EURONOM®
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MANUAL EXOTROL

Green Energy

Installation and user guide for

ExoAir

Polaris

Exotic™ S

2008-11-13
ver. 1.05

Introduction

This manual is intended for the ExoAir, Polaris and Exotic heat pumps together with Exotrol control and ExoTank VPS tank system.
The manual consists of 7 chapters of which the first 4 cover installation and commissioning. Chapters 5 and 6 describe menus and settings as well as maintenance and checks. Chapter 7 is intended for service technicians for repairs/troubleshooting of the installation.

Congratulations!
You are now the owner of a top quality product that will minimise your electricity bills, saving you money for much nicer things. You get a system with the latest technology and reliability that you have the right to demand and that will last for many years to come.

Both the heat pump and ExoTank are manufactured in Sweden, which has a long tradition of heating systems, and heat pumps in particular.
All boilers/heat pumps that come out of the factory are technology and function tested. The quality is monitored continuously through all stages from the steel chassis to complete tank/heat pump.

ExoTank

ExoTank VPS is a boiler designed and constructed for optimum heat pump operation and with the possibility of connecting/docking other energy sources such as solar energy, wood fired boilers, pellets etc.
ExoTank VPS has a unique integrated diffuser that brakes the water's movements/mixing and gives optimum layering of hot and cold water, which results in a more energy efficient system.
ExoTank VPS has integrated double coil exchangers that provide optimum hot water comfort and legionella-free domestic water.
The boiler is equipped with a BIV mixing valve that primarily uses the cheap heat pump energy and only uses additional heat in exceptional cases such as very cold weather.
Integrated in ExoTank are 2 electric heaters that are automatically controlled in power stages if the need arises.

ExoAir™ **And** Polaris

ExoAir and Polaris are so called air/water heat pumps that use the energy in the outdoor air (indirect solar energy) to transfer heat to your heating system through a cooling process and thereby provide cheap energy.

Exoair is a well proven heat pump that operates at temperatures down to –10ºC. Extra sound insulated compressor and double thermal length of the heat exchanger gives a high level of efficiency.

Polaris is the fruit of innovative solutions as well as a technological advancement on the compressor side, which means that you can have cheap heating from the air even when the outdoor temperature is as low as
-25ºC. Also provides a water temperature up to 60ºC

Exotic is a liquid/water heat pump, which means that the energy is extracted from a collector coil in, for example, bedrock, surface earth, lakes etc.
Exotic has the same proven components as ExoAir and Polaris as well as extra thick noise insulation to prevent annoying noise.

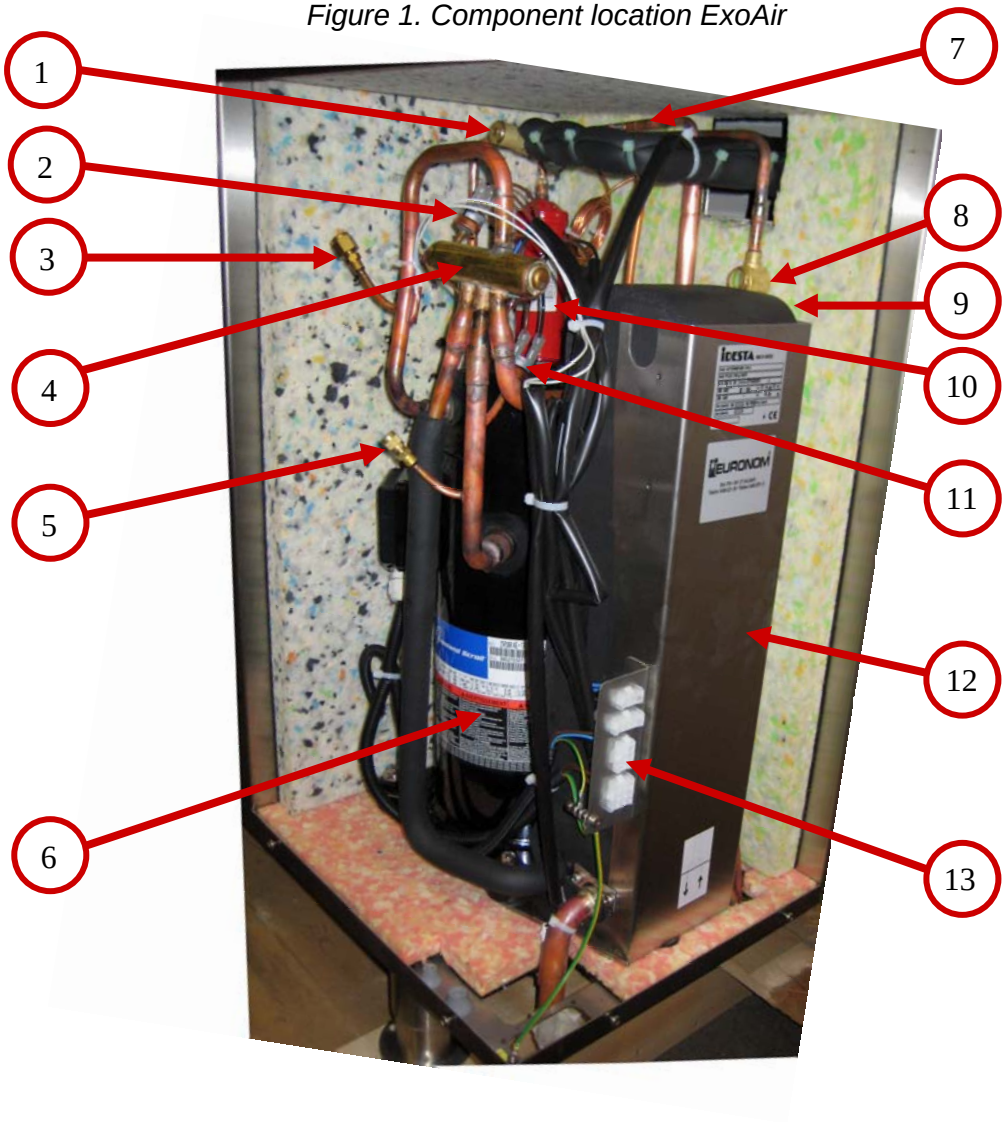
Contents

1 Installation ExoAir and Polaris

► This chapter is intended for the installer of the installation.

1.1 Component location ExoAir

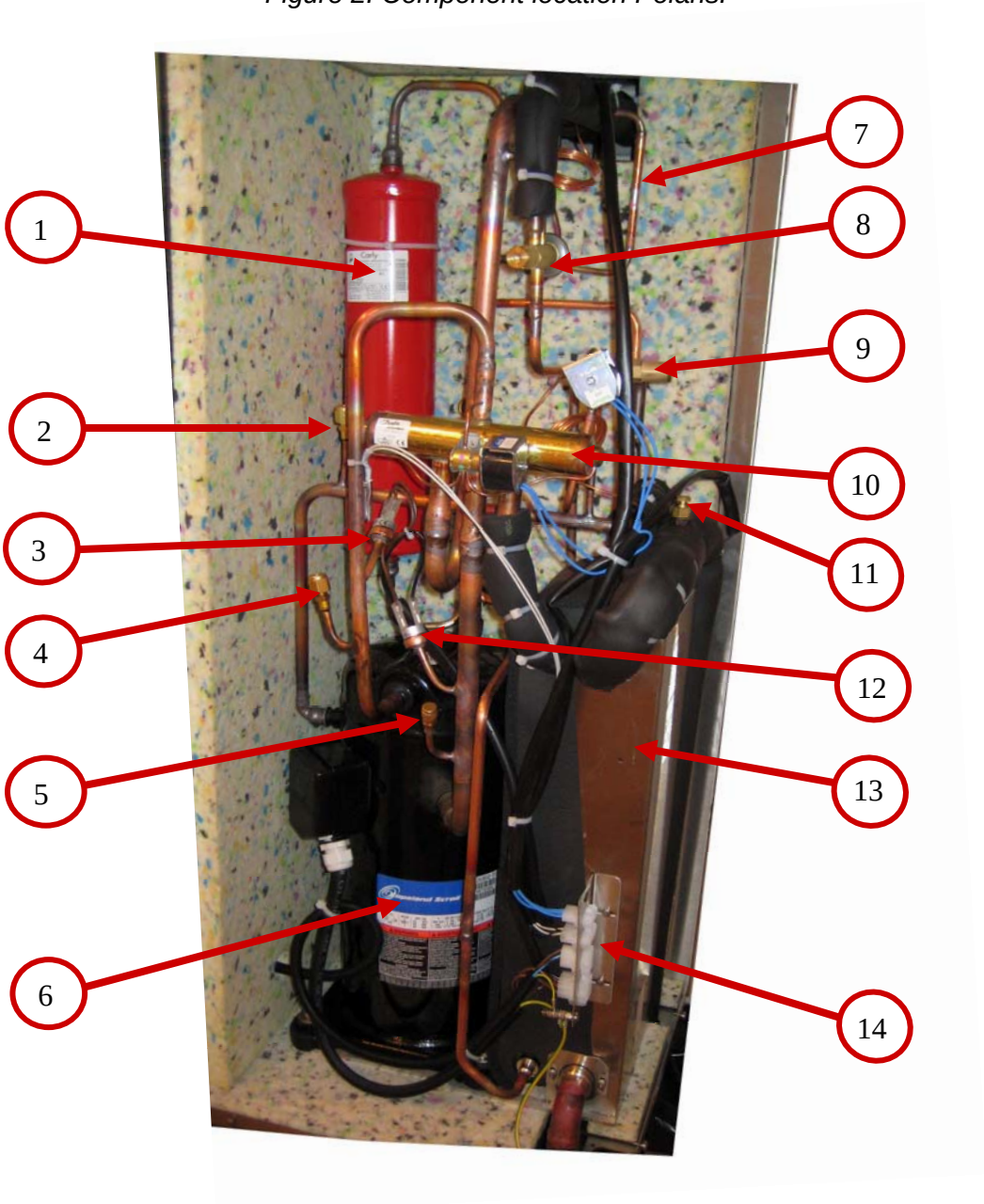
Figure 1. Component location ExoAir



List of components	
1. Expansion valve	8. Sight glass
2. High pressure pressostat	9. Vent valve, Water circuit
3. Service connector/Schrader High pressure	10. Drier filter
4. 4 way valve	11. Low pressure pressostat
5. Service connector/Schrader Low pressure	12. Condenser
6. Compressor	13. Electrical connections
7. Check valve	

1.2 Component location Polaris

Figure 2. Component location Polaris.



Component list	
1. Drier filter	8. Expansion valve, Main circuit
2. Service connector/Schrader EVI	9. Expansion valve EVI circuit
3. High pressure pressostat	10. 4 way valve
4. Service connector/Schrader High pressure	11. Vent valve, Water circuit
5. Service connector/Schrader Low pressure	12. Low pressure pressostat
6. Compressor	13. Condenser
7. Check valve	14. Electrical connections

1.3 Positioning the heat pump

- The heat pump must be located outdoors and must not be placed in a car port or outbuilding of any type. The heat pump must not be placed on a roof as this makes servicing difficult, and can cause larger wind loads than the unit is dimensioned for. The heat pump must be free standing, without a roof or similar above it.

- Ensure that the air circulation around the heat pump is as good as possible.
  Installation near ExoTank is suggested so that pipe routing is shorter and that heat losses are minimised.

- Even if ExoAir and Polaris have good noise insulation, they must be positioned to minimise noise levels to neighbours and anyone inside the building. Note that asphalt, concrete, slabs etc. makes the sound resonate more easily/longer than for example grass, which absorbs a lot the noise. Contact your local council for the relevant local noise regulations.

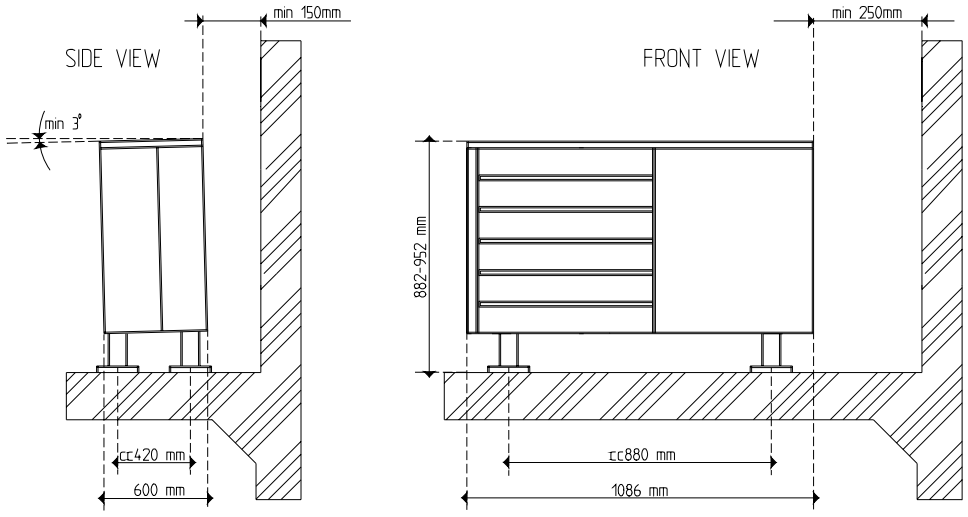
- The heat pump automatically reduces the fan speed during the summer months, depending on set cut-out temperature in the control, which reduces noise.

- The heat pump is best placed on some type of fixed surface, such as paving slabs on a draining shingle bed. Note that in some locations it is necessary to have a high foundation to cope with any heavy snowfall.

- The distance from the exterior wall to the heat pump must be at least 150 mm. When positioning in a corner the minimum distance to the end must be 250 mm, see figure 3.

- During defrosting a large amount of condensation water can run off the coil so it must be ensured that water can run off into a gravel bed and not cause a risk of slippery open surfaces.
  When positioning, it should also be ensured that the whole heat pump leans slightly forward to prevent water running down onto the condenser coil and causing icing problems, see figure 3. Set-up can be easily done by adjusting the legs.

Figure 3. Positioning the heat pump



1.4 ExoTank VPS

- Exotank should be positioned on a fixed base and secured using the position screws on the bottom of the tank. This should be carried out before the pipes are connected and the system is filled with water.
- Connections that are not be used must be plugged in a suitable way.
- Safety equipment in the form of expansion tank, safety and mixer valve must be connected to ExoTank.
- ExoTank must be positioned in a space with a floor drain.
- Hot water circulation, hwc, is not suitable for combination with ExoTank VPS.
- ExoTank VPS is equipped with double coil exchangers that heat the domestic water at the outlet. For large hot water requirements such as for a hot tub, the VPS tank may need to be supplemented with an electric hot water heater. The heater is connected in series with the coil exchanger in ExoTank VPS.
- If Euronom's larger heat pumps are to be used, 15kw or greater, and the demand of domestic hot water is large, Euronom's two tank system is recommended, see chapter 1.6.
- The water softener ExoRen is recommended for use in hard water areas. Sold as an accessory.

1.5 Pipe installation

- 22 mm copper pipes are routed to/from the heat pump as per table 1 below.
- Charge pump speed is set as per table 1 in normal cases. For extremely long pipe work, >20 m, or in the event of many bends, it may be necessary to adjust the pump speed. The nominal flow for each model can be seen in table 6, chapter 7.1. Generally speaking, the flow must be adjusted to give a temperature difference between return and outlet of about a 10ºC at an outdoor temperature of 15ºC.

Table 1. Pipe dimension, charge pump and speed charge pump

Model	Pipe dimension	Charge pump	Speed charge pump
Exoair 7,5 & Polaris 10	22mm	Wilo RS25/6	2
Exoair 10,5	22mm	Wilo RS25/6	3
Exoair 16	28mm	Wilo S25/7,5	3
Polaris 16	28mm	Wilo S25/7,5	2
Polaris 20	28mm	Wilo S25/7,5	3

- Dirt filters must be installed on pipes **to** the heat pump (return line), according to figure 5.

- Charge pumps must be installed on pipes **to** the heat pump (return line), according to figure 5.

- A braided hose is connected between the connection pipe and the heat pump's condenser to prevent vibrations/noise being transferred to the radiator system of the house.

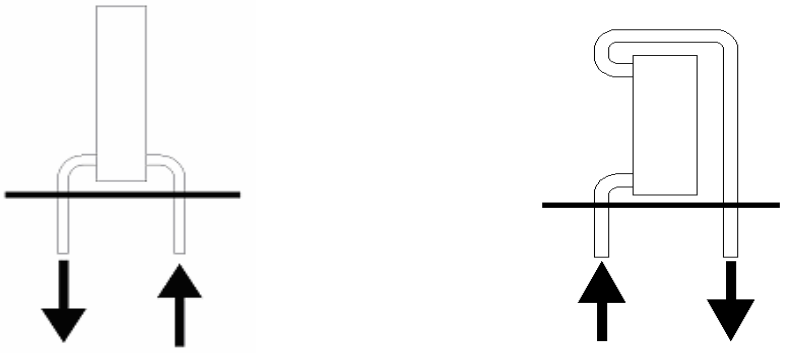
- Note the direction of connection of the connecting pipes/hoses on the heat pump. The direction is indicated in the form of an image (according to figure 4) on the side of the condenser.

- Outdoor pipes/hoses should be insulated with at least 15 mm thick armaflex or similar insulation. The insulation must be moisture resistant and not be affected by moisture from outside. Indoors, insulation must be at least 8 mm thick, however, if the boiler room is to be heated, it may be best not to insulate the pipes.

- Pipework must be carried out in such a way that the system is as self venting as possible. There is a bleed valve at the highest point on the condenser in the heat pump. Bleed valves are necessary if pipes are routed above these bleed valves.

- The operating pressure in Exotank must not exceed 1.5 bar. A safety valve with an opening pressure of 1.5 bar must, therefore, always be installed.

Figure 4. Direction of connection of water on heat pump.

