions, to the type of heat exchangers and the level and frequency of demand for DHW.

Heating and DHW mode operation in relation to scheduling, restart after night time running

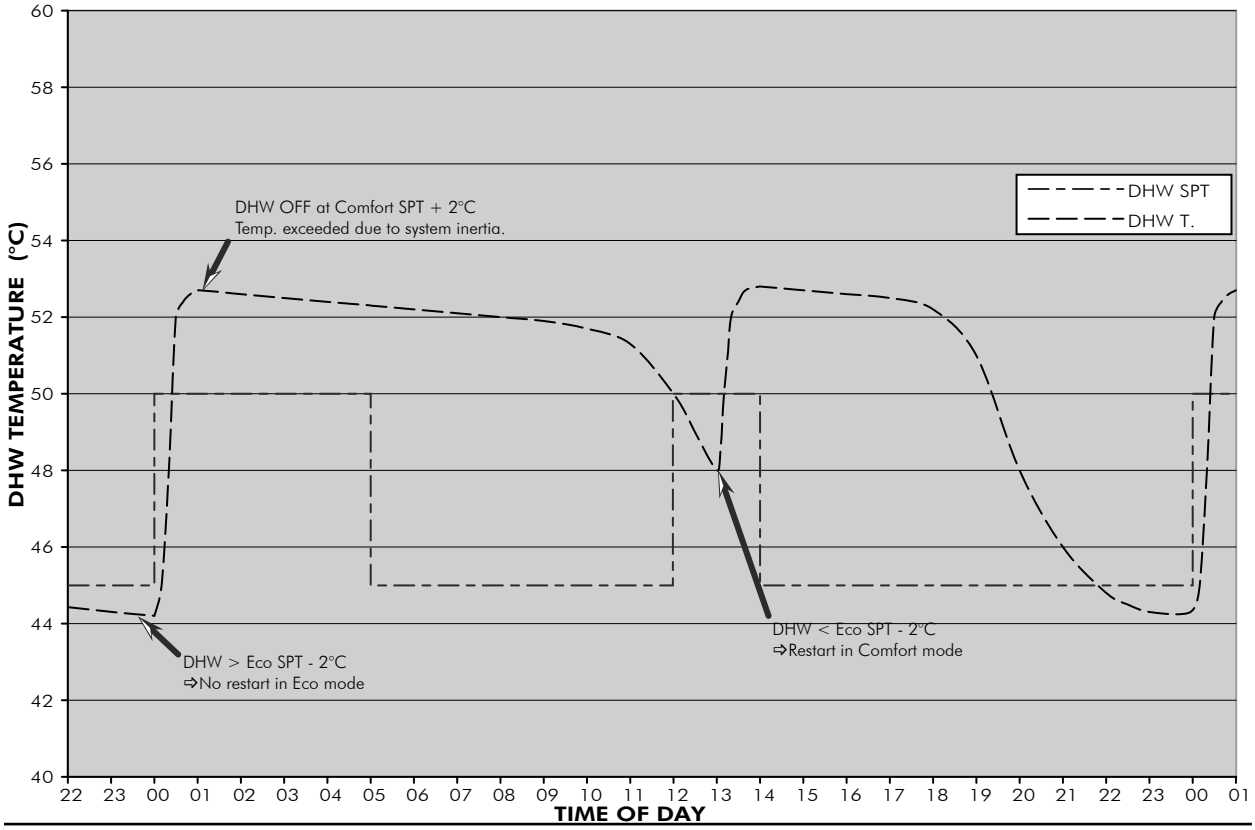


3 DHW schedulings (via off-peak hours input or daily scheduling) without consideration for Heating demand

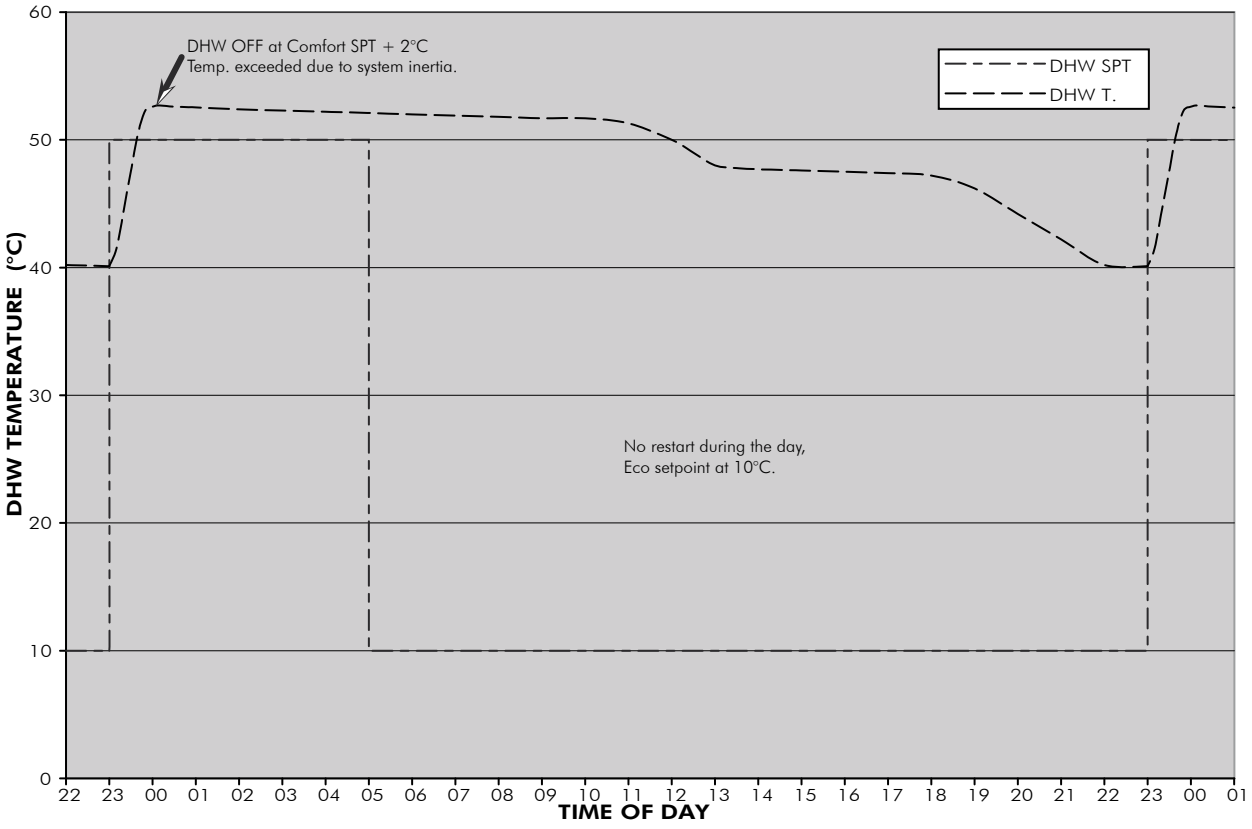
Off-peak input connected or default daily scheduling (Comfort between 23h00 and 05h00 in the morning, Eco the rest of the time), Comfort and Eco setpoints at 50°C and 45°C.



Off-peak input connected or daily scheduling with a restart at midday (Comfort between 0h00 and 05h00 in the morning and between 12h00 and 14h00, Eco the rest of the time), Comfort and Eco setpoints at 50°C and 45°C.

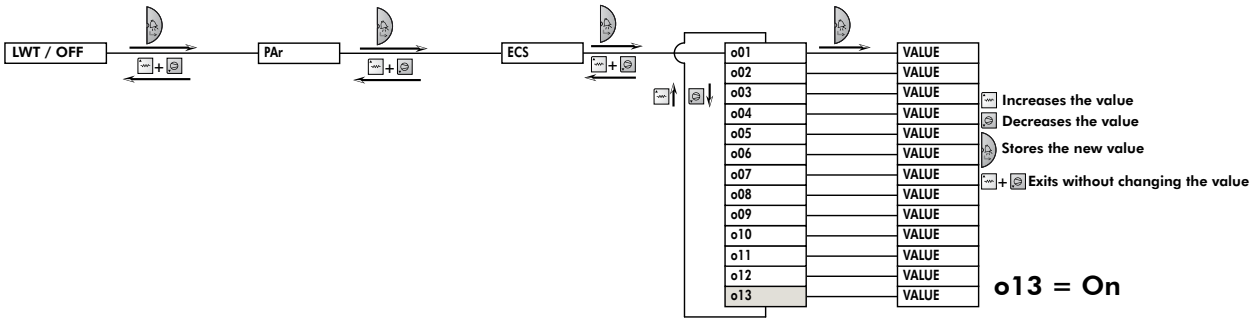


Off-peak input connected or default daily scheduling (Comfort between 23h00 and 05h00 in the morning, Eco the rest of the time), set Comfort and Eco temperatures at 50°C and 10°C, no DHW production during the day.



6.4. "QUICK HEAT-UP" FUNCTION

This function can be used when DHW is needed in a hurry and the tank is not hot enough as, for example when you return from holidays with the **Aqu@Scop Advance DCI** in MAIN OFF mode or even switched off from the power supply (not recommended).



When the "QUICK HEAT-UP" function is activated, the aim is to heat the DHW as rapidly as possible. The **Aqu@Scop Advance DCI**'s controller acts in the following manner :

- The system is switched to forced DHW mode, and ignores the room temperature conditions,
- The DHW setpoint changes to the Comfort setpoint, even is the current mode was Eco,
- The electric heater is authorised to start at the same time as the compressor to provide extra heating capacity.

When the DHW reaches the setpoint + 2°C, the "QUICK HEAT-UP" function will be automatically deactivated and the **Aqu@Scop Advance DCI** will return to its original operating mode.

6.5. COMPRESSOR MANAGEMENT

The compressor speed will automatically adjust to water temperature and outdoor air conditions. If there is a heating demand at the same time maximum possible compressor speed is used.

If there is no heating demand a lower compressor speed may be used to optimise the system efficiency.

6.5.1. BELOW 0°C OUTDOOR TEMPERATURE

The maximum possible water temperature is limited by low air temperatures. The electric heater will be used more.

6.6. ADDITIONAL ELECTRIC HEATER MANAGEMENT

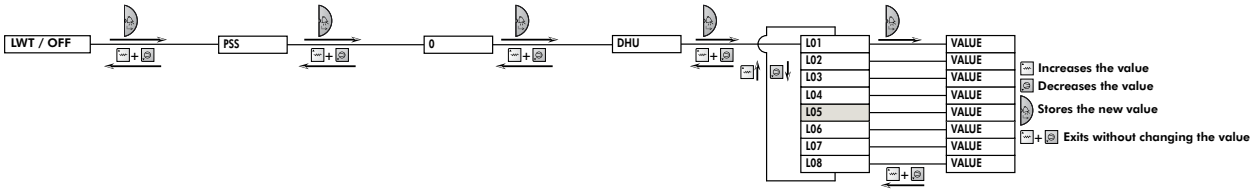
Two types of DHW electric heater may be used.

1. An electric heater inside the water tank (best solution)
2. Use the electric heater inside the Heat pump to heat the DHW.

