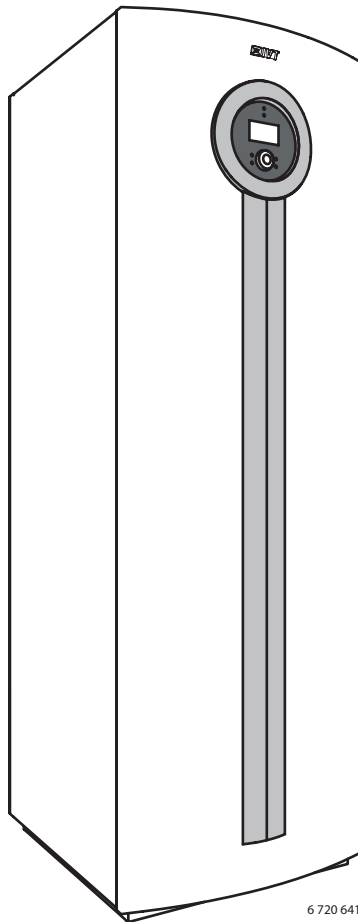


Greenline HE

C6-C11 E6-E17



6 720 641 855-01.11

Installer Guide

Art. no.: 6720643409; Version 2010/03



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1 Explanation of symbols and safety information

1.1 Explanation of symbols

Warning symbols


	Safety instructions in this document are framed and identified by a warning triangle which is printed on a grey background.
---	---

	Electrical hazards are identified by a lightning symbol surrounded by a warning triangle.
---	---

Signal words indicate the seriousness of the hazard in terms of the consequences of not following the safety instructions.

- **NOTICE** indicates possible damage to property or equipment, but where there is no risk of injury.
- **CAUTION** indicates possible injury.
- **WARNING** indicates possible severe injury.
- **DANGER** indicates possible risk to life.

Important information

	Notes contain important information in cases where there is no risk of personal injury or material losses and are identified by the symbol shown on the left. They are bordered by horizontal lines above and below the text.
---	---

Additional symbols

Symbol	Meaning
▶	a step in an action sequence
→	a reference to a related part in the document or to other related documents
•	a list entry
–	a list entry (second level)

Tab. 1

1.2 Safety precautions

General

- ▶ Read the guide carefully and keep it to hand for future use.

Installation and commissioning

- ▶ The heat pump may be installed and put into operation only by a qualified installer.

Service and maintenance

- ▶ Only qualified personnel may carry out repairs. Incorrect repairs can lead to serious risks to the user, and a reduction in savings.
- ▶ Only use original spare parts.
- ▶ Service and maintenance must be carried out annually by an authorised service representative.

2 Included in the delivery

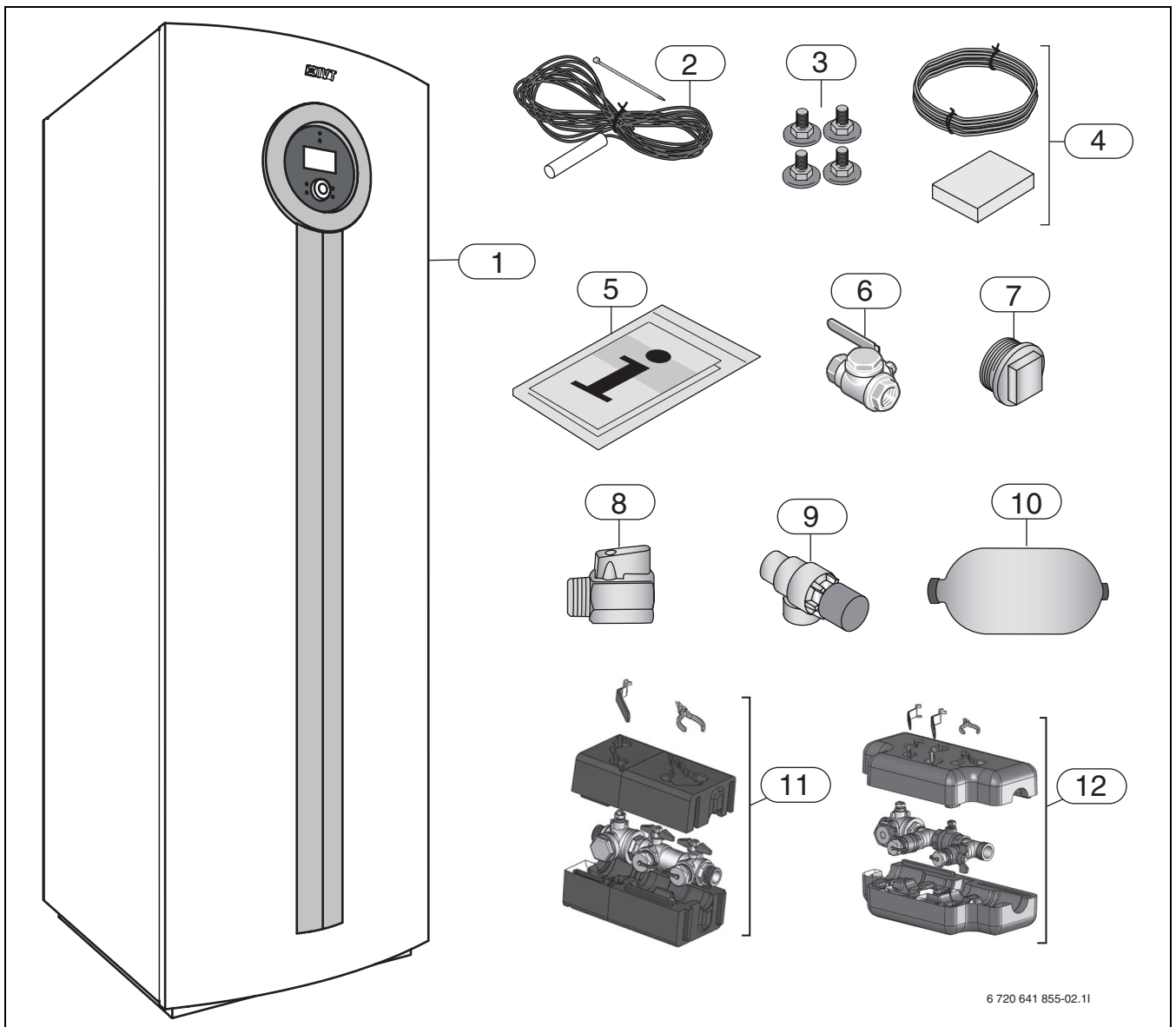


Fig. 1

- 1** Heat pump
- 2** Flow sensor
- 3** Adjustable feet
- 4** Outdoor sensor
- 5** Document set
- 6** Particle filter (R 3/4 inner thread) for heating system (C6 - 11)
- 7** Drain plug
- 8** Ball valve
- 9** Safety valve
- 10** Expansion tank
- 11** Filling kit E6 - 11, C6 - 11
- 12** Filling kit E 14 - 17

3 General



Only qualified installers may carry out the installation. The installer must follow applicable rules and regulations and recommendations from the supplier.

3.1 Information about the heat pump

C6 - 11 are ground source heat pumps with integrated hot water heaters.

E6 - 17 are ground source heat pumps designed to be supplemented with external hot water heaters.

3.2 Application area

The heat pump must only be used in a closed hot water heating system according to EN 12828.

Other forms of use are not permitted. We take no responsibility for damage occurring due to non-permitted use.

3.3 Type overview

C	6	7	9	11		
E	6	7	9	11	14	17

Tab. 2 Type overview

- C** Heat pump (with integrated hot water heater)
- E** Heat pump (without integrated hot water heater)
- 6-17** Heating output 6...17 kW

3.4 Type plate

The type plate is located on the roof plate of the heat pump. Information about the heat pump's output, part number, serial number and date of manufacture is stated there.

3.5 Transport and storage

The heat pump should always be transported and stored in an upright position. However, the heat pump may be tilted temporarily, but must not be laid down.

The outer cover plates should be removed to avoid damage if the heat pump is transported without the supplied transport pallet.

The heat pump must not be stored at temperatures below -10 °C.

3.6 Positioning the heat pump

- ▶ The heat pump is placed indoors, on a level and stable surface that withstands a weight of at least 500 kg.

- ▶ Adjust the rubber feet so the heat pump does not lean.
- ▶ The ambient temperature around the heat pump must be between +10 °C and +35 °C.
- ▶ The installer should take sound propagation into consideration when positioning the heat pump.
- ▶ Make sure there is a floor drain in the room where the heat pump is installed.

3.7 Checks before installation

- ▶ Installation of the heat pump should be performed by a qualified installer.
- ▶ Before the heat pump is commissioned, the heating system, hot water cylinder and the collector circuit system, including the heat pump, must be filled and vented.
- ▶ Check that all pipe connections are intact and have not shaken loose during transportation.
- ▶ Wiring should be kept as short as possible to protect the system from downtime, for example during a thunderstorm.
- ▶ Heat pump installation, energy drilling and collector installation must follow applicable regulations.

3.8 Checklist



Each heat pump installation is unique. The following checklist will give you a general description of how the installation should be carried out.

1. Position the heat pump on an even base. Adjust the height using the adjustable feet.
2. Install the incoming and outgoing pipes for the heat pump, as well as the expansion vessel.
3. Fit the filling unit, particle filters and valves.
4. Connect the heating unit to the heating system.
5. Install the outdoor sensor and possible room sensors.
6. Fill and vent the heating and collector systems before commissioning.
7. Carry out the external connections.
8. Connect the heating installation to the power supply.
9. Commission the heating installation by making all the necessary settings on the control panel.
10. Check the heating installation after commissioning.
11. Top up more collector circuit fluid, if required.

3.9 CAN-BUS

The various circuit boards in the heat pump are joined by a communications cable, CAN-BUS. CAN (Controller Area Network) is a two-wire system for communication between microprocessor based modules/circuit boards.

CAUTION: Interference.

- ▶ The CAN-BUS cable must be screened and laid separately from the power cable.

Suitable cable for external laying is cable LIYCY (TP) 2x2x0.5. The cable must be twisted pair and screened. The screen must only be earthed at one end and to the chassis.

Maximum cable length is 30 m.

CAN-BUS cable must **not** be laid alongside power supply cables. Minimum distance 100 mm. They may be laid alongside sensor cables.

CAUTION: Do not mix up the 12V and CAN-BUS connections!

The processors are destroyed if 12V is connected to the CAN-BUS.

- ▶ Check that the four cables are connected to the contacts with the corresponding marking on the circuit board.

The connection between the circuit boards is by four wires, because the 12V-supply between the circuit boards must also be connected. The circuit boards have markings for both the 12V and CAN-BUS connections.

Switch Term is used to mark the start and end of a CAN-BUS loop. Ensure that the correct circuit board is terminated and that all other switches are in the opposite position.

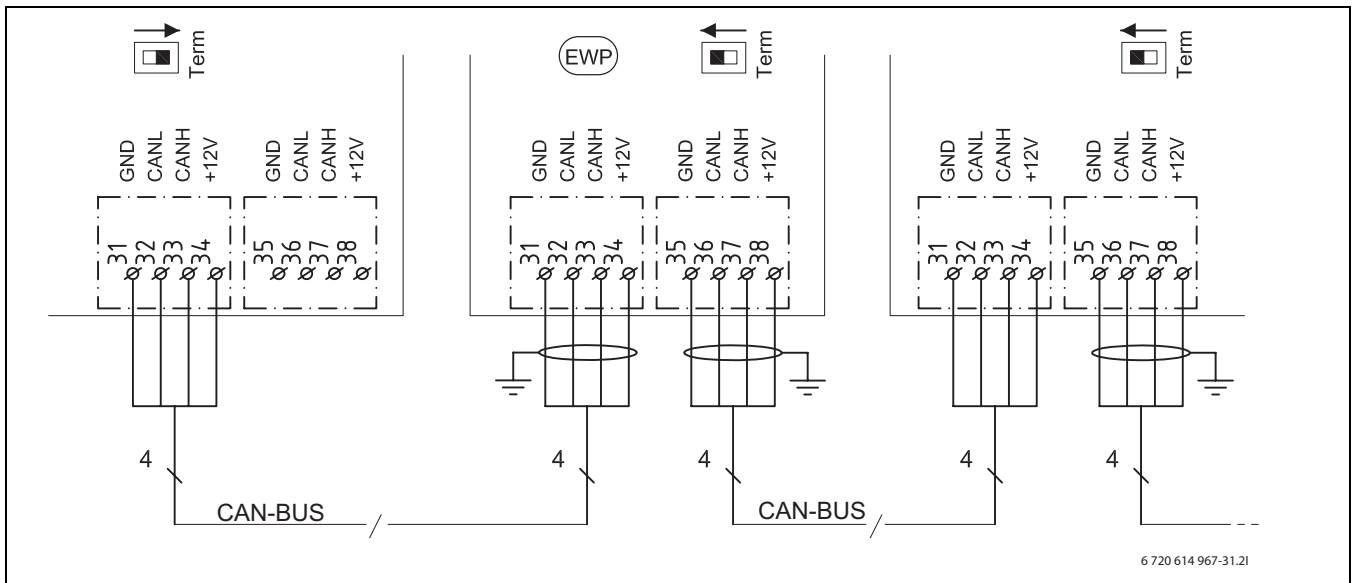


Fig. 2

- EWP** Heat pump
- GND** Soil
- CANL** CAN low
- CANH** CAN high
- +12V** Connection 12V

3.10 Handling circuit boards

Circuit boards with control electronics are sensitive to discharges of static electricity (ESD – ElectroStatic Discharge) when handled. To prevent damaging the components, special care is therefore required when handled.

CAUTION: Never grasp a circuit board without wearing a ground-connected bracelet.

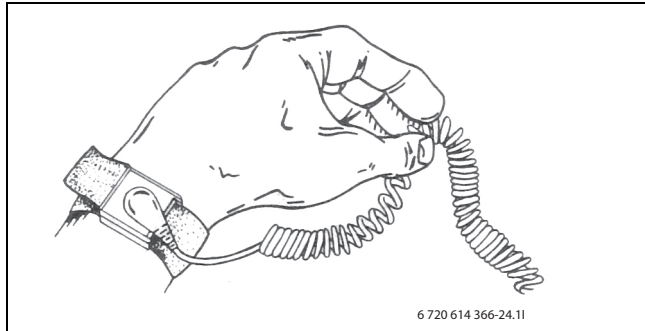


Fig. 3 Bracelet

Damage is usually latent, and a circuit board can operate impeccably during commissioning but show signs of problems later. Charged objects may only be problematic if they are in close proximity to the electronics. Keep a distance of at least one metre from expanded polystyrene, protective plastic and other packaging, synthetic material (e.g. fleeces) and similar before starting work.

A condition for good ESD protection is a ground-connected bracelet when handling electronics. This bracelet must be put on before opening the screened metal bag/package or before exposing an installed board. The bracelet must be worn until the circuit board is enclosed in its screen packaging or closed electric box. Replaced, returned circuit boards must be handled in the same way.

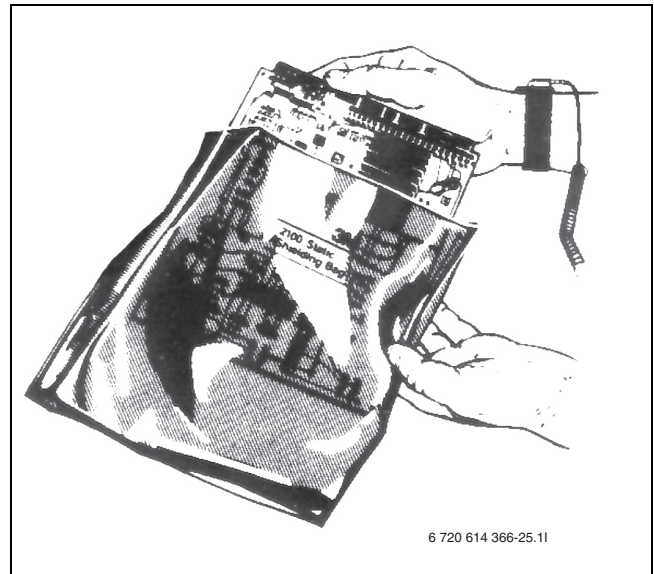


Fig. 4

4 Heating in general

The heating system consists of one or more circuits; these may also have a cooling function (option). The heating system is installed according to operating mode, depending on access to and type of addition. Settings for this are made by the installer

4.1 Circuits for heating

- **Circuit 1;** the first circuit is included by default in the control unit and is controlled by the installed flow sensor, possibly in combination with an installed room sensor.
- **Circuit 2-4 (mixed);** control of up to 3 additional circuits is optional. Each circuit is then fitted with a mixing valve module, circulation pump, flow sensor and possible room sensors.



Circuits 2 through 4 cannot have a higher flow temperature than circuit 1. This means that underfloor heating on circuit 1 cannot be combined with radiators on another circuit. Room temperature reduction for circuit 1 can affect other circuits in some cases.



The maximum number of circuits is reduced by one circuit for each XB2 based accessory, such as IVT PKS 1000.

4.2 Control method for heating

- **Outdoor sensor;** a sensor is fitted on the outside wall of the house. The sensor sends signals to the control unit in the heat pump. Control with an outdoor sensor means that the heat pump automatically regulates the heating in the house depending on the outdoor temperature. The customer determines the temperature of the heating system in relation to the outdoor temperature by setting the current room temperature in the control unit.
- **Outdoor sensor and room sensors** (one room sensor per circuit is possible); Control with outdoor sensor supplemented with room sensor(s) means that one (or several) sensors are mounted in a central location inside the house. It is connected to the heat pump and provides the control unit with information about the current room temperature. The signal affects the flow temperature. For example, it falls when the room sensor indicates a higher temperature than the one set. Room sensors are used when factors other than the outdoor temperature influence the indoor temperature of the house. For example, this can be when a stove or fan-assisted radiator is used in the

house, or if the house is sensitive to the wind or exposed to direct sunlight.



It is only the room where the room sensor is located that can influence regulation of the temperature.

4.3 Clock setting of heating

- **Program control;** the control unit offers four fixed and two individual programs for clock setting of day/time.
- **Holiday;** the control unit has a program for holiday mode, which means that during the selected period the room temperature changes to a lower or higher level. The program also allows switching off hot water production.
- **External control;** the control unit can make settings for external control, which means that the preselected function is performed when the control unit senses an input signal.

4.4 Operating modes

- **With electrical additional heat;** the heat pump is dimensioned less than the house peak heating load and electrical additional heat is permitted to cut in at the same time as the heat pump to meet the demand, when the heat pump cannot meet it itself. Alarm mode, Extra hot water and Hot water peak, and if the heat pump is off at low outdoor temperatures, the addition is also activated.

5 Energy metering

Energy metering in the heat pump is an approximation based on the sum of the nominal emitted output during the relevant metering period. The calculation requires for example that the heat pump is correctly installed, and that the flow and Δ temperatures on the hot and cold sides are adjusted as recommended. The value should therefore be regarded as an estimate of the actual emitted output. The margin of error in the calculation is normally put at 5-10%

In addition, the energy output is affected by the outdoor temperature, the settings for the thermostat and room controls and heat pump usage. Ventilation, indoor temperature and hot water demand can play a deciding role.

6 Dimensions and clearance

6.1 C6 - C11

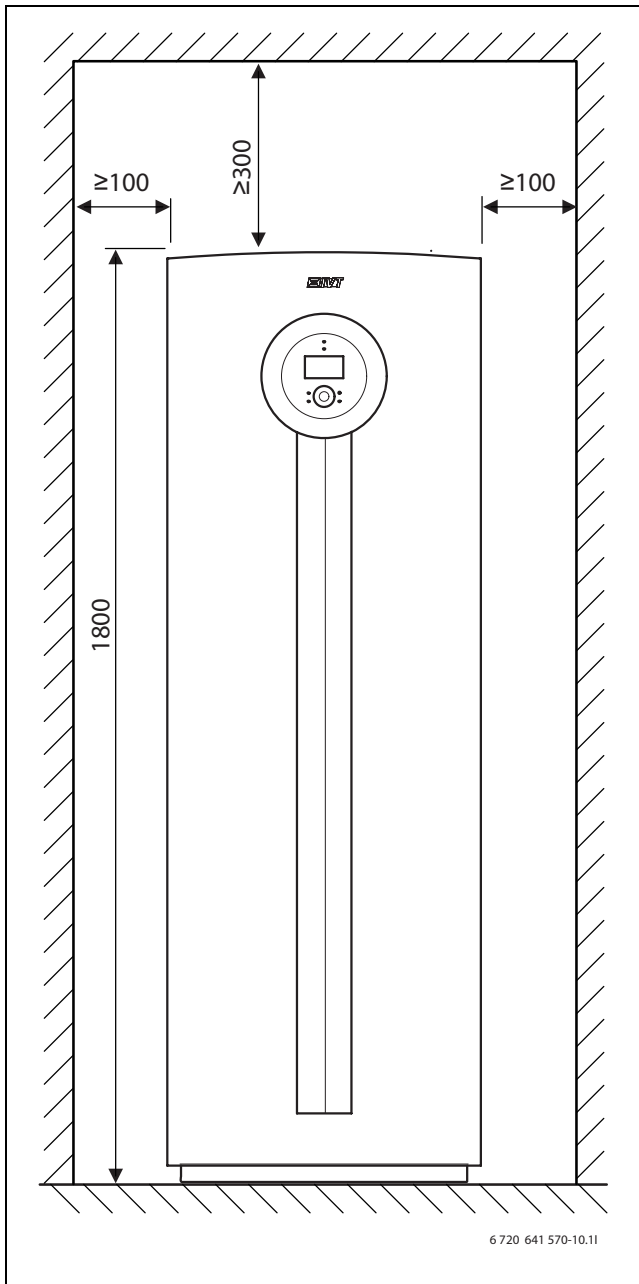


Fig. 5

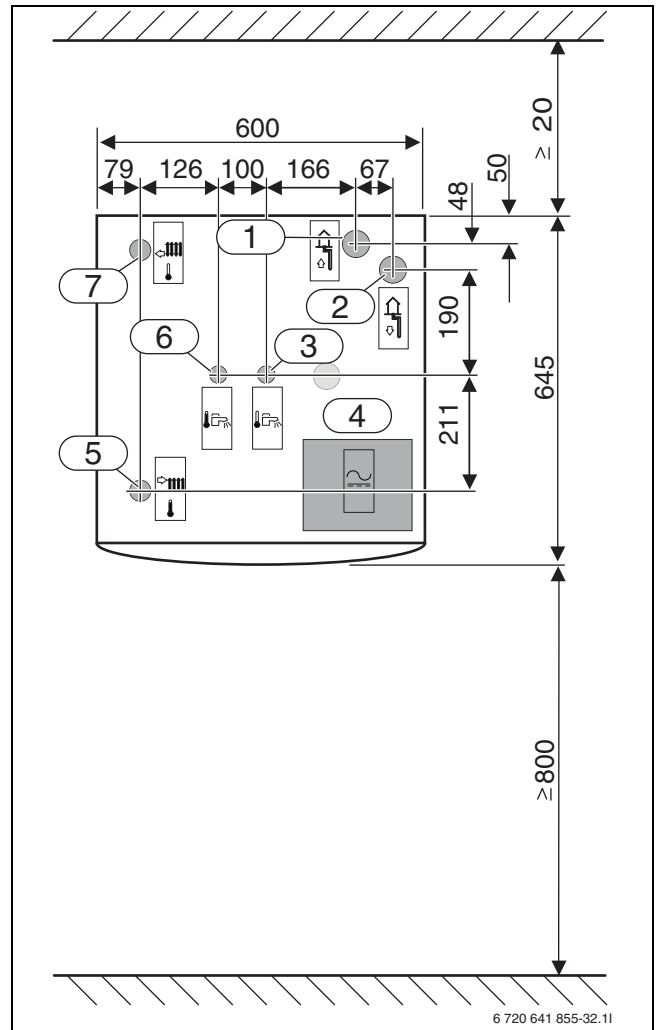


Fig. 6

All dimensions are stated in mm.:

- 1 HTF (coll) in
- 2 HTF (coll) out
- 3 Cold water in
- 4 Electrical connections
- 5 Flow heating system
- 6 Hot water out
- 7 Return heating system

6.2 E6 - E11

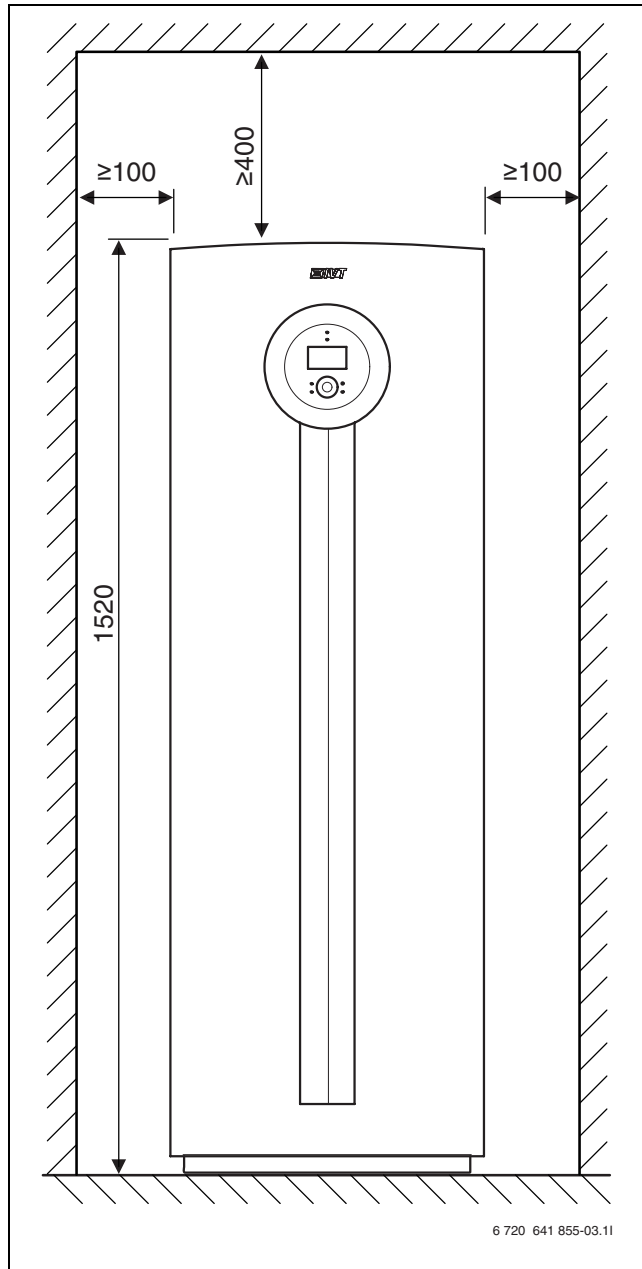


Fig. 7

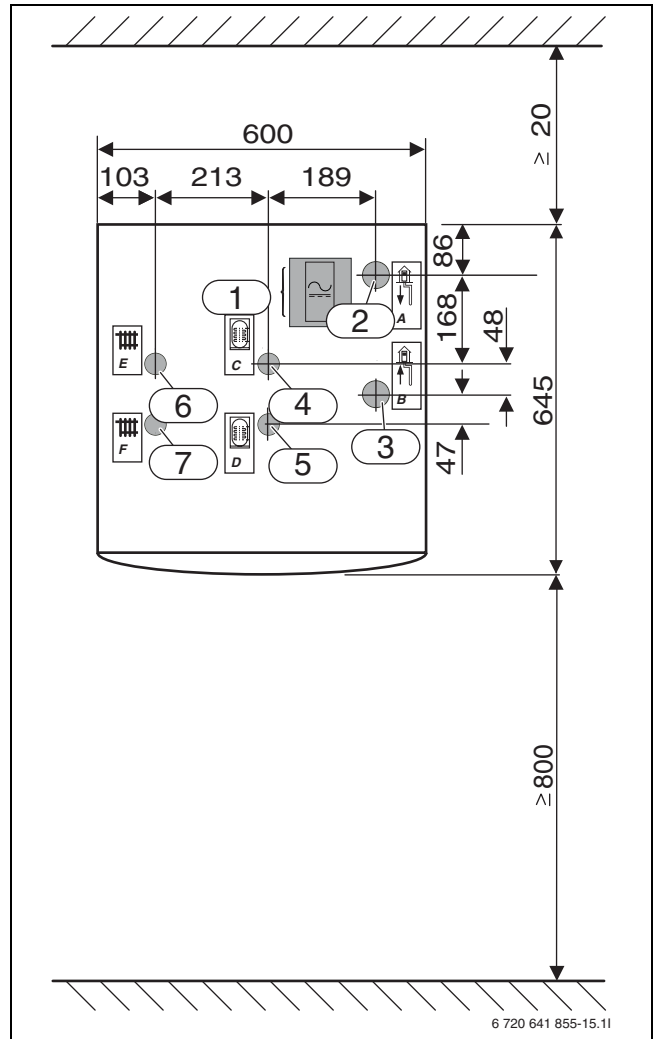


Fig. 8

All dimensions are stated in mm.:

- 1 Electrical connections
- 2 HTF (coll) out
- 3 HTF (coll) in
- 4 Return, hot water heater
- 5 Flow, hot water heater
- 6 Return heating system
- 7 Flow heating system

6.3 E14 - E17

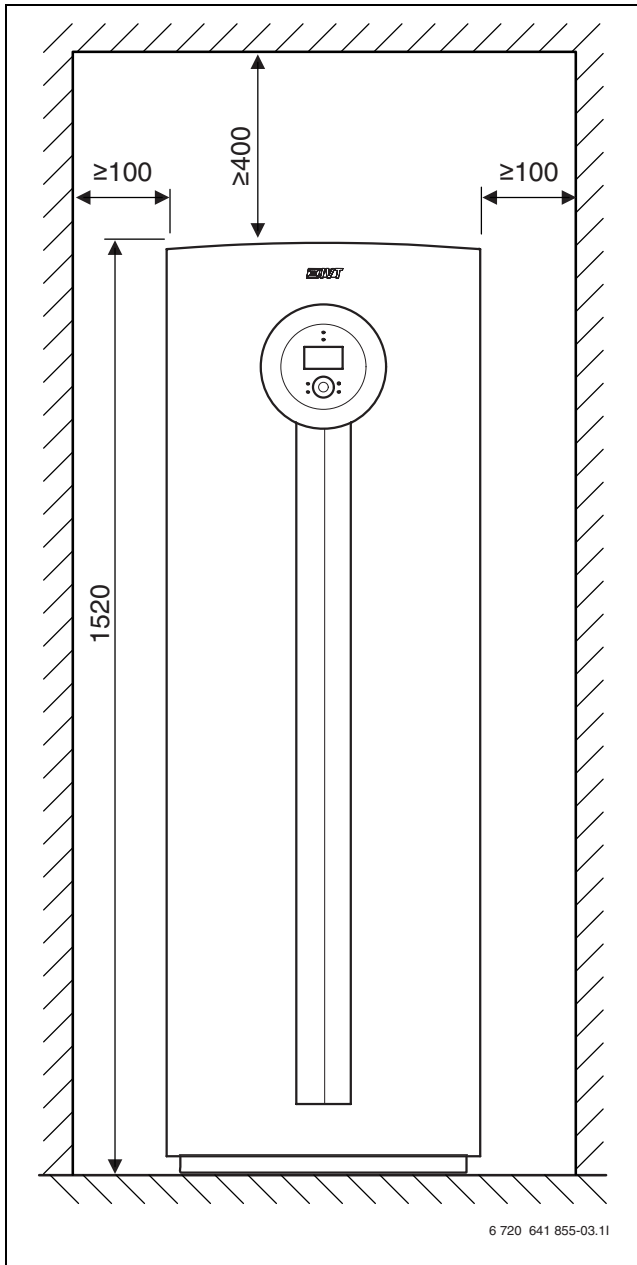


Fig. 9

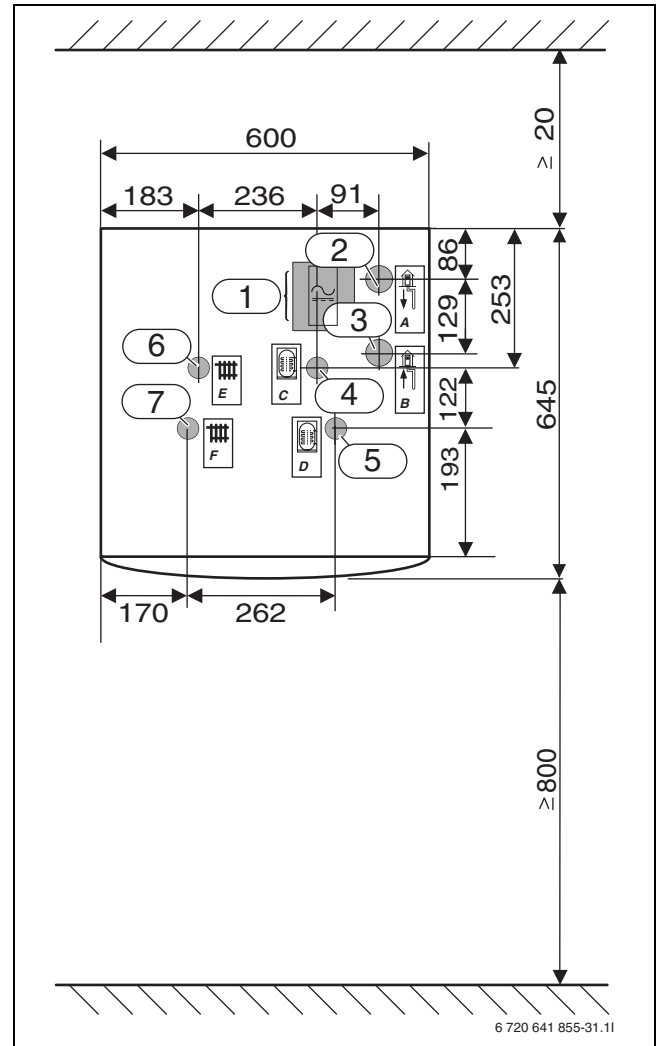


Fig. 10

All dimensions are stated in mm.:

- 1 Electrical connections
- 2 HTF (coll) out
- 3 HTF (coll) in
- 4 Return, hot water heater
- 5 Flow, hot water heater
- 6 Return heating system
- 7 Flow heating system

