

# GEOSMART NETZERO



NETZERO BW



NETZERO CW



## **EN** TECHNICAL SERVICE MANUAL

MODEL:

SERVICE CONTACT:



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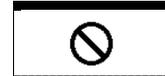
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## 1. Controller user guide



**NOTE**

- The information included below corresponds to application versions launched after January 2016. Other versions, both earlier and later, may differ slightly from the contents found in this section.
- There might be screens or screen contents that are not shown, depending on the heat pump model and the settings configured by the technical service.
- If the following screen appears when accessing a menu, this means that the service requested has not been enabled by the technical service.



### 1.1. Control panel

The heat pump control panel has a screen with 6 buttons, like the one shown in the illustration below. The buttons are used to move through the various user menus and to adjust the parameters.



**Figure 1.1.** Control panel.

The general functions and operation of each of the buttons are indicated below.



The ALARMS menu can be accessed directly from anywhere in the application.



The list of user menus can be accessed from anywhere in the application.



The user can return to the previous menu from anywhere in the application.



This allows the user to move through the menu lists.

This allows the user to move from one screen to another inside a menu.

This is used to adjust the settings of the parameters contained in a screen.

This is used from the main menu to access the adjustment of the outlet temperatures for heating  and cooling .



This allows the user to access the selected menu.

This is used to move from one adjustable parameter to another in the same screen.

This is used to access the INFORMATION menu directly from the main screen.

## 1.2. Main screen

The main screen of the application contains a series of fields with information about heat pump operation.

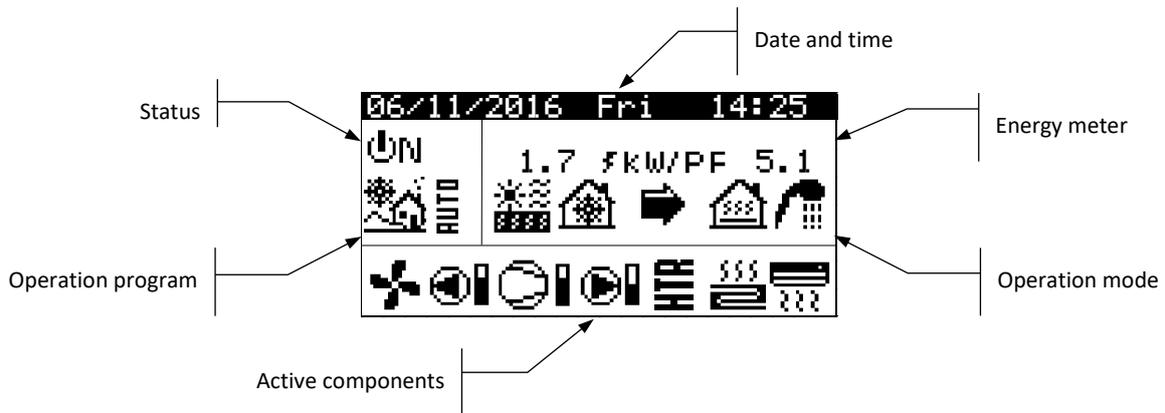


Figure 1.2. Description of the main screen.

## 1.3. Active components

This field shows the main components of the heat pump that are activated. A consumption bar is also shown for the compressor and modulating circulator pumps.

-  Aerothermal fan activated
-  Source pump activated
-  Compressor in start-up phase
-  Compressor activated
-  Compressor in shut-down phase
-  Production pump activated
-  Heating units activated
-  Cooling units activated
-  Auxiliary heating unit activated
-  HTR system activated

## 1.4. Mode

This field shows the icons that indicate the operating modes that are active. Several operating modes can be viewed simultaneously, depending on the heat pump model and the configuration set up by the technical service.



### **DIRECT HEATING Mode / DIRECT COOLING Mode**

The heat pump sends hot / cold water directly to the heating / cooling system and adjusts the power supply to the consumption of the home. The outlet temperature and flow are constantly controlled to optimize installation performance.

These modes are activated when the heat pump receives a heating / cooling request from the interior terminals installed in the home (thermostats, th-Tune terminals, thT terminals or TH sensors).



### **BUFFER HEATING Mode / BUFFER COOLING Mode**

The heat pump sends hot / cold water to the buffer storage tank of the heating / cooling system. The power supply, flow and outlet temperature are constantly controlled to maintain storage tank temperature and optimize installation performance.

These modes are activated when the buffer storage tank temperature is lower / higher than the differential of start-up temperatures.



### **DHW mode**

The heat pump sends hot water to increase the temperature of the storage tank so it reaches the DHW setpoint temperature as soon as possible.

This mode is activated when the DHW storage tank temperature is lower than the differential of start-up temperatures.



### **POOL mode**

The heat pump sends hot water to the pool production exchanger and adjusts the power supply. The outlet temperature and flow are constantly controlled to optimize installation performance.

This mode is activated when the heat pump receives a demand for pool production.



### **LEGIONELLA PROTECTION Mode**

The heat pump raises the temperature of the storage tank to the final temperature set by the technical service for the legionella protection program. Heating is produced initially by the compressor, followed by activation of the auxiliary DHW system, if there is one, until the final temperature is reached.

This mode is activated in compliance with the provisions in the weekly legionella protection program.



#### **NOTE**

- Activation of the various OPERATING MODES may be affected by the time schedule functions or heat pump service priorities (DHW, HEATING, COOLING, POOL).
- The activation of the HEATING and COOLING operating modes may be affected by service shut-down temperatures.

Apart from the icons that define the operating modes, the following icons can also be found in this field.



**Operation**

This indicates thermal energy transfer between circuits.  
 If the icon is shown continuously, this indicates normal heat pump operation.  
 If the icon flashes, there is a heat pump protection activated.



**Energy source**

Power removal or injection at the energy source.



**Cycle inversion**

The HEAT/COLD production cycle is being inverted. Only for reversible heat pumps.



**Wait**

Compressor start-up is deactivated due to standby between start-ups (15 minutes). The minutes remaining for the compressor to start up are shown next to the icon.

STAND-BY No demand. The heat pump remains in standby because there is no demand.

### 1.5. Operation program

The heat pump operation program determines which operation modes can be activated.



**WINTER program**

The heat pump does not allow activation of the PASSIVE COLD and ACTIVE COLD operating modes.



**SUMMER program**

The heat pump does not allow activation of the HEATING operating mode.



**COMBINED program**

The heat pump allows activation of any operating mode.



**AUTO program**

The heat pump automatically switches between the WINTER/SUMMER operating programs, depending on the outside temperature. The temperatures and time required for the switch must be adjusted by the user.



**REMOTE Control**

WINTER / SUMMER program selection is triggered by an external signal.

### 1.6. Heat pump status

This indicates heat pump availability to service the various heat pump functions.



**ON status**

The heat pump is on and available to activate all its functions.



**ON + EVU status**

The heat pump is on but the compressor is deactivated by the EVU signal. Secondary functions such as outlet unit start-up, DHW recirculation, etc. can be activated.



**ON + SURPLUS CONTROL status**

The heat pump is on and the comfort conditions are fulfilled to take advantage of the electric surplus. Only available with ecoSmart e-manager / e-system.



**ON + CONSUMPTION CONTROL status**

The heat pump is on and adjust the total consumption of the installation to the maximum limit set by the installer. Only available with ecoSmart e-manager / e-system.

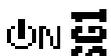


**ON + TARIFF CONTROL status**

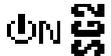
The heat pump is on due to a tariff control schedule or calendar, therefore, the setpoint may vary depending on what is set in the calendars.

**ON + SMART GRID status**

The heat pump is on and fulfilling any SG state.



**SG1 (Normal status):** The heat pump operates normally according to their configuration.



**SG2 (Reduced tariff):** We are in a reduced tariff period, so we will take advantage of the lower price of electricity to change heat pump setpoints and produce more heat and cold.



**SG3 (Locked status):** The heat pump is on, but limits the high consumptions, therefore, it sends a compressor and heater lock signal.



**SG4 (Forced status):** The heat pump will force the maximum possible consumption in the installation to help balance the grid.



**ON + NIGHT SCHEDULE status**

The heat pump is on and available to activate all its functions, but performance is limited by night-time schedule programming.



**OFF status from control panel**

The heat pump is switched off from the front panel of the controller and is therefore not available to activate any of its functions.



**OFF status due to time schedule or calendar**

The heat pump is off due to an active time schedule or calendar and is therefore not available to activate any of its functions.



**OFF status due to data bus signal**

The heat pump is off due to an external signal through the data bus and is therefore not available to activate any of its functions.



**OFF status due to supervisor**

In facilities with several units operating in parallel, the heat pump is switched off by the supervisor and is therefore not available to activate any of its functions.



**EMERGENCY status from control panel**

The heat pump is in emergency status, activated manually from the front panel of the controller. The compressor cannot be started up, but the services can be attended to if there is an auxiliary unit enabled for emergency situations.

**EMERGENCY status due to active alarm**

The heat pump is in emergency status due to an active alarm. The compressor cannot be started up, but the services can be attended to if there is an auxiliary unit enabled for emergency situations.

**EMERGENCY status due to repeated alarms**

The heat pump is in emergency status due to an alarm that goes off repeatedly. The compressor cannot be started up, but the services can be attended to if there is an auxiliary unit enabled for emergency situations.

**NOTE**

- 
- The EVU signal is used in some countries by the electricity company to control electrical consumption. The EVU signal prevents energy production by the compressor and the auxiliary equipment. Circulator pumps, valves and other components can be activated to consume energy from the storage systems.
-

### 1.7. List of user menus

Follow the instructions below to browse through the various user menus. Each menu has a series of screens that are used to change heat pump STATUS and OPERATION MODE, adjust comfort parameters and view desired information.

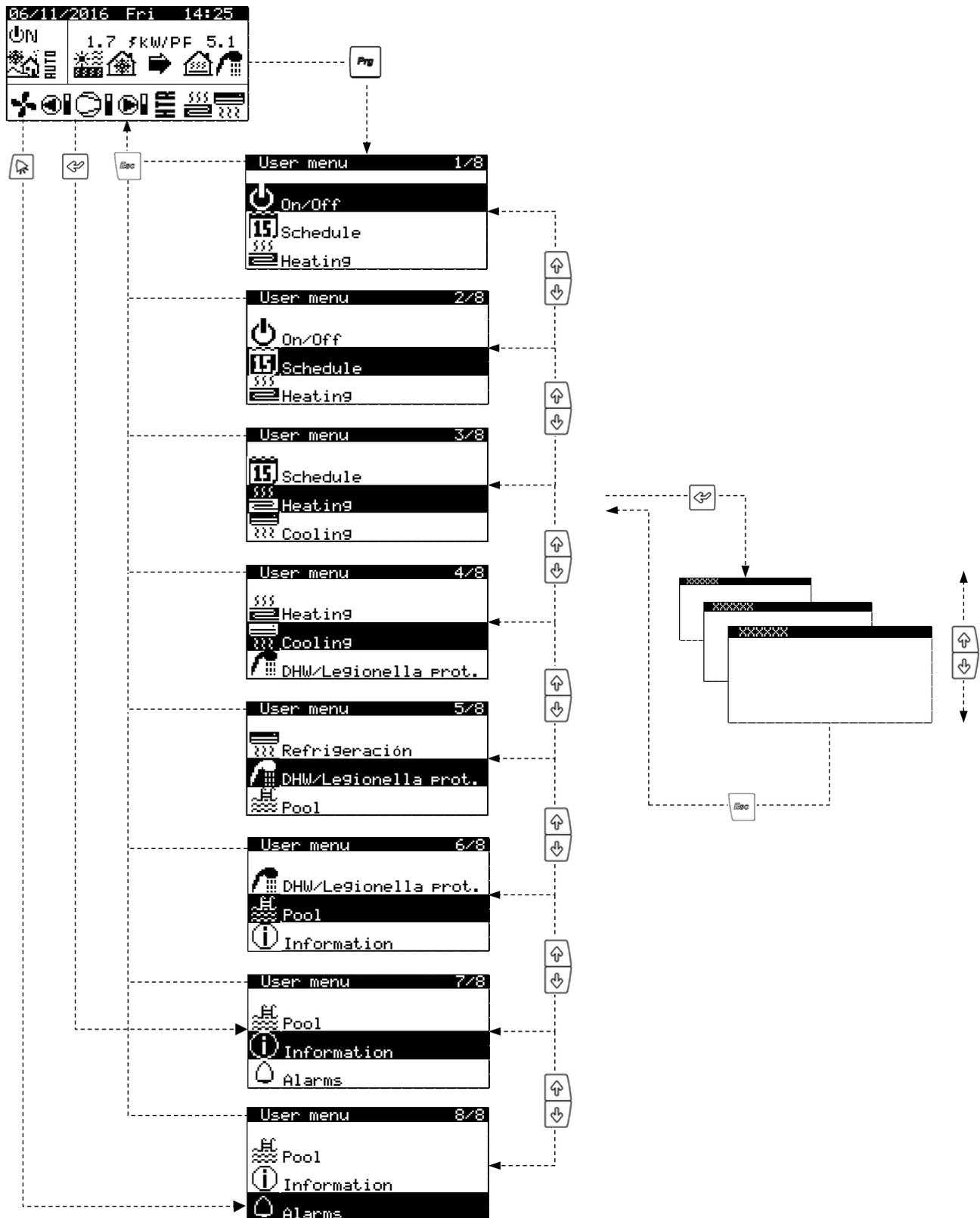


Figure 1.3. Browsing through the list of user menus.

EN

### 1.8. Parameter adjustment

Take the following steps to change a parameter:

1. Search for the screen containing the parameter that needs adjusting (see Section 1.7).
2. With the cursor in position 1 press on to enter the screen and move the cursor to the parameter in position 2.
3. Adjust the parameter in position 2 using buttons .
4. Press to accept and move the cursor to position 3.
5. Adjust the parameter in position 3 with buttons .
6. Press to accept and return to position 1.
7. With the cursor in position 1 again, press buttons to go to the previous or next screen, or to return to the list of user menus.

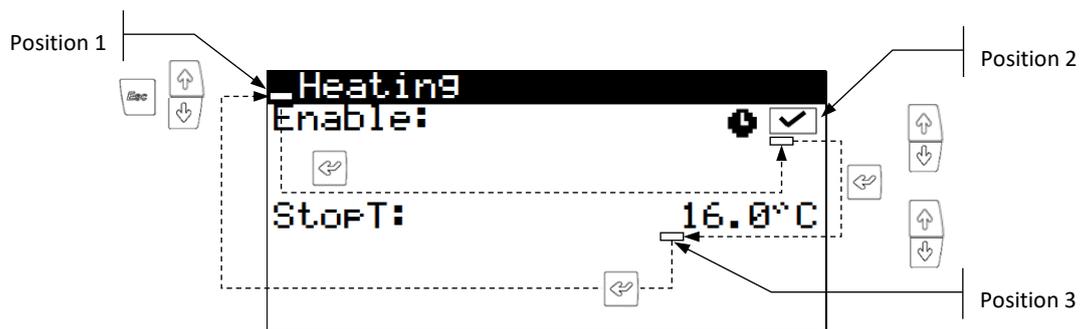
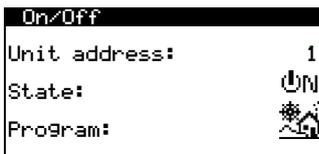


Figure 1.4. Adjusting comfort parameters.

### 1.9. ON/OFF Menu

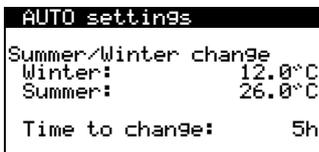


#### On/Off

Shows the direction of the unit.

Used to switch the heat pump on / off or to activate the EMERGENCY status.

Also used to choose the operation program.



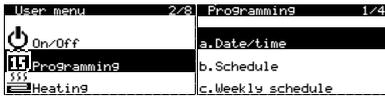
#### Setting up the AUTO program

The AUTO program can be used to adjust the outdoor temperatures and the time needed to switch between the WINTER and SUMMER programs.



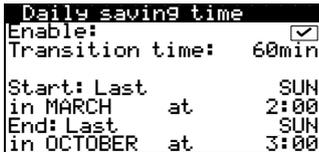
- The selected status of the heat pump can be changed automatically using the time schedule functions, calendar or using active alarms.

## 1.10. PROGRAMMING Menu



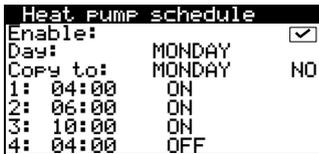
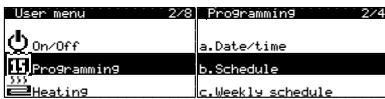
### Date/Time

This is used to adjust the day of the week, date (DD/MM/YY) and time (HH:MM 24-hour format) of the controller.



### Daily saving time

The settings of automatic time change between seasons (autumn-winter / spring-summer) can be adjusted.



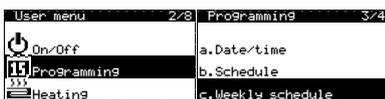
### Heat pump schedule

This allows programming up to 4 time periods for each day of the week to switch the heat pump on / off.



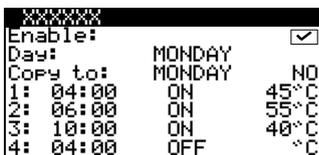
### Holiday calendar

This can be used to program up to 3 periods a year when the heat pump stays on or off.



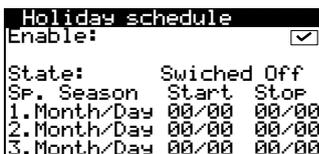
### Night-time

This is used to set up a daily time period when the maximum speed of the compressor or unit heater is limited. This function is especially useful to reduce noise emissions at night.



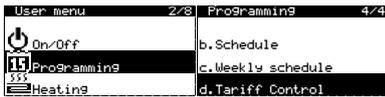
### DHW Schedule / Heating Schedule / Cooling Schedule / Pool Schedule / BC Schedule

This allows programming up to 4 time periods for each day of the week. Independent time schedules can be set up for DHW, HEATING, COOLING AND POOL services.



### Holiday calendar

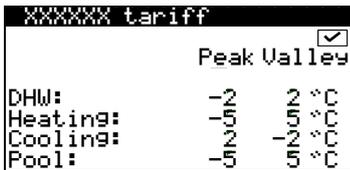
This can be used to program up to 3 periods a year when the heat pump stays on or off.



**Peak / valley tariff for Winter / summer**

This allows programming up to 4 time periods for each day of the week.

Independent time schedules can be set up for winter peak, winter valley, summer peak and summer valley tariffs.



**Temperature differential for winter / summer tariff**

This allows configure the temperature differentials on the heat pump setpoint in the peak and valley periods for each service in winter / summer period.

**1.11. HEATING Menu**



**Heating**

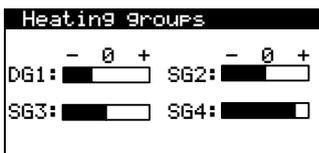
This enables the HEATING mode and adjusts the heating cut-off temperature. The HEATING mode is never activated for temperatures over the cut-off setpoint.

The icon indicates that there is a time schedule activated in the HEATING mode.



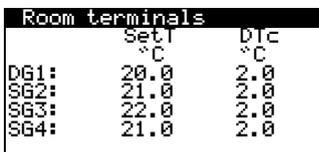
**Heating buffer**

This shows the setpoint temperature of the buffer storage tank and allows adjustments to be made to the start-up temperature differential.



**Heating units**

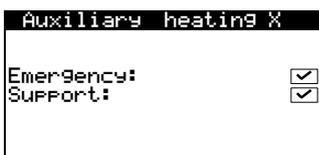
This can be used to adjust the heating target outlet temperatures programmed by the technical service. Each ramp increases or decreases the outlet temperature by 2°C.



**Interior terminals**

Used to show and adjust the inside environment temperature setpoint (Tcons) and the comfort temperature differential (DTc) of the terminals of each outlet unit.

If the heat pump is in the COMBINED program, it can also be used to show and adjust the temperature switch differential (DTsw) between HEATING and COOLING modes.



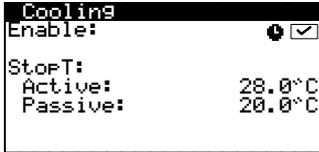
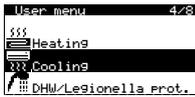
**Auxiliary X heating**

This is used to enable the auxiliary heating system in both EMERGENCY and SUPPORT mode.