Not avaiable in the **Aqu@Scop Advance DCI-R** version

The parameter L05 is used to configure the use of the DHW electric heater.

- L05 = OFF (default) use the water tank heater (DHWEH) with the output NO11.
- L05 = ON use the internal electric heaters.



The electric heater is used then the compressor is not able to heat the DHW up to the required setpoint. This could be because the DHW setpoint is higher than the maximum water temperature or could de due to a problem of undersized heat exchanger in the water tank.

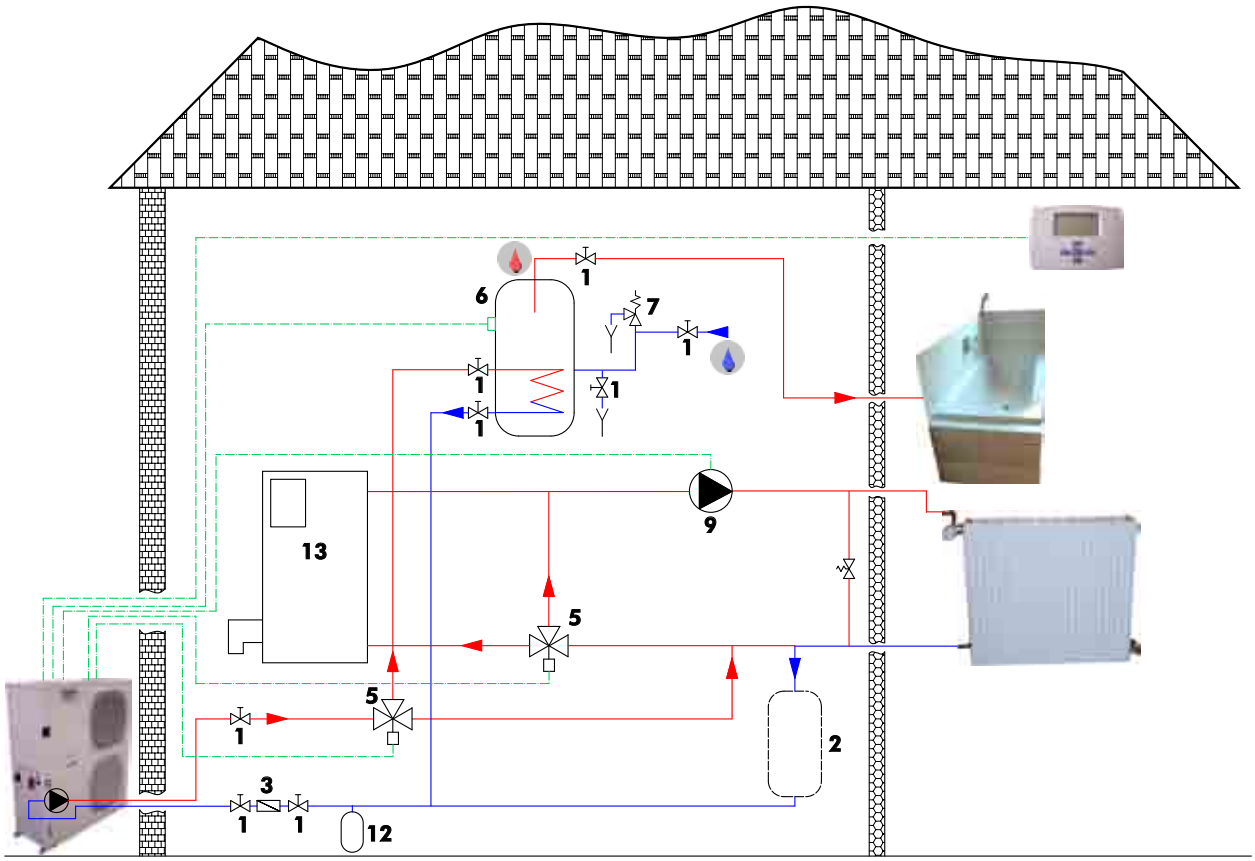
If the water tank DHWEH electric heater is used then the heat pump can return to normal space heating as soon as the compressor is switched off.

If the internal electric heaters are used for DHW heating then the space heating can only restart when the DHW has reached its setpoint.

6.6.1. DHW USED WITH BOILER RELIEF

This configuration presumes that the boiler is not used to heat the DHW.

The compressor heats the DHW as much as possible then a water tank electric heater (DHWEH) will heat the water further if required. Configuration is L07 = "ON"



6.6.2. SET TEMPERATURE UNATTAINABLE WITH THE COMPRESSORS

When the **Aqu@Scop Advance DCI** is in Heating mode and a demand for DHW production appears, the controller estimates whether it is possible to produce DHW with the compressor. If the DHW temperature is too high, the appliance will remain in Heating mode but the DHW electric heater will be able to operate in accordance with the previous rules. **It is for this reason, as recommended above, that it is very important not to set the DHW setpoints too high in order to avoid starting the electric heater too frequently.**

6.6.3. APPLIANCE FAULT PREVENTING START-UP OF THE COMPRESSOR

If the compressor can not provide DHW production, then the electric heater will automatically take over the role with the same setpoint.

6.6.4. LEGIONNAIRES' DISEASE PROTECTION FUNCTION

This function is not activated as a default setting.

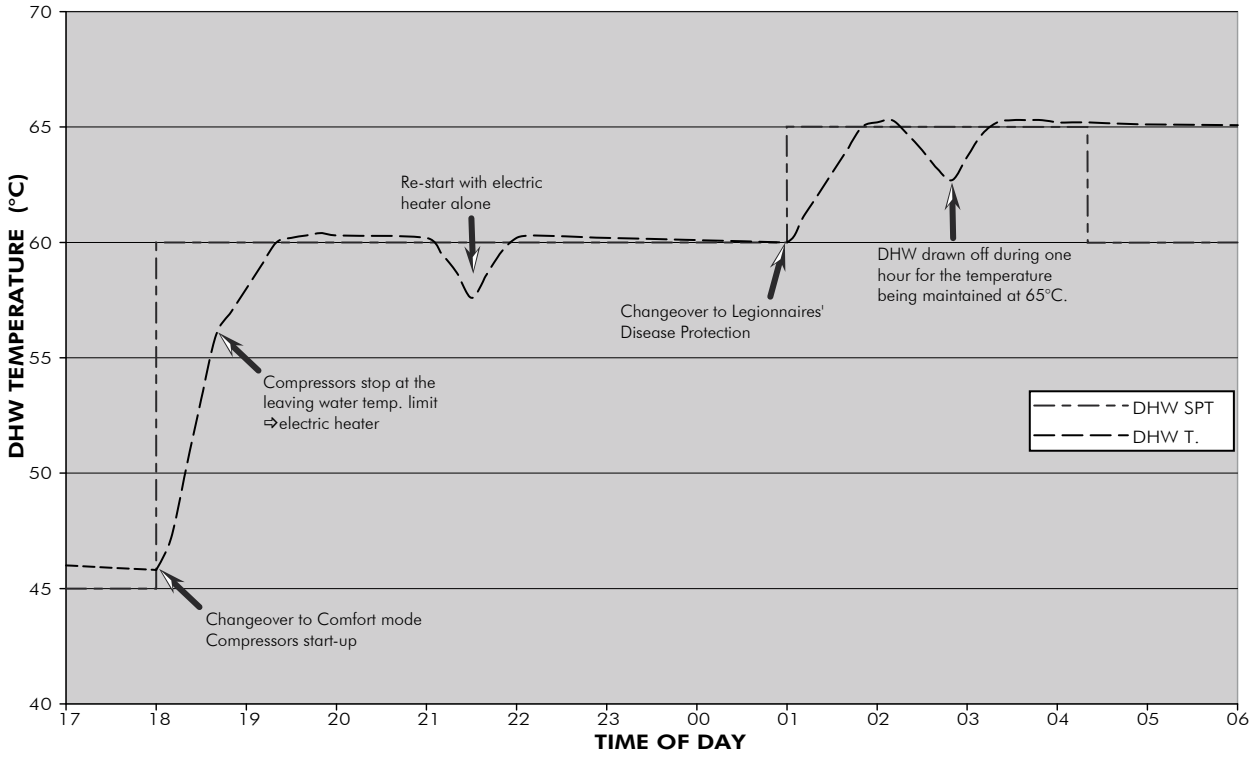
This works by increasing the DHW temperature to a higher value once a week and maintaining it there for a fixed time. This means that the electric heat will be switched on and off during the cycle time to maintain the DHW temperature about a required limit.

The time and day of activation and duration are all adjustable values.

PARAMETER		UNIT	DEFAULT
o08	Anti-legionellosis On/OFF	On/ Off	Off
o09	DHW Setpoint in anti legionellosis mode	°C	60
o10	Day of the anti legionellosis cycle	1= Monday etc.	1
o11	Start time of the anti legionellosis cycle	Hours	01H
o12	Duration of the anti legionellosis cycle	Minutes	30

If it is intended to use this function, an electric heater **must** be fitted as it is the only way to attain the required DHW temperature.

EXAMPLE OF DHW PRODUCTION AND OPERATION OF THE LEGIONNAIRES' DISEASE PROTECTION WITH THE USE OF THE ELECTRIC HEATER



6.6.5. HEATING ⇆ DHW CHANGEOVER

If the compressor is already running in heating mode when there is a DHW request the DHW valve will change over without the compressor switching off.

To switch back to heating mode the compressor can stop depending on conditions but in some cases the valve will switch back without a compressor stop.

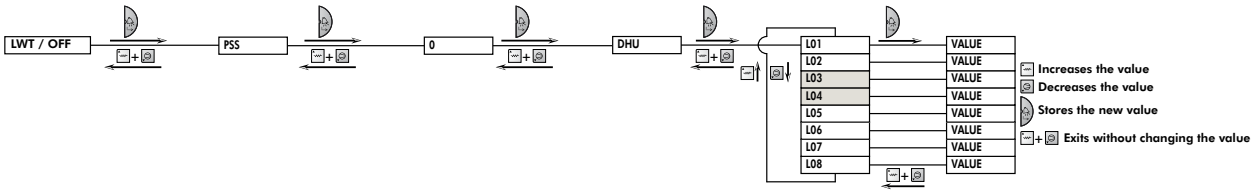
The heat pump will always leave DHW mode after 3 hours.

The DHW electric heater will never be activated for over 2 hours.

These time limits are to prevent the heat pump being frozen in DHW mode in the case of component failure. In the event of DHW mode failure we recommend that the mode is disabled so that the heat pump can be used only for space heating.

6.7. DHW HEAT EXCHANGER MODULE

The **Aqu@Scop Advance DCI** is compatible with the DHW module accessory used to connect an existing water tank without an internal heat exchanger. If it is possible to connect the DHW temperature sensor inside the tank so that it can measure the water temperature even when there is no water flow then there is no need to configure for the DHW module(L03 = OFF), the standard water tank configuration is correct. If the temperature sensor cannot directly measure the water temperature inside the tank the DHW module must be configured (L03 = ON). The DHW module configuration will switch on the DHW pump at regular intervals so that the DHW sensor can take a measurement. Outside the cycle times the sensor cannot measure the water temperature so the DHW heating cannot start. The DHW pump cycling must be used if the DHW sensor is placed on the module heat exchanger or on the interconnecting pipes.



