

Maintenance manual

Ground source heat pump

WPE-I xxH 400 Premium version 2020/21

Version D0000105598-b 12.11.2021

The maintenance manual describes the maintenance process for a ground source heat pump. The sequence of steps is simply a recommendation, which can be customised.

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Destination country: Germany



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1. General information

Work on an open appliance and repair work may only be carried out by a person trained by STIEBEL ELTRON. Current safety instructions contained in the operating and installation instructions for the appliance must be observed.

2. Further relevant information

Document	Number
Controller operating instructions	339364
Commissioning	339365
Heat pump operating instructions	339363
Repair instructions	082394
Commissioning manual	103180

3. Relevant appliances

Appliance	Material no.	Version
WPE-I 33H 400 Premium	201412	A
WPE-I 44H 400 Premium	201413	B
WPE-I 59H 400 Premium	201414	C
WPE-I 87H 400 Premium	201415	D

4. Special features of the appliance series

- None

5. Appliance description

The heat pumps are inverter ground source heat pumps for indoor installation. They are designed for mono mode use for heating and DHW modes. With the help of additional hydraulic components, the existing source system can be used for passive and active cooling. For a high heating output, up to 6 heat pumps can be connected in a cascade. During normal heat pump operation, the hot gas technology enables the hot gas to be utilised directly to simultaneously heat the DHW via an additional heat exchanger. In combination with the optionally available ISG, the heating system can be controlled via the home network, the building management system or a mobile device.

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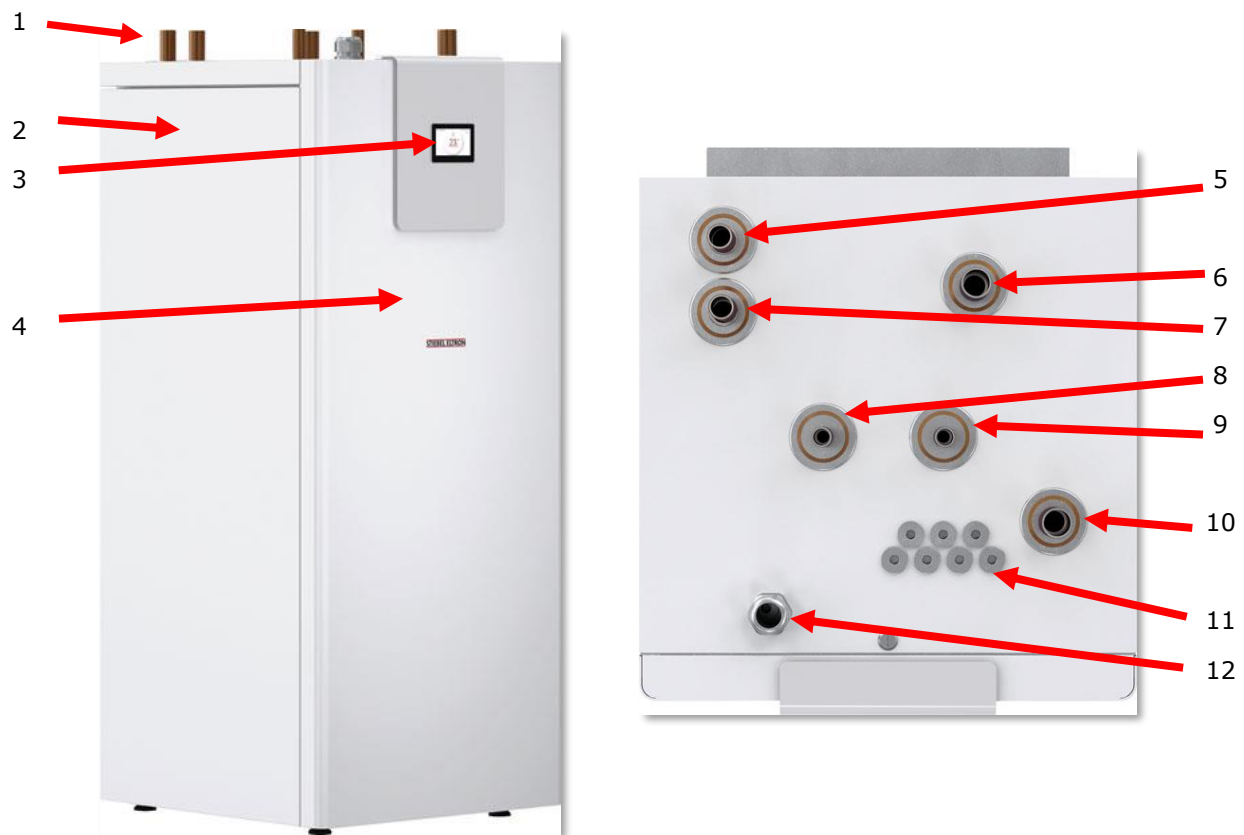
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5.1 Appliance overview

The heat pumps are available in 4 output sizes (versions A to D). The design and appliance layout of versions A and B are the same. With regard to layout, versions C and D are the same, but differ from versions A and B with the exception of output sizes in a matched inverter cooling system

5.1.1 External view of versions A and B



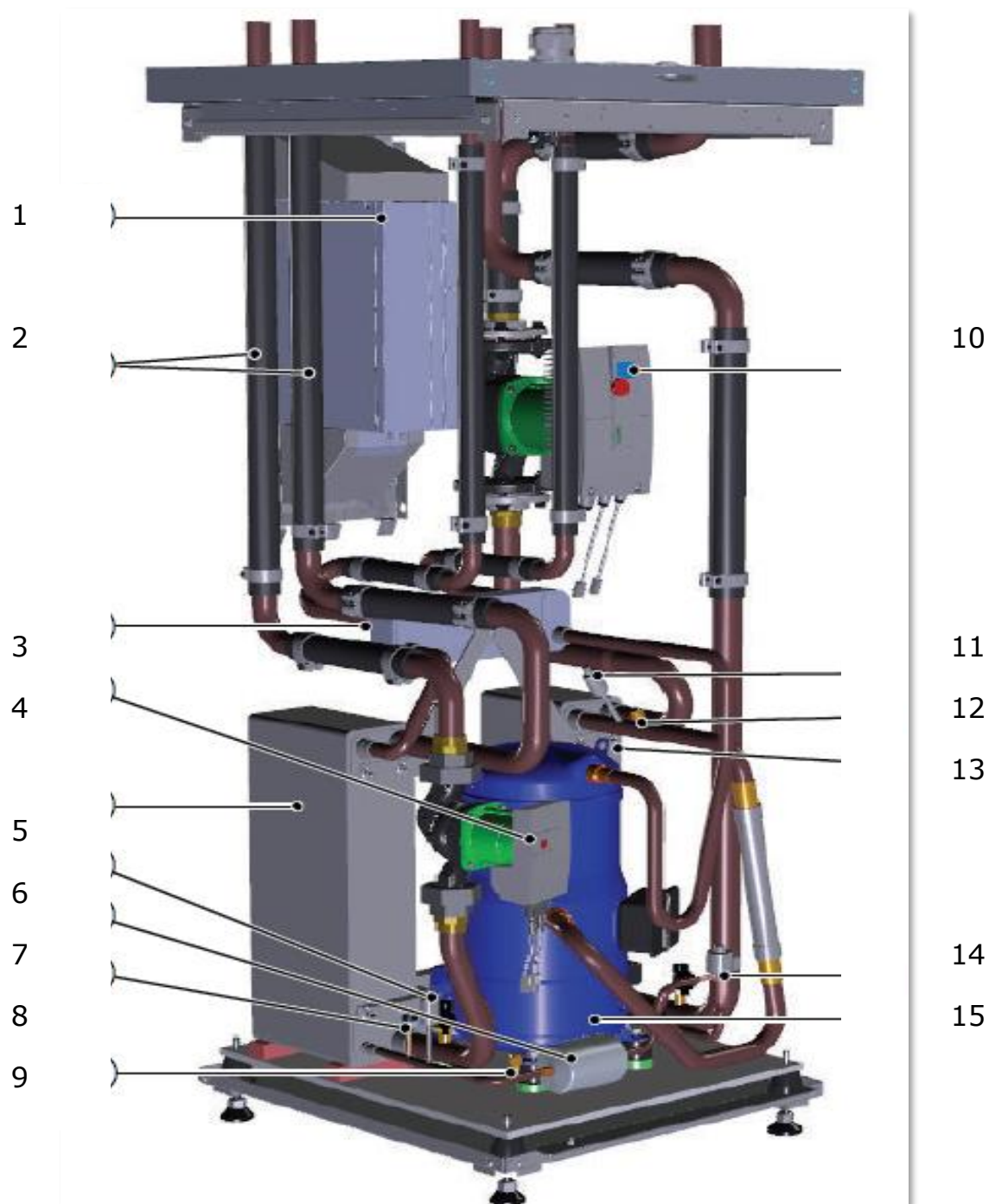
No.	Designation	No.	Designation
1	Appliance connections	7	Heating flow, outlet
2	Side panel	8	Hot gas return, inlet, optional
3	CM module (programming unit)	9	Hot gas flow, outlet, optional
4	Front panel	10	Heat source return, inlet
5	Heating return, inlet	11	Entry electrical cables II (sensor and bus cables)
6	Heat source flow, outlet	12	Entry electrical cables (power cable)