In EMERGENCY mode, the auxiliary system is activated automatically when any of the alarms are active.

In SUPPORT mode, the auxiliary system is activated automatically for normal HEAT production, as programmed by the technical service.

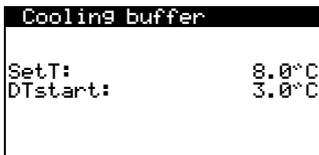
## 1.12. COOLING Menu



### Cooling

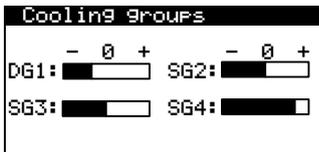
This is used to enable the COOLING mode and adjust the active and passive cooling cut-off temperatures. The COOLING mode cannot be activated for outside temperatures under the cooling cut-off temperature. Only PASSIVE COOLING can be activated for outside temperatures between passive and active cut-off temperatures. ACTIVE COOLING activation is only allowed for outside temperatures over the active cooling cut-off temperature.

The  icon indicates that there is a time schedule activated in the COOLING mode.



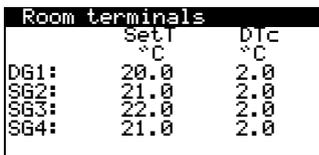
### Cooling buffer

This shows the setpoint temperature of the cooling buffer storage tank and allows adjustments to be made to the start-up temperature differential.



### Cooling units

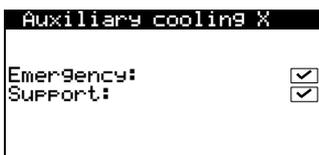
This can be used to adjust the cooling target outlet temperatures programmed by the technical service. Each ramp increases or decreases the outlet temperature by 2°C.



### Interior terminals

Used to show and adjust the inside environment temperature setpoint (Tcons) and the comfort temperature differential (DTc) of the terminals of each outlet unit.

If the heat pump is in the COMBINED program, it can also be used to show and adjust the temperature switch differential (DTsw) between HEATING and COOLING modes.



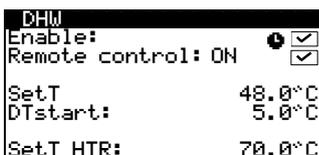
### Auxiliary X cooling

Used to enable the auxiliary heating system in both EMERGENCY and SUPPORT mode.

In EMERGENCY mode, the auxiliary system is activated automatically if there are any active alarms that prevent compressor start-up.

In SUPPORT mode, the auxiliary system is activated automatically for normal COOL AIR production, as programmed by the technical service.

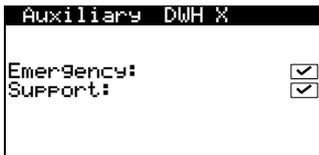
## 1.13. DHW/LEGIONELLA PROT. Menu



### DHW

This is used to enable the DHW mode and adjust the setpoint temperature and start-up temperature differential for the DHW storage tank. It is also used to adjust the setpoint temperature for DHW heating with the HTR system.

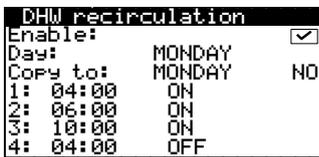
The  icon indicates that there is a time schedule activated in the DHW mode.



**Auxiliary X DHW**

This is used to enable the auxiliary DHW system in both EMERGENCY and SUPPORT mode. In EMERGENCY mode, the auxiliary system is activated automatically if there are any active alarms that prevent compressor start-up.

In SUPPORT mode, the auxiliary system is activated after the compressor when the latter cannot reach the target DHW storage tank temperature.



**DHW Recirculation**

This is used to set up as many as 4 time periods per day for DHW recirculation.



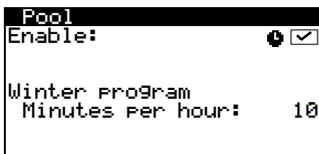
**Legionella protection program**

This is used to set up a weekly program for protection against legionella.

The legionella protection program is deactivated automatically if 5 hours have elapsed without reaching the final temperature set up by the technical service.

Legionella protection programs should be carried out at night, or when there is no DHW consumption.

**1.14. POOL Menu**



**Pool**

Used to enable the POOL mode.

In versions for NETZERO BW and NETZERO CW, it can be used to adjust the percentage of minutes/hours that the heat pump is dedicated to the POOL mode when there are simultaneous demands for heating and pool during the WINTER program.

The  icon indicates that there is a time schedule activated in the POOL mode.



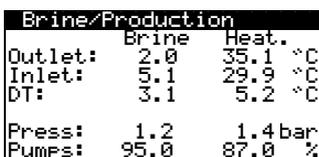
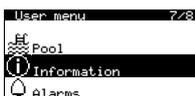
**Auxiliary X pool**

This is used to enable the auxiliary POOL system in both EMERGENCY and SUPPORT mode. In EMERGENCY mode, the auxiliary system is activated automatically if there are any active alarms that prevent compressor start-up.

In SUPPORT mode, the auxiliary system is activated automatically for normal POOL production, as programmed by the technical service.

**1.15. INFORMATION Menu**

Press  for quick access to the information menu from the main screen.



**Source/Production**

This shows the inlet and return temperatures, temperature difference, current pressure and the percentage of circulator pump regulation in the source and production circuits or shows the simultaneous production valves regulation value.

Boiler	
State	Off
Realt:	40.0°C
Regulation:	100%

**Boiler**

Shows whether the boiler is On or Off, the current temperature in the support with boiler sensor and the regulation percentage of the boiler or the mixing valve.

Outdoor temperature	
OutdoorT:	14.7°C
Outdoor StopT Heating:	21.0°C
Active cool.:	28.0°C
Passive cool.:	23.0°C

**Outdoor temperature**

Shows the current outdoor temperature and the outside temperatures for heating and cooling cut-off.

Room terminals			
	SetT °C	Realt °C	RH %
T1:	50.0	49.8	23.2
T2:	45.0	46.2	10.1
T3:	45.0	43.0	23.2
T4:	35.0	35.1	94.6

**Interior terminals**

In installations with interior terminals equipped with bus communication (Th-T or TH sensors), it displays the interior setpoint temperature (Tcons), the current temperature (Treal) and the current relative humidity (HR) of the terminals assigned to each outlet unit.

XXXXXX buffer tank	
Realt:	49.9°C
SetT	50.0°C
DTstart:	5.0°C

**Heating buffer / Cooling buffer**

This shows the setpoint temperature, the start-up temperature differential and the current temperature of the buffer storage tank.

There are separate screens for the heating and cooling buffer storage tanks.

XXXXXX Groups			
	SetT °C	Realt °C	Reg %
DG1:	50.0	49.8	
SG2:	45.0	46.2	10.1
SG3:	45.0	43.0	23.2
SG4:	35.0	35.1	94.6

**Heating units / Cooling units**

This shows the target outlet temperature (Tcons), the current outlet temperature (Treal) and the regulation percentage (Reg) of each outlet unit.

There are separate screens for the heating and cooling outlet units.

DHW	
Realt:	47.9°C
SetT:	48.0°C
DTstart:	5.0°C
Start comp .T:	43.0°C

**DHW Tank**

This shows the setpoint temperature, the start-up temperature differential and the current temperature of the DHW storage tank.

Pool	
State	Off
Tsup:	32.0°C
SetT:	37.0°C

**Pool**

Shows whether the pool is On or Off Shows the outlet temperature to the pool and the setpoint temperature.

XXXXXXXX meter			
SSS	15.2 kW	COP:	5.8
SSS	12.6 kW	ERR:	0.0
SSS	2.6 kW	PF:	5.8

**Instant meter / Monthly meter / Annual meter**

These screens show information regarding heat pump consumption, power, energy supplied and energy performance.

It has screens with information about the current moment, each month and by year.

Active demands	
SSS1 SSS2 SSS3 SSS4 SSS5	
SSS6 SSS7 SSS8 SSS9 SSS0	

**Active demands**

The upper part shows current demands for compressor start-up.

The bottom part shows the demands received by the heat pump to start the various outlet units.

Active demands for the compressor or the outlet units do not imply that they will switch on. There may be other reasons that prevent them from starting up.

```

Version
Version:      0.1.0058
Date:        02/10/15

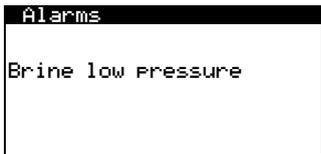
Bios: 6.24    25/02/14
Boot: 4.05    04/02/13
Version firmw: 5.0
Firmware version: 0.2
    
```

**Version**

This shows information about the application installed in the controller.

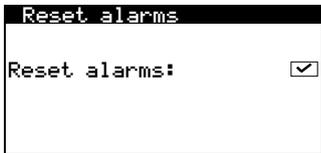
**1.16. ALARMS Menu**

Press  for quick access to the information menu from the main screen.



**Active alarms**

These screens display the alarms that are active and do not allow compressor start-up. The  button stays on.



**Reset alarms**

The heat pump is blocked and switches to EMERGENCY mode when a critical alarm goes off more than 5 times a day. In these cases, the heat pump can be unblocked from this screen once the problem has been solved.

## 2. Controller Technical Service Guide

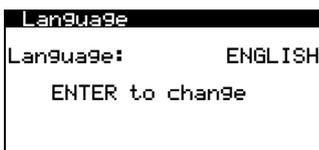
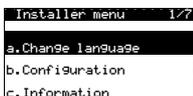
To access the installer menu, press   at the same time. Afterwards, enter access password PW1. This menu is used to define the type of installation and the services the heat pump will deal with, to adjust the various operation parameters and protections as well as to carry out various start-up and maintenance operations.

This menu shows the sub-menu structure of the INSTALLER menu.

INSTALLER menu			
Sub-menu level 1	Sub-menu level 2	Sub-menu level 3	
1. Language			
2. Configuration	2.1. Heat pump model		
	2.2 Source		
	2.3. Services		2.3.1. Heating
			2.3.2. Cooling
			2.3.3. DHW
			2.3.4. Pool
			2.3.5. Priorities
			2.3.6. Special programs
	2.4. Auxiliary equipment		2.4.1. Bivalent parameters
			2.4.2. Internal resistor
		2.4.3. DHW resistor	
		2.4.4. Buffer resistor	
		2.4.5. Boiler	
2.5 Remote control		2.5.1. EVU/SG control	
		2.5.2. Services control	
		2.5.3. BUS control	
	2.6. Protections		
	2.7. Probe Conf.		
3. Information			
4. Manual activation			
5. Alarm log			
6. Default values			
7. Change password			

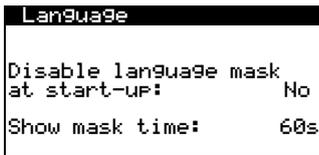
Table 2.1. INSTALLER menu structure.

### 2.1. Language selection



#### Language

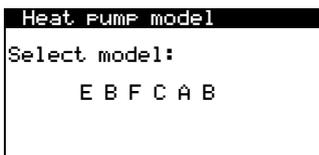
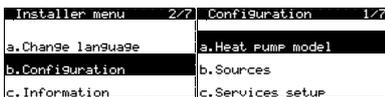
1. Used to select the language of the heat pump controller.



**Language**

1. Used to enable the language selection screen that appears on launching the controller.
2. Used to adjust the display time of the language selection screen on launching the controller.

**2.2. Selecting the heat pump model**

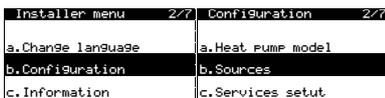


**Model selection**

1. Used to select the heat pump model within the NETZERO range. This selection is required for the correct operation of the heat pump and the energy counters. Once the model has been selected, you must restart the inverter, for this you must cut the power supply to the inverter for a minimum of 30 seconds.

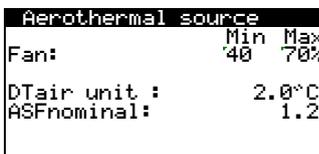
**Note:** Access to some of the heat pump configuration screens may be limited, depending on the model selected.

**2.3. Configuration of the source system**



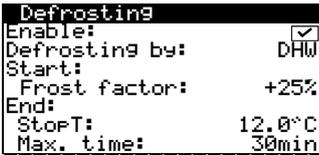
**Source**

1. Used to select the type of source system.
  - A. GEOTHERMAL: System with vertical or horizontal geothermal collector.
  - B. AEROTHERMAL: System with source via aerothermal units. The variable speed aerothermal units and defrost program controls are enabled.
  - C. HYBRID: Source systems that combine a geothermal collector and an aerothermal collector. The management controls for the hybrid system, variable speed aerothermal units and defrost programs are enabled.



**Aerothermal collector**

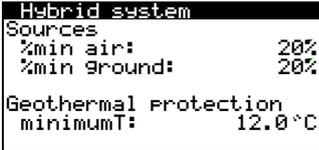
1. Used to adjust the difference in air-antifreeze agent target temperatures to control the fan.
2. Used to adjust the maximum fan percentage allowed.
3. Used to adjust the nominal operation factor (ASFnominal) of the aerothermal collector.



**Defrost**

1. Used to adjust the defrost program of the aérothermal collector and to adjust its parameters.
2. Used to adjust the production system used as a heat source to perform defrosting (heating / DHW / pool).
3. Used to adjust the difference between the ASFnominal and defrost program start-up.
4. Used to adjust the source fluid temperature required to finish the defrost program.
5. Used to adjust the maximum defrost program operation time.

**Note:** This screen is only available for aérothermal or hybrid source systems and with models that include integrated passive cooling.

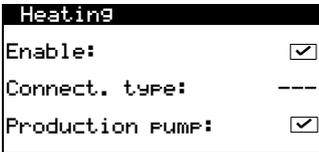
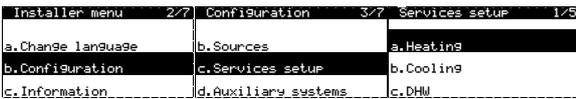


**Hybrid system**

1. Used to adjust the minimum power percentage absorbed by each collector. If the power percentage absorbed by one of the collectors decreases below the established limit, it is disabled.
2. Used to set a minimum input temperature for the geothermal collector; below this temperature, the geothermal collector will be disabled. This option is useful for disabling horizontal source systems when they are blocked, thereby assisting in their recovery.

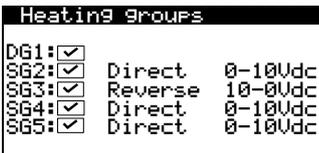
**Note:** This screen is only available for hybrid source systems.

**2.4. Configuration of the heating system**



**Heating**

1. Used to enable the heating service.
2. Used to select the type of connection to the heat emission system:
  - A. DIRECT: Heat production is enabled by requests coming from indoor terminals. Activation of the outlet units for heating is not allowed when another service is being produced (cooling / DHW / pool).
  - B. BUFFER: Heating production is enabled by the temperature probe of the buffer storage tank. Activation of the outlet units for heating is allowed when another service is being produced (cooling / DHW / pool).
  - C. COMBI: Heating production is enabled by the temperature probe of the buffer storage tank. Activation of outlet units for heating is not allowed when another DHW is being produced.
3. Used to enable use of the heat pump to produce heat.



**Heating units**

1. Used to enable the outlet units in heating mode.
2. Used to select the modulating valve control logic of the combined outlet units.

**Note:** The modulating valve control logic must be the same in both heating and cooling mode. If it is changed for one service, it will be changed automatically for the other.

```
Heat emission system
DG1: Heating floor
SG2: Heating floor
SG3: Fancoils
SG4: Radiators
SG5: Heating floor
```

**Heat emission system**

- Used to select the type of heat emission system used in each unit. This selection affects the shape of the heating curve used.

**Note:** Different emission systems can be used for heating and cooling in a single outlet unit.

```
Heat relay thermostats
DG1: NO-DI5
SG2: NO-DI7
SG3: NO-DI9
SG4: NC-DI11
SG5: NC-DI13
```

**Heating relay thermostats**

- Used to select the type of logic used in each of the digital inputs of the outlet units in heating mode.

- A. NO: Contact closed to activate the request.
- B. NC: Contact open to activate the request.

- Shows the connection terminal of each digital input (DIxx).

```
Heating bus terminals
DG1: th-Tune      Address
SG2: th-Tune      AD1
SG3: th-Tune      AD2
SG4: th-Tune      AD3
SG5: th-Tune      AD4
SG5: th-Tune      AD5
```

**Heating bus terminals**

- Used to enable the use of indoor terminals with data bus communication in heating mode.

- Shows the address assigned (ADx) by the controller to the indoor terminal associated to each outlet unit. Bus terminals must be configured with the addresses displayed on this screen.

**Note:** This configuration is associated with the heating and cooling services. If a bus terminal is enabled for a unit for heating, it is automatically enabled for cooling.

```
BUS-terminal AUTO
Enable: 
DG1: DTsummer/winter 2.0°C
SG2: DTsummer/winter 2.0°C
SG3: DTsummer/winter 2.0°C
SG4: DTsummer/winter 2.0°C
SG5: DTsummer/winter 2.0°C
```

**Cooling/heating terminals**

- Used to enable automatic switching between WINTER / SUMMER in indoor bus terminals. If this option is enabled, the switch between WINTER / SUMMER programs of the indoor terminals will be carried out automatically based on the room temperature.

- Used to adjust the temperature change differential (DTsw) between the WINTER / SUMMER programs.

**Note:** If the heat pump is in the WINTER program and all indoor terminals with bus connections are changed to the SUMMER program, the heat pump will change automatically to the SUMMER program and vice versa.

**Note:** This configuration is associated with the heating and cooling services. If it is modified for the heating service, it will automatically change for cooling.

```
Interior compensation
DG1: 1.0
SG2: .
SG3: .
SG4: .
SG5: .
```

**Indoor offset**

- Used to adjust the indoor offset factor for each outlet unit. The indoor offset factor corrects the target outlet temperature based on the indoor temperature.

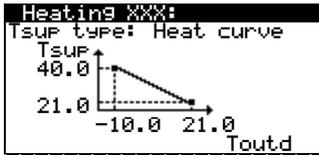
0: No indoor temperature offset.

0.5: Correction of the outlet temperature equal to half the difference between actual and setpoint temperature.

1: Correction of the outlet temperature equal to the difference between actual and setpoint temperature.

2: Correction of the outlet temperature equal to double the difference between actual and setpoint temperature.

**Note:** This configuration is associated to the heating and cooling services. If it is modified for the heating service, it will automatically change for cooling.



### Heating BT/DG1, SG2, SG3, SG4 and SG5

1. Used to select the type of outlet temperature control in heating mode.
  - A. FIXED TEMP: Fixed outlet temperature.
  - B. HEAT. CURVE: Variable outlet temperature based on outdoor temperature.
2. Used to configure fixed outlet temperature, or the representative parameters of the heating curve for each of the outlet units.

Insulation  
Building insulation:  
Good

### Insulation

1. Used to select the building insulation level.

**Note:** The calculation of the target outlet temperatures based on the heating curves of the outlet units is carried out using an attenuated outdoor temperature. The higher the insulation level, the higher the attenuation applied to the outdoor temperature.

Special Parameters  
DTheating: 5.0°C  
DTsupply: 0.0°C  
Simultaneous consum. heating + cooling

### Special parameters

1. Used to adjust the target temperature difference between the production circuit outlet and inlet in heating mode.
2. Used to adjust a temperature difference between the calculated target outlet temperature and the actual outlet temperature of the heating pump. This option is useful in cases where collection must be performed at a different temperature than consumption, or when an intermediate exchanger is installed between production and use.
3. Used to enable simultaneous activation of units that request heating and cooling.
  - A. ENABLED: In case of simultaneous heating and cooling requests, all outlet units are enabled equally.
  - B. DISABLED: In case of simultaneous heating and cooling requests, priority is given to the service (heating / cooling) of the lowest number outlet group with an enabled request. Activation of units that do not request the service set as a priority is not allowed. This restriction only affects the outlet units that are enabled for both heating and cooling mode.

**Note:** Simultaneous unit activation is associated with the heating and cooling services. If it is modified for the heating service, it will automatically change for cooling.

Heating Buffer  
Max. SetP: 65 °C

### Heating buffer

1. Allows adjust the maximum settable heating buffer setpoint. This is the setpoint in case of surplus for the SG states.