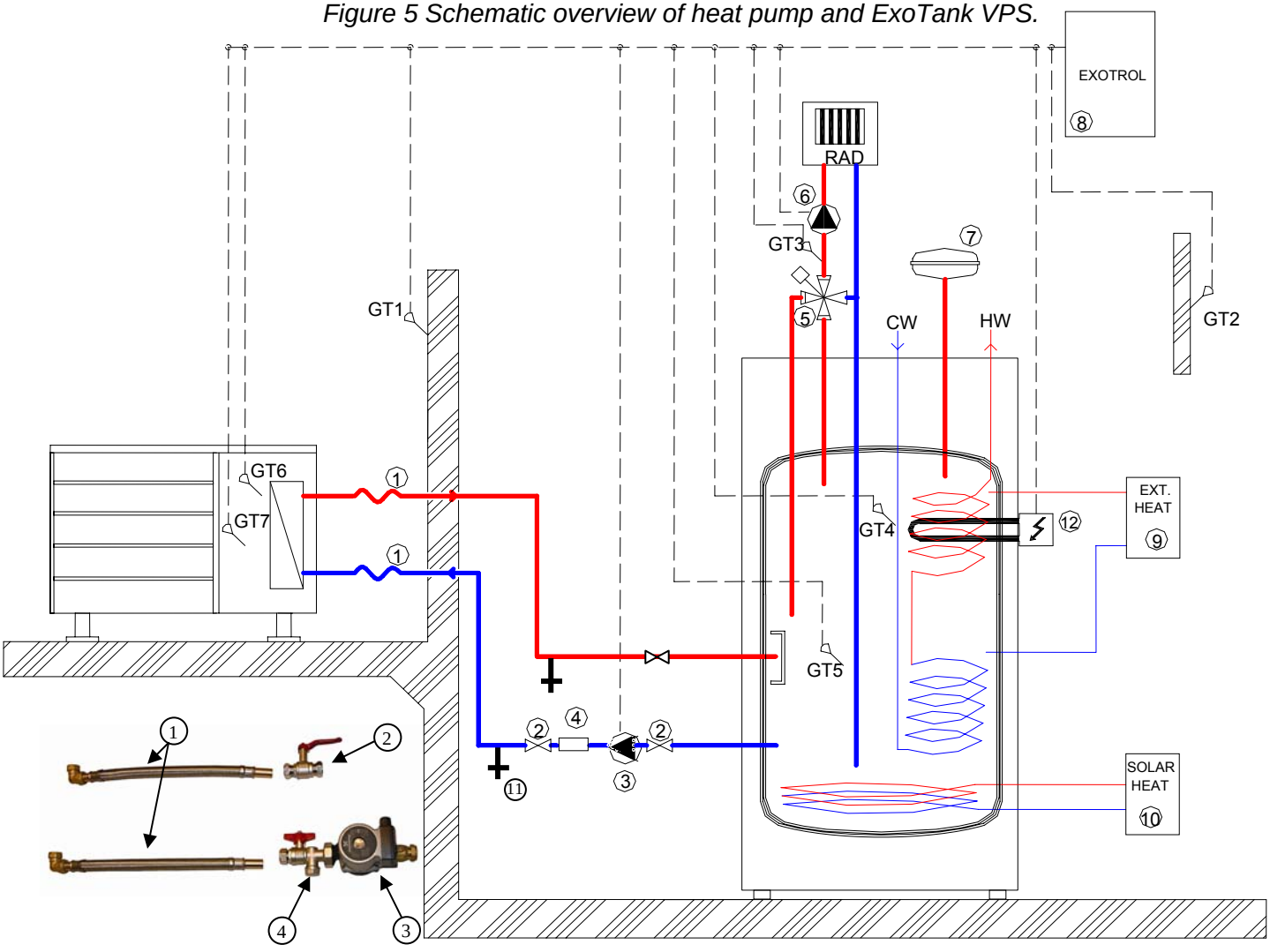


Applies to ExoAir **Applies to Polaris**

1.6 System description Exoair & Polaris

Figure 5 shows a schematic overview of the heat pump and ExoTank. Note that the image is schematic and does not show where/how the different connections are to be connected. Figure 6 on the next page shows ExoTank's connections in detail.

Figure 5 Schematic overview of heat pump and ExoTank VPS.

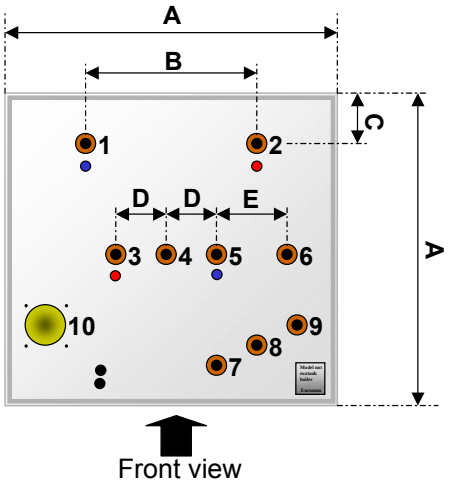


Hose & pump kit

List of components	Sensor designations
1. Flexible hose	GT1: Outdoor sensor
2. Shut-off	GT2: Room sensor
3. Charge pump	GT3: Outlet sensor
4. Dirt filter	GT4: Hot water sensor
5. Mixing valve motor	GT5: Tank sensor
6. Radiator pump	GT6: Hot gas sensor
7. Expansion tank	GT7: Defrost sensor
8. Exotrol (control unit)	
9. Any external energy source	
10. Any solar energy	
11. Drain	
12. Electric heater	

1.7 Connections Exotank VPS

Figure 6
Connections Exotank VPS.



Exotank without front panel

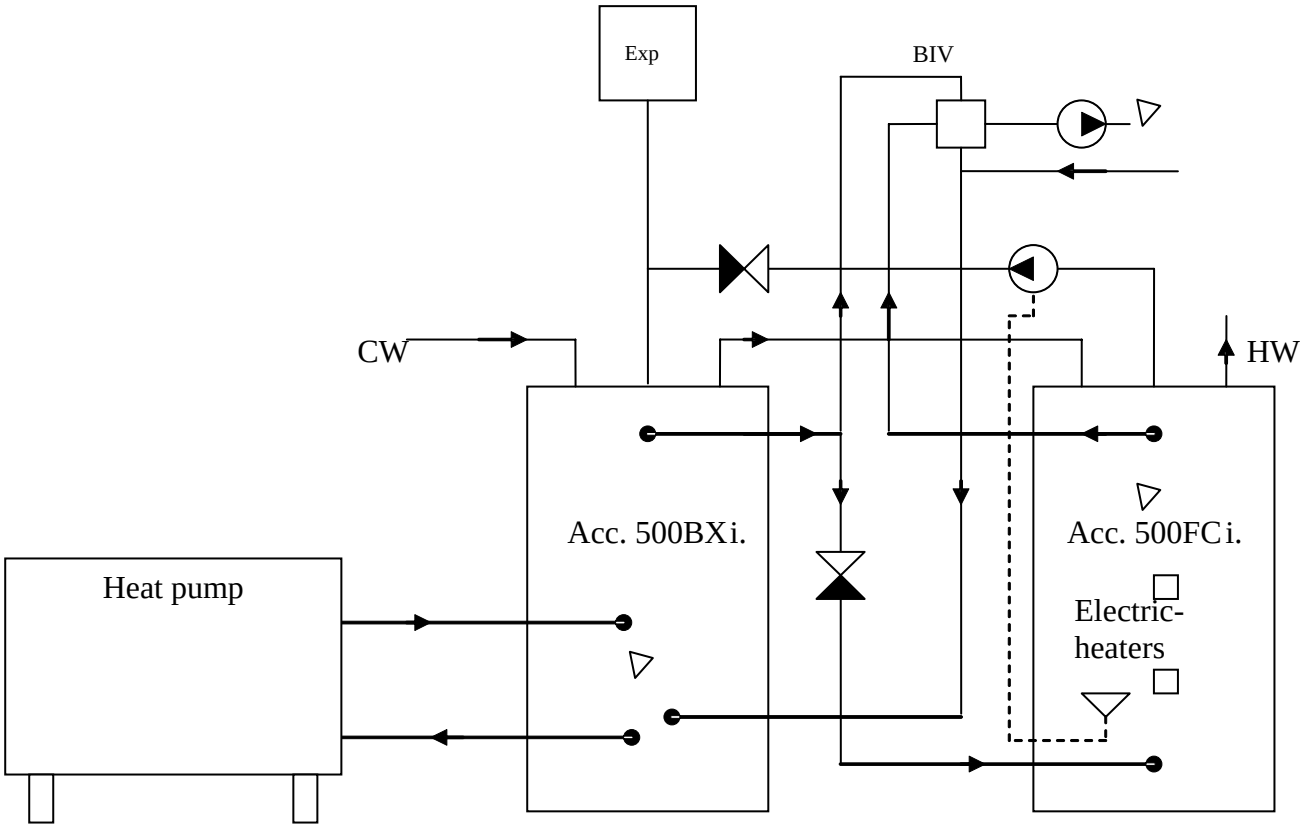
Model/dimensions	VPS 300	VPS 500
A	600	700
B	305	320
C	130	180
D	100	100
E	115	130

Connection	Type
1. To heat pump (Return line)	DN25 ext
2. From heat pump (Outlet)	DN25 ext
3. Hot water connection	Ø22 cu
4. Expansion / external heating (Outlet)	DN25 ext
5. Cold water connection	Ø22 cu
6. Any external heating (Return line)	DN25 ext
7. Internally connected	-
8. To heating system (Outlet)	Compression ring 22 mm
9. From heating system (Return line)	Compression ring 22 mm
10. Cable lead-in (Electrical connection)	-

1.8 Two tank system

If Euronom's heat pumps with outputs above 15kw are to be installed and there is a large hot water demand, the Two tank system is recommended, see figure 7. With this system the heat pump receive a greater water volume to work towards. In addition, the supplied energies in the different tanks differ depending on cost.
To dimension and obtain components that are required for the Two tank system contact Euronom.

Figure 7 Two tank system

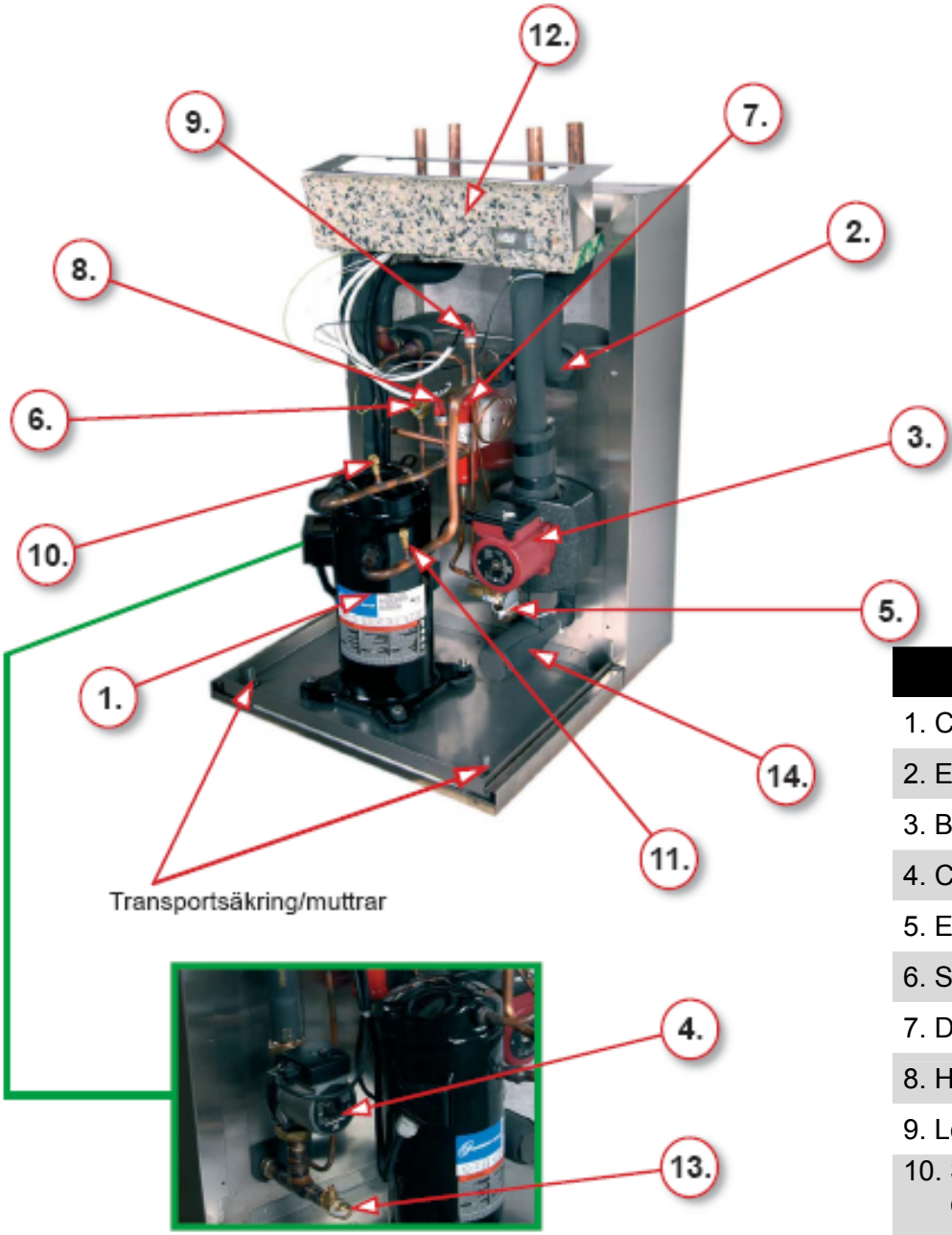


2 Installation Exotic

► This chapter is intended for the installer of the installation.

2.1 Component location Exotic

Figure 8. Component location Exotic



List of components
1. Compressor
2. Evaporator
3. Brine pump
4. Charge pump heating
5. Expansion valve
6. Sight glass
7. Drier filter
8. High pressure pressostat
9. Low pressure pressostat
10. Service connector/Schrader High pressure
11. Service connector/Schrader Low pressure
12. Electrical connections
13. Drain valve Heating
14. Drain valve Brine

2.2 Location

- Exotic must be positioned indoors on a fixed base, preferably on a concrete floor. To prevent unnecessary noise, position the heat pump with the rear side against an outer wall, if possible.

- If possible, avoid placing close to bedrooms or other noise sensitive areas.

2.3 Brine

- The collector for ground/rock/ground water/lake heat etc. must be dimensioned according to the calculation program using a computer.

- Ground heat collectors must be positioned in such a way that self-venting can occur without air pockets. If this is not possible, the highest points must be supplied with venting valves.

- Indoor brine lines must be insulated with moisture inhibiting material to prevent moisture from condensation.

- The brine must contain freezing point depression liquids, for example ethanol, so that it can maintain a fluid state down to -15ºC.

- Note that if the collector is placed close to water lines or ground, extra insulation is required to prevent freezing or channeling.

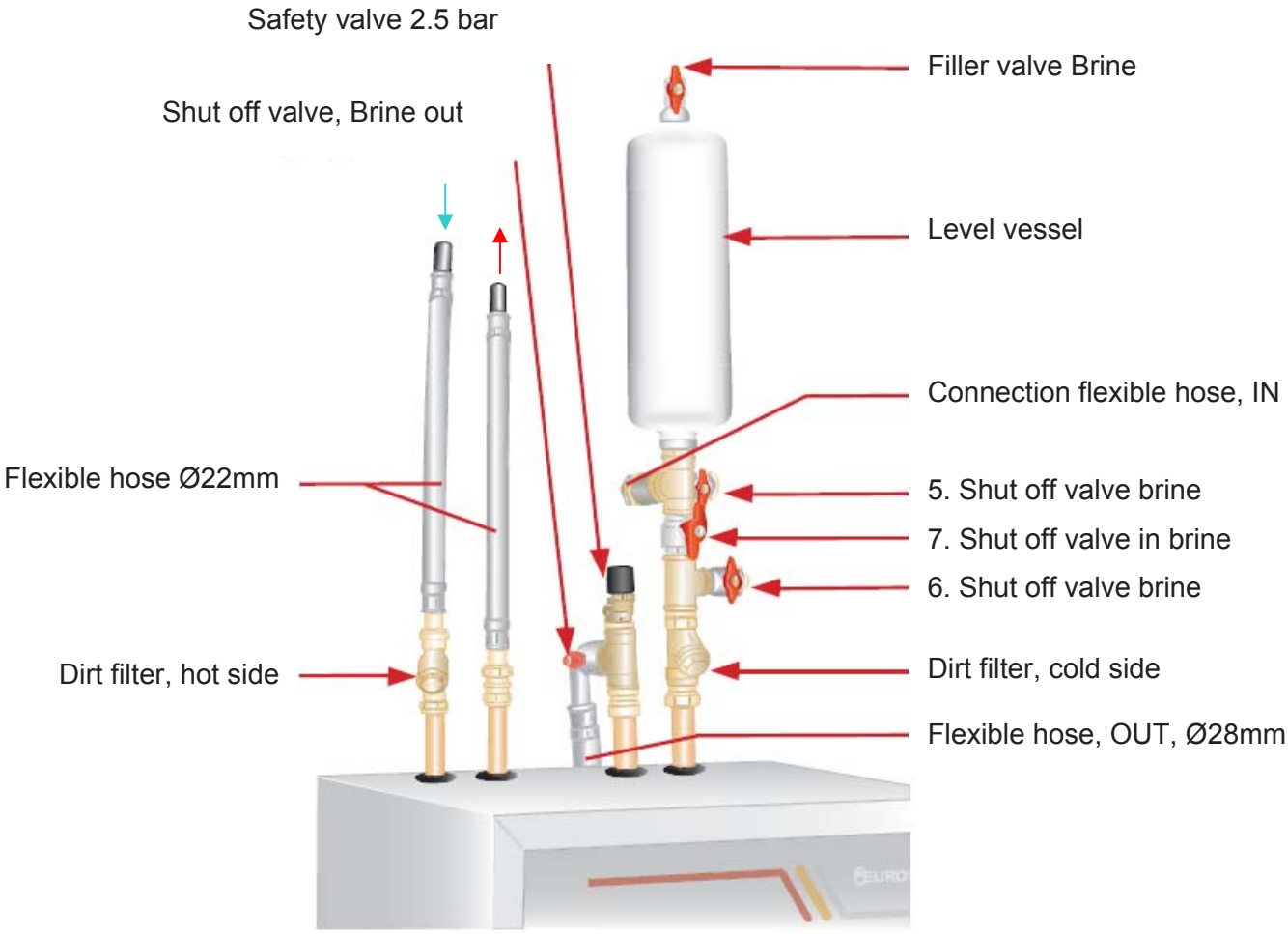
- Collector slang hose PEM 40 x 2.4 PN 6.3 is normally used. Each metre of hose holds 1 litre of fluid.