➢ **L03 = OFF**
Use a DHW water tank with internal heat exchanger or the DHW module accessory with the DHW temperature sensor inside the tank.

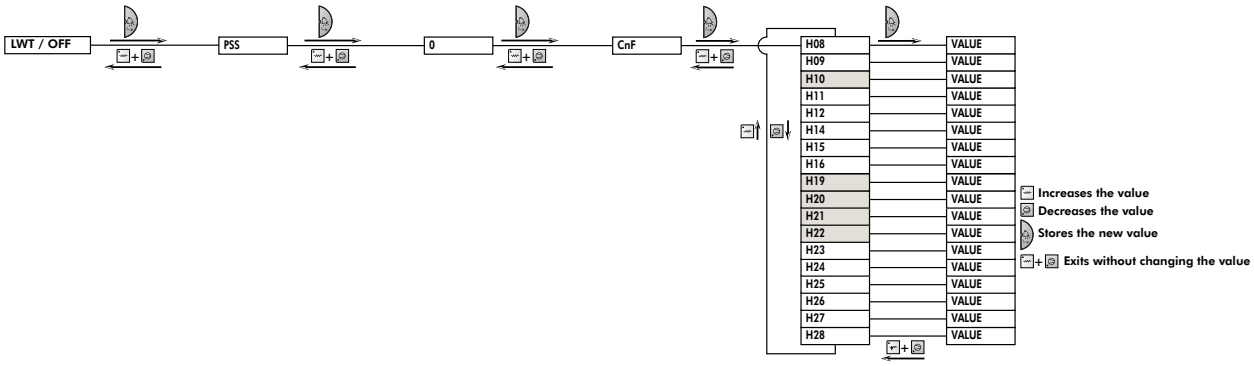
➢ **L03 = ON**
Use the DHW module accessory with the DHW water temperature sensor on the module.

L04 interval between the DHW pump cycles. Set to 120 minutes as a default setting.

At the end of the cycle time the pump will run for 100s. At the end of this time the temperature read by the DHW sensor will be used to decide if a DHW heating cycle is required. If DHW is required and the space heating rules are satisfied then the DHW pump will restart and remain on during the heating cycle by compressor heat or electric heat.

7. ELECTRIC HEATER

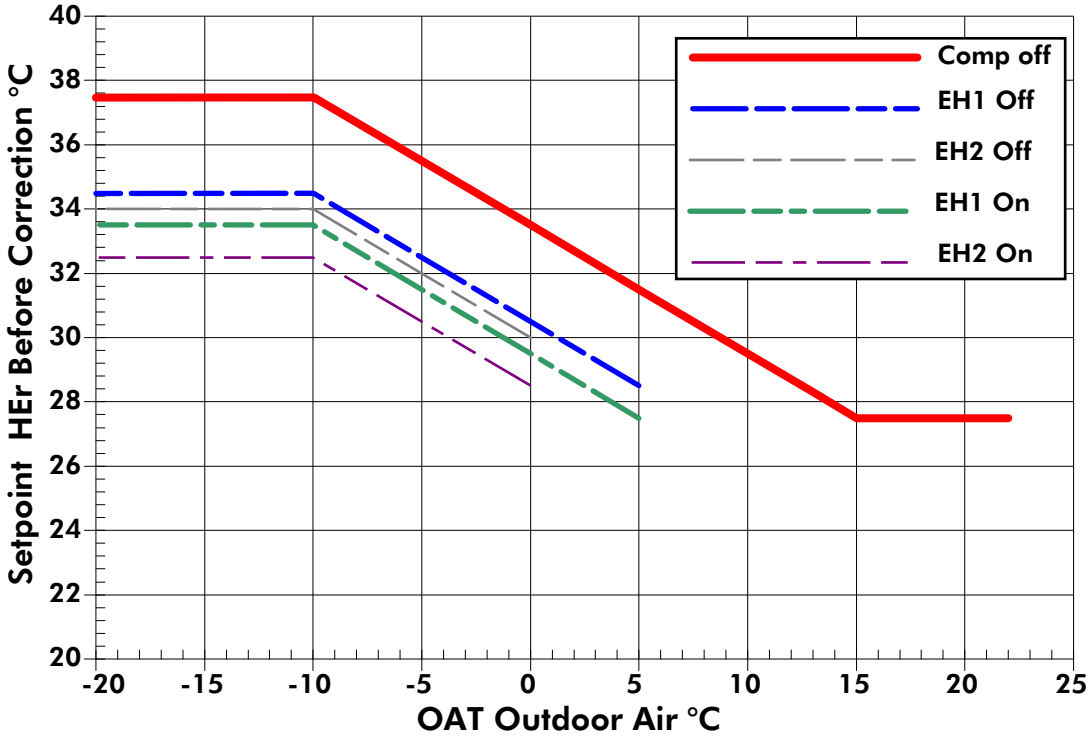
The heat pump is available with factory fitted electric heaters or can be fitted with external electric heaters available as a kit. In both cases the configuration parameter H10=0. It is not possible to have both a boiler relief operation and an electric heater configuration at the same time.



The electric heaters are allowed to start depending on the following factors:

1. Outdoor air temperature.
   The first stage heater is not allowed to start when the outdoor air temperature (OAT) is above H21 (default value = 5°C). The second stage is not allowed to start above H22 (default value = 2°C).
2. Water temperature
   The first stage starts at
   LWT < Heating setpoint HEr – Differential H19 (Default 3.0°C) - H20 (Default 1.0°C) and will stop at LWT > HEr- H19
   The second stage will start at 1.0°C lower than the first stage and stop at 0.5°C lower than the first stage.

Example for default parameters with no correction for underfloor heating.



3. Time
The First stage will only start after the compressor has been on for 10 minutes. The second stage can only start 15 minutes after the first stage.

4. Room temperature
The Electric heaters will switch off when the room temperature reaches setpoint. Note that the compressor switch off temperature is higher.

5. Rate of increase of water temperature
During the first ten minutes of compressor and continuously afterwards the rate of increase of the temperature of the water is calculated. If this rate of increase is low or negative then the electric heaters are allowed to start.

Exceptions to the above rules.

1. If the emergency heat switch is on then only the water temperature rules are used with a higher setpoint.

2. If certain types of alarm prevent the compressor to start the electric heat is allowed to start but will use the indoor room temperature and will only allow a low setpoint. In this case the user should switch to emergency heat mode. This mode is only possible when the room terminal is used.

3. Below the cut-off point given by the parameter H23 the compressor will stop, only the electric heaters will then operate. Default setting = -20°C.

8. BOILER RELIEF

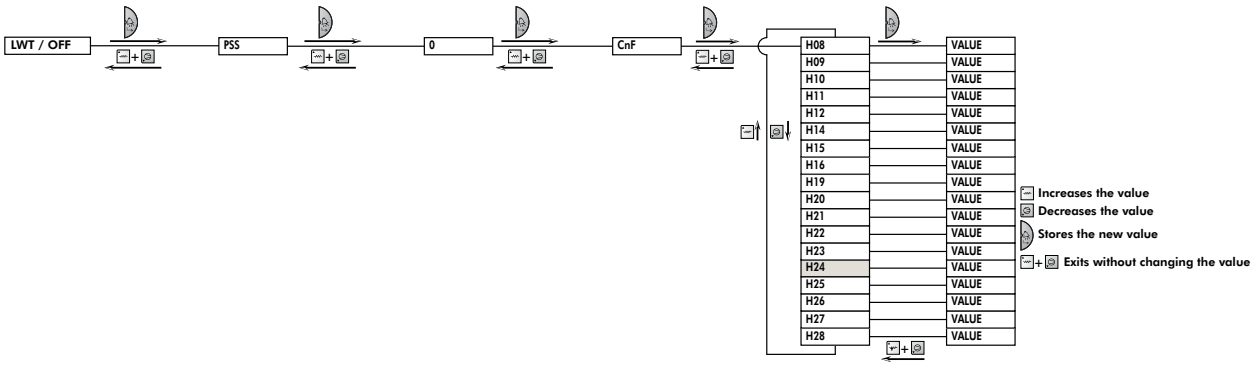
8.1. INPUT/OUTPUT COMPATIBILITY

The boiler and bypass valve can be connected directly to the main control PCB. The boiler output between NO7 and C3 is a dry contact. The contact can take up to 1A 230Vac. The bypass valve can be connected directly to the output NO8. This output is designed for a 230Vac valve continuously on to open the valve.

The parameter H24 can be used to reverse the bypass valve output:

- H24 = 0 the valve output is on when the boiler of off
- H24 = 1 the valve output is on when the boiler is on

The expected valve opening time is 90s.



8.2. OUTDOOR AIR TEMPERATURE

Three types of operation are possible.

1. Above the balance point. Only the heat pump will operate.
2. Below the balance point but above the cut-off point, both the heat pump and boiler can operate.
3. Below the cut-off point. Only the boiler will operate.

H21 = balance point. Default = 5°C

H23 = cut-off point. Default = -5°C

8.3. WATER TEMPERATURE

The boiler on/off uses the same heat curve as the compressor but not the same limiting.

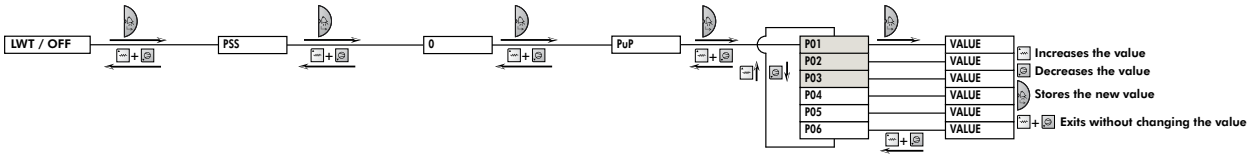
Below the compressor cut-off point the value of HEr is not used for the boiler a higher value may be used depending on conditions.

8.4. OTHERS

Below the balance point and above the cut-off point the boiler will operate according to the same rules as the electric heat described above.

9. WATER PUMP MANAGEMENT

The heat pump can control two pumps. An internal pump is provided with the unit. A second external pump not provided by Airwell can be connected.



9.1. INTERNAL PUMP

The parameter P01 is used to configure the pump

- P01 = 0, the pump will run continuously even in off mode.
  The only exception is the presence of a waterflow alarm.
- P01 = 1, the pump will run continuously except in off mode.
  The pump will stop in the case of a waterflow alarm.
  The pump will start in the case of an antifreeze alarm.
- P01 = 2, the pump will run when there is a heating demand according to room conditions.
  The pump will stop in the case of a waterflow alarm
  The pump will start in the case of an antifreeze alarm.

9.1.1. POST PUMPING

The pump will always stop 2 minutes after the compressor or heat sources switches off.

9.1.2. ANTI SEIZE

The pump will run for a short time periodically to prevent the impeller from seizing

The parameters P02 and P03 control the anti seize cycle.