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5.1.2 Internal view of versions A and B



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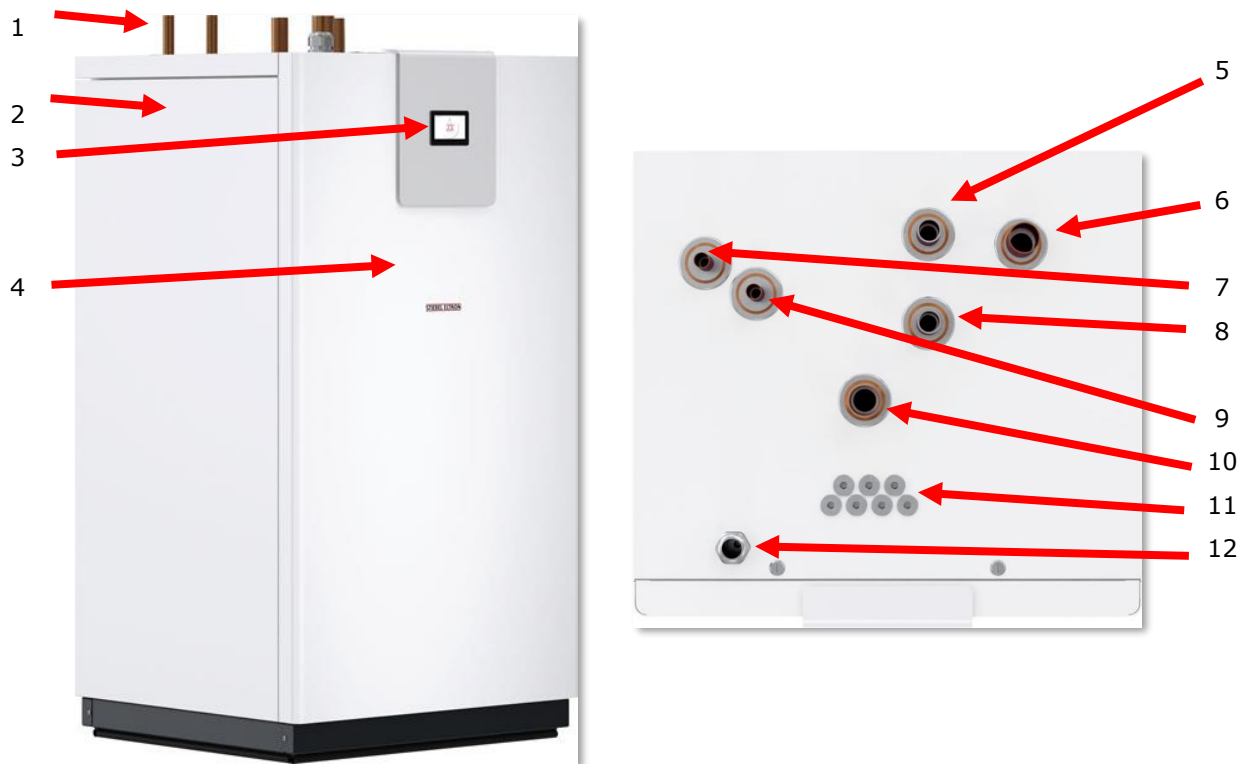
No.	Designation
1	Inverter
2	Flexible hoses for anti-vibration insulation
3	Hot gas heat exchanger
4	Circulation pump
5	Condenser
6	High pressure sensor
7	Filter dryer
8	High pressure switch
9	Service valve, high pressure side
10	Brine pump
11	Low pressure sensor
12	Service valve, low pressure side
13	Evaporator
14	Expansion valve
15	Compressor

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5.1.3 External view of versions C and D



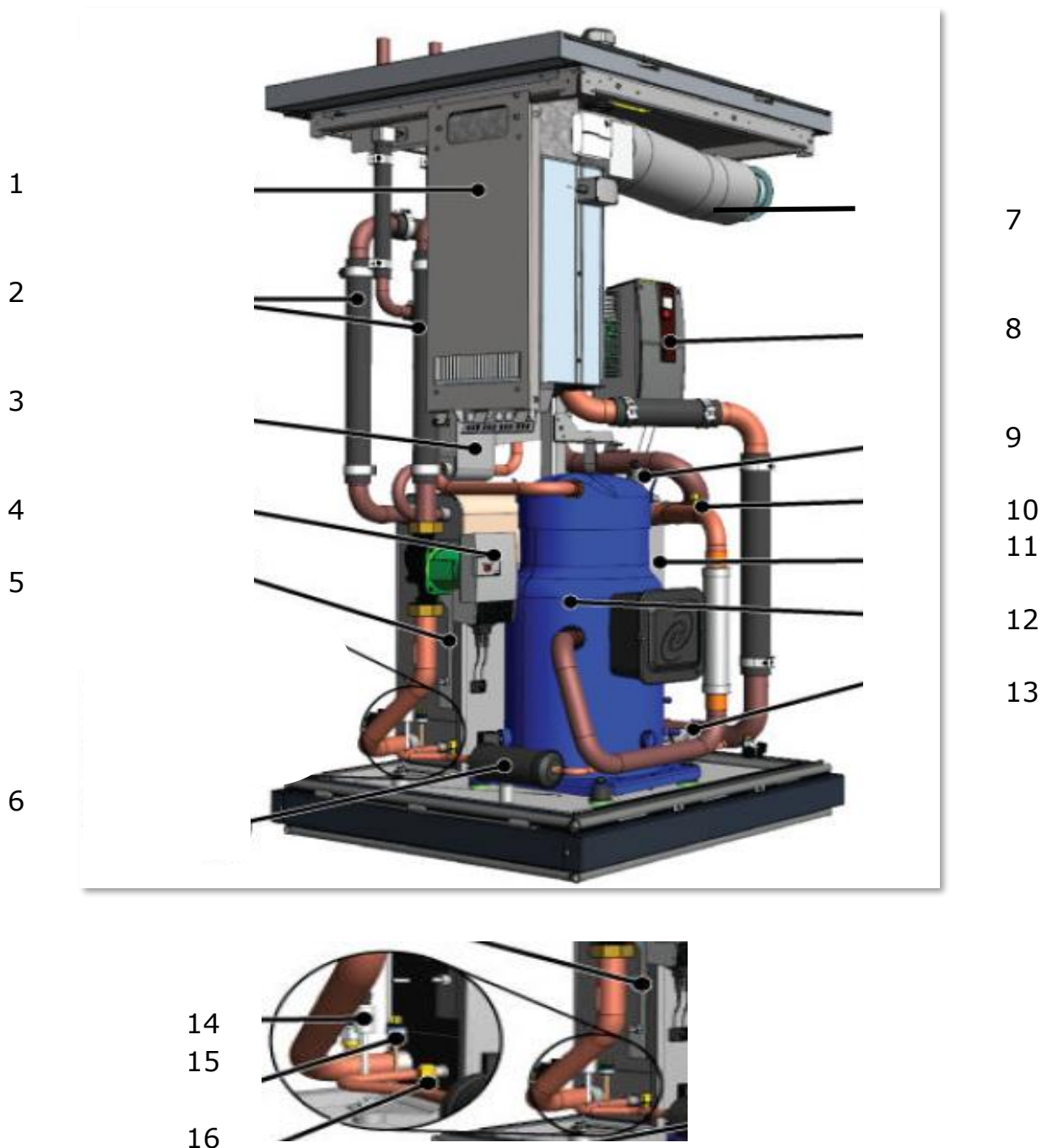
No.	Designation	No.	Designation
1	Appliance connections	7	Hot gas flow, outlet, optional
2	Side panel	8	Heating return, inlet
3	CM module (programming unit)	9	Hot gas return, inlet, optional
4	Front panel	10	Heat source flow, outlet
5	Heating flow, outlet	11	Entry electrical cables II (sensor and bus cables)
6	Heat source return, inlet	12	Entry electrical cables (power cable)

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5.1.4 Internal view of versions C and D