- The pipes must be insulated when routed through walls.

- The expansion or level vessel must be positioned at the highest point in the system, according to figure 11.

- Shut off valves, filler valves and filter must be installed according to figure 9, next page.

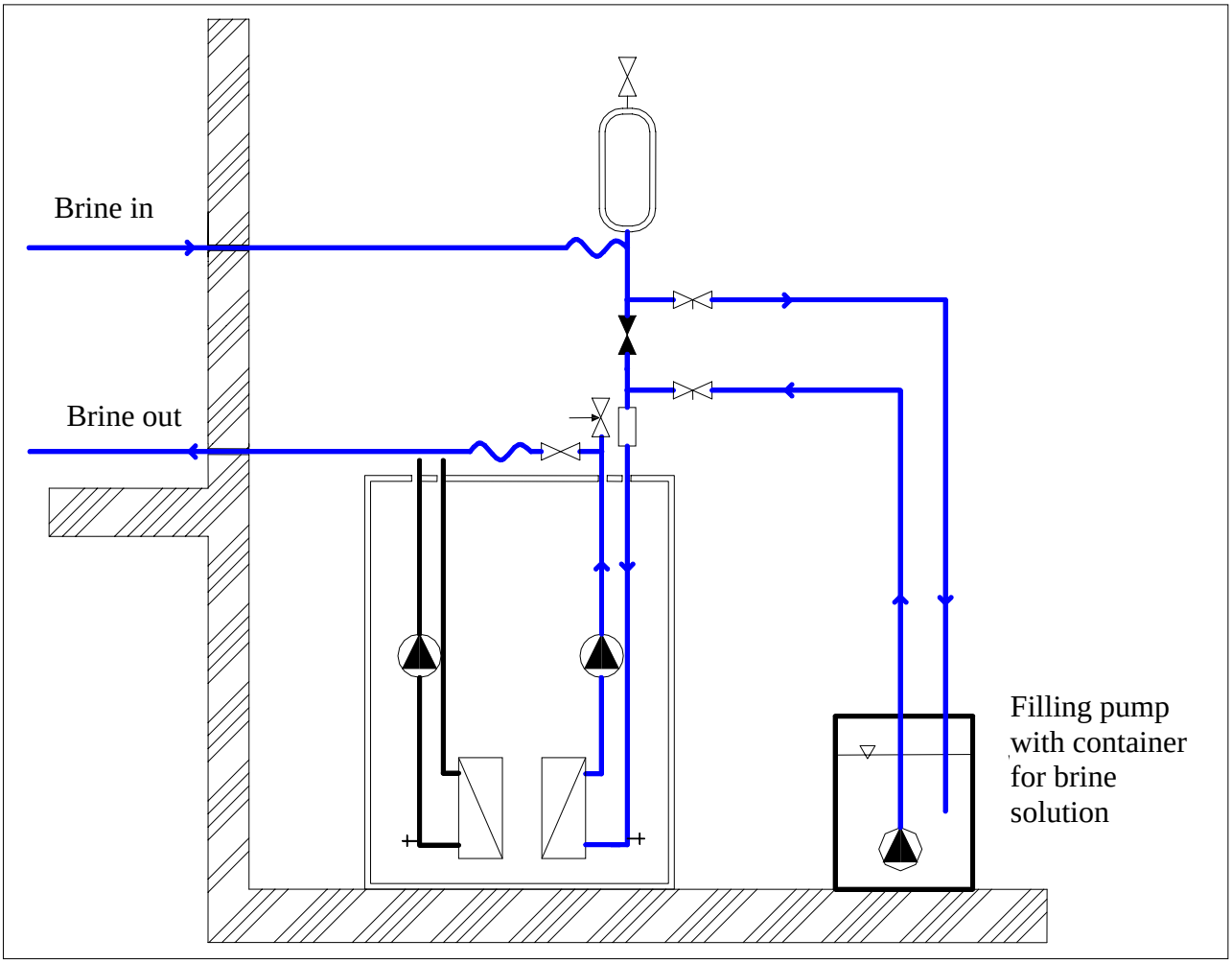
Figure 9. Connection Exotic



2.4 Filling brine

- Fill the brine system according to figure 10 on the next page.
- Connect the suction hose to ”Shut off valve brine” no.5 and the delivery hose to ”Shut off valve brine no.6
- ”Shut off valve in brine” no.7 must be closed during filling.
- The brine circulates until it is completely clear (not “milky”) when it returns from the collector.
- Circulation should occur for at least one night for a smaller system.

Figure 10. Filling brine



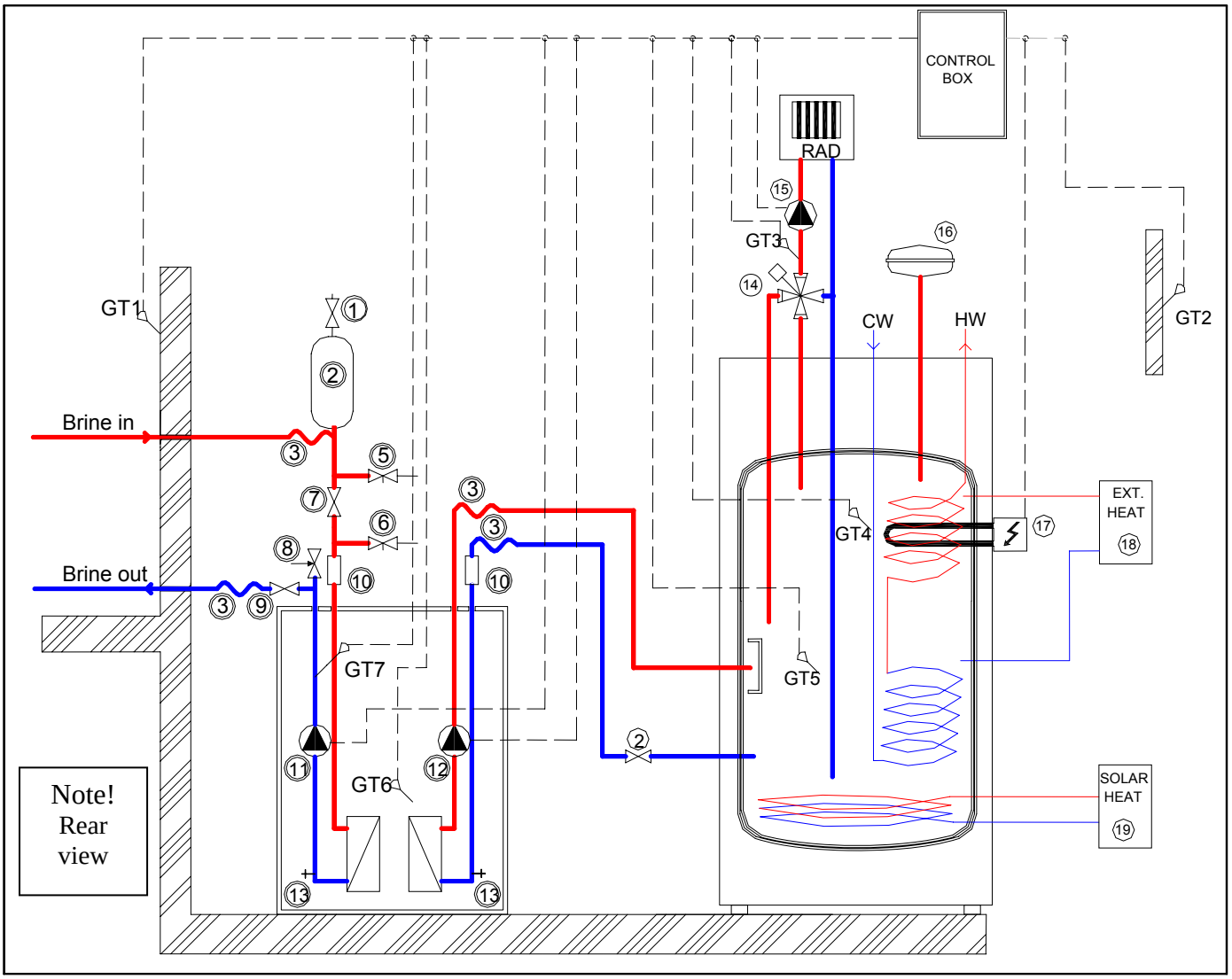
2.5 Heating medium

- 22 mm copper pipes are routed to /from the heat pump and Exo tank.
- A braided hose is connected between the connection pipe and the heat pump's connection to prevent vibrations/noise being transferred to the radiator system of the house.
- The pipes must be insulated with 8 mm thick insulation, however, can be left uninsulated if the area is heated.
- Pipework must be carried out in such a way that the system is as self venting as possible.
- The operating pressure in Exotank must not exceed 1.5 bar. A safety valve with an opening pressure of 1.5 bar must, therefore, always be installed.

2.6 System description Exotic

Figure 11 shows a schematic overview of Exotic and ExoTank. Note that the image is schematic and does not show where/how the different connections are to be connected. Figure 4 shows ExoTank's connections in detail.

Figure 11. Schematic overview of Exotic and ExoTank VPS.



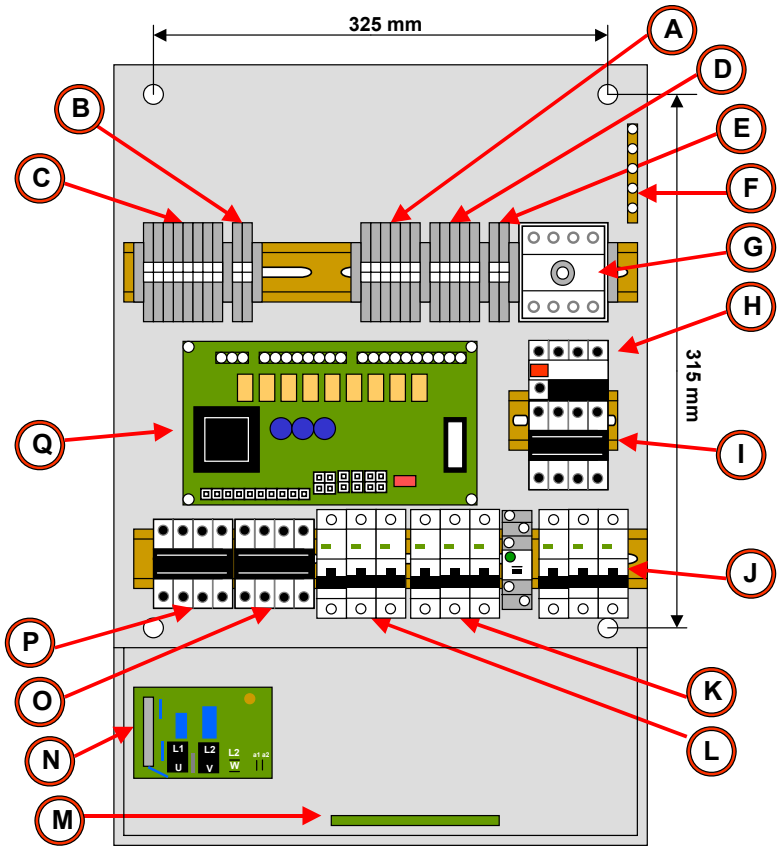
List of components		Sensor designations
1. Filler valve brine	11. Brine pump	GT1: Outdoor sensor
2. Level vessel	12. Charge pump	GT2: Room sensor
3. Flexible hose	13. Drain valve	GT3: Outlet sensor
4. Filler valve	14. Mixing valve motor	GT4: Hot water sensor
5. Shut off valve	15. Radiator pump	GT5: Tank sensor
6. Shut off valve	16. Expansion valve	GT6: Hot gas sensor
7. Shut off valve brine in	17. Electric heater	GT7: Brine sensor
8. Safety valve 2.5 bar	18. Any external energy source	
9. Shut off valve, Brine out	19. Any solar energy	
10. Dirt filter		

3 Electrical installation

Electrical connections must be carried out by an authorised electrician and according to the applicable regulations.
The control cabinet, Exotrol, is constructed in a logical manner and installation instructions are in the upper section of the cabinet (figure 13). The component parts of the control cabinet can be seen in figure 12 below.

- To open the control cabinet, the main switch must be in position 0 and the two screws in the upper edge on Exotrol must be removed.
- Low voltage (sensor connections) and high current are separated and marked in the control cabinet.
- The control cabinet must be wall mounted, cc-dimensions for the mounting holes are in figure 12 below.

Figure 12. Exotrol's lay-out



A	→	Block A. High current heat pump	**J**	→	Piston type fuse compressor, S3 16A)
B	→	Block B. Low current heat pump	**K**	→	Piston type fuse electric heater 1, S1 (10A)
C	→	Block C. Low current ExoTank/external	**L**	→	Piston type fuse electric heater 2, S2 (10A)
D	→	Block D. High current ExoTank	**M**	→	Display card
E	→	Block E. Circulation pumps	**N**	→	Soft start relay
F	→	Earth strip	**O**	→	Contactor electric heater1, K1
G	→	Main switch (32A)	**P**	→	Contactor electric heater 2, K2
H	→	Motor protection compressor	**Q**	→	Circuit board
I	→	Contactor compressor			

3.1 Electrical connections

There are 4 prefabricated cables included with the control module in two bunches with quick-release connectors at one end. The cables are marked as follows:

Cable markings	Type	Function
Heat pump / Block A	12Gx1.5	High current heat pump
Sensor / Block B	4x0.75	Low current heat pump
Boiler / Block D	10Gx1.5	High current boiler (ExoTank)
Sensor /Block C	7Gx0.5	Low current boiler (ExoTank)

- The cables are mounted with cable unions on a mounting plate, which is installed in the pump respectively ExoTank. The quick-release connectors are unique and cannot be connected incorrectly in the heat pump or ExoTank. See Fig 16.
- The cables are numbered and must be installed according to the numbers in Exotrol.
- There is a connection diagram in the control unit which, together with the explanations below, can be used for electrical/sensor installation, see figure 13.
- The terminal blocks in the control unit are of the 2-deck spring plate type, which means that no screws are necessary. See figure 14 below for installation instructions.

Figure 13. Connection diagram and Spring terminals.

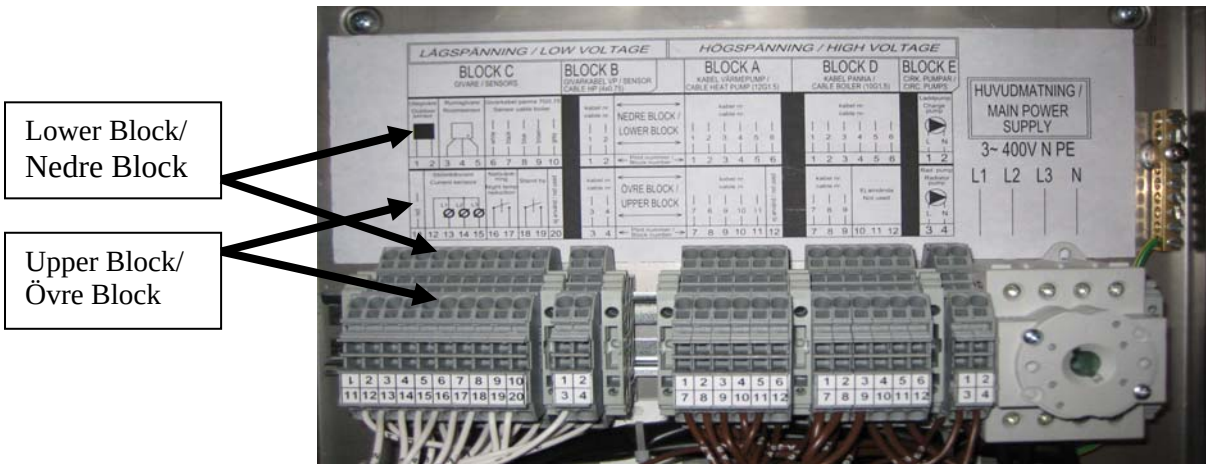
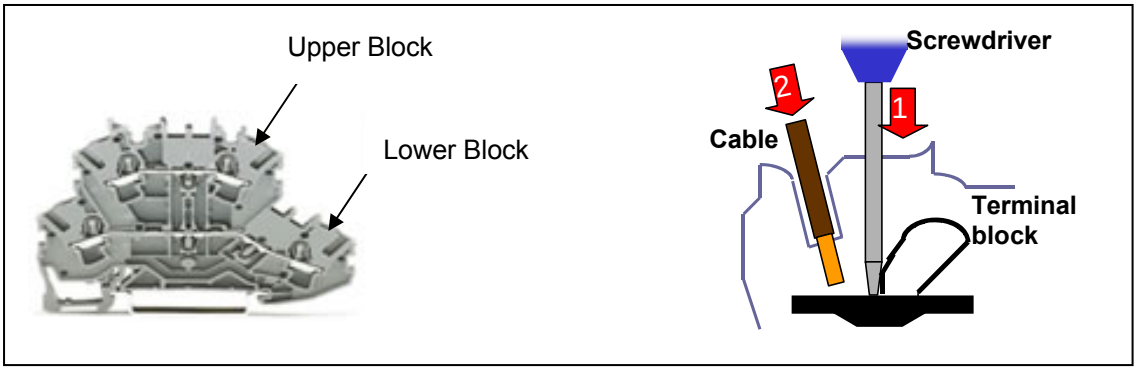


Figure 14. Spring plate and installation instructions.