## 2.5. Configuration of the cooling system

Installer menu 2/7	Configuration 3/7	Services setup 2/3
a. Change language	b. Sources	a. Heating
b. Configuration	c. Services setup	b. Cooling
c. Information	d. Auxiliary systems	c. DHW

```

Active cooling
Enable: 
Connect. type: ---
Production PUMP: 
    
```

**Active cooling**

1. Used to enable the active cooling service.
2. Used to select the type of connection to the active cooling emission system.
  - A. DIRECT: Cooling production is enabled by requests coming from indoor terminals. Enabling the outlet units for active cooling is not allowed when another service is being produced (heating / DHW / pool).
  - B. BUFFER: Active cooling production is enabled by the temperature probe of the buffer storage tank. Enabling the outlet units for active cooling is allowed when another service is being produced (heating / DHW / pool).
3. Used to enable use of the production pump for the active cooling service.

```

Passive cooling
Enable: 
Production PUMP: 
Brine PUMP: 
    
```

**Passive cooling**

1. Used to enable the passive cooling service.
2. Used to enable use of the circulator pump for the passive cooling service.

Used to enable use of the collector circulator pump for the passive cooling service.

**Note:** The passive cooling system is enabled by requests coming from indoor terminals, even in installations with a cooling buffer storage tank.

```

Cooling groups
DG1: 
SG2:  Direct 0-10Vdc
SG3:  Reverse 10-0Vdc
SG4:  Direct 0-10Vdc
SG5:  Direct 0-10Vdc
    
```

**Cooling units**

1. Used to enable the outlet units in cooling mode.
2. Used to invert the modulating valve control logic of the combined outlet units.

**Note:** The modulating valve control logic must be the same in both heating and cooling. If it is changed for one service, it will be changed automatically for the other.

```

Cool emission system
DG1: Heating floor
SG2: Heating floor
SG3: Fancoils
SG4: Radiators
SG5: Heating floor
    
```

**Cooling emission systems**

1. Used to select the type of emission system used in each outlet unit in cooling mode.

**Note:** Different emission systems can be used for heating and cooling in a single outlet unit.

**Note:** In units where an UNDERFLOOR HEATING or RADIATOR emission system is selected and a temperature reading and relative humidity terminal is enabled, the anti-condensation protection will activate automatically.

```

Cool.relay thermostats
DG1: NO-DI6
SG2: NO-DI8
SG3: NO-DI10
SG4: NC-DI12
SG5: NC-DI14
    
```

**Cooling relay thermostats**

1. Used to select the type of logic used in each of the digital inputs of the outlet units in cooling mode.
  - A. NO: Contact closed to activate the request.
  - B. NC: Contact open to activate the request.
2. Shows the connection terminal of each digital input (DIxx).

```

Cooling bus terminals
Type      Address
DG1: th-Tune AD1
SG2: th-Tune AD2
SG3: th-Tune AD3
SG4: th-Tune AD4
SG5: th-Tune AD5
    
```

**Cooling bus terminals**

1. Used to enable the use of indoor terminals with data bus communication in cooling mode.
2. Shows the address assigned (ADx) by the controller to the indoor terminal associated to each outlet unit. Bus terminals must be configured with the addresses displayed on this screen.

**NOTE:** This configuration is associated to the heating and cooling services. If a bus terminal is enabled for an outlet unit in a service, it is automatically enabled for the other one.

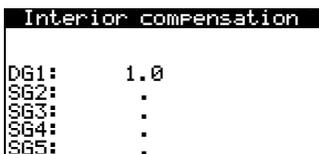


### Cooling/heating terminals

1. Used to enable automatic switching between WINTER / SUMMER programs in indoor bus terminals. If this option is enabled, the switch between WINTER / SUMMER programs of the indoor terminals will be carried out automatically based on the room temperature.
2. Used to adjust the temperature change differential (DTsw) between the WINTER / SUMMER programs.

**Note:** If the heat pump is in the WINTER program and all indoor terminals with bus connections are changed to the SUMMER program, the heat pump will change automatically to the SUMMER program and vice versa.

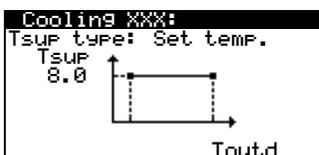
**Note:** This configuration is associated to the heating and cooling services. If it is modified for the heating service, it will automatically change for cooling.



### Indoor offset

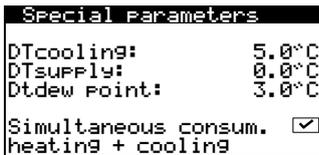
1. Used to adjust the indoor offset factor for each outlet unit. The indoor offset factor corrects the target outlet temperature based on the indoor temperature.
  - 0: No indoor temperature offset.
  - 0.5: Correction of the outlet temperature equal to half the difference between actual and setpoint temperature.
  - 1: Correction of the outlet temperature equal to the difference between actual and setpoint temperature.
  - 2: Correction of the outlet temperature equal to double the difference between actual and setpoint temperature.

**Note:** This configuration is associated to the heating and cooling services. If it is modified for the heating service, it will automatically change for cooling.



### Cooling BT/DG1, SG2, SG3, SG4 and SG5

1. Used to select the type of outlet temperature control in cooling mode.
  - A. FIXED TEMP: Fixed outlet temperature.
  - B. COOL. CURVE: Variable outlet temperature based on outdoor temperature.
2. Used to configure the fixed outlet temperature, or the representative parameters of the cooling curve for each outlet unit.



**Special parameters**

1. Used to adjust the target temperature difference between the production circuit outlet and inlet in cooling mode.
2. Used to adjust a temperature difference between the calculated target outlet temperature and the actual outlet of the heating pump. This option is useful in cases where collection must be performed at a different temperature than use, or when an intermediate exchanger is installed between production and use.
3. Used to set a minimum production temperature protection in cooling mode based on the dewpoint. This option is only available when outlet units with UNDERFLOOR HEATING or RADIATOR outlet units are enabled for cooling.
4. Used to enable simultaneous activation of units that request heating and cooling.
  - A. ENABLED: In case of simultaneous heating and cooling requests, all outlet units are enabled equally. This option is appropriate for installations with independent heating and cooling distribution lines.
  - B. DISABLED: In case of simultaneous heating and cooling requests, the heat pump gives priority to the service of the lowest number of outlet unit with a request. For example, if the outlet unit has a heating request, only the outlet groups that request heating will be enabled. This option is appropriate for installations with the same heating and cooling distribution line.

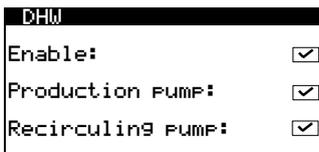
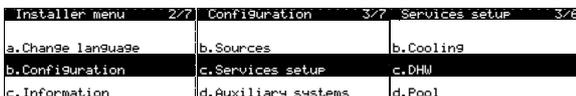
**Note:** Simultaneous activation is associated to the heating and cooling services. If it is modified for the heating service, it will automatically change for cooling.



**Cooling buffer**

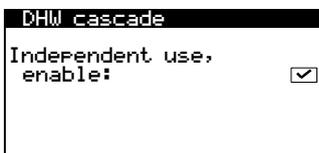
1. Allows adjust the minimum settable cooling buffer setpoint. This is the setpoint in case of surplus for the SG states.

**2.6. Configuration of the DHW production service**



**DHW**

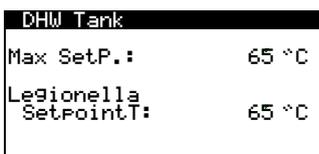
1. Used to enable the DHW production service.
2. Used to enable use of the circulator pump for the DHW service.
3. Use to enable the use of a DHW recirculation pump.



**DHW cascade**

1. Allows enable the independent DHW production on each heat pump that is connected in parallel.

**Note:** Enable this configuration, in a heat pump connected in parallel, means that the heat pump manages its own tank and not one common for the installation.

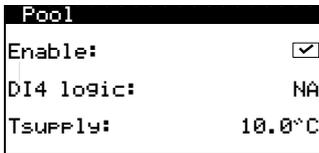


**DHW tank**

1. Allows adjust the maximum settable DHW tank setpoint. This is the setpoint in case of surplus for the SG states.
2. Used to adjust the setpoint temperature in the DHW storage tank for the legionella protection program. Allows adjust the minimum settable cooling buffer setpoint. This is setpoint in case of surplus for the SG states.

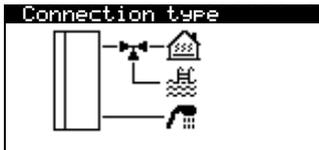
## 2.7. Configuration of the pool service

Installer menu	2/7	Configuration	3/7	Services setup	4/6
a. Change language		b. Sources		c. DHW	
b. Configuration		c. Services setup		d. Pool	
c. Information		d. Auxiliary systems		e. Priorities	



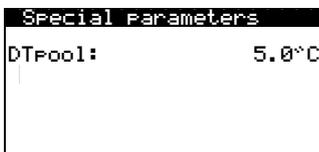
### Pool

1. Used to enable the pool service.
2. Used to adjust the target outlet temperature in pool mode. Also used to set the request logic of the pool.
3. Used to enable use of the production circulator pump for the pool service.



### Connection type

1. Used to select whether the pool is connected in parallel to the heating circuit or the DHW circuit (HTR system).



### Special parameters

1. Used to adjust the target temperature difference between the production circuit outlet and inlet in pool mode.



### Pool

1. Allows adjust the maximum settable pool setpoint. This is the setpoint in case of surplus for the SG states.

## 2.8. Configuration of production priorities

Installer menu	2/7	Configuration	3/7	Services setup	5/6
a. Change language		b. Sources		d. Pool	
b. Configuration		c. Services setup		e. Priorities	
c. Information		d. Auxiliary systems		f. Special programs	

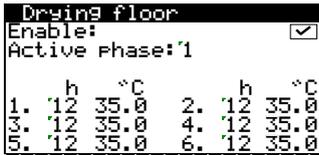


### Priorities

1. Allows the response to the different services to be prioritized. Services with the same priority level can be dealt with simultaneously.

## 2.9. Activation of special programs

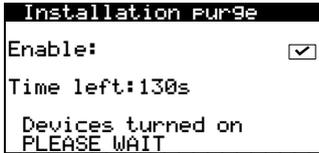
Installer menu	2/7	Configuration	3/7	Services setup	6/6
a. Change language		b. Sources		d. Pool	
b. Configuration		c. Services setup		e. Priorities	
c. Information		d. Auxiliary systems		f. Special programs	



### Floor drying

1. Used to enable the floor drying program. This program helps control the mortar drying process using underfloor heating.
2. It allows setting a schedule with up to six time periods with different outlet temperatures.

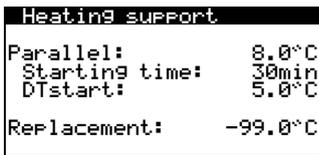
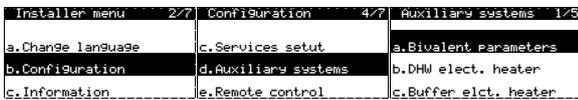
**Note:** After all the stages set in the floor drying program are completed, the heat pump returns to normal operation. If there are requests for the enabled services, the heat pump deals with them.



### Installation bleeding

1. Used to enable the bleeding program of the installation. This program turns the circulation pumps of the installation on and off to assist the bleeding.

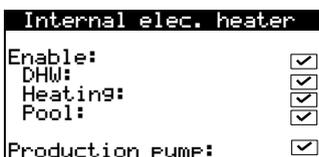
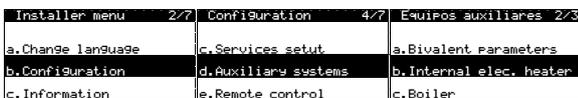
## 2.10. Configuration of auxiliary equipment



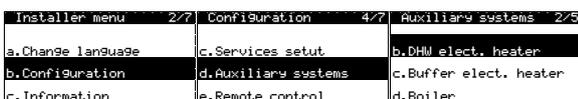
### Heat support

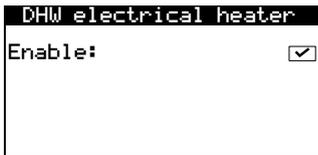
1. Used to set the outdoor temperature at which simultaneous use of the heat pump and the auxiliary equipment is allowed.
2. Used to set a minimum time period and the temperature difference with regard to the outlet target temperature so the auxiliary equipment can be used at the same time. If the outlet temperature remains below the target within a range higher than the starting temperature difference and during at least the established starting time, the use of auxiliary equipment is allowed.
3. Used to set the temperature at which the heat pump is replaced by the auxiliary equipment. The compressor cannot be used below the replacement temperature and all services are dealt with by the enabled support equipment.

**Note:** The parallel support parameters only affect the heating and pool services. The replacement temperature affects all services (heating, cooling, DHW and pool).



1. Used to enable the indoor auxiliary resistor for heating, DHW and/or pool services. In the USER level, its use must be enabled as SUPPORT and/or EMERGENCY for the heating, DHW and/or pool services.



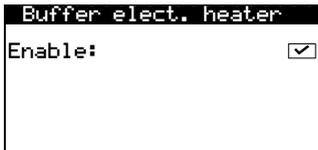


### DHW resistor

1. Used to enable the auxiliary electric resistor installed inside the DHW inter-accumulator for SUPPORT, EMERGENCY or for LEGIONELLA PROTECTION programs.

**Note:** In the USER level, it must be enabled as SUPPORT and/or EMERGENCY for the DHW production service.

Installer menu 2/7	Configuration 4/7	Auxiliary systems 3/5
a.Change language	c.Services setut	b.DHW elect. heater
b.Configuration	d.Auxiliary systems	c. Buffer elect. heater
c.Information	e.Remote control	d.Boiler

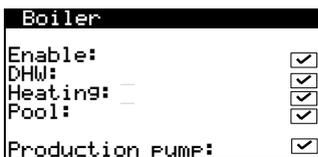


### Buffer resistor

1. Used to enable an auxiliary resistor installed inside the heating buffer resistor for SUPPORT or EMERGENCY.

**Note:** In the USER level, it must be enabled as SUPPORT and/or EMERGENCY for the heating service.

Installer menu 2/7	Configuration 4/7	Auxiliary systems 4/5
a.Change language	c.Services setut	c.Buffer elect. heater
b.Configuration	d.Auxiliary systems	d.Boiler
c.Information	e.Remote control	e.Chiller



### Boiler

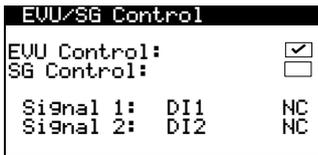
1. Used to enable an auxiliary external boiler for heating, DHW and/or pool services.
2. Used to enable / disable the production pump when the services are provided only with the boiler.

**Note:** In the USER level, its use must be enabled as SUPPORT and/or EMERGENCY for the heating, DHW and/or pool services.

**Note:** If it is enabled for DHW, it will also be used for the LEGIONELLA PROTECTION programs.

## 2.11. Configuration of remote control options

Installer menu 2/7	Configuration 5/7	Remote Control 1/3
a.Change language	d.Auxiliary system	a.EU/SG Control
b.Configuration	e.Remote control	b.Services Control
c.Information	f.Protections	c.BUS Control



**EVU/SG control**

1. Used to enable the EVU electrical consumption control. The EVU control prevents production of energy with the compressor or the auxiliary equipment. Circulator pumps, valves and other components can be activated to consume energy from the storage systems.
2. Used to enable the SG states control. If SG control is enabled, it is not possible to enabled the EVU control and vice versa. Depending on the value of the digital inputs, we distinguish four operating states SG:
  - **-SG1 [0 0] (Normal status):** The heat pump operates normally according to their configuration.
  - **-SG2 [0 1] (Reduced tariff):** We are in a reduced tariff period, so we will take advantage of the lower price of electricity to change heat pump setpoints and produce more heat and cold.
  - **-SG3 [1 0] (Locked status):** The heat pump sends a compressor lock signal to the heat pump, but production surpluses can still be used by activating or deactivating the non-critical loads configured.
  - **-SG4 [1 1] (Forced status):** The heat pump will force the maximum possible consumption in the installation to help balance the grid.

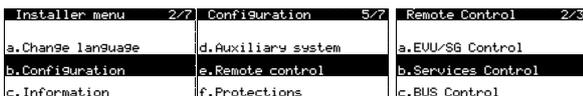
These external signals can be sent by the electric company itself to try to keep the distribution network balanced at any time.

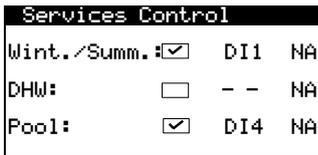
3. Used to select the desired digital input for EVU signals or SG signals.
4. Used to select the operation logic of the EVU / SG control.
  - a. NO: Closed contact to activate EVU control. SG control is a 0 with open contact.
  - b. NC: Open contact to activate EVU control. SG control is a 1 with open contact.



**SG2 Mode**

1. Used to adjust the temperature differential for each service on the heat pump setpoints, when the stat SG2 "Reduced tariff" is active.



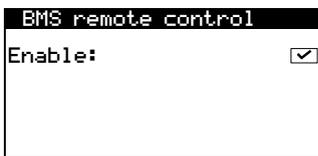
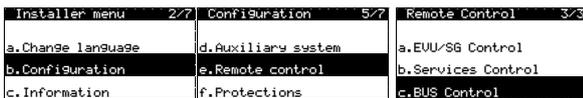


**Services control**

- Used to enable remote control of the SUMMER / WINTER program. Also allows select DI1 / DI2 / DI3 as digital input for winter / summer remote control. With SG mode and winter / summer remote control activated, it is not allowed select DHW remote control. Also used to select the program control operation logic.
  - NO: Closed contact to select WINTER, open contact to select SUMMER.
  - NC: Closed contact to select SUMMER, open contact to select WINTER.
- Used to enable remote control of DHW production. Also allows select DI1 / DI2 / DI3 as digital input for DHW remote control. With SG mode and DHW remote control activated, it is not allowed select winter / summer remote control. Used to select the DHW remote control operation logic.
  - NO: Closed contact to enable DHW production.
  - NC: Open contact to enable DHW production.
- Used to enable remote control of pool production. Used to select the pool remote control operation logic.
  - NO: Closed contact to enable pool production.
  - NC: Open contact to enable pool production.

**Note:** When DHW production is enabled, it will only start if there is a request according to the parameters established as USER and if there is no higher priority service with a request.

**Note:** When pool production is enabled, it will only start if there is a request according to the parameters established as USER and if there is no higher priority service with a request



**BMS remote control**

- Used to enable remote control via BMS or BMS / FBus2 communication ports through ModBus protocol.

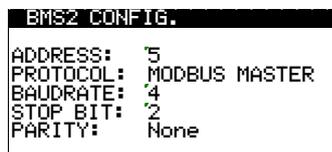
**Note:** To access the controller via the BMS or BMS2 ports, they must be configured as MODBUS SLAVE EXTENDED.



**BMS configuration**

- Used to assign the address of the BMS port.
- Used to configure the communication parameters via the BMS port.

**Note:** This port can be used to connect several expansion cards for communication that allow remote access to the controller through various protocols.

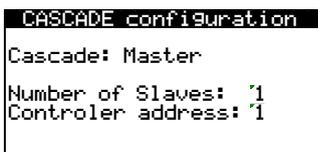


**BMS2 configuration**

- Used to assign the controller BMS2 port address.
- Used to configure the communication parameters via the BMS2 port.

**Note:** This port can be used to connect indoor bus terminals with MODBUS MASTER configuration.

**Note:** This port can be used to access the controller remotely with MODBUS SLAVE EXTENDED configuration.



**Configuración cascada**

- Used to enable / disable communication between controllers through the pLAN port.
- Used to select the number of slaves. Maximum 2.
- Used to assign the network address of the controller

**Note:** This port can be used to connect blocks of NETZERO heat pumps with parallel operation.

## 2.12. Protection configuration

Installer menu 2/7	Configuration 6/7
a.Change language	e.Remote control
b.Configuration	f.Protections
c.Information	g.Probe conf.

Compressor capacity		
	Min	Max
Heating:	25	100 %
Cooling:	25	100 %
DHW:	25	100 %
Pool:	25	100 %

### Limit compressor

- Used to limit the modulation range of the compressor for each production service. This option is used to adjust the range of thermal power supplied to the production circuit, absorbed in the source circuit or the electrical consumption of the heat pump.