- P02 is the interval in hours between the starts. If no anti seize cycles are required then this value should be 0.
- P03 is the value in seconds that the pump will remain on for each cycle.

9.2. EXTERNAL PUMP

Two types of installation are possible and configured by the parameter P04.

- P04 = 0 Pump controlled by room air temperature. To be used with a mixing tank.
- P04 = 1 Pump depends on boiler demand. To be used with a boiler when the boiler pump is inside the boiler.

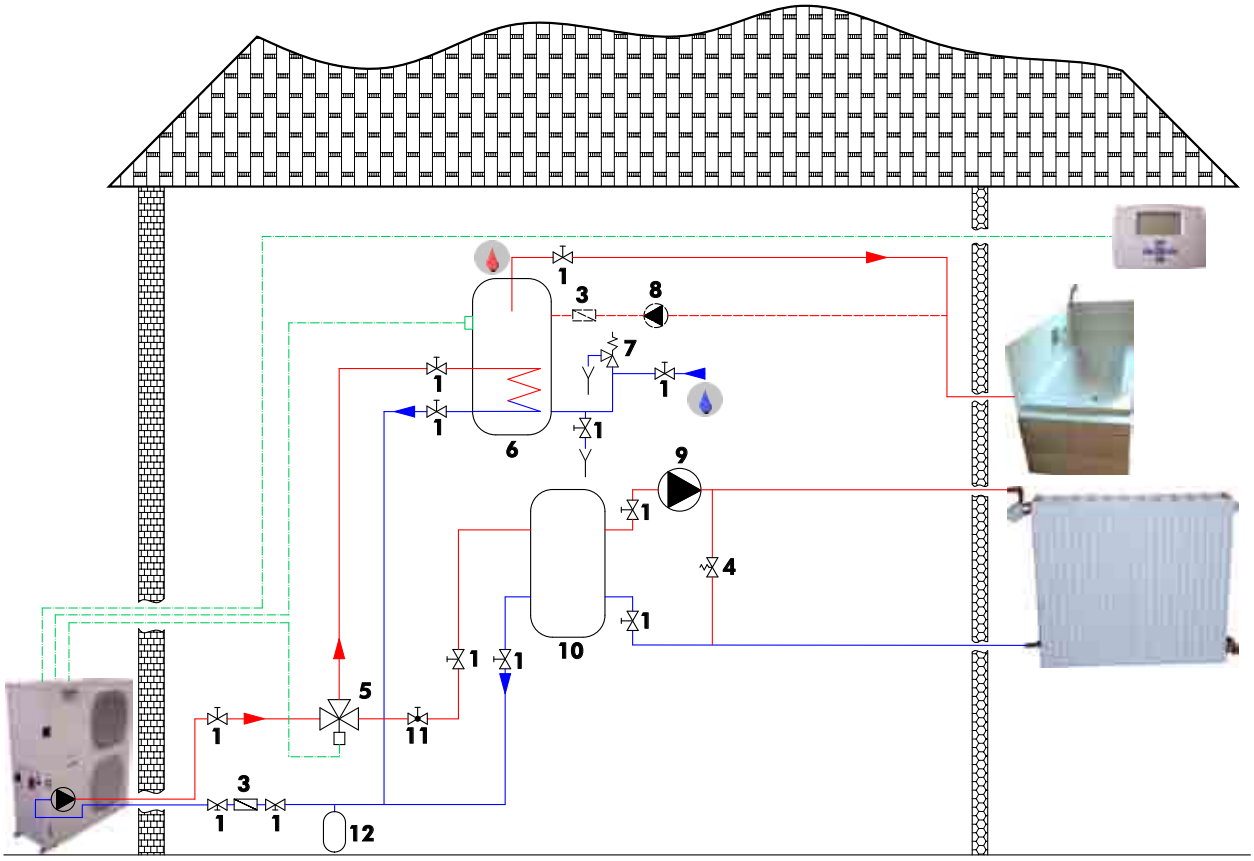
The external pump must not be connected directly to the control board. A power relay must be used. Neither the relay nor the pump are provided by Airwell.

Example of pump controlled by room temperature

The external pump is independent from the compressor on/off. It must run depending on room temperature and mode.

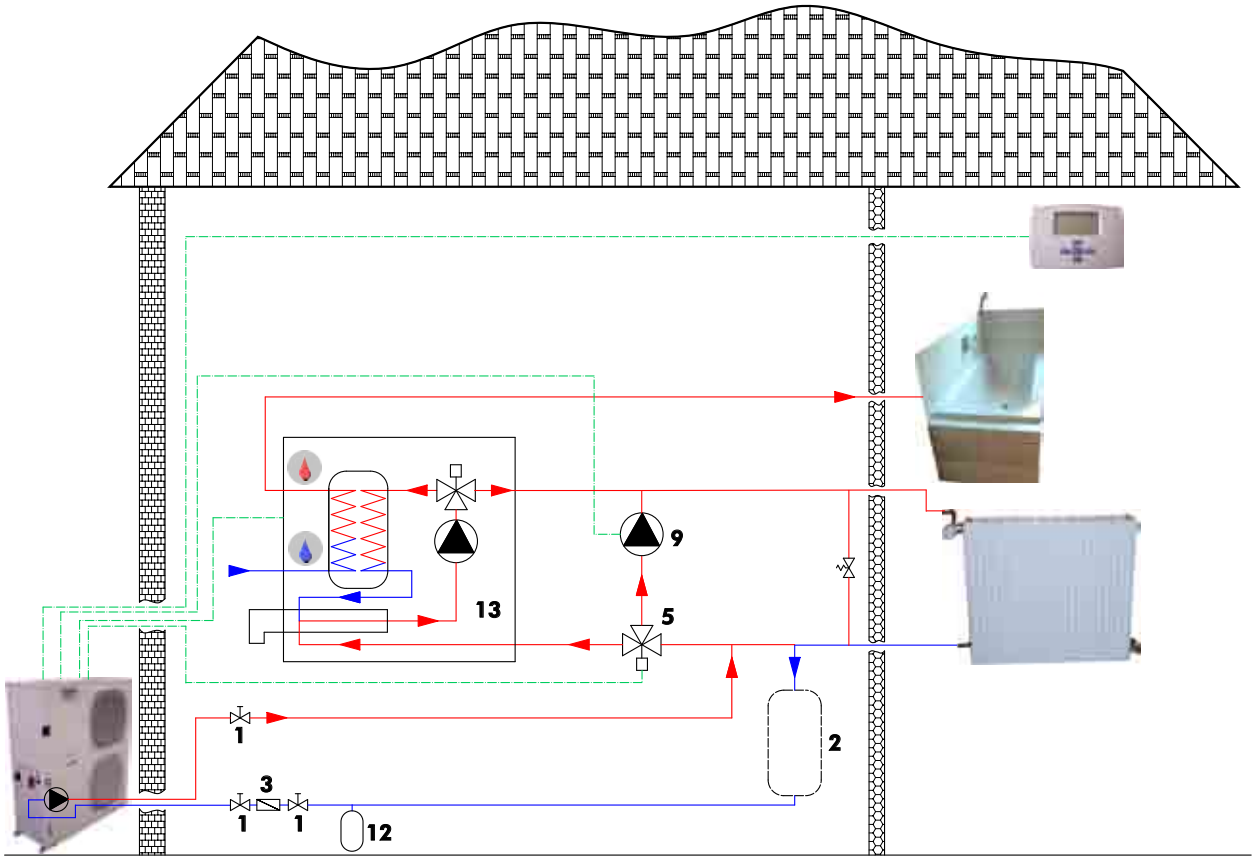
The temperature difference at which the pump starts and stops is given by parameters P05 and P06.

- P05 External pump on. Room temperature – Setpoint. default setting = 0.2°C
- P06 External pump off. Room temperature – Setpoint. default setting = 0.6°C



Example of pump operation depending on boiler demand.

The external pump must be on only when the boiler is bypassed and there is a heating demand. When the boiler is on the bypass is closed and the boiler internal pump is on so the external pump is not required and turned off.



10. ANTI FREEZE PROTECTION

Two different anti freeze limits are used. Both are active with the compressor on and off and are activated by either LWT or EWT sensors.

➢ The first limit is a 6°C the actions are:

- ✔ Start the internal pump
- ✔ Switch off the compressor

➢ The second limit is at 4°C, the actions are:

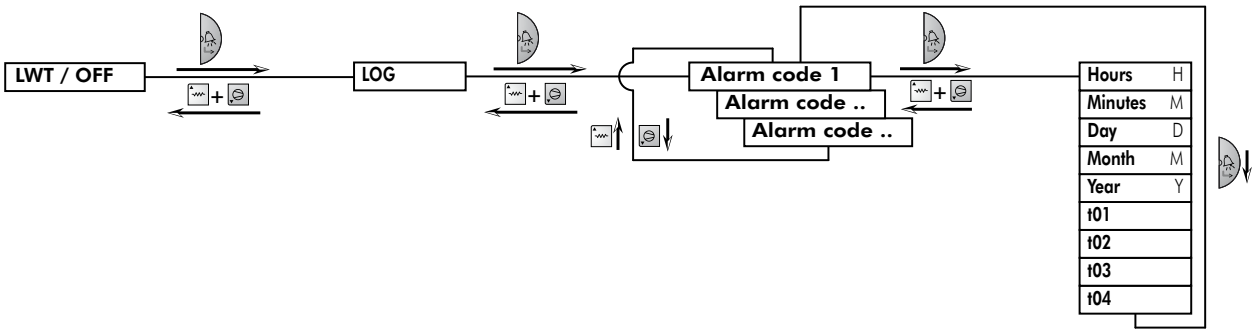
- ✔ If the unit is in off mode then switch on.
- ✔ Allow the internal electric heaters to start if a room terminal is connected.
- ✔ Start the plate heat exchanger heater

If the heat pump is started up in winter in cold conditions the compressor will not be able to start. If the room terminal is connected then the electric heaters or boiler will switch on to heat so the compressor can then start. If no room terminal is connected then use the emergency heat switch next to the display to start the back-up heat.

11. ALARM LOG

The **Aqu@Scop Advance DCI** will store the last 20 alarms in chronological order. Each alarm is memorised with an alarm code, time, date, EWT, LWT, OCT and OAT. If more than 20 alarms occur the oldest alarms are automatically deleted.

After entering the alarm list from "Err" the last alarm is always displayed. It is possible to scroll through the alarm list but the way to identify the last alarm is either to look at the time and date or to exit the alarm menu and enter it again.

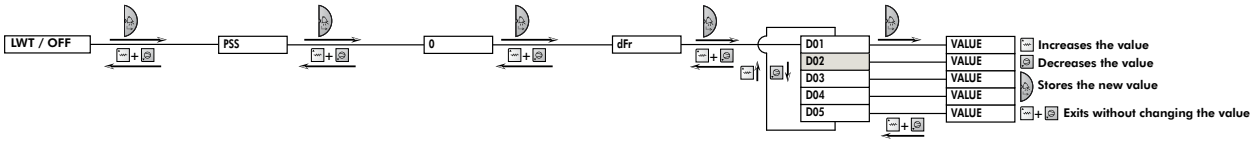


12. DE-ICING

The **Aqu@Scop Advance DCI** automatically detects a need for de-icing in two different ways.