3.2 Power supply Exotrol

Incoming supply to control unit must be 400V, neutral + earth. Phases and neutral are connected to the main switch, earthed to the earth strip, see figure 8. Exotrol is dimensioned for max 32A and is why the fuse rating is a maximum of 32A. Use table 2 to adjust fuse rating as well as the cable area at installation. The control program has the option of locking certain power stages on the heating elements, which makes it possible to reduce the power. Power transformers (option) are installed to allow the control program to automatically lock the electric power stage when the current consumption exceeds the size of the main fuse. To reduce the compressor's starting current, Exotrol is equipped with a soft start relay.

Table 2. Maximum current consumption for heat pump and different heating element outputs

Model	HP	HP+ 3kW heat. ele.	HP+ 6kW heat. ele.	HP+ 9kW heat. ele.	HP+ 12kW heat. ele.
Exoair 7.5	5,5A	9,8A	14,2A	18,5A	22,8A
Exoair 10,5	7,3A	11,6A	16,0A	20,3A	24,6A
Exoair 16	11,0A	15,3A	19,7A	24,0A	28,3A
Polaris 10	6,0A	10,3A	14,7A	19,0A	23,3A
Polaris 16	8,9A	13,2A	17,6A	21,9A	26,2A
Polaris 20	13,8A	18,1A	22,5A	26,8A	31,2A
Exotic s6	5,7A	10,0A	14,4A	18,7A	23,1A
Exotic s8	6,3A	10,6A	15,0A	19,3A	23,7A
Exotic s10	7,3A	11,6A	16,0A	20,3A	24,7A
Exotic s12	8,1A	12,4A	16,8A	21,1A	25,5A
Exotic s15	9,7A	14,0A	18,4A	22,7A	27,1A
Exotic s17	11,1A	15,4A	19,8A	24,1A	28,5A

3.3 Setting motor protection

Motor protection for the heat pump's compressor is not set for a specific model at delivery and is why an electrician must set the motor protection according to table 3 below.

Table 3. Setting motor protection

Model	Setting motor protection
ExoAir 7.5	7A
ExoAir 10.5	11A
ExoAir 16	13,5A
Polaris 10	7,5A
Polaris 16	10A
Polaris 20	14A
Exotic s6	6A
Exotic s8	7A
Exotic s10	9A
Exotic s12	11A
Exotic s15	11,5A
Exotic s17	13,5A

3.4 Block A – High current heat pump

Terminal block A has block connections for all high current components to the heat pump. The cables are installed with cable numbers corresponding to the terminal block number. Earth cable installed in earth strip.

► Cable marked: **”Heat pump / Block A”** must be used

3.5 Block B - Low current heat pump

Terminal block B contains low current connections for the heat pump. To prevent interference the low current wiring must be routed away from the high current wiring. The cables are installed with cable numbers corresponding to the terminal block number.

► Cable marked: **”Sensor / Block B”** must be used

3.6 Block C - Low current ExoTank/external

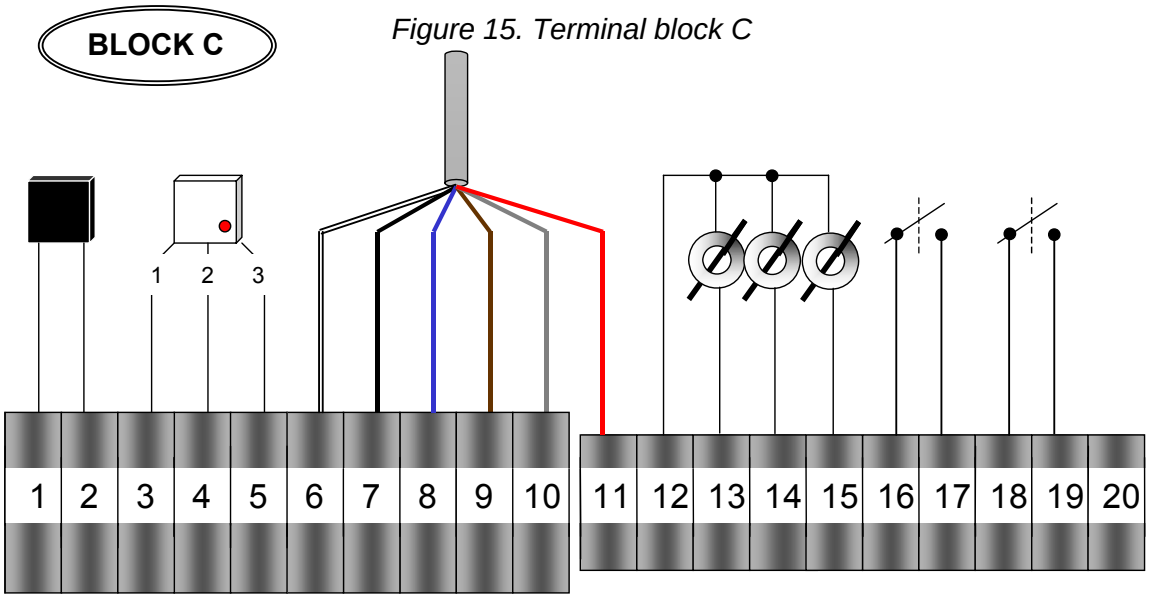
Terminal block C has all other low current connections, including Exotank's. Installation according to table 4 below. See Fig 15.

Table 4. Terminal block C

Terminal block number	Connection/ function	Comments
1,2	Outdoor sensor	Route the outdoor sensor with a minimum 0.5 mm^2 cable and install on the north or north west side of the house to prevent it being subjected to morning sun. Place the sensor 2/3 the way up the facade of the building and install out of direct sunlight. Ensure that the sensor is not affected by the ventilation ducts, doors, windows or similar, which can affect the temperature reading.
3,4,5	Room sensor No.1 -> block 3 No.2 -> block 4 No.3 -> block 5 No.4 -> not used	The task of the room sensor is to relay information about the room temperature to regulate the house curve. However, it is not necessary to use room sensors to control the heating system, (switched off in the system menu in the program). The room sensor also has an alarm LED that flashes in the event of an operational error. For optimum room sensor functionality, the sensor must be placed in a central and open space in the house. It is not recommended that the sensor is placed by a window, radiator or similar. Install 2/3 of the way up the wall and so that it can be repositioned if necessary. The room sensor blocks are marked (1-4) and must be connected according to the column to the left.
6-11	Low current boiler Cable marked: ”Sensor / Block C”	Low current cable to ExoTrol is colour marked and connected as follows: **Terminal block 6** → **white** **Terminal block 7** → **black** **Terminal block 8** → **blue** **Terminal block 9** → **brown** **Terminal block 10** → **grey** **Terminal block 11** → **red**

Terminal block number	Connection/ function	Comments
12-15	Power transformers	Power transformers are optional, and do not need to be installed in order for the system to work. The task of the power transformers is to measure the current consumption of the entire house/building and compare it with the installed main fuse. If the current exceeds the main fuses', the control program is automatically closed by the heating elements until the current no longer exceeds the main fuse. The power transformers are installed on incoming phases in the main terminal as follows: **Terminal block 12** → **Common** **Terminal block 13** → **L1** **Terminal block 14** → **L2** **Terminal block 15** → **L3**
16,17	Night reduction (Digital input)	When blocks 16 and 17 are closed, an adjustable temperature reduction is obtained in the programme. Note that room sensor operation must be activated in order for this function to work. The block pair must be potential free and can be closed by a timer with a closing contact
18,19	Standby (Digital input)	When blocks 18 and 19 are closed, the heat pump and electric heaters are set to standby and cannot be started until the blocks are opened again. The mixing valve function is unaffected by this closure. The block pair must be potential free

Figure 15. Terminal block C



3.7 Block D - High current ExoTank

Terminal block D has block connections for all high current components to ExoTank.
The cables are installed with cable numbers corresponding to the terminal block number for cables 1 to 9.
The earth cable is connected to the earth strip.

Note! Blocks 10-12 not used.

► Cable marked: **”Boiler / Block D”** must be used

3.8 Block E – Connecting circulation pumps

Connect the charge pump for ExoAir and Polaris as well as the radiator system's circulation pump in block E. Connection according to table 5 below. The earth cable is connected to the earth strip.

► **Note!** On Exotic, the charge pump is integrated inside the heat pump

Table 5. Terminal block E

Block number	Signal	Function
1	Phase, (L)	Charge pump ExoAir & Polaris
2	Neutral, (N)	
3	Phase, (L)	Radiator pump heating system
4	Neutral, (N)	

3.9 Connections in heat pump and ExoTank

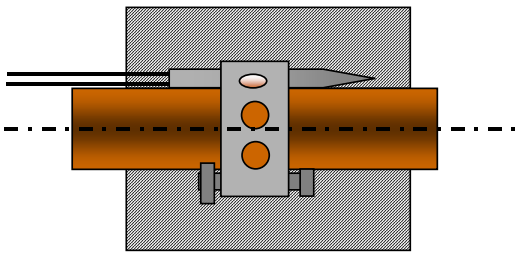
The 2 cable bundles are pre-mounted with a mounting plate and screws that are installed on the heat pump respectively ExoTank.
The quick-release connectors (AMP) are installed in corresponding female, see figure 16.
The two top contacts in ExoTank are numbered 1 and 2, where 1 is the upper and 2 the lower heating element.
The other contacts only fit one way and cannot be mixed up. Ensure that the connectors engage each other when installing.

For ExoTank, the outlet sensor must be installed when the pipework is complete. This sensor is on top of the tank.

The output sensor must be installed after the mixing valve on the output pipe. Use the supplied retaining strap at installation and insulate thoroughly using pipe insulation for example, see figure 17 below.

Figure 16. Quick-release connectors

Figure 17. Installing output sensor.



4 Check list prior to start-up

► This check list is used to ensure that no installation steps are missed.

4.1 Exoair and Polaris

□ Direction of connection heating medium between heat pump and ExoTank correct according to figure 2.

□ Charge pump correctly installed and with correct direction of flow as well as speed set according to table 1. If adjustment valves are used, normal flow should be set to according to table 6, chapter 7.1.

□ Ensure that the system is properly vented, and that the operating pressure is at least 1 bar.

□ Power supply to the control unit is correctly fused according to table 2.

□ Motor protection correctly set according to table 3.

□ All sensors are correctly installed.

4.2 Exotic

□ Direction of connection heating medium correct according to marking on the heat pump.

□ Direction of connection brine correct according to marking on the heat pump.

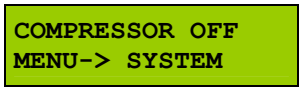
□ Ensure that the system is properly vented, and that the operating pressure is at least 1 bar.

□ Power supply to the control unit is correctly fused according to table 2.

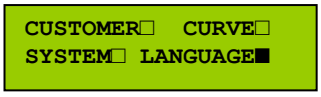
□ Motor protection correctly set according to table 3.

4.3 First start-up

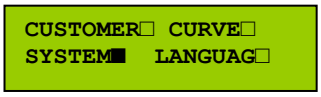
- When installation is complete and the control cabinet is powered for the first time, settings must be made that are suitable for the installation.
- When power is supplied, the following Text appears in the display



- To change the Language in the display, select **SETTINGS** in the main menu and then **LANGUAGE** to select the desired language, chapter 5.6.5.



- The compressor and electric heaters will be blocked and prevent operation until settings are made in the **SYSTEM** menu.



  - In the system menu, first select the installed heat pump model. In addition, the compressor block and electric heater block can be unlocked. Also enter the maximum output for electric heaters and if control with or without room sensor is required.

  - Go to chapter 5.6.4 for further information about settings in the system menu.

5 Operation

This chapter is designed for users and explains how your new heating system works and which settings you can make yourself.

5.1 The control unit

Manual switches:
(no.1 figure 18)

The function of the 2 switches is to bypass control and in this way start the electric heaters manually. The top switch (HEATER 1) starts the 3 or 6 kW power stage depending on the installed electric heater. The lower switch (HEATER 2) sets the 6 kW power stage. In normal mode the switches should be in the OFF (automatic) position, which means that the programme starts the electric heaters automatically when necessary.

► The switches must only be used in cases of emergency, if, for example, the control stops working.

Piston type fuse:

(no.2 figure 18)

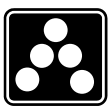
The piston type fuse prevents the circuit board from being damaged in the event of a short-circuit for example. If the fuse blows, it can be reset by pushing it in. Note that it is return-sprung. (The circuit board is also fused with glass fuse directly on the circuit board.)

Status LEDs:
(no.2 figure 18)

The LEDS indicate the status of control. During normal operation the green LED should be lit (ON). In the event of an alarm, the red LED flashes (ERROR) until the alarm is reset.

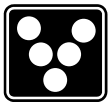
ENTER:

The enter button is used to scroll through the menus and to confirm settings. The Enter button is also used to reset any alarms.



UP

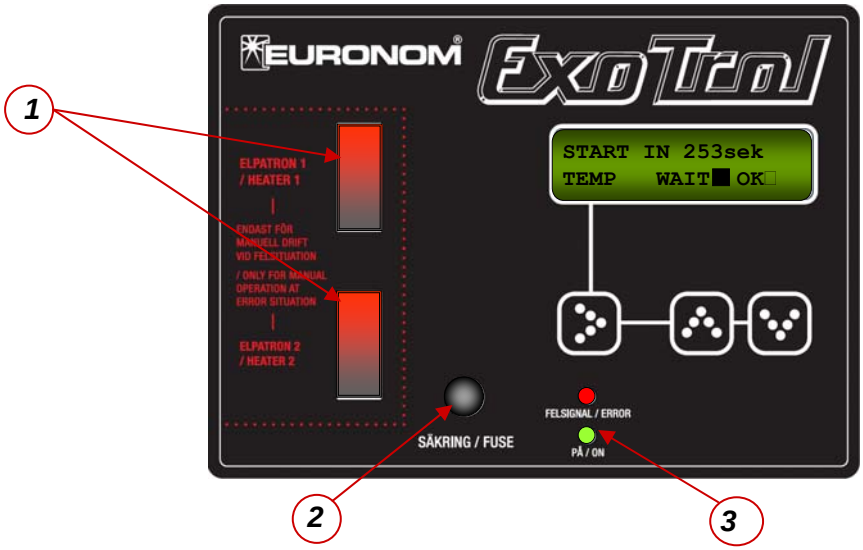
The up arrow (+) is used to increase the values and to select sub menu.



DOWN

The down arrow (–) is used to reduce the values when making settings in The menus.

Figure 18. The control unit



5.2 Mixing valve motor

The mixing valve motor that is located on the ExoTank regulates the hot water temperature to the radiators or under floor heating. This occurs automatically and using the set values, see the section regarding house curve.
However, the mixing valve can be operated manually in the event of an error in control, see figure 19. This is done by pushing in the mixing valve's knob and turning it to the desired position or pulling out and turning, depending on model. To return to automatic mode, turn the knob until it pops back out.

Figure 19. mixing valve motor, two versions.

5.3 Programme structure

The programme contains submenus with main menus that provide a good overview. There are two programme modes:

Standby/Alarm and Setting mode.

To shift between the various modes, use the ENTER button by keeping it depressed for at least 2 seconds. This shift can be done in all modes, even in a menu. Description of the various modes can be seen below.

Standby/Alarm: This part of the programme continually shows the status of the system.
In the event of an error and an alarm is triggered, the alarm text will appear. In the same way, any time delays will appear if they are active.
Standby appears automatically after 15 minutes if no buttons are touched.

Setting mode: In this programme mode, system settings can be made and actual operating parameters seen. When shifting from standby display, you are directed to the main menu that consists of 4 sub menus.

5.3.1 The menu system – the setting mode

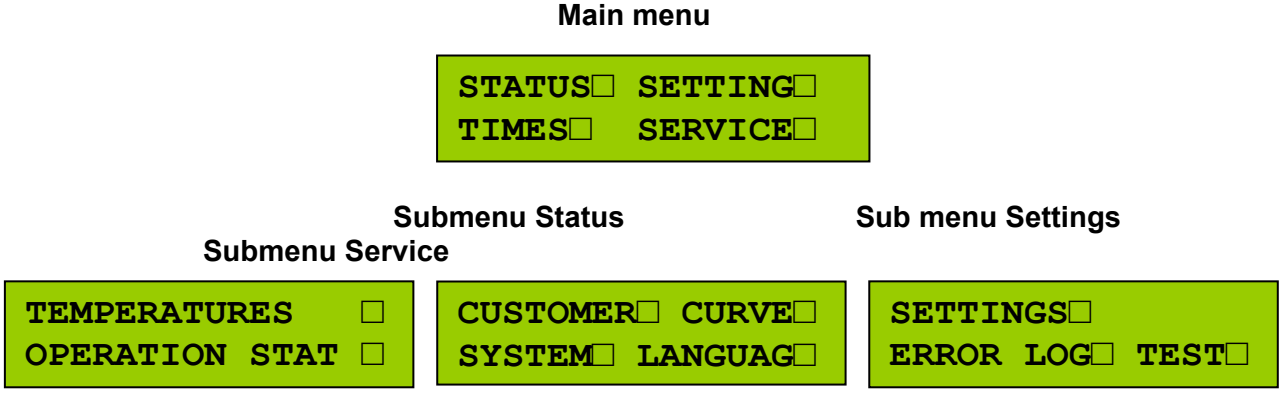
Figure 20 below shows the menu structure of the programme.