7 Technical information

7.1 Component parts

7.1.1 C6 - C11

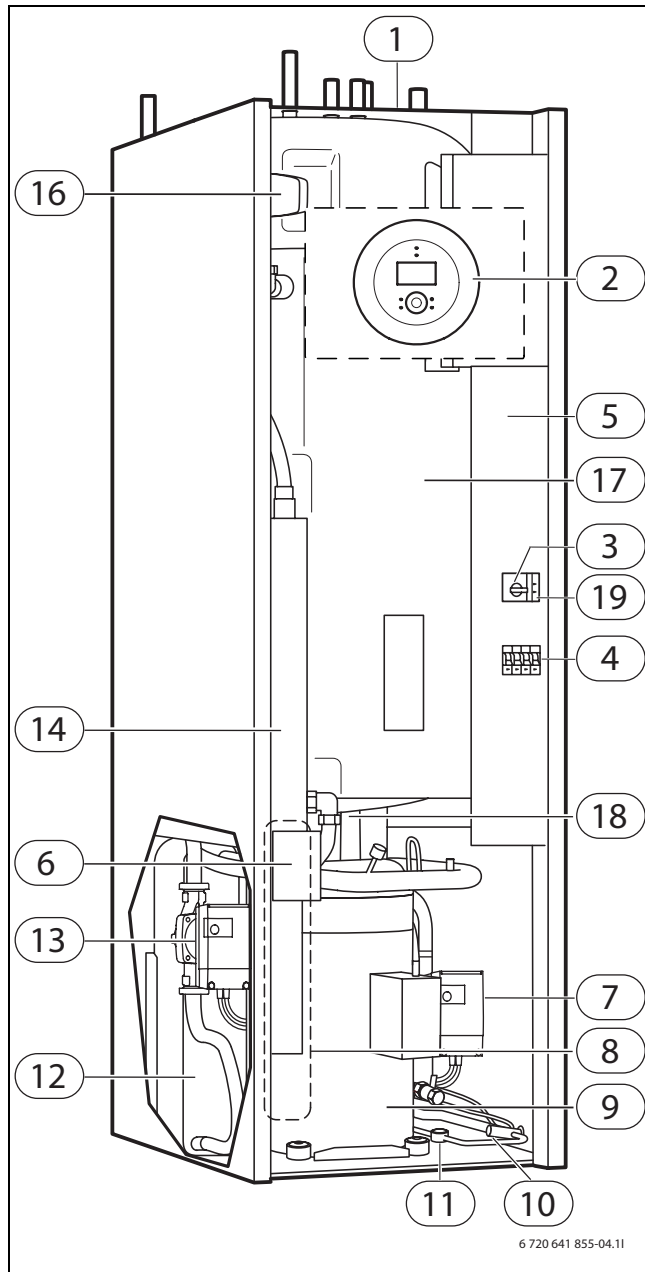


Fig. 11

- 1** Type plate
- 2** Control panel
- 3** Motor cut-out with reset compressor
- 4** Automatic fuses
- 5** Electric box
- 6** Reset button for overheat protection on the electric additional heat C6-C11 E14-E17
- 7** Heat transfer fluid pump
- 8** Evaporator (concealed)

7.1.2 E6 - E17

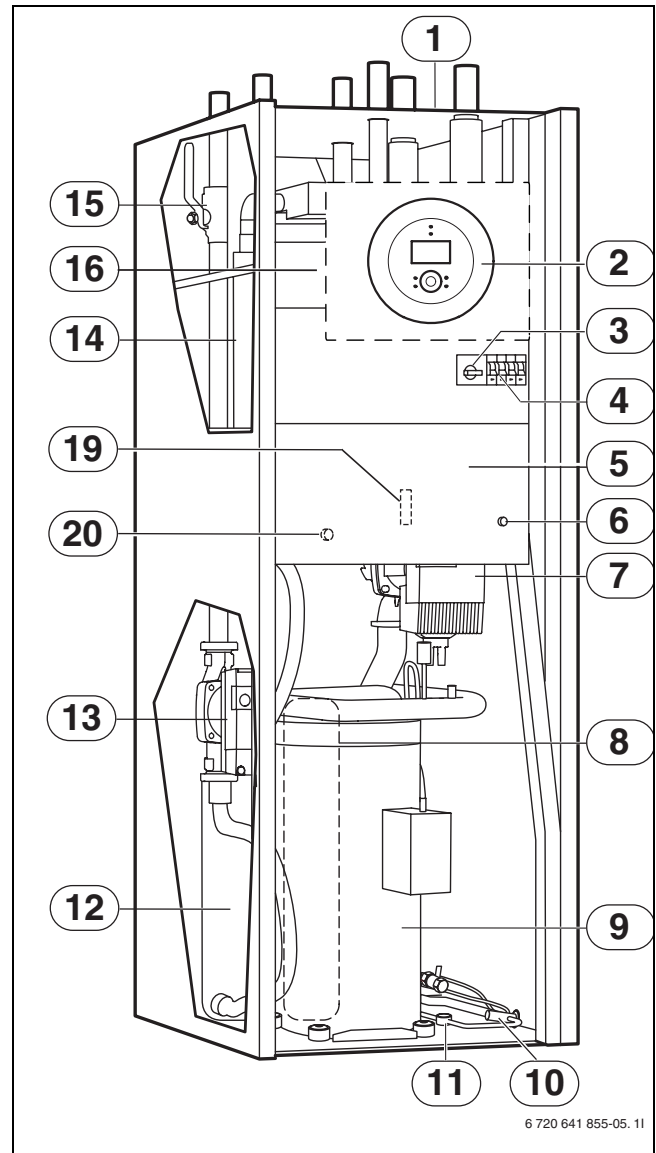


Fig. 12

- 9** Compressor with insulation
- 10** Expansion valve
- 11** Sight glass
- 12** Condenser
- 13** Heat carrier pump
- 14** Electric additional heat
- 15** Particle filter for the heating system
- 16** 3-way valve
- 17** Double shelled hot water heater
- 18** Drain tap under the hot water heater
- 19** Phase guard
- 20** Reset button for overheat protection on the electric additional heat E6-E11 (concealed)

7.2 System solutions



Detailed system solutions can be found in the product's planning documentation.

7.2.1 System solution explanations

E10	
E10.T2	Outdoor sensor

Tab. 3 E10

E11	
E11.C101	Expansion tank
E11.C111	Buffer tank
E11.F101	Safety valve
E11.G1	Circulation pump, heating system
E11.P101	Pressure gauge
E11.T1	Flow sensor
E11.TT	Room sensor

Tab. 4 E11

E12	
E12.G1	Circulation pump mixed circuit
E12.Q11	Mixing valve
E12.T1	Flow sensor
E12.T5	Room sensor

Tab. 5 E12

E21	
E21	Heat pump
E21.E2	Electric add. heat
E21.F101	Safety valve
E21.G2	Heat carrier pump
E21.G3	Heat transfer fluid pump
E21.Q21	3-way valve
E21.R101	Non-return valve
E21.T6	Hot gas sensor
E21.T8	Sensor Heat transfer fluid out
E21.T9	Sensor Heat transfer fluid in
E21.T10	Sensor Collector circuit in

Tab. 6 E21

E21	
E21.T11	Sensor Collector circuit out
E21.V101	Filter

Tab. 6 E21

E22	
E22	Heat pump
E22.E2	Electric add. heat
E22.G2	Heat carrier pump
E22.G3	Heat transfer fluid pump
E22.Q22	3-way valve
E22.R101	Non-return valve
E22.T6	Hot gas sensor
E22.T8	Sensor Heat transfer fluid out
E22.T9	Sensor Heat transfer fluid in
E22.T10	Sensor Collector circuit in
E22.T11	Sensor Collector circuit out
E22.V101	Filter

Tab. 7 E22

E31	
E31.C101	Expansion tank
E31.F101	Safety valve
E31.P101	Pressure gauge
E31.Q21	Filler valve
E31.Q22	Filler valve
E31.Q23	Filler valve
E31.R101	Non-return valve
E31.R102	Non-return valve
E31.V101	Filter

Tab. 8 E31

E41	
E41	Water heater
E41.F101	Safety valve
E41.T3	Hot water sensor
E41.V41	Hot water
E41.W41	Cold water

Tab. 9 E41

7.2.2 C6 - C11

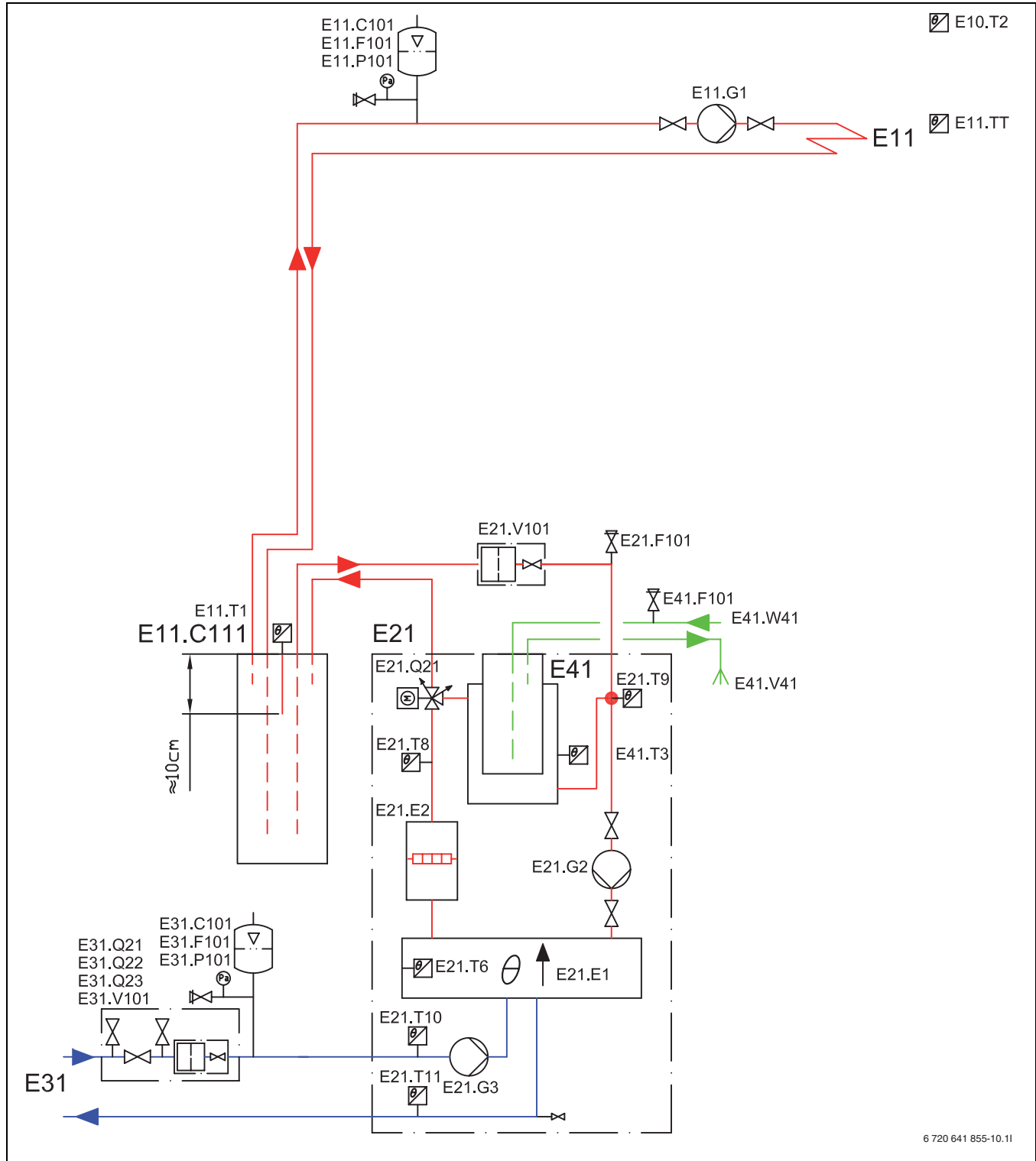


Fig. 13 Non-shunted heating circuit with buffer tank

When installing to underfloor heating systems with individual room control, a system solution with a buffer tank (E11.C111) is a requirement so that flow over the heat pump is guaranteed.



For explanations for the system solutions (→ 7.2.1).

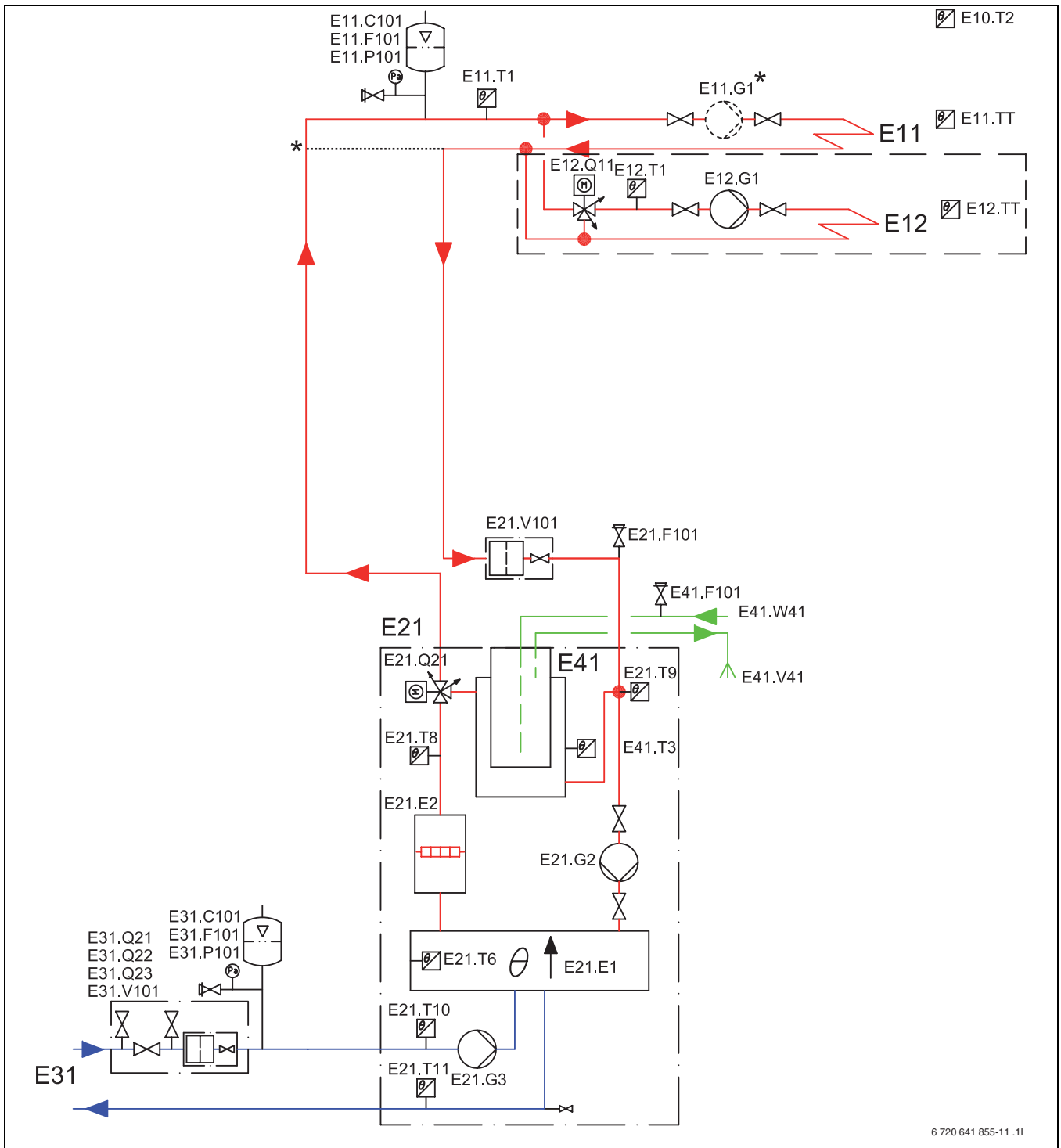


Fig. 14 Non-shunted and shunted heating circuit with buffer tank

An absolute prerequisite for the connection is that a minimum flow of at least 70% of the nominal flow can be maintained throughout the year.

* If a bypass is used and an external circulation pump is fitted, the flow over the heating system can be reduced by 40% of the nominal flow of the heat pump. Ensure that the larger section of the thermostat valves is fully open. Otherwise an accumulator tank of at least 100 litres in capacity must be fitted. The bypass length must be at least ten times that of the pipe's inner dimension.



For explanations for the system solutions (→ 7.2.1).



For circuit E12 bypass solution and accessory IVT mixing valve module 1000 is required

7.2.3 E6 - E17

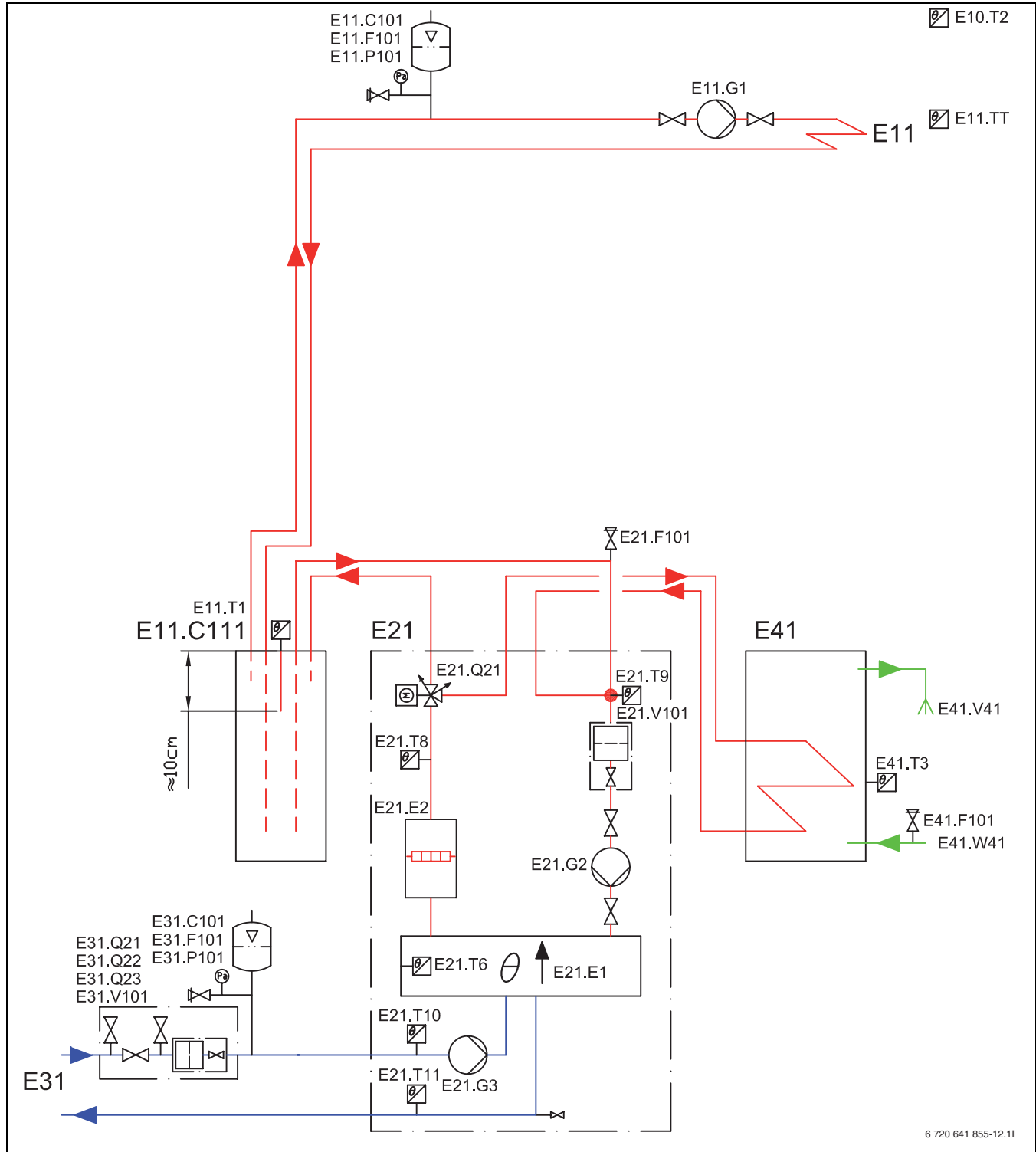


Fig. 15 Non-shunted heating circuit with buffer tank and external hot water heating

When installing to underfloor heating systems with individual room control, a system solution with a buffer tank (E11.C111) is a requirement so that flow over the heat pump is guaranteed.



For explanations for the system solutions (→ 7.2.1).

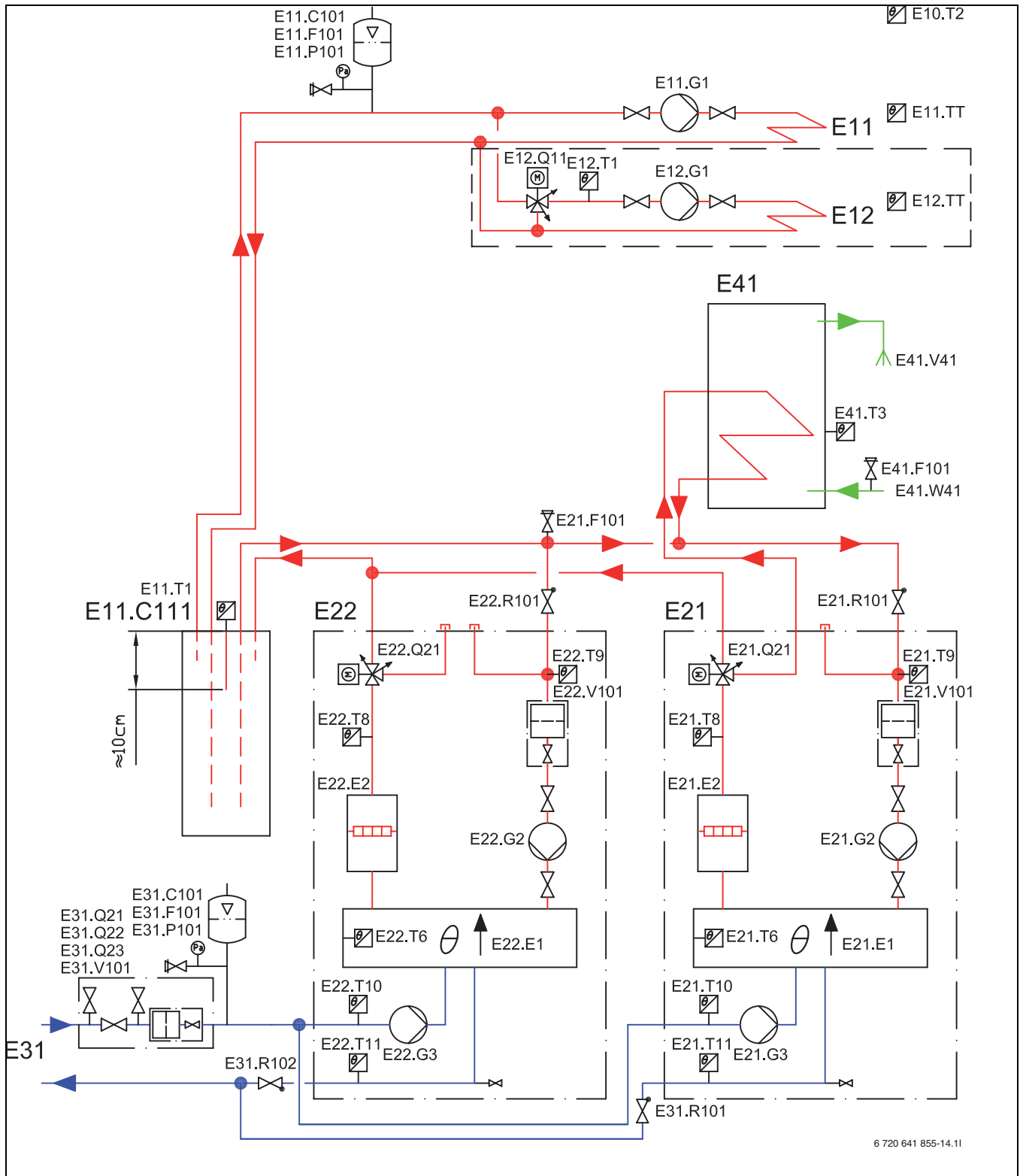


Fig. 16 Two heat pumps (cascade connection), non-shunted and shunted heating circuit with buffer tank and external hot water heating



For explanations for the system solutions (→ 7.2.1).



For circuit E12 the accessory IVT mixing valve module 1000 is required

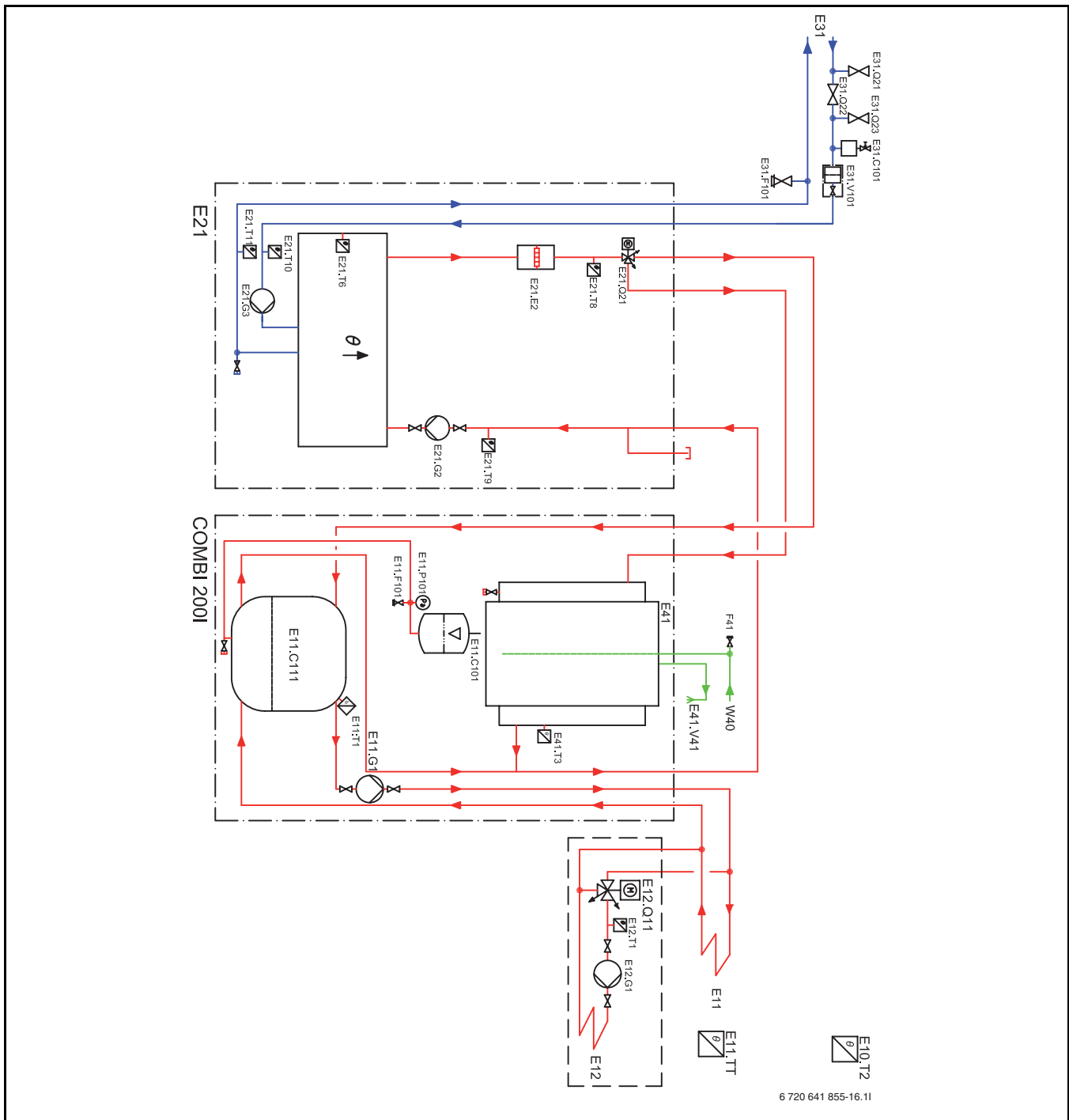


Fig. 17 Non-shunted and shunted heating circuit with combi heater

When installing to underfloor heating systems with individual room control, a system solution with a buffer tank (E11.C111) is a requirement so that flow over the heat pump is guaranteed.



For explanations for the system solutions (→ 7.2.1).



For more information about the combi heater (COMBI) see the Installation and conversion kit manual for the combi heater.



For circuit E12 the accessory IVT mixing valve module 1000 is required

7.3 Technical information

7.3.1 C6 - C11

	Unit	C6	C7	C9	C11
Mode fluid/water					
Heating output (B0/W35) ¹⁾	kW	5,5	7,2	8,8	10,3
Heating output (B0/W45) ¹⁾	kW	5,1	6,6	8,2	9,9
COP (B0/W35) ¹⁾	–	4,1	4,2	4,2	4,4
COP (B0/W45) ¹⁾	–	3,2	3,3	3,3	3,5
Heat transfer fluid					
Nominal flow	l/s	0,30	0,38	0,46	0,57
Permit external pressure drop	kPa	49	45	44	80
Max. pressure	bar	4			
Contents (internal)	l	6			
Operating temperature	°C	–5... +20			
Connection	mm	Ø 28			
Compressor					
Type	–	Mitsubishi Scroll			
Weight refrigerant R407c	kg	1,6	1,6	1,8	2,4
Max. pressure	bar	31			
Heating system					
Nominal flow	l/s	0,20	0,25	0,31	0,38
Min./max. flow temperature	°C	20/65			
Max. permitted operating pressure	bar	1,5			
Heating water incl. outer shell hot water heater	l	47			
Connection	mm	Ø 22			
Hot water					
Max. output with/without 6kW electric additional heat	kW	5,5/11,5	7,0/13,0	8,4/14,4	10,2/16,2
Volume hot water	l	185			
Min./max. permitted operating pressure	bar	2/10			
Connection	mm	Ø 22			
Values for electrical connection					
Electrical supply		400V 3N~50Hz			
Fuse, slow; with electric add. heat 3 kW/6 kW	A	16	16	16/20	16/20
Nominal power consumption compressor (B0/W35)	kW	1,33	1,64	1,99	2,22
Max. current with soft starter ²⁾ (accessories)	A	< 30			
Enclosure class	IP	X1			
General					
Permitted ambient temperature	°C	+10... +35			
Sound pressure level ³⁾	dB(A)	31	34	36	35
Dimensions (height x depth x width)	mm	600 x 645 x 1800			
Weight (copper/stainless steel hot water heater)	kg	230/200	231/201	240/210	218 (stainless steel)