12.1. DE-ICING MANAGEMENT BY TIME

The principle of de-icing management by time is simple. When the coil temperature (sensor located at the bottom of the outdoor exchanger) drops below a certain limit, a timer starts counting down. When this counted down time reaches a set value (Default setting 50 minutes) the controller considers that there is a need for de-icing.

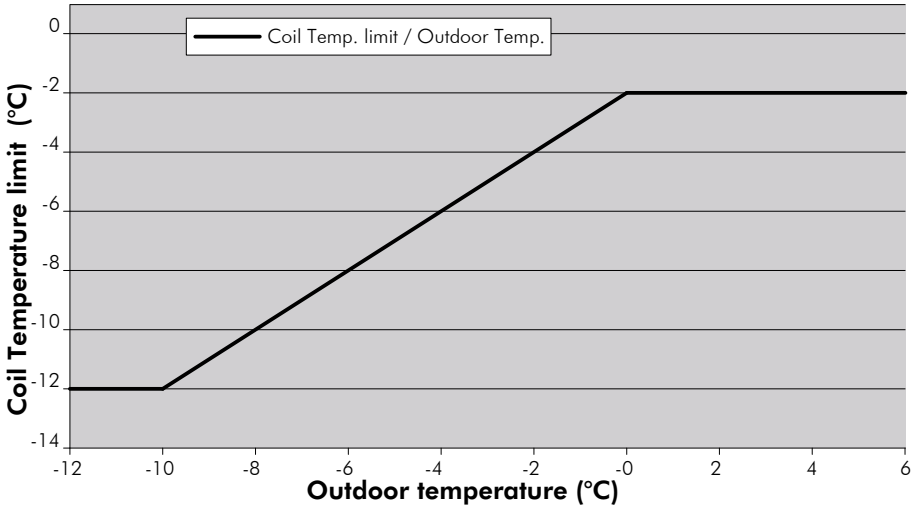


12.1.1. TEMPERATURE FOR THE START OF THE TIME COUNTDOWN

The two parameters used for deice temperature are:

OCT is the instantaneous temperature read by the sensor located at the bottom of the outdoor exchanger (known as the evaporator).

D02 is the coil temperature limit for starting the countdown. When OCT drops below this value, the time countdown starts. The maximum value of this parameter is -2°C, but it changes automatically in relation to the outdoor temperature in the following manner:



12.1.2. TIME COUNTED DOWN BEFORE DE-ICING

When the coil temperature (OCT) has remained below the **D02 value** for a time **D04** (50 minutes), de-icing starts.

The deice time D04 can be modified by the user.

We do not recommend that the time before de-icing is changed without knowledge of the actual operating conditions of the **Aqu@Scop Advance DCI**, and of heat pump systems in general. Increasing this time may lead to major de-icing malfunctions. Reducing it will lead to degraded product performance.

The lapsed (or counted down) time only resets itself to zero in the case of de-icing, if the power to the **Aqu@Scop Advance DCI** is switched off, or under very special conditions with the appliance stopped (Outdoor temperature > 7°C, coil temperature > 5°C and the compressor stopped for at least 30 minutes). If the compressor stops this time is frozen and the countdown resumes when the compressor restarts. If an alarm stops the de-icing, the time is not reset to zero and the **Aqu@Scop Advance DCI** will attempt to proceed with a new de-icing sequence after the alarm has been reset.

Refer to the § **EXAMPLE OF DE-ICING**, page 30

12.1.3. POSSIBILITY OF DE-ICING WHEN THE COMPRESSOR STOP

When the compressor stops, either because the water or the room temperature setpoint has been reached, it is possible for the **Aqu@Scop Advance DCI** to force a de-icing sequence.

When the compressor stops, if:

➢ Time counted down (**D01**) > time limit (**D04**) – 5minutes (therefore default setting = 45 minutes),

it is considered more worthwhile to de-ice straightaway with the hot water in the Heating circuit, rather than launching a de-icing sequence just after compressor restarting.

12.2. ANTICIPATED DE-ICING

Under certain unfavourable outdoor conditions (e.g. freezing fog), it is possible that the **Aqu@Scop Advance DCI** would need to start an anticipated de-icing sequence.

To start an anticipated de-icing sequence the following conditions are required:

➢ Entering water Temperature > 22°C,

➢ Outdoor Temperature < 10°C,

➢ Coil Temperature < -2°C,

➢ Time passed > 20 minutes (***Minimum delay***)
Outdoor Temperature(OAT) – Coil Temperature (OCT) > 17°C

Therefore, the principle is to anticipate the de-icing sequence when the controller detects an abnormal difference between the Outdoor temperature and the Coil temperature, while respecting a compressor operating time of at least 20 minutes.

12.3. DEICE SEQUENCE

Two different sequences are possible, with a compressor stop before and after deice and without a compressor stop.

The Deice with a compressor stop is only available with V2XX software and must be used with the second generation compressor driver available on the **Aqu@Scop Advance DCI** 12 and 16 units. On other units it is possible to activate the compressor stop.

- D06 = ON compressors stops before and after deice
- D06 = OFF compressor does not stop

Sequence without a compressor stop:

1. Changeover valve switches to deice position.
2. Electronic expansion valve opens
3. Compressor increases speed to 80Hz
4. When the OCT>4°C the compressor speed reduces.
5. When OCT > 16°C the fans start.
6. After 10s the changeover valve switches back to heating.
7. The compressor is forced to stay at 60 Hz for 20s before increasing speed back to 80Hz

Sequence with a compressor stop:

1. Compressor switches off
2. Electronic expansion valves opens
3. Changeover valve switches to deice position.
4. Compressor starts and increases speed to 80Hz
5. When the OCT>4°C the compressor speed reduces.
6. When OCT > 16°C the fans start.
7. Compressor stops.
8. After 10s the changeover valve switches back to heating.
9. The compressor starts and remains at 50Hz for 20s before increasing speed back to 80Hz.

The normal condition for an end to the de-icing sequence is the coil temperature above 16°C. However, other "abnormal" conditions may stop the de-icing cycle:

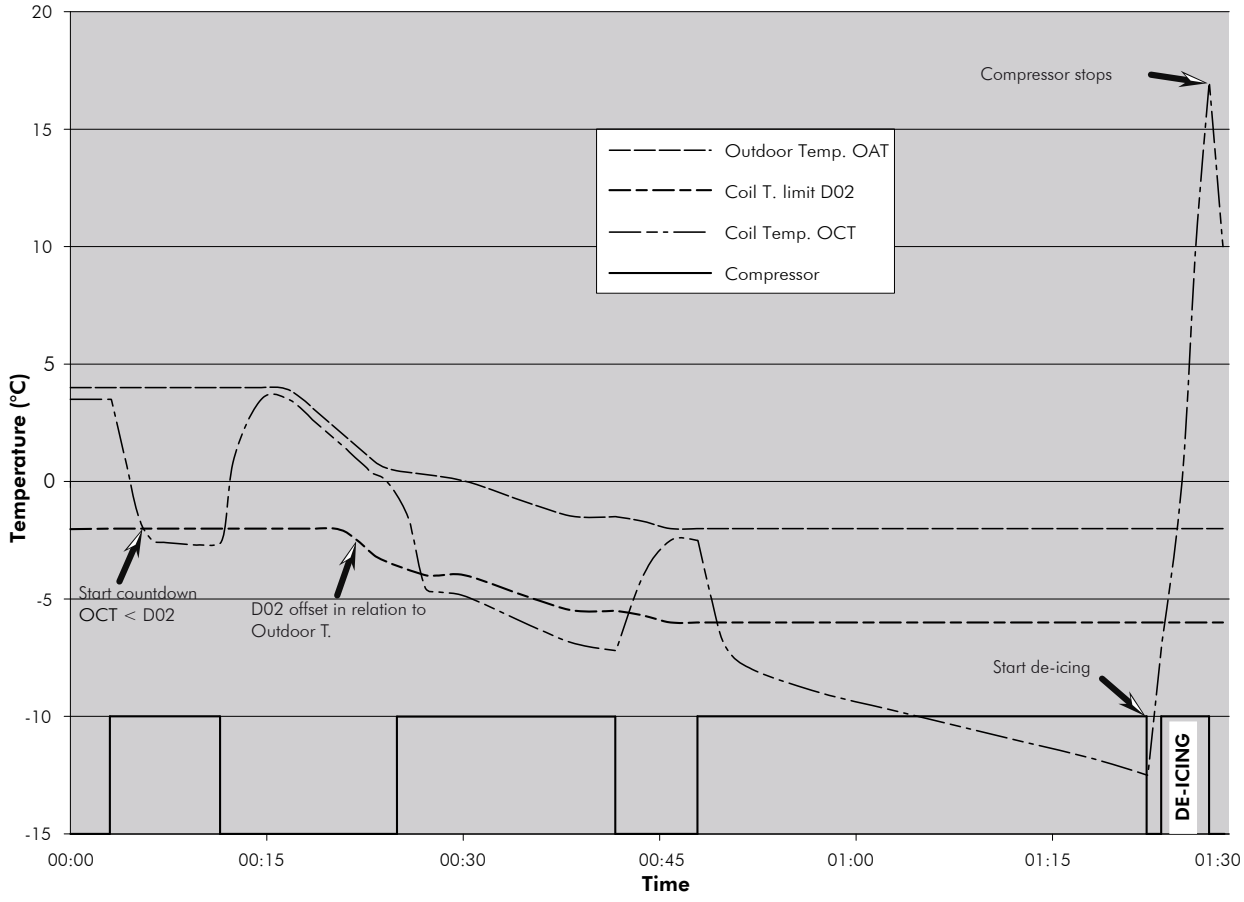
- De-icing time too long, longer than 10 minutes. The alarm AL 22 is for information purposes only and automatically disappears after 2 minutes.
- Leaving water temperature < 10°C, risk of the plate exchanger freezing. Just as the alarm AL 22, the alarm AL 23 will disappear automatically after 2 minutes.