The top display text is the main menu, to which you always come back to after being in sub menus.

Use the ENTER button to scroll through the menus. Use the arrow buttons to select the desired submenu, confirm using ENTER.

To exit a menu, keep the ENTER button depressed for at least 2 seconds, whereupon you come to the standby texts.

Figure 20. Menu structure



5.4 Menu – TIMES

This part of the menu contains operation times for the system and heat pump

Display	Explanation	Comments
STATUS□ SETTING□ TIMES ■ SERVICE□		
↓		
OPERATION TIME SYSTEM 00000h	→ The operation time for the entire system. I.E. The counting starts the first time the installation is powered.	
↓		
OPERATION TIME COMPR. 00h 00min	→ Operation time for heat pump last 24 hrs.	
↓		
OPERATION HP LAST 24h 0	→ Number of compressor starts last 24 hrs. (Counter starts when the system is powered for the first time.)	
↓		
COMPR. STARTS LAST 24h 00000h	→ Total operation time for the heat pump compressor.	

5.5 Menu – STATUS

The status menu provides information about the system's actual temperatures as well as which outputs (relays) are active. Parameters cannot be changed here, only read off.

5.5.1 Temperatures

Display	Explanation	Comments
TEMPERATURES ■ OPERATION STAT □		
↓		
TEMP 45°C SETVALUE 48°C	→ The actual tank temperature as well as the set valve that the system is to reach. The set value varies depending on the house curve's setting.	
↓		
PRI FLOWTMP 33°C SETVALUE 34°C	→ Shows the outgoing temperature to the house radiators and/or under floor heating system. The set value varies depending on the house curve's setting and outdoor temperature.	
↓		
ROOM TEMP 20.5°C SETVALUE 20.0°C	→ Shows the actual room temperature and set value. Set the room temperature in the customer menu.	**Only shown if room sensor operation is selected in the system menu.**
↓		
HOT WATER 53°C SETVALUE 50°C	→ Actual temperature and set value for the boiler's hot water section. Set the set value in the customer menu.	
↓		
HOTGAS TEMP 85°C OUTDOOR TMP 2°C	→ Actual hot gas temperature on the heat pump's delivery pipe and actual outdoor temperature.	
↓		
DEFROSTSENS -2°C START TEMP -6°C	→ Actual temperature on defrost sensor and start temperature for defrost (Defrost interval: Max 1 time/h.)	**Only displayed for ExoAir and Polaris.**
↓		
BRINE TEMP -2°C ALARM TEMP -6°C	→ Actual temperature of the brine and set temperature when the system gives an alarm for low brine temp.	**Only displayed for Exotic**

5.5.2 Operation status

Activated functions are indicated by a filled in box.

Display	Explanation	Comments
TEMPERATURES □ OPERATION STAT ■		
↓		
COMPRESSOR □ CHARGE PUMP □	→ Operation status for compressor and charge pump.	
↓		
ACTUAL FAN SPEED OFF□ LOW□ HIGH□	→ Operation status for fan. The fan shifts automatically to low/high speed depending on the outdoor temperature and settings in the service menu.	**Only displayed for ExoAir and Polaris**
↓		
BRINE PUMP □	→ Operation status of brine pump	**Only displayed for Exotic.**
↓		
PRESSOSTATE OK□ MOTORPROT. OK□	→ Status of the pressostat and compressor motor protection.	
↓		
4-WAY VALVE □ EVI VALVE □	→ Information about the heat pump's 4-way valve and EVI valve for polaris being activated.	**Only displayed for Polaris.**
↓		
4-WAY VALVE □	→ Information about the heat pump's 4-way valve being activated	**Only displayed for ExoAir.**
↓		
ELECTRIC HEATERS 3(6)kW□ 6kW□	→ Information about which power stage is active for the system's electric heaters 1 and 2.	
↓		
CURRENT 19.6A MAIN FUSE SIZE 25A	→ Information about the house actual current consumption and which fuse is installed. (Note that power transformers must be installed in order for the actual current to be read off.)	
↓		

CURRENT LIMITED ELP 3(6)kW□ 6kW□	→ Information about whether the system restricts one or both electric heaters in order for the total current for the house to exceed the main fuse. Filled in box means that power is blocked. The system reactivates the electric heater(s) again when the power has dropped to a value that does not risk the main fuse blowing. (The function only works if power transformers are installed.)	
↓		
MIXING VALVE OP. OPENS□ CLOSING□	→ Operation status for the mixing valve motor.	
↓		
LI.SW MIX VALVE□ NIGHT TEMP REDU□	→ Information about whether the mixing valve motor's limit position is active and if the night reduction contact is closed.	
↓		
EXOTROL ver 1.00 model: EXOAIR	→ Information about program version and set heat pump model	**Only displayed for ExoAir.**
↓		
EXOTROL ver 1.00 model: POLARIS	→ Information about program version and set heat pump model	**Only displayed for Polaris.**
↓		
EXOTROL ver 1.00 model: EXOTIC	→ Information about program version and set heat pump model	**Only displayed for Exotic.**

5.6 Menu - SETTINGS

This menu group contains settings for the system as well as language settings and house curve etc.

5.6.1 Customer

Display	Explanation	Comments
STATUS□ SETTINGS■ TIMES□ SERVICE□		
↓		
CUSTOMER■ CURVE□ SYSTEM□ LANGUAGE□		
↓		
ROOM TEMP 21.0°C SET TMP 20.5°C	→ Actual and desired room temperature. If the room temperature is greater than the desired temperature, the outlet temperature	**Only shown when room sensor operation is selected in the system menu.**
↓		
NIGHT TEMP REDUCTION 2.0°C	→ This option means that the room temperature drops the set number of degrees during the time that the night reduction contact is closed (see table 4). Note! In order for this function to work, a timer or similar must be used to close the contact.	**Only shown when room sensor operation is selected in the system menu.**
↓		
DESIRED HOT WAT TEMP 50°C	→ Setting desired hot water temperature. Increasing this value can increase the operating time of the electric heaters.	

5.6.2 Curve

The curve menu makes it possible to affect how the heating system is to shunt heat to the house radiators or under floor heating system.

Display	Explanation	Comments
CUSTOMER□ CURVE■ SYSTEM□ LANGUAGE□		
↓		
PRI FLOW TMP AT OUT TMP -15° C55°C	→ Outlet temperature to radiators or under floor heating system at -15ºC outdoor temperature. Compare point A in figure 20 next page.	
↓		
PARALLEL TRANSL.OF CURVE 0°C	→ Makes it possible to move the house curve vertically up or down. (±10ºC). Compare point B in figure 20 next page.	
↓		
RAD. HEAT OFF AT 17°C OUTDOOR TMP	→ When the outdoor temperature reaches the set value in this menu, the mixing valve closes completely, i.e. no heat is sent to radiators/under floor heating. Compare point C in figure 20 next page.	
↓		
MIN ALLOWED TANK TEMP 35°C	→ Minimum permitted tank temp is the lowest temperature that the system (heat pump) permits the tank temperature to drop to.	
↓		
HOT WATER CHARGE AT OUTD TEMP 12°C	→ This setting makes it possible to decide the change point when the heat pump charges towards maximum permitted temperature regardless of the curve (fixed condensing).	
FLOOR HEAT ONLY? YES□ NO□	→ If the house only has under floor heating, the outlet temperature from the mixing valve can be limited.	
↓		
MAX TEMPERATURE FLOOR HEAT 35°C	→ Max permitted output temperature from mixing valve during under floor heating. Compare point D in figure 20 next page.	**Only appears when under floor heating is selected.**

House curve

The house curve is a way of controlling how hot water is to be sent to the house radiators or under floor heating system. This is done using the outdoor temperature but also the room temperature is a parameter that can regulate it if room sensor operation is active. Not that the room sensor can only reduce the outlet temperature when it becomes warmer than the desired room temperature. e.g. if lighting a fire. Even in room sensor operation, the curve must be adjusted to the house heating demand.

A well set house curve gives a comfortable room temperature regardless of the outdoor temperature and can also reduce energy costs.

The house curve is unique to each installation/house and can require adjustment to give optimal heating comfort.

The following settings are possible:

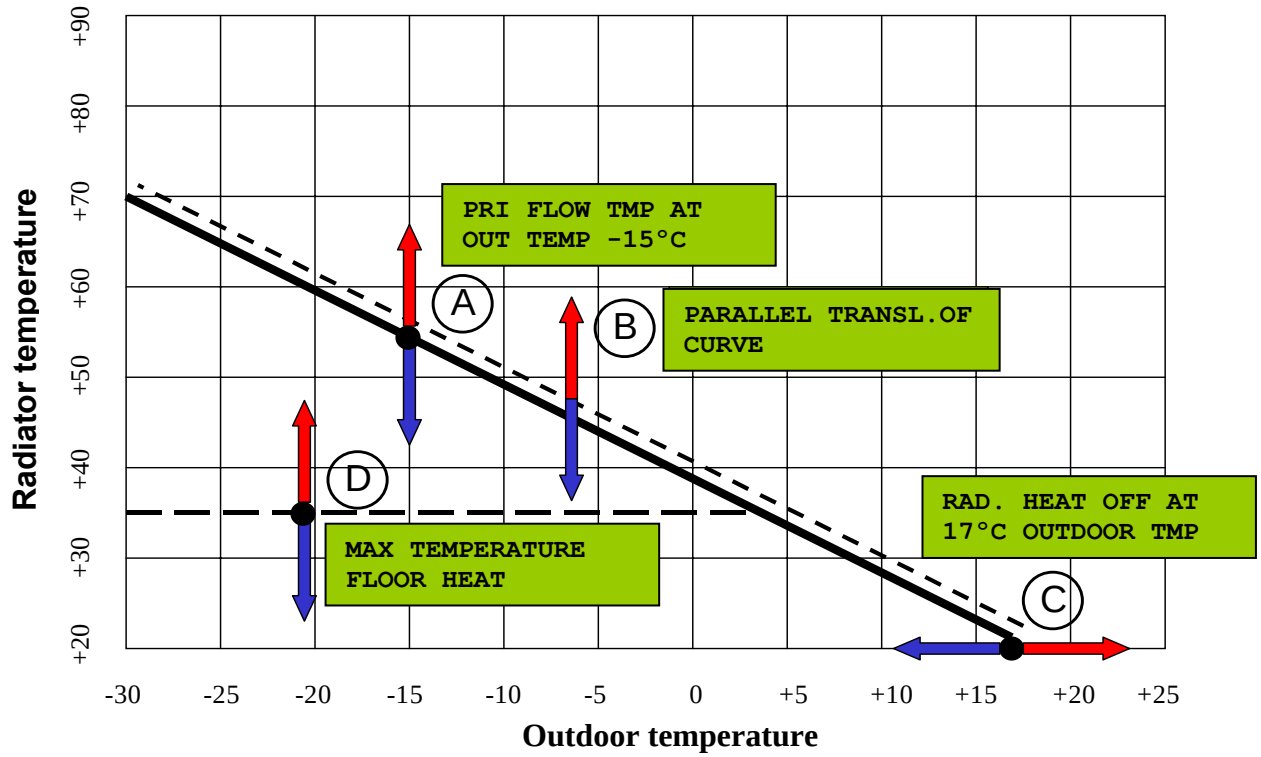
Point: A This point means that the curve's slope is moved up or down.

Point B: This point allows the entire curve to be moved up or down (parallel offset). The curve's slope is not affected.

Point C: This point also changes the curve's slope and indicates at which outdoor temperature the mixing valve is to close completely, i.e. when there is no heating demand. If you want to heat the cellar radiators in summer time, this point should be moved to 25-30ºC. If the outdoor temperature has exceeded the set value for more than 8 hours, a delay is activated that means that the mixing valve does not open again until the outdoor temperature has been below the set value for 8 hours.

Point D: This option is only valid if the option ”Only under floor heating” is selected in the customer menu and means that the mixing valves limits the temperature to the under floor heating system. I.E. the temperature to the under floor loops can never exceed the set value in this box.

Figure 20. House curve



Example of house curve settings

Figure 22. Adjustment of house curve point A

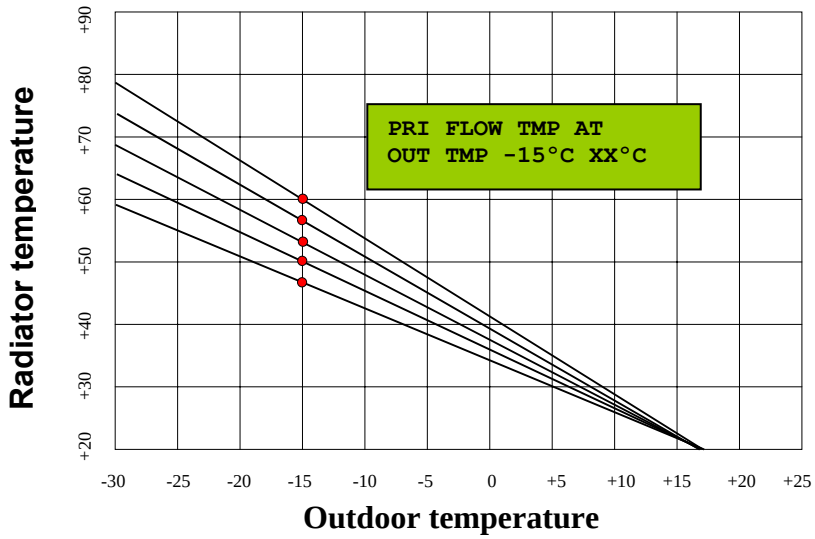


Figure 23. Adjustment of house curve point B

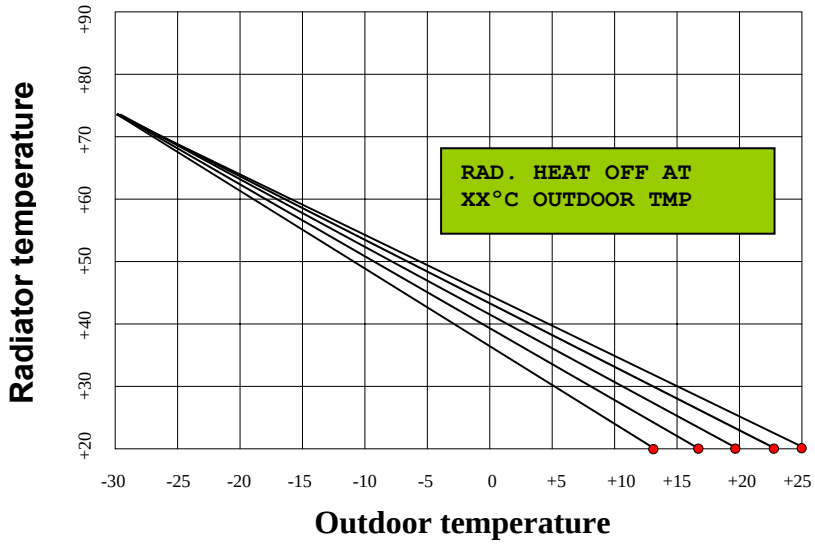
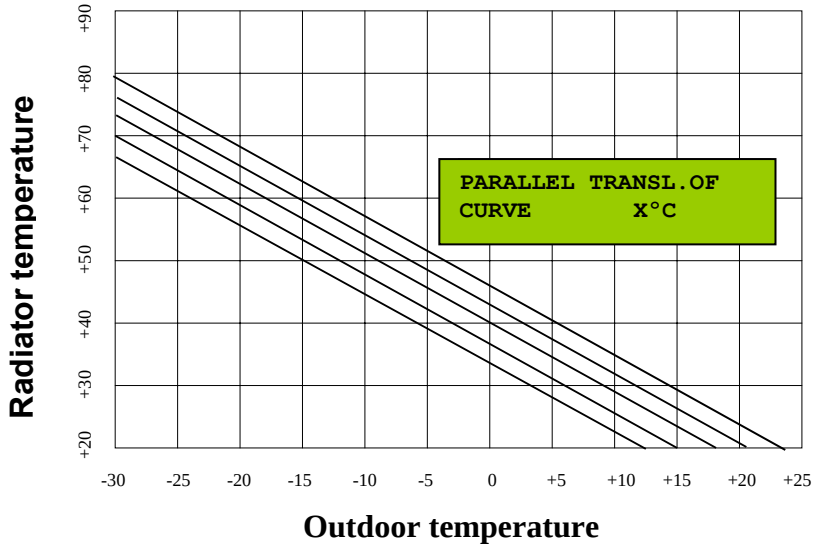


Figure 24. Adjustment of house curve point C



5.6.3 Heat pump operation towards house curve

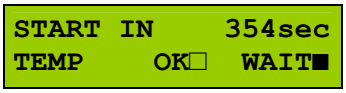
The heat pump works towards always heating ExoTank's water so that the demand from the house curve is met.
To ensure the temperature in the tank, the heat pump works towards the set value from the house curve + 5ºC. I.E. If the demand to the house radiators, at a certain time is 40ºC, the heat pump heats the boiler water to 45ºC.

When the set value is reached, the heat pump stops and cannot be restarted until the following 2 conditions are met:

- Time delay if 10 minutes have passed
- The temperature in the boiler dropped the set number of degrees.

For as long as the conditions are not met, the remaining time delay is shown in the display and if the temperature has dropped sufficiently for a restart.
Note that both conditions must be met, which means that the time delay can be inactive but the system waits for the temperature to drop.

► Temperature hysteresis for restarting can be set in the service menu.



Regardless of the house curve, there is a minimum tank temperature that the heat pump always must maintain. It is called ”Min allowed tanktemp” and is set in the house curve menu.

To be able to prioritise hot water, there is also a setting called ”Hot water charge at outd tmp XXºC”. This setting makes it possible to decide at which outdoor temperature the heat pump is to charge the tank's water towards hot water temperature or maximum permitted temperature.