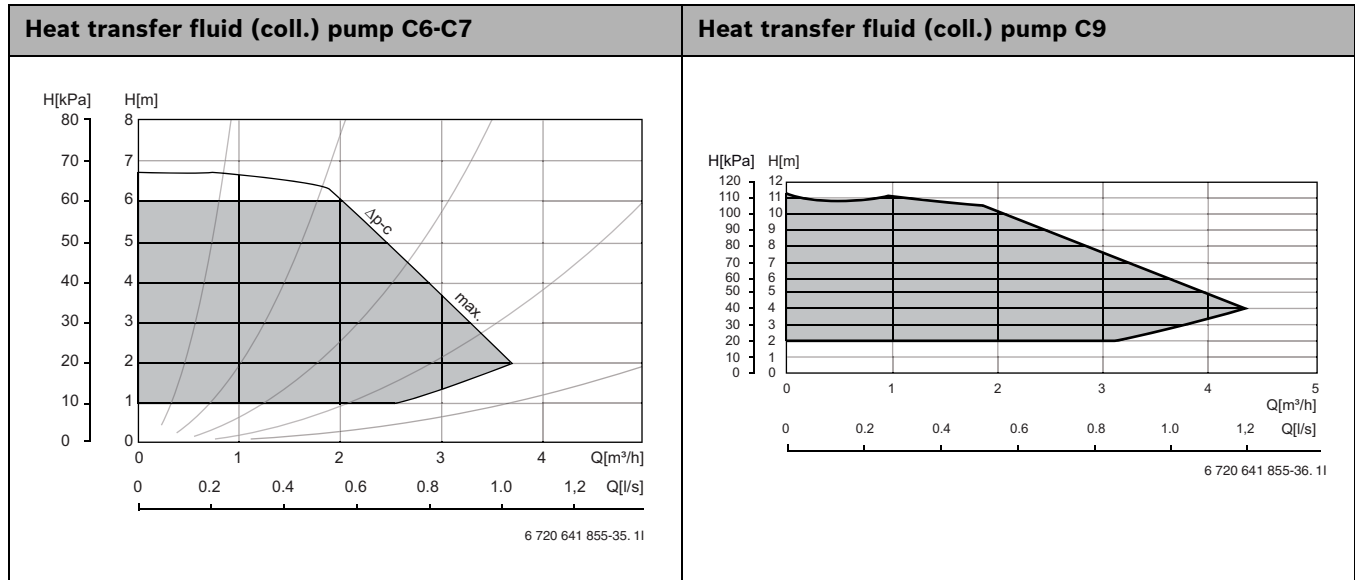
Tab. 10 Technical data

1) According to EN 14511

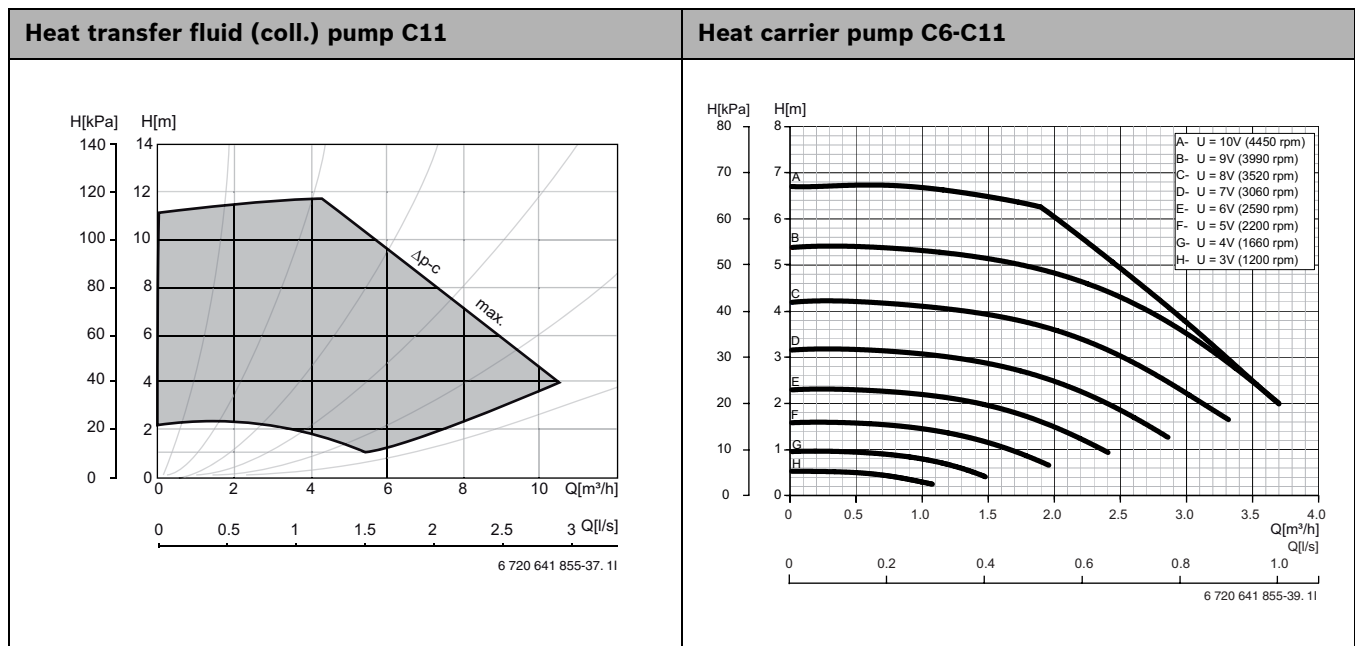
2) No soft starter in C6

3) According to EN ISO 11203

7.3.2 Diagram circulation pumps C6-C11



Tab. 11



Tab. 12

- h** Residual lift height
- Q** Flow



Note the pressure loss when using propylene glycol as anti-freeze

7.3.3 E6 - E17

	Unit	E6	E7	E9	E11	E14	E17
Mode fluid/water							
Heating output (B0/W35) ¹⁾	kW	5,5	7,2	8,8	10,3	14,8	16,4
Heating output (B0/W45) ¹⁾	kW	5,1	6,6	8,2	9,9	14,1	15,5
COP (B0/W35) ¹⁾	–	4,1	4,2	4,2	4,4	4,3	4,0
COP (B0/W45) ¹⁾	–	3,2	3,3	3,3	3,5	3,4	3,1
Heat transfer fluid							
Nominal flow	l/s	0,30	0,38	0,46	0,57	0,78	0,90
Permit external pressure drop	kPa	49	45	44	80	74	71
Max. pressure	bar	4					
Contents (internal)	l	6					
Operating temperature	°C	–5... +20					
Connection	mm	Ø 28			Ø 35		
Compressor							
Type		Mitsubishi Scroll					
Weight refrigerant R407c	kg	1,6	1,6	1,8	2,4	2,3	2,3
Max. pressure	bar	31					
Heating system							
Nominal flow	l/s	0,18	0,23	0,29	0,34	0,47	0,54
Min. flow temperature	°C	20					
Max. flow temperature	°C	65					
Max. permitted operating pressure	bar	1,5					
Hot water content	l	7					
Connection	mm	Ø 22			Ø 28		
Values for electrical connection							
Electrical supply		400V 3N~50Hz					
Fuse, slow; with electric add. heat 3 kW/6 kW	A	16	16	16/20	16/20		
Fuse, slow; with electric add. heat 4.5 kW/9 kW	A					20/25	25/32
Nominal power consumption compressor (B0/W35)	kW	1,33	1,64	1,99	2,22	3,15	3,73
Max. current with soft starter ²⁾ (accessories)	A	< 30					
Enclosure class	IP	X1					
General							
Permitted ambient temperature	°C	+10... +35					
Sound pressure level ³⁾	dBA	35	38	40	36	39	35
Dimensions (height x depth x width)	mm	600 x 645 x 1520					
Weight	kg	146	152	155	170	190	195

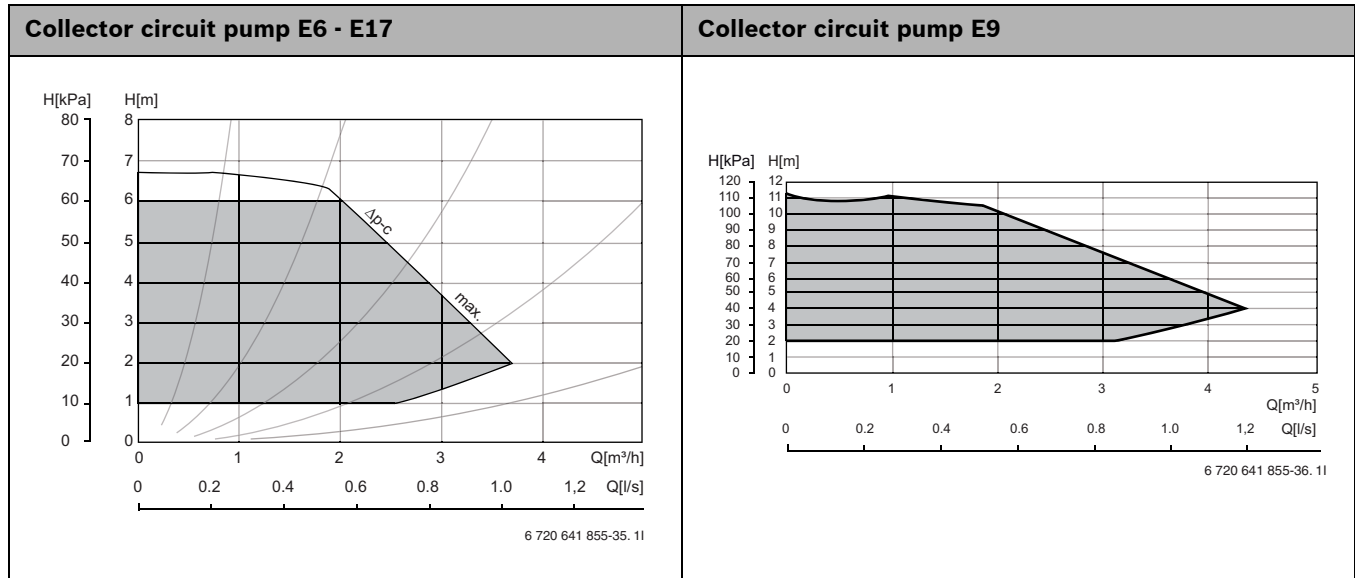
Tab. 13 Technical information

1) According to EN 14511

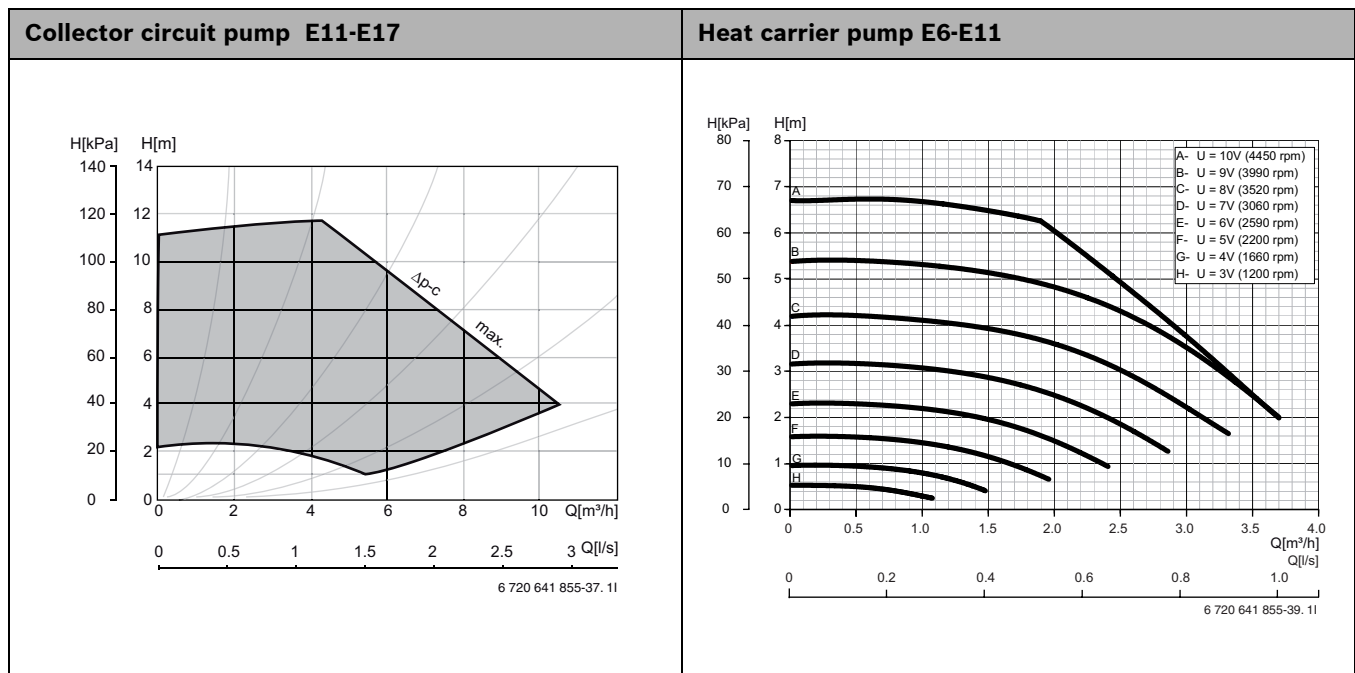
2) No soft starter in C6

3) According to EN ISO 11203

7.3.4 Diagram circulation pumps E6-E17

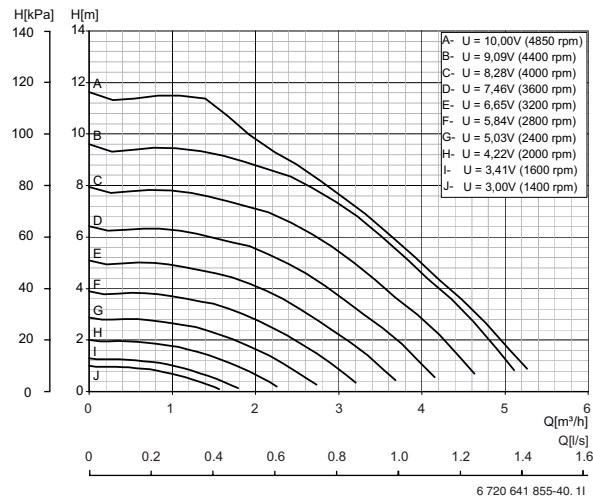


Tab. 14



Tab. 15

Heat carrier pump E14-E17



Tab. 16

- h** Residual lift height
- Q** Flow



Note the pressure loss when using propylene glycol as anti-freeze

7.3.5 Collector pressure loss



When calculating pressure loss, the concentration of antifreeze (propylene glycol) should be taken into consideration.

The collector's pressure loss depends on the temperature and the mixing ration of antifreeze and water. When the temperature falls and the share of antifreeze increases, the pressure loss from the collector rises.

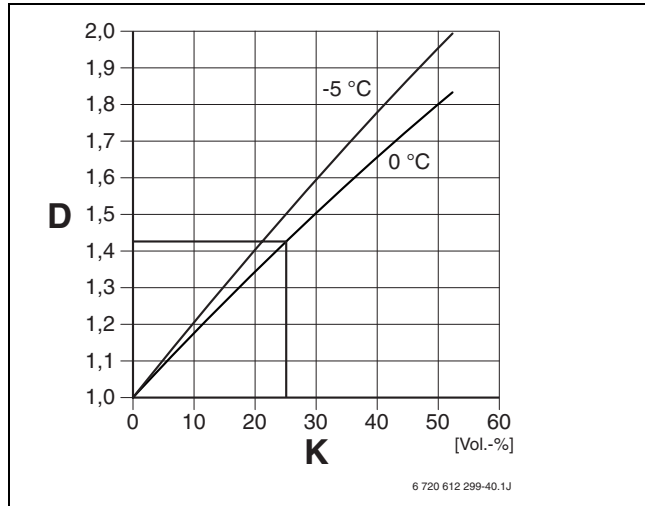


Fig. 18

- D** Factor relative to pressure loss
- K** Concentration of antifreeze

Example:

If the concentration of antifreeze is 25 vol. % and the temperature is 0 °C, the pressure loss with regard to the water medium increases by a factor of 1.425.

7.3.6 Measurement values for temperature sensors

°C	$\Omega_{T...}$	°C	$\Omega_{T...}$	°C	$\Omega_{T...}$	°C	$\Omega_{T...}$
-40	154300	-5	19770	30	3790	65	980
-35	111700	0	15280	35	3070	70	824
-30	81700	5	11900	40	2510	75	696
-25	60400	10	9330	45	2055	80	590
-20	45100	15	7370	50	1696	85	503
-15	33950	20	5870	55	1405	90	430
-10	25800	25	4700	60	1170		

Tab. 17

8 Regulations

The following regulations and requirements must be observed:

- The responsible power supply company's local regulations and requirements, including any corresponding special rules
- National building regulations
- **EN 60335** (Safety of electric and similar household appliances)
 - part 1** (General requirements)
 - Part 2-40** (Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers)
- **EN 12828** (Heating systems in buildings. Design for water-based heating systems)
- **BBR 16** (National building regulations)

9 Installation



Only qualified installers may carry out the installation. The installer must follow applicable rules and regulations and recommendations from the supplier.

9.1 Collector system

Installation and filling

Installation and filling of the collector system should comply with applicable laws and regulations. Soil used for refilling around the collector hose may not contain stones or other sharp objects. Pressure test the collector system before refilling to ensure that the system is airtight.

When cutting the collector, it is important that no dirt or gravel enters the system. This can cause stoppages in the heat pump and damage components.

Filling unit

A filling unit is included in the delivery and should be installed close to the collector circuit inlet.

Expansion vessel, safety valve, pressure gauge

The expansion vessel, safety valve and pressure gauge are to be provided by the dealer.

Heat transfer fluid pump

Factory setting for the collector circuit pump is max (→ Image 19). The setting may need to be adjusted to achieve the correct delta value (→ Chapter 18.4). The value must lie within the grey area. To adjust the value, turn the dial.

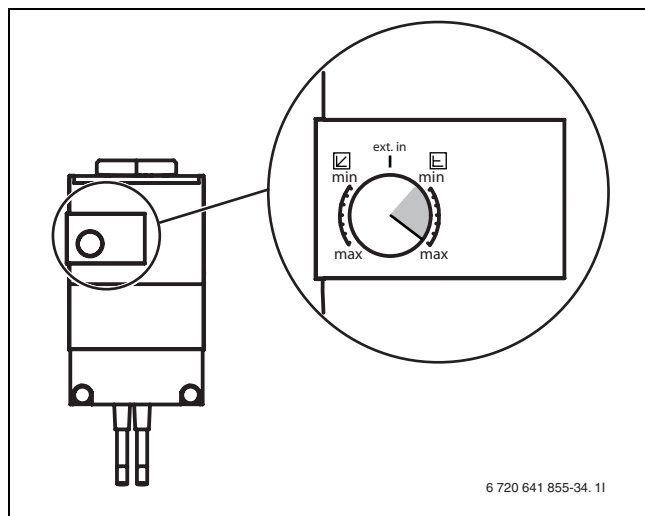


Fig. 19

Membrane expansion vessel in the collector circuit

Select membrane expansion vessel according to:

Model	Volume
E6-E11, C6-C11	12 litres
E14 - E17	18 litres

Tab. 18

Antifreeze/Corrosion preventative

Freeze protection to -15 °C should be ensured. We recommend the primary use of bio-ethanol, otherwise propylene glycol.

9.2 Heating system

Expansion tank

Select expansion vessel in accordance with EN 12828.

It is important when installing the expansion vessel to position it at the highest point in the circuit, preferably above the heat pump. If there is a low ceiling making it impossible to fit the tank above the pump, it can be

positioned as illustrated in the figure to the left. It is important to install the tank so that any air disappears upwards. Air will remain in the circuit if the tank is fitted incorrectly (see the figure to the right).

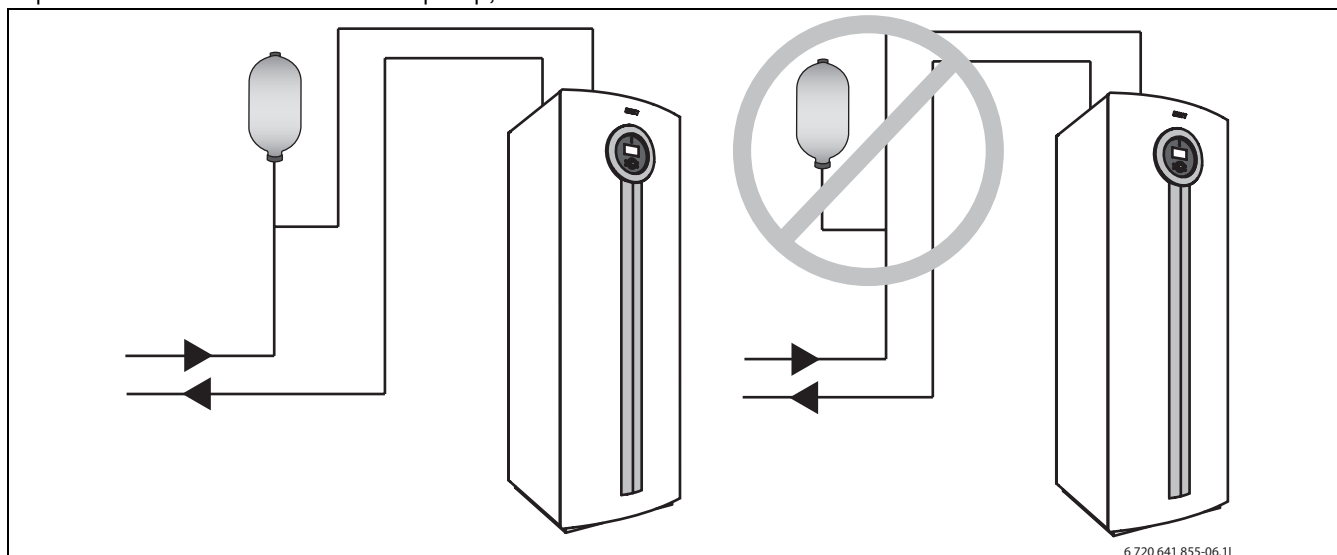


Fig. 20 Installing the expansion vessel

Particle filter (integrated in E6 - 17)

A particle filter for the heating system is included in the delivery of C6 - 11 and should be installed on the connection for the heating system's return line.

Heat carrier pump

Factory setting for the heat carrier pump is ext. in (→ Image 21). The factory setting (ext. in) on the heat carrier pump must not be changed using the dial, the pump settings are controlled from the control unit.

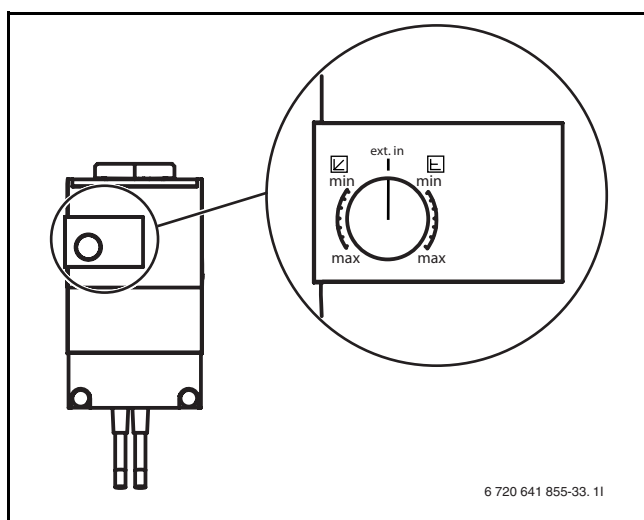


Fig. 21

Safety thermostat

In certain countries, a safety thermostat must be installed in the under floor heating circuits. The safety thermostat is connected to the external input (→ Image 48) for the circuit and **Block heating** set to **Yes**(→ 15.6).

Galvanized radiators and pipes

To prevent the formation of gas in the heating system, never use galvanised radiators or pipework.

Propylene glycol

Glycol is not normally used in the heating system. In special cases, where increased protection is required, glycol can be added with a maximum concentration of 15%. Heat pump performance will however decrease.

WARNING:

- ▶ Alcohol based anti-freeze must not be used in the heating system.

Safety valve

Pursuant to EN 12828, a safety valve should be used.

The safety valve should be installed vertically.

WARNING:

- ▶ Never block the safety valve outlet.

9.3 Siting the appliance

Sound propagation must be taken into consideration when choosing a position for the heat pump (→ Chapter. 7.3).

9.4 Pipework preparations

- ▶ Connection pipes for the collector system, heating system and possible hot water should be installed in the premises to the set-up location.
- ▶ An expansion vessel, a safety group and a pressure gauge should be mounted in the heating circuit (accessories).
- ▶ Mount the filling unit in a suitable place in the collector circuit.

9.5 Flush the heating system

The heat pump is a part in a heating system. Faults in the heat pump can be caused by poor water quality in the radiators/floor loops or air penetrating the system continuously.

Oxygen causes corrosion products in the form of magnetite and sediment.

Magnetite has a grinding effect on the heating system's pumps, valves and components with turbulent flows such as the condenser.

Heating systems which require regular filling or where the heating water is not clear when drained, require remedial measures before the installation of a heat pump, for example the heating system must be fitted with filters and vents.

Do not use any water treatment additives except agents for raising the pH level. Recommended pH value is 7.5 – 9.

An intermediate heat exchanger is sometimes necessary to protect the heat pump.

	<p>CAUTION: The heat pump may become damaged in the event of dirt or other particles in the pipework.</p> <ul style="list-style-type: none">▶ Flush out the system to remove all dirt residues.
--	--

9.6 Setting up

- ▶ Remove packing, taking care to observe the instructions on the packing.
- ▶ Remove the supplied accessories.
- ▶ Install the supplied adjustable feet and adjust the height.

9.7 Heat insulation

All heat transfer and collection lines must have suitable heat and condensation insulation according to applicable norms.

9.8 Removing the front panel

- ▶ Loosen the screws, tilt the front panel outwards and take it off.

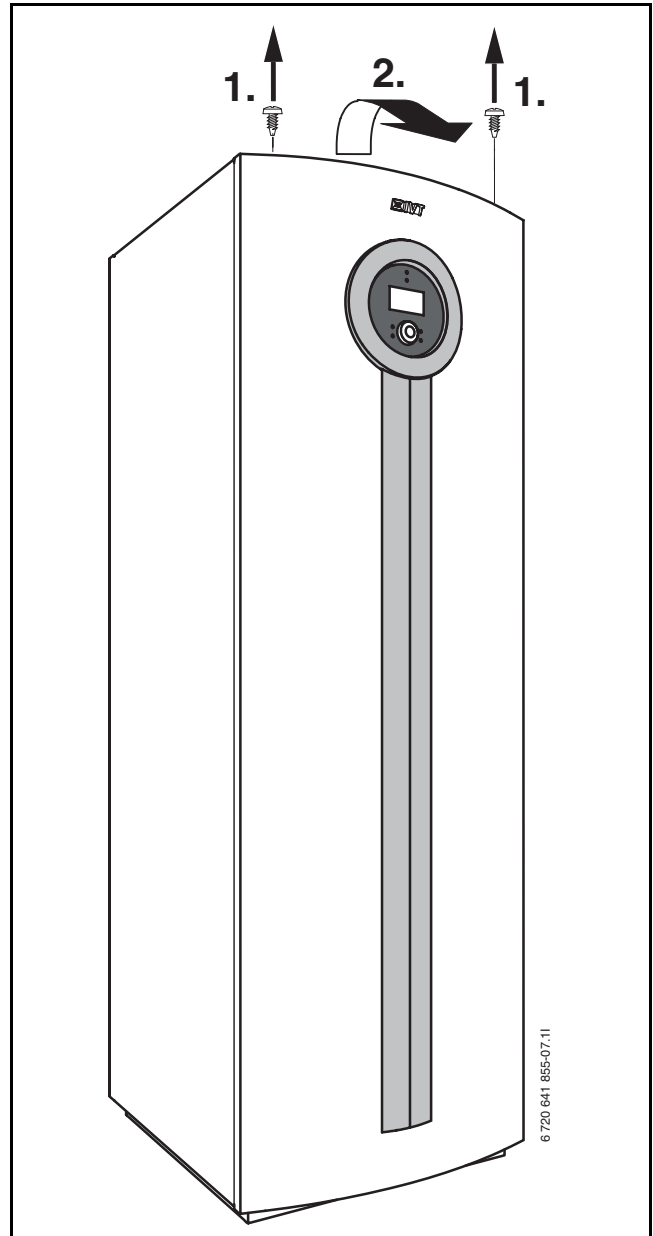


Fig. 22

9.9 Installing soft starter (accessory)

DANGER: Risk of electric shock!
 ▶ Switch off the main power supply before starting work on the electrical part.

CAUTION: Never grasp a circuit board without wearing a ground-connected bracelet (→ Chapter 3.10).

9.9.1 C6 - C11

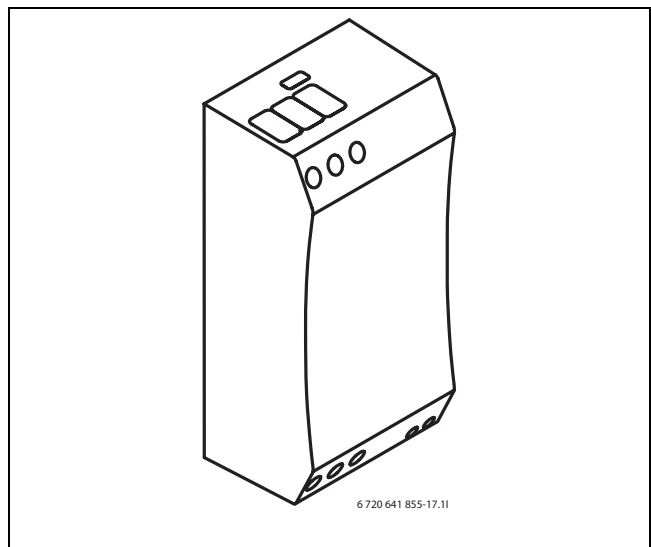


Fig. 23 Soft starter C6-C11

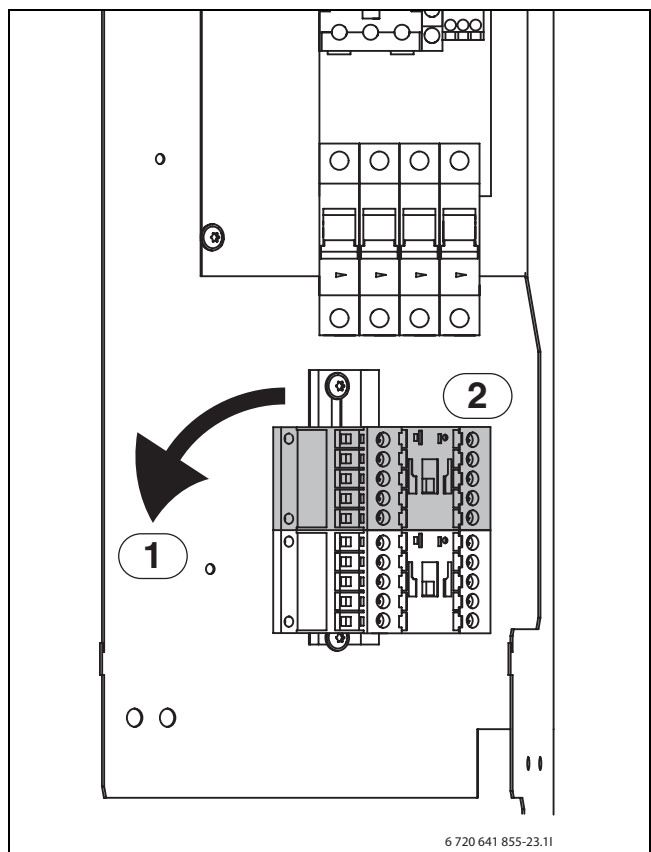


Fig. 24

1. Unscrew the screws and twist the mounting rail 90° degrees. Screw the mounting rail into place in the existing holes.
2. Replace the contactor with the soft starter. Connect the cables to the soft starter as they were previously connected to the contactor.

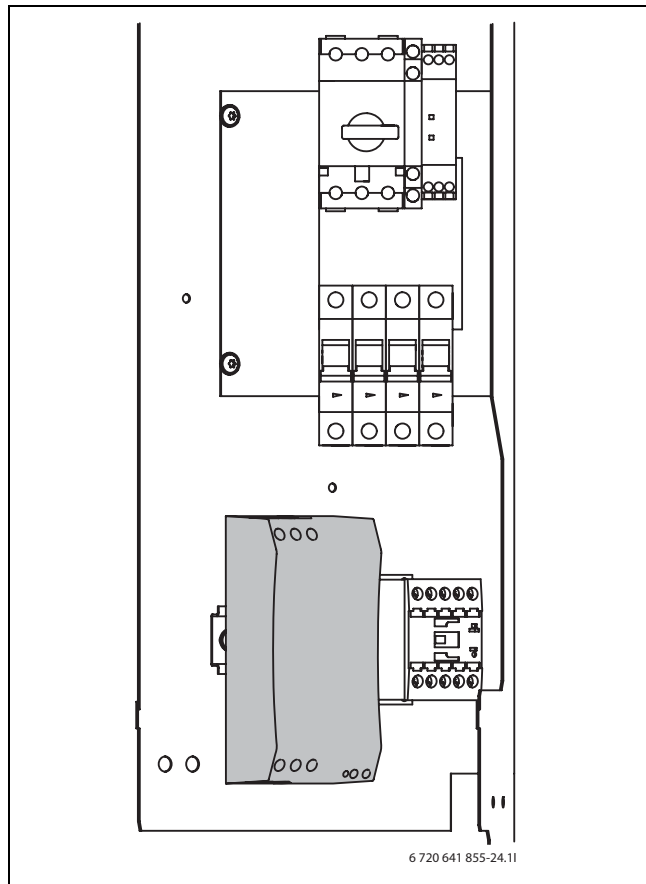


Fig. 25 Soft starter installed

9.9.2 E6 - E11

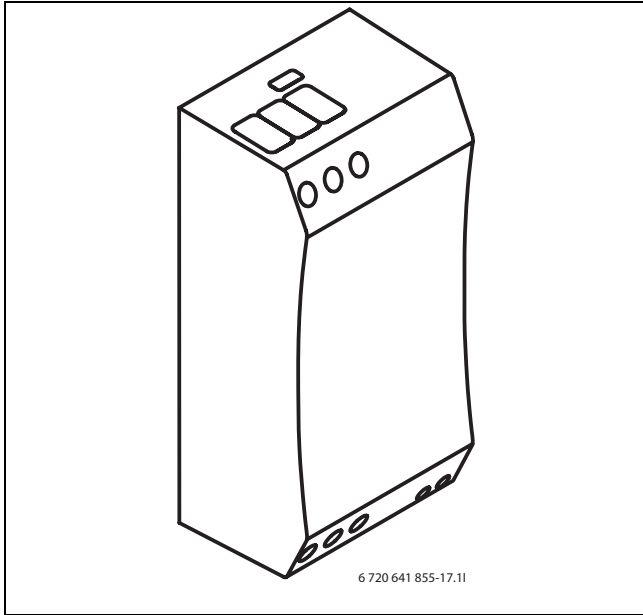


Fig. 26 Soft starter E6-E11

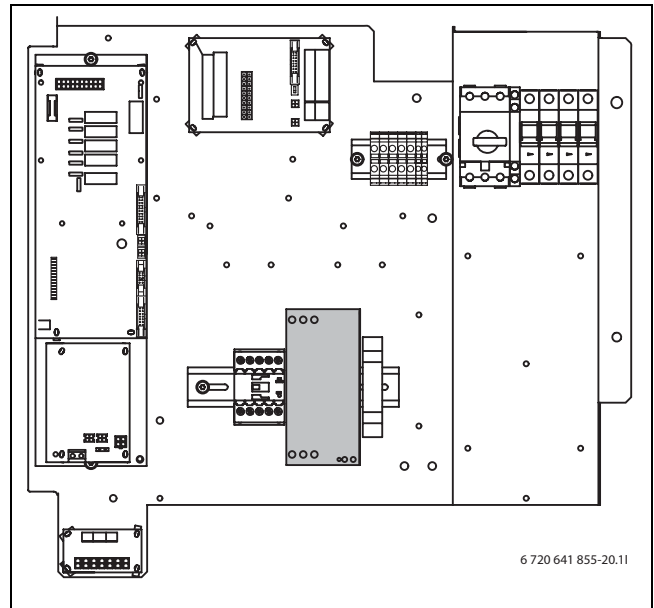


Fig. 28 Soft starter installed

9.9.3 E14 - E17

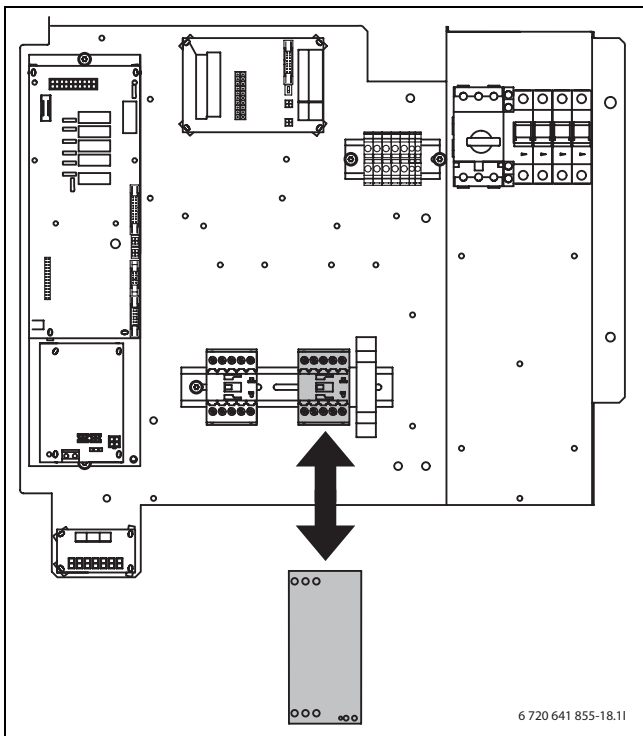


Fig. 27 Replace the contactor

- ▶ Replace the contactor with the soft starter. Connect the cables to the soft starter as they were previously connected to the contactor.