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No.	Designation
1	Inverter with inverter ventilation
2	Flexible hoses for anti-vibration insulation
3	Hot gas heat exchanger
4	Circulation pump
5	Condenser
6	Filter dryer
7	Inverter ventilation
7	Brine pump
9	Low pressure sensor
10	Service valve, low pressure side
11	Evaporator
12	Compressor
13	Expansion valve
14	High pressure sensor
15	High pressure switch
16	Service valve, high pressure

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6. Maintenance checklist

No.	Version	Point	BI
1	Visual inspection of appliance components	7.1	X
2	VDE measurement / checking the earth conductor resistance / switching the appliance off	7.2 / 7.3	
Brine system			
3	Visual inspection of all brine-carrying components	7.4	
4	Check the pre-charge pressure of the brine DEV (internal), check the external DEV only if cap valve is fitted	7.5	
5	Measure the frost protection temperature	7.6	X
6	Check the brine pressure	7.7	
Heating / DHW / cooling circuit / pool			
7	Visual inspection of the water-carrying components	7.8	X
8	Check the pre-charge pressure of the DEV (internal), check the external DEV only if cap valve is fitted	7.9	
9	Measure the hardness of heating water (max. 3°dH)	7.10	
10	Check the heating system pressure	7.11	X
11	Check the connected cooling circuit (if installed) for leaks (visual inspection)	7.12	

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No.	Version	Point	BI
12	Visual inspection for damage to the diffusion-proof insulation on the cooling circuit	7.13	
Refrigerant circuit			
13	Check the refrigerant circuit for leaks acc. to Reg. (EU) No 517/2014	7.14	X
Function check			
14	Switch on all pumps, mixing valves and diverter valves via "Manual test" and check they are working	7.15	X
15	Review of the controller settings	7.16	X
16	Switch on the heat pump and ensure functionality in heating and DHW mode (if available)	7.17	X
17	Check the brine pressure switch (external pressure switch if installed)	7.18	X
18	Check for a uniform throughput in the individual probes (only if Tacosetter installed / visual inspection)	7.19	
19	Check the high pressure shutdown with the high pressure limit reached – please note: mandatory test!	7.20	X
20	Record temperature values and check for plausibility (at least 10 minutes runtime of compressor)	7.21	
21	Final VDE measurement acc. to VDE 0701 and 0702	7.22	

Key to abbreviations in the text:

Point	Bullet point in the maintenance manual with information about implementation
BI	Reference to the operating and installation instructions
DEV	Diaphragm expansion vessel
Reg (EU) No 517/2014	EU regulation concerning leak tests of refrigerant circuits
HD	High pressure in the refrigerant circuit

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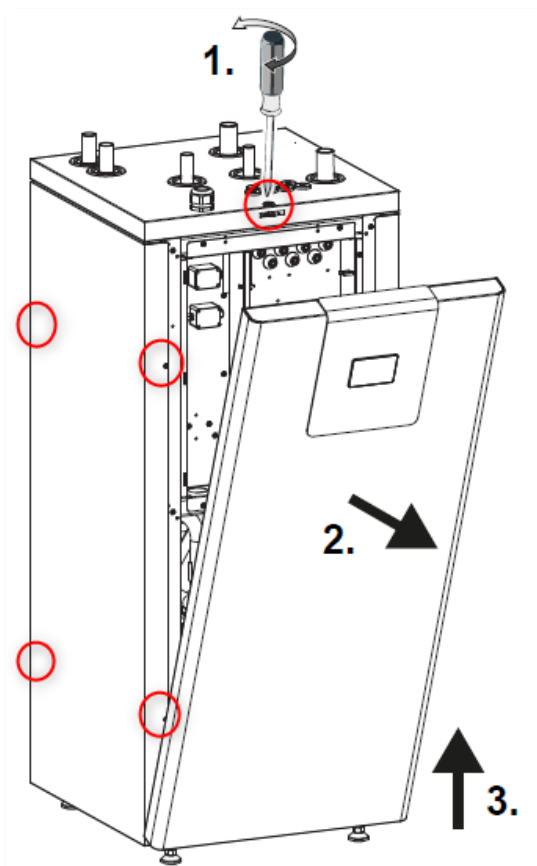
7. Maintenance process

The process described here is based on the sequence in the maintenance checklist. "Point" in the maintenance checklist refers to the relevant section in the manual.

7.1 Visual inspection of appliance components

The visual inspection should include clarifying whether the heat pump is accessible and whether maintenance can be carried out in a reasonable amount of time. If serious damage is identified during the visual inspection, repairs should be carried out before continuing with maintenance.

7.1.1 Opening the appliance, versions A and B



Open the top closure using a screwdriver (1)

Pivot the front of the casing forwards (2)

Lift the front of the casing out of the bottom guide (3)

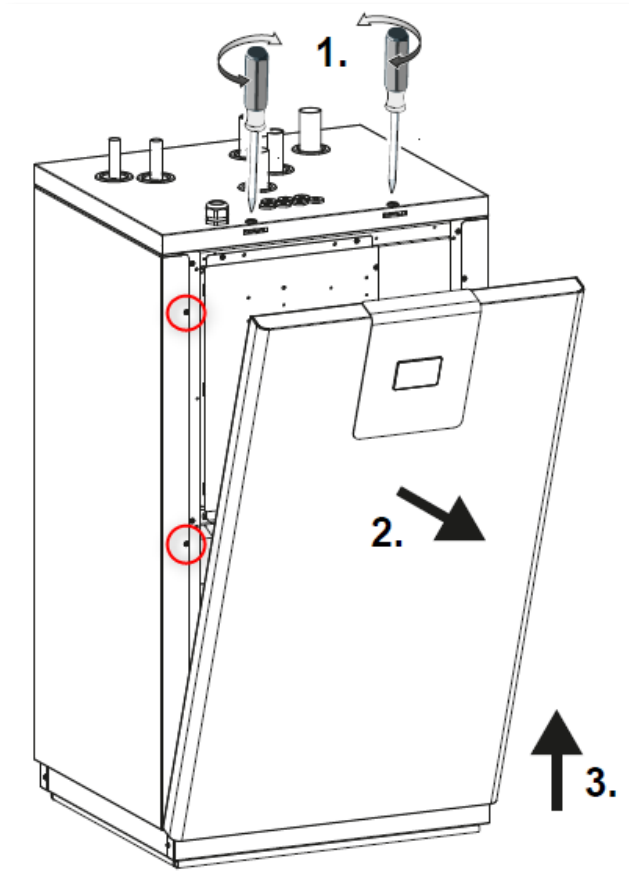
Remove the screws from the side panels (2 screws at the front and 2 screws at the back) and remove the side panels

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7.1.2 Opening the appliance, versions C and D



Open the top closure using a screwdriver (1)

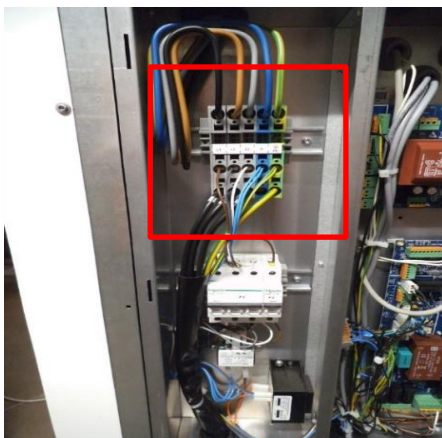
Pivot the front of the casing forwards (2)

Lift the front of the casing out of the bottom guide (3)

Remove the front screws from the side panels. Then lift the casing out of the back guide and remove the side panels

7.2 VDE measurement / checking earth conductor resistance

This is the first part of the VDE measurement. The earth conductor resistance test serves as a safety test for subsequent activities. The earth conductor resistance must not exceed the specified limit.



View of the wiring chamber, access for VDE measurements

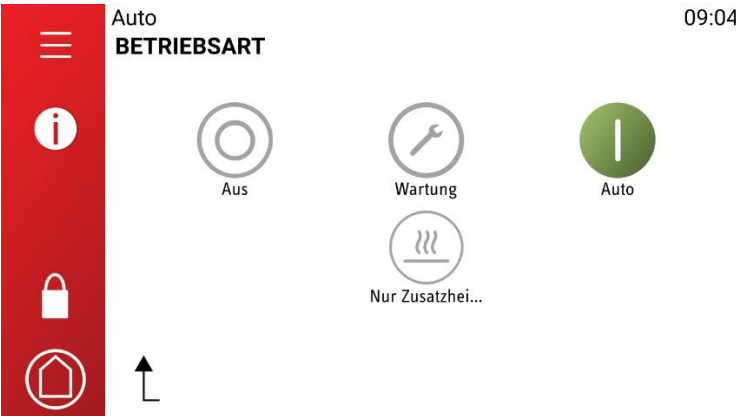
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7.3 Switching off the heat pump

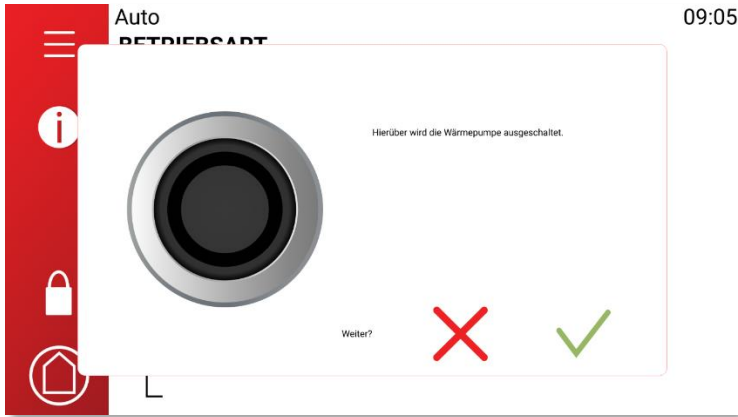
After the VDE measurement, the heat pump should be switched off.