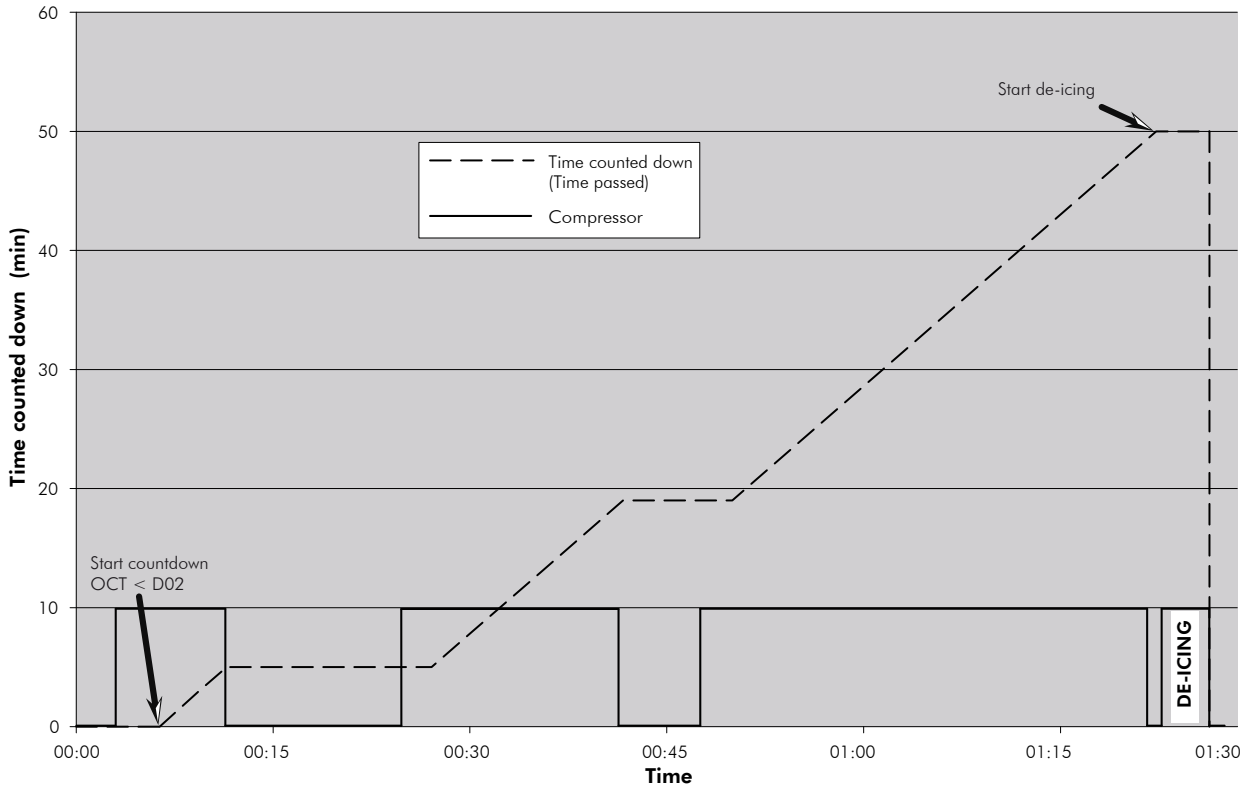
Action should be taken if these two de-icing malfunctions occur repeatedly. Care must be taken to ensure that the Aqu@Scop Advance DCI de-ices correctly (correct water flow, no obstruction of the airflow over the outdoor coil...).

During de-icing, a pressostat manages the restarting of the upper fan in order to control the condensing pressure. When the latter is too high (around 33 bars), the fan starts until the pressure is lowered sufficiently. The fan then stops.

Apart from the coil temperature condition, excessively long de-icing or too cold leaving water, the alarms such as water flow interruption can also stop the de-icing sequence. However, if the **Aqu@Scop Advance DCI** is already in a de-icing sequence, switching the system off via MAIN OFF will not stop it and the de-icing will continue right until the end of the cycle.

12.4. EXAMPLE OF DE-ICING





13. INPUTS / OUTPUTS

13.1. TEMPERATURE SENSORS

Three different types of sensors are used.

Important: the different sensors use different temperature / resistance characteristics and are not interchangeable.

DISPLAY	DESCRIPTION	INPUT	TYPE	RANGE
T01	EWT Entering Water Temperature	B1	Carel NTC	-50°C to 95°C
T02	LWT Leaving Water Temperature	B2	Carel NTC	-50°C to 95°C
T03	OCT Outdoor Coil Temperature	B3	Airwell NTC	-50°C to 95°C
T04	OAT Outdoor Air Temperature	B4	Airwell NTC	-50°C to 95°C
T05	CDT Compressor Discharge Temp	B5	Carel HT NTC	0 to 150°C
T06	CST Compressor Suction Temperature	B6	Airwell NTC	-50°C to 95°C
T08	DHWT Domestic Hot Water Temp	B8	Carel NTC	-50°C to 95°C

The temperature and pressure sensors can be checked by using the display in the tP menu to see the value. All values are instantaneous except the OAT sensor.

13.1.1. OAT SENSOR

The OAT value is read when the fan is on and is averaged over a few minutes. When the fan turns off the last value is used for 30 minutes before the instantaneous value is used. The fan will run for 3 minutes every 30 minutes when there is a heating demand so that the outdoor temperature is not influenced by heat sources. If a remote sensor is used the value read becomes the instantaneous value when the parameter H11 =On and the fan cycling is cancelled.

13.2. PRESSURE TRANSDUCER

The low pressure transducer is connected to the input B7.

- Type: 0-4.5V ratiometric.
- Range: 0 to15 bar
- Voltage input: 5Vdc

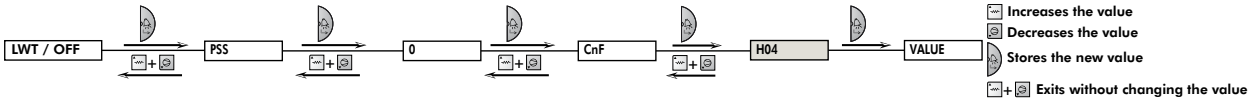
When the compressor is off and outdoor temperature is high the refrigerant pressure could exceed 15bar. Therefore in some conditions the transducer alarm is bypassed to avoid unnecessary alarms.

13.3. CONFIGURATION INPUTS

The inputs B11 and B12 are used to configure the type of units.

These inputs must correspond to the model. The configuration can be checked using PAr ->CnF -> H04.

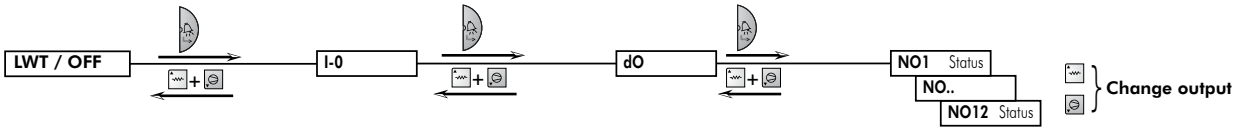
An incorrect configuration could lead to irreversible compressor damage or the compressor not starting.



13.4. RELAY OUTPUTS

All relays have a 1A maximum loading at 250Vac. The outputs are 230V except for the N07 output for the boiler.

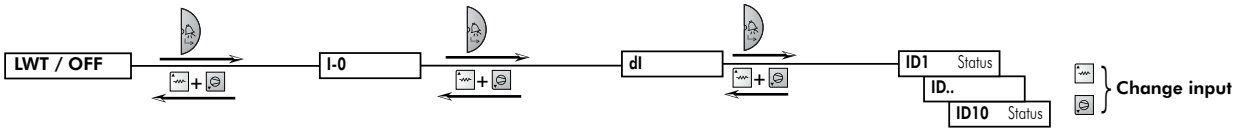
The output status can be seen in the menu I-O -> dO. The status is 1 when the relay contact is closed and 0 when the relay contact is open.



13.5. DIGITAL INPUTS

The inputs use a low voltage signal difficult to measure with a voltmeter. We recommend using the display to check the input status.

Menu I-O -> dI . The status is 1 when the contact connected to the input is closed and 0 when it is open.



For example when the fan internal overload switch is closed the display will show "6-1" to show the status; as the alarm contact is normally closed this is normal and shows that the fan motor is not overheating.

13.6. ANALOGUE OUPUT

The Y3 output is used to control the fan speed. The Y1 is a PWM type so it is not possible to measure the value with a voltmeter.

The fan speed status is available on the display in the "I-O" menu. The value given is a percentage of the maximum possible speed for any given model.

13.7. KWH METER

The compressor driver measures the current used. This information is used to estimate the power consumption. An estimation of fan and pump current is added to the compressor current. The output is given in kWh kilowatt hours. Note that this value must be considered as estimation only; the true value will vary depending on voltage and auxiliary power use.

The voltage is set at 225V by default, this parameter can be changed at H26.

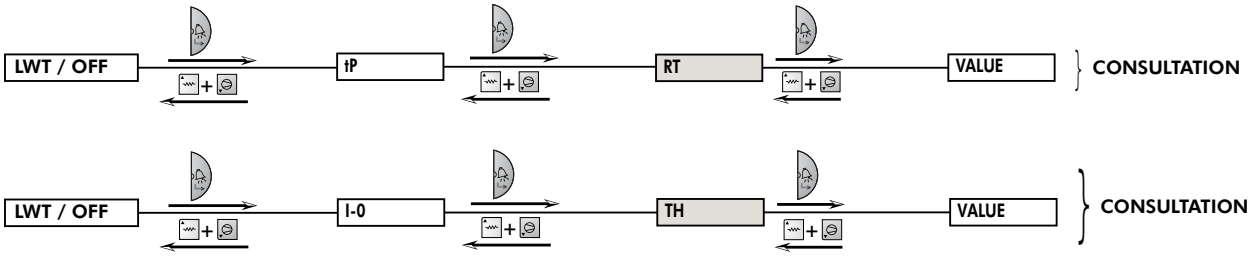
14. ROOM TERMINAL

Either the wired or the RF versions can be used. There is no difference in configuration for the heat pump.

The communication between the main controller and the room terminal or the transmitter is in RS485 Modbus.

The room temperature value measured by the room terminal can be seen at tP -> RT. The instantaneous setpoint can be seen at I-O -> tH.

The alarm E16 (no communication with room terminal) does not prevent the heat pump from working.



14.1. ANTICIPATION

The heatpump automatically starts early to anticipate mode change when changing from night mode ( ) to Comfort mode ( ) when automatic scheduling is being used. The algorithm presumes that the room temperature can increase 4°C per hour then calculates the difference between room temperature and the comfort setpoint and starts early in comfort mode. For example if there is a 2°C difference between room temperature and comfort setpoint the comfort mode will start 30 minutes before the programmed time.

15. VARIABLE SPEED COMPRESSOR

15.1. COMPONENT FOR THE VARIABLE SPEED DRIVE

15.1.1. FILTER

The filter in the compressor driver box (LF on the wiring diagram) situated under the top panel is used to remove the noise on the power line generated by the power conversion circuit.

15.1.2. DRIVER

The driver PCB is in the driver box (CD on the wiring diagram). The driver converts the 230VAC to DC then powers the three coils on the compressor through high speed semiconductor switching devices. The driver is able to detect the actual compressor rotation as well as the voltage and current. The driver can detect certain types of malfunction and will stop the compressor.

Faults detected by the driver

Over voltage	detected on the AC or DC lines
Under voltage	detected on the AC or DC lines
Over current	the compressor current use exceeds the maximum current
Overheating	Internal components temperature too high.
Synchronisation	The compressor does not rotate at the expected speed or has not started.
Component	Power component failure

Some of the above alarms are triggered then reset rapidly by the driver. In some cases the alarm is not memorised by the main controller but an unusual compressor stop is detected. In this case an alarm E53 is shown. This allows the compressor to restart using the correct starting sequence. If the alarm E53 is repeated a lockout occurs requiring manual reset.

An occasional alarm is not considered as important but a lockout alarm requires further investigation into its root cause.