The setting can be used if you wish to run the system as a fixed condensing system, where hot water production is always prioritised. Note, however, that the energy consumption becomes greater if the system is run with fixed condensing.

The heat pump works mostly according to the house curve or the minimum permitted tank temperature, alternatively maximum charging at outdoor temperatures above the set value in the menu ”Hot water charge at outd tmp XXºC”.
When the heat pump works towards the house curve and there is a hot water demand, the heat pump continues until the hot water temperature is reached or ”Max temp heat pump” is reached.

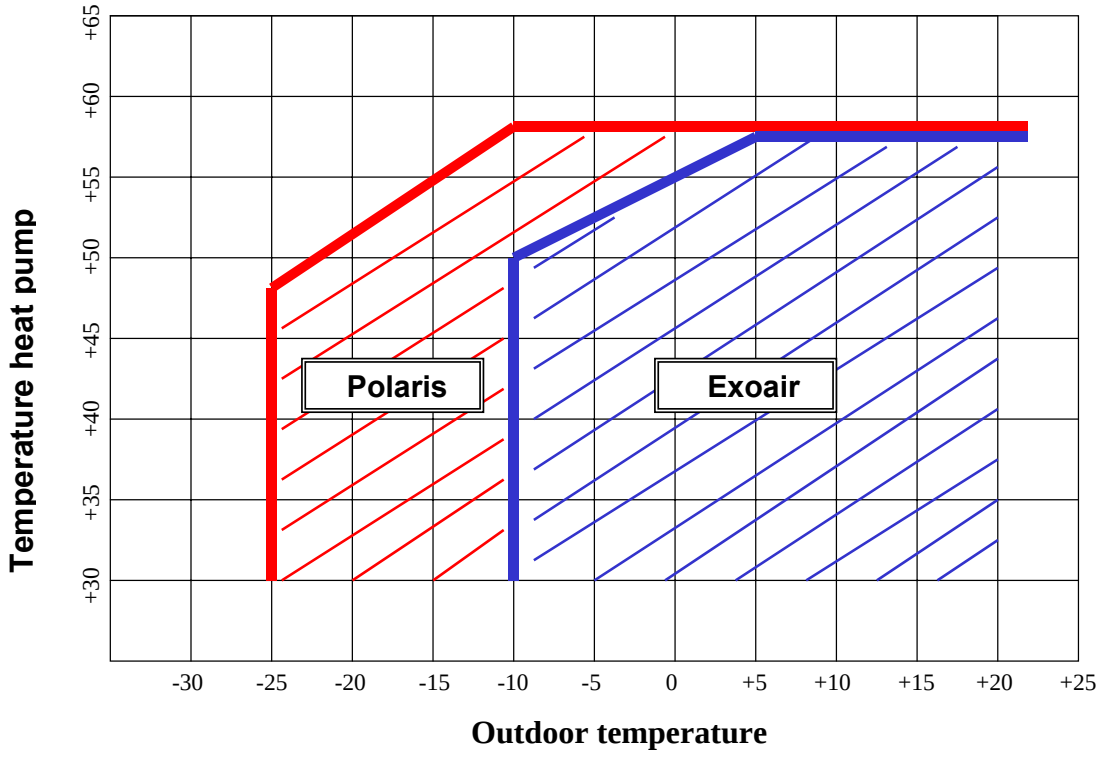
For ExoAir and Polaris there are temperature restrictions that mean that the heat pump's working range can differ from the house curve's as the outdoor temperature becomes low.

This means that the maximum temperature that can be achieved is not always the same as the maximum temperature that is set in the service menu, ”Max temp heat pump”

Temperature restriction for ExoAir and Polaris depending on the outdoor temperature can be viewed in figure 25 below.

(The figure is based on the set maximum temperature 57ºC.)

Figure 25. Temperature restriction at low outdoor temperatures for Exoair/Polaris



5.6.4 System

The system menu may only be managed by the installer and/or service technicians. Settings are made in the menu for electric heaters as well as system settings that affect how the system works.

Display	Explanation	Comments
CUSTOMER□ CURVE□ SYSTEM■ LANGUAGE□		
↓		
MODEL: EXOAIR□ POLARIS□ EXOTIC□	→ Setting heat pump model. The selection means that menu and function changes can be made for internal relays.	
↓		
ROOM SENSOR OP. WITH□ WITHOUT□	→ Option with or without room sensor operation. A room sensor can affect the house curve and thereby give better control of the room temperature. Room sensor must always be installed if the night reduction function is to be used.	**The room sensor must always be installed, even if it cannot be used to control the heating system.** **This is because the room sensor's alarm lamp is interesting.**
↓		
MAIN FUSE SIZE FUSE BOX 25A	→ Setting the house/building's main fuse. Setting is only relevant if the current transformer is installed.	
↓		
COMPRESSOR BLOCK BLOCKED□ ALLOW□	→ The compressor block prevents start-up if the system is powered before installation is complete. The limiter must be first deactivated when the system is ready to be started.	
↓		
EL. HEATER BLOCK BLOCKED□ ALLOW□	→ System electric heaters blocked. The limiter must be first deactivated when the system is ready to be started.	
MAX POWER EL.H 3□ 6□ 9□ 12□ kW	→ Setting maximum permitted output for the electric heaters. Note that stages 3 and 9kW are only relevant if the boiler's installed electric heaters are 3 + 6kW.	**Only shown if the electric heater limiter is removed**
↓		
65°C CHARGE ONCE A WEEK ON□ OFF□	→ This setting allows the system to charge the boiler water to 65ºC once a week with the electric heaters.	**Only shown if the electric heater limiter is removed**
↓		

SAVE SETTINGS? PRESS +□ SAVED□	→	To save made settings hold the up arrow (+) in until the box by saved is filled, approximately 3 seconds. If the settings are not to be saved, advance using the right arrow (enter button).
RESET TIME LOG PRESS□ RESET□	→	Reset stored times by holding in the up arrow for 3 seconds until the ”RESET” box illuminates.

5.6.5 Language

Menu language gives the option of selecting the display language.

Display	Explanation	Comments
CUSTOMER□ CURVE□ SYSTEM□ LANGUAGE■		
↓		
SVE□ ENG□ DEU□ POL□ FIN□	→ Setting the display language.	There are different language options depending on which EPROM is installed.

5.7 Menu - SERVICE

The service menu enables installers and service technicians to make advanced settings and manually test operate and check error logs. Service mode can only be accessed via a PIN code and settings should not be made without being familiar with the system or before consulting an installer/supplier.

► PIN code =1,2,3.

The menu opens for 15 minutes after the code has been approved.

5.7.1 Settings

Display	Explanation	Comments
SETTINGS■ ERROR LOG□ TEST□		
HIG FAN SPEED 2 AT 10°C OUTD. TMP	Setting for the change temperature when the fan is to work at the highest speed.	**Only displayed for ExoAir and Polaris**
TEMP HYSTERESIS RESTART HP 5°C	Setting the temperature hysteresis for restarting the heat pump in the lower part of the tank. If many there are many start/stops or if you wish to extend the operating time for the heat pump, this parameter can be increased.	
TEMP HYSTERESIS W.HEATER 5°C	Setting the temperature hysteresis for restarting the upper part of the tank (hot water section).	

DELAY MIX VALVE W.HEATER 180min	There is a parameter limit in the mixing valve motor, which is activated when the mixing valve tries to open towards the hot water section of the tank. To prevent the mixing valve from using the expensive energy in this section, a time delay starts, which forces the mixing valve to wait a certain amount of time before it can continue to open. If the demand remains after the set time, the mixing valve opens towards the hot water section.	
DEFROST START AT SENSOR TEMP -6°C	Indicates start temperature for a defrost to be initiated. Defrost is temperature and time dependent according to the following: The temperature is read from the evaporator every hour (active compressor time). If, at the time of reading, the temperature falls below the set value, defrost is initiated. Defrost continues until the sensor temperature has increased by the start value + the temperature difference, which is set in the next box. Maximum defrost time is 10 minutes.	**Only displayed for ExoAir and Polaris**
TEMP INTERVAL DEFROSTING 18°C	Defrost interval. See explanation in the box above.	**Only displayed for ExoAir and Polaris**
FREEZE ALARM BRINE AT -10°C	Setting freeze alarm for brine for Exotic.	**Only displayed for Exotic**
MAX TEMP HEAT- PUMP 57°C	Setting maximum temperature for heat pump. (Note that the maximum temperature is reduced for ExoAir and Polaris depending on the outdoor temperature. See figure 19.)	
CALIBRATION OUTDOOR SENS13.7°C	Enables calibration of outdoor sensor.	
CALIBRATION ROOM SENSOR 20.7°C	Enables calibration of room sensor.	

5.7.2 Error log

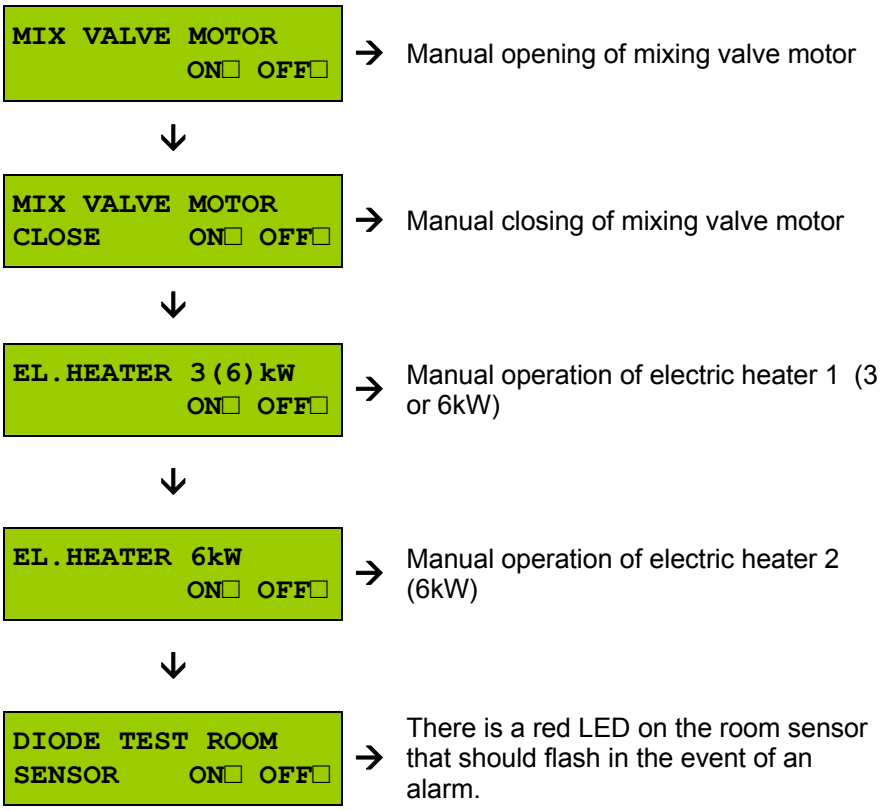
The error log stores all errors that the system generates and different types of error can be checked via the menu. For advanced troubleshooting see chapter 7.7 Troubleshooting guide.

Display	Explanation	Comments
SETTINGS□ ERROR LOG■ TEST□		
MOTOR PROTECTION ERROR COUNT: 0	→ Number of alarms initiated by the compressor's motor protection.	
↓		
PRESSOSTATE ERROR COUNT: 0	→ Number of pressostat alarms. (Note that high and low pressure alarms are not separated)	
↓		
HIGH HOTGAS ERROR COUNT: 0	→ Number of alarms with high hot gas, above 130ºC	
↓		
SENSOR FAILURE ERROR COUNT: 0	→ Number of sensor errors. (Alarm initiated when the values deviate from the temperature interval, which can be read about in chapter 7.4.)	
↓		
RESET ERROR LOG? YES□ NO□	→ At service, the error log should be reset.	

5.7.3 Test

The test menu enables manual activation of the different control relays and therefore enables troubleshooting at component level. All relays switch off when the test menu is accessed.

Display	Explanation	Comments
SETTINGS□ ERROR LOG□ TEST■		
↓		
CHARGE PUMP ON□ OFF□	→ Manual operation charge pump	
↓		
BRINE PUMP ON□ OFF□	→ Manual operation brine pump.	**Only displayed for Exotic**
↓		
FAN HIGH SPEED ON□ OFF□	→ Manual operation fan high speed.	**Only displayed for ExoAir and Polaris.**
↓		
FAN LOW SPEED ON□ OFF□	→ Manual operation fan low speed	**Only displayed for ExoAir and Polaris.**
↓		
COMPRESSOR ON□ OFF□	→ Manual operation compressor. (Charge pump starts automatically with this option.)	
↓		
EVI VALVE ON□ OFF□	→ Manual opening of EVI valve for Polaris.	**Only displayed for Polaris.**
↓		
4-WAY VALVE ON□ OFF□	→ Manual opening of the heat pump's 4 way valve	**Only displayed for ExoAir and Polaris.**
↓		
MANUAL DEFROSTING ON□ OFF□	→ Manual defrost. (Compressor, charge pump, 4-way valve activated.) Can be used during forced defrost. Maximum time 6 minutes	**Only displayed for ExoAir and Polaris.**
↓		


MIX VALVE MOTOR
ON□ OFF□
Manual opening of mixing valve motor
MIX VALVE MOTOR
CLOSE ON□ OFF□
Manual closing of mixing valve motor
EL.HEATER 3(6)kW
ON□ OFF□
Manual operation of electric heater 1 (3 or 6kW)
EL.HEATER 6kW
ON□ OFF□
Manual operation of electric heater 2 (6kW)
DIODE TEST ROOM
SENSOR ON□ OFF□
There is a red LED on the room sensor that should flash in the event of an alarm.

5.8 Error messages

► In the event of an error, this appears in the display's standby/alarm mode.

► Alarm has occurred before standby text.

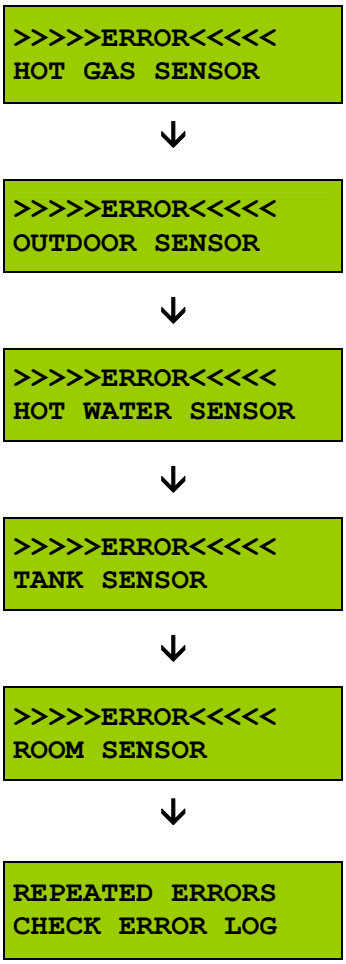
► Acknowledge the alarm by pressing "ENTER"

► The alarm can only be reset if the error is corrected.

► In cases where more than one error occurs, the error with the highest priority is displayed.

The following page shows alarms in sequence of priority.

Display	Explanation	Comments
>>PHASE ERROR<< RESTART SYSTEM!	This error is initiated if the hot gas temperature on the pressure pipe does not rise when the compressor starts. In most cases, this is because the phase sequence is incorrect. Check the phase sequence and restart. The error may also be due to the hot gas sensor being defective/having become loose or that it is incorrectly connected. (The alarm cannot be reset using the Enter button.)	
>>>>>ERROR<<<<< HOTGAS OVER 130°C	The alarm can be due to several things. If the error recurs, contact service. For troubleshooting see chapter 7.7 Troubleshooting guide	
>>>>>ERROR<<<<< PRESSOSTATE H/L	The alarm indicates that the pressure in the heat pump is too high or too low. If the fault recurs contact service. For trouble shooting see chapter 7.7 Troubleshooting guide.	
>>>>>ERROR<<<<< LOW BRI.TMP -12°C	Alarm indicating that the brine temperature has dropped below the set cut-out temperature. If the fault recurs contact service. For trouble shooting see chapter 7.7 Troubleshooting guide.	**Only displayed for Exotic**
>>>>>ERROR<<<<< PRI. FLOW SENSOR	Sensor faults can be due to several different things. For trouble shooting see chapter 7.7 Troubleshooting guide.	



Sensor faults can be due to several different things.
For trouble shooting see chapter 7.7 Troubleshooting guide.

Sensor faults can be due to several different things.
For trouble shooting see chapter 7.7 Troubleshooting guide.

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For trouble shooting see chapter 7.7 Troubleshooting guide.

Only appears if Room Sensor Op.With is set

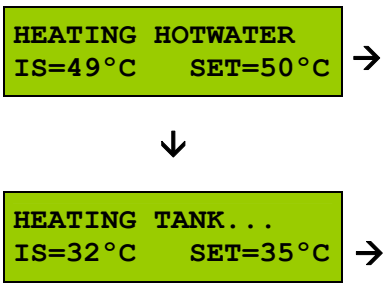
In the event of 3 or more alarms during a 24 hour period, this box appears. If possible, check the error log and contact service.

5.9 Standby texts

Standby texts work just like alarm texts and are ordered by priority. The text with the highest priority appears if it is active.

► Alarm texts have priority over all standby texts.