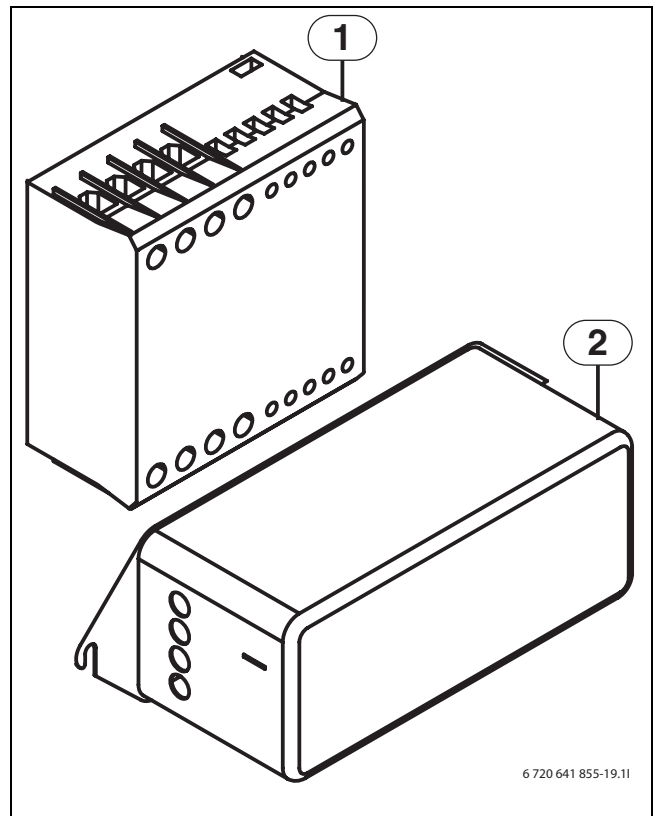


Fig. 29 Soft starter and EMC filter

- 1 Soft starter
- 2 EMC filter

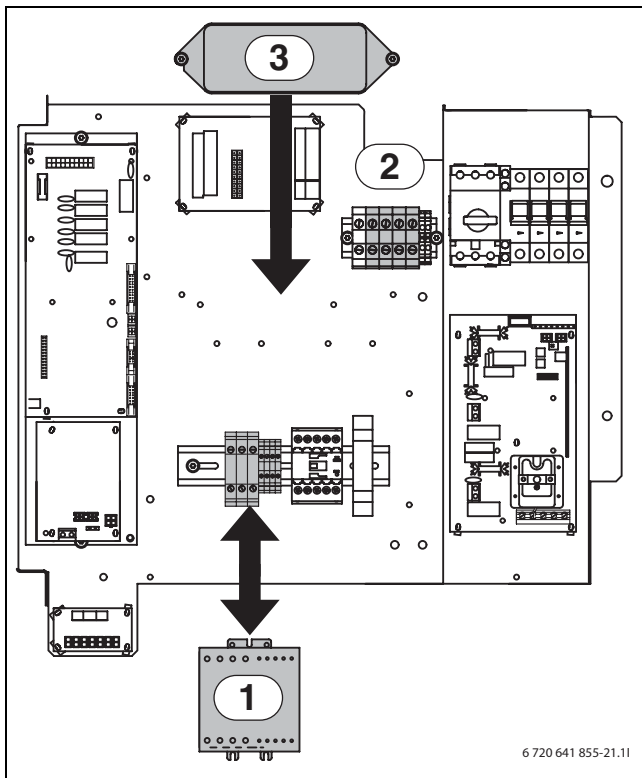


Fig. 30 Installing soft starter and EMC filter

1. Check that the power cables are in the following order on the terminal blocks: L1 black, L2 brown, L3 grey. Disconnect the cables and remove the terminal blocks.
 - ▶ Remove the remaining terminal blocks, 22, 23, 24 and A1 and A2 from the mounting rail and put them carefully to one side with the cables still connected. Then install the soft starter on the rail.
 - ▶ Connect the power cables to the soft starter as they were previously connected on each side: L1 black, L2 brown, L3 grey.
 - ▶ Remove the remaining cables from the terminal blocks and connect the soft starter as numbered. The cables must be connected to the soft starter on the same connector numbers as the previous terminal blocks were installed on (note that a terminal block can have two cables connected together). All cables are now reconnected.
 - ▶ Carefully remove the cover of the soft starter and set the rotary potentiometers to the values given in the documentation provided with the soft starter. Then reinstall the cover.
2. Remove the marked terminal blocks. (N, L1, L2, L3)
3. Install the EMC filter in the existing holes so that Line in is on the right hand side and Load out on the left.

- ▶ Connect the cables to the EMC filter to the same connection numbers as the previous terminal blocks were mounted. The cables were connected to the EMC filter load side marked Load out.
- ▶ Install the incoming power supply for the heat pump on the EMC filter side marked Line in.

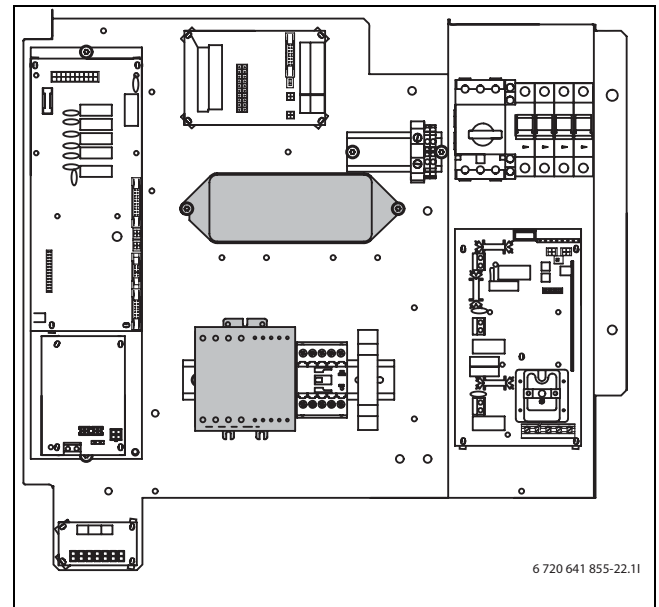


Fig. 31 Install the soft starter and filter.

9.10 Switching electric element from 3kW to 6kW.

- ▶ Disconnect the three grey cables on contactor K2.
- ▶ Insulate them.
- ▶ Uninsulate the three white cables.
- ▶ Connect the three white cables where the grey cables were connected (the order does not matter).

9.11 Temperature sensor installation

9.11.1 Flow sensor T1

- ▶ Install the sensor in direct contact with the flow line pipe and preferably after a 90° bend (horizontally), according to the system diagram.
- ▶ With buffer tank: Install the sensor in the upper part of the buffer tank, according to the system solution. See installation instructions for the buffer tank.

9.11.2 Outdoor sensor T2

- ▶ Install the sensor on the coldest side of the house. It must be protected from direct sunlight, ventilation air or anything that can affect the temperature measurement. The sensor must not be installed directly beneath the roof.

9.11.3 Hot water sensor T3

C6 - 11: The sensor is pre-installed in the hot water heater.

E6 - 17: The sensor must be installed when the external hot water heater is used. Install the sensor approx 1/3 up from the bottom of the hot water heater. The sensor must be installed over the return connection to the heat pump.

9.11.4 Room sensor T5 (accessory)



CANbus connected room sensor can only be used on Circuit 1.



It is only the room where the room sensor is located that can influence regulation of the temperature for the relevant heating circuit.

Installation location requirements:

- If possible, interior wall without drafts or heat radiation.
- Unimpeded circulation of room air under room sensor T5 (dotted area in image 32 must be kept clear).

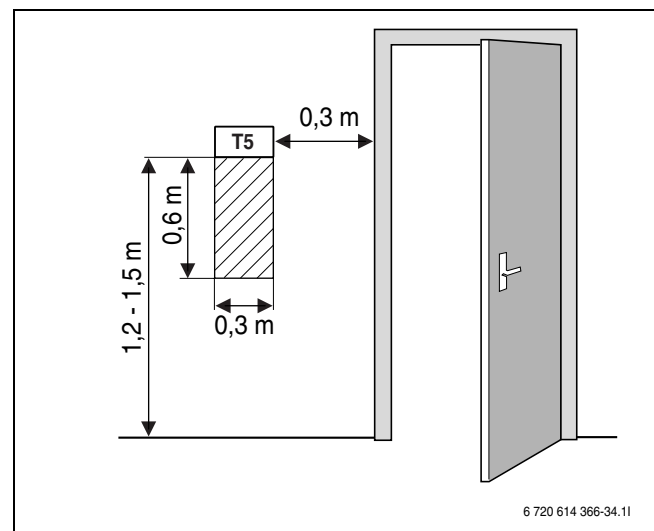


Fig. 32 Recommended installation location for room sensor T5

9.12 Filling the heating system

- ▶ Set the pre-pressure for the expansion vessel in the premises according to the heating unit's statistical height.
- ▶ Open the heating system's valves.
- ▶ Open the stopcock on the particle filter, fill the heating system to between 1 and 2 bar and close it.
- ▶ Vent the heating system.
- ▶ Refill central heating system to between 1 and 2 bar again.
- ▶ Check all connections for leaks.

9.13 Filling the collector system

The collector system is filled with collector circuit fluid which must guarantee antifreeze protection until - 15 °C. We recommend bio-ethanol or a mixture of water and propylene glycol.

A rough estimate of the amount of collector circuit fluid that is required in relation to the length of the collector system and the inner diameter of the pipe can be made using table 19.

Inner diameter	Volume per metre	
	Single pipes	Double U pipes
28 mm	0,62 l	2,48 l
35 mm	0,96 l	3,84 l

Tab. 19



Single U pipes, consisting of one descending and one ascending pipe, are most often used as a rock collector.

The following description of filling presupposes the use of the filling station accessory. Follow corresponding steps if other equipment is used.

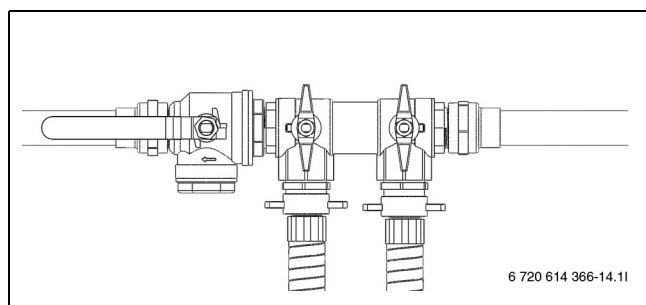


Fig. 33 Påfyllnadssats E6 - E11, C6 - C11

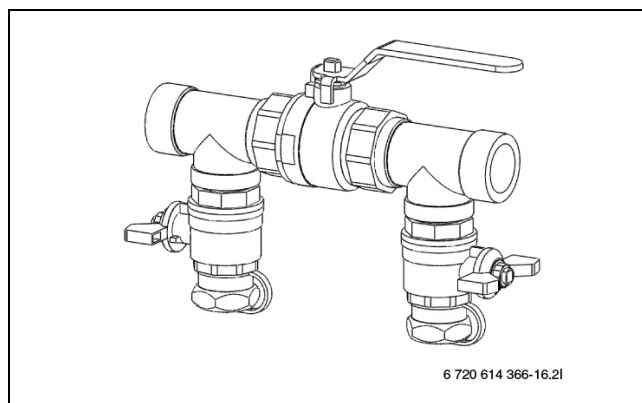


Fig. 34 Filling unit E14 - E17

- ▶ Connect two hoses from the filling station to the filling unit (→ Figure 35).

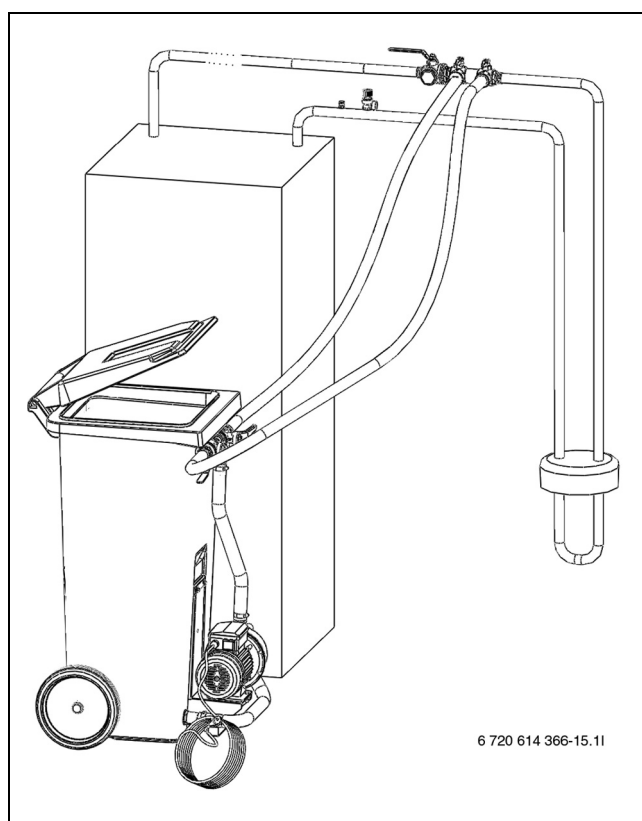


Fig. 35 Filling with filling station

- ▶ Fill the filling station with collector circuit fluid. Fill water before you fill antifreeze.
- ▶ Turn the valves on the filling unit so that they are in filling position (→ Figure 36).

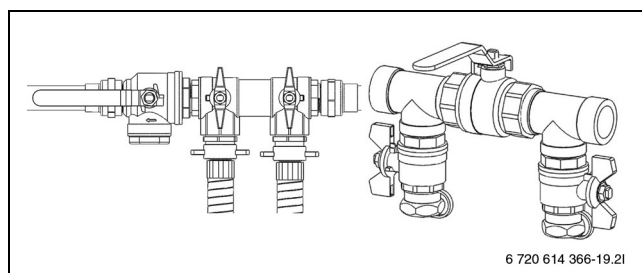


Fig. 36 Filling units in filling position

- ▶ Turn the valves on the filling station so that they are in mixing position (→ Figure 37).

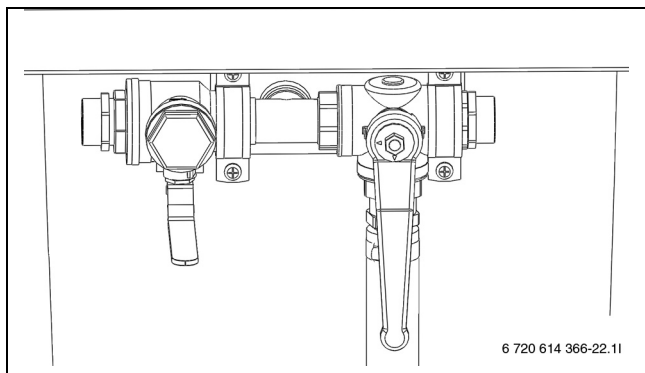


Fig. 37 Filling station in mixing position

- ▶ Start the filling station (pump) and mix the collector circuit fluid for at least two minutes.



Repeat the following steps for each circuit. One circuit at a time is filled with collector circuit fluid. Keep the valves closed in the other loops during the process.

- ▶ Turn the valves on the filling station to filling position and fill the circuit with collector circuit fluid (→ Figure 38).

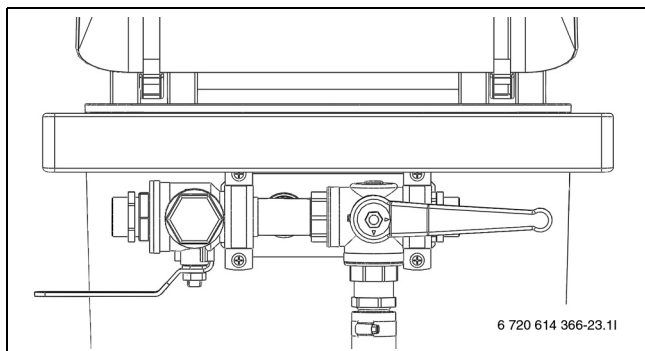


Fig. 38 Filling unit in filling position

- ▶ When the fluid level has fallen to 25% in the filling station, the pump should be stopped and more collector circuit fluid should be filled and mixed.
- ▶ When the circuit is full and air no longer comes from the return pipe, the pump should be run again for at least 60 minutes (the fluid should be clear and should not contain any bubbles).

- ▶ The circuit must be pressurized when venting is complete. Turn the valves on the filling unit to pressure increase position and pressurize the circuit to 2.5 to 3 bar (→ Figure 39).

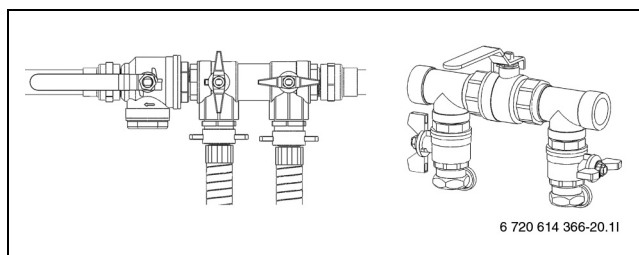


Fig. 39 Filling units in pressure increase position

- ▶ Turn the valves of the filling unit to normal position (→ Figure 40) and turn off the pump on the filling station.

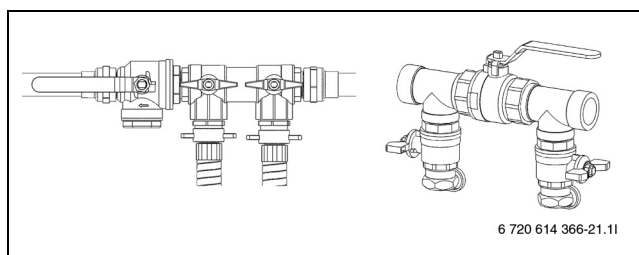


Fig. 40 Filling units in normal position

- ▶ Disconnect the hoses and insulate the filling unit.

If other equipment is used, the following is required, among other things:

- A clean container with capacity for the amount of collector circuit fluid that is required
- An additional container for collection of contaminated collector circuit fluid
- Submerged pump with filter, flow capacity of min. 6 m³/h, pressure height of 60 to 80 m
- Two hoses, Ø 25 mm

10 Electrical connections



DANGER: Risk of electric shock!

- ▶ Switch off the main power supply before starting work on the electrical part.

All regulation, control and safety devices on the heat pump are connected and checked upon delivery.



The heat pump's electrical connections must be able to be disabled safely.

- ▶ Install separate safety switch that cuts all current to the heat pump. A safety switch for each supply is required for separate power supplies.
- ▶ Install a separate earth breaker for the heat pump.

- ▶ According to the applicable regulations for 400 V/ 50 Hz connection, a H05VV-... type 5-core cable must be used as a minimum. Select cable area and cable type that corresponds to the relevant fuse rating (→ Chapter 7.3) and routing method.
- ▶ Connect the heat pump to the electric box connection strip according to EN 60335 part 1 and via a switch with a minimum contact distance of 3 mm (e.g. fuses, LS switch). Other consumers must not be connected.
- ▶ Follow the relevant wiring diagram when connecting an earth breaker. Only connect components that are approved for each market.
- ▶ Observe the colour coding when replacing circuit boards.

10.1 Connecting the heat pump



CAUTION: Never grasp a circuit board without wearing a ground-connected bracelet (→ Chapter 3.10).

- ▶ Remove the front panel (→ page 30).
- ▶ Remove the electric box cover.
- ▶ Route the connection cables to the electric box through the cable gland in the roof plate of the heat pump.
- ▶ Connect the cables according to the wiring diagram.
- ▶ Reinstall the electric box cover and the front panel of the heat pump.

10.2 Phase guard

A phase guard is mounted and connected to the heat pump in order to monitor the phase sequence to the compressor during installation (→ Image 11 and 12).

When the heat pump is started for the first time, the first status lamp on the phase guard lights. If the phases are correct, the second status lamp lights, as well. If the phases are incorrectly connected, a signal is sent to the control unit which triggers an alarm, **Phase error E2x.B1** (→ Chapter 16.9.9).

10.3 Screed drying

Screed drying must take place with continuous access to current. When screed drying is used, the electric connection should therefore be made in the standard way, see (→ Chapter 10.4).

The screed drying process is described in (→ Chapter 15.7).

10.4 Electrical connection wiring diagram

10.4.1 Overview of circuit board

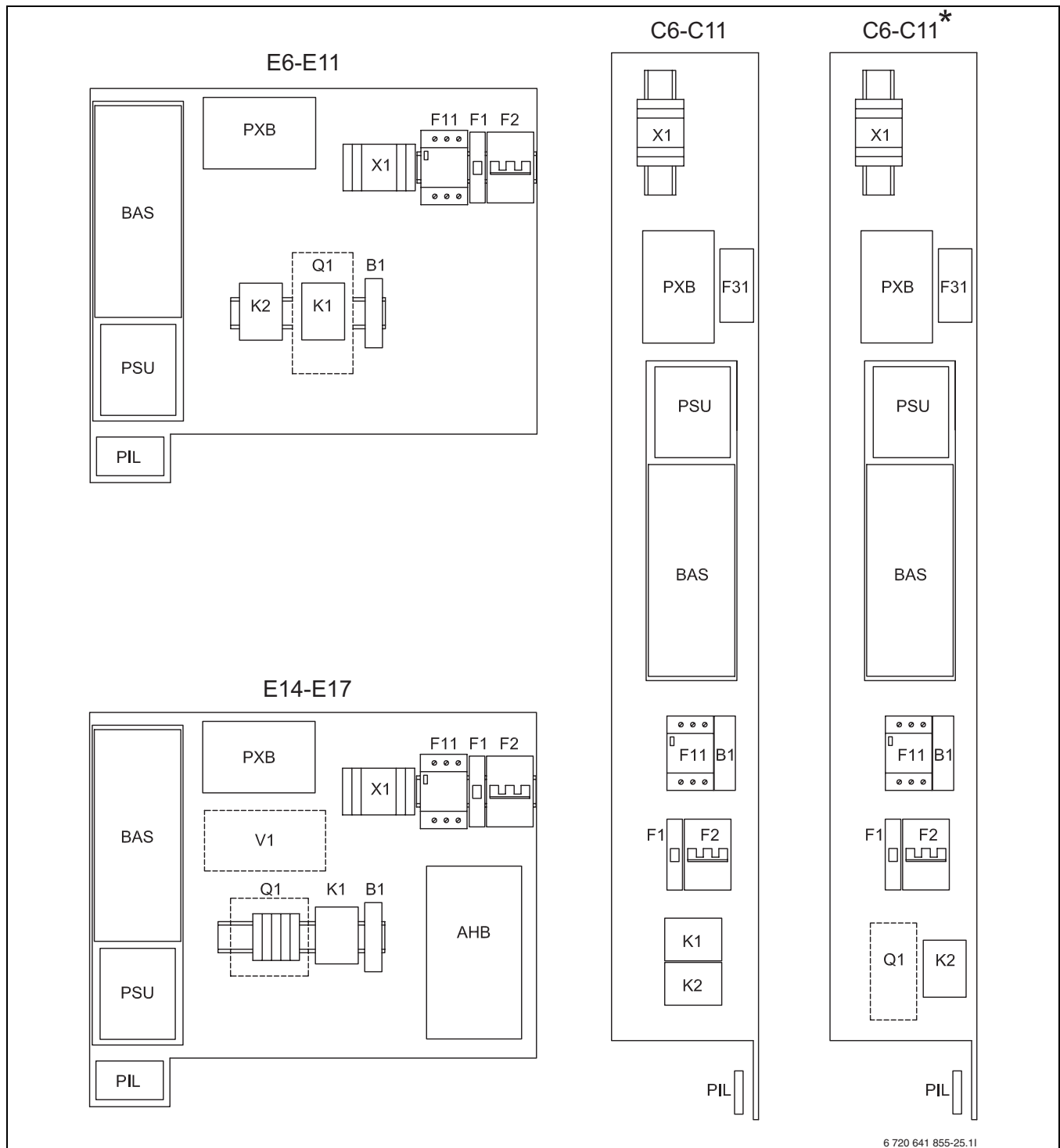


Fig. 41 Overview of circuit board

* With soft starter (accessory)

B1 Phase meter

F1 Miniature circuit-breaker heat pump

F2 Automatic fuse electric additional heat

F11 Motor cut-out compressor

K1 Contactor compressor

K2 Contactor electric element

Q1 Soft starter (accessory)

V1 EMC filter

X1 Terminal block

BAS Circuit board

AHB Circuit board

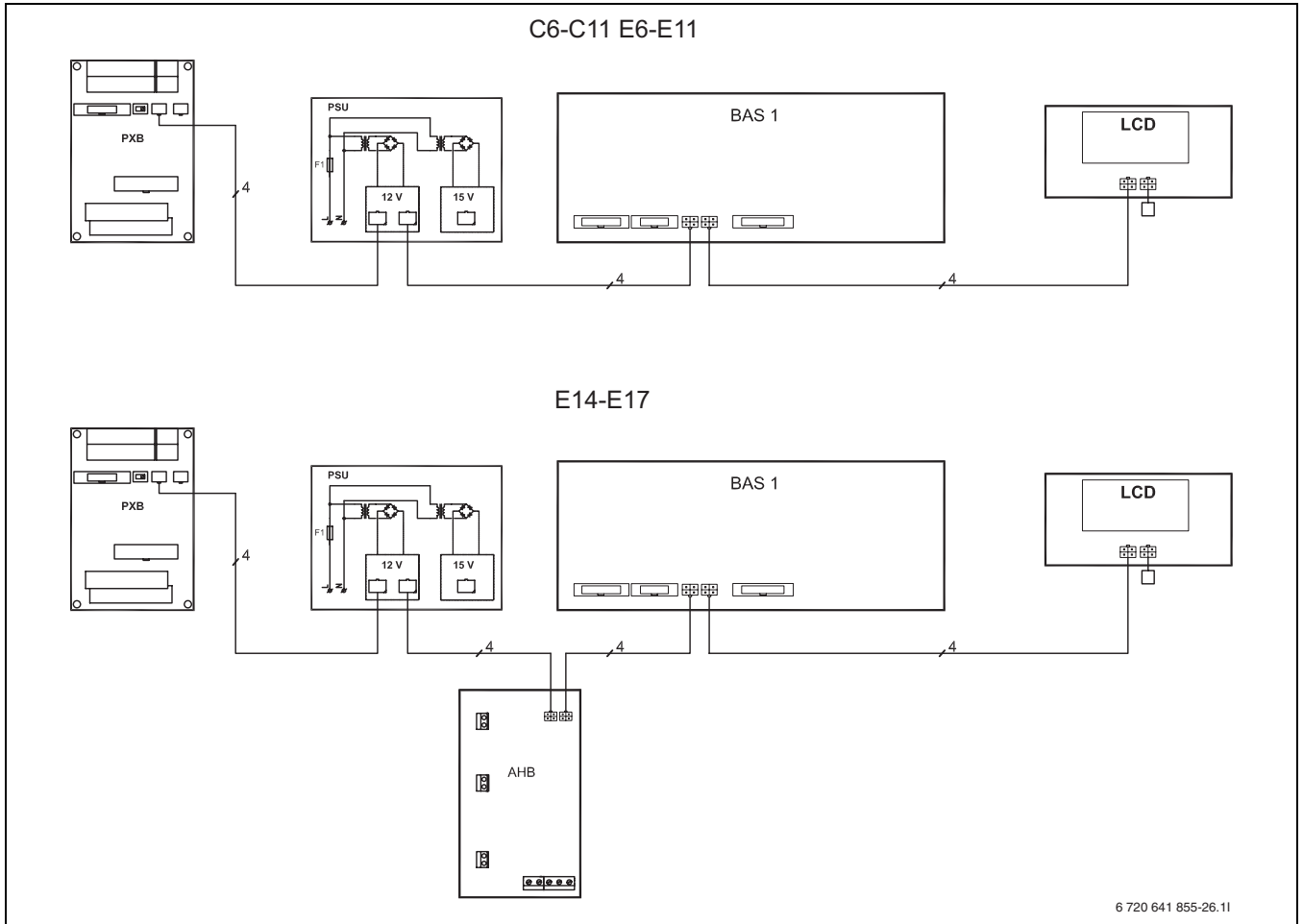
PIL Circuit board

PXB Circuit board

PSU Circuit board

F31 Circuit board protective anode

10.4.2 CANbus overview



6 720 641 855-26.11

Fig. 42 CANbus overview

10.4.3 Circuit board wiring

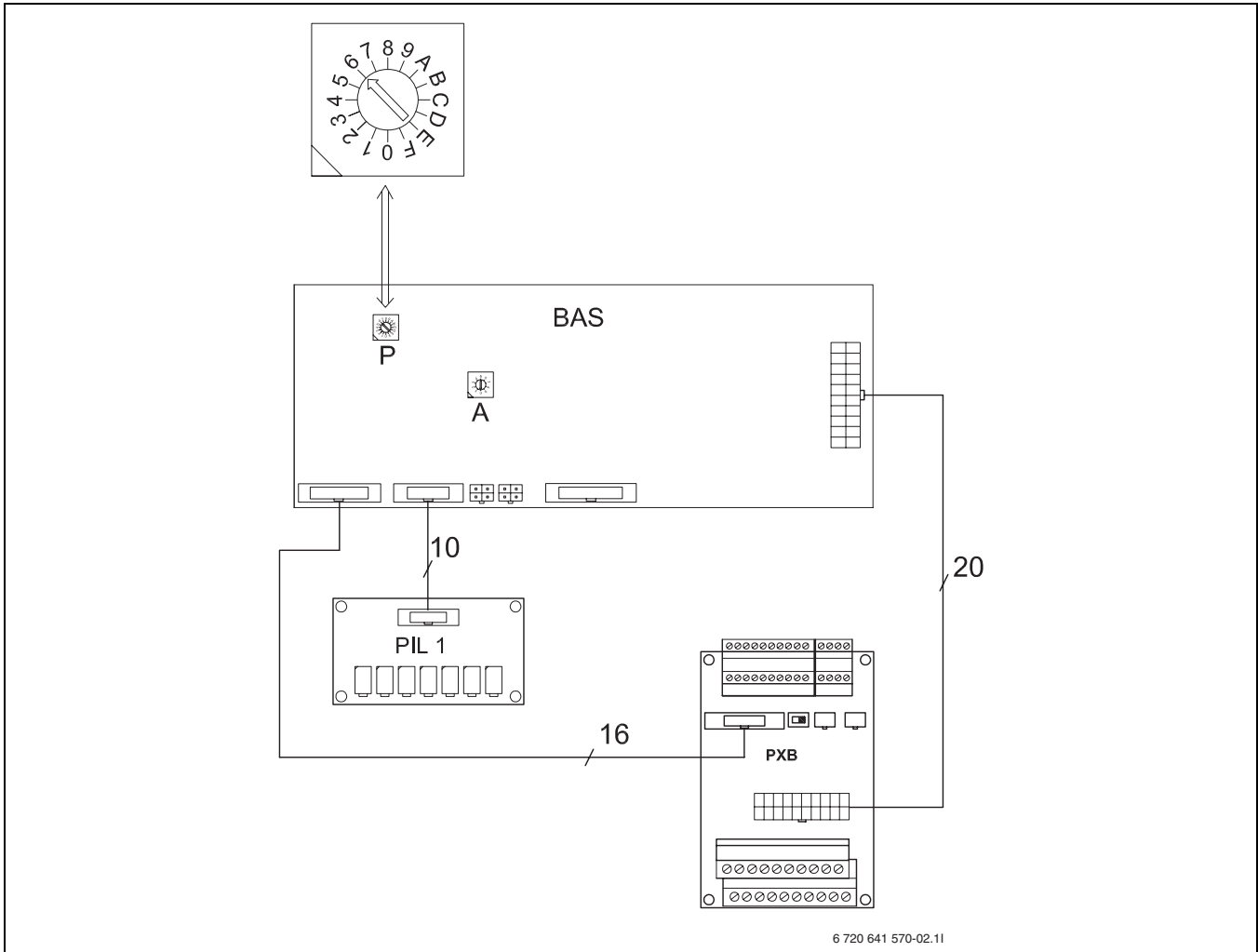


Fig. 43 Circuit board wiring

10.4.4 Internal wiring diagram C6-C11 E6-E11

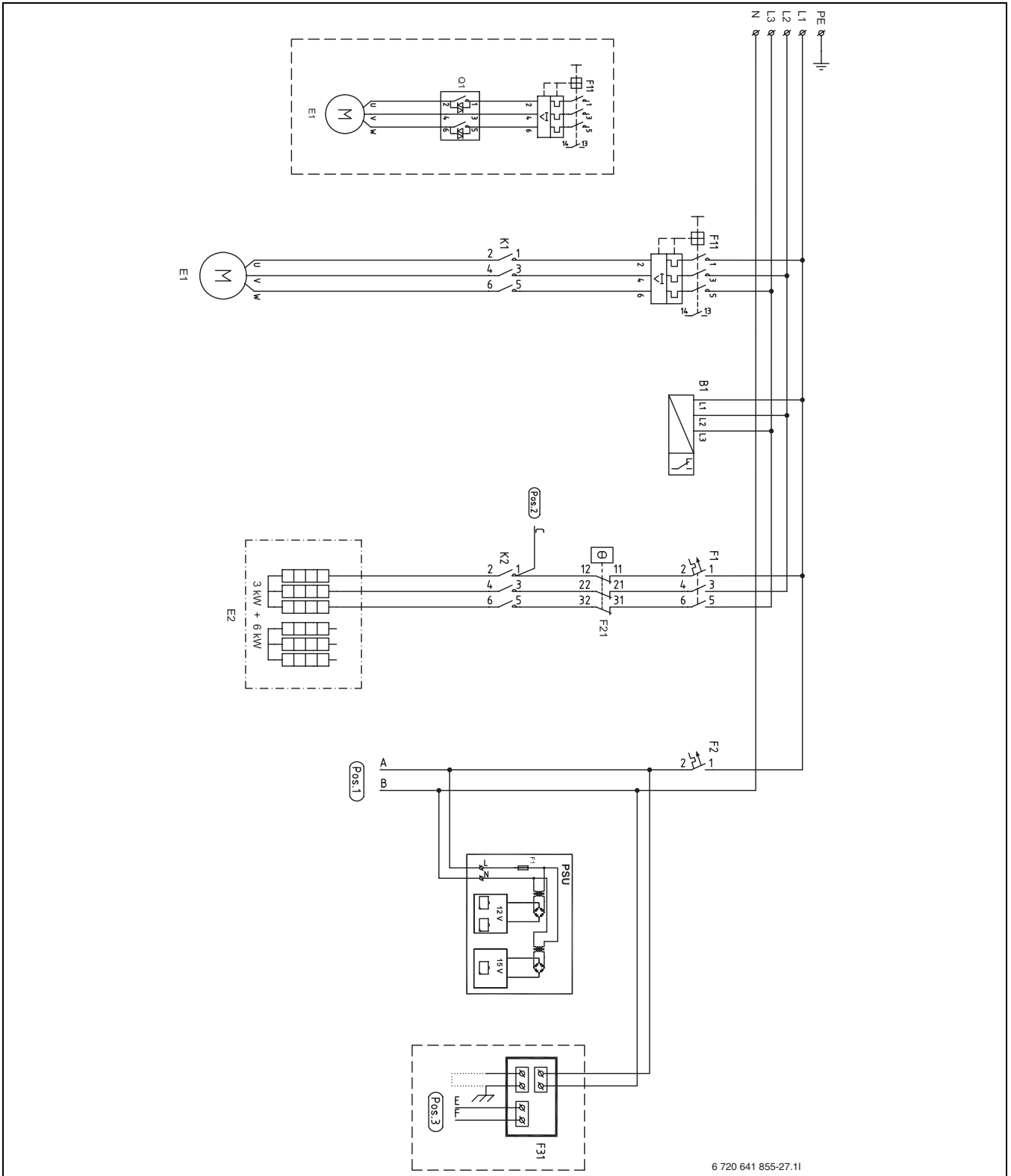


Fig. 44 Internal wiring diagram

- | | |
|---|--------------------------------------|
| B1 Phase guard | F31 Protective anode card |
| E1 Compressor | PSU Circuit board |
| E2 Electric add. heat | K1 Contactor compressor |
| F1 Automatic fuse electric additional heat | K2 Contactor electric element |
| F2 Miniature circuit-breaker heat pump | X1 Terminal block |
| F11 Motor cut-out compressor | Q1 Soft starter (accessory) |
| F21 Overheat protection electric additional heat | |