Display on the controller	Action
	- On the standard display, click on the menu button and open the main menu. - No password is required. 
	In the main menu, click on the "Operating mode" button.  Betriebsart
	In the operating mode menu, click on "OFF".  Aus

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Display on the controller	Action
	Confirm shutdown with the green tick. 
	- The appliance is switched off and the "OFF" button is red. - Further maintenance can be carried out. 

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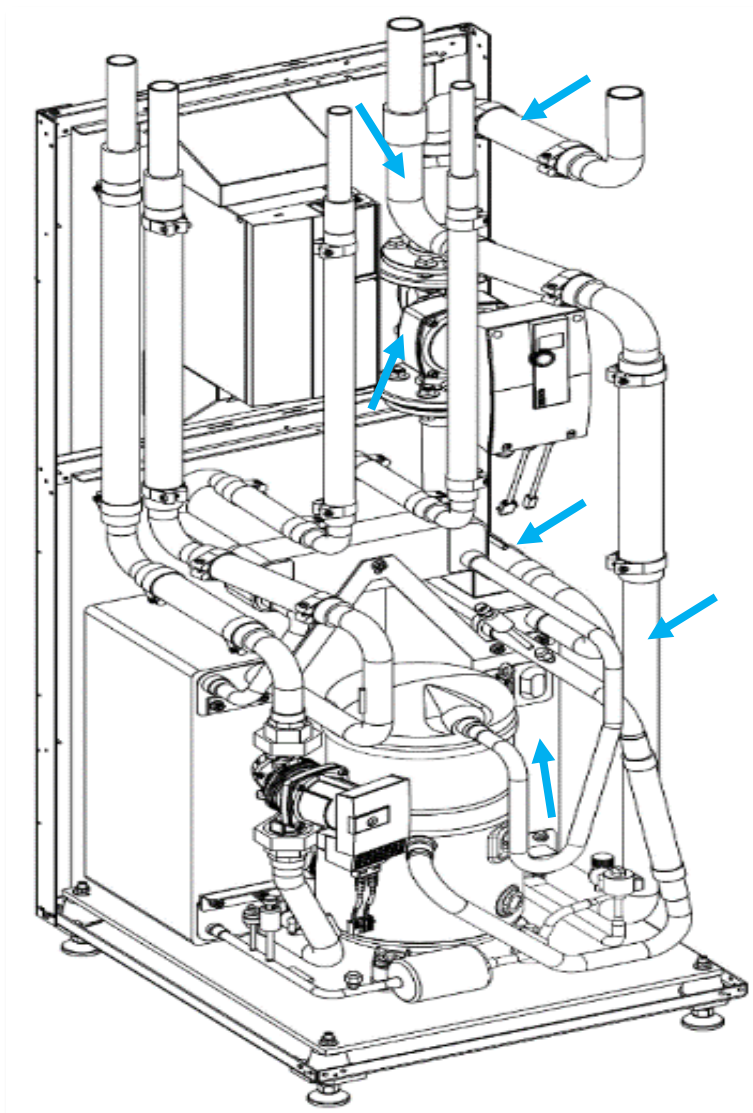
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7.4 Visual inspection of all brine-carrying components

All brine-carrying components are checked visually for leaks. The inspection relates primarily to all components in the heat pump and the connections on the heat pump. In the event of leaks, repairs should be carried out.

7.4.1 Versions A and B



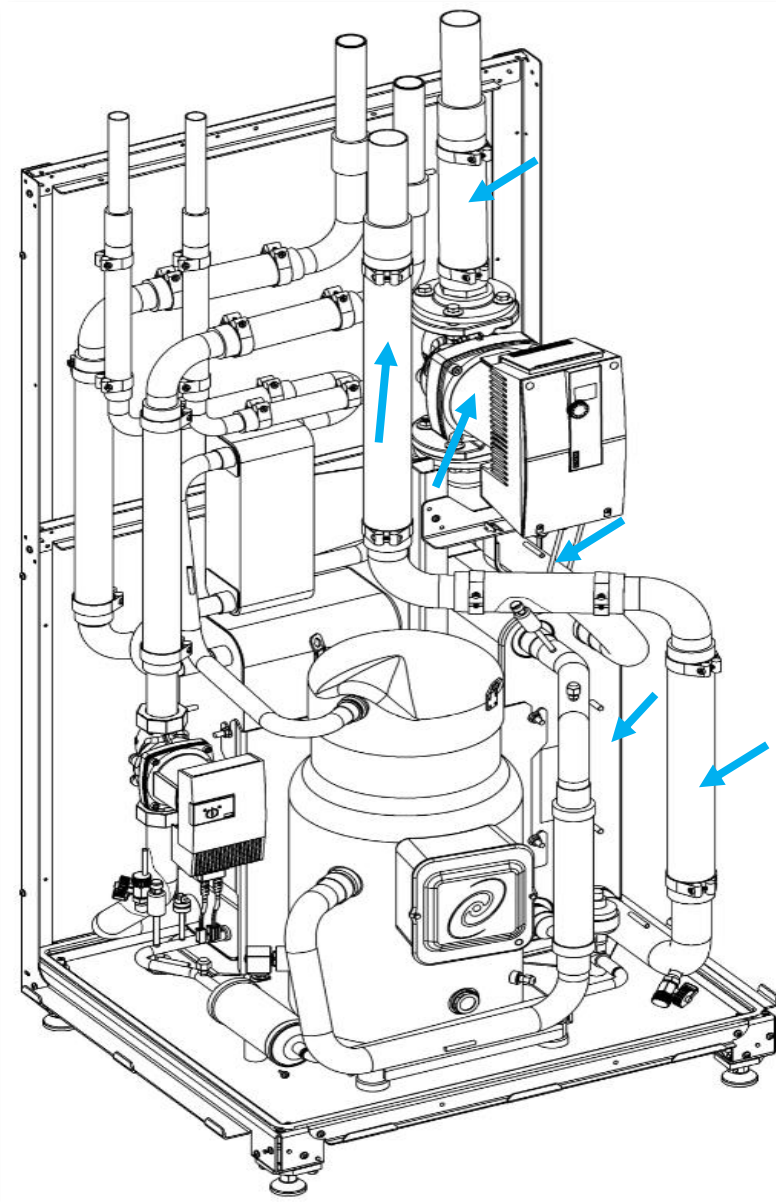
Visual inspection of brine-carrying components

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7.4.2 Versions C and D



Visual inspection of brine-carrying components

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7.5 Checking the pre-charge pressure of the brine DEV

The diaphragm expansion vessel(s) of the solar thermal system are always installed outside the heat pump. 2 points should be observed as a prerequisite for checking.

1. The brine fluid used in the system should be available on site.
2. A correctly fitted cap valve must also be present upstream of the DEV.

If either of the points are not fulfilled, the check must not be carried out.

For the check, the cap valve upstream of the DEV must be closed. In the next step, the valve on the cap valve is used to relieve the brine pressure in the DEV. The brine fluid should be collected. On the DEV, remove the cap from the service valve and measure the pre-charge pressure at the service valve. The pre-charge pressure should be between 0.5 and 0.8 bar. In the event of discrepancies, adjust the pre-charge pressure accordingly with nitrogen or a corresponding vessel filler. After the check, close the service valve. Open the cap valve and compensate for the pressure drop with the collected brine fluid and, if required, with the brine fluid available on site. Refit the cap on the shut-off valve and secure with a safety wire if necessary.



Example of a cap valve from Afriso

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7.6 Measuring the frost protection limit

The frost protection limit of the brine fluid can be determined when the DEV is checked. The brine fluid drained from the system during the DEV check can be used to measure the frost protection limit. If it is not possible to remove brine fluid during the DEV check, a brine sample should be taken directly from the system. In brine systems, the frost protection limit should be set to at least -12 °C and maximum -18 °C. Checks can be carried out using a refractometer.