Compressor capacity	
Consumption:	1.5kW
Heating:	19.7kW
Cooling:	15.5kW
DHW:	14.3kW
Pool:	18.0kW

### Limit compressor 2

- Used to limit the heat pump electrical consumption. And for each service, it limits the thermal capacity.

Pumps capacity		
	Min	Max
Brine:	30.0	89.1 %
Produc.:	30.0	87.4 %

### Limit pumps

- Used to limit the modulation range of the source and production circulation pumps. This option is used to adjust the flow of the source and production circuits.

Brine protection	
MaximumT:	40.0°C
MinimumT:	2.0°C
MinimumP:	0.5bar

### Source protection

- Used to adjust the maximum and minimum temperature of the source circuit. If any of the limit values are reached, the source temperature alarm is activated.
- Used to set the minimum pressure of the source circuit, under which the alarm is triggered.

**Danger:** The setting of the minimum source temperature is a very important parameter in the start-up of the equipment. A bad configuration of this value can lead to serious equipment damage due to freezing. The minimum source temperature must be at least 5°C higher than the freezing temperature of the fluid used. If you are not sure of the freezing temperature of the fluid used, check it with a refractometer.

Production protection	
MinimumT:	4.0°C
MinimumP:	0.5bar
Anti frost:	<input checked="" type="checkbox"/>

### Production protection

- Used to adjust the minimum production temperature in cooling mode. If the set temperature is reached, the compressor stops.
- Used to set the minimum pressure of the production circuit, under which the alarm is triggered.
- Used to adjust the anti-freeze protection of the production circuit. If the external temperature drops below 5°C, the circulation of the production circuit pumps is activated. If the temperature drops below 20°C in any part of the production circuit, the heat pump starts up.

**Danger:** The setting of the minimum production temperature is a very important parameter in the start-up of the equipment. A bad configuration of this value can lead to serious equipment damage due to freezing. The minimum production temperature must be at least 5°C higher than the freezing temperature of the fluid used. If you are not sure of the freezing temperature of the fluid used, check it with a refractometer.

Compressor delay	
Delay:	0 min

### Compressor delay

- Used to adjust the duration of the compressor switched on delay.

**Note:** The compressor switched on may experience extra delays due to automatic pre-start checks.

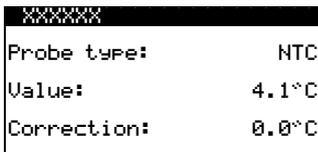
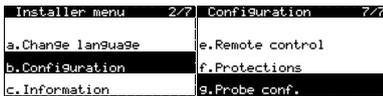


**Trial period**

- Used to enable the trial period. If it is enabled, the heat pump is locked after the established time.
- Used to adjust the duration of the trial period.

**Note:** The trial period must be disabled to unlock the heat pump.

**2.13. Probe configuration**

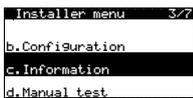


**XXXXXX**

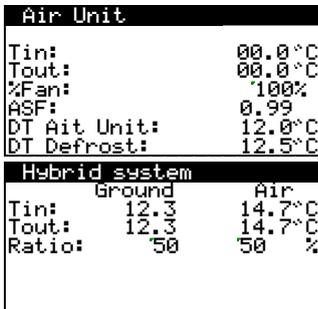
- Display the type of probe installed in each analogue input and their current value.
- Used to enter a correction of the probe readings.

**Note:** There are screens for all temperature and hydraulic pressure probes and for the external temperature probe.

**2.14. Technical information menu**



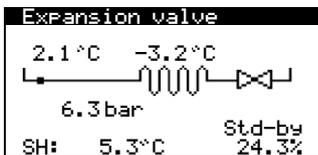
You can find the same user menu information screens (see point 1.15) as well as those shown below:



**Hybrid / Heat Unit System**

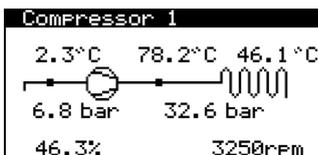
In hybrid source systems (geothermal-aerothermal), it displays the inlet and return temperatures and the percentage of energy absorption in each source system. It also displays the air-antifreeze temperature difference, the aerothermal operation factor (ASF) and the estimated setpoint for the defrost program to start up.

In exclusively aerothermal source systems, it only displays aerothermal information.



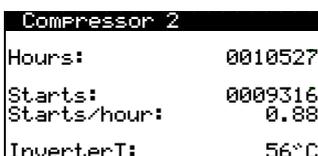
**Expansion valve**

This displays the current parameters of evaporator operation and the expansion valve.



**Compressor 1**

This shows the parameters of compressor and condenser operation.



**Compressor 2**

This displays the registry of compressor hours of operation, number of start-ups and start-up/hour ratios.

It also shows the current temperature of the compressor inverter.

```

AI Values
AI1: 16.3 AI8: 29.8
AI2: 9.0 AI9: 1.4
AI3: 20.0 AI10: 26.5
AI4: 11.4 AI11: 19.9
AI5: 14.6 AI12: 19.5
AI6: 1.1 AI13: 23.8
AI7: 30.8 AI14: 27.3
    
```

**AI Values**

This shows the current measured value at all analog inputs.

```

DI Status
DI1: On DI8: On
DI2: Off DI9: Off
DI3: Off DI10: Off
DI4: On DI11: Off
DI5: On DI12: On
DI6: Off
DI7: Off
    
```

**DI Status**

This shows the current status of all digital inputs.

```

AO signals
AO1: 100.0
AO2: 87.4
AO3: 56.9
AO4: 32.9
AO5: 46.5
AO6: 0.0
    
```

**AO Signals**

This shows the current status of all analog outputs.

```

DO Status
DO1: Off DO8: On
DO2: Off DO9: On
DO3: On DO10: Off
DO4: On DO11: Off
DO5: On DO12: On
DO6: Off DO13: Off
DO7: Off DO14: Off
    
```

**DO Signals**

This shows the current status of all digital outputs.

### 2.15. Manual activation of components

```

Installer menu 4/2
b.Configuration
c.Information
d.Manual test
    
```

```

XXXXXX
State: On
Regulation: 100.0%
    
```

**XXXXXX**

1. Used to activate the various components controlled by the heat pump manually, both internal and external.
2. For components with modulating control, used to adjust different regulation values manually.

### 2.16. Alarm log

```

Installer menu 5/2
d.Manual test
e.Alarm log
f.Default values
    
```

```

Log alarms
Press ENTER to
view LOG ALARMS
    
```

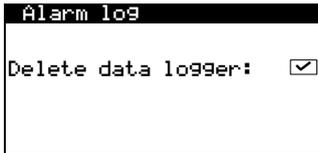
**Alarm log**

The heat pump stores the information from the last 50 alarms.

From this screen, press  to access the alarm log.

```

N*001 03:04 06/12/14
Brine low pressure
Out: 00.0 00.0 °C
In: 00.0 00.0 °C
RP: 00.0 00.0 bar
%: 00.0 00.0 %
Code: 0 2058
    
```



**Alarm log**

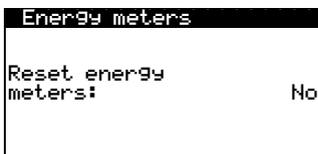
1. Used to delete the alarm history log.

**2.17. Default values**



**Initialization**

1. Used to delete the settings in the USER and INSTALLER menus and restore default factory settings.



**Delete counters**

1. Used to delete the energy counter history log.



**Configure inverter**

1. Used to configure the compressor inverter. Performed automatically after starting the configuration.

**Note:** This option is only available for heat pumps with Danfoss compressors.

**2.18. Change password**



**New password**

1. Used to change the password to access the INSTALLER menu (PW1).

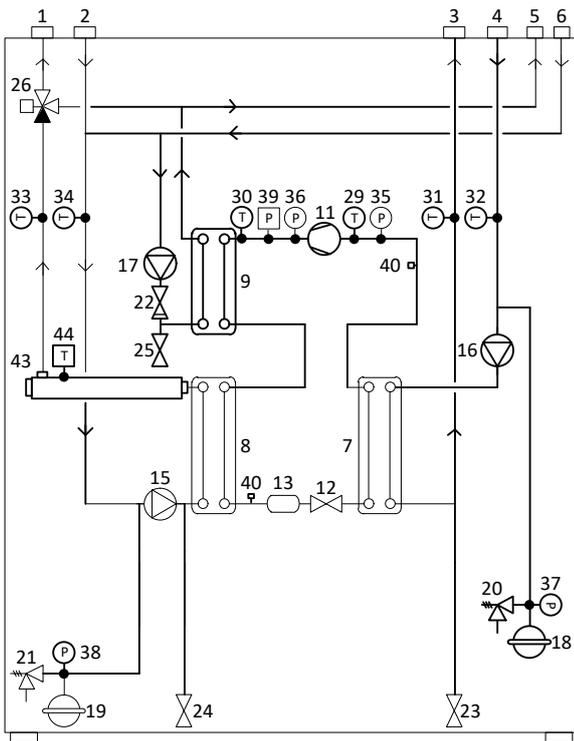
### 3. Technical specifications NETZERO BW | NETZERO CW

#### 3.1. Component location

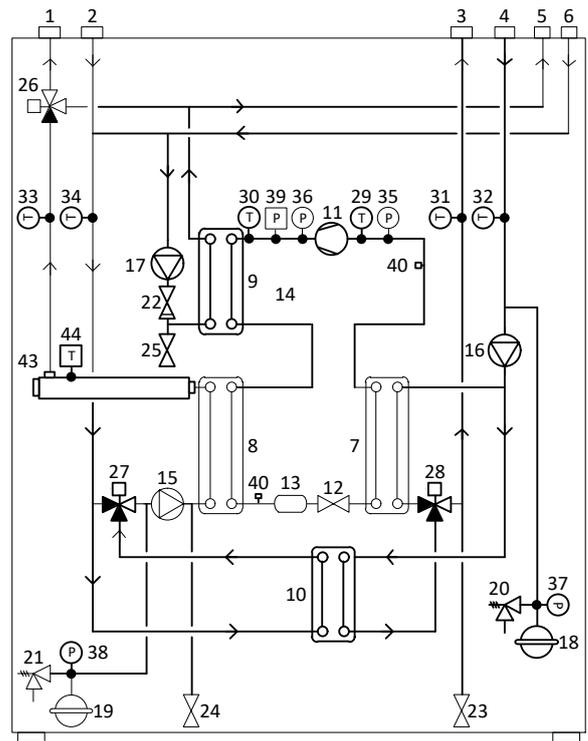
No.	Description	No.	Description
1	Production outlet	28	Passive cooling source valve
2	Production return	29	Compressor suction temp. probe
3	Source outlet	30	Compressor discharge temp. probe
4	Source inlet	31	Source outlet temp. probe
5	DHW inter-accumulator outlet	32	Source inlet temp. probe
6	DHW inter-accumulator inlet	33	Production outlet temp. probe
7	Evaporator (direct cycle)	34	Production inlet temp. probe
8	Condenser (direct cycle)	35	Suction pressure transducer
9	HTR system exchanger	36	Discharge pressure transducer
10	Passive cooling / defrosting exchanger	37	Source pressure transducer
11	Compressor	38	Production pressure transducer
12	Electronic expansion valve	39	Discharge mini- pressure switch
13	Filter dryer	40	Service outlet
14	Cycle inversion valve	41	Cooling outlet inverter
15	Production circulator pump	42	Cooling inlet inverter
16	Source circulator pump	43	Outlet resistor
17	HTR circulator pump	44	Safety thermostat
18	Source expansion vessel	45	Electrical panel
19	Production expansion vessel	46	Tap water inlet
20	Source safety valve	47	DHW outlet
21	Production safety valve	48	DHW Recirculation
22	HTR system retention valve	49	DHW storage tank
23	Source drain valve	50	DHW coil
24	Production discharge valve	51	Manual trap
25	HTR system discharge valve	52	Storage tank drain valve
26	DHW valve	53	DHW temperature probe
27	Passive cooling production valve		