10.4.5 Internal wiring diagram E14-E17

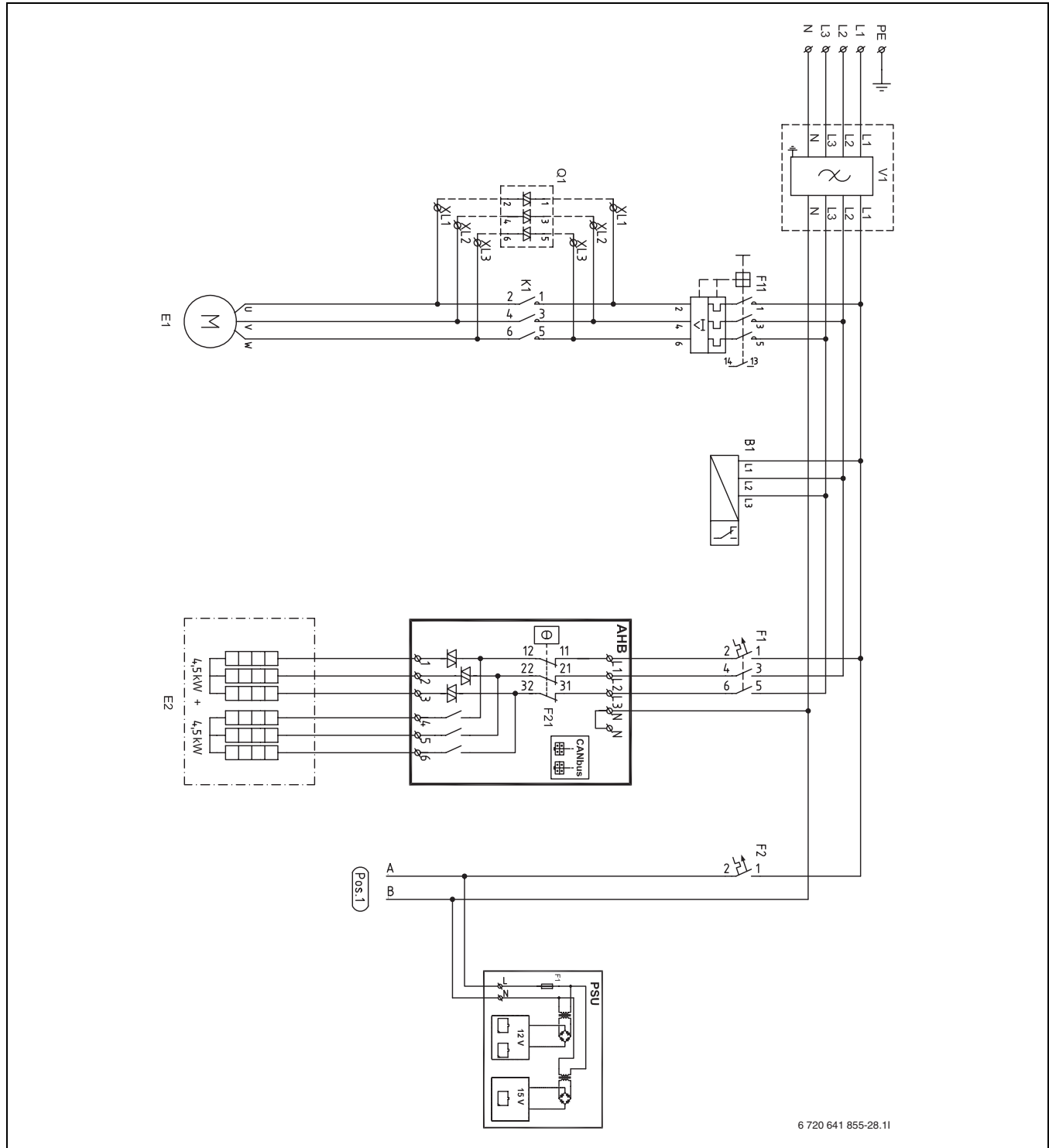
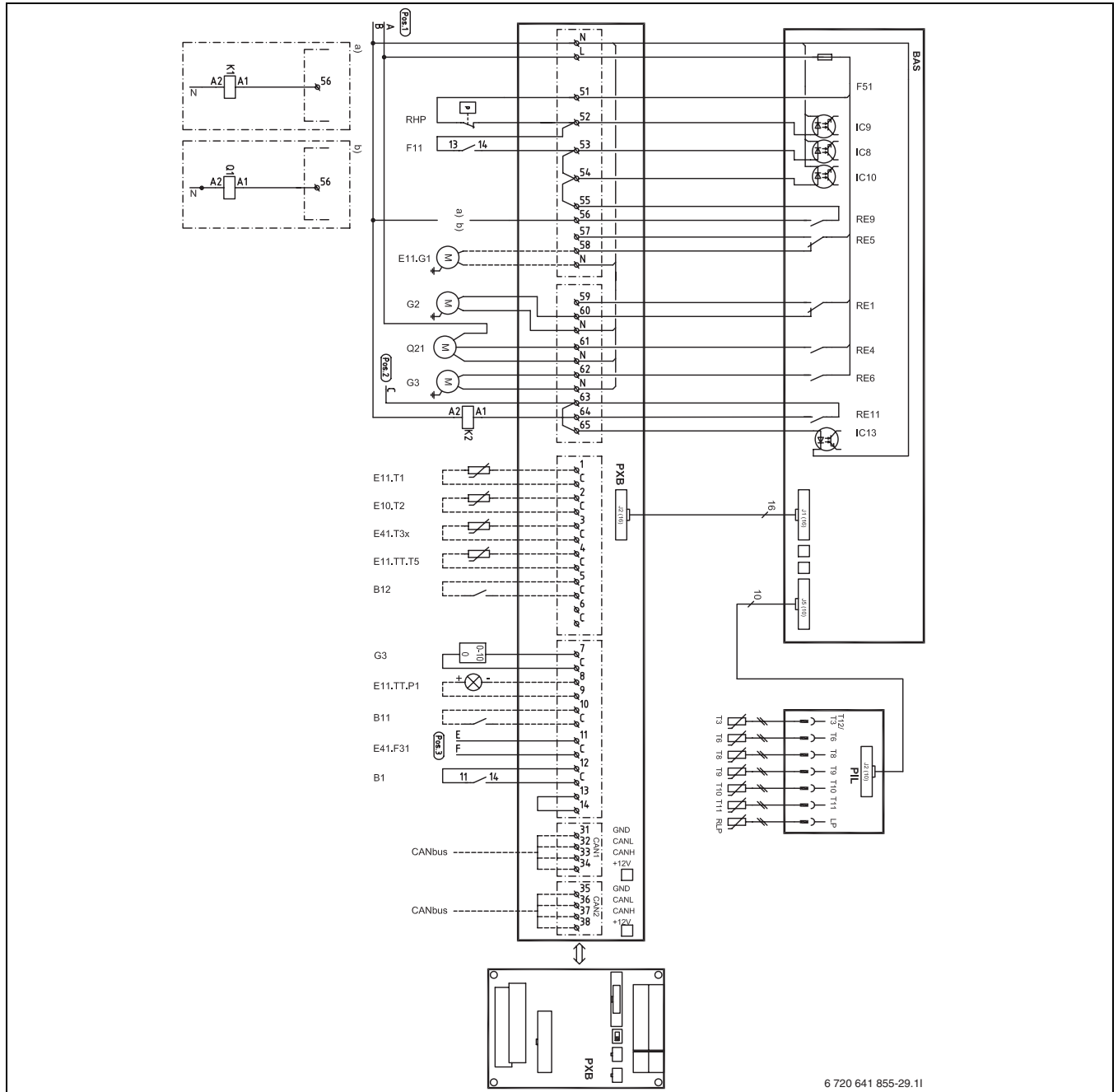


Fig. 45 Internal wiring diagram

- | | |
|---|--------------------------|
| B1 Phase guard | X1 Terminal block |
| E1 Compressor | PSU Circuit board |
| E2 Electric add. heat | AHB Circuit board |
| F1 Automatic fuse electric additional heat | |
| F2 Miniature circuit-breaker heat pump | |
| F11 Motor cut-out compressor | |
| F21 Overheat protection electric additional heat | |
| K1 Contactor compressor | |
| Q1 Soft starter (accessory) | |
| V1 EMC filter (accessory) | |

10.4.6 Complete wiring diagram connections C6-C11 E6-E11



6 720 641 855-29.11

Fig. 46 Complete wiring diagram connections

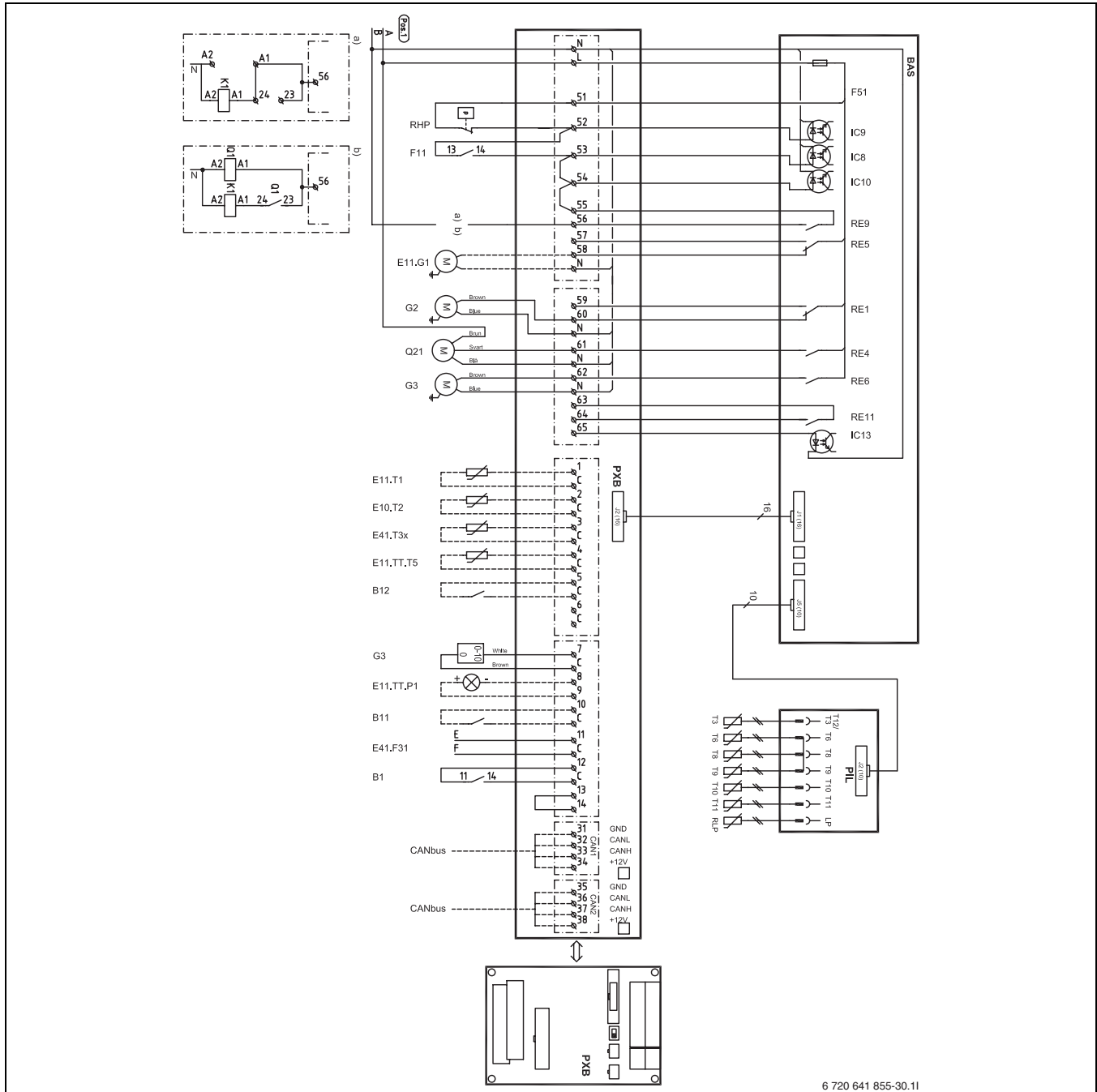
Solid line = factory connected

Dotted line = connect during installation:

- RHP** High pressure switch
- F11** Motor cut-out compressor
- Q1** Soft starter (accessory)
- K1** Contactor compressor
- K2** Contactor electric element
- E11.G1** Circulation pump circuit 1
- G2** Heat carrier pump
- G3** Heat transfer fluid pump
- Q21** 3-way valve
- F51** Fuse 6,3A
- E11.T1** Flow
- E10.T2** Out
- E41.T3x** Hot water E model

- E11.TT.T5** Room sensor, circuit 1
- B12** External input 2
- E11.TT.P1** LED room sensor
- B11** External input 1
- E41.F31** Alarm protective anode
- B1** Alarm phase meter
- E41.T3** Hot water C-model
- T6** Hot gas
- T8** Heat transfer fluid out
- T9** Heat transfer fluid in
- T10** HTF (coll) in
- T11** HTF (coll) out
- RLP** Low pressure switch
- a)** Delivery version
- b)** 6-11kW Soft starter

10.4.7 Complete wiring diagram connections E14-E17



6 720 641 855-30.11

Fig. 47 Complete wiring diagram connections

Solid line = factory connected

Dotted line = connect during installation:

- RHP** High pressure switch
- F11** Motor cut-out compressor
- Q1** Soft starter (accessory)
- K1** Contactor compressor
- E11.G1** Circulation pump circuit 1
- G2** Heat carrier pump
- G3** Heat transfer fluid pump
- Q21** 3-way valve
- F51** Glass fuse 6.3A
- E11.T1** Flow
- E10.T2** Out
- E41.T3x** Hot water E model
- E11.TT.T5** Room sensor, circuit 1

- B12** External input 2
- E11.TT.P1** LED room sensor
- B11** External input 1
- E41.F31** Alarm protective anode
- B1** Alarm phase meter
- E41.T3** Hot water C-model
- T6** Hot gas
- T8** Heat transfer fluid out
- T9** Heat transfer fluid in
- T10** HTF (coll) in
- T11** HTF (coll) out
- RLP** Low pressure switch
- a)** Delivery version
- b)** 14-17kW Soft starter

10.5 External connections

All external connections are made on terminal card PXB:

- ▶ High and low current cables should be routed separately in order to avoid interference on the sensors (minimum distance of 100 mm).

- ▶ Use the following cable area when extending the temperature sensor cable:
 - Up to 20 m long cable: 0.75 to 1,50 mm²
 - Up to 30 m long cable: 1.0 to 1,50 mm²

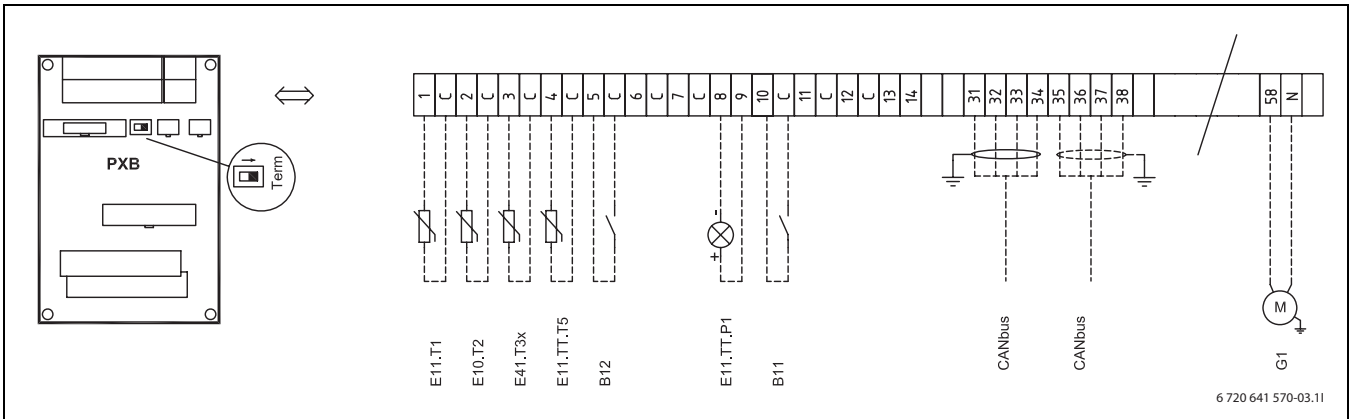


Fig. 48 External connections

Solid line = always connected

Dotted line = option, alternative:

- E11.T1** Flow circuit 1
- E10.T2** Outdoor sensor
- E41.T3x** Hot water E model
- E11.TT.T5** Room temperature circuit 1 (not CANbus sensor)
- B12** External input 2
- E12.TT.P1** LED room sensor, circuit 2
- B11** External input 1
- E11.G1** Circulation pump circuit 1

11 Control panel

Settings for the control of the heat pump are made with the control unit's control panel, which also provides information about current status.

11.1 Panel overview

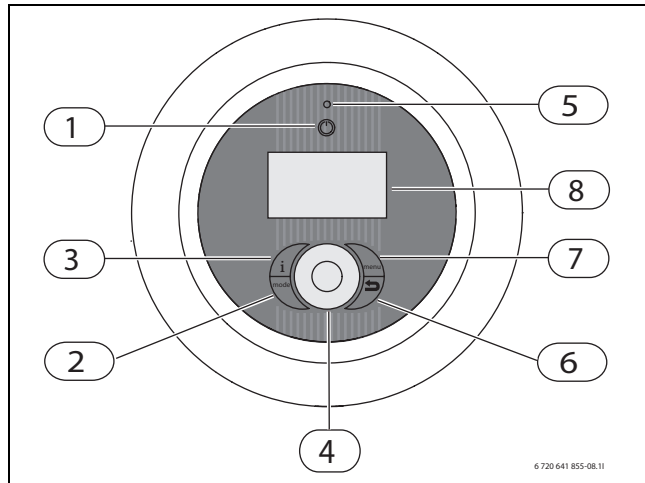


Fig. 49 Control panel

- 1 On/Off button
- 2 Mode button
- 3 Info button
- 4 Menu dial
- 5 Status lamp
- 6 Return button
- 7 Menu button
- 8 Menu display

11.2 On/Off button

Use the On/Off button to switch the heat pump on and off.

11.3 Status lamp

<i>The lamp lights continuously.</i>	The heat pump is running.
<i>Lamp flashes rapidly.</i>	There is an alarm that has not been acknowledged.
	The alarm has been acknowledged but the alarm cause remains.
<i>Lamp flashes slowly, menu window not lit.</i>	The heat pump is in stand-by mode ¹⁾ .
<i>The lamp and menu display not lit.</i>	No voltage to control unit.

Tab. 20 Lamp functions


- 1) Stand-by means that the heat pump is running but no heating or hot water demand exists.

11.4 Menu display

Use the menu display in order to:

- See information from the heat pump.
- See available menus.
- Change set values.

11.5 Menu button and menu dial

Use  to get from *Initial menu* to the menus. Use the menu dial in order to:


- Navigate the menus and get to the setting displays.
 - Turn the dial to see more menus on the same level or change a set value.
 - Press the dial to change to a lower menu level or save a change.

11.6 Return button

Use  to:


- Go back to the previous menu level.
- Leave a setting display without changing the set value.

11.7 Mode button

Use  to change type of operation.

- Change type of operation.

11.8 Info button

Use  to see information from the control unit about operating mode, temperature, program version, etc.

12 Start up

The first time the heat pump is started, a number of settings are displayed automatically so as to facilitate putting it in operation.

Before this stage, the heat pump should be installed in accordance with the previous sections (→ Chapter 9, → Chapter 10). Collector circuits, heating circuits and hot water circuits should be filled and aired.

The settings are also available under ordinary installer menus.



Only functions which are identified by the control unit are displayed in the initial menu.

The start-up menus are available until **Yes** is entered in **Start-up completed**.

- ▶ Read the complete menus before start-up.
- ▶ A selection must be made in **Heat pump x capacity** and **Protective anode installed**.

Language and Operating mode

- ▶ Select language for the menus of the control unit (→ Chapter 15.10).
- ▶ Select operating mode (**L/W + electric additional heat**) (→ Chapter 4.4, → Chapter 15.7).

Start-up

Review and adjust, as required, the functions below. See the references for description of the functions.



The selected system solution would normally require a review of more settings than the ones in the start-up.

- ▶ Set the following for each heat pump (compressor):
 - **Acknowledge phase guard** (→ Chapter 15.9).
 - **Hot water production** (→ Chapter 15.2).
- ▶ Set the heat pump output for each heat pump in **Heat pump x capacity** (→ Chapter 15.7). See the type plate.
- ▶ Set **Minimum outdoor temperature** (→ Chapter 15.1).
- ▶ State if **Groundwater** is used.
- ▶ Set **Circuit 1 Heating \ Type of heating system** (→ Chapter 15.1).
- ▶ Set **Circuit 1 Cooling** (if Cooling has been installed, optional), see the documentation of options.
- ▶ Set **Circuit 2, 3...** (→ Chapter 15.1) (option).
 - **Mixing valve mode**

– **Type of heating system**

– **Mixing valve running time**

- ▶ Select option in **Protective anode installed** (→ Chapter 15.2).
- ▶ Set values for **Pool** (if pool has been installed), see the documentation for options.
- ▶ Set **Date** (→ Chapter 15.10).
- ▶ Set **Time** (→ Chapter 15.10).
- ▶ **Start-up completed, Yes/No.**
The start-up menus will be available until **Yes** is entered.

After the start-up menus, the Initial menu is shown in the display. All customer functions are accessible from this menu, whereas the installer menus are accessible only after change of access level.

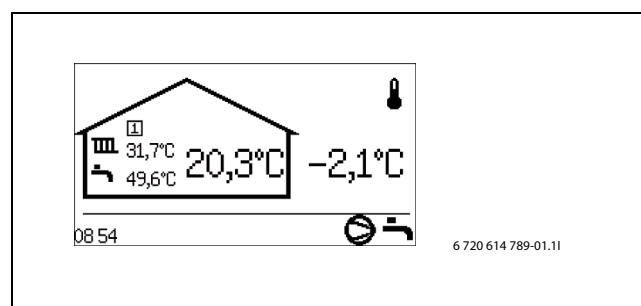


Fig. 50 Initial menu

13 Installer menus

13.1 Access to the functions on Installer level

A four digit access code is required to switch from Customer level to Installer level in the menus. The access code is the present date given as two digits for the month and two digits for the date (for example 0920).


- ▶ Go to **Access level** under **Menu** at Customer level.
- ▶ Enter the four digit access code using the menu dial. Press the menu dial after setting each digit. **Access = Installer** shown in the menu window.
- ▶ Turn the menu dial to see the menus in the top level. All functions at Customer level and Installer level can now be reached.

The control unit returns automatically to Customer level:

- On return to the Initial menu.
- After 20 min (adjustable value, → Chapter 15.7).

13.2 Compressor fast restart

During commissioning, manual operation, etc., you may need to quickly restart the compressor without waiting for the restart timer (10 min).

- ▶ Press  for 5s in an optional installer menu (not a setting display).
The compressor starts after 20s.

13.3 Temperature sensor

The control unit controls the production of heat, hot water, etc., after signals from a great number of temperature sensors. Most signals that can appear in the display are listed here.



Complete component names are displayed in the control unit only when needed. If, for example, you are in a menu which refers only to circuit 2, the sensor names are indicated without E12. before the sensor name.

The complete name is always presented in alarm information so as to facilitate troubleshooting. Full names can also be found on drawings and in system solutions.

T1 E11.T1	Flow line, circuit 1
T2 E10.T2	Out

Tab. 21 Temperature sensor

T3 E41.T3	Hot water (if hot water production)
T5 E11.TT.T5	Room, circuit 1 (option, CANbus sensor)
T6 E21.T6	Hot gas
T8 E21.T8	Heat transfer fluid out
T9 E21.T9	Heat transfer fluid in
T10 E21.T10	HTF (coll) in
T11 E21.T11	HTF (coll) out
T1 E12.T1	Flow line, circuit 2 (if circuit 2 is used)
T5 E12.TT.T5	Room, circuit 2 (optional)

Tab. 21 Temperature sensor

The sensors name in heat pump 2 is:

E22.T6	Hot gas
E22.T8	Heat transfer fluid out
E22.T9	Heat transfer fluid in
E22.T10	Collector circuit in
E22.T11	Collector circuit out

Tab. 22 Sensors, heat pump 2

The control unit recognizes which sensors are installed and acknowledges them automatically. An accessory sensor can be deacknowledged manually in the control unit. This makes it possible to remove the sensor from the control unit if it is not used.

Sensors for options

Circuit 2, 3, 4 etc.

E12.T1	Flow line, circuit 2
E12.TT.T5	Room, circuit 2 (optional)
E13.T1	Flow line, circuit 3
E13.TT.T5	Room, circuit 3 (optional)
E14.T1	Flow line, circuit 4
E14.TT.T5	Room, circuit 4 (optional)

Tab. 23 Sensor, circuit 3, 4

The control unit recognizes which sensors are installed and acknowledges them automatically. An accessory sensor can be deacknowledged manually in the control unit. This makes it possible to remove the sensor from the control unit if it is not used.

14 Menu overview

The top menu level for installers is:

- Room temperature
- Hot water
- Holiday
- Energy measurements
- Timers
- External control
- Installer

- Additional heat
- Safety functions
- General
- Alarms
- Access level
- Return to factory settings
- Program version

Access level 0 = Customer

Access level 1 = Installer

Room temperature			Access level
General	Summer/winter operation	Winter operation	0
		Outdoor temperature limit for change over	0
		Delay before change over to winter operation	1
		Delay before change over to summer operation	1
		Direct start limit for winter operation	1
	Maximum operating time for heating at hot water demand	0	
	Shut down protection during change over from hot water to heating	1	
	Minimum outdoor temperature	1	
Circuit 1 Heating	External set point value		1
	Type of heating system		1
	Highest permitted flow temperature T1		1
	Lowest permitted flow temperature T1		1
	Heat curve		0
	Heat curve hysteresis heat pump x	Maximum	1
		Minimum	1
		Time factor	1
	Room sensor	Room temperature influence (if installed)	0
		Knob's operating range (if installed)	0
		Acknowledge room sensor	1
	Room temperature program	Active program	0
		View/edit active program	0
Room temperature normal		0	
Temperature increase/decrease (no room sensor)		0	
Setting temp. increase/decrease (no room sensor)		1	
> Limit value for left or right end point		1	
> Change when much colder/warmer		1	
> Change when colder/warmer		1	
Room temperature influence (no room sensor)		0	
Room temperature exception		0	
Copy to all heating circuits	0		

Tab. 24 Room temperature menus

Room temperature			Access level	
Circuit 2, 3...(optional)	Mixing valve mode		1	
	Type of heating system		1	
	Highest permitted flow temperature T1		1	
	Lowest permitted flow temperature T1		1	
	Heat curve		0	
	Room sensor	As Circuit 1 Heating	0, 1	
	Room temperature program	As Circuit 1 Heatingminus Copy to all heating circuits	0, 1	
	Regulator settings	P constant		1
		I constant		1
		D constant		1
Minimum PID signal			1	
Maximum PID signal			1	
Mixing valve running time			1	
	Mixing valve fully closed		1	
	Mixing valve start closing		1	

Tab. 24 Room temperature menus

Hot water			Access level
Acknowledge hot water sensor T3			1
Extra hot water	Extra hot water duration		0
	Extra hot water stop temperature		0
Hot water peak	Day of the week		0
	Interval in weeks		0
	Start time		0
	Stop temperature		1
	Maximum time		1
	Time for warm-keeping		1
Hot water program	Active program		0
	View/edit active program		0
Hot water mode			0
Hot water settings heat pump x	Hot water production		1
	Start temperature T3 economy mode		1
	Stop temperature T8 economy mode		1
	Start temperature T3 comfort mode		1
	Stop temperature T8 comfort mode		1
Block heating during hot water demand			0
Maximum operating time for hot water at heating demand			0
Protective anode installed			1

Tab. 25 Hot water menus

Holiday		Access level
Circuit 1 and hot water	Activate holiday function	0
	Start date	0
	Stop date	0
	Room temperature	0
	Copy to all heating circuits	0
	Block hot water production	0
Circuit 2, 3...(optional)	Activate holiday function	0
	Start date	0
	Stop date	0
	Room temperature	0

Tab. 26 Holiday menus

Energy measurements		Access level
Generated energy	Heating	0
	Hot water	0
Consumption electric additional heat	Heating	0
	Hot water	0

Tab. 27 Energy metering

Timers		Access level	
Extra hot water		0	
Hot water peak time for warm-keeping		1	
Alarm mode delay		0	
Party mode		0	
Operating time for heating at hot water demand		0	
Hot water, operating time at heating demand		0	
Heat pump x timers	Compressor start delay	0	
	Compressor start delay groundwater	1	
	G2 heat carrier pump stop delay	1	
	Block low pressure switch	1	
	Compressor working area timers	Block after hot water production	1
		Delay after temporary stop	1
Block after low outdoor temperature		1	
Additional heat timers	Additional heat start delay	0	
	Delay mixing valve control after additional heat start	0	
	Additional heat program activation delay after low outdoor temperature	1	
	Additional heat start delay after high outdoor temperature	1	
Delay before change over to summer operation		1	
Delay before change over to winter operation		1	

Tab. 28 Timers

Menu overview

Timers			Access level
Shut down protection during change over from hot water to heating			1
Heating start delay			1
Heating stop delay			1

Tab. 28 Timers

External control			Access level
External input 1, 2	Block compressor		0
	Block additional heat		0
	Block heating at tripped underfloor temperature limiter		0
	Block heating		0
	Room temperature		0
	Block hot water production		0
	Start collector circuit pump		1
	Alarm at low pressure in collector circuit		1
External input circuit 2, 3...	Block heating at tripped underfloor temperature limiter		1
	Block heating		0
	Room temperature		0

Tab. 29 External control menus

Installer			Access level
General	Anti-seizure mode	Day of the week	1
		Start time	1
	Highest permitted flow temperature T1		1
	Operating mode		1
	Groundwater	Groundwater	1
		Compressor start delay groundwater	1
Time for reset of access level		1	
Heat pump x capacity		1	
Connected I/O boards	Shows which circuit boards are connected and their program version		1
Compressor working area	Hot gas stop function activated		1
	Outdoor stop function activated		1
Generated energy	Heating		1
	Hot water		1
Operating times and consumptions	Displays the total operating times of the compressor and add. heat. Short term measurements can be made.		1
Temperatures	All connected temperature sensors are displayed and can also be corrected.		1

Tab. 30 Installer menus

Installer			Access level	
Inputs	Shows the status of all connected inputs (pressostats, motor cut-out, external inputs, etc.)		1	
Outputs	Manual operation of and status of constituent components (pumps, valves, additional heater, alarm indication etc.)		1	
Circulation pumps	Operation alternative heating circuit pump G1		1	
	Operation alternative heat carrier pump G2		1	
	Heat carrier pump G2 speed		1	
	Operation alternative collector circuit pump G3		1	
Screed drying	Activate		1	
	Heat source		1	
	Current program step		1	
	Current program step		1	
	Remaining time for current step		1	
	Program settings	Flow temperature increase per heating step		1
		Number of days per heating step		1
Maximum flow temperature			1	
Number of days with maximum temperature			1	
Flow temperature decrease per cooling step			1	
Number of days per cooling step		1		

Tab. 30 Installer menus

Additional heat			Access level
Additional heat general	Start delay		1
	Allow additional heat timer during energy supply cut-off		1
	Additional heat only		1
	Ramp time when additional heat only		1
	Block additional heat		1
	Maximum outdoor temperature for additional heat		1
	Additional heat set point value E11.T1 offset		1

Tab. 31 Additional heat menus

Menu overview

Additional heat			Access level
Electric additional heat	Electric heater connection	Connected electric heaters	1
		Connect heater 1 to heat pump	1
	Connection capacity per el. heater	Output per heater	1
		Output limitation in compressor mode	1
		Output limitation when additional heat only	1
		Output limitation in hot water mode	1
	Regulator settings	P constant	1
		I constant	1
		D constant	1
		Minimum PID signal	1
Maximum PID signal		1	
Ramp up delay after defrost		1	
Additional heat program	Active program		1
	View/edit active program		1
	Outdoor temperature limit for deactivation of time control		1

Tab. 31 Additional heat menus

Safety functions			Access level
Setting collector circuit in T10	Lowest permitted temperature E21.T10		1
	Lowest permitted temperature E22.T10		1
	Hysteresis alarm reset		1
	Number of warnings before alarm		1
Setting collector circuit out T11	Lowest permitted temperature E21.T11		1
	Lowest permitted temperature E22.T11		1
	Hysteresis alarm reset		1
	Number of warnings before alarm		1
Heat pump x	Acknowledge phase guard		1

Tab. 32 Safety functions menus

General	Access level
Set date	0
Set time	0
Summer/winter time	0
Display backlight intensity	0
Language	0

Tab. 33 General menus

Alarms			Access level
Information log			0
Delete information log			0
Alarm log			0
Delete alarm log			0
Alarm history			1
Alarm indication	Alarm buzzer signal	Interval	0
		Blocking time	0
	Alarm indication control unit	Block alarm buzzer	0
	Alarm indication room sensor	Block alarm buzzer	0
		Block alarm indicator lamp	0
General alarm level	Alarms and warnings	1	

Tab. 34 Alarm menus

Access level	Access level
Access level	0, 1


Tab. 35 Access level menu

Return to factory settings	Access level
Return to factory settings	0, 1

Tab. 36 Return to factory settings menu

15 Settings

15.1 Room temperature

Press the  button in the standard display to open the main menu. Select **Room temperature** to adjust the heating.