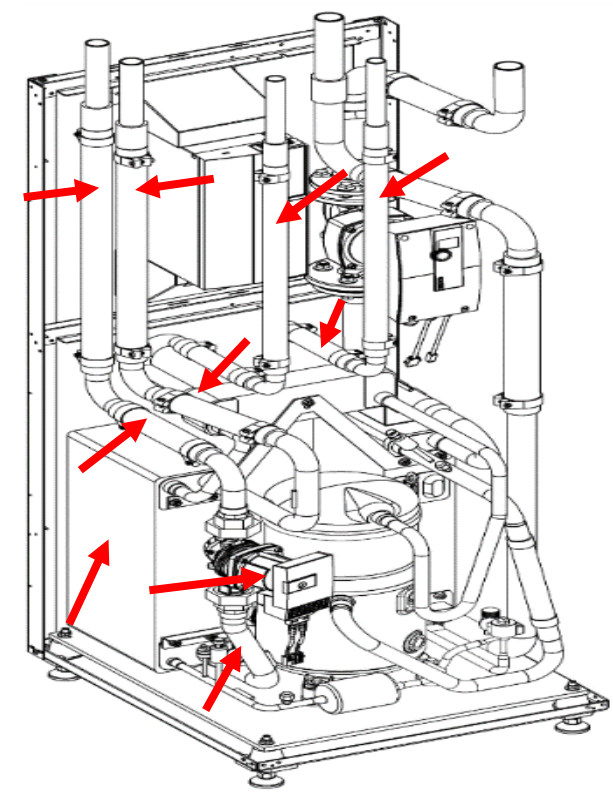
7.7 Checking the brine pressure

The brine pressure should be between 1.5 and 2.0 bar. The pressure can be read off the corresponding pressure gauges in the brine circuit.

7.8 Visual inspection of the water-carrying components

A visual inspection of all water-carrying components of the heat pump should be carried out. This also includes the connections on the heat pump. The side panels should be removed to enable a view of all components in the heat pump. Repairs should be carried out to rectify any leaks. In both diagrams below, the water-carrying components in the heat pump are marked.

7.8.1 Water-carrying components in versions A and B



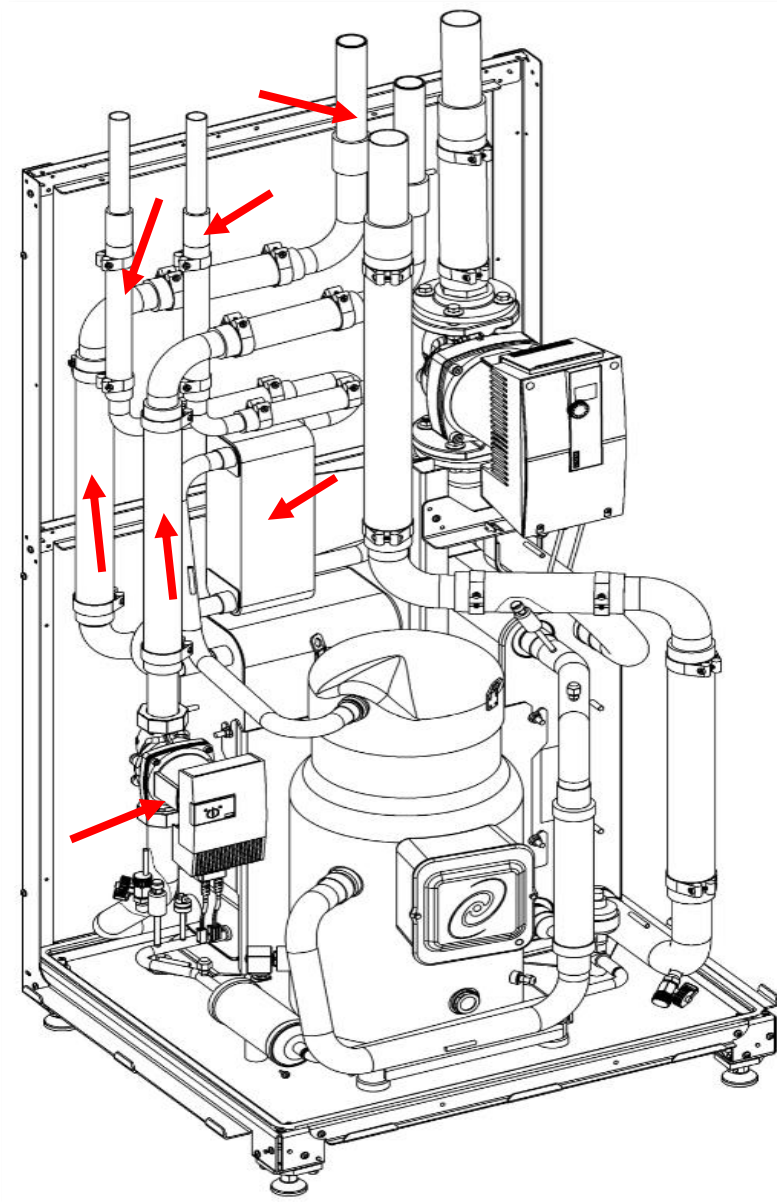
Visual inspection of the water-carrying components

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7.8.2 Water-carrying components of versions C and D



Visual inspection of the water-carrying components

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7.9 Checking the pre-charge pressure of the DEV (heating system)

The external diaphragm expansion vessel (DEV) of the heating system should only be checked if a correctly fitted cap valve is installed.

When performing a check, close the cap valve upstream of the DEV. In the next step, the valve on the cap valve is used to relieve the pressure in the DEV. On the DEV, remove the cap from the service valve and check the pre-charge pressure at the service valve (see chapter 7.5). The required pre-charge pressure is determined from the total of the head pressure (static head / 10) + 0.2 bar and should be at least 0.7 bar. In the event of discrepancies, adjust the pre-charge pressure with nitrogen or a corresponding vessel filler. After the check, close the service valve with the cap. Open the cap valve and compensate for the pressure drop by topping up the heating water. The hardness of the top-up water should not exceed 3 °dH.

7.10 Measuring the hardness of the heating water

The heating water drained during the testing of the pre-charge pressure of the heating DEV can be used to determine the water hardness. If this is not possible, a water sample should be taken from the system. The maximum water hardness should not exceed 3 °dH. See also information in the operating and installation instructions. If the measured values are too high, the client should be notified.

7.11 Checking the heating system pressure

The system pressure of the heating system is displayed via an external pressure gauge in the heating system.

If the heating system pressure is too low, it must be adjusted. The system pressure must be matched to local conditions, particularly the static head of the heating system and the pre-charge pressure of the DEV. The system pressure when cold should be equal to at least the pre-charge pressure of the DEV + approx. 0.2 bar. The pressure should not fall below 1 bar. The maximum system pressure must not exceed the response pressure of the safety valve – 0.5 bar. It is important to ensure that, when topping up with heating water, the water hardness does not exceed 3 °dH.

The formula for calculating the fill pressure of the system is as follows:

Minimum fill pressure = $\{[(\text{selected DEV volume} \times (\text{pre-charge pressure} + 1))] / (\text{selected DEV volume} - \text{hydraulic seal})\} - 1 \text{ bar}$

7.12 Checking the cooling circuit (if installed) for leaks

If a cooling system is to be connected in the heat pump system, it should be visually checked for leaks. This includes the diverter valves and external heat exchangers from the cooling circuit to the components to be checked.

7.13 Visual inspection of the diffusion-proof insulation on the cooling circuit (if installed)

To avoid water damage caused by condensate, the pipes and components of the cooling circuit must have diffusion-proof insulation. A visual inspection of the insulation should be carried out. Significant damage to the insulation should be repaired as soon as possible.

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7.14 Checking the refrigerant circuit for leaks (acc. to Regulation (EU) No 517/2014)

In installation areas subject to European regulations, the heat pumps must be checked according to Regulation (EU) No 517/2014. The check must only be carried out by authorised persons and documented in the system manual. To check the refrigerant circuit, electronic leak detectors can be used.

7.15 Final testing of components

Finally, the switching outputs and temperature indicators should be tested. The switching outputs can be actuated manually via the controller in the "Manual test" submenu. The number of checking options will depend on the design of the system and the components connected. For manual actuation, service code 718293 should be entered at password level.