EN

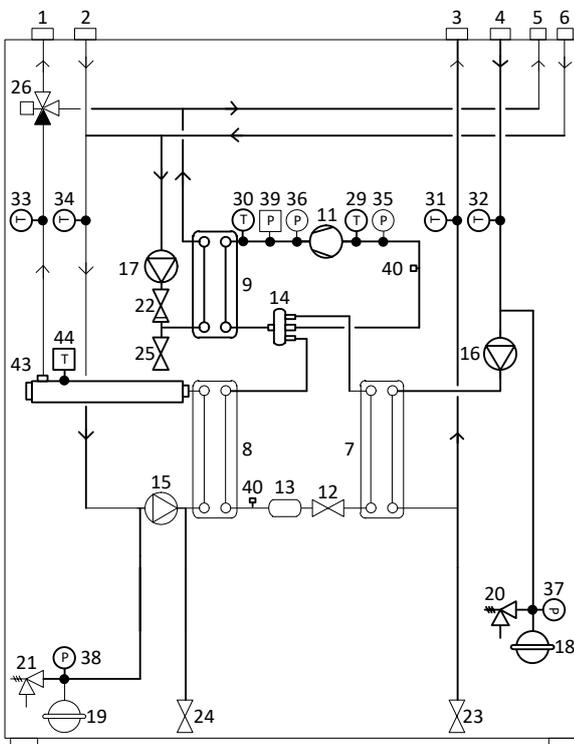
NETZERO BW H B



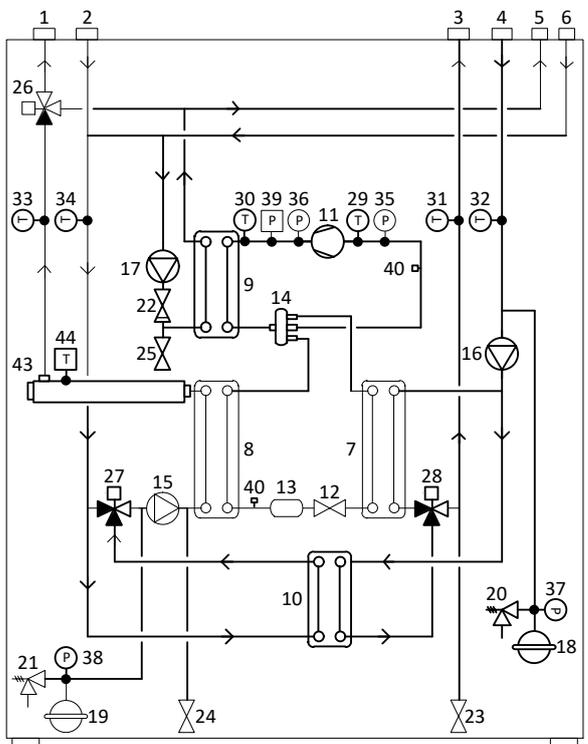
NETZERO BW P B



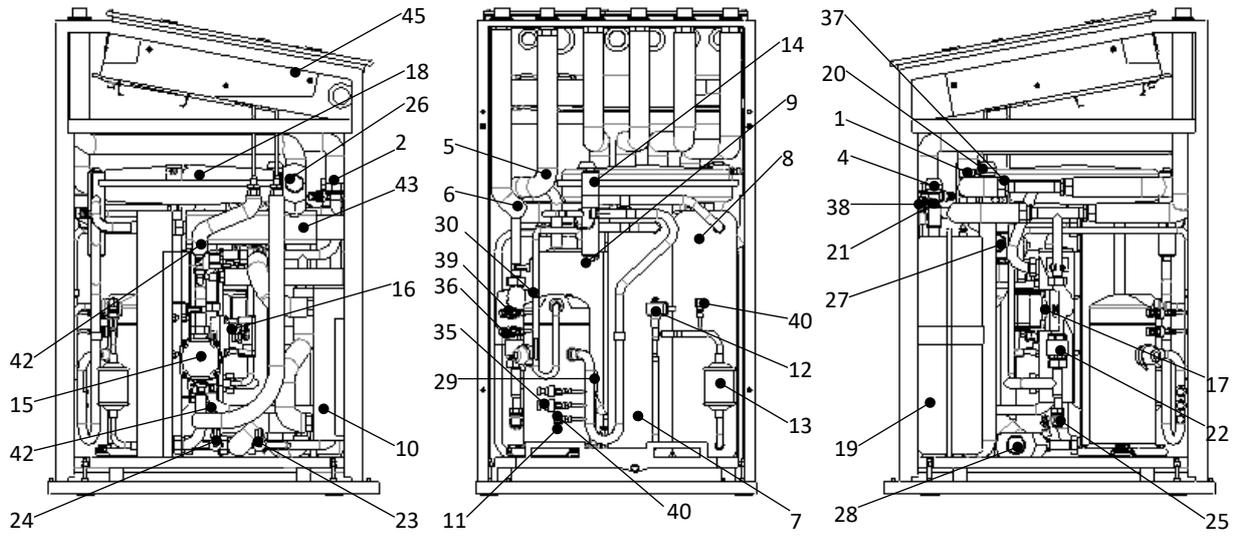
NETZERO BW R B



NETZERO BW B B



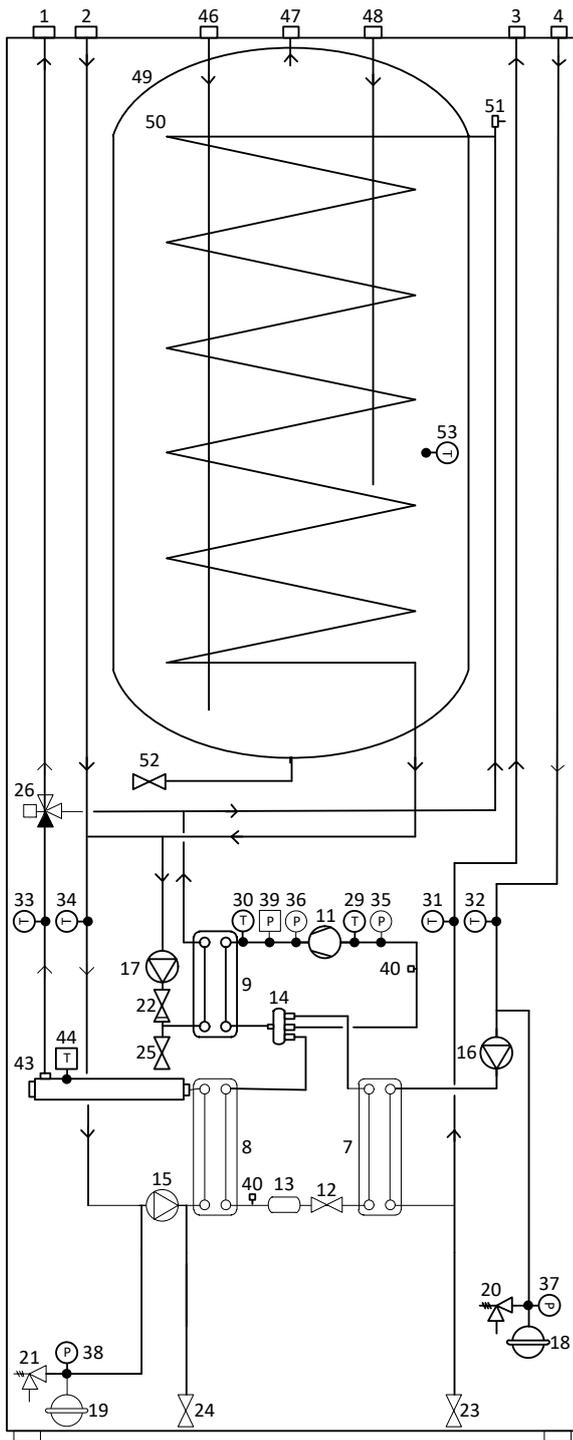
NETZERO BW



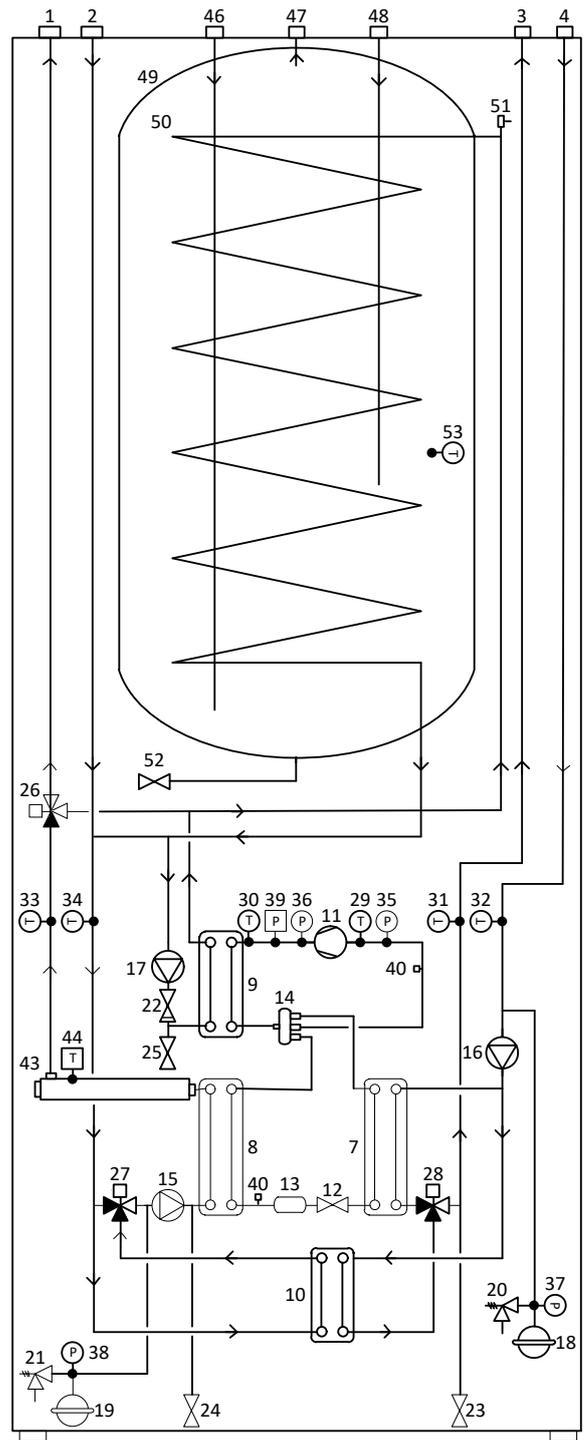
EN



NETZERO CW R B



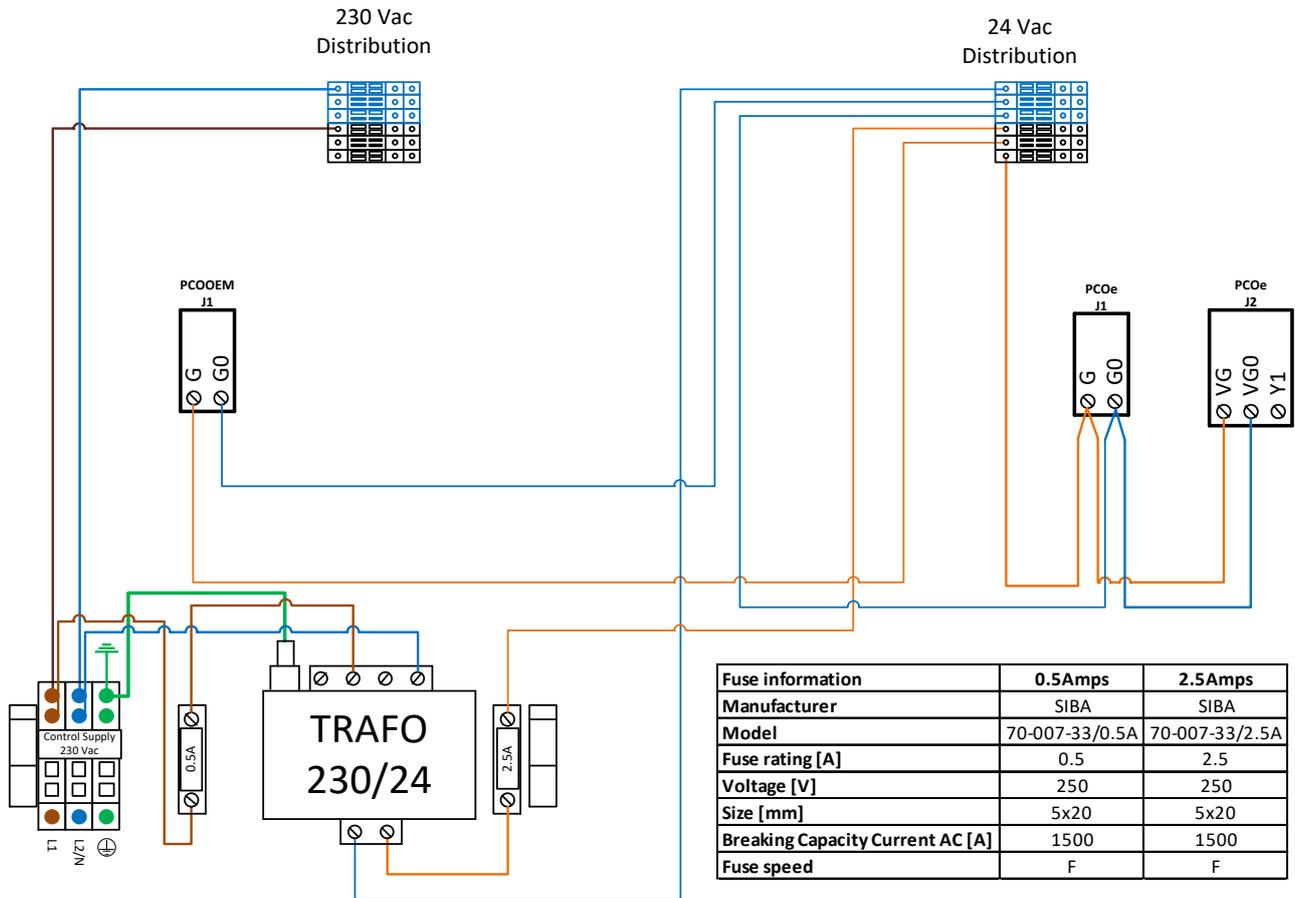
NETZERO CW B B





### 3.2. Power circuit diagram

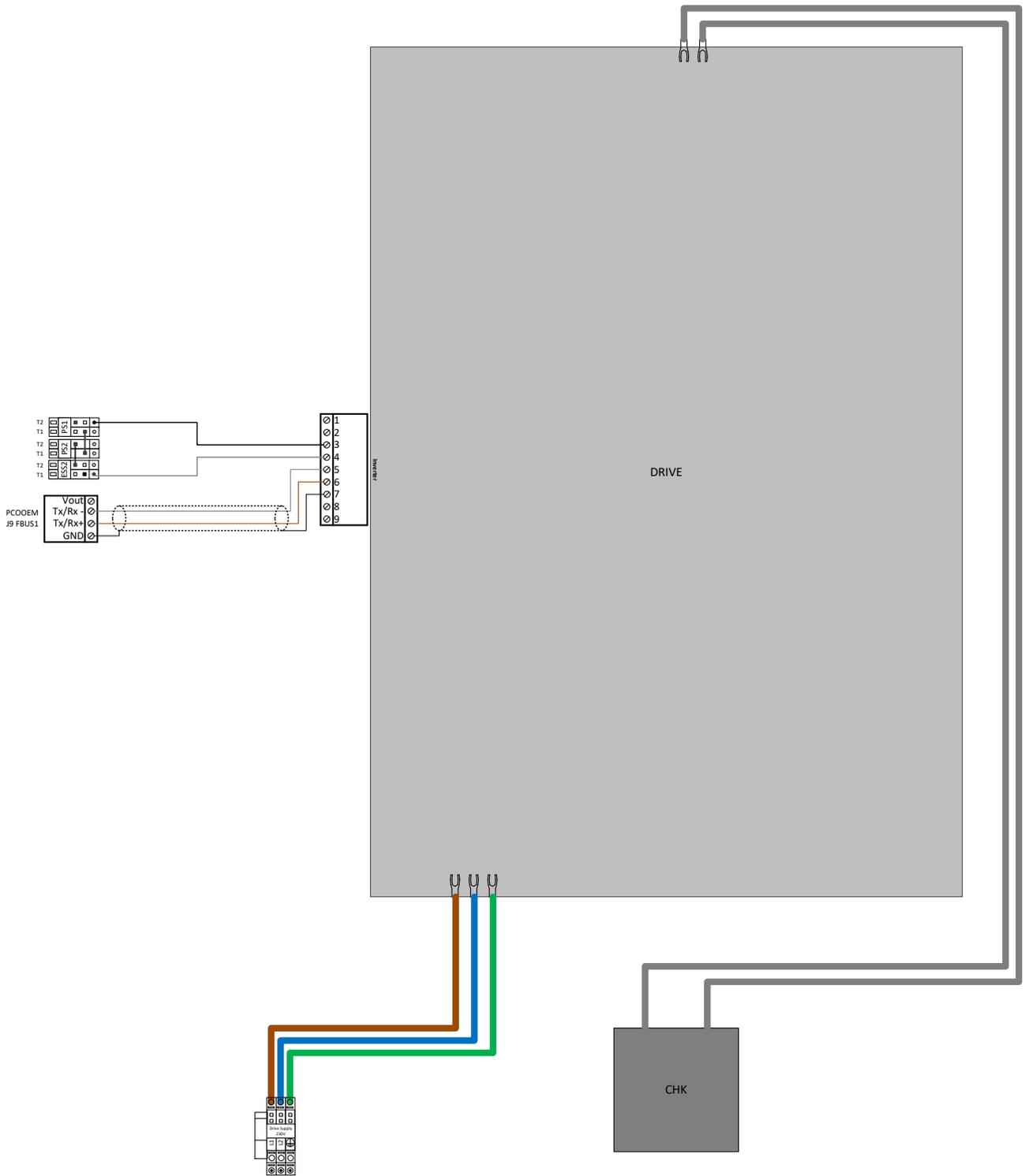
NETZERO. All models.



EN

NETZERO. Single phase models.

EN



### 3.3. Electrical connection tables

ANALOGUE INPUTS			
CONNECTIONS		DESCRIPTION	
Connection terminal	Controller terminal	Type	Signal
Block I / AI1	pCOOEM+ / J2 / U1	NTC 10K 25°C	Compressor suction temperature
Block I / AI2	pCOOEM+ / J2 / U2	Radiometer 0-5Vdc	Compressor suction pressure
Block I / AI3	pCOOEM+ / J2 / U3	Radiometer 0-5Vdc	Compressor discharge pressure
Block I / AI4	pCOOEM+ / J3 / U4	NTC 10K 25°C	Source outlet temperature
Block I / AI5	pCOOEM+ / J3 / U5	NTC 10K 25°C	Source inlet temperature
Block I / AI6	pCOOEM+ / J4 / U6	Radiometer 0-5Vdc	Source circuit pressure
Block I / AI7	pCOOEM+ / J4 / U7	NTC 10K 25°C	Production outlet temperature
Block I / AI8	pCOOEM+ / J5 / U8	NTC 10K 25°C	Production inlet temperature
Block I / AI9	pCOOEM+ / J5 / U9	Radiometer 0-5Vdc	Production circuit pressure
Block I / AI10	pCOOEM+ / J5 / U10	NTC 10K 25°C	DHW inter-accumulator temperature
Block I / AI11	pCOOEM+ / J26 / U11	NTC 50K 25°C	Compressor discharge temperature
Block I / AI12	pCOOEM+ / J26 / U12	NTC 10K 25°C	Mixture group 2 temperature
Block I / AI13	pCOe / J9 / B1	NTC 10K 25°C	Mixture group 3 temperature
Block I / AI14	pCOe / J9 / B1	NTC 10K 25°C	Mixture group 4 temperature
Block I / AI15	pCOe / J10 / B3	NTC 10K 25°C	Heating buffer temperature
Block I / AI16	pCOe / J10 / B4	NTC 10K 25°C	Cooling buffer temperature

DIGITAL INPUTS			
CONNECTIONS		DESCRIPTION	
Connection terminal	Controller terminal	Type	Signal
Block II / DI1	pCOOEM+ / J7 / DI1	Voltage-free (0V)	EVU / SG / WINTER-SUMMER / DHW
Block II / DI2	pCOOEM+ / J7 / DI2	Voltage-free (0V)	EVU / SG / WINTER-SUMMER / DHW
Block II / DI3	pCOOEM+ / J7 / DI3	Voltage-free (0V)	EVU / SG / WINTER-SUMMER / DHW
Block II / DI4	pCOOEM+ / J7 / DI4	Voltage-free (0V)	Pool production
Block II / DI5	pCOOEM+ / J25 / DI7	24Vdc / 24Vac	DG1 heating request
Block II / DI6	pCOOEM+ / J25 / DI8	24Vdc / 24Vac	DG1 cooling request
Block II / DI7	pCOOEM+ / J26 / DI9	24Vdc / 24Vac	SG2 heating request
Block II / DI8	pCOOEM+ / J26 / DI10	24Vdc / 24Vac	SG2 cooling request
Block II / DI9	pCOe / J4 / DI1	24Vdc / 24Vac	SG3 heating request
Block II / DI10	pCOe / J4 / DI2	24Vdc / 24Vac	SG3 cooling request
Block II / DI11	pCOe / J4 / DI3	24Vdc / 24Vac	SG4 heating request
Block II / DI12	pCOe / J4 / DI4	24Vdc / 24Vac	SG4 cooling request

ANALOGUE OUTPUTS			
CONNECTIONS		DESCRIPTION	
Connection terminal	Controller terminal	Type	Signal
Block II / AO1	pCOOEM+ / J6 / Y1	PWM	Source pump adjustment
Block II / AO2	pCOOEM+ / J6 / Y2	PWM	Production pump adjustment
Block II / AO3	pCOOEM+ / J6 / Y3	0-10Vdc	Regulation of mixture group 2
Block II / AO4	pCOOEM+ / J26 / Y4	0-10Vdc	Regulation of mixture group 3
Block II / AO5	pCOOEM+ / J26 / Y5	0-10Vdc	Regulation of mixture group 4
Block II / AO6	pCOe / J2 / Y1	0-10Vdc	Ground-water valve regulation

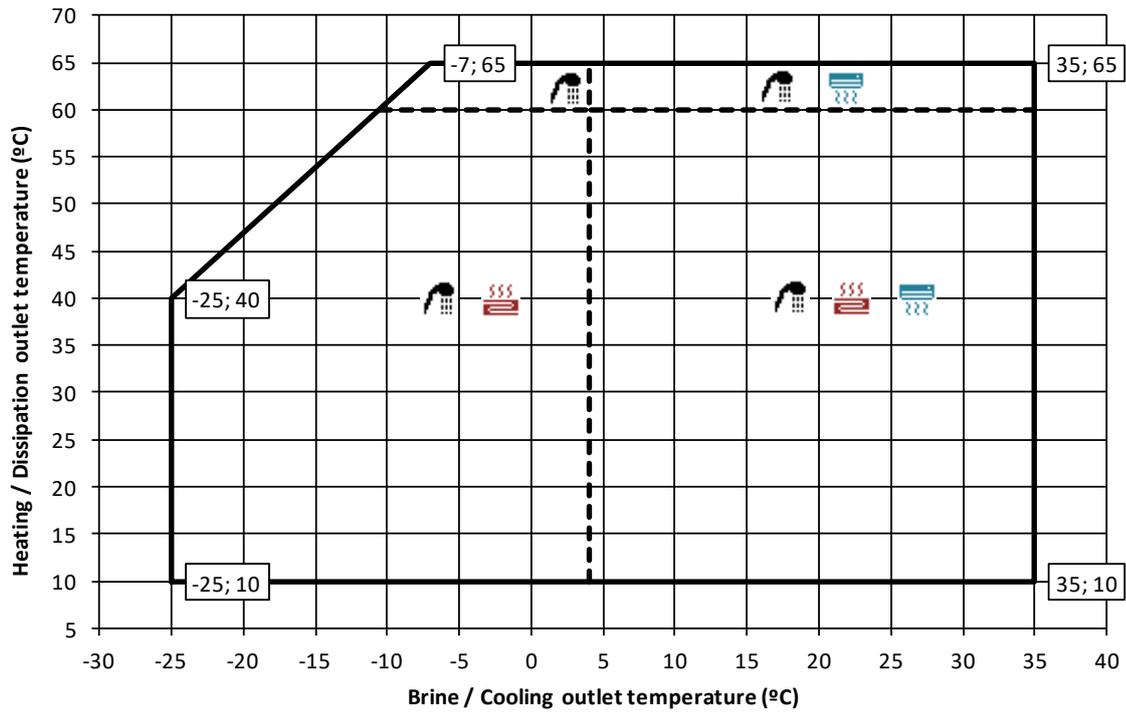
DIGITAL OUTPUTS			
CONNECTIONS		DESCRIPTION	
Connection terminal	Controller terminal	Type	Signal
Block III / DO1	pCOOEM+ / J16 / NO1-NC1	Activation 24Vac / 1A max	Passive cooling production
Block III / DO2	pCOOEM+ / J27 / NO9-NC9	Activation 24Vac / 2A max	Pool production
Block III / DO3	pCOOEM+ / J27 / NO10-NC10	Activation 24Vac / 2A max	DHW production
Block III / DO4	pCOOEM+ / J28 / NO11	Activation 230Vac / 2A max	DHW Recirculation
Block III / DO5	pCOOEM+ / J28 / NO12	Activation 230Vac / 2A max	DG1 group production
Block III / DO6	pCOOEM+ / J28 / NO13	Activation 230Vac / 2A max	SG2 group production
Block III / DO7	pCOOEM+ / J22 / NO6	Activation 230Vac / 2A max	HTR system production
Block III / DO8	pCOOEM+ / J23 / NO7	Activation 230Vac / 2A max	Compressor + circulator activation
Block III / DO9	pCOOEM+ / J24 / NO8	Activation 230Vac / 2A max	Alarm signal
Block IV / DO10	pCOOEM+ / J17 / Out2	Activation 230Vac / 1A max	Buffer storage tank resistor / Internal resistor
Block IV / DO11	pCOOEM+ / J18 / Out3	Activation 230Vac / 2A max	DHW inter-accumulator resistor
Block IV / DO12	pCOOEM+ / J19 / Out4	Activation 230Vac / 2A max	Heating / cooling consumption
Block IV / DO13	pCOOEM+ / J20 / Out5	Activation 230Vac / 2A max	Active cooling production
Block IV / DO14	pCOe / J5 / NO1	Activation 230Vac / 2A max	SG3 group production
Block IV / DO15	pCOe / J6 / NO2	Activation 230Vac / 2A max	SG4 group production
Block IV / DO16	pCOe / J7 / NO3NC3	Activation 230Vac / 2A max	Air source
Block IV / DO17	pCOe / J8 / NC3	Activation 230Vac / 2A max	Geothermal source

PROTECTIONS			
CONNECTIONS		DESCRIPTION	
Connection terminal	Controller terminal	Type	Signal
Block III / PS	Inverter / 3	Safety switch	High pressure switch
Block III / ESS	Inverter / 4	Safety switch	External safety switch

COMMUNICATIONS			
CONNECTIONS		DESCRIPTION	
Serial port	Controller terminal	Type	Signal
pLAN	pCOOEM+ / J15 Phone connector	RJ11	Controller screen
	pCOOEM+ / J14 Plug-in connector	RS485 Modbus RTU	Controller network connector
FBus	pCOOEM+ / J9	RS485 ModBus RTU	Compressor inverter
FBus2	pCOOEM+ / J29	RS485 ModBus RTU	Outdoor bus terminals Expansion module pCOe Outside temperature probe
BMS Card	pCOOEM+ / J13	RS485 ModBus RTU	Connector for remote access communication cards
BMS2	pCOOEM+ / J11	RS485 ModBus RTU	Remote access through bus Remote outside temperature probe
Expansion valve	pCOOEM+ / J12	Stepper motor	Unipolar valve control