Repeated alarms detected by the driver and resulting in a driver lockout need to be reset by switching off the power.

15.1.3. COMPRESSOR

The compressor is a special inverter version with a dc motor.

15.1.4. MAIN CONTROLLER

The main controller communicates via a front mounted communication card with the driver.

The compressor speed is set by the main controller. In the event of a communication failure between the main controller and the driver the compressor will stop.

15.2. COMPRESSOR STARTING SEQUENCE

Every time the compressor starts except for a deice cycle the following sequence is followed:

1. Outdoor fans will turn on for 3 minutes or must have been on during the last 30minutes. This is to be sure that the outdoor air temperature value used is precise.
2. The Electronic expansion valve (EEV) opens.
3. The compressor will start and accelerates to 50Hz.
4. The EEV will open to a pre-defined position and adjusts its position automatically after 15s.
5. The compressor remains at 50Hz for 3 minutes. After this time the compressor speed will change automatically according to the water temperature and water setpoint.

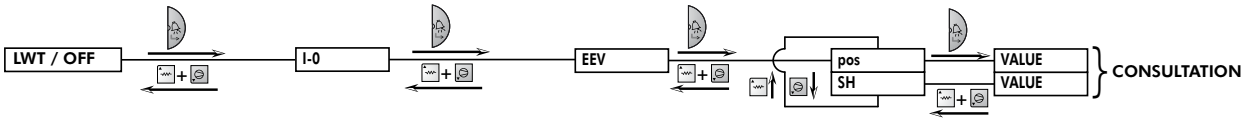
16. ELECTRONIC EXPANSION VALVE

The electronic expansion valve is controlled by a stepper motor connected directly to the main control PCB. The EEV changes position depending on compressor superheat measured by the LP pressure transducer and the CST compressor suction temperature.

The EEV position and superheat value can be seen in the I-O menu.

The minimum EEV position is 0 and maximum is 480.

When the outdoor air temperature is high the EEV can be almost fully open. This is normal operation and is due to a lack of subcooling.



17. ALARM OPERATION MODE

When some alarms occur the **Aqu@Scop Advance DCI** will be able to operate in a reduced mode to provide some heating until repair is possible. In some cases this reduced mode will reduce the heating capacity and increase the use of back up heating and therefore increase power consumption.

17.1. EWT ALARM

The value of EWT is replaced by LWT -5.

17.2. OAT OR CDT ALARM

The compressor maximum speed is reduced to 65Hz

17.3. OCT ALARM

The compressor will still operate only if the OAT > 5°C and LP > 5 bars.

17.3.1. EMERGENCY HEAT SWITCH

The emergency heat switch is placed next to the display behind the transparent window.

The switch is used to manually change the priority heating from the compressor to the additional heat.

When in emergency heat mode the room temperature is likely to be less stable and electricity consumption is likely to increase.

18. TEST MODE

A test mode is available to keep the heat pump in a constant speed.

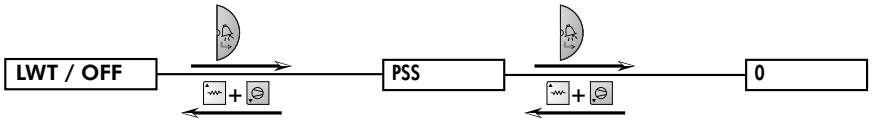
18.1. TEST MODE ACTIONS

- Compressor will run at a constant speed after the starting sequence has been completed and as long as there is no speed limiting protection active.
- Supplementary heat like electric heater or boilers remain off.
- Water setpoint is set to 55°C but will be limited by outdoor conditions.
- DHW is disabled
- The electric heater LED flashes

18.2. TO START TEST MODE

Enter the code 942 into PSS, press Sel

Then enter the code 27 press Sel. The top green LED must flash to confirm test mode.



18.3. TO EXIT TEST MODE

- Switch unit off using Set -> O-F -> Off
- or Turn off the power
- or Unit will leave test mode after 10 minutes (V1 software) or 30 minutes (V2 software)

19. PARAMETERS

Installer password is 177

The After Sales Service parameters are in the menu S02 to S18. These parameters can only be modified by Airwell personnel.

PARAMETRE			UNIT	MIN	MAX	DEFAULT	TYPE
SEt	HEA	Initial setpoint for the heating law	°C	20 °C underfloor or 30 °C radiator	40°C underfloor or 50°C radiator	27.5/38	modifiable
	HEr	Water setpoint after correction	°C				read only
	O-F	ON OFF	On/ OFF	On	Off	OFF	modifiable
	EC	ECS comfort setpoint	°C	10	60	48	modifiable
tP	t01	Water inlet temperature B1	°C	-50°C	90 °C		read only
	t02	Water outlet temperature B2	°C	-50°C	90 °C		read only
	t03	Outside coil temperature B3	°C	-50°C	90 °C		read only
	t04	Outside air temperature B4	°C	-50°C	90 °C		read only
	t05	Discharge temperature B5	°C	0	120 °C		read only
	t06	Sunction temperature B6	°C	-50°C	90 °C		read only
	RT	Ambience temperature	°C	0°C	40°C		read only
	P07	Sunction pressure B7	bar	0	15		read only
	t08	Hot water temperature B8	°C	-50°C	90°c		read only
I-0 /dO	1 -	Status of output NO1		0 = output open	1 = output energised		read only
	2 -	Status of output NO2		0 = output open	1 = output energised		read only
	3			0 = output open	1 = output energised		read only
	et....12	.....Status of output NO12		0 = output open	1 = output energised		read only
I-0 / DI	1 -	Status of input ID1	0 or 1	0 = output not energised	1 = output energised		read only
	etc....10	..... Status of input ID10	0 or 1	0 = output not energised	1 = output energised		read only
I-0 / EEV	pos	Position of expansion valve	pitch	0	480		read only
	SH	Superheating	K	0	40		read only
I-0 / DCI	SPd	Compressor speed	Hz	0	80		read only
	CUr	Current	A	0	30		read only
I-0	FAN	Fan speed	%	0	100		read only
	TH	Thermostat setpoint	°C	0	30		read only
	dFr	Time until next defrost	minutes	0	60		read only
	ELE	Estimated consumption in kWh.	kWh	0	999999		read only
I-O / ECS	Sta	Hot water status		"Off" = DHW stopped "On" = DHW operating "LEg" = anti-legionellosis operating			read only
	Val	Current value of hot water setpoint	°C	10	65		read only
Err		Alarms	code				read only
LOG		Alarm LOG	code				read only
PAr / CnF	H01	Software version					read only
	H03	Type of water CURVE		0 = radiator 1 = underfloor 2 = no heat curve			read only
	H04	Type of DCI		Model 6, 12 or 16			read only
	H05	SPH or DCI		Compressor configuration 0 = fixed 1 = variable			read only

PARAMETRE			UNIT	MIN	MAX	DEFAULT	TYPE
PAr / ECS	o01	Permanent comf. mode		On = permanent comfort mode Off = dry contact or programmed mode		On	modifiable
	o02	comfort period setpoint	°C	10	60	48	modifiable
	o03	eco period setpoint	°C	10	55	45	modifiable
	o04	Start time for comfort period 1	Hr	0	23	23:00	modifiable
	o05	Stop time 1	Hr	0	23	03:00	modifiable
	o06	Start time for comfort period 2	Hr	0	23	0	modifiable
	o07	Stop time 2	Hr	0	23	0	modifiable
	o08	Anti-legionellosis function On/OFF		On	Off	Off	modifiable
	o09	Water setpoint in anti-legionellosis mode	°C	0	70	60	modifiable
	o10	day of anti-legionellosis cycle	day	1 (Monday)	7	1	modifiable
	o11	Start time of anti-legionellosis cycle	Hr	0	23	01:00	modifiable
	o12	Duration of anti-legionellosis cycle	min	0	90	30	modifiable
	o13	manual rapid charge		On = hot water tank heated by compressor and resistance Off = normal			modifiable
PSS / CnF	H08	Activation of Hot Water		On = DHW activated Off = no DHW		OFF	modifiable
	H09	Selection of heat curve		0 = radiator 1 = underfloor 2 = fixed (no heat curve))		1	modifiable
	H10	Selection of unit		0 = Electric heater 1 = Boiler back-up 2 = no additional heating			modifiable
	H11	Activation of outside air temperature sensor		OFF = use inside sensor ON = use a wall-mounted air temperature sensor		OFF	modifiable
	H12	Activation of ambience remote control		ON = room terminal activated (recommended) OFF = no room terminal		ON	modifiable
	H14	Heat curve Outside air temperature setpoint	°C	0	25	15°C	modifiable
	H15	Heat curve Outside air delta temperature setpoint	°C	0	40	15 °C underfloor 25 °C radiator	modifiable
	H16	Heat curve Max compensation of water temperature	°C	0	20	10° underfloor 12° radiator	modifiable
	H19	Electric heater differential	°C	0	6	3	modifiable
	H20	Electric heater hysteresis	°C	0	3	1	modifiable
	H21	Outside air temperature for shut-down of EH1 or boiler	°C			5	modifiable
	H22	Outside air temperature for shut-down of EH2	°C			2	modifiable
	H23	Outside air temperature for shut-down of compressor	°C	-20	20	-5°C (back-up) 20°C (resistance)	modifiable
	H24	Reversal of boiler bypass outlet direction		0 = The bypass valve is energised when the boiler is off. 1 = The bypass valve is energised when the boiler is on		0	modifiable
	H25	Reversal of "EJP" tariff intake logic		dir = Input closed = "EJP" tariff mode ON inv = Input open = "EJP" tariff mode ON		0	modifiable

PARAMETRE			UNIT	MIN	MAX	DEFAULT	TYPE
PSS / CnF	H26	Supply voltage used for kWh estimation	V	200	250	225	modifiable
	H27	ΔT for compressor restart	°C			0.2°C	modifiable
	H28	ΔT for compressor shut-down	°C			0.6°C	modifiable
	H29	Input 9 selection On / Off or Electric heat load shedding		OF = On / Off LS = Electric heat load shedding		OF	modifiable
	H30	Reverse Input 9 (On/Off or load shedding)		dir = Input closed = On inv = Input open = On		inv	modifiable
	H31	Maximum possible water temperature for floor heating	°C	30	55	45	modifiable
PSS / PuP	P01	Type of water pump operation		0 = Continuous operation even when in off mode. 1 = Continuous operation except when in off mode. 2 = Operation on demand from compressor		2	modifiable
	P02	Interval between anti-seize cycles	hours	0	99	24	modifiable
	P03	Length of anti-seize cycle	s	0	999	60	modifiable
	P04	Configuration of water pump WP2		0 = Used with a mixing tank. On / Off as a function of ΔT below. 1 = Operation as boiler back-up. On with bypass valve.		0	modifiable
	P05	Restart water pump WP2	°C	-2.0	2.0	0.2	modifiable
	P06	Shut-down of water pump WP2	°C	-2.0	2.0	0.6	modifiable
PSS / dFr	D01	Time remaining until defrost	min				read only
	D02	Corrected temperature at start of defrost timer	°C				read only
	D03	Temperature at start of de-ice timer before correction	°C			-2	read only
	D04	Interval between de-icing cycles	min	40	60	50	modifiable
	D05	End of de-ice	°C			16	read only
PSS / RTC	HR	Time used	Hr / min				read only
	Dat	Date used	dd / mm / yy				read only
	Chd	Update the date					modifiable
	ChH	Update the time					modifiable
PSS / DHU	L01	Selection of switch-over mode between comfort and eco		Prg = Uses hour programming In = Uses day / night INPUT		Prg	modifiable
	L02	DHW cycle start time if ΔT< 2	min	0	240	60	modifiable
	L03	Type of DHW kit		0 = DHW tank	1 = DHW module with pump	0	modifiable
	L04	DHW module pump cycle time interval	min	10	300	120	modifiable
	L05	Use the internal elec heat for DHW additional heat		ON = Internal elec heat OFF = DHWEH used		OFF	modifiable
	L06	Compressor can be used for DHW for boiler relief and low OAT		ON = Compressor used OFF = compresseur not used		OFF	modifiable
	L07	Comp and DHWEH used for boiler back-up config only		ON = DHW by comp and DHWEH OFF = DHW by comp and boiler		OFF	modifiable
	L08	Reverse input 10 (Day / Night)		dir = Input closed = night mode inv = Input open = night mode		dir	modifiable