The following options are available under **Room temperature**:

- **General**
- **Circuit 1 Heating**
- **Circuit 2, 3...**

> **General**

>> **Summer/winter operation**

>>> **Winter operation**

Factory setting	Automatic
Alternative	On/Automatic/Off

Tab. 37 Summer/winter operation

If **On** is selected, the heat pump is constantly in winter operation and heat and hot water are always produced. **Off** signifies constant summer operation; only hot water is produced. **Automatic** signifies change-over at the set outdoor temperature.

>>> **Outdoor temperature limit for change over**

Factory setting	18 °C
Lowest value	5 °C
Highest value	35 °C

Tab. 38 Change over temperature

The menu is displayed only if **Automatic** has been selected in **Winter operation**.

>>> **Delay before change over to winter operation**

Factory setting	4h
Lowest value	1h
Highest value	48h

Tab. 39 Delay before change over to winter operation

>>> **Delay before change over to summer operation**

Factory setting	4h
Lowest value	1h
Highest value	48h

Tab. 40 Delay before change over to summer operation

>>> **Direct start limit for winter operation**

Factory setting	13 °C
Lowest value	5 °C
Highest value	17 °C

Tab. 41 Direct start limit



In the event of change over between winter and summer operation and vice versa, there is a certain delay to prevent constant starting and stopping of the compressor when the outdoor temperature oscillates around the temperature limit. Below the direct start limit, the control unit changes over to winter operation without delay.

>> **Maximum operating time for heating at hot water demand**

The menu is not displayed if **Block heating during hot water demand** be set to **Yes** (→ Chapter 15.2).

F value	20min
Lowest value	0min
Highest value	120min

Tab. 42 Operating time heating

>> **Shut down protection during change over from hot water to heating**

F value	300s
Lowest value	0s
Highest value	600s

Tab. 43 Shut down protection during change over to hot water

- ▶ Set how long it should take before a heating demand may be deactivated after hot water production. This ensures that the hot water amount that goes out into the heating circuit after production of hot water does not become a reason for incorrect deactivation of a heating demand.

>> **Minimum outdoor temperature**

F value	-35,0 °C
Lowest value	-35,0 °C
Highest value	-10,0 °C

Tab. 44 *Lowest outdoor temperature*

- ▶ Set the minimum outdoor temperature for the heat curve.

> **Circuit 1 Heating**>> **External set point value**

Factory setting	No
Alternative	Yes/No

Tab. 45 *External set point value*

- ▶ Change to **Yes** if an external signal 0-10V should control the flow temperature (fixed set point value). 1V= 10 °C, 10V = 80 °C (linear function).

>> **Type of heating system**

F value	Underfloor
Alternative	Radiator/Underfloor

Tab. 46 *Type of heating system*

- ▶ Select type of heating system, **Radiator** or **Underfloor**.

The factory settings for the **Radiator** have a curve value (flow line temperature) of 22 °C at 20 °C an outdoor temperature, 37,4 °C at -2.5 °C and 60 °C at -35 °C at an outdoor temperature (the high point of the curve).

The factory settings for the **Underfloor** have a curve value (flow temperature) of 22 °C at 20 °C outdoor temperature, 27,2 °C at -2.5°C and 35 °C at -35 °C outdoor temperature.

At a temperature higher than 20 °C, the same curve value applies as for 20 °C.



The right point of the curve (-10 °C) can be changed in **Minimum outdoor temperature** (→Chapter 15.1). The set value applies to all heat curves.

A change of the right point affects the flow temperature for all outdoor temperatures that are lower than the set temperature.

>> **Highest permitted flow temperature T1**

Factory setting	80.0 °C
Lowest value	1)
Highest value	100.0 °C

Tab. 47 *Radiator*

Factory setting	45.0 °C
Lowest value	1)
Highest value	45.0 °C

Tab. 48 *Underfloor*

¹⁾ The value that is set in **Lowest permitted flow temperature T1**.

>> **Lowest permitted flow temperature T1**

Factory setting	10.0 °C
Lowest value	10.0 °C
Highest value	80.0 °C

Tab. 49 *Radiator*

Factory setting	10.0 °C
Lowest value	10.0 °C
Highest value	45.0 °C

Tab. 50 *Underfloor*

- ▶ Set the highest and lowest permitted temperature for T1. Ensure that the value corresponds with the selected curve and possible curve adjustments.
- ▶ Check also that the highest temperature T1 with **Underfloor** does not exceed the permitted value for the type of floor used.



The heat curve forms the basis for set point value calculation of the flow line temperature. Most other temperatures for heating that are set refer to room temperature. These values are transformed by the control unit into flow values.

>> **Heat curve**

The heat curve constitutes the basis for the control unit's control of the temperature on the heating water to the circuit and indicates how high it needs to be in relation to the outdoor temperature. The control unit increases the temperature of the heating water when the outdoor temperature drops. The temperature of the heating water out to the circuit, i.e. the flow temperature is measured by sensor T1 for circuit 1 (full name E11.T1) and sensor T1 for circuit 2 (full name E12.T1).

Each circuit is controlled by its own heat curve. The installer sets the type of heating for each circuit, that is **Radiator** or **Underfloor**. The curve for **Underfloor** has lower values because the floors do not tolerate such high temperatures.

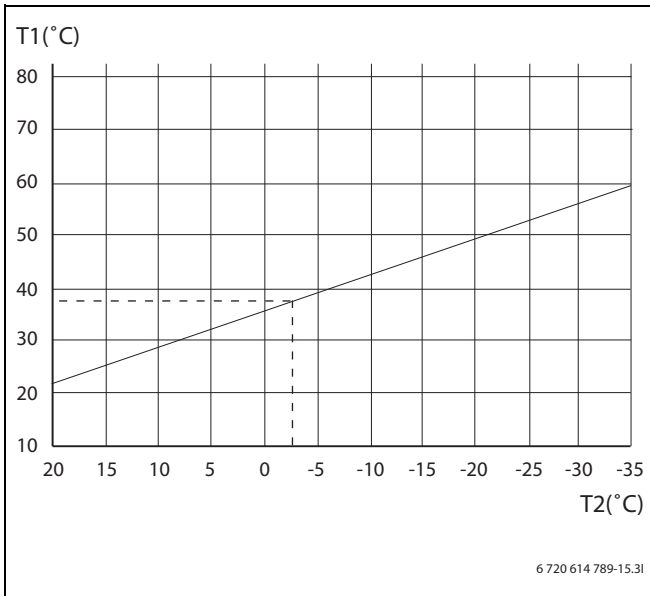


Fig. 51 Radiator

The images display the factory setting curve for radiator circuit. At -2.5 °C the flow set point is 37.4 °C.

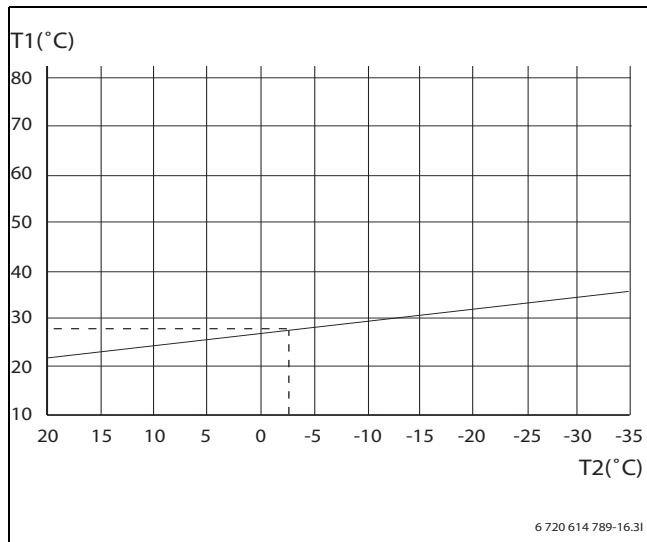


Fig. 52 Underfloor

The images display the factory setting curve for underfloor circuit. At -2.5 °C the flow set point is 27.2 °C.

Heat curve set for each circuit. If the room temperature is perceived to be too high or too low in the circuit, it is preferable to adjust the curve.

The curve can be changed in different ways. The slope of the curve can be changed by offsetting the flow line temperature upwards or downwards in the left-hand

(the value at outdoor temperature 20 °C, factory value 22.0 °C) as well as right-hand points (the value at outdoor temperature -35 °C, factory setting 60.0 °C). In addition, the curve can be affected by every 5th outdoor temperature degree.

The value at 0 °C is displayed above the curve's left-hand part, factory value 35.7 °C.

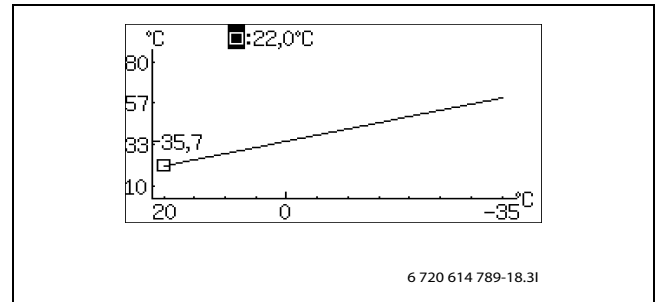


Fig. 53 Setting window Heat curve (radiator)

Change the left point:

- ▶ Press the menu dial when the square is marked. The value is marked.

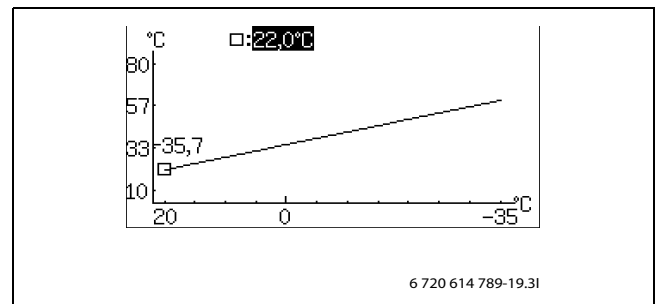



Fig. 54

- ▶ Turn the menu dial to change the value. Press the dial to save or use  to return without saving. In the window, the square is marked again and any changed values are displayed after the square. In addition, the curve is updated according to the new value.

Change the right point:

- ▶ Turn the menu dial when the square is marked. The upper square is changed to outdoor temperature with the corresponding curve value after the colon. The circle marks the relevant curve position.
- ▶ Continue to turn the dial until it shows a square before the colon.
- ▶ Press the dial to mark the value.

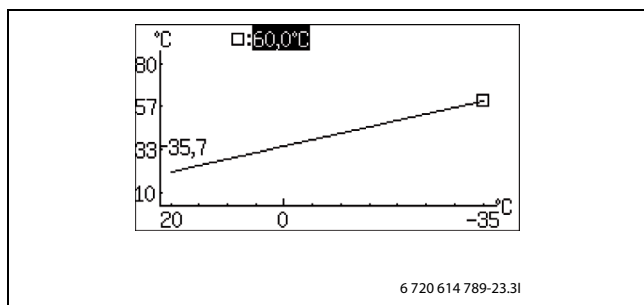



Fig. 55

- ▶ Turn the menu dial to change the value. Press the dial to save or use  to return without saving. In the window, the square is marked again and any changed values are displayed after the square. In addition, the curve is updated according to the new value.

Change a specific value, for example the value at an outdoor temperature of 0 °C:

- ▶ Turn the menu dial when the square is marked until 0 °C is marked (→ Image 56).
- ▶ Press the dial to mark the value.

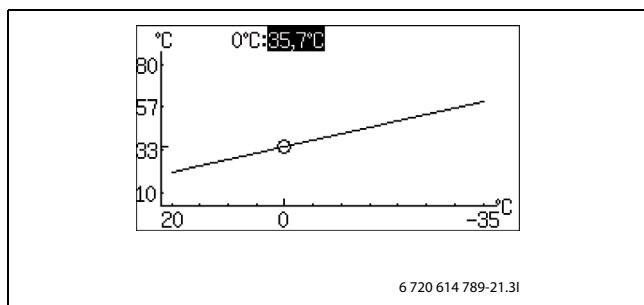


Fig. 56

- ▶ Turn the menu dial to change the value.

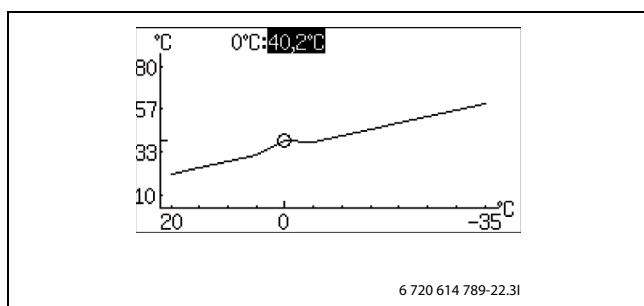




Fig. 57

- ▶ Press the dial to save or use  to return without saving.
- ▶ Use  to leave the curve setting window and return to the menu.



Recommendations:

- ▶ Increase the value of the right point if it feels too cold at low outdoor temperatures.
- ▶ Increase the value of curve at 0 °C if it feels a little cold at outdoor temperatures around 0.
- ▶ Increase or decrease the value of the curve equally at the right and left points to fine adjust the heat (the curve is parallel offset).

>> Heat curve hysteresis heat pump x

>>> Maximum

Factory setting	16.0K
Lowest value	The value in Minimum
Highest value	30.0K

Tab. 51 Maximum hysteresis

- ▶ Set how big the maximum hysteresis from the flow line can be.

>>> Minimum

Factory setting	4.0K
Lowest value	2.0K
Highest value	The value in Maximum

Tab. 52 My hysteresis

- ▶ Set how big the minimum hysteresis for the flow temperature can be.

>>> Time factor

Factory setting	10.0
Lowest value	1.0
Highest value	20.0

Tab. 53 Time factor

- ▶ Set the time factor that should apply to the hysteresis reduction. A lower factor gives shorter run times for the compressor.

Example

With the factory settings, hysteresis is changed, as follows:

Time	Hysteresis
At start/stop for heating demand	16K
2 min	14K
5 min	12K
10 min	10K
14 min	9K
20 min	8K

Tab. 54 Hysteresis

When the flow falls below the set point value with half the hysteresis, there is heating demand and when it exceeds the set point value with half the hysteresis, the heating demand is met.

>> **Room sensor**

>>> **Room temperature influence**

Factory setting	3.0
Lowest value	0.0
Highest value	10.0

Tab. 55 Room temperature influence

- ▶ Set how much a 1 K (°C) difference in room temperature should influence the set point value for the flow temperature.
Example: at a 2 K (°C) deviation from the set room temperature, the set point value for the flow temperature is changed by 6 K (°C) (2 K deviation * factor 3 = 6 K).

The menu is displayed only if a room sensor is installed.

>>> **Knob's operating range**

Factory setting	6K
Lowest value	0K
Highest value	6K

Tab. 56 Operating range, room sensor knob

- ▶ Set how many degrees the turn of the knob of the room sensor should represent between + and - . 6K means that a full turn to + gives approx. +3K and a full turn to - gives approx. -3K.

>>> **Acknowledge room sensor**

Factory setting	Yes (if correctly installed)
Alternative	Yes/No

Tab. 57 Acknowledge room sensor

- ▶ Indicate **No** only if the room sensor, even if it is installed, should not be used.

The room sensor measures the temperature in the room where it is located. The value is compared with the set desired room temperature under **Room temperature program**.

>> **Room temperature program**

F value	Optimised operation
Alternative	<ul style="list-style-type: none"> • Optimised operation • Program 1 • Program 2

Tab. 58 Program selection, circuit 1

- ▶ Choose if the circuit should be controlled with a program or not.

Optimised operation

This means that the control unit is only controlled by the flow set point value (→ Chapter 15.1.1), without programmed changes during the day. Optimised operation provides the best comfort and energy savings in the vast majority of cases.

Program 1 and 2

These selections provide an opportunity to define own programs for time control by adjusting the start and stop times, as well as a normal and an exception temperature.

Program	Day	Start	Stop
Program 1, 2	Mon - Sun	5:30	22:00

Tab. 59 Program 1 and 2

To set the desired time of day:

- ▶ Select **Program 1** or **Program 2**.
- ▶ Go to menu **View/edit active program**.
- ▶ Select day by turning the menu dial.

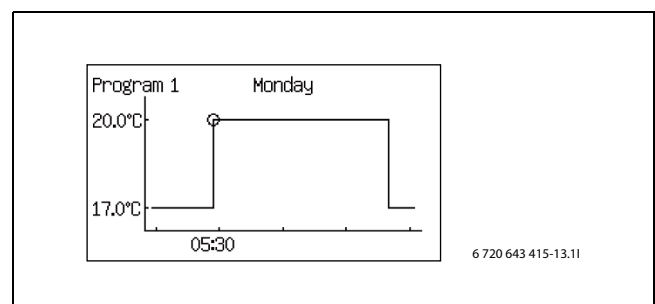


Fig. 58

- ▶ Press the menu dial to mark the value to be changed.

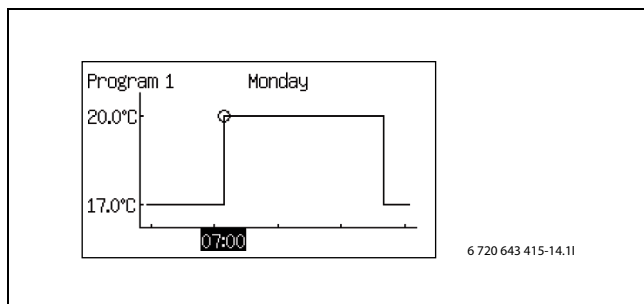



Fig. 59

- ▶ Turn the menu dial until the desired setting has been selected.
- ▶ Then press the menu dial.
- ▶ Turn the menu dial to be able to set additional values in the same way as above.
- ▶ Go back one step with .
- ▶ Select **Saving alternative**:
 - **Return without saving**
 - **Program 1**
 - **Program 2**
 The set changes are saved as a selected program or not at all.
- ▶ To adjust the normal temperature, proceed to menu **Room temperature normal**.
- ▶ To adjust the exceptional temperature, proceed to menu **Room temperature exception**.

Room temperature program when there are room sensors:

>> Room temperature program

>>> Active program

If a program is selected, the following (if the menu button is turned) is displayed:

>>> View/edit active program

>>> Room temperature normal

Factory setting	20.0 °C
Lowest value	10.0 °C
Highest value	35.0 °C

Tab. 60 Room temperature, normal

- ▶ Set the desired set point for the room temperature.

>>> Room temperature exception

Factory setting	17.0 °C
Lowest value	10.0 °C
Highest value	30.0 °C

Tab. 61 Room temperature, exception

- ▶ Set the temperature that should apply as exceptional temperature in the program.
The menu is displayed only if **Program 1** or **Program 2** has been selected.

>>> Copy to all heating circuits

Factory setting	No
Alternative	No/Yes

Tab. 62 All circuits

- ▶ Select **Yes** to have the same control for all installed circuits.
The menu is displayed only under **Circuit 1**.

Room temperature program when there is no room sensor:

>> Room temperature program

>>> Active program

>>> View/edit active program

The same as when there is a room sensor, see above.

>>> Room temperature normal

Factory setting	20.0 °C
Lowest value	10.0 °C
Highest value	35.0 °C

Tab. 63 Room temperature, normal

- ▶ Set the measured value in the room.
The indicated value is used by temperature programs to calculate the difference between normal and exceptional temperature.

>>> Temperature increase/decrease

Factory setting	=
Alternative	- , - , = , + , ++

Tab. 64 Room temperature increase/decrease

- ▶ Use this function to adjust the room temperature so that the normal room temperature (see the previous menu) becomes the desired temperature.

- ▶ Use this function to simply increase or decrease the heat when there are no room sensors.
 - - gives approx. 1 °C lower room temperature.
 - gives approx. 0.5 °C lower room temperature.
 - + gives approx. 0.5 °C higher room temperature.
 - ++ gives approx. 1 °C higher room temperature.

>>> **Setting temp. increase/decrease**

>>>> **Limit value for left or right end point**

Factory setting	0.0 °C
Lowest value	-10.0 °C
Highest value	15.0 °C

Tab. 65 Heating increase/decrease limit value

- ▶ Set which outdoor temperature should be the limit value for the end point that should be adjusted when increase/decrease is requested.
 At outdoor temperatures lower than the limit value, the flow line temperature in the right end point (-35 °C) of the heat curve is affected, with change indicated in %, see below.
 At outdoor temperatures higher than the limit value, the flow line temperature in the left end point (+20 °C) of the heat curve is affected, with change indicated in %, see below.

>>> **Setting temp. increase/decrease**

>>>> **Change when much colder/warmer**

Factory setting	8%
Lowest value	1%
Highest value	20%

Tab. 66 Change when much colder/warmer

- ▶ Set how many % the flow temperature in the applicable end point of the heat curve should change down or up when - - or ++ is selected in **Temperature increase/decrease**.

>>>> **Change when colder/warmer**

Factory setting	3%
Lowest value	1%
Highest value	20%

Tab. 67 Change when colder/warmer

- ▶ Set how many % the flow temperature in the applicable end point of the heat curve should change down or up when - or + is selected in **Temperature increase/decrease**.

>>> **Room temperature influence**

Setting is carried out in the same way as in the menu **Room sensor** (→ Chapter 15.1). The setting is used in the temperature program to calculate how the flow line temperature is affected when exceptional temperature should apply.

>>> **Room temperature exception**

>>> **Copy to all heating circuits**

The same as when there is a room sensor, see above.



It always takes some time for a change of a heating setting, e.g. an increase or decrease in room temperature, to apply. The same applies in the event of a quick change of the outdoor temperature. This is why you should always wait for at least 24 hours before making a new change.

> **Circuit 2, 3...**

Make the settings for the first mixed circuit under **Circuit 2**. Other circuits are displayed only if they exist. The same functions apply to these as the functions for circuit 2.

>> **Mixing valve mode**

Factory setting	Off
Alternative	Heating/Off

Tab. 68 Mixing valve operating mode

- ▶ Select **Off** if the circuit is not ready-built or needs to be turned off temporarily or should not be used.

>> **Type of heating system**

Factory setting	Underfloor
Alternative	Radiator/Underfloor

Tab. 69 Type of heating system

- ▶ Select type of heating system.

The factory settings for the **Radiator** have a curve value (flow line temperature) of 22 °C at 20 °C an outdoor temperature, 37,4 °C at -2.5 °C and 60 °C at -35 °C at an outdoor temperature (the high point of the curve).

The factory settings for the **Underfloor** have a curve value (flow temperature) of 22 °C at 20 °C outdoor temperature, 27,2 °C at -2.5°C and 35 °C at -35 °C outdoor temperature.

At a temperature higher than 20 °C, the same curve value applies as for 20 °C.



The right point of the curve (-35 °C) can be changed in **Minimum outdoor temperature** (→ Chapter 15.1). Set value applies for all heat curves.

A change of the right point affects the flow temperature for all outdoor temperatures that are lower than the set temperature.

>> Highest permitted flow temperature T1

Factory setting	80.0 °C
Lowest value	1)
Highest value	100.0 °C

Tab. 70 Radiator

Factory setting	45.0 °C
Lowest value	1)
Highest value	45.0 °C

Tab. 71 Underfloor

1) The value that is set in **Lowest permitted flow temperature T1**.

>> Lowest permitted flow temperature T1

Factory setting	10.0 °C
Lowest value	10.0 °C
Highest value	80.0 °C

Tab. 72 Radiator

Factory setting	10.0 °C
Lowest value	10.0 °C
Highest value	45.0 °C

Tab. 73 Underfloor

- ▶ Set the highest and lowest permitted temperature for T1. Ensure that the value corresponds with the selected curve and possible curve adjustments.
- ▶ Check also that the highest temperature T1 with **Underfloor** does not exceed the permitted value for the type of floor used.

>> Heat curve

The settings are the same as for **Circuit 1**.

>> Room sensor

The settings are the same as for **Circuit 1**.

>> Room temperature program

The settings are the same as for **Circuit 1**, except that **Copy to all heating circuits** is not included.

>> Regulator settings

The mixing valve is controlled with PID regulator in order to reach the flow set point value when there is a need. The signal determines how much the opening of the mixing valve should change. It is calculated with short time intervals.

>> Regulator settings

>>> P constant

Factory setting	1.0
Lowest value	0.1
Highest value	30.0

Tab. 74 P constant

>>> I constant

Factory setting	300.0
Lowest value	5.0
Highest value	600.0

Tab. 75 I constant

>>> D constant

Factory setting	0.0
Lowest value	0.0
Highest value	10.0

Tab. 76 D constant

>>> Minimum PID signal

Factory setting	0%
Lowest value	0%
Highest value	100%

Tab. 77 Minimum PID signal

>>> Maximum PID signal

Factory setting	100%
Lowest value	0%
Highest value	100%

Tab. 78 Maximum PID signal

>>> Mixing valve running time

Factory setting	300s
Lowest value	1s
Highest value	6000s

Tab. 79 Mixing valve running time

- ▶ Set the run time that is indicated on the mixing valve and indicate value in number of seconds.



If there is no time indication on the mixing valve, run it manually (→ Chapter 15.7) and measure how long it takes to go from fully closed to a fully open mixing valve (the mixing valve stops sounding and the endposition switch switches off).

>>> **Mixing valve fully closed**

Factory setting	2.0K
Lowest value	1.0K
Highest value	10.0K

Tab. 80 *Mixing valve fully closed*

- ▶ Set how many K below the maximum permitted flow temperature T1 the mixing valve is to be fully closed. The maximum flow temperature is different depending on the type of heating system (radiator or underfloor). With an underfloor system, the mixing valve should be fully closed at 45 °C-2K=43 °C (with factory settings).

>>> **Mixing valve start closing**

Factory setting	2.0K
Lowest value	1.0K
Highest value	10.0K

Tab. 81 *Start closing mixing valve*

- ▶ Set how many K below the value for fully closed mixing valve the closure of the mixing valve should begin. The result is 43 °C-2K=41 °C (with the factory settings for underfloor heating).

15.1.1 Set point value

The heating circuit's set point value is the temperature of the flow that the heat pump attempts to maintain. Sometimes, the measured actual value fluctuates a bit upward and downward depending on changes in the outdoor temperature or a large hot water demand.



The set point value specified by the customer/installer is most often the room temperature, which is recalculated by the control unit into a corresponding flow temperature set point value. Under normal conditions, 1 K (°C) in room temperature corresponds to approx. 3 K (°C) in flow temperature.

The set point value is normally based on:

- Current curve value (the flow temperature at the current outdoor temperature according to the applicable heat curve).
- Current curve influence through:
 - **Room sensor**
 - **Holiday**
 - **Active program**
 - **External control**

Set point value calculation

The set point value for the heating circuit is the current curve value adjusted with active curve influence, if any such exists.

Priority order for curve influence is:

- **External control**
- **Active program**
- **Holiday**
- **Room sensor**

Only one of these can be active. How big the influence should be and when to exercise it is set in the respective function.

Fixed set point value

A fixed set point value (not curve-based) applies in the event of:

- External set point value. The set point value is determined according to input signal 0-10V where 1V is 10 °C and 10V is 80 °C (0V triggers an alarm).

Set point value limitation

The calculated set point value is always checked against the permitted temperature limits.

The applicable set point value T1 for **Circuit 1** and the measured actual value for T1 are used to activate and deactivate the heat demand.

The following applies to **Circuit 2, 3...:** When the actual value for the mixed circuit's T1 is low in relation to the set point value, more heating water is shunted into the circuit so as to maintain the set point value.

If the flow line temperature has been below the set point value for a certain period of time, there is heat demand and the compressor produces heat before there is a too significant temperature reduction indoors. This happens until the flow line temperature is a couple of degrees higher than the set point value. (Or because **Maximum operating time for heating at hot water demand** has passed.)

Heating demand is not active during summer operation.

> Heat curve hysteresis heat pump x

>> Maximum

Factory setting	16.0K
Lowest value	The value in Minimum
Highest value	30.0K

Tab. 82 Maximum hysteresis

- ▶ Set how big the maximum hysteresis from the flow line can be.

>> Minimum

Factory setting	4.0K
Lowest value	2.0K
Highest value	The value in Maximum

Tab. 83 My hysteresis

- ▶ Set how big the minimum hysteresis for the flow temperature can be.

>> Time factor

Factory setting	10.0
Lowest value	1.0
Highest value	20.0

Tab. 84 Time factor

- ▶ Set the time factor that should apply to the hysteresis reduction. A lower factor gives shorter run times for the compressor.

Example

With the factory settings, hysteresis is changed, as follows:

Time	Hysteresis
At start/stop for heating demand	16K
2 min	14K
5 min	12K
10 min	10K
14 min	9K
20 min	8K

Tab. 85 Hysteresis

When the flow falls below the set point value with half the hysteresis, there is heating demand and when it exceeds the set point value with half the hysteresis, the heating demand is met.

15.2 Hot water

Under **Hot water**, there are functions to:

- **Acknowledge hot water sensor T3**
- **Extra hot water**
- **Hot water peak**
- **Hot water program**
- **Hot water mode**
- **Hot water settings heat pump x**
- **Block heating during hot water demand**
- **Maximum operating time for hot water at heating demand**
- **Protective anode installed**

> Acknowledge hot water sensor T3

F value	Yes (if correctly installed)
Alternative	Yes/No

Tab. 86 Acknowledge hot water sensor

> Extra hot water

>> Extra hot water duration

Factory setting	0h
Lowest value	0h
Highest value	48h

Tab. 87 Extra hot water duration

- ▶ Set the duration of extra hot water production.

>> Extra hot water stop temperature

Factory setting	65 °C
Lowest value	50 °C
Highest value	65 °C

Tab. 88 Hot water temperature

- ▶ Set the stop temperature for extra hot water.

Additional amount of hot water is produced by temporarily increasing the temperature of the hot water during the set number of hours to the indicated stop temperature.

The heat pump starts the function directly and uses first the compressor and then the additional heat source for the temperature increase. When the respective number of hours have passed, the heat pump returns to normal hot water mode.



DANGER: Risk of burn injuries.

- ▶ Use a mixing valve when the hot water temperature exceeds 60 °C.

> **Hot water peak**

Hot water peak means a temporary increase in the hot water temperature to approx. 65 °C for thermal elimination of bacteria.

For the hot water temperature increase, the compressor is used first; the additional heat source then continues alone.

>> **Day of the week**

Factory setting	Wednesday
Area	None, Day, All

Tab. 89 Weekday

- ▶ Set the day on which the hot water peak should take place. **None** means that the function is disabled. **All** means that a hot water peak takes place every day. If hot water peak is deactivated comfort mode must be selected in the menu hot water mode.
- ▶ Select **None** if electric additional heat in the hot water heater is missing.

>> **Interval in weeks**

Factory setting	1
Lowest value	1
Highest value	4

Tab. 90 Week interval

- ▶ Set how often a hot water peak should take place.
 - 1 means a hot water peak every week.
 - 2 means that a hot water peak takes place in all even weeks of the year, i.e. in week 2, 4, 6, etc.
 - 3 means week 3, 6, 9, etc.
 - 4 means week 4, 8, 12, etc.
 - Start time

Factory setting	3:00
Lowest value	0:00
Highest value	23:00

Tab. 91 Start time

- ▶ Set the time of the hot water peak.

>> **Stop temperature**

Factory setting	65.0 °C
Lowest value	48.0 °C
Highest value	70.0 °C

Tab. 92 Stop temperature

>> **Maximum time**

Factory setting	3.0h
Lowest value	1.0h
Highest value	5.0h

Tab. 93 Maximum time

>> **Time for warm-keeping**

Factory setting	1.0h
Lowest value	1.0h
Highest value	Maximum time - 1h

Tab. 94 Time for warm-keeping

- ▶ Set **Stop temperature**, **Maximum time** and **Time for warm-keeping**.

The hot water peak is activated on the selected day and at the selected time. It continues until the stop temperature has been reached plus the time for warm-keeping. The hot water peak cannot continue longer than the set **Maximum time**. If it is cancelled because the maximum time has expired, a message is shown in the display and a new attempt is made after 24 hours.

> **Hot water program**

Program 1 and **Program 2** enables you to block hot water production during the set time.

>> **Active program**

Factory setting	Always hot water
Alternative	<ul style="list-style-type: none"> • Always hot water • Program 1 • Program 2

Tab. 95 Hot water program

>> **View/edit active program**

The menu is displayed only if **Program 1** or **Program 2** has been selected. Programs are changed in the same way as for **Room temperature program** (→Chapter 15.1).

> **Hot water mode**

F value	Economy
Alternative	Economy/Comfort

Tab. 96 Hot water mode

- ▶ Select hot water mode.

Economy means that the hot water is permitted to cool slightly before hot water production starts compared to **Comfort**. Heating stops at a slightly lower temperature.