### 3.4. Operation map

NETZERO 9 kW / NETZERO 12 kW / NETZERO 22 kW



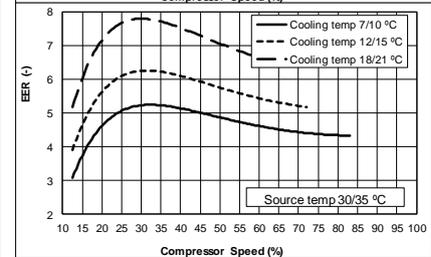
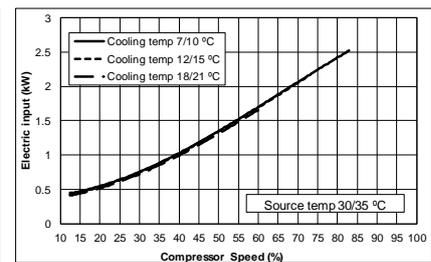
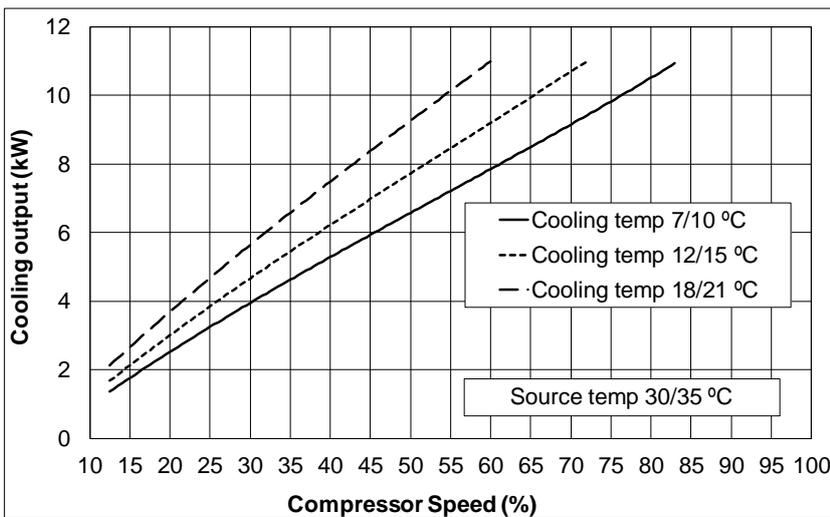
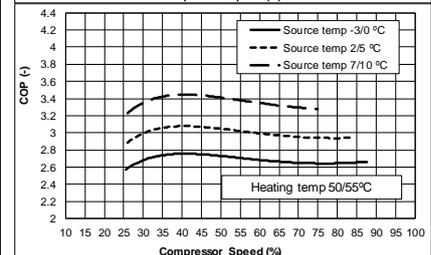
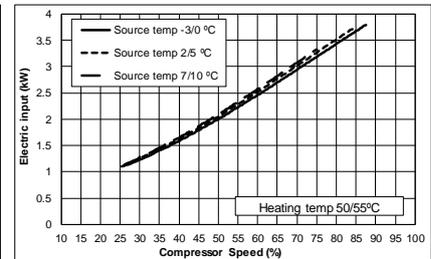
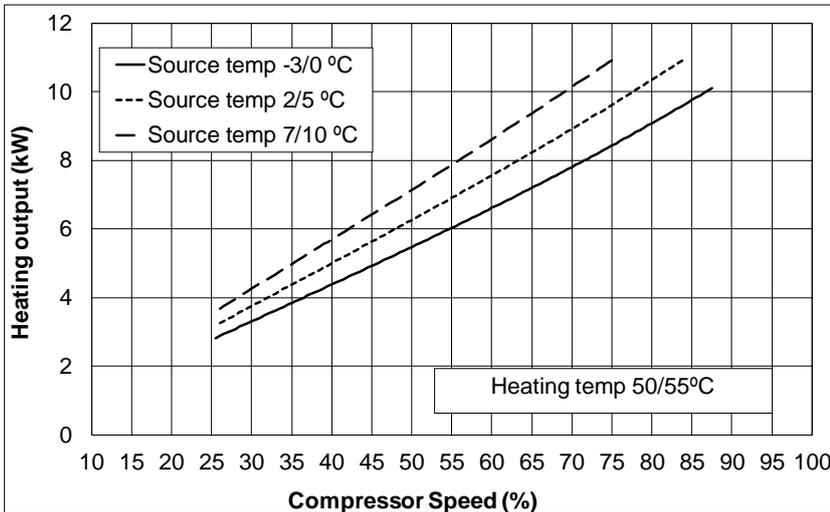
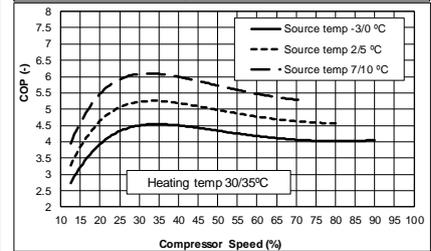
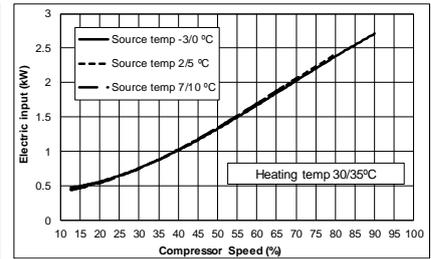
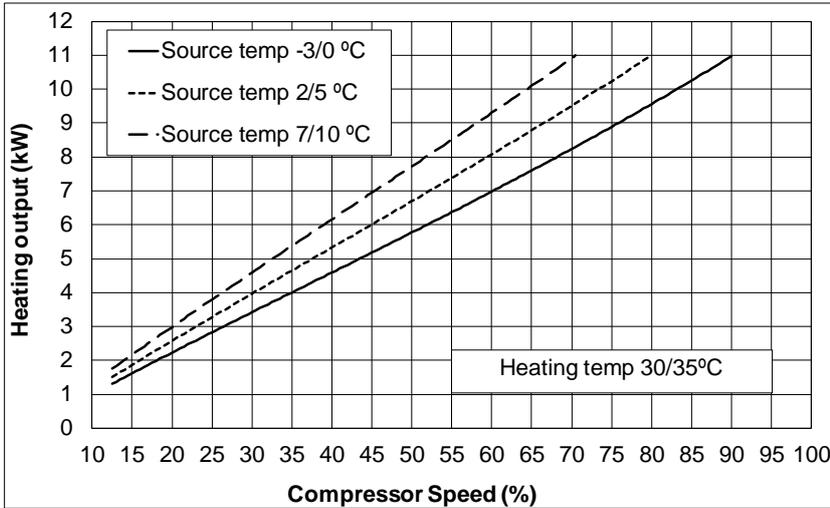
NOTE

- Maximum speed of compressor is not able in all the areas of the operation map.

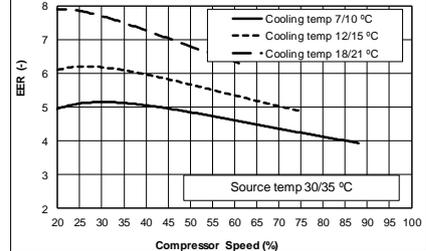
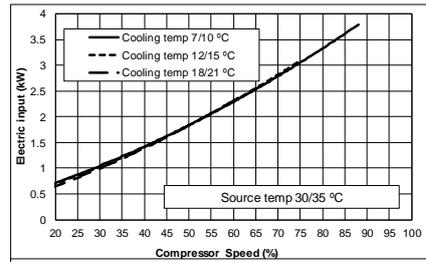
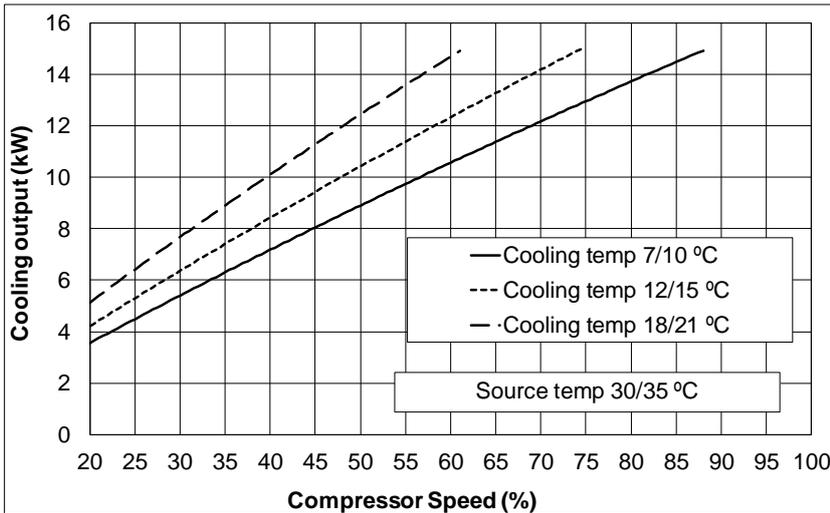
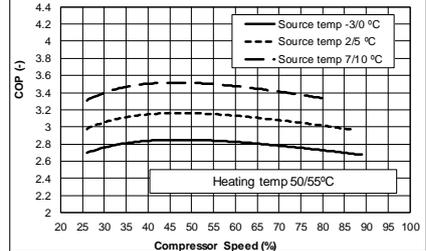
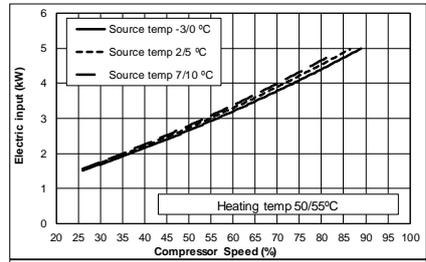
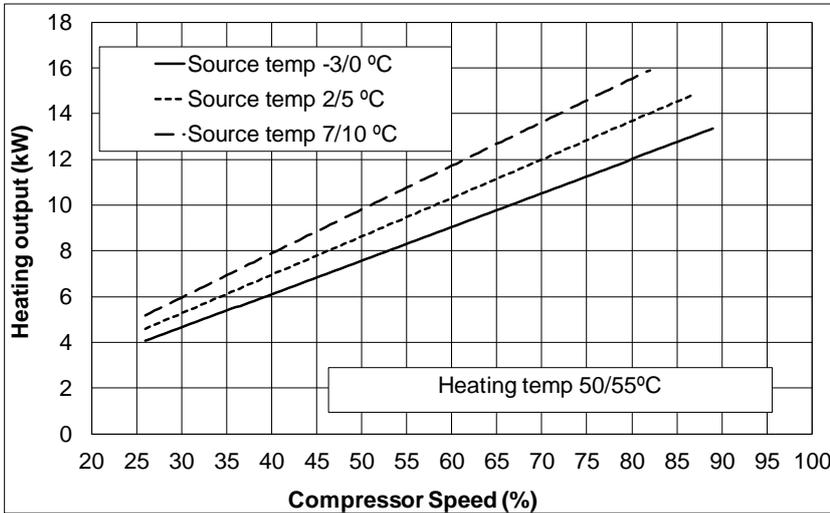
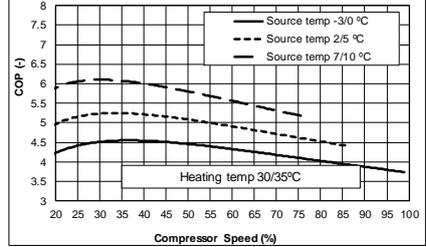
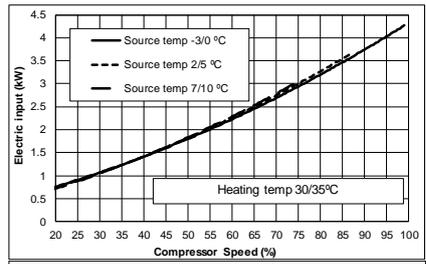
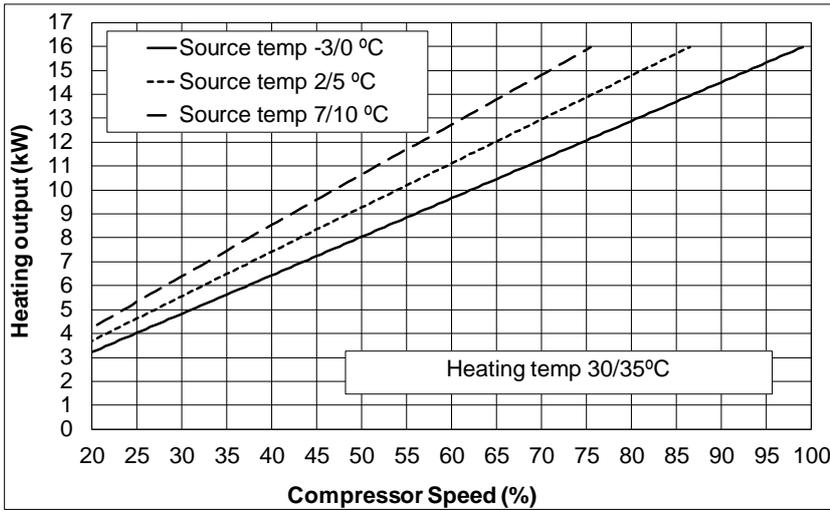
### 3.5. Operation curves

NETZERO 1-9

EN

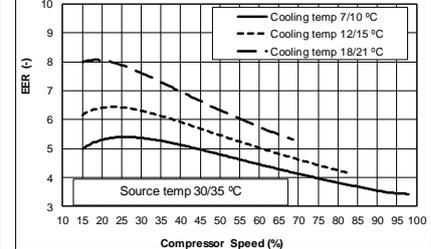
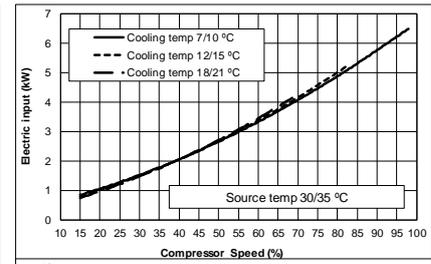
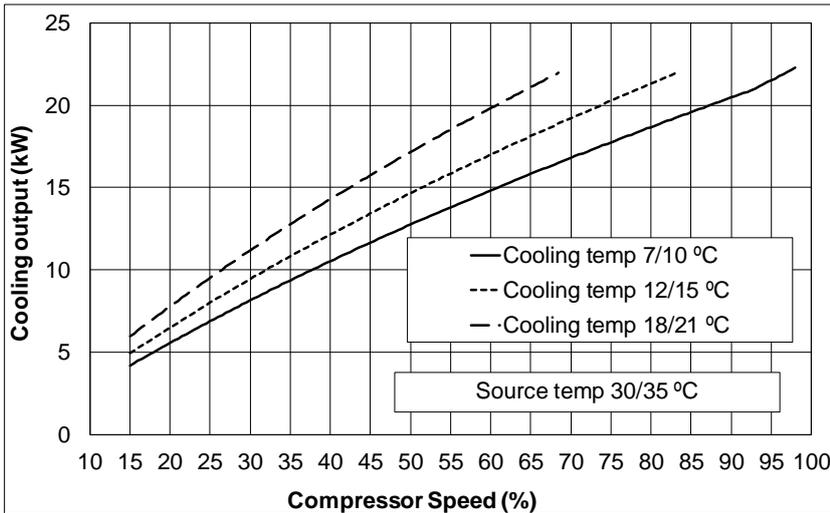
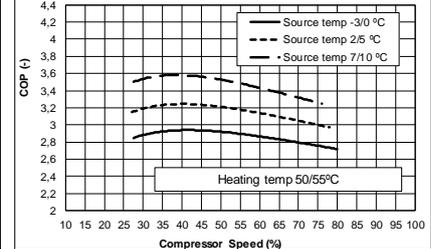
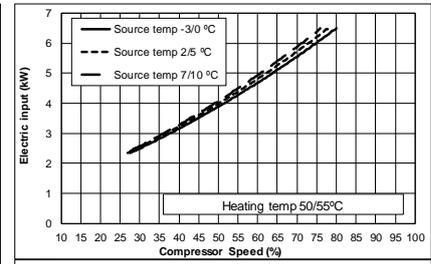
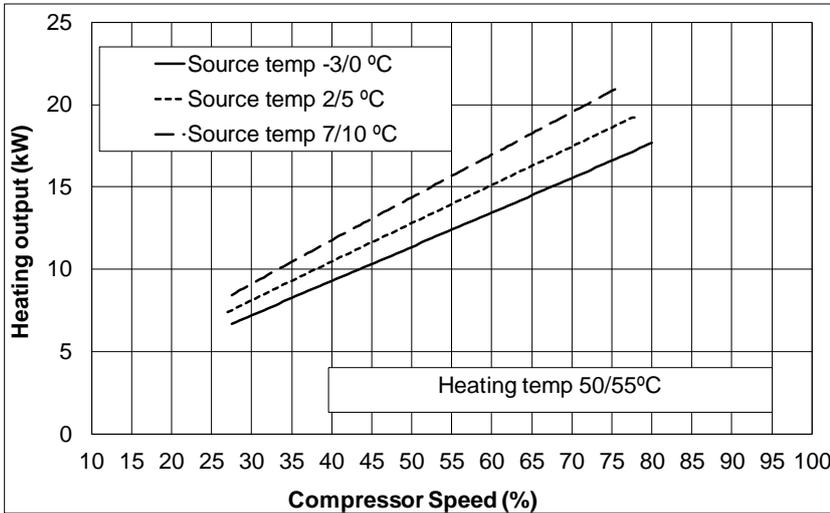
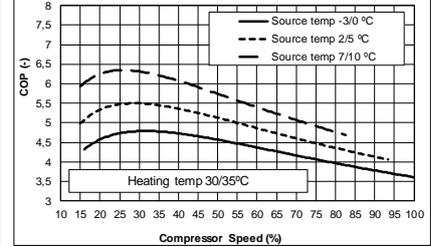
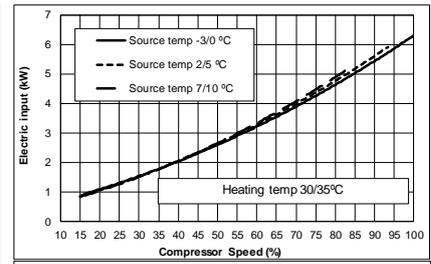
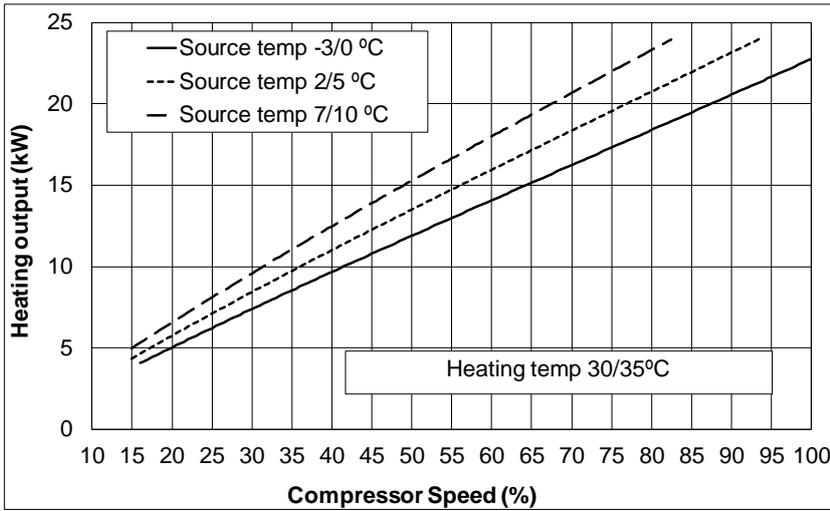