Overview of all tests that can be carried out in "Manual test"

Function	Activated by switch	Adjusted via adjustment bar	Menu page
Brine pump on/off	Yes	0-100 %	2
Circulation pump (HP) on/off	Yes	0-100 %	2
External brine pump on/off	Yes	No	2
Brine pump manual mode	Yes	No	3
Hot gas pump manual mode	Yes	No	3
Hot gas diverter valve, cylinder charging	Yes	No	3
Hot gas pump on/off	Yes	No	3
Diverter valve (0 – heating, 1 – DHW)	No	Switch 1/2	3
Auxiliary heater on/off	Yes	No	4
Compressor manual mode	Yes	1-10/rpm display	5
Auxiliary heater	Yes	No	6
Auxiliary heater On/Off	Yes	Opening level 0-100 %	6
External heat generator pump	Yes	No	6
External heat generator pump on/off	Yes	No	6
Heating circuit 1 manual mode	Yes	No	7
Heating circuit 1 circulation pump	Yes	0-100 %	7
Cooling circuit pump on/off	Yes	No	8
Activate manual cooling mixing valve	Yes	Mixing valve opening level 0-100 %	8
Cooling cylinder diverter valve on/off	Yes	No	8
Disconnect borehole diverter valve on/off	Yes	No	9
Heat surplus diverter valve on/off	Yes	No	9
Pump overheating	Yes	No	9
Heat surplus fan	No	0-100 %	9
Heating circuit 2 pump on/off	Yes	Mixing valve opening level 0-100 %	10
Heating circuit 3 pump on/off	Yes	Mixing valve opening level 0-100 %	10
Heating circuit 4 pump on/off	Yes	Mixing valve opening level 0-100 %	11
Heating circuit 5 pump on/off	Yes	Mixing valve opening level 0-100 %	11

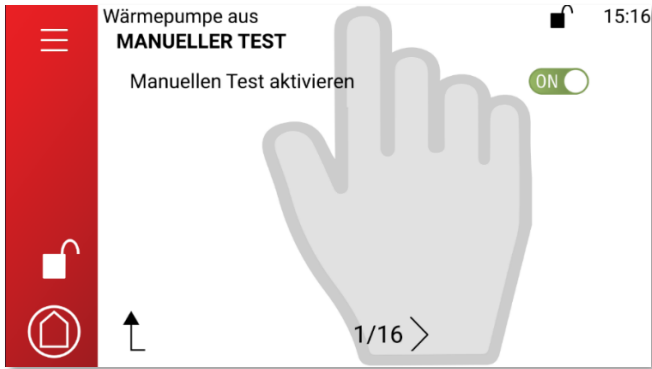
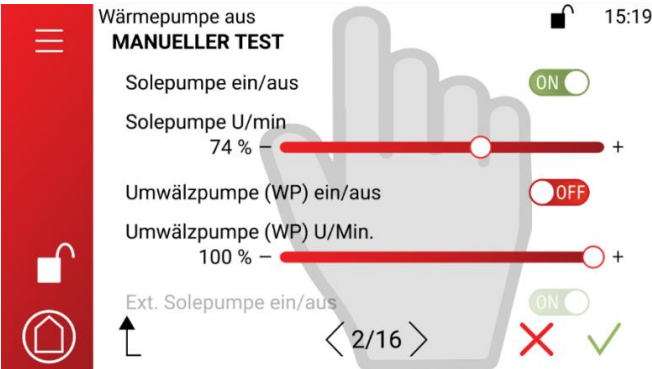
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Function	Activated by switch	Adjusted via adjustment bar	Menu page
DHW draw-off control pump	Yes	Mixing valve opening level 0-100 %	12
DHW draw-off control auxiliary heater	Yes	No	12
Water charging system pump unit	Yes	Mixing valve opening level 0-100 %	13
Pool diverter valve on/off	Yes	No	14
Pool pump on/off	Yes	Mixing valve opening level 0-100 %	14
Manually activate expansion valve	Yes	Opening level 0-100 %	15
Ignore measured operating pressure	Yes	No	15
Central fault, test signal	Yes	No	15
Check high pressure switch Start/Stop	Yes	Pressure display, high pressure	16

In cascade systems, all heat pumps should be tested individually with the relevant connected components.

Display on the controller	Action
	• In the "Settings" menu, switch to the "Manual test" menu. • Activate the test. • While the test is activated, the hand is always visible in the background.
	• For the test, the test function is activated via the switch. • The speeds can be adjusted on the sliders, as shown here by way of example. This function must also be confirmed with the green tick. • After the test, turn the function off again. • The test should be carried out in the same way on the subsequent pages.

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7.16 Review of the controller settings

Check the plausibility of the settings. If settings seem unusual, they should be queried or changed. No new standard settings should be carried out here. The access code for contractor level is 718293. Depending on the heating system installed, the listed menu settings may differ or may not be available as a menu. (Subject to system configuration.)

7.16.1 Heating

The following standard settings in the heating section should be checked for plausibility.

- Heating curve
- Min. flow temperature
- Max. flow temperature
- Seasonal stop
- Switching delay
- Set flow temperature with fixed set value (optional if set)

Menu in the heating section

Main menu	Settings	Submenu Function Page 1/4	Submenu Function Page 2/4	Submenu Function Page 3/4	Submenu Function Page 4/4
Settings					
	Heating				
		Heating curve			
		Min. flow			
		Max. flow			
			Seasonal stop		
				Switching delay	
					Set flow temperature with fixed set value

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7.16.2 DHW heating (if available)

The following standard settings in the DHW heating section should be checked for plausibility.

- DHW mode activated
- Start temperature
- Stop temperature
- Pasteurisation mode activated (if activated)
- Pasteurisation mode stop temperature (if activated)

Menu in the DHW heating section

Main menu	Submenu	Submenu Function Page 1/5	Submenu Function Page 2/5	Submenu Function Page 3/5	Submenu Function Page 4/5	Submenu Function Page 5/5
Settings						
	DHW					
		DHW active				
			Start temperature			
			Stop temperature			
				Pasteurisation mode		
				Pasteurisation mode stop temperature		

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7.16.3 Mixer settings / heating curves (if available)

The following standard settings in the mixer settings section should be checked for plausibility.

- Setting the heating type / radiator or underfloor heating system
- Min. flow temperature
- Max. flow temperature
- Heating curve settings

Menu in the mixer settings section

Main menu	Submenu	Submenu Function Page 1/5	Submenu Function Page 2/5	Submenu Function Page 3/5	Submenu Function Page 4/5	Submenu Function Page 5/5
Settings						
	Mixing valves / heating circuit (1-5)					
		Setting type				
			Heating curve Min. flow Max. flow			
		Heating curve				

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7.16.4 Cooling (if available)

The following standard settings in the cooling section should be checked for plausibility.

- Setting of passive or active cooling
- Seasonal stop
- Settings in the mixing valves section (if available)
- Setting in the cylinder section (if available)
- Settings in the heat surplus section (if available)

Menu in the cooling section

Main menu	Submenu	Submenu Function Page 1/5	Submenu Function Page 2/5	Submenu Function Page 3/5	Submenu Function Page 4/5	Submenu Function Page 5/5
Settings						
Cooling						
		Passive / active cooling				
		Season start-up				
				Mixing valves Cylinder heat surplus		
		Active cooling				
		Season start-up				
			On/off Temperature			
					Mixing valves Cylinder Heat surplus	

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7.16.5 Pool / special settings (if available)

The following standard settings in pool mode should be checked for plausibility.

- Set temperature
- Charging temperature

Menu in the pool mode section

Main menu	Submenu	Submenu Function Page 1/5	Submenu Function Page 2/5	Submenu Function Page 3/5	Submenu Function Page 4/5	Submenu Function Page 5/5
Settings						
	Pool					
		Set / charging temperature				

7.16.6 Hot gas extraction (if available)

The following standard settings in the heating section should be checked for plausibility.