Display	Explanation	Comments
SYSTEM SET IN STANDBY MODE...	When the standby contact closes (see table 4), the system goes into standby mode and the heat pump and electric heaters are blocked.	**Does not affect mixing valve control.**
COMPRESSOR OFF MENU-> SYSTEM	Upon the first start-up, the compressor (and electric heaters) are blocked and settings must be made before they can be unblocked. Unblock in the system menu. See chapter 5.6.4 System.	
HEAT PUMP OFF OUTDOOR TEMP-12°C	For ExoAir and Polaris, operation at low outdoor temperatures is restricted to -10ºC respectively -25ºC. The box disappears automatically when the temperature has risen above the minimum permitted temperature.	**Only displayed for ExoAir and Polaris.**
TEMP REDUCTION ACTIVATING...	When the night reduction contact closes (see table 4), this box is activated and is active for 3 seconds.	
DEFROSTING IN PROGRESS. 25secs	When defrost is in progress, this box appears with information about the passed time. The box disappears automatically when defrost is complete.	**Only displayed for ExoAir and Polaris.**
START IN 256sec TEMP OK□ WAIT■	When the heat pump has reached its set value, it stops and waits for a restart, which can occur 10 minutes after a stop at the earliest. The start delay also depends on how quickly the temperature drops in the tank.	



Temperature and set value hot water section (upper part).
Heated by heat pump and at larger outputs also by the electric heater.

The temperature and set value in the tank section (lower part).
Charging towards the heat curve. Also see the info box above.

6 Maintenance and checks

☐ **ExoAir and Polaris**

- During the cold times of the year, ice can build up under the heat pump. This is completely normal and need not be remedied.
- In conjunction with defrosting, the evaporator/cooling coil is heated and when defrosting stops and the pump returns to normal heating operation, hot humid air is blown out to start with, which results in a white cloud of steam. This is also completely normal.
- Check the dirt filter annually or as necessary.
- Check that the air can pass the heat pump without any obstruction, such as leaves etc.
- The heat pump should be flushed and cleaned externally 1-2 times/year.
- In exceptional circumstances a thin film may appear on the stainless steel. If this happens, special cleaning agents are available for stainless steel, e.g. Avesta original finish – rust remover. This agent can be ordered from Euronom.

Figure 26. Avesta original finish

- Check annually that the sight glass in the heat pump is clean, without bubbles, when the heat pump is running. If there are bubbles, this can indicate a lack of refrigerant and service should be contacted.
- Condensation run-off usually soaks away into the ground and is absorbed by the house drainage. Check that there is no moisture penetration.

☐ **Exotic**

- Check annually that the sight glass in the heat pump is clean, without bubbles, when the heat pump is running. If there are bubbles, this can indicate a lack of refrigerant and service should be contacted.
- Wipe the heat pump if necessary, if residue due to water leaks is detected, cleaning agent as above can be used to regain a fine finish.
- Check the dirt filter annually or as necessary.

7 Service

This chapter is intended to be used by service technicians and/or installers as an information document and for use during installation troubleshooting.

7.1 Technical data Exoair and Polaris

Table 6. Technical data Exoair & Polaris

Model	Exoair 7.5	Exoair 10,5	Exoair 16	Polaris 10	Polaris 16	Polaris 20
Refrigerant	R407C			R404A		
Amount of refrigerant	1665g	2100g	2600g	2400g	3800g	4000g
Dimensions (wxhxd)	1086x(882-952)x600	1086x(882-952)x600	1086x(1212-1282)x620	1086x(882-952)x600	1086x(1212-1282)x620	1086x(1212-1282)x620
Weight	130 kg	135 kg	185 kg	135 kg	180 kg	185 kg
Power supply	400V N PE, 50Hz					
Motor protection	7A	11A	13,5A	7,8A	10A	14A
Soft start relay	Included as Standard					
IP-class control	IP 23					
Compressor	Scroll					
High pressure pressostat	Break pressure 29bar, diff -6bar			Break pressure 31bar, diff -6bar		
Low pressure pressostat	Break pressure 0.3bar, diff +0.9bar					
Connection heating medium	➢22	➢22	➢28	➢22	➢28	➢28
Normal flow[1]	750l/h	1100l/h	1600l/h	1100l/h	1400l/h	2000l/h
Defrost system	Time and temperature dependent hot gas defrost					
Lowest outdoor temp, operation	-10ºC			-25ºC		
Heating output/Input[2]	7.71 / 2.54kW	10.35 / 3.53 kW	17.60 / 5.17kW	9.89 / 3.37kW	12.94 / 4.48kW	19,66 / 6,69

[1] At an outdoor temperature of 15ºC and with an outlet/return (ΔT) temperature difference of 10ºC

[2] At an outdoor temperature of 7ºC and outlet temperature of 50ºC

7.2 Technical data Exotic

Table 7. Technical data Exotic

Model	Exotic 6	Exotic 8	Exotic 10	Exotic 12	Exotic 15	Exotic 17
Refrigerant	R407C					
Amount of refrigerant	1550g	1550g	1630g	1630g	1950g	2050g
Dimensions (wxhxd)	598x(885-920)x650					
Weight	109 kg	111 kg	119 kg	129 kg	137 kg	139 kg
Power supply	400V N PE, 50Hz					
Motor protection	6A	7A	9A	11A	11,5A	13,5A
Soft start relay	Included as Standard					
IP-class control	IP 23					
Compressor	Scroll					
High pressure pressostat	Break pressure 29bar, diff -6bar					
Low pressure pressostat	Break pressure 0.3bar, diff +0.9bar					
Connection heating medium	➢22					
Conn. brine	➢28					
Normal flow heating medium[3]	850l/h	900l/h	1100l/h	1350l/h	1650l/h	1900l/h
Normal flow brine	1830l/h	2020l/h	2500l/h	2935l/h	3640l/h	4280l/h
Heating output/Input[4]	6.75 / 2.07kW	7.40 / 2.25kW	9.20 / 2.74kW	10.80 / 3.26kW	13.40 / 3.97kW	15,60 / 4,59

[3] At brine in 0ºC and temperature difference outlet/return (ΔT) 7ºC

[4] At brine in 0ºC and outlet 50ºC

7.3 Technical data Exotank

Table 8. Technical data Exotank

Model	**Exotank VPS 300**	**Exotank VPS 500**
Volume	300l	500l
Dimensions (wxhxd)	600x1530x600	700x1660x700
Weight	128 kg	160 kg
Hot water production	Double cam flange coils 25 m	
Mixing valve system	Bivalent	
Electric heaters	6 kW	
Connection domestic water	Ø22 cu	
Connection heating system	Compression ring 22mm	
Connection any external heat	DN25 ext	
Connection heat pump	DN25 ext	
Connection expansion tank	DN25 ext	
Connection solar coil (Option)	Ø22 cu	

7.4 Sensor resistances

Table 9. Temperature-resistance conversion table

All sensors without hot gas sensor

Temperature	Resistance
-20ºC	16.3 kΩ
-15ºC	12.6 kΩ
-10ºC	10.0 kΩ
-5ºC	7.8 kΩ
0ºC	6.2 kΩ
5ºC	4.9 kΩ
10ºC	4.0 kΩ
15ºC	3.2 kΩ
20ºC	2.6 kΩ
25ºC	2.2 kΩ
30ºC	1.8 kΩ
35ºC	1.5 kΩ
40ºC	1.2 kΩ
45ºC	1.0 kΩ
50ºC	0.8 kΩ
55ºC	0.7 kΩ

Hot gas sensor

Temperature	Resistance
0ºC	163 kΩ
10ºC	95 kΩ
20ºC	61 kΩ
30ºC	39 kΩ
40ºC	26 kΩ
50ºC	18 kΩ
60ºC	12 kΩ
70ºC	8.5 kΩ
80ºC	5.9 kΩ
90ºC	4.4 kΩ
100ºC	3.3 kΩ
110ºC	2.5 kΩ
120ºC	1.9 kΩ
130ºC	1.4 kΩ

7.5 Default settings and preset values

All settings in the control unit are checked prior to delivery. In some cases, it may be necessary to reset the factory settings.

► When replacing EPROM, a reset must be performed in order for the settings to be stored.

To reset to factory settings, hold all 3 display buttons in for at least 5 seconds as in figure 27 below.
Note that all settings have now been reset to zero and that settings for the system must be made again, as well as any adjustments of other parameters.

Figure 27. Default setting Exotrol

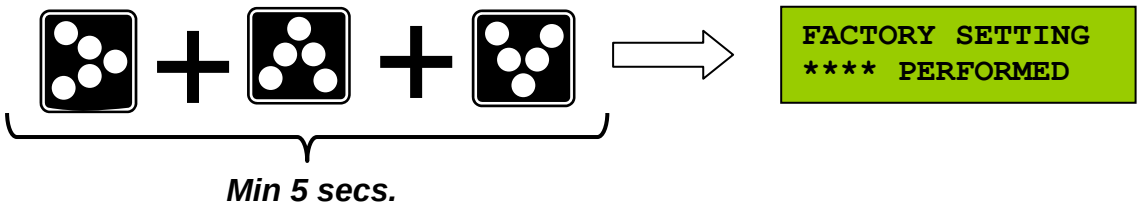
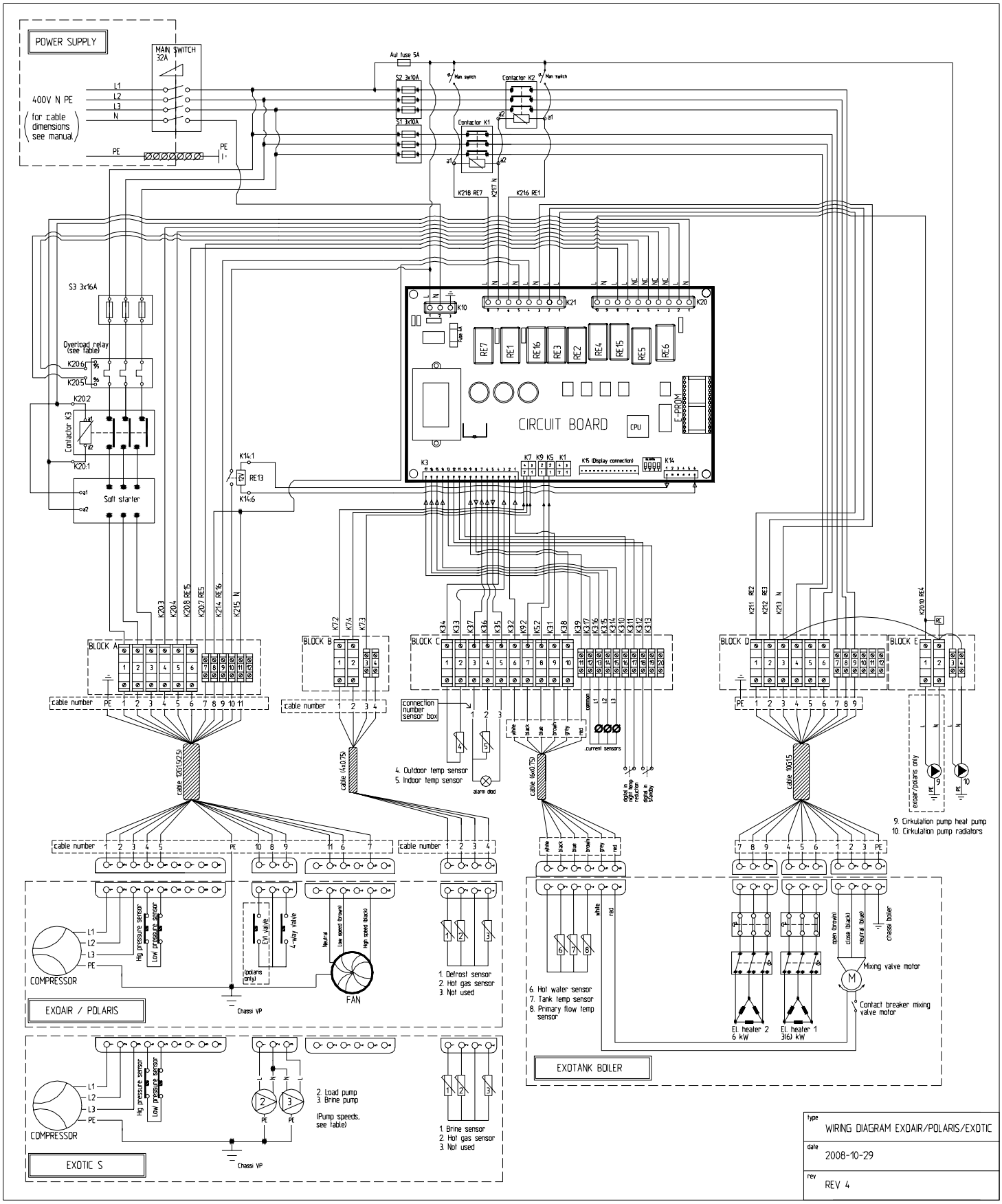


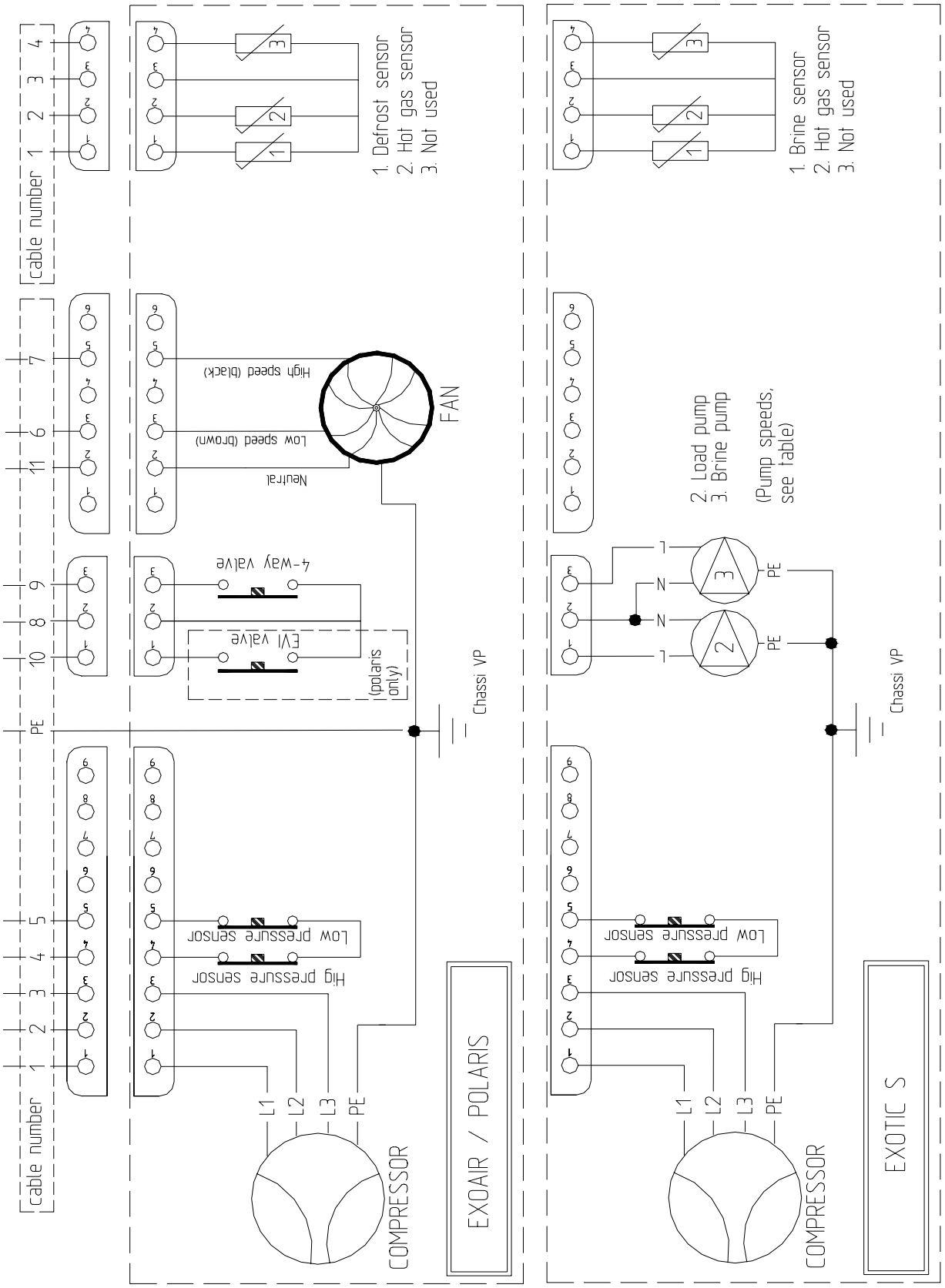
Table 10. Preset values.