NETZERO 3-12

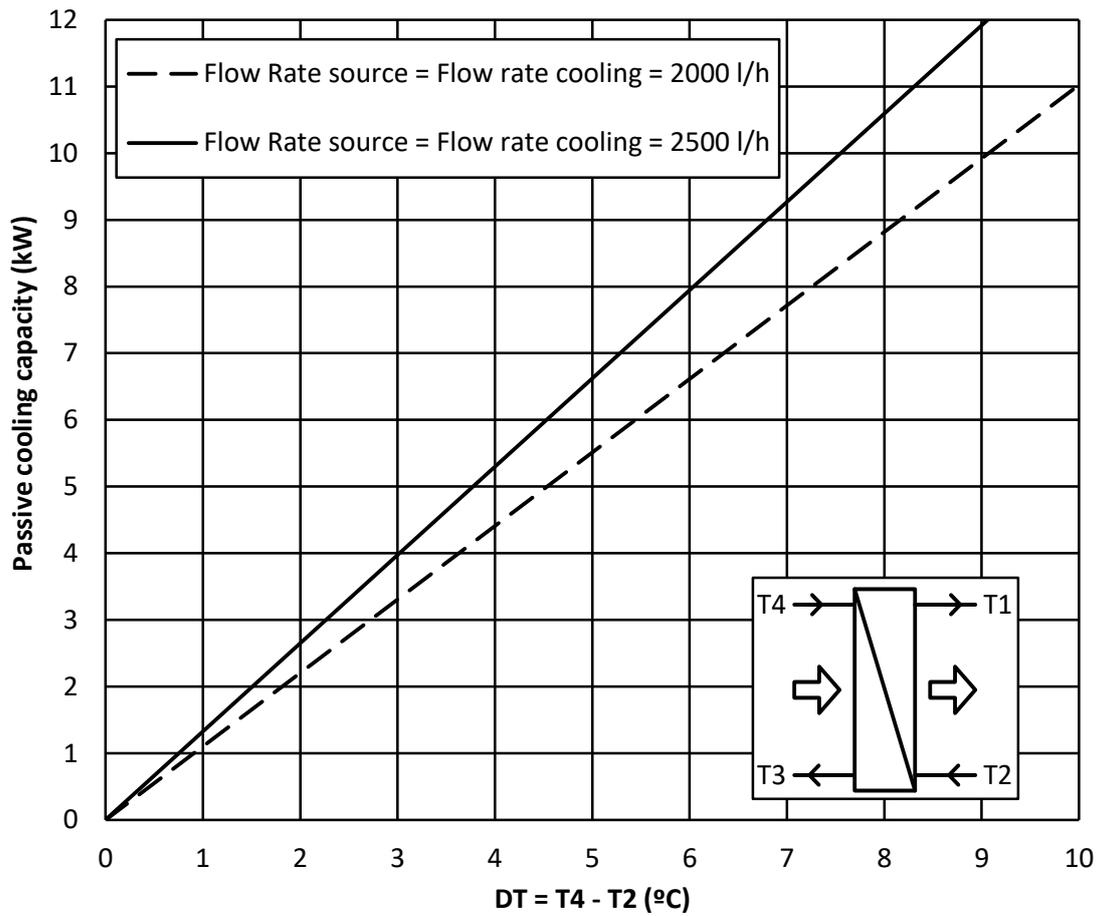


NETZERO 5-22

EN



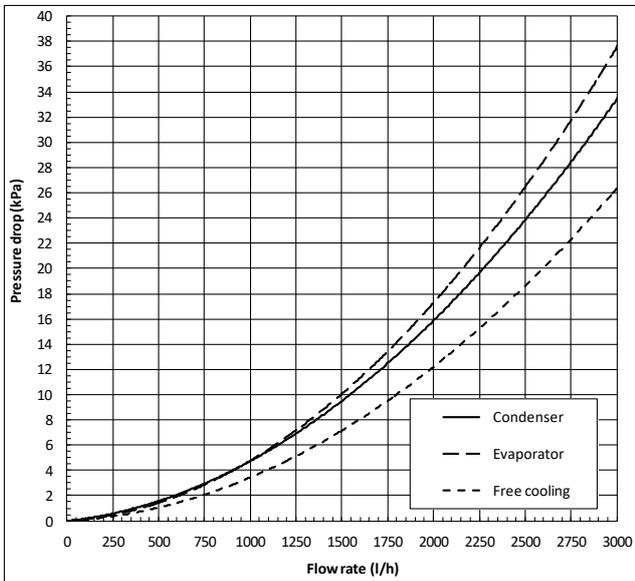
NETZERO BW P / NETZERO BW B / NETZERO CW P / NETZERO CW B



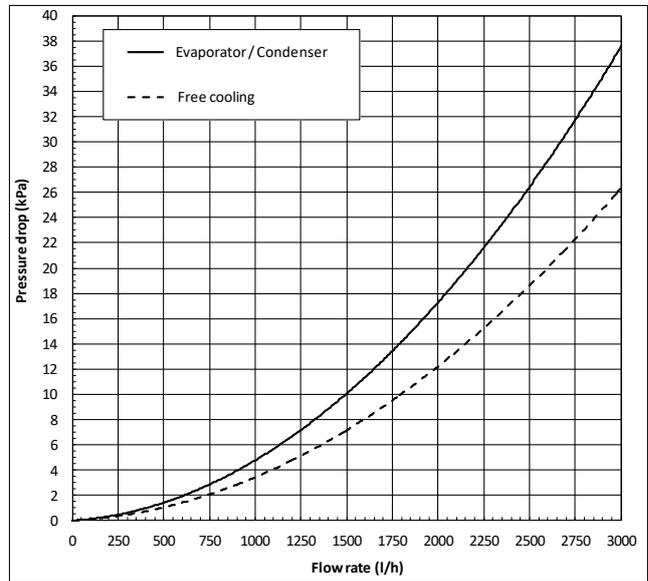
EN

### 3.6. Load losses

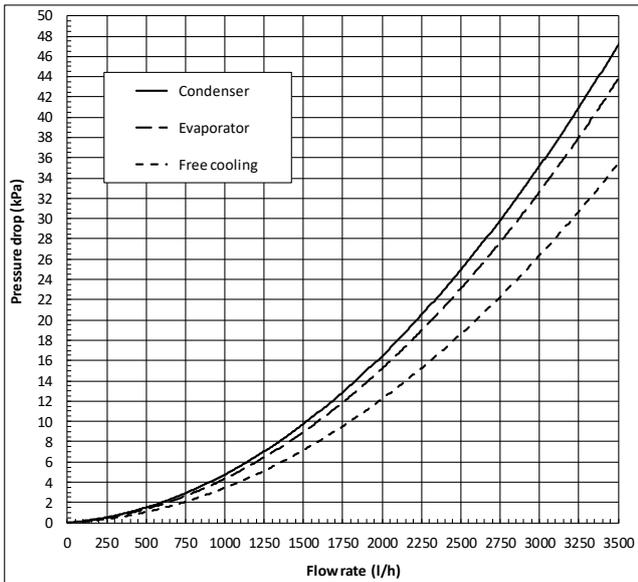
NETZERO 9 kW 2 BW/CW H/P



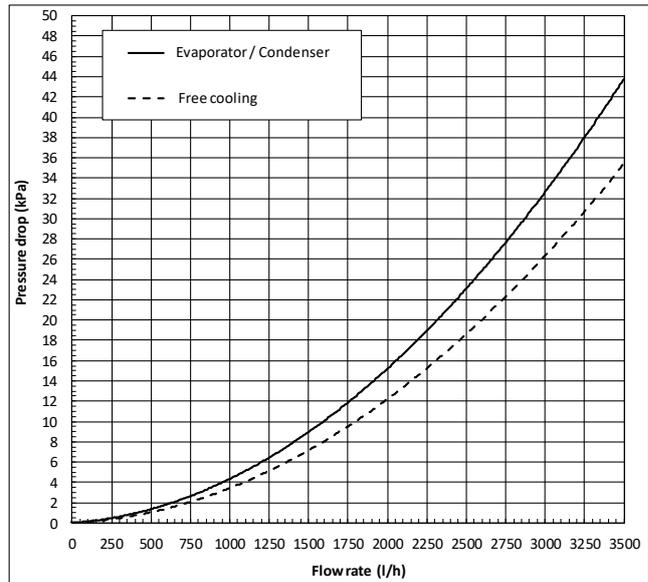
NETZERO 9 kW 2 BW/CW R/B



NETZERO 12 kW 2 BW/CW H/P

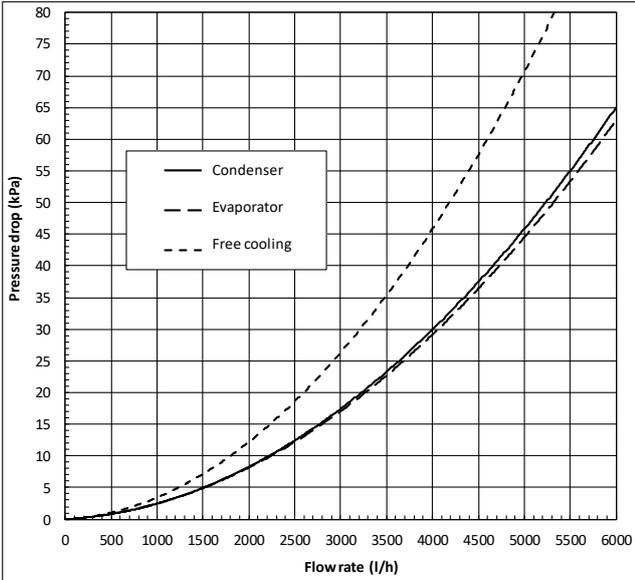


NETZERO 12 kW 2 BW/CW R/B

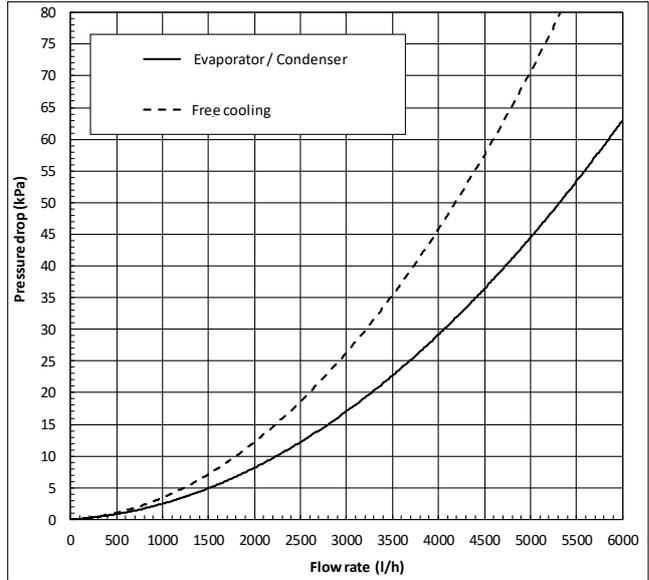


EN

NETZERO 22 kW 2 BW/CW H/P

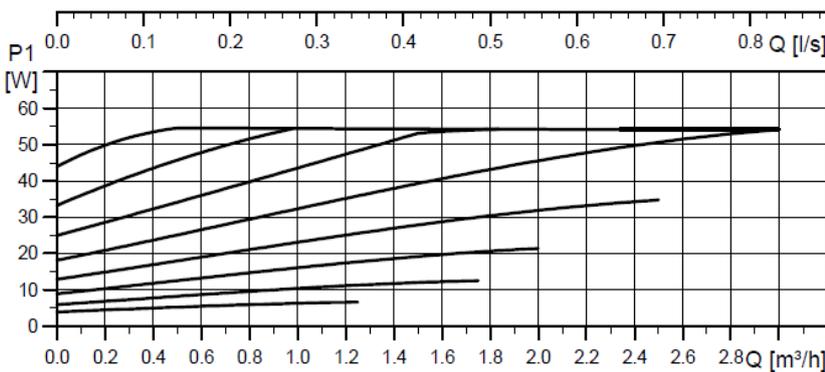
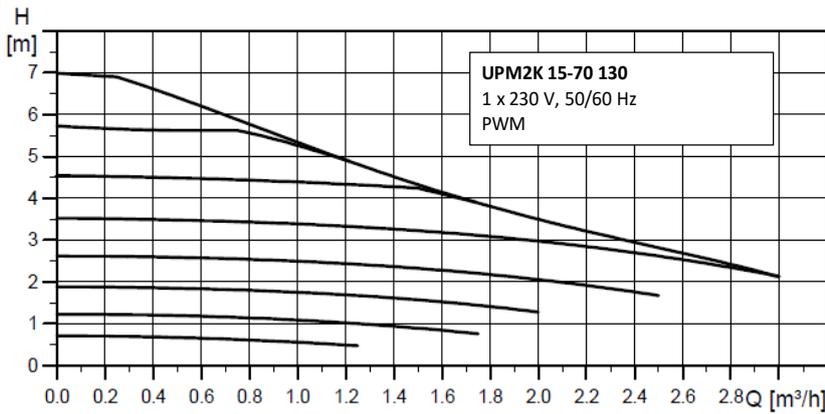