- Start temperatures
- Stop temperatures

Menu in the hot gas extraction section

Main menu	Submenu	Submenu Function Page 1/5	Submenu Function Page 2/5	Submenu Function Page 3/5	Submenu Function Page 4/5	Submenu Function Page 5/5
Settings						
	Hot gas					
		On/off Temperature				

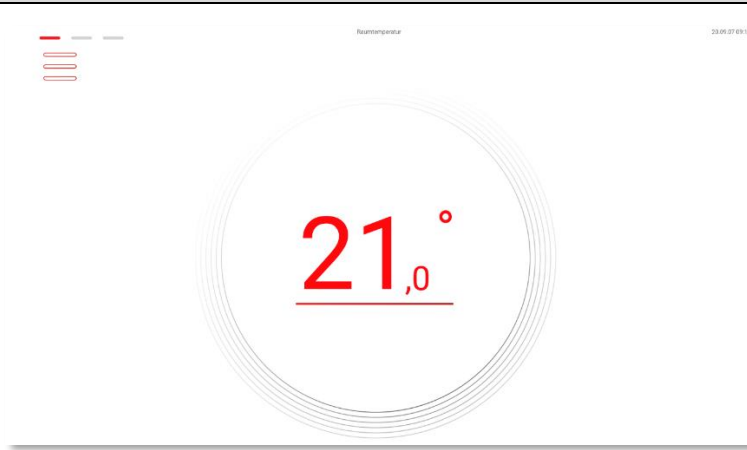
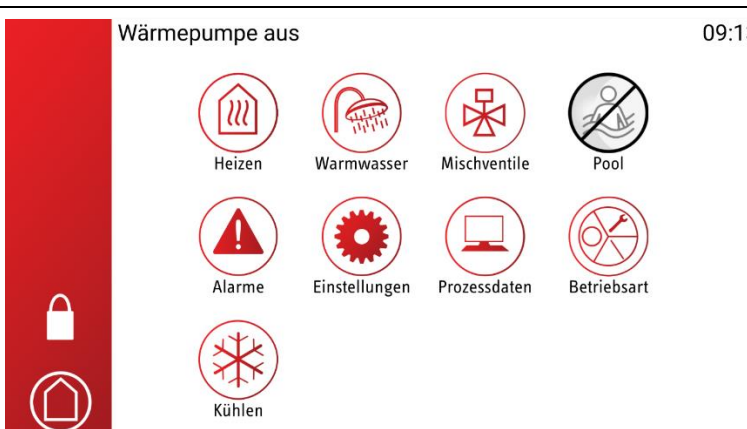
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7.17 Switching on the heat pump

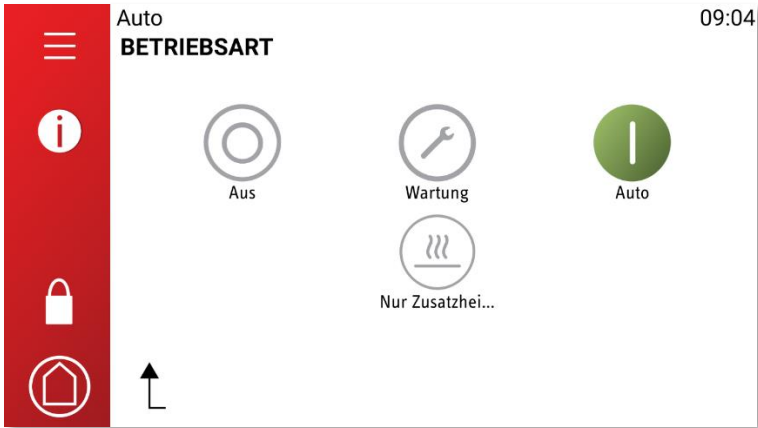
The heat pump should be switched back on and functionality in heating mode or DHW mode should be ensured.

Display on the controller	Action
	From the standard display, call up the main menu and click on the menu button. 
	In the main menu, call up the operating mode menu.  Betriebsart
	In the operating mode menu, click on the "Auto" button.  Auto

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Display on the controller	Action
	• The colour of the "Auto" button changes to green. • The heat pump has been restored to automatic mode. • Use the arrow to return to the main menu. 
	• The heating and DHW symbols should not be crossed out. • Exception: one of the two functions is not wanted. 

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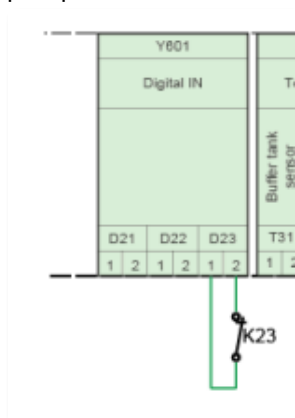
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7.18 Checking the brine pressure switch (if installed)

In accordance with legal regulations, the use of a brine pressure switch in the brine circuit may be stipulated.

Visual inspection includes the plausibility of the settings (min./max.) for the brine pressure switch. There is usually one setting for shutting down below 1.0 bar and one for starting again at 1.2 bar. There may be deviations from the usual switching values due to structural or legal requirements.

A heat pump shutdown should be carried out during the function test.



The brine pressure switch is connected at contact D23 on the BM card. The connection between D23 contacts 1 and 2 should be opened for the test. The heat pump must switch off.

Once the function test is complete, correctly reterminate the disconnected contact.

7.19 Checking for a uniform throughput in the individual probes

To achieve the full heat pump output, there must be a uniform flow through all brine circuits.

Hydronic balancing of the individual probes should have taken place during commissioning. Visual inspection can be carried out via Tacosetters in the brine circuit distributors. The brine pump can be activated under the "Manual test" menu item on the controller. Testing can be performed along with the final inspection of the components.

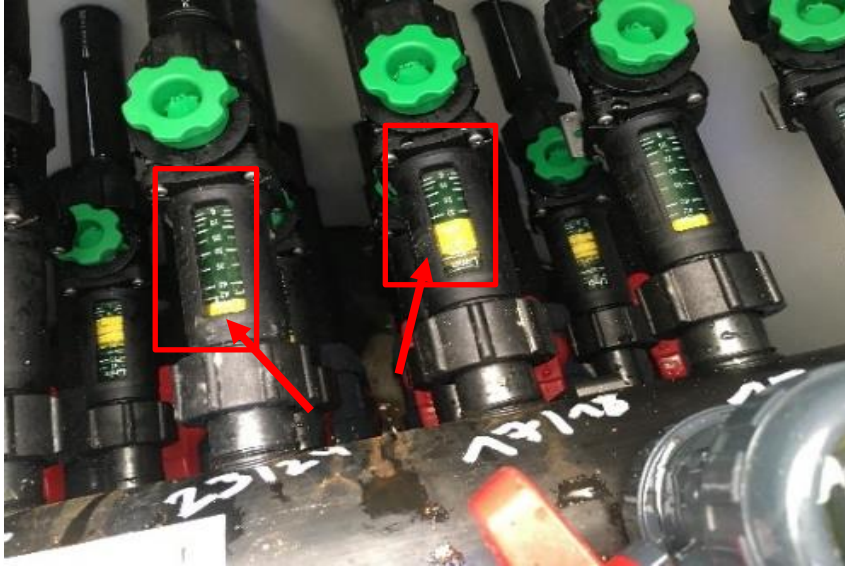


External brine circuit distributor with Tacosetters

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Uniform pressure should be applied to all Tacosetters. The example shows that the brine circuits have not undergone hydronic balancing. This means that the brine circuits do not absorb heat consistently, leading to reduced heat pump output.

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7.20 Testing the high pressure switch

This test should be performed once a year. For this test, the flow rate of the heating system can be reduced to ensure faster switching of the high pressure switch.

Display on the controller	Action
	• The test is carried out in the "Manual test" menu. • The service code for enabling the test is 718293. • Start the test using the switch.
	• The test runs automatically. The pressure is displayed. • The switching value is 42 bar.

Once the test has been successfully completed, disable "Manual test" again and return to the standard menu. The hand must then no longer be visible in the background.

If the heating water flow rate was reduced, it should be increased again.

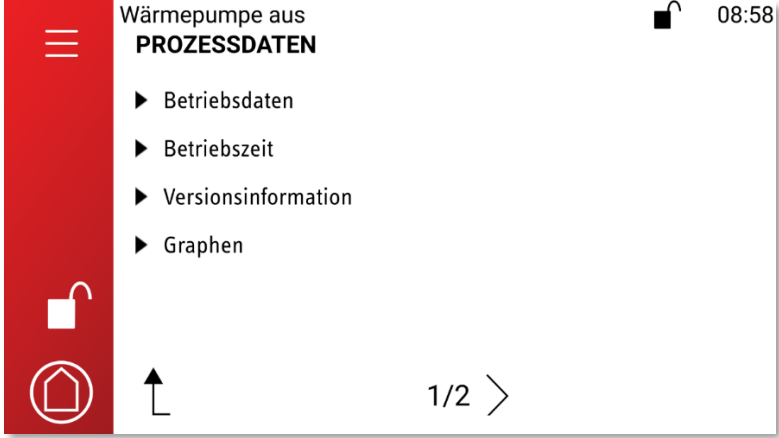
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7.21 Checking the plausibility of temperature values

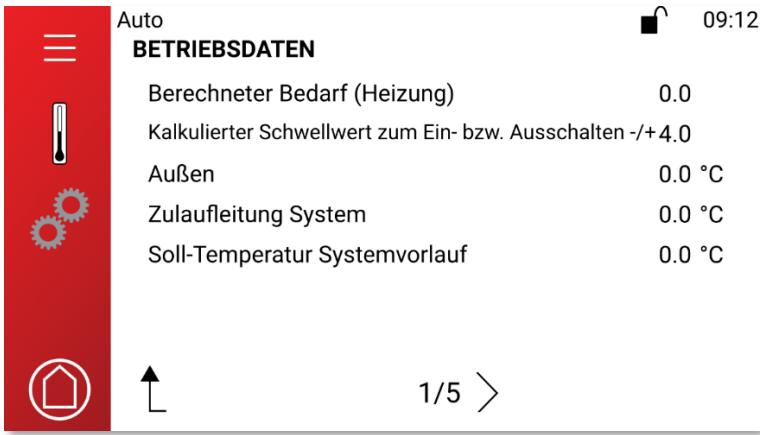
The control unit enables measured values from the sensors and controllers to be read out. If required, the measured values can be copied to a test report. Significant measured values can only be recorded after a compressor runtime of at least 10 minutes. The plausibility of the measured values should also be checked. For example, an indication of an outside temperature of -150 °C would not be plausible.