- ▶ Change to **Comfortif** more or hotter hot water is desired.
This setting must be used if electric add. heat is missing or if the hot water circulation is used, when the temperature in the hot water circulation is otherwise too low.

> Hot water settings heat pump 1



In certain countries there are requirements regarding the lowest hot water temperature in buildings. Check that the settings in Economy and Comfort mode conform to the applicable regulations.

>> Hot water production

F value	Yes
Alternative	No/Yes

Tab. 97 Hot water production

>> Start temperature T3 economy mode

F value	46 °C
Lowest value	20 °C
Highest value	56 °C

Tab. 98 Start temperature T3 economy mode

>> Stop temperature T8 economy mode

F value	54 °C
Lowest value	20 °C
Highest value	64 °C

Tab. 99 Stop temperature T8 economy mode

>> Start temperature T3 comfort mode

F value	56 °C
Lowest value	20 °C
Highest value	56 °C

Tab. 100 Start temperature T3 comfort mode

>> Stop temperature T8 comfort mode

F value	64 °C
Lowest value	20 °C
Highest value	64 °C

Tab. 101 Stop temperature T8 comfort mode

> Hot water settings heat pump x

Heat pump 2 has factory setting **No** for **Hot water production**. This value must not be changed.

> Block heating during hot water demand

F value	No
Alternative	Yes/No

Tab. 102 Block the heat

- ▶ Select **Yes** if the hot water demand must always be satisfied before the heat demand.
- ▶ Select **No** if hot water production should be interrupted after a certain time in event of a heat demand.
- ▶ In **No** also set the duration that hot water production may occur for during the heat demand.
- Maximum operating time for hot water at heating demand

F value	30 min
Lowest value	5 min
Highest value	60 min

Tab. 103 Operating time hot water

>> Hot water circulation pump active

F value	Yes
Alternative	No/Yes

Tab. 104 Hot water circulation pump active


- ▶ Indicate **Yes** if there is circulation pump. Time settings can then be made.
- ▶ In **Yes**, change hot water mode to comfort mode.

>> Time settings

Start time	Stop time
00:00	24:00

Tab. 105 Time settings

- ▶ Set up to four separate intervals.
- ▶ To change time: turn the menu dial until the desired time appears. Push the menu dial to continue to the next setting field.

- ▶ Go back to the previous field by using .
- ▶ Press the menu dial in the last setting field to save settings
Hot water circulation takes place every day during the set periods.

> **Protective anode installed**

Factory setting	1)
Alternative	Yes/No

Tab. 106 Anode installed

1) value set during **Start-up**

Change the value if there has been a change since start-up.

- ▶ Change to **No** if no anode exists.
Normally, there is an anode in the hot water heater in order to protect it against corrosion. If the anode breaks, it must be fixed to prevent the hot water heater from being damaged. The control unit alerts when the anode is broken.

15.3 Holiday

During holidays (absence), the heating can, for example, be kept at a lower or higher level and hot water production can be switched off. *Start* and *Stop date*, *Room temperature* and *Block hot water production* is only displayed if the holiday function is activated.

> **Circuit 1 and hot water**

>> **Activate holiday function**

Factory setting	No
Alternative	No/Yes

Tab. 107 Holiday function

>> **Start date**

>> **Stop date**

- ▶ Set start and stop date for the desired period. Format yyyy-mm-dd.
The period starts and ends at 00:00. Both the start and end date are included in the period.
- ▶ Terminate the period prematurely by indicating **No** in the menu **Activate holiday function**.

>> **Room temperature**

- ▶ Set the room temperature that should apply to the circuit during the period.

Factory setting	17 °C
Lowest value	10 °C
Highest value	35 °C

Tab. 108 Room temperature, holiday

>> **Copy to all heating circuits**

Factory setting	No
Alternative	Yes/No

Tab. 109 Copy circuits

>> **Block hot water production**

Factory setting	No
Alternative	Yes/No

Tab. 110 Block hot water

> **Circuit 2, 3...**(optional)

>> **Activate holiday function**

>> **Start date**

>> **Stop date**

>> **Room temperature**

- ▶ Set the values in the same way as for **Circuit 1 and hot water**.

15.4 Energy measurements

> **Generated energy**

This displays **Generated energy** in kWh divided into **Heating** and **Hot water**.


> **Consumption electric additional heat**

This displays **Consumption electric additional heat** in kWh divided into **Heating** and **Hot water**.

15.5 Timers

The control unit shows the timers that are in operation. There are a number of timers for, e.g., delays of different types, but also for extra hot water, hot water peak, etc. A number of these times are set under customer or

installer, whereas others have a set factory value which cannot be changed. Level shows at what level the setting can be made. 0 = Customer, 1 = Installer, 3 = Factory.

Timers	Setting	F value	Level
Extra hot water	Extra hot water duration	0h	0, 1
Hot water peak time for warm-keeping	Hot water\Hot water peak\Time for warm-keeping	1.0h	1
Alarm mode delay		1.0h	3
Party	Party ()	0h	0
Operating time for heating at hot water demand	Room temperature\General\Maximum operating time for heating at hot water demand	20min	0
Hot water, operating time at heating demand	Hot water\Maximum operating time for hot water at heating demand	30min	0
Heat pump x timers			
> Compressor start delay		10min	3
> Compressor start delay groundwater	Heat pump\Groundwater\Compressor start delay	0s	1
> G2 heat carrier pump stop delay		5mins	3
> Block low pressure switch		150s	3
> Compressor working area timers			
>> Block after hot water production		120s	3
>> Delay after temporary stop		30min	3
>> Block after low outdoor temperature		30min	3
Additional heat timers			
> Additional heat start delay	Additional heat\Additional heat general\Start delay	60min	1
> Additional heat start delay after high outdoor temperature	Additional heat\Additional heat general\Additional heat start delay after high outdoor temperature	30min	1
Delay before change over to summer operation	Room temperature\General\Summer/winter operation\Delay before change over to summer operation	4h	1
Delay before change over to winter operation	Room temperature\General\Summer/winter operation\Delay before change over to winter operation	4h	1
Shut down protection during change over from hot water to heating	Room temperature\General	300s	1
Heating start delay ^{*)}		3min	-
Heating stop delay ^{*)}		3min	-

Tab. 111 Timers

^{*)} Delay between compressors start/stop for heating with two compressors/heat pumps.

15.6 External control

When an external input is connected, the control unit performs functions which are set to **Yes** or is separated from 0 (**Room temperature**). When the external input is no longer connected, the control unit returns to normal mode. Only installed functions are displayed.

There are functions for external input 1, external input 2 and external input for circuit 2, 3, etc.

> External input 1, 2

>> Block compressor

Factory setting	No
Alternative	No/Yes

Tab. 112Blocking

>> Block additional heat

Factory setting	No
Alternative	No/Yes

Tab. 113Blocking

>> Block heating at tripped underfloor temperature limiter

Factory setting	No
Alternative	No/Yes

Tab. 114Blocking



This function requires the installation of a safety thermostat to the floor heating circuit and its connection to the external input.

>> Block heating

Factory setting	No
Alternative	No/Yes

Tab. 115Blocking

>> Room temperature

Factory setting	No (0.0 °C)
Lowest value	10.0 °C
Highest value	35.0 °C

Tab. 116Room temperature

- ▶ Set the room temperature that should apply in the event of enabled external control.
- ▶ Value > 0 °C enables the function.

>> Block hot water production

Factory setting	No
Alternative	No/Yes

Tab. 117Blocking

>> Start collector circuit pump

Factory setting	No
Alternative	No/Yes

Tab. 118Start collector circuit pump

>> Alarm at low pressure in collector circuit

Factory setting	No
Alternative	No/Yes

Tab. 119Alarm at low pressure in collector circuit



This function requires the installation of a pressure switch in the collector circuit and its connection to the external input. In the event of incorrect pressure in the circuit, the external input closes, triggering a category A alarm (→ Chapter 16.7).

> External input circuit 2, 3...

>> Block heating at tripped underfloor temperature limiter

Factory setting	No
Alternative	No/Yes

Tab. 120Blocking

>> Block heating

Factory setting	No
Alternative	No/Yes

Tab. 121Blocking

>> Room temperature

Factory setting	No (0.0 °C)
Lowest value	10.0 °C
Highest value	35.0 °C

Tab. 122Room temperature

- ▶ Set the room temperature that should apply in the event of enabled external control.
- ▶ Value > 0 °C enables the function.

15.7 Installer

This section includes:

- **General**
- **Heat pump x capacity**
- **Connected I/O boards**
- **Compressor working area**
- **Generated energy**
- **Operating times and consumptions**
- **Temperatures**
- **Inputs**
- **Outputs**
- **Circulation pumps**
- **Screed drying**

> General

>> Anti-seizure mode

>>> Day of the week

Factory setting	Wednesday
Alternative	Monday-Sunday

Tab. 123 Anti-seizure day

>>> Start time

Factory setting	12:00
Alternative	0:00 - 23:00

Tab. 124 Anti-seizure start time

- ▶ Set date and time for anti-seizure operation of vital parts of the installation.
Anti-seizure mode ensures that vital components do not become clogged during periods when they are not used.



Anti-seizure mode starts only if there is no other type of demand. When there is a demand, the anti-seizure operation waits for one hour at the most for the demand to be satisfied. Otherwise, the anti-seizure operation has to wait until the next occasion.

Heat pump 1 runs first followed by heat pump 2, etc. 3-way valves and circulation pumps are run for 1 minute and mixing valves for the respective mixing valve's run time + 10s. A pause of 30s is made between components.

During anti-seizure mode, certain parts of the heating system become hot for a short period of time, which is completely normal.

>> Highest permitted flow temperature T1

F value	80,0 °C
Lowest value	10,0 °C
Highest value	100,0 °C

Tab. 125 Radiator

F value	45,0 °C
Lowest value	10,0 °C
Highest value	45,0 °C

Tab. 126 Underfloor

>> Operating mode

F value	
Alternative	L/W + electric additional heat

Tab. 127 Operating modes

- ▶ For a description of operating modes (→ Chapter 4.4).



The set operating mode is indicated with the symbol > before the alternative. Operating mode is selected directly the first time the heat pump is started. Operating mode can be changed here. The control unit allows only the alternative(s) that can be achieved with the installed equipment. Selection of operating mode leads to automatic setting of certain values in the control unit.

>> Groundwater

F value	No
Alternative	Yes/No

Tab. 128 G33

- ▶ Indicate if groundwater pump G33 exists or not. G33 is normally run simultaneously with collector circuit pump G3.

In the event of **Yes**:

>> Compressor start delay

Factory setting	15s
Lowest value	0s
Highest value	600s

Tab. 129 Start delay compressor

- ▶ Indicate the delay that is required until the groundwater circuit circulates. The compressor should not start before this has taken place.

>> **Time for reset of access level**

Factory setting	20min
Lowest value	1min
Highest value	240min

Tab. 130 Reset of access level

- ▶ Set how much time it should take for the control unit to return automatically from installer level to customer level.



Return to the initial menu means a direct switch to customer level.

> **Heat pump x capacity**

Lowest value	6.0kW
	7.5kW
	9.0kW
	11.0kW
	14.0kW
Highest value	17.0kW

Tab. 131 Heat pump capacity

> **Connected I/O boards**

All boards and current version are displayed, if relevant.

> **Compressor working area**

This defines a number of functions that make the compressor stop temporarily or change operating mode to avoid more serious alarms.

>> **Hot gas stop function activated**

F value	No
Alternative	Yes/No

Tab. 132 Hot gas stop function

- ▶ Select **Yes** if the stop function should be active. The function protects the compressor when the hot gas temperature exceeds the factory value for maximum hot gas temperature. If the heat pump goes into hot water mode the compressor returns to heating mode and any electrical add heat hot water is activated. The value for T3 is saved. The stop function is deactivated when T3 falls 5K below the saved value. If the hot gas temperature is too high for heating mode the outdoor temperature T2 is saved and the

compressor stops. T2 must rise a few degrees and the timer temporary stop must count down before compressor may start.

>> **Outdoor stop function activated**

Factory setting	No
Alternative	Yes/No

Tab. 133 Outdoor temperature stop function

- ▶ Select **Yes** if the stop function should be active. The compressor stops when the outdoor temperature falls below the lowest permitted outdoor temperature for the compressor (-20 °C). When the outdoor temperature rises to a value that is higher than the lowest permitted temperature and this continues for 30 minutes (factory value), the stop function is deactivated and the compressor starts automatically if there is a demand.



The stop functions are always inactive at outdoor temperatures higher than -5 °C (factory value, not adjustable).

> **Generated energy**


This displays **Generated energy** in kWh divided into **Heating** and **Hot water**.

> **Operating times and consumptions**

The total operating time for the control unit, heat pump x and additional heat (active connection). It can also make short term measurements for compressor and additional heat.

> **Temperatures**

All connected/acknowledged sensors present values. The set point value is also given for some. The opportunity to correct the sensors is also given.

Open circuits/short circuits/faults in sensors are indicated with a dash in the  display and under **Temperatures**. Alarms are triggered and stored in alarm log and alarm history.

T2 Outdoor, display	T2 correction
Temperatures heat pump x	T1 Start/stop limits compressor
	T6,T8,T9,T10,T11 display, correction
	T3 hot water start
	T8 hot water stop
Circuit x	T1 set point
	T1 display, correction
	T5, display, correction, damping
	Room temperature set point value
	Menu dial influence, display (CANbus)
Hot water	T3 display, correction
	Extra hot water stop temperature
	Hot water peak stop temperature

Tab. 134 Temperature display

> Inputs

The status of all inputs is displayed here. Pressostats and motor cut-outs are shown for each heat pump. In addition, any alarms for shunted additional heat, status for external inputs and protective anode are shown. Only connected inputs are displayed.

> Outputs

All components can be manually operated individually here to check function.

>> Manual operation time

F value	0min
Lowest value	0min
Highest value	240min

Tab. 135 Manual operation time

- ▶ Set the number of minutes for manual operation. Different vital components can be put into operation/turned off separately. With 0min, status, e.g., **On** or **Off**, is displayed for each component.



Use the manual operation function on commissioning in order to check if the installed components work.

Manual operation is possible for the following components (only the ones that are installed are displayed):

>> G1 Heating circuit pump

>> Heat pump x

>>> Q21 Three-way valve(Heating/Hot water)

>>> G2 Heat carrier pump

>>> G3 Collector circuit pump

>>> Compressor

>> Hot water electric heater

>> Hot water circulation pump

>> Circuit 2, 3...

>>> Circulation pump

>>> Mixing valve signal

>>> Mixing valve open

>>> Mixing valve close

>> Connect heater 1 to heat pump

>>> Electric additional heat triac(all Off/On)

>>> Electric additional heat relay(all Off/On)

>> Alarm buzzer(all Off/On)

>> General alarm

> Circulation pumps

>> Operation alternative heating circuit pump G1

Factory setting	Continuous
Alternative	Continuous/Automatic

Tab. 136G1

- ▶ Select if circulation pump G1 should run continuously or in optimised operation. The setting applies to G1 of all circuits.

Continuous means that G1 is always in operation during the heating season.

Automatic means that the circulation pump runs in approx. 10 min, stands idle for 10 min, and so on, if it is in winter operation and there has not been any heating demand for 40 min. Automatic operation is cancelled when heating demand arises or winter operation is disabled.

G1 stands idle (apart from anti-seizure operation) if it is summer operation.

>> **Operation alternative heat carrier pump G2**

Factory setting	Automatic
Alternative	Continuous/Automatic

Tab. 137G2

- ▶ Select if heat carrier pump G2 should run continuously or start automatically when the compressor starts.
In systems without bypass or without a buffer tank, G2 must be in continuous operation.
The setting applies to G2 of all heat pumps. In automatic operation, G2 starts for heat pump 2 when compressor 2 starts.

> **Heat carrier pump G2 speed**

F value	40%
Lowest value	30%
Highest value	100%

Tab. 138Heat carrier pump G2 speed

> **Operation alternative collector circuit pump G3**

Factory setting	Automatic
Alternative	Continuous/Automatic

Tab. 139G3

- ▶ Select if collector circuit pump G3 should run simultaneously with the compressor or continuously.

> **Screed drying**



Screed drying requires the installation of underfloor heating coils under the floor tiles.

The screed drying function is used to expel humidity from the floor tiles in newly-built houses. The drying program has the highest priority, i.e., all other functions than security functions and additional heat only are disabled. All circuits contribute to the drying. Screed drying takes place in three phases:

- Heating phase
- Phase with maximum temperature
- Cooling phase

Heating and cooling are performed stepwise; each step continues for at least a day. The phase with maximum temperature is considered to be one step. There are 9 steps with the factory values: Heating phase in 4 steps (25 °C, 30 °C, 35 °C, 40 °C), maximum temperature (45 °C for four days), cooling phase in 4 steps (40 °C, 35 °C, 30 °C, 25 °C).

It is possible to cancel a running program. On completion of the program, the heat pump returns to normal operation.

>> **Activate**

Factory setting	No
Alternative	Yes/No

Tab. 140Activate screed drying

- ▶ Select **Yes** if drying should be performed.

There is an opportunity to change the current program step.

>> **Remaining time for current step**(displays if screed drying is active)

>> **Heat source**

Factory setting	Additional heat
Alternative	Both/Compressor/ Additional heat

Tab. 141Heat source drying

>> **Program settings**

>>> **Flow temperature increase per heating step**

Factory setting	5.0K
Lowest value	1.0K
Highest value	10.0K

Tab. 142Temperature increase per heating step

>>> **Number of days per heating step**

Factory setting	1
Lowest value	1
Highest value	5

Tab. 143Days per heating step

>>> **Maximum flow temperature**

Factory setting	45 °C
Lowest value	25 °C
Highest value	60 °C

Tab. 144Maximum flow temperature drying

>>> **Number of days with maximum temperature**

Factory setting	4
Lowest value	0
Highest value	20

Tab. 145Days with maximum temperature

>>> **Flow temperature decrease per cooling step**

Factory setting	5.0K
Lowest value	1.0K
Highest value	10.0K

Tab. 146 Temperature decrease per cooling step

>>> **Number of days per cooling step**

Factory setting	1
Lowest value	1
Highest value	5

Tab. 147 Days per cooling step

**CAUTION:** Risk of floor damage

- ▶ Follow the manufacturer's recommendations for the floor tiles.

15.8 Additional heat

The additional heat works together with the heat pump to maintain the right heating in the circuits. The additional heat can be selected to work alone.

Under **Additional heat**, there are:

- **Additional heat general**
- **Electric additional heat**
- **Additional heat program**

> **Additional heat general**

Under **Additional heat general** the functions that are common to electric additional heat and mixed additional heat are found.

>> **Start delay**

F value	120 min
Lowest value	0 min
Highest value	240 min

Tab. 148 Additional heat start delay

- ▶ Set what start delay should apply to the additional heat.
When the need for additional heat arises, a timer with set time is started. It is first when this time has passed that the additional heat may start.

>> **Allow additional heat timer during energy supply cut-off**

Factory setting	Economy
Alternative	Economy/Comfort

Tab. 149 Allow additional heat timer during energy supply cut-off

- ▶ Set the desired value.
In **Economy**, the additional heat timer is not allowed to count down before the energy supply stop is discontinued. In **Comfort**, the additional heat timer is allowed to start. This applies to type 1 energy supply cut-off and allows a quicker start of the additional heat after an energy supply cut-off, if there is a demand.

>> **Additional heat only**

Factory setting	No
Alternative	Yes/No

Tab. 150 Additional heat only

- ▶ Change to **Yes** if the additional heat should work alone.
This can be suitable if the heat pump should provide heat before, e.g., the collector circuit is ready.

>> **Ramp time when additional heat only**

F value	3min
Lowest value	0min
Highest value	60min

Tab. 151 Ramp time for additional heat only

- ▶ Set the time that it should take for the additional heat to be up to 100% when only the additional heat applies and there is a heat demand or frost protection mode.

>> **Block additional heat**

Factory setting	No
Alternative	Yes/No

Tab. 152 Block additional heat

- ▶ Indicate if the additional heat should be blocked. In this case, the additional heat may not take part. The additional heat is, however, allowed to kick in in alarm mode and additional heat only mode if no other blocking function is enabled, e.g., type 1 energy supply cut-off.

>> **Maximum outdoor temperature for additional heat**

Factory setting	10 °C
Lowest value	-30 °C
Highest value	40 °C

Tab. 153 Maximum outdoor temperature for additional heat

- ▶ Set the desired temperature limit. If the outdoor temperature exceeds this value, the additional heat may not work.

>> **Additional heat set point value E11.T1 offset**

Factory setting	1.0K
Lowest value	0.0K
Highest value	10.0K

Tab. 154 Additional heat set point value offset

- ▶ Set the desired change.
The additional heat's set point value for T1 becomes T1's normal set point value - the set value. As a result of the reduction, the compressor is not turned off unnecessarily when the additional heat is in operation.

> **Electric additional heat**

Control unit supports 1 additional heat unit.

The settings for connection capacity and regulator for the additional heat use are made under this menu.

>> **Electric heater connection**

>>> **Connected electric heaters**



This is a display window that states the total number of electric additional heaters connected.

>>> **Connect heater 1 to heat pump**

F value	1
Lowest value	None
Highest value	Number of heat pumps

Tab. 155 Connected electrical additional heat

>> **Connection capacity per el. heater**

>>> **Output per heater**

F value	9.0kW
Lowest value	0.0kW
Highest value	13.5kW

Tab. 156 Output per unit

- ▶ Set the actual output of the input electric heater.



The heat pump's integrated electric heater is 6kW or 9 kW.

>>> **Output limitation in compressor mode**

F value	50% of Output per unit
Lowest value	0.0kW
Highest value	Output per unit

Tab. 157 Output limitation

- ▶ Set the output permitted at the same time when the compressor is in operation.

>>> **Output limitation when additional heat only**

F value	Output per unit
Lowest value	0.0kW
Highest value	Output per unit

Tab. 158 Output limitation during additional heat only

- ▶ Set the output permitted when the compressor is not in operation.

>>> **Output limitation in hot water mode**

F value	Output per unit
Lowest value	0.0kW
Highest value	Output per unit

Tab. 159 Output limitation in hot water mode

- ▶ Set the output permitted during hot water production.

>> **Regulator settings**

>>> **P constant**

Factory setting	4.0
Lowest value	0.1
Highest value	30.0

Tab. 160 P constant

>>> **I constant**

Factory setting	300.0
Lowest value	5.0
Highest value	600.0

Tab. 161 I constant

>>> **D constant**

Factory setting	0.0
Lowest value	0.0
Highest value	10.0

Tab. 162 D constant

>>> **Minimum PID signal**

Factory setting	0%
Lowest value	0%
Highest value	100%

Tab. 163 Minimum PID signal

>>> **Maximum PID signal**

Factory setting	100%
Lowest value	0%
Highest value	100%

Tab. 164 Maximum PID signal

> **Additional heat program**

This function can be used to set the times between which additional heat mode is blocked.

>> **Activate program**

F value	No
Alternative	No/Yes

Tab. 165 Activate additional heat program

>> **View/edit active program**

Only displayed if a program has been selected.

>> **Outdoor temperature limit for deactivation of time control**

Only displayed if a program has been selected.

F value	-26 °C (Off)
Lowest value	-26 °C
Highest value	20 °C

Tab. 166 Outdoor temperature limit time control

- Set a suitable temperature for deactivation of time control. -26 °C = function **Off**.

If T2 is over set **Outdoor temperature limit for deactivation of time control** for 15 minutes, or if **Outdoor temperature limit for deactivation of time control** be set to **Off**, the additional heat should be blocked by time control as long as **Additional heat program** is activated.

If T2 is under set **Outdoor temperature limit for deactivation of time control** or if **Additional heat program** is deactivated the additional heat should be not blocked by time control.

15.9 Safety functions

- **Setting collector circuit in T10**
- **Setting collector circuit out T11**
- **Heat pump x**

The settings for collector circuit in/out are:

> **Setting collector circuit in T10/Setting collector circuit out T11**>> **Lowest permitted temperature E21.T10/ Lowest permitted temperature E21.T11**

Factory setting	-10.0 °C 4.0 °C Groundwater (T10) 2.0 °C Groundwater (T11)
Lowest value	-10.0 °C
Highest value	20.0 °C

Tab. 167 Lowest temperature, collector circuit

>> **Hysteresis alarm reset**

Factory setting	1.0K
Lowest value	1.0K
Highest value	10.0K

Tab. 168 Hysteresis

>> **Number of warnings before alarm**

Factory setting	1
Lowest value	1
Highest value	4

Tab. 169 Number of warnings before alarm

The number of warnings is calculated during a time period of 180 min.

> **Heat pump x**>> **Acknowledge phase guard**

Factory setting	Yes
Alternative	No/Yes

Tab. 170 Acknowledge phase guard

15.10 General

Among other things, settings for date and time are available here.

> Set date

Factory setting	
Format	yyyy-mm-dd

Tab. 171Date

> Set time

Factory setting	
Format	hh:mm:ss

Tab. 172Time

- ▶ Check and change, if necessary, date and time. These are used by the control unit to manage the different clock settings, e.g., holiday and room temperature program.

> Summer/winter time

Factory setting	Automatic
Alternative	Manual/Automatic

Tab. 173Summer/winter time.

- ▶ Select if there should be automatic change over between summer and winter time or not (times according to EU standard).

> Display backlight intensity

Factory setting	100%
Lowest value	20%
Highest value	100%

Tab. 174Display backlight intensity

- ▶ If necessary, change the background light of the control panel.

> Language

- ▶ Change language, if desired.

15.11 Alarms

The different alarms that can occur are described in (→Chapter 16).

Under **Alarms** there is:

- **Information log**
- **Delete information log**
- **Alarm log**
- **Delete alarm log**
- **Alarm history**

- **Alarm indication**

> Information log

The information log displays information from the heat pump. The control panel output mode displays the symbol for information log when the active information is available.

> Delete information log

The information log is deleted here.

> Alarm log

The alarm log shows the alarms and warnings that have occurred. Alarm category (→ Chapter 16.7) is displayed in the top left corner of the display and if the alarm is active, the alarm symbol is displayed both in the alarm log and the initial menu of the control panel.

> Delete alarm log

The alarm log is deleted here.

> Alarm history

Alarm history shows extensive information about the 20 most recent alarms that have occurred. For example actual and set point values of the temperature sensor and heat pump status at the time of the alarm. Limited information is displayed for older alarms.

> Alarm indication

Under **Alarm indication** settings for alarm buzzer and status lamp are made here.

>> Alarm buzzer signal

>>> Interval

Factory setting	2s
Lowest value	2s
Highest value	3600s (60min)

Tab. 175Interval

- ▶ Set the length of the alarm interval.
The alarm buzzer sounds for one second and is silent during the rest of the interval. The setting applies to all alarm buzzers.

>>> Blocking time

Factory setting	Off
Start time	0:00 - 23:45
Stop time	0:00 - 23:45

Tab. 176Blocking time

- ▶ Indicate the times between which the alarm buzzer may not give out a sound.
All alarm buzzers are silent during a set interval.

>> Alarm indication control unit

>>> Block alarm buzzer

Factory setting	No
Alternative	No/Yes

Tab. 177 Block alarm buzzer

The setting applies only to the control unit's alarm buzzer.

>> Alarm indication room sensor

>>> Block alarm buzzer

Factory setting	Yes
Alternative	No/Yes

Tab. 178 Block alarm buzzer

- ▶ Set if the alarm buzzer should be off or not.

The setting applies to **Circuit 1** and to a CANbus-connected room sensor.

>>> Block alarm indicator lamp

Factory setting	Yes
Alternative	No/Yes

Tab. 179 Block status lamp

- ▶ Set if the indicator lamp should be off or not.

The setting applies to all room sensors.

>> General alarm level

>>> Alarms and warnings

Factory setting	No
Alternative	No/Yes

Tab. 180 Alarms and warnings

No means that alarms produce a signal on the general alarm output. **Yes** means that alarms as well as warnings produce a signal on the general alarm output.

15.12 Access level

Access level is **Customer** as standard: This level gives you access to all functions that the user requires. The installer also has access to the additional functions required at installation.

15.13 Return to factory settings

- ▶ Select **Return to factory settings** and **Yes** to reset all settings to the factory settings. Settings made by the customer are not affected.

Factory setting	No
Alternative	Yes/No

Tab. 181 Return to factory settings

16 Alarms

16.1 Alarms

This section includes:

- **Information log** (→ Chapter 15.11)
- **Delete information log** (→ Chapter 15.11)
- **Alarm log** (→ Chapter 15.11)
- **Delete alarm log** (→ Chapter 15.11)
- **Alarm history** (→ Chapter 15.11).

16.2 Control unit and room sensor alarm lamp

The status lamp on the control unit is used to show ON/OFF status for the heat pump but also to show possible alarms. The status lamp is therefore also called alarm lamp. If there are room sensors, it/they provides the same information as the lamp on the heat pump.

In the event of an alarm the alarm lamp flashes blue (control unit) until the warning cause has disappeared. The alarm lamp is not used for warning alarms. The room sensor alarm lamp can be blocked.

Behaviour	Function
<i>The lamp lights green continuously.</i>	The heat pump is running.
<i>The lamp flashes red</i>	There is an alarm which has not been acknowledged
<i>The lamp lights red continuously.</i>	The alarm has been acknowledged but the alarm cause remains
<i>Lamp flashes green slowly</i>	The heat pump is in stand-by mode ¹⁾

Tab. 182 Alarm lamp control unit

1) Stand-by means that the heat pump is running but no heating or hot water demand exists.

The alarm lamp of the CANbus sensor shows the same information as the alarm lamp of the control unit.

Other room sensors flash with low-frequency red light in the event of alarms; the lamp is otherwise off.


16.3 Alarm display

When an alarm/warning occurs, the display shows information about what has happened. At the same time, information is saved in the alarm log and alarm history.

16.4 Alarm buzzer at alarm

When there is an alarm, the alarm buzzer on the heat pump and the CANbus-connected room sensor sounds for a second per set alarm interval. The alarm buzzer can be blocked for a certain part of the day or completely. In the event of a warning alarm, the alarm buzzer does not sound.

16.5 Acknowledgement of alarms

Acknowledgement means that you have to press  to make the alarm window disappear. What happens after acknowledgement is described in the respective alarm description.

In most cases, warnings do not have to be acknowledged. The alarm window disappears by itself once the warning cause has disappeared. It is, however, possible to acknowledge the warning.

16.6 Alarm timer, alarm mode

In the event of an alarm that stops the compressor the control unit starts a timer at 1h. If the fault does not recur additional heat may start when the timer has counted down.

16.7 Alarm categories

The alarms are divided into different categories depending on the type and seriousness of the fault.

Alarm category is displayed in the alarm window, alarm log and alarm history.

Categories A-H are alarms, categories I-J are warnings/information, categories K-M are warnings, category Z is information.

Meaning	A	B	C	D	E	F	G	h	In	J	K	L	M	Z
Stops the compressor	X	X	X	X	X				X	X				
Stops additional heat						X	X				X			
Alarm lamp, alarm buzzer is activated	X	X	X	X	X	X	X	X						
Alarm delay	5s	3s	15 min	1 min	5s	1s	1s	1s	5s	5s	2s	5s	0s	0s
Requires acknowledgement to restart	X	X	X	X		X								
Can be restarted before acknowledgement					X		X	X	X	X	X		X	
Menu display must be acknowledged	X	X	X	X	X	X	X	X				X	X	
Placed in the information log									X	X				X

Tab. 183 Alarm categories

- In** Temporary stop of compressor. The information may recur a number of times during a certain time period; if there are more during the period, a category A alarm is sounded.
- J** Temporary stop of compressor. The information may recur a number of times during a certain time period; if there are more during the period, a category A alarm is sounded.
- M** Used for board connection problems.

16.8 Alarm window

When an alarm/warning occurs, the display shows information about what has happened. At the same time, information is saved in the alarm log and alarm history.

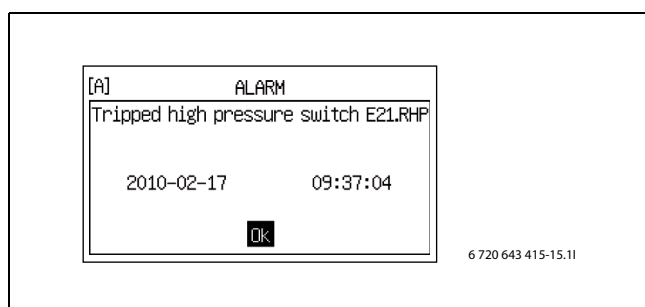


Fig. 60 Example

16.9 Alarm functions

The alarm text is indicated in the heading.

16.9.1 High hot gas temperature E2x.T6

Function: Compressor stops. Activated when the temperature on sensor T6 exceeds the applicable maximum hot gas temperature.

Alarm timer starts: Yes.

Reset condition: The hot gas temperature drops 5K below the alarm limit.

Category: A.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required.

16.9.2 Tripped low pressure switch E2x.RLP

Function: The compressor is stopped because of too low pressure in the refrigerant circuit. Activated on open contact on the low pressure switch. The alarm is delayed with 150s after compressor start or alternation between hot water and heating production.

Alarm timer starts: Yes.

Reset condition: Closed signal over the pressure switch.

Category: A.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required.

16.9.3 Tripped high pressure switch E2x.RHP

Function: The compressor is stopped because of too high pressure in the refrigerant circuit. Activated on open contact on the high pressure switch.

Alarm timer starts: Yes.

Reset condition: Closed signal over the pressure switch.

Category: A.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required.

16.9.4 Low pressure collector circuit

Function: If **Alarm at low pressure in collector circuit** is selected and the external input closes, this alarm is triggered. The compressor stops (→ Chapter 15.6).

Alarm timer starts: Yes.

Reset condition: The pressure exceeds the set level. The setting is made on the pressure switch.

Category: A.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required.

16.9.5 Low temperature collector circuit in E2x.T10

Function: Warning/alarm is given if the temperature of the collector circuit in is too low. First, a warning is given. If the warning appears several times during a certain time period, the warning transforms into a category A alarm.

For settings of T10: (→Chapter 15.9).

Alarm timer starts: Yes.

Reset condition: T10 exceeds the lowest permitted temperature T10 plus hysteresis.

Category: J which goes over into A.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required in category A.

16.9.6 Low temperature collector circuit out E2x.T11

Function: Warning/alarm is given if the temperature of the collector circuit out is too low. First, a warning is given. If the warning appears several times during a certain time period, the warning transforms into a category A alarm.