Parameter	Unit	Max	Min	Preset
Operation time system time	h	32000	0	0
Compressor operation time	h	32000	0	0
Heat pump last 24hrs	h	24	0	0
Heat pump starts latest 24hrs	pcs	255	0	0
Set value room temp	ºC	30	10	20
Room sensor operation with/without	-	1	0	1
Compr. blocked/permitted	-	1	0	1
Electric heater block	-	1	0	1
Hysteresis HW. Heater	ºC	30	2	5
Only under floor heating no/yes	-	1	0	1
Set value minimum tank temp	ºC	52	20	35
Set value outlet at -15ºC	ºC	80	20	55
Radiator heating at outdoor temp	ºC	30	0	17
Hysteresis heat pump restart	ºC	30	2	5
Outlet radiator adjustment	ºC	10	-10	0
Max outlet under floor heating	ºC	60	20	25
Fan speed 2 at outdoor temp	ºC	10	-15	10
Desired hot water temp	ºC	70	20	50
Night reduction	ºC	9,5	0	2
Max output electric heater	kW	12	3	-
Start defrost at sensor temp	ºC	0	-10	-6
65ºC charging once/week	-	1	0	0
Temp interval defrost	ºC	35	5	18
Heat pump max temp	ºC	60	30	57
Hot water charging at outdoor temp	ºC	40	-25	12
Time delay mixing valve	min	255	0	180
Calibrating outdoor sensor	ºC	+6	-6	0
Calibrating room sensor	ºC	+6	-6	0

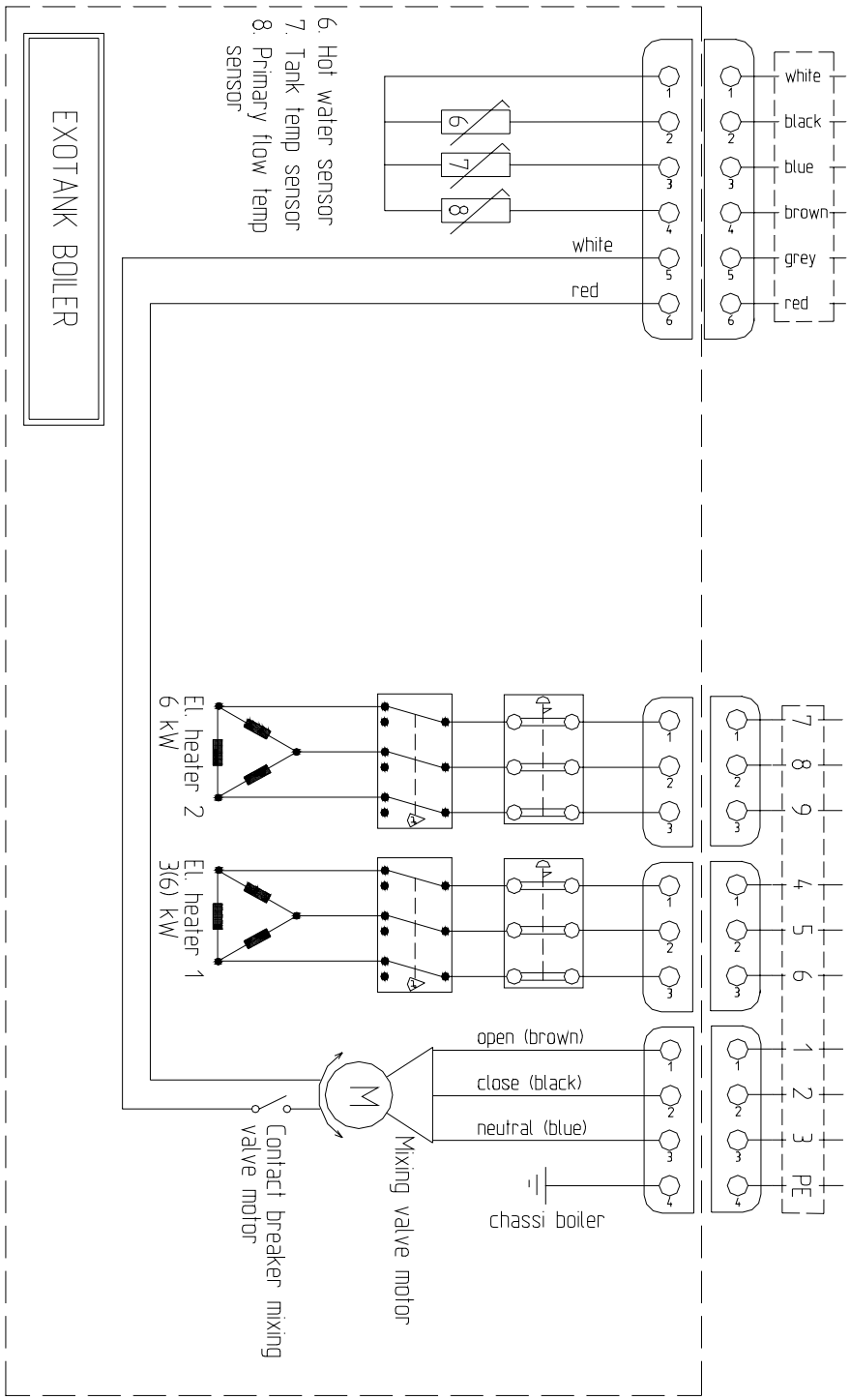
7.6 Wiring diagram



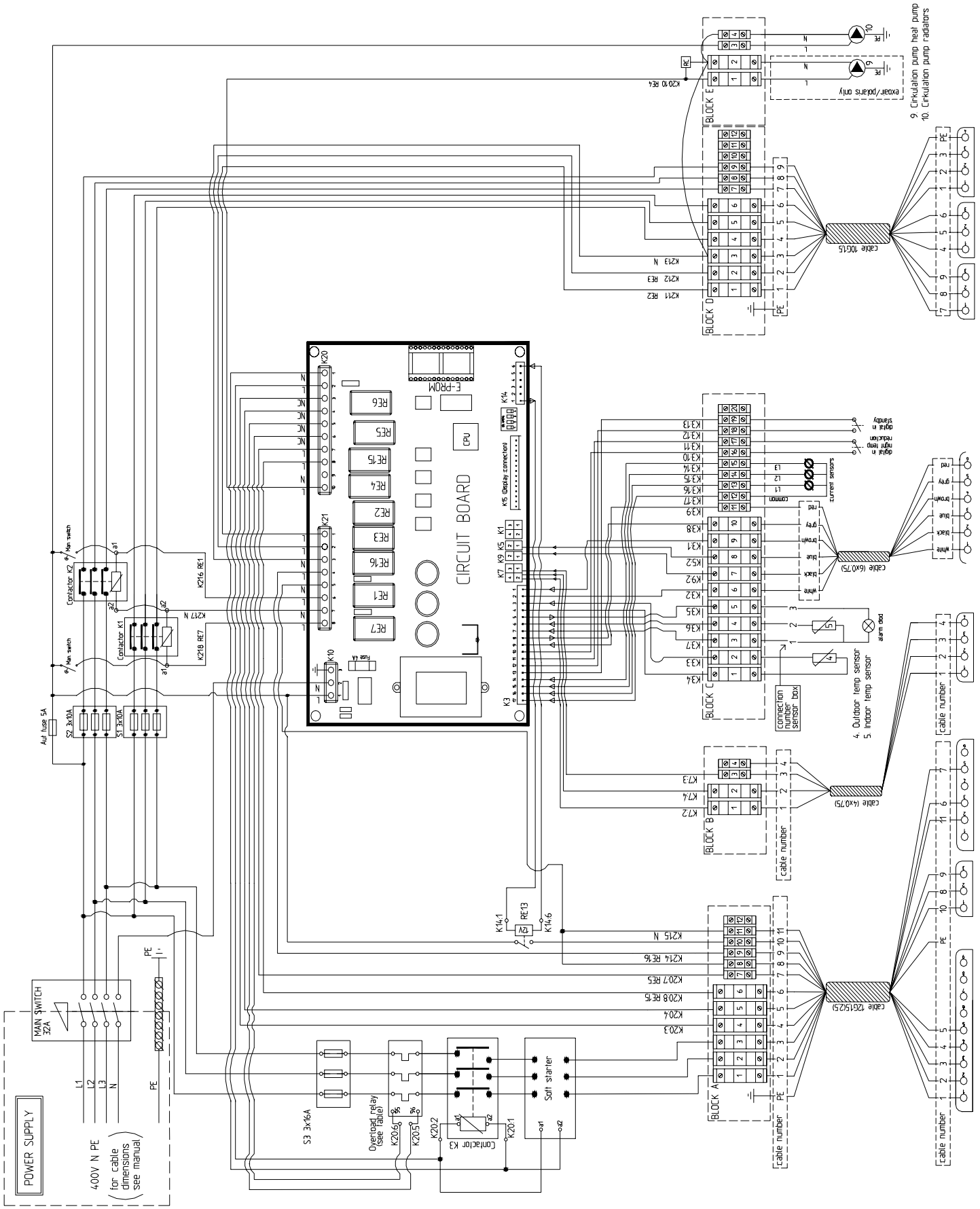
7.6.1 Wiring diagram – Heat pump



7.6.2 Wiring diagram – ExoTank VPS



7.6.3 Wiring diagram – ExoTrol



7.7 Troubleshooting guide

Type of error	Check/Action
Heat pump does not start	• Check that the compressor is not blocked in the system menu in the control unit. • Check that the time delay and/or temperature hysteresis for compressor is not active. • Check the power supply to the compressor. • Check that the piston type fuse (S3) in Exotrol is on. • Cut the current on the control cabinet and switch on again. • Test operate the compressor and other components manually in the test menu to eliminate electro mechanical errors
Hot gas alarm	High hot gas may be due to various things and values must be checked and read off. • Check for bubbles in the sight glass. If there are bubbles, the problem may be due to a lack of refrigerant. Leak trace the installation • **(Only ExoAir & Polaris)** A frozen evaporator gives low evaporator temperatures, which, together with high water temperatures, gives high hot gas. Defrost the evaporator manually until all ice has gone. Adjust any start defrosts and/or the temperature interval for the defrost in the service menu if the fault recurs. • Defective expansion valve. Check overheating • **(Only Polaris)** EVI circuit not activated. Check that EVI valve and expansion valve for the EVI circuit are not defective. Measure supercooling and compare with table 2. The difference is measured between the condensate and the temperature just before the expansion valve to the main circuit. • Hot gas sensor. Check that the hot gas sensor shows the correct value by comparing with another temperature instrument. If sensor problems are established, first determine whether the signal is good and that the cable is properly installed in the terminal block in the control unit. • Poor circulation on the water side. Check the temperature difference between the input and output water, must be max 10ºC at approximately 15ºC outdoor temperature. Check the dirt filter on the water side.

Hot gas alarm cont'd.	• Blocked condenser. If there are high temperature differences between the input/output water and checks have been carried out as stated above, the condenser may be blocked. Remedy: Reverse flush the condenser • **(Only ExoAir & Polaris)**Leakage 4-way valve. Measure the temperature difference on the suction gas line before and after the 4 way valve. The temperature difference must be a maximum of 4ºC. If there is a greater difference, the 4-way valve is leaking internally at which hot gas is pressed directly into the suction port. In this case, the evaporator temperature will be higher than normal. • Internal leak compressor. If the above checks are performed and other measurement values are checked, the problem may be due to internal leakage in the compressor. Contact Euronom.
Pressostat alarm	• The heat pump has low and high pressure pressostats that are connected in series to the control unit. In the event of an alarm, it is therefore not possible to establish whether a low or high pressure pressostat has tripped. The high pressure pressostat trips, depending on model, at 31 respectively 29 bar and closes when the pressure has dropped to 25 respectively 23 bar. The low pressure pressostat trips at 0.3 bar and closes when the pressure has risen to at least 1.2 bar. • To establish which pressostat has tripped/trips, a manometer must be connected and readings taken from the heat pump. **High pressure pressostat:** • Poor circulation on water side. Check the temperature difference between the input and output water, must be max 10ºC at approximately 15ºC outdoor temperature. Check the dirt filter on the water side and that the circulation pump is not defective or set to too low a speed. • Blocked condenser. If there are high temperature differences between the input/output water and checks have been carried out as stated above, the condenser may be blocked. Remedy: Reverse flush the condenser • **(Only ExoAir & Polaris)**Leakage 4-way valve. Measure the temperature difference on the suction gas line before and after the 4 way valve. The temperature difference must be a maximum of 4ºC. If there is a greater difference, the 4-way valve is leaking internally at which hot gas is pressed directly into the suction port. In this case, the evaporator temperature will be higher than normal.

Pressostat alarm cont'd.	• Water temperature too high. Heat pump operation must be stopped at the set maximum value in the service menu. Read off the actual temperature of the water from the heat pump and compare with the sensor values in the control unit. If there is a difference, lower the maximum temperature for the heat pump in the service menu. • Defective expansion valve. Check overheating • Check the difference between the condensing temperature and outgoing water temperature. Depending on the conditions, the difference should not be greater than 3ºC • Check that the high pressure pressostat does not trip before 31 bar (polaris), 29 bar (ExoAir & Exotic). **Low pressure pressostat:** • Lack of refrigerant. (Bubbles in sight glass) Check for leakage. • **(Only ExoAir & Polaris)** Frozen evaporator. Check that the 4-way valve switches. Run manual defrost. Check that the defrost sensor shows the correct value. Check that the angle of the heat pump is correct. • Defective expansion valve. Check overheating • **(Only ExoAir & Polaris)** Defective check valve. Check that the temperature difference occurs during normal operation and that there is no temperature difference when the heat pump is operated in defrost mode. • **(Only ExoAir & Polaris)**Defective 4-way valve. Check that the valve shifts through manual operation in the test menu.

Motor protection	• Check for any phase drops. • Check that cables 1,2,3 in block A in the control module are secure in the terminals. • Check that the motor protection is properly set. The motor protection must be set according to table 3 and set to automatic mode (A) • Measure the compressor current phases for phase during operation and compare with the table material. • Check the compressor windings. If possible, through inductance measurement, measure with motor tester directly on the compressor. The measurement values must not deviate from each other. If inductance measurement is not possible, the windings can be ohm measured with a normal multimeter. The resistance between the windings depends on the model, but must be within 1.5-7Ω. • Earth fault compressor. Measure all phases to earth to check for any earth faults.
Sensor errors	• Sensor errors are most commonly caused by poor sensor cable earthing. Check that the cable is properly spliced and is secure in the terminals in block B in the control unit. • Check cable routing and for any cable breaks. • Ohm read the sensors at a determined temperature and compare with table 9.
Electric heaters not working	• Check that the electric heaters are not active and that the correct maximum output is set in the system menu in the control module • Check that the piston type fuses, S1 and S2, in Exotrol are on. • Check that the thermostats on the electric heaters in ExoTank are set to 70°C • Check that the overheating protection, brown button on the electric heaters in ExoTank has not tripped. Press the button with a tool.

7.8 Spare parts list

Table 11. Spare parts list ExoAir & Polaris

	Order number					
Component	**ExoAir 7.5**	**ExoAir 10.5**	**ExoAir 16**	**Polaris 10**	**Polaris 16**	**Polaris 20**
Compressor	520933800	520879800	520964700	520606300	520990000	521019500
Receiver drier	520837800	520837800	520740900	520740900	520990400	520990400
Evaporator	521003100	521003100	520972500	521003100	520972500	520972500
Low pressure pressostat	520930500	520930500	520930500	520930500	520930500	520930500
High pressure pressostat	520930400	520930400	520930400	520994200	520994200	520994200
Check valve	520930700	520930700	520930700	520930700	520930700	520930700
Sight glass	520930800	520930800	520930800	520930800	520930800	520930800
Expansion valve main circuit	520613500	520613500	520613500	520994300	520994100	520994100
Thermo section expansion valve	520693600	520693600	520693600	-	-	-
Nozzle expansion valve	520693700	520693800	520693900	-	-	-
Expansion valve EVI circuit	-	-	-	520994400	520994400	520994400
Condenser	520879900	520894100	520972300	520995400	520995200	520995200
Economizer	-	-	-	520995300	520995100	520995100
Solenoid	-	-	-	520996200	520996200	520996200
Coil EVI valve	-	-	-	520996300	520996300	520996300
4 way valve	520931500	520931500	520972400	520931500	520972400	520972400
Coil 4 way valve	520884700	520884700	520884700	520884700	520884700	520884700
Fan	520931600	520931600	520931600	520931600	520931600	520931600
Contact	521079700	521079800	521079800	521079700	521079800	521079800
Motor protection	520512901	520512900	520512900	520512901	520512900	520512900
Rocker switch	521071600	521071600	521071600	521071600	521071600	521071600
Main switch 32A	521072200	521072200	521072200	521072200	521072200	521072200
Soft start	521042500	521042500	521042500	521042500	521042500	521042500
Hot gas sensor	520920400	520920400	520920400	520920400	520920400	520920400
Outdoor sensor	520927600	520927600	520927600	520927600	520927600	520927600
Room sensor	520928600	520928600	520928600	520928600	520928600	520928600
Sensor tank, outlet, defrost	520920300	520920300	520920300	520920300	520920300	520920300
Circuit board	520621300	520621300	520621300	520621300	520621300	520621300
E-prom	ExotrolA	ExotrolA	ExotrolA	ExotrolA	ExotrolA	ExotrolA
Roof panel	520911000	520911000	520911000	520911000	520911000	520911000
Motor room panel	520862800	520862800	520971100	520862800	520971100	520971100
Deflector	520862900	520862900	520971200	520862900	520971200	520971200

Table 12. Spare parts list Exotic.

	Order number					
Component	**Exotic 6**	**Exotic 8**	**Exotic 10**	**Exotic 12**	**Exotic 15**	**Exotic 17**
Compressor	520964300	520933800	520969100	520879800	520969000	520964700
Receiver drier	520837800	520837800	520837800	520837800	520740900	520740900
Evaporator/Condenser(hwx)	520917500	520917500	520917503	520917503	520917505	520917505
Low pressure pressostat	520930500	520930500	520930500	520930500	520930500	520930500
High pressure pressostat	520930400	520930400	520930400	520930400	520930400	520930400
Sight glass	520930800	520930800	520930800	520930800	520930800	520930800
Expansion valve	520613500	520613500	520613500	520613500	520613500	520613500
Thermo section expansion valve	520693600	520693600	520693600	520693600	520693600	520693600
Nozzle expansion valve	520693700	520693700	520693800	520693800	520693900	520693900
Contact	521079700	521079700	521079700	521079800	521079800	521079800
Motor protection	520512901	520512901	520512901	520512900	520512900	520512900
Rocker switch	521071600	521071600	521071600	521071600	521071600	521071600
Main switch 32A	521072200	521072200	521072200	521072200	521072200	521072200
Soft start	521042500	521042500	521042500	521042500	521042500	521042500
Hot gas sensor	520920400	520920400	520920400	520920400	520920400	520920400
Outdoor sensor	520927600	520927600	520927600	520927600	520927600	520927600
Room sensor	520928600	520928600	520928600	520928600	520928600	520928600
Sensor tank, outlet, brine	520920300	520920300	520920300	520920300	520920300	520920300
Circuit board	520621300	520621300	520621300	520621300	520621300	520621300
E-prom	ExotrolA	ExotrolA	ExotrolA	ExotrolA	ExotrolA	ExotrolA

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