PARAMETRE			UNIT	MIN	MAX	DEFAULT	TYPE
PSS / mot de passe service	S02	Configuration for Inverter or fixed speed unit		dcI = DCI inverter unit	fix = fixed speed compressor		
	S03	min compressor on time	seconds	0	600	30	
	S04	min compressor off time	seconds	30	600	180	
	S05	Compressor start to start minimum timer	seconds	180	900	300	
	S06	Deice start temperature before compensation = D03	°C	-20	10	-2	
	S07	deice end temperature = D05	°C	0	30	16	
	S08	maximum water setpoint before compensation depending on OAT	°C	0	60	55	
	S09	max water set at low OAT	°C	0	60	45	
	S10	coefficient used to change water setpoint depending on HSPT		-9.9	9.9	3.0 (rad) 2.0 (floor)	
	S11	deice interval used in test mode for OAT =2	min	0	180	50	
	S12	coefficient of correction to the water setpoint depending on PI		0	2	1	
	S13	EWT high alarm limit	°C	0	99	80	
	S14	Sensor type OCT OAT		CAr= Carel type of sensor Air = Airwell type of sensor		Air	
	S15	Sensor type CST		CAr= Carel type of sensor Air = Airwell type of sensor		Air	
	S16	Sensor type DHWT		CAr= Carel type of sensor Air = Airwell type of sensor		CAr	
	S17	Sensor type DZWT		CAr= Carel type of sensor Air = Airwell type of sensor		Air	
	S18	Sensor type EWT LWT		CAr= Carel type of sensor Air = Airwell type of sensor		CAr	
OHr	CH	Compressor operating hours	hours	0	999999		read only
	CS	Nbr of compressor starts.		0	999999		read only
	PH	Pump operating hours	hours	0	999999		read only
	PS	Nbr of pump starts.		0	999999		read only

Ref.	Alarm description	Aqu@Scop Advance DCI action	Alarm cancellation	Time delay	Possible cause(s)	Recommended action(s)
E0	Communication error between display and board	Normal operation	Automatic		Interconnection Board not started up	Normal for the first 30 seconds after power-up.
E01	EnterilNG water sensor EWT disconnected or damaged	Reduced capacity operation	Automatic	10 s	Disconnected or faulty sensor	Check the wiring of sensor, replace if defective
E02	Leaving water sensor LWT disconnected or damaged	Complete shutdown	Automatic	10 s		
E03	Outdoor temperature sensor OAT disconnected or damaged	Reduced capacity operation	Automatic	10 s		
E04	Domestic hot water sensor disconnected or damaged	Shut-down of ECS function		10 s		
E05	Outdoor coil sensor OCT disconnected or damaged	Reduced capacity or stop if coil con freeze	Automatic	10 s		
E06	Lack of water flow, risk of freezing	Complete shutdown	Automatic once then manual	26s after start of circulation pump	Seized water pump	Check water pump operation
					Water flow too low or air in the system	Check the PAC's temperature difference in operation. Increase the flow (change the water pump speed)
E08	Fan fault		Auto twice then manual	2 s	Internal temperature protection cut-out in one of the fans	Reset the alarm after allowing the motors to cool. Check which fan is overheating. Replace the defective fan.
E11	High Pressure safety tripped	Complete shutdown	Automatic once then manual	None	Refer to the fault diagnosis guide in the Installation and Maintenance Manual	Refer to the fault diagnosis guide in the Installation and Maintenance Manual
					Water flow too low or air in the system	Re-establish nominal water flow or bleed the system
E12	Low Pressure safety trips	Complete shutdown	Auto twice then manual	5 s	Refer to the fault diagnosis guide in the Installation and Maintenance Manual	Refer to the fault diagnosis guide in the Installation and Maintenance Manual
					Coil blocked	Clean the finned coil
					ncomplete de-icing (lack of refrigerant charge)	Check the amount of refrigerant charge
					Fan fault	Check the fans

Ref.	Alarm description	Aqu@Scop Advance DCI action	Alarm cancellation	Time delay	Possible cause(s)	Recommended action(s)
E16	PAC/Terminal communication failure	Switchover to forced Heating mode	Manual	Variable depending on the cause of the problem (clean trip or trip due to electrical interference)	Ambiance terminal is not connected	Deactivate it via the **Aqu@Scop Advance DCI** keypad
					One of the communication cables is disconnected	Check the connections on the **Aqu@Scop Advance DCI** and the terminal as well as the polarities (A and B)
					Too much interference on the communication bus	Use shielded cable as recommended
E22	De-icing ended abnormally by maximum time limit.	De-icing stopped	Auto. Alarm displayed for 2 minutes for information purposes	None	De-icing has lasted over 10 minutes. This is abnormal as de-icing usually takes between 3 and 4 minutes	Monitor the appliance to see if this fault is a one-off occurrence, If not, check all possible causes of poor de-icing (lack of refrigerant charge)
E23	De-icing ended abnormally by low outlet water temperature	De-icing stopped	Auto. Alarm displayed for 2 minutes for information purposes	None	Outlet water temperature during de-icing has fallen below 10° C	Check that there is sufficient water volume in the system, as recommended in the Installation and Maintenance Manual
E24	Compressor discharge temperature thermostat	Complete shutdown	Manual	None	Tripped out by the compressor discharge temperature thermostat	Monitor the appliance to see if this fault is a one-off occurrence, if not check the charge or for compressor superheating (perhaps too high)
E25	Compressor overheat thermostat FM1				Shut-down by compressor discharge temperature sensor	Monitor the appliance to see if this fault is a one-off occurrence, if not check the charge or for compressor superheating (perhaps too high)
E32	Inlet /outlet water sensors inverted	Complete shutdown	Manual (**Aqu@Scop Advance DCI** OFF via keypad)	90 s	Automatic detection by management system if the water temperature sensors are inverted	Invert the sensors at the level of the controller. Check the sensor values during operation of compressor
E33	EWT/LWT temperature difference too high	Information only	Automatic		Low water flow.	Check water flow

Ref.	Alarm description	Aqu@Scop Advance DCI action	Alarm cancellation	Time delay	Possible cause(s)	Recommended action(s)
E36	--Information-- Boiler/ Electric heat. backup activated	Information	Stop backup mode	None	Emergency heat switch is ON (see § **Aqu@Scop Advance DCI** EMERGENCY OPERATIONS SWITCH)	
E37	Frost protection Water temperature below limit	Compressor stop Heaters ON	Automatic		Reversing valve stuck Unit in Off mode	Check reversing valve Heat water using auxilary heat
E50	Compressor discharge temperature sensor CDT disconnected or damaged	Reduced capacity operation	Automatic	10 s	Disconnected or faulty sensor	Check the wiring of the sensor, replace the sensor if it is faulty.
E51	Compressor suction temperature sensor CST disconnected or damaged	Complete shutdown	Automatic	10 s	Disconnected or faulty sensor	Check the wiring of the sensor, replace the sensor if it is faulty.
E52	Compressor suction pressure transducer EP disconnected or damaged	Complete shutdown	Automatic	10 s	Transducer disconnected or faulty	Check the wiring of the transducer, replace the transducer if it is faulty.
E53	The compressor does not start	Complete shutdown	twice then then manual		Driver problem Compressor wiring Compressor unserviceable	Switch the power supply off and then on Check the voltage Check the wiring between the driver and the compressor Replace the compressor
E54	ECS water return temperature too high	Information			ECS temperature sensor incorrectly located or heat exchanger undersized	
E55	Overheating of electric heater resistance	Resistance shut-down	Auto twice then manual		Insufficient water flow Excessive water temperature	
E60	DCI driver temperature too high	Complete shutdown	Automatic		Dirty heat sink Operating conditions outside limits	Clean the heat sink Check the operating conditions
E61	DCI driver voltage too low	Complete shutdown	Automatic		Supply voltage	Check the power supply
E62	DCI driver voltage too high	Complete shutdown	Automatic		Supply voltage	Check the power supply
E63	DCI current too high	Complete shutdown	Automatic		Supply voltage	Check the power supply

Ref.	Alarm description	Aqu@Scop Advance DCI action	Alarm cancellation	Time delay	Possible cause(s)	Recommended action(s)
E64	DCI communication error with driver	Complete shutdown	Automatic		Communication problem between the driver and the NPC board	Check the communication cable between the driver and the board. Check the communication board J6
E65	DCI4 power supply frequency (ZX)		Automatic		Unstable power supply	Check the power supply and the frequency (50 Hz)
E66	DCI4 IPM fault (PIN)		Automatic		Overheated driver Faulty component	Replace the driver if several alarms are triggered
E67	DCI4 comp transducer fault (CS)		Automatic		Overheated driver Faulty component	Replace the driver if several alarms are triggered
E68	DCI4 radiator sensor fault (HSB)		Automatic		Overheated driver Faulty component	Replace the driver if several alarms are triggered
E69	DCI4 IPM on current (IPM)		Automatic		Compressor current too high Faulty components	Check the operating conditions Replace the driver
E70	DCI4 PFC sensor fault (PS)		Automatic			Replace the driver if several alarms are triggered
E71	DCI6 IC fault		Automatic			Replace the driver if several alarms are triggered
E72	DCI6 current sensor fault		Automatic			Replace the driver if several alarms are triggered
E73	DCI6 short current cut-out		Automatic		micro power cut	Check the power supply
E74	DCI6 Micro restart		Automatic		Unstable power supply	Check the power supply
E75	DCI6 loss of synchronisation		Automatic		Compressor wiring Excessive coolant charge	Check the wiring between the compressor and the driver Check the coolant charge
com	refer to E16		Automatic		No communication with the terminal	Check the wiring
RF	Loss of com between receiver and RF thermostat		Automatic		No communication between the receiver and the transmitter.	Bring the two elements closer together. Replace the batteries New components not matched

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