For settings of T11: (→Chapter 15.9).

Alarm timer starts: Yes.

Reset condition: T11 exceeds the lowest permitted temperature T11 plus hysteresis.

Category: J which goes over into A.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required in category A.

16.9.7 Motor cut-out 1 E2x.F11, Compressor

Function: Activated when the compressor's motor cut-out has tripped because of high current or lost current phase resulting in undue strain on the compressor.

Alarm timer starts: Yes.

Reset condition: Motor cut-out reset.

Category: B.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required.

16.9.8 Motor cut-out 2 E2x.F12, Collector circuit pump

Function: Activated when the collector circuit pump motor cut-out has tripped. The collector circuit pump stops and the compressor also stops so as to prevent the evaporator from freezing.

Reset condition: Motor cut-out reset.

Category: B.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required.

16.9.9 Phase error E2x.B1

Function: The compressor stops when the phase guard trips because of the lack of a phase or the presence of a phase sequence error. A voltage difference > 15 % between the phases also results in an alarm.

Alarm timer starts: Yes.

Reset condition: The error has been remedied and the phase guard is under voltage.

In the event of a voltage difference: The difference between phases has been reduced to < 15 %.

Category: E.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required.

16.9.10 Failure on sensor E2x.T6 hot gas

Function: The compressor stops because the hot gas cut-out cannot be guaranteed. Activated when the sensor's value indicates a temperature lower than -50 °C.

Alarm timer starts: Yes.

Reset condition: The value of the sensor indicates > -50 °C.

Category: E.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.11 Short circuit on sensor E2x.T6 hot gas

Function: The compressor stops because the hot gas cut-out cannot be guaranteed. Activated when the sensor's resistance value indicates a temperature higher than 150 °C.

Alarm timer starts: Yes.

Reset condition: The value of the sensor indicates < 150 °C.

Category: E.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.12 High flow temperature E1x.T1

Function: The compressor stops because the flow line temperature is too high for the heating circuit. Activated when the sensor shows a value which is 5K higher than the highest set point value for the circuit. The factory setting for the highest set point value is 60 °C for radiator type of circuit and 35 °C for underfloor type of circuit

After hot water production, the alarm is delayed with 4 min.

Alarm timer starts: Yes.

Reset condition: The sensor's value falls below the temperature for beginning of the heating demand.

Category: E.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.13 Faulty electric heater E21.E2

Function: The electric heater is turned off. Activated by triggered overheat protection on the electric add. heat, high flow temperature or too high temperature in the electric add. heat.

Reset condition: Overheat protection reset.

Category: F.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required.

16.9.14 Faulty external additional heat E71.E1.E1.F21

Function: External additional heat refers to additional heat which is controlled as mixed additional heat or via 0-10V signal. If the alarm signal from the additional heat has been connected to 10 - C on the PEL board, the alarm can be given when an error occurs. The type of error depends on the connected unit.

Reset condition: The error in the external additional heat has been overcome and no alarm signal.

Category: F.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required.

16.9.15 Overheat protection tripped hot water electric heater

Function: The electric heater is turned off. If alarm output from the electric heater has been connected to the control unit, the alarm is given when an error occurs.

Reset condition: The error in the electric heater has been overcome and no alarm signal.

Category: F.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required.

16.9.16 Failure on sensor E31.T32 anti-freeze cooling

Function: Activated when the sensor's value indicates a temperature lower than -10 °C. The sensor is used in the collector circuit for cooling in order to prevent the heat exchanger from freezing. The mixing valve in the collector circuit is closed.

Reset condition: The value of the sensor indicates >-10 °C.

Category: G.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.17 Short circuit on sensor E31.T32 anti-freeze cooling

Function: Activated when the sensor's value indicates a temperature higher than 30 °C. The sensor is used in the collector circuit for cooling in order to prevent the heat exchanger from freezing. The mixing valve in the collector circuit is closed.

Reset condition: The value of the sensor indicates < 30 °C.

Category: G.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.18 Error dew point sensor E1x.TM

Function: Activated when voltage 0-10V for temperature falls below 0.5V or exceeds 8V. Also activated when voltage 0-10V for humidity falls below 0.5V or exceeds 9.8V. Cooling on current mixing valve is aborted. The alarm may appear after a power failure but the alarm cause normally disappears automatically and the only thing that has to be done is to acknowledge the alarm.

Reset condition: The sensor's value for temperature is 1V-7V and the sensor's value for humidity is 1-9.7V.

Category: G.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.19 Faulty protective anode E41.F31

Function: The alarm is activated when the anode in the hot water heater is broken or does not work. Presupposes that **Yes** is indicated in **Protective anode installed**.

Reset condition: The anode should be taken care of so as to prevent corrosion in the hot water heater.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Acknowledgement is required.

16.9.20 Failure on sensor E11.T1 flow

Function: The alarm is activated when the sensor's value indicates a temperature lower than 0 °C. The flow line temperature T1 becomes identical to T8. If there are several heat pumps installed, T1 = T8 for the heat pump that does not produce hot water and has the highest value on T8. Additional heat mixing valve shut.

Reset condition: The value of the sensor indicates >0 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.21 Short circuit on sensor E11.T1 flow

Function: The alarm is activated when the sensor's value indicates a temperature higher than 110 °C. The flow line temperature T1 becomes identical to T8. If there are several heat pumps installed, T1 = T8 for the heat pump that does not produce hot water and has the highest value on T8. Additional heat mixing valve shut.

Reset condition: The value of the sensor indicates < 110 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.22 Failure on sensor E12.T1, E13.T1... flow

Function: The alarm is activated when the sensor's value indicates a temperature lower than 0 °C. The mixing valve for the circuit is closed completely.

Reset condition: The value of the sensor indicates >0 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.23 Short circuit on sensor E12.T1, E13.T1... flow

Function: The alarm is activated when the sensor's value indicates a temperature higher than 110 °C. The mixing valve for the circuit is closed completely.

Reset condition: The value of the sensor indicates < 110 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.24 Failure on sensor T2 outdoor

Function: The alarm is activated when the sensor's value indicates a temperature lower than -50 °C. In the event of a failure on T2, the outdoor temperature is set to 0 °C.

Reset condition: The value of the sensor indicates > -50 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.25 Short circuit on sensor T2 outdoor

Function: The alarm is activated when the sensor's value indicates a temperature higher than +70 °C. In the event of a short circuit on T2, the outdoor temperature is set to 0 °C.

Reset condition: The value of the sensor indicates < 70 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.26 Failure on sensor T3 hot water

Function: The alarm is activated when the sensor's value indicates a temperature lower than 0 °C. The hot water production is terminated.

Reset condition: The value of the sensor indicates >0 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.27 Short circuit on sensor T3 hot water

Function: The alarm is activated when the sensor's value indicates a temperature higher than +110 °C. The hot water production is terminated.

Reset condition: The value of the sensor indicates < 110 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.28 Failure on sensor E1x.TT.T5 room

Function: The alarm is activated when the sensor's value indicates a temperature lower than -1 °C. In the event of a failure on sensor T5, the room temperature influence is set to 0.

Reset condition: The value of the sensor indicates > -1 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.29 Short circuit on sensor E1x.TT.T5 room

Function: The alarm is activated when the sensor's value indicates a temperature higher than +70 °C. In the event of a short circuit on sensor T5, the room temperature influence is set to 0.

Reset condition: The value of the sensor indicates < 70 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.30 Failure on sensor E31.TT.T5 room

Function: The alarm is activated when the sensor's value indicates a temperature lower than -1 °C. In the event of a failure on sensor T5, the room temperature influence is set to 0.

Reset condition: The value of the sensor indicates > -1 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.31 Short circuit on sensor E31.TT.T5 room

Function: The alarm is activated when the sensor's value indicates a temperature higher than +70 °C. In the event of a short circuit on sensor T5, the room temperature influence is set to 0.

Reset condition: The value of the sensor indicates < 70 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.32 Failure on sensor E2x.T8 heat transfer fluid out

Function: Activated when the sensor's value indicates a temperature lower than 0 °C. To be able to make hot water, T8 is set at a temperature calculated according to the following formula: $T8 = T9 + Compressor \times 7K + 0.07K \times current\ output\ in\ operation$.

The active compressor provides $Compressor = 1$ and *current output in operation* means additional heat in %. Compressor operation and 50% additional heat then give $T8 = T9 + 10.5K$. Compressor off ($Compressor = 0$) and no additional heat (0%) give $T8 = T9$.

Reset condition: The value of the sensor indicates >0 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.33 Short circuit on sensor E2x.T8 heat transfer fluid out

Function: Activated when the sensor's value indicates a temperature higher than 110 °C. T8 is calculated according to the same formula as in the event of a failure → Chapter 16.9.32).

Reset condition: The value of the sensor indicates < 110 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.34 Failure on sensor E2x.T9 heat transfer fluid in

Function: Activated when the sensor's value indicates a temperature lower than 0 °C. T9 is calculated according to the following formula: $T9 = T8 - Compressor \times 7K + 0.07K \times current\ output\ in\ operation$.

Reset condition: The value of the sensor indicates >0 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.35 Short circuit on sensor E2x.T9 heat transfer fluid in

Function: Activated when the sensor's value indicates a temperature higher than 110 °C. T9 is calculated according to the following formula: $T9 = T8 - \text{Compressor} \times 7K + 0.07K \times \text{current output in operation}$.

Reset condition: The value of the sensor indicates < 110 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.36 Failure on sensor E2x.T10

Function: Activated when the sensor's resistance value indicates a temperature lower than -20 °C. In the event of a failure, T10 is set at a temperature calculated according to the following formula: $T10 = T11 + \text{Compressor} \times 3K$.

Reset condition: The value of the sensor indicates > -20 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.37 Short circuit on sensor E2x.T10

Function: Activated when the sensor's value indicates a temperature higher than 40 °C. In the event of a short circuit, T10 is set at a temperature calculated according to the following formula: $T10 = T11 + \text{Compressor} \times 3K$.

Reset condition: The value of the sensor indicates < 40 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.38 Failure on sensor E2x.T11

Function: Activated when the sensor's value indicates a temperature lower than -50 °C. In the event of a failure, T11 is set at a temperature calculated according to the following formula: $T11 = T10 - \text{Compressor} \times 3K$.

Reset condition: The value of the sensor indicates > -50 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.39 Short circuit on sensor E2x.T11

Function: Activated when the sensor's value indicates a temperature higher than 40 °C. In the event of a short circuit, T11 is set at a temperature calculated according to the following formula: $T11 = T10 - \text{Compressor} \times 3K$.

Reset condition: The value of the sensor indicates < 40 °C.

Category: H.

Alarm lamp/buzzer: Yes.

Restart: Automatic once the alarm cause has disappeared.

16.9.40 Additional heat is now working at its highest temperature

Function: The electric additional heat begins to be stepped down. The warning is activated in additional heat mode if the sensor T8 approaches the highest temperature permitted for T8. The warning is blocked during hot water peaks or extra hot water.

Reset condition: The warning is deactivated when the sensor temperature falls sufficiently.

Category: K.

Alarm lamp/buzzer: No.

Restart: Automatic once the alarm cause has disappeared.

16.9.41 Electric additional heat shut down due to high temperature E2x.T8

Function: The electric heater is turned off. The warning is activated in additional heat mode if the sensor T8 exceeds 80 °C.

Reset condition: The warning is deactivated when T8 falls below 76 °C.

Category: K.

Alarm lamp/buzzer: No.

Restart: Automatic once the alarm cause has disappeared.

16.9.42 High temperature difference heat transfer fluid E2x

Function: The warning is activated when the difference between sensor E2x.T8 and E2x.T9 exceeds 13K. 10 min after compressor start and change of production mode, the temperature difference is measured and if it is too big, the warning is given after a delay of 3 min. The warning is not given when the compressor is inactive or when additional heat is allowed.

Reset condition: The warning does not shut down any function but is registered in the alarm log.

Category: L.

Alarm lamp/buzzer: No.

Restart: Deactivated on acknowledgement of the warning display.

16.9.43 High temperature difference collector circuit E2x

Function: The warning is activated when the difference between sensor E2x.T10 and E2x.T11 exceeds 6K. 30 min after compressor start and change of production mode, the temperature difference is measured and if it is too big, the warning is given after a delay of 15 min. The warning is not given when the compressor is inactive.

Reset condition: The warning does not shut down any function but is registered in the alarm log.

Category: L.

Alarm lamp/buzzer: No.

Restart: Deactivated on acknowledgement of the warning display.

16.9.44 Screed drying set point value for heating not reached

Function: Activated when the set point value for a drying step has not been reached.

Reset condition: The warning is deactivated on acknowledgement of the warning display.

Category: L.

Alarm lamp/buzzer: No.

Restart: The warning does not shut down anything, the drying program continues with the following step.

16.9.45 The heat pump is now working in anti-freeze mode

Function: Activated when the flow line temperature of a circuit falls below 8 °C and the 10-min timer has counted down.

Reset condition: The circuit's flow line exceeds 25 °C.

Category: L.

Alarm lamp/buzzer: No.

Restart: Automatic once the alarm cause has disappeared.

16.9.46 Check connection to I/O board x

Function: Depends on the board.

Reset condition: Communication with the board is re-established.

Category: M.

Alarm lamp/buzzer: No.


Restart: Acknowledgement is required.

16.10 Alarm log

The alarm log shows the alarms, warnings and other information that has come up. Alarm category (→ Chapter 16.7) is displayed in the top left corner of the display and if the alarm is active, the alarm symbol is displayed both in the alarm log and the initial menu of the control panel.

16.11 Alarm history

The alarm history saves complete information about the latest 20 alarms/warnings. Older alarms are displayed with limited information. What happened latest is listed as number 1.

Press  and turn the dial to see all information about the alarm. Turn the dial to see more alarms.

The information shows the current values immediately after the appearance of the alarm but before action/cancellation.

Information	Comment/Value
Alarm category	Letter (→Table 16.7). Displayed in the top left corner of the display.
Alarm text	Displayed at the top of the display. Full component name is most often indicated.
Start date, Start time	Indicates when the alarm occurred
Stop date, Stop time	Indicates when the alarm was acknowledged/cancelled
=====	
=	
Heat pump x	On (/%) / Off
Additional heat	%/Off/Blocked
=====	
=	
T1 Flow line	Current value
T1 Flow line set point value	Current set point value
T2 Out	Current outdoor temperature
Hot water	Calculated hot water temperature
Hot water set point value	
T5 Room	Current value if room sensor exists

Tab. 184 Information in Alarm history

Information	Comment/Value
Room	Current value if room sensor does not exist/is used
G1 Heat carrier pump	Off/On
=====	
=	
Heat pump E2x	
E2x.T6 Hot gas	Current value
E2x.T8 Heating medium out.	Current value
E2x.T9 Heating medium in	Current value
E2x.T10 Collector circuit in	Current value
E2x.T11 E2x.T10 Collector circuit out	Current value
E2x.RLP Low pressure switch	OK/Error
E2x.RHP High pressure switch	OK/Error
E2x.G2 Heat carrier pump	Off/On
E2x.G3 Collector circuit pump	Off/On
E2x.Q21 3-way valve	Off/On

Tab. 184 Information in Alarm history

16.12 Information log

The information log displays information from the heat pump.

16.12.1 High flow temperature E2x.T8

Function: Compressor stops. Activated when the temperature on sensor T8 exceeds the maximum permitted temperature for T8.

Reset condition: Restarts when E2x.T9 falls below the saved temperature with hysteresis on 3K (not adjustable).

Category: I.

16.12.2 Temporary heat pump stop E21.RLP

Function: Activated when the pressure in the refrigerant circuit of the heat pump becomes too low. If the information appears several times during a certain time period, the information transforms into a category A alarm (→ Chapter 16.9.2).

Reset condition: The pressure goes back to the permitted level.

Category: I.

16.12.3 Temporary heat pump stop E21.RHP

Function: Activated when the pressure in the refrigerant circuit becomes too high. If the information appears several times during a certain time period, the information transforms into a category A alarm (→ Chapter 16.9.3).

Reset condition: The pressure goes back to the permitted level.

Category: I.

16.12.4 Low temperature collector circuit in E2x.T10

Function: The information is given if the temperature of the collector circuit in is too low. First, a information is given. If the information appears several times during a certain time period, the informations transforms into a category A alarm.

For settings of T10: (→Chapter 15.9).

Alarm timer starts: Yes.

Reset condition: T10 exceeds the lowest permitted temperature T10 plus hysteresis.

Category: J which goes over into A.

16.12.5 Low temperature collector circuit out E2x.T11

Function: The information is given if the temperature of the collector circuit out is too low. First, a information is given. If the information appears several times during a certain time period, the warning transforms into a category A alarm.

For settings of T11: (→Chapter 15.9).

Alarm timer starts: Yes.

Reset condition: T11 exceeds the lowest permitted temperature T11 plus hysteresis.

Category: J which goes over into A.

16.12.6 Hot water peak failure, new try within 24 hours

Function: The hot water has not come up at the right temperature. The hot water peak is repeated at the same time on the next day.

Reset condition: The correct hot water peak temperature is reached.

Category: Z.

16.12.7 Temporary heat pump stop due to working area limits

Function: The information is displayed only if *Hot gas stop function activated* has been set to Yes. The compressor stops until the hot gas temperature falls below the set limit.

Reset condition: The hot gas temperature is within the range of the compressor.

Category: Z.

16.12.8 Temporary hot water stop due to working area limits

Function: The information is displayed only if *Hot gas stop function activated* has been set to Yes. Ongoing hot water operation is aborted and replaced with heating operation.

Reset condition: The hot gas temperature is within the range of the compressor.

Category: Z.

16.12.9 Additional heat is now working at its highest temperature

Function: The additional heat begins to be stepped down. The information is activated in additional heat mode if the outgoing temperature (T1 or T8) approaches the set maximum value. The information is blocked during hot water peaks or extra hot water.

Reset condition: The information is deactivated when the temperature falls.

Category: Z.

17 Factory settings

17.1 Return to factory settings

The function exists on both customer and installer level. All settings available to the customer are restored on customer level.

All settings on installer level are restored when the

function is used on installer level. Customer level settings are not affected.

17.2 Factory values

Access level 0 = Customer

Access level 1 = Installer

Room temperature			F value	Access level	
General	Summer/winter operation	Winter operation	Automatic	0	
		Outdoor temperature limit for change over	18 °C	0	
		Delay before change over to winter operation	4h	1	
		Delay before change over to summer operation	4h	1	
		Direct start limit for winter operation	13 °C	1	
	Maximum operating time for heating at hot water demand		20min	0	
	Shut down protection during change over from hot water to heating		300s	1	
	Minimum outdoor temperature		-35 °C	1	
Circuit 1 Heating	External set point value		No	1	
	Type of heating system		Radiator	1	
	Highest permitted flow temperature T1		80/45 °C	1	
	Lowest permitted flow temperature T1		10 °C	1	
	Heat curve			0	
	Heat curve hysteresis heat pump x	Maximum		16.0K	1
		Minimum		4.0K	1
		Time factor		10.0	1
	Room sensor (if such exists)	Room temperature influence		3,0	0
		Knob's operating range		6K	0
		Acknowledge room sensor		(Auto)	1
	Room temperature program	Active program		Optimised	0
		View/edit active program			0
		Room temperature normal		20.0 °C	0
		Room temperature increase/decrease (no room sensor)		=	0
Setting room temperature increase/decrease (no room sensor)				1	
--- Limit value for right and left end point			0.0 °C	1	
--- Change when much colder / warmer			8%	1	
--- Change when colder/warmer			3%	1	
Room temperature influence (no room sensor)			3.0	0	
Room temperature exception			17.0 °C	0	
Copy to all heating circuits			No	0	

Tab. 185 Factory settings Room temperature

Factory settings

Room temperature			F value	Access level	
Circuit 2, 3...(optional)	Mixing valve mode		Off	1	
	Type of heating system		Underfloor	1	
	Highest permitted flow temperature T1	Radiator/Underfloor	80/45 °C	1	
	Lowest permitted flow temperature T1		10 °C	1	
	Heat curve			0	
	Room sensor	As Circuit 1 Heating		0, 1	
	Room temperature program	As Circuit 1 Heating minus Copy to all heating circuits		0, 1	
	Regulator settings	P constant		4	1
		I constant		300	1
		D constant		0,0	1
		Minimum PID signal		0%	1
		Maximum PID signal		100%	1
		Mixing valve running time		300s	1
Mixing valve fully closed			2.0K	1	
Mixing valve start closing		2.0K	1		

Tab. 185 Factory settings Room temperature

Hot water			F value	Access level
Acknowledge hot water sensor T3			(Auto)	1
Extra hot water	Extra hot water duration		0h	0
	Extra hot water stop temperature		65 °C	0
Hot water peak	Day of the week		Wednesday	0
	Interval in weeks		1	0
	Start time		3:00	0
	Stop temperature		65.0 °C	1
	Maximum time		3.0h	1
	Time for warm-keeping		1.0h	1
Hot water program	Active program		Always	0
	View/edit active program			0
Hot water mode			Economy	0
Hot water settings heat pump x	Hot water production		Yes/No	1
	Start temperature T3 economy mode		46 °C	1
	Stop temperature T8 economy mode		54 °C	1
	Start temperature T3 comfort mode		56 °C	1
	Stop temperature T8 comfort mode		64 °C	1
Block heating during hot water demand			No	0
Maximum operating time for hot water at heating demand			30 min	0
Protective anode installed			Yes/No	1

Tab. 186 Factory settings Hot water

Installer			F value	Access level	
General	Anti-seizure mode	Day of the week	Wednesday	1	
		Start time	12:00	1	
	Highest permitted flow temperature T1	Radiator/Underfloor	80/45 °C	1	
	Operating mode			1	
	Groundwater	Groundwater	No	1	
	Compressor start delay groundwater	15s	1		
	Time for reset of access level		180 min	1	
Heat pump x capacity			Select	1	
Connected I/O boards	Shows which circuit boards are connected and their program version			1	
Compressor working area	Hot gas stop function activated		No	1	
	Outdoor stop function activated		No	1	
Circulation pumps	Operation alternative heating circuit pump G1		Continuous	1	
	Operation alternative heat carrier pump G2		Automatic	1	
	Heat carrier pump G2 speed		40%	1	
	Operation alternative collector circuit pump G3		Automatic	1	
Screed drying	Activate		No	1	
	Heat source		Compressor	1	
	Remaining time for current step			1	
	Program settings	Flow temperature increase per heating step		5,0K	1
		Number of days per heating step		1	1
		Maximum flow temperature		45 °C	1
		Number of days with maximum temperature		4	1
Flow temperature decrease per cooling step			5.0K	1	
Number of days per cooling step		1	1		

Tab. 187 Factory settings Installer

Additional heat			F value	Access level
Additional heat general	Start delay		60 min	1
	Allow additional heat timer during energy supply cut-off		Economy	1
	Additional heat only		No	1
	Ramp time when additional heat only		3 min	1
	Block additional heat		No	1
	Maximum outdoor temperature for additional heat		10 °C	1
	Additional heat set point value E11.T1 offset		1,0K	1

Tab. 188 Factory settings Additional heat

Factory settings

Additional heat			F value	Access level
Electric additional heat	Electric heater connection	Connected electric heaters		1
		Connect heater 1 to heat pump	1	1
	Connection capacity per el. heater	Output per heater	9kW	1
		Output limitation in compressor mode	4.5kW	1
		Output limitation when additional heat only	9kW	1
		Output limitation in hot water mode	9kW	1
	Regulator settings	P constant	4,0	1
		I constant	300.0	1
		D constant	0.0	1
		Minimum PID signal	0%	1
Maximum PID signal		100%	1	
	Ramp up delay after defrost	10 min	1	
Additional heat program	Active program		No	1
	View/edit active program			1
	Outdoor temperature limit for deactivation of time control		-26,0 °C	1

Tab. 188 Factory settings Additional heat

Safety functions			F value	Access level
Setting collector circuit in T10	Lowest permitted temperature E21.T10		-10,0 °C	1
			4,0 °C Groundwater	
	Lowest permitted temperature E22.T10		-10,0 °C	1
			4,0 °C Groundwater	
	Hysteresis alarm reset		1,0K	1
	Number of warnings before alarm		1	1
Setting collector circuit out T11	Lowest permitted temperature E21.T11		-10,0 °C	1
			2,0 °C Groundwater	
	Lowest permitted temperature E22.T11		-10,0 °C	1
			2,0 °C Groundwater	
	Hysteresis alarm reset		1,0K	1
	Number of warnings before alarm		1	1
Heat pump x	Acknowledge phase guard		Yes	1

Tab. 189 Factory settings Safety functions

Alarms			F value	Access level
Alarm indication	Alarm buzzer signal	Interval	2s	0
		Blocking time	Off	0
	Alarm indication control unit	Block alarm buzzer	No	0
	Alarm indication room sensor	Block alarm buzzer	Yes	0
Block alarm indicator lamp		Yes	0	
General alarm level	Alarms and warnings		No	1

Tab. 190 Factory settings Alarm

18 Function check

18.1 Refrigerant circuit



The refrigerant circuit may only be opened by authorised service engineers with refrigeration authorisation.



DANGER: Risk of toxic fumes!

The refrigerant circuit contains substances which, when released or exposed to open fire, can form toxic fumes. The fumes block the airways even at low concentrations.

- ▶ If the refrigerant circuit is not air-tight, the room must be vacated immediately and properly aired.

When the heat pump starts and there are quick changes in temperature, bubbles may become visible in the sight glass → Image 61..

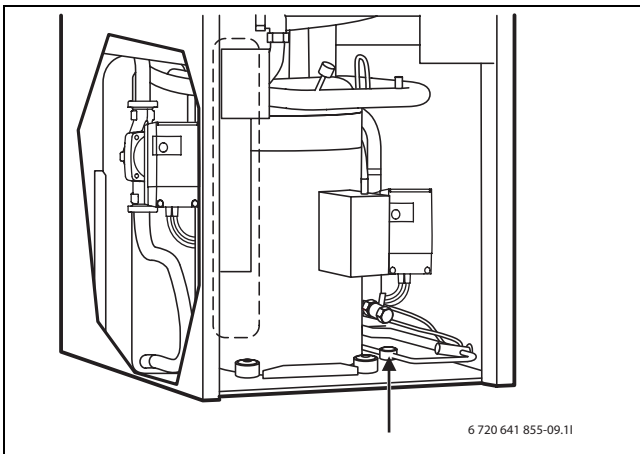


Fig. 61

In the event of constant formation of bubbles:

- ▶ Contact a service representative.

18.2 Filling pressure in collector circuit

- ▶ Check the filling pressure in the collector circuit.

If the filling pressure is lower than 1 bar:

- ▶ Fill up collector circuit fluid (→ Chapter 9.13).

18.3 Setting heating system operating pressure



CAUTION: The heat pump can be damaged.

- ▶ Fill with hot water only when the heat pump is cold.

Pressure gauge reading

1 bar	Minimum system pressure (when cold)
1 - 2 bar	Optimum system pressure
3 bar	Maximum system pressure at maximum central heating system temperature: must not be exceeded (safety valve opens).

Tab. 191

- ▶ If the pointer is below 1 bar (when the system is cold), top up with water to the system until the pointer is between 1 bar and 2 bar again.



Fill the hose with water before topping up the heating system. This will prevent air getting into the central heating system.

- ▶ If there is a pressure drop: check the expansion vessel and heating system for leaks.

18.4 Operating temperatures

Check the temperatures in the heat carrier and collector circuit after 10 minutes of operation:

- Temperature difference between heating forward flow and return approx. 7 ... 10 K.
- Temperature difference between collector circuit in and out approx. 2 ... 5 K, recommendation: 2 ... 3 K.

When the temperature difference is too small:

- ▶ Reduce the speed of the corresponding circulation pump (G2 or G3) in order to obtain a lower flow.

When the temperature difference is too great:

- ▶ Increase the speed of the corresponding circulation pump (G2) in order to obtain a greater flow.

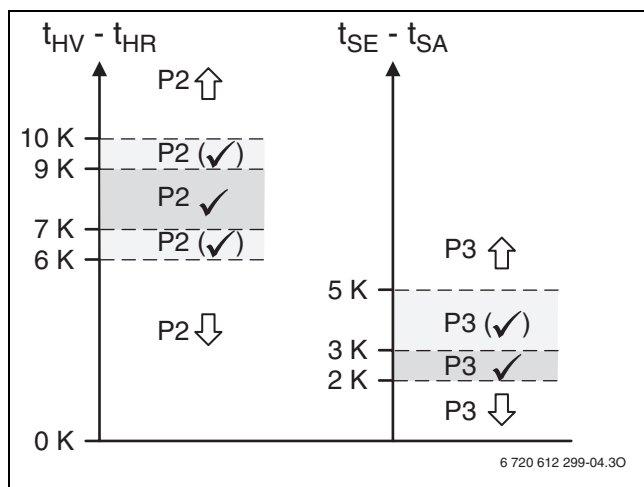


Fig. 62

- P2** Heat carrier pump G2
- P3** Collector circuit pump G3
- t_{SA}** Temperature collector circuit out T11
- t_{SE}** Temperature collector circuit in T10
- t_{HV}** Temperature heat transfer fluid out T8
- t_{HR}** Temperature heat transfer fluid in T9

19 Environmental protection

Environmental protection is a fundamental corporate strategy of the Bosch Group.

The quality of our products, their economy and environmental safety are all of equal importance to us and all environmental protection legislation and regulations are strictly observed.

We use the best possible technology and materials for protecting the environment taking account of economic considerations.

Packaging

We participate in the recycling programmes of the countries in which our products are sold to ensure optimum recycling.

All of our packaging materials are environmentally compatible and can be recycled.

Old products

Old products contain materials which should be sorted.

Component groups are simple to differentiate and the materials are marked. In this way, the different component groups are sorted and handed over for recycling or waste disposal, respectively.

20 Maintenance



DANGER: Risk of electric shock!

- ▶ Switch off the main power supply before starting work on the electrical part.

We recommend that a function check be performed regularly by an authorised installer.

- ▶ Only use genuine spare parts!
- ▶ Refer to the spare parts list when ordering spare parts.
- ▶ Always renew seals and O-rings removed during servicing or repair work.

During service, the activities described below should be conducted.

Show alarms

- ▶ Check the alarm log (→ Chapter 16.10).

Function check

- ▶ A function check should be performed in connection with each service (→ Page 95).

Electrical cable routing

- ▶ Check the electrical cable routing with regard to mechanical damage and replace defective cables.

Check the particle filters for the heating system and collector system

The filters prevent dirt from entering the heat pump. If they are clogged, they can cause malfunctions.

- ▶ Turn off the heat pump.
- ▶ Close the valve.
- ▶ Loosen the lid.
- ▶ Remove the circlip with the circlip pliers.

- ▶ Pull the filter out and clean it, if necessary, under running water.

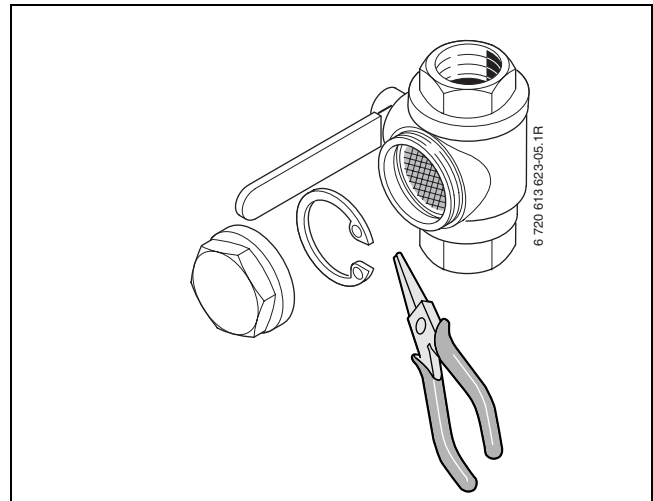


Fig. 63

- ▶ Put the parts back again in reverse order.

21 Commissioning protocol Greenline HE

Customer/responsible for installation:	
Installer of installation:	
Heat pump type:	Serial number:
Commissioning date:	Date of manufacture:
Type of collector:	Total length of collector:
Other components in the installation:	
Additional heat <input type="checkbox"/>	Room sensor T5 <input type="checkbox"/>
Water heater <input type="checkbox"/>	Exhaust air collector <input type="checkbox"/>
3-way valve <input type="checkbox"/>	Hot water sensor T3 <input type="checkbox"/>
	Flow line sensor heating circuit 2 E12.T1 <input type="checkbox"/>
Miscellaneous:	
The following work has been carried out:	
Heating system: filled <input type="checkbox"/> vented <input type="checkbox"/> particle filter cleaned <input type="checkbox"/> minimum flow ensured <input type="checkbox"/> installation of T1 checked <input type="checkbox"/> Heat curve set <input type="checkbox"/>	
Collector system: filled <input type="checkbox"/> vented <input type="checkbox"/> particle filter cleaned <input type="checkbox"/> vents installed <input type="checkbox"/> heat transfer fluid concentration checked <input type="checkbox"/>	
Electrical connection: performed <input type="checkbox"/> motor cut-out settings checked <input type="checkbox"/>	
Sight glass: checked <input type="checkbox"/> notes:	
Operating temperatures after 10 minutes heating/hot water operation:	
Heat transfer fluid out (T8):..... °C	Heat transfer fluid in (T9):..... °C
Temperature difference between Heat transfer fluid out (T8) and in (T9) approx. 6 ... 10 K (°C) <input type="checkbox"/>	
Heat transfer fluid (coll.) in (T10): °C	Heat transfer fluid (coll.) out (T11): °C
Temperature difference between Heat transfer fluid (coll.) in (T10) and Heat transfer fluid (coll.) out (T11) approx. 2 ... 5 K (°C) <input type="checkbox"/>	
Setting heat carrier pump (G2):	Setting collector circuit pump (G3):
Leak test for heating system and collector system carried out <input type="checkbox"/>	
Function check carried out <input type="checkbox"/>	
Customer/responsible for installation: has been informed of how to operate the heat pump <input type="checkbox"/>	
Documentation handed over <input type="checkbox"/>	
Date and signature of installation installer:	

Tab. 192



HEAT PUMPS

Alto Energy Limited
Unit 17 Glenmore Business Centre
Witney, Oxfordshire, OX29 0AA, United Kingdom
www.altoenergy.co.uk | info@altoenergy.co.uk