Display on the controller	Action
	• In the main menu, open the "Process data" submenu.  Prozessdaten
	• There are 2 pages with the relevant submenus (click to see the next page)

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Display on the controller	Action
	In "Operating data", the display shows either the temperatures or the component status. The function can be selected from the symbols on the left-hand side.  

Possible process data. The number of individual submenus will vary according to the components connected and enabled functions. The values shown in a paler type are visible only with the relevant configuration.

Top level	Temperatures and process values	Display in
Operating data	Calculated demand, heating	
	Calculated start/stop threshold	+/-
	Outside temperature	°C
	System supply line	°C
	Set system flow temperature	°C
	Flow temperature HP	°C
	Return temperature HP	°C
	Brine inlet	°C
	Brine outlet	°C
	Heating season start / Summer mode integral component	No/0.0
	Cooling season start / Summer mode integral component	No/0.0
	DHW temperature, top	°C
	DHW temperature, weighted	°C
	DHW temperature, bottom	°C
	Hot gas line	°C
	Liquid line	°C
	Suction gas	°C
	Low pressure	Bar
	High pressure	Bar
	Supercooling	K
	Superheating	K
	Coolant parameter graph	°C
	DHW flow, draw-off control	°C
	Set flow temperature	°C
	Return	°C
	Hot gas DHW	°C

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Top level	Temperatures and process values	Display in
	External brine pump, brine inlet	°C
	External brine pump, brine outlet	°C
	Return, water charging system	°C
	Set return temperature	°C
	Flow, HC 1	°C
	Set flow temperature, HC 1	°C
	Flow, HC 2	°C
	Set flow temperature, HC 2	°C
	Return, HC 2	°C
	Flow, HC 3	°C
	Set flow temperature, HC 3	°C
	Return, HC 3	°C
	Flow, HC 4	°C
	Set flow temperature, HC 4	°C
	Return, HC 4	°C
	Flow, HC 5	°C
	Set flow temperature, HC 5	°C
	Return, HC 5	°C
	Cylinder, cooling	°C
	Cylinder return line, cooling	°C
	Cooling flow temperature	°C
	Set flow temperature, cooling	°C
	Return temperature, cooling	°C
	Heat surplus, flow, cooling	°C
	Heat surplus, return, cooling	°C
	Flow temperature, pool	°C
	Return temperature, pool	°C

Top level	Component status	Display
Operating data	Actual compressor speed	Rpm
	Circulation pump HP	%
	Brine pump HP	%
	DHW valve	%
	Expansion valve opening level	%
	System pump	0/1
	Hot gas pump	0/1
	External brine pump	0/1
	Circulation pump HC 1	0/1
	Mixing valve, HC 1	%
	Circulation pump HC 2	0/1
	Mixing valve, HC 2	%
	Directional control valve, cooling, HC 2	0/1
	Circulation pump HC 3	0/1
	Mixing valve, HC 3	%
	Directional control valve, cooling, HC 3	0/1
	Circulation pump HC 4	0/1
	Mixing valve HC	%
	Circulation pump HC 5	0/1
	Mixing valve, HC 5	%
	Auxiliary heater On/Off	0/1
	Auxiliary heater 0-10 V	%
	Circulation pump faulty	0/1

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Top level	Component status	Display
	Digital input, flow switch	0/1
	Smart grid 1	0/1
	Smart grid 2	0/1
	Mixing valve, DHW draw-off control	0/1
	Circulation pump, DHW draw-off control	0/1
	Hot gas heating on/off	0/1
	Charging pump, water charging system	0/1
	Mixing valve, water charging system	%
	Circulation pump, cooling	0/1
	Mixing valve, cooling	%
	Directional control valve, cooling cylinder	0/1
	Directional control valve, active cooling	0/1
	Circulation pump, surplus cooling	0/1
	Directional control valve, surplus cooling	0/1
	Mixing valve, surplus cooling	%
	Fan, surplus cooling	%
	Mixing valve, pool	%
	Directional control valve, pool	0/1
	Circulation pump, pool	0/1
	External stop, pool	0/1

Top level	Submenu	Display value	Display
Operating time	Compressor	0:00:00	
	DHW	0:00:00	
	External heat generator	0:00:00	
Version information	Model		
	STE		
	GUI		
Graphs	Heating system	Return temperature	°C
		Flow temperature	°C
		System flow temperature	°C
		Heating circuit 1	°C
		Set heating circuit temperature	°C
	Climate	Outside temperature	°C
	Demand	Stage	
		Calculated demand (heat)	
	DHW	DHW temperature, top	°C
		DHW temperature, weighted	°C
		DHW temperature, bottom	°C
	Brine	Brine inlet temperature	°C
		Brine outlet temperature	°C
		Suction gas	°C
	Energy measurement	L1	A
		L2	A
		L3	A

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Top level	Submenu	Display value	Display
Energy measurement	L1 to N		V
	L2 to N		V
	L3 to N		V
	L1 to L1		V
	L2 to L3		V
	L3 to L1		V
	L1 current		A
	L2 current		A
	L3 current		A
	Power L1		W
	Power L2		W
	Power L3		W
	W total		W
	kWh total		kWh
Heat pump status	Start-up restriction		
	Reason for stop		
	Latest inverter codes		
	Communication analysis		
	Status of expansion valve	Stability superheating	grey/green
		Stability compressor speed	grey/green
		Stability brine inlet	grey/green
		Stability, condenser inlet	grey/green
		Liquid line OK	grey/green
	Reason for restriction		
Change log			

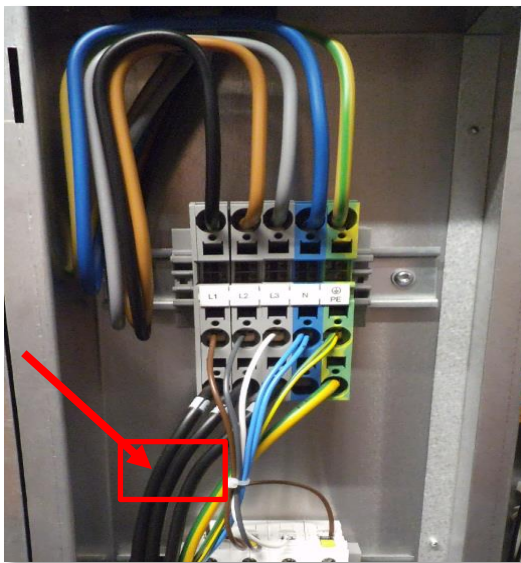
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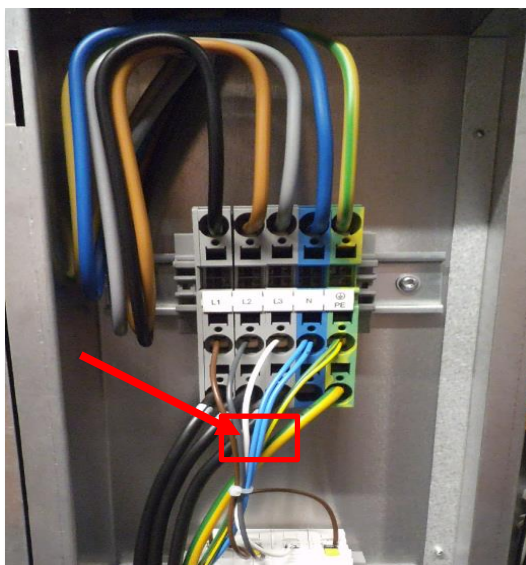
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7.22 Final VDE measurement acc. to VDE 0701 / 0702

In the second part of the VDE measurement, the residual currents of the control unit, compressor and electric reheater should be tested.



This is where the ammeter for testing the residual current of the compressor can be attached. The power cable is routed directly to the inverter.



This is where the ammeter for testing the residual current of the control unit can be attached.

The contact current should then be tested. No specific measurement points are stipulated.

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8. Information about testing intervals

The high pressure switch must be tested annually.

9. Change history

Version	Change
D0000105598-b	Creation of the document.