NETZERO 22 kW 2 BW/CW R/B

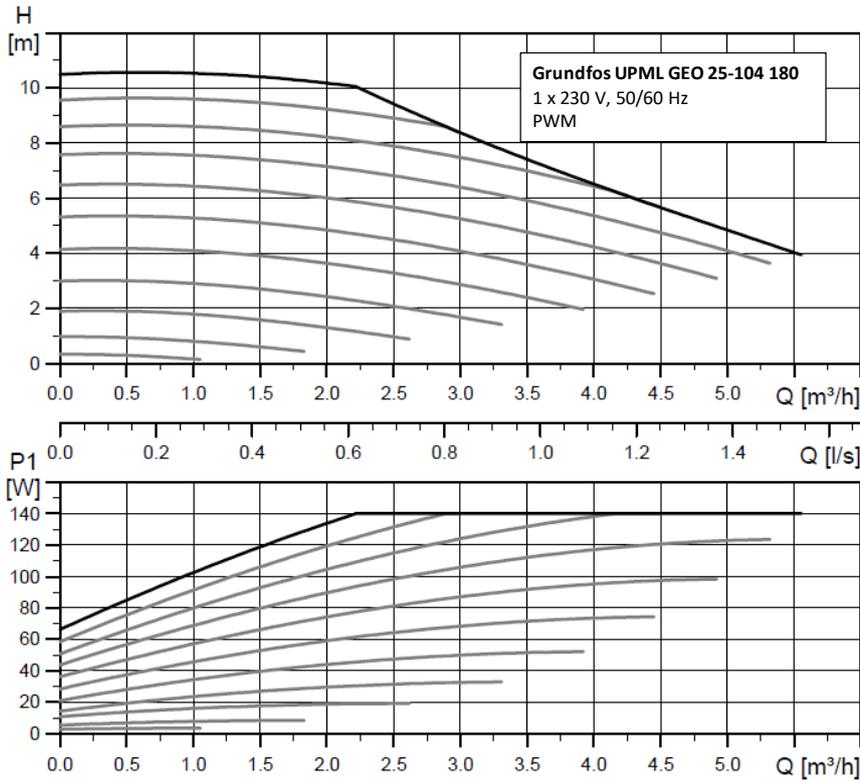


### 3.7. Source circulation pump

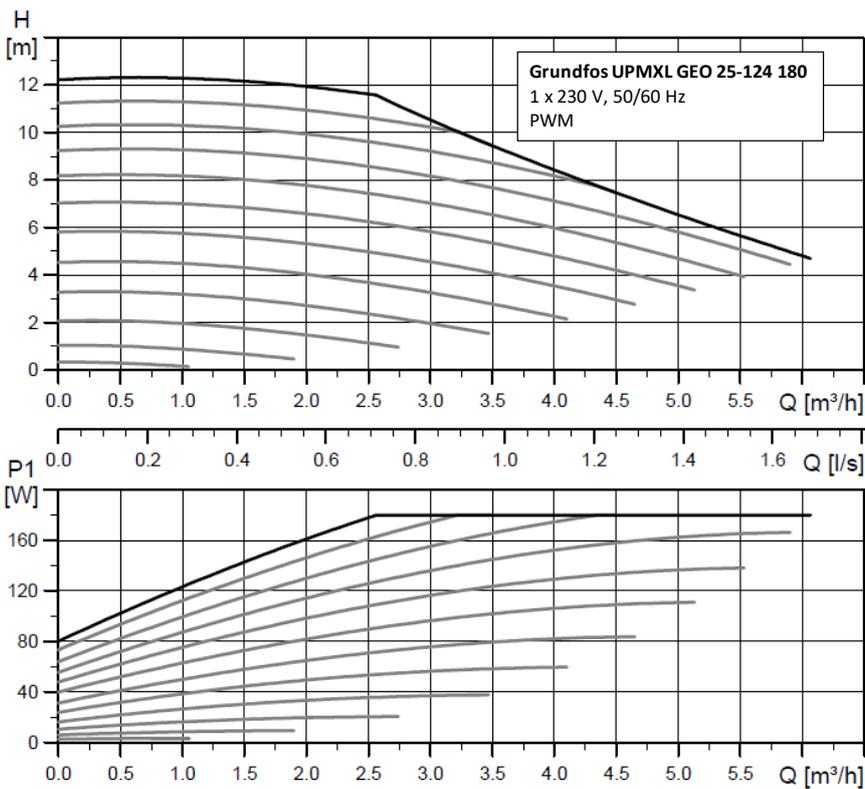
NETZERO 9 kW



**NETZERO 12 kW**

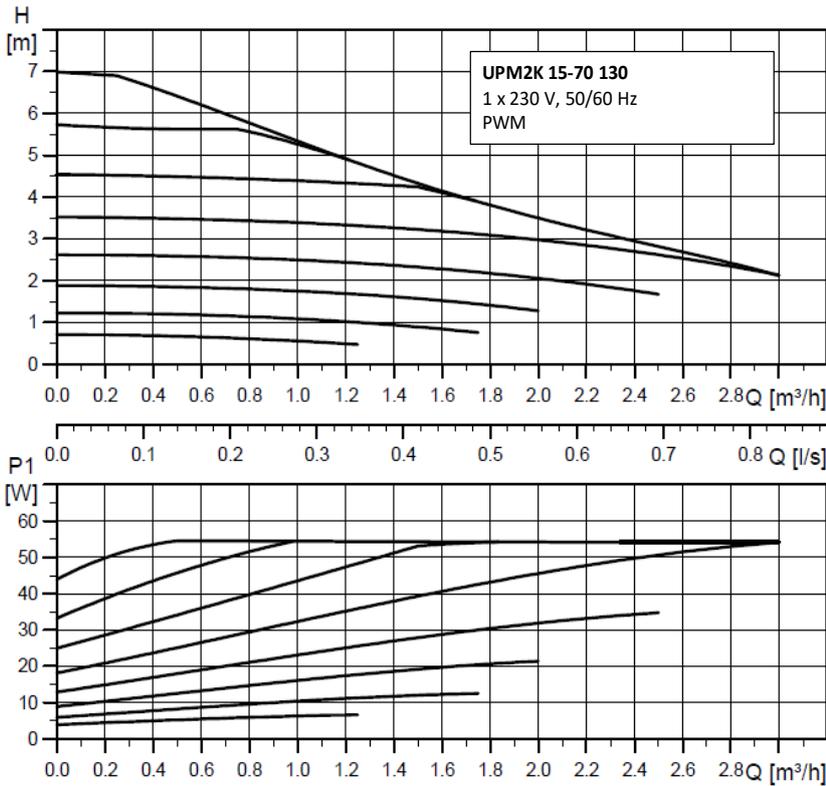


**NETZERO 22 kW**

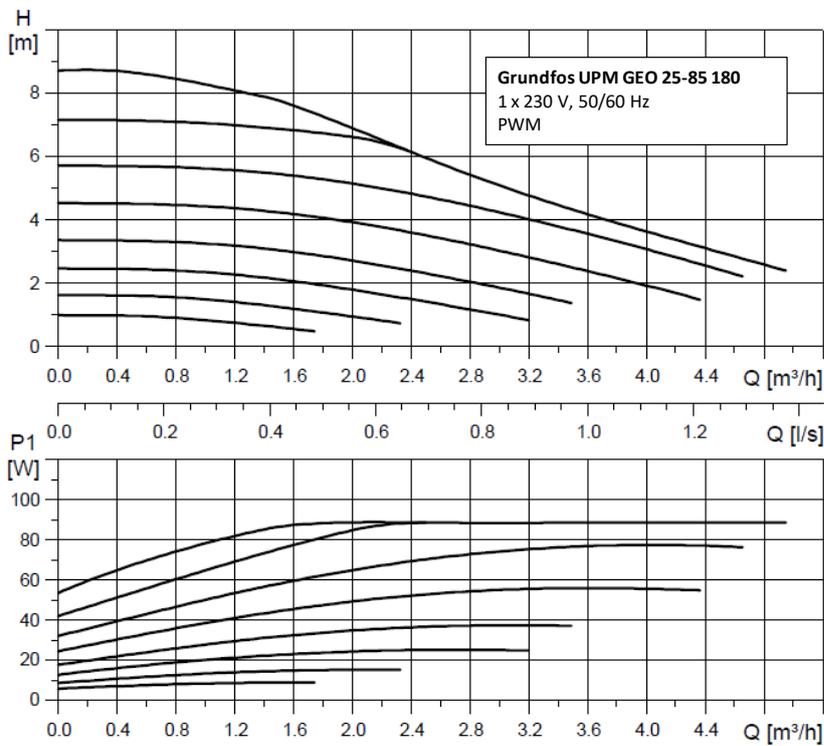


### 3.8. Production circulator pumps

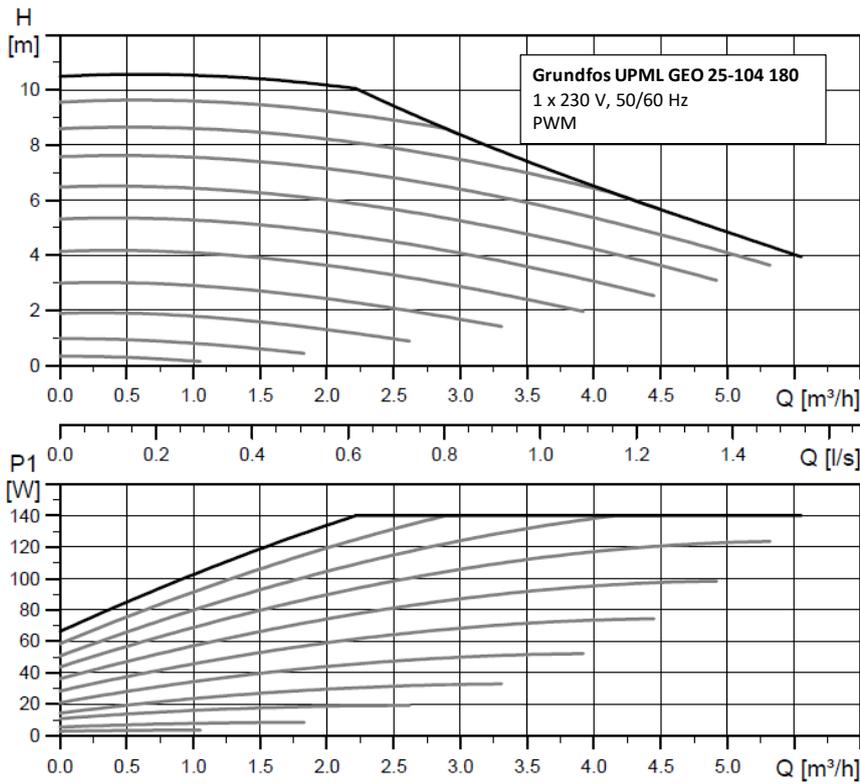
#### Main circulator pump NETZERO 9 kW



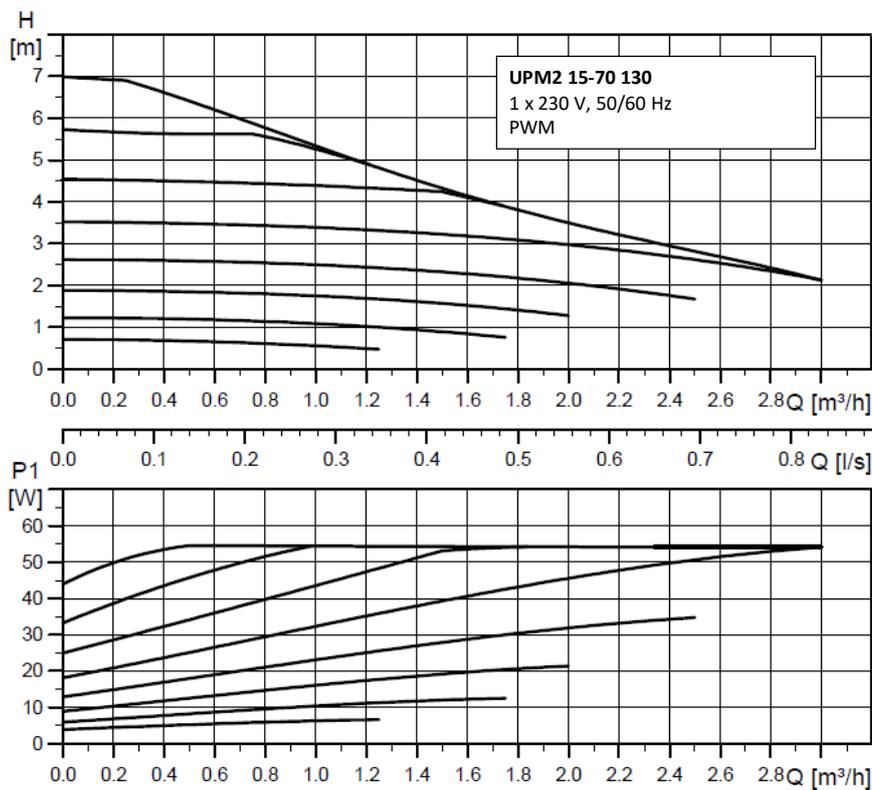
#### Main circulator pump NETZERO 12 kW



Main circulator pump NETZERO 22 kW



HTR system circulator pump



### 3.9. Technical data table

Specification NETZERO 9 kW		Units	Heating only	Passive cooling	Reversible	Reversible and passive cooling
<b>Application</b>	Place of installation	-	Indoors			
	Type of source system <sup>1</sup>	-	Geothermal / Aerothermic / Hybrid			
	Heating	-	✓	✓	✓	✓
	HTR - High temperature recovery system	-	✓	✓	✓	✓
	Integrated active cooling	-	--	--	✓	✓
	Passive outdoor cooling control	-	--	✓	--	✓
<b>Performance</b>	Compressor range of modulation	%	12,2 to 100			
	Heating power <sup>2</sup> , B0W35	kW	1,3 to 11			
	COP <sup>2</sup> , B0W35 <sup>10</sup>	-	4,5			
	Active cooling power <sup>2</sup> , B35W7	kW	--	1,4 to 11		
	EER <sup>2</sup> , B35W7 <sup>10</sup>	-	--	5,2		
	Maximum unassisted DHW temperature	°C	63			
	Maximum assisted DHW temperature <sup>5</sup>	°C	70			
	Sound power level <sup>6</sup>	dBA	33 to 44			
	Energy label / η <sub>s</sub> with average temperature control	--	A+++ / 190%			
<b>Operation limits</b>	Heating outlet temperature range	°C	10 to 60 (Max setpoint 60°C)			
	Cooling outlet temperature range	°C	-20 to 35 (Min setpoint -15°C)	-10 to 35 (Min setpoint 2°C)		
	Source inlet temperature in heating mode range	°C	-25to +35			
	Source outlet temperature in cooling mode range	°C	10 to 60			
	Cooling circuit pressure min / max	bar	2 / 45			
	Production / Pre-load circuit pressure	bar	0,5 to 3 / 1,5			
	Source / Pre-load circuit pressure	bar	0,5 to 3 / 0,7			
	Maximum DHW storage tank pressure	bar	8 (Only for NETZERO CW)			
<b>Working fluids</b>	Refrigerant R410A load	kg	0,85	1		
	Compressor oil type / load	kg	POE / 0,74			
<b>Control electrical data</b>	1/N/PE 230 V / 50-60 Hz <sup>8</sup>	-	✓			
	Maximum recommended external protection <sup>9</sup>	A	C16A			
	Transformer primary circuit fuse	A	0,5			
	Transformer secondary circuit fuse	A	2,5			
<b>Electrical data: Single phase</b>	1/N/PE 230 V / 50-60 Hz <sup>8</sup>	-	✓			
	Maximum recommended external protection <sup>9</sup>	A	C40A			
	Maximum consumption <sup>2</sup> , B0W35	kW/A	2,7/11,8			
	Maximum consumption <sup>2</sup> , B0W55	kW/A	3,8/16,5			
	Starting current min/max <sup>7</sup>	A	2,8/5,8			
	Correction of cosine φ	-	0,96-1			

EN

Specification NETZERO 9 kW		Units	Heating only	Passive cooling and heating	Reversible	Reversible and passive cooling
Electrical integrated resistance support data	Connection option 1/N/PE 230Vac / 50-60 Hz <sup>8</sup>	-	✓			
	Number of elements	-	1 / 2 / 3			
	External protection recommended 1 / 2 / 3	A	C10A / C16A / C20A			
	Maximum consumption 1 / 2 / 3	kW	1,3 / 2,7 / 4,0			
	Maximum consumption 1 / 2 / 3	A	6,3 / 12,6 / 18,9			
	Connection option 3/N/PE 400Vac / 50-60 Hz <sup>8</sup>	-	✓			
	External protection recommended	A	C10A			
	Maximum consumption	kW	4,0			
	Maximum consumption	A	6,3			
Dimensions and weight	Height x width x depth	mm	NETZERO BW: 1060x600x710 NETZERO CW: 1845x600x720			
	Empty weight (without assembly)	Kg	B: 184 C: 245	B: 192 C: 253	B: 184 C: 245	B: 192 C: 253
<ol style="list-style-type: none"> <li>Replacing or combining the geothermal collector with one or more NETZERO AU12 aerothermal units. Refer to the NETZERO AU12 aerothermal units manual for more detailed information.</li> <li>In compliance with EN 14511, this includes the consumption of the circulation pumps and the compressor driver.</li> <li>Certification in process.</li> <li>Considering a heat ramp of 20°C to 50°C in absence of consumption.</li> <li>Considering support provided by the emergency electrical resistor or the HTR system. Maximum DHW temperature with the HTR system can be limited by the compressor discharge temperature.</li> <li>In compliance with EN 12102, this includes the acoustic insulation kit of the compressor.</li> <li>Starting current depends on working condition of the hydraulic circuits.</li> <li>The admissible voltage range for proper operation of the heat pump is ±10%.</li> <li>Maximum consumption can vary significantly according to working conditions, or if the compressor's range of operation is restricted. Refer to the technical service manual for more detailed information.</li> <li>The installation must be carried out in the way that guarantees the nominal flows, which will be calculated for the maximum powers with a temperature differential of 5°C. on the other hand, for the correct start-up of the compressor the installation must guarantee a higher flow rate than that resulting from the formula:  <math display="block">Q \geq 1.2 \times P_{ref}, \text{ where:}</math>                     Q= Flow rate in liters per minute.                      P<sub>ref</sub> = Colling capacity at 25% of compressor speed, see operation curves.</li> </ol>						

Specification NETZERO 12 kW		Units	Heating only	Passive cooling and heating	Reversible	Reversible and passive cooling
Application	Place of installation	-	Indoors			
	Type of source system <sup>1</sup>	-	Geothermal / Aerothermic / Hybrid			
	Heating	-	✓	✓	✓	✓
	HTR - High temperature recovery system	-	✓	✓	✓	✓
	Integrated active cooling	-	--	--	✓	✓
	Passive outdoor cooling control	-	--	✓	--	✓
Performance	Compressor range of modulation	%	12,5 to 100			
	Heating power <sup>2</sup> , B0W35	kW	2,1 to 16			
	COP <sup>2</sup> , B0W35 <sup>10</sup>	-	4,6			
	Active cooling power <sup>2</sup> , B35W7	kW	--	2,1 to 15		
	EER <sup>2</sup> , B35W7 <sup>10</sup>	-	--	5,2		
	Maximum unassisted DHW temperature	°C	63			
	Maximum assisted DHW temperature <sup>5</sup>	°C	70			
	Sound power level <sup>6</sup>	dBA	34 to 45			
Operation limits	Energy label / ηs with average temperature control	--	A+++ / 194%			
	Heating outlet temperature range	°C	10 to 60 (Max setpoint 60°C)			
	Cooling outlet temperature range	°C	-20 to 35 (Min setpoint -15°C)	-10 to 35 (Min setpoint 2°C)		
	Source inlet temperature in heating mode range	°C	-25 to +35			
	Source outlet temperature in cooling mode range	°C	10 to 60			
	Cooling circuit pressure min / max	bar	2 / 45			
	Production / Pre-load circuit pressure	bar	0,5 to 3 / 1,5			
	Source / Pre-load circuit pressure	bar	0,5 to 3 / 0,7			
Working fluids	Maximum DHW storage tank pressure	bar	8 (Only for NETZERO CW)			
	Refrigerant R410A load	kg	1	1		
Control electrical data	Compressor oil type / load	kg	POE / 0,74			
	1/N/PE 230 V / 50-60 Hz <sup>8</sup>	-	✓			
	Maximum recommended external protection <sup>9</sup>	A	C16A			
	Transformer primary circuit fuse	A	0,5			
Electrical data: Single phase	Transformer secondary circuit fuse	A	2,5			
	1/N/PE 230 V / 50-60 Hz <sup>8</sup>	-	✓			
	Maximum recommended external protection <sup>9</sup>	A	C50A			
	Maximum consumption <sup>2</sup> , B0W35	kW/A	4,2/18,6			
	Maximum consumption <sup>2</sup> , B0W55	kW/A	5/21,7			
Starting current min/max <sup>7</sup>	A	2/8				
Correction of cosine φ	-	0,96-1				

Specification NETZERO 12 kW		Units	Heating only	Passive cooling and heating	Reversible	Reversible and passive cooling
Electrical integrated resistance support data	Connection option 1/N/PE 230Vac / 50-60 Hz <sup>8</sup>	-	✓			
	Number of elements	-	1 / 2 / 3			
	External protection recommended 1 / 2 / 3	A	C16A / C20A / C32A			
	Maximum consumption 1 / 2 / 3	kW	2 / 4 / 6			
	Maximum consumption 1 / 2 / 3	A	8,8 / 17,6 / 26,4			
	Connection option 3/N/PE 400Vac / 50-60 Hz <sup>8</sup>	-	✓			
	External protection recommended	A	C16A			
	Maximum consumption	kW	6			
	Maximum consumption	A	9,4			
Dimensions and weight	Height x width x depth	mm	NETZERO BW: 1060x600x710 NETZERO CW: 1845x600x720			
	Empty weight (without assembly)	Kg	B: 185 C: 246	B: 193 C: 254	B: 185 C: 246	B: 193 C: 254
<ol style="list-style-type: none"> <li>Replacing or combining the geothermal collector with one or more NETZERO AU12 aerothermal units. Refer to the NETZERO AU12 aerothermal units manual for more detailed information.</li> <li>In compliance with EN 14511, this includes the consumption of the circulation pumps and the compressor driver.</li> <li>Certification in process.</li> <li>Considering a heat ramp of 20°C to 50°C in absence of consumption.</li> <li>Considering support provided by the emergency electrical resistor or the HTR system. Maximum DHW temperature with the HTR system can be limited by the compressor discharge temperature.</li> <li>In compliance with EN 12102, this includes the acoustic insulation kit of the compressor.</li> <li>Starting current depends on working condition of the hydraulic circuits.</li> <li>The admissible voltage range for proper operation of the heat pump is ±10%.</li> <li>Maximum consumption can vary significantly according to working conditions, or if the compressor's range of operation is restricted. Refer to the technical service manual for more detailed information.</li> <li>Certification in process.</li> <li>The installation must be carried out in the way that guarantees the nominal flows, which will be calculated for the maximum powers with a temperature differential of 5°C. on the other hand, for the correct start-up of the compressor the installation must guarantee a higher flow rate than that resulting from the formula:  <math display="block">Q \geq 1.2 \times P_{ref}, \text{ where:}</math> <p>Q= Flow rate in liters per minute.                      P<sub>ref</sub> = Colling capacity at 25% of compressor speed, see operation curves.</p> </li> </ol>						

Specification NETZERO 22 kW		Units	Heating only	Passive cooling and heating	Reversible	Reversible and passive cooling
Application	Place of installation	-	Indoors			
	Type of source system <sup>1</sup>	-	Geothermal / Aerothermic / Hybrid			
	Heating	-	✓	✓	✓	✓
	HTR - High temperature recovery system	-	✓	✓	✓	✓
	Integrated active cooling	-	--		✓	✓
	Passive outdoor cooling control	-	--	✓	--	✓
Performance	Compressor range of modulation	%	15 to 100			
	Heating power <sup>2</sup> , B0W35	kW	4 to 22,8			
	COP <sup>2</sup> , B0W35 <sup>10</sup>	-	4,9			
	Active cooling power <sup>2</sup> , B35W7	kW	--	4,2 to 22		
	EER <sup>2</sup> , B35W7 <sup>10</sup>	-	--	5,4		
	Maximum unassisted DHW temperature	°C	63			
	Maximum assisted DHW temperature <sup>5</sup>	°C	70			
	Sound power level <sup>6</sup>	dBA	35 to 46			
	Energy label / ηs with average temperature control	--	A+++ / 184%			
Operation limits	Heating outlet temperature range	°C	10 to 60 (Max setpoint 60°C)			
	Cooling outlet temperature range	°C	-20 to 35 (Min setpoint -15°C)	-10 to 35 (Min setpoint 2°C)		
	Source inlet temperature in heating mode range	°C	-25 to +35			
	Source outlet temperature in cooling mode range	°C	10 to 60			
	Cooling circuit pressure min / max	bar	2 / 45			
	Production / Pre-load circuit pressure	bar	0,5 to 3 / 1,5			
	Source / Pre-load circuit pressure	bar	0,5 to 3 / 0,7			
	Maximum DHW storage tank pressure	bar	8 (Only for NETZERO CW)			
Working fluids	Refrigerant R410A load	kg	1,4	1,5		
	Compressor oil type / load	kg	POE / 1,18			
Control electrical data	1/N/PE 230 V / 50-60 Hz <sup>8</sup>	-	✓			
	Maximum recommended external protection <sup>9</sup>	A	C16A			
	Transformer primary circuit fuse	A	0,5			
	Transformer secondary circuit fuse	A	2,5			
Electrical data: Single phase	1/N/PE 230 V / 50-60 Hz <sup>8</sup>	-	✓			
	Maximum recommended external protection <sup>9</sup>	A	C50A			
	Maximum consumption <sup>2</sup> , B0W35	kW/A	5,5/23,9			
	Maximum consumption <sup>2</sup> , B0W55	kW/A	5,5/23,9			
	Starting current min/max <sup>7</sup>	A	2,6/12,5			
Correction of cosine φ	-	0,96-1				

Specification NETZERO 22 kW		Units	Heating only	Passive cooling and heating	Reversible	Reversible and passive cooling
Electrical integrated resistance support data	Connection option 1/N/PE 230Vac / 50-60 Hz <sup>8</sup>	-	✓			
	Number of elements	-	1 / 2 / 3			
	External protection recommended 1 / 2 / 3	A	C16A / C20A / C32A			
	Maximum consumption 1 / 2 / 3	kW	2 / 4 / 6			
	Maximum consumption 1 / 2 / 3	A	8,8 / 17,6 / 26,4			
	Connection option 3/N/PE 400Vac / 50-60 Hz <sup>8</sup>	-	✓			
	External protection recommended	A	C16A			
	Maximum consumption	kW	6			
Dimensions and weight	Height x width x depth	mm	NETZERO BW: 1060x600x710 NETZERO CW: 1845x600x720			
	Empty weight (without assembly)	Kg	B: 185 C: 247	B: 193 C: 255	B: 185 C: 247	B: 193 C: 255
<ol style="list-style-type: none"> <li>Replacing or combining the geothermal collector with one or more NETZERO AU12 aerothermal units. Refer to the NETZERO AU12 aerothermal units manual for more detailed information.</li> <li>In compliance with EN 14511, this includes the consumption of the circulation pumps and the compressor driver.</li> <li>Certification in process.</li> <li>Considering a heat ramp of 20°C to 50°C in absence of consumption.</li> <li>Considering support provided by the emergency electrical resistor or the HTR system. Maximum DHW temperature with the HTR system can be limited by the compressor discharge temperature.</li> <li>In compliance with EN 12102, this includes the acoustic insulation kit of the compressor.</li> <li>Starting current depends on working condition of the hydraulic circuits.</li> <li>The admissible voltage range for proper operation of the heat pump is ±10%.</li> <li>Maximum consumption can vary significantly according to working conditions, or if the compressor's range of operation is restricted. Refer to the technical service manual for more detailed information.</li> <li>The installation must be carried out in the way that guarantees the nominal flows, which will be calculated for the maximum powers with a temperature differential of 5°C. on the other hand, for the correct start-up of the compressor the installation must guarantee a higher flow rate than that resulting from the formula:  <math display="block">Q \geq 1.2 \times P_{ref}, \text{ where:}</math> <p>Q= Flow rate in liters per minute.                      P<sub>ref</sub> = Colling capacity at 25% of compressor speed, see operation curves.</p> </li> </ol>						







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The manufacturer reserves the right to make modifications without prior notice.