Installation and service instructions

for contractors

Vitocal 200-G

Compact heat pump type BWP (400/230 V)

For applicability, see the last page

VITOCAL 200-G

5592 795 GB 3/2007

Please keep safe.

Safety instructions

Please follow these safety instructions closely to prevent accidents and material losses.

Safety instructions explained

Danger
This symbol warns against the risk of injury.

Please note
This symbol warns against the risk of material losses and environmental pollution.

Note
Details identified by the word "Note" contain additional information.

Target group

These instructions are exclusively designed for qualified personnel.

- Work on gas equipment must only be carried out by a qualified gas fitter.
- Work on electrical equipment must only be carried out by a qualified electrician.
- The system must be commissioned by the system installer or a qualified person authorised by the installer.

Regulations

Observe the following when working on this system

- all legal instructions regarding the prevention of accidents,
- all legal instructions regarding environmental protection,
- the Code of Practice of relevant trade associations,
- all current safety regulations as defined by DIN, EN, DVGW, TRGI, TRF, VDE and all locally applicable standards.

If you smell gas

Danger
Escaping gas can lead to explosions which may result in serious injury.

- Never smoke. Prevent naked flames and sparks. Never switch lights or electrical appliances ON or OFF.
- Close the gas shut-off valve.
- Open windows and doors.
- Remove all people from the danger zone.
- Notify your gas or electricity supplier from outside the building.
- Shut off the electricity supply to the building from a safe place (outside the building).

If you smell flue gas

Danger
Flue gas can lead to life-threatening poisoning.

- Shut down the heating system.
- Ventilate the boiler room.
- Close all doors leading to the living space.

5592 795 GB

Safety instructions (cont.)

Working on the system

- When using gas as fuel, also close the main gas shut-off valve and safeguard against unauthorised reopening.
- Isolate the system from the power supply and check that it is no longer 'live', e.g. by removing a separate fuse or by means of a main isolator.
- Safeguard the system against unauthorised reconnection.

Please note
Electronic modules can be damaged by electro-static discharges.
Touch earthed objects, such as heating or water pipes, to discharge static loads.

Repair work

Please note
Repairing components which fulfil a safety function can compromise the safe operation of your heating system.
Replace faulty components only with original Viessmann spare parts.

Ancillary components, spare and wearing parts

Please note
Spare and wearing parts which have not been tested together with the heating system can compromise its function. Installing non-authorised components and non-approved modifications/conversion can compromise safety and may invalidate our warranty.
For replacements, use only original spare parts from Viessmann or those which are approved by Viessmann.

5592 795 GB

Index

Installation instructions

Preparing for installation

Installation sequence

Service instructions

Commissioning, inspection, maintenance

Troubleshooting

Control settings

5592 795 GB

Index (cont.)

5592 795 GB

Index (cont.)

5592 795 GB

Index (cont.)

5592 795 GB

Index (cont.)

5592 795 GB

Handling and installation

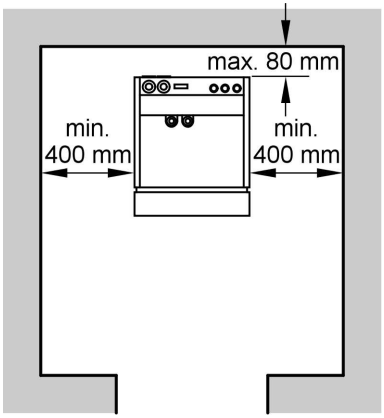
Transport

Do not tilt the heat pump module with compressor by more than 30° during transportation and installation.

Installation room requirements

- The installation room must be dry and safe from the risk of frost.
- To prevent corrosion damage, provide the brine-side heat pump installation with thermal insulation in accordance with current rules as vapour diffusion proof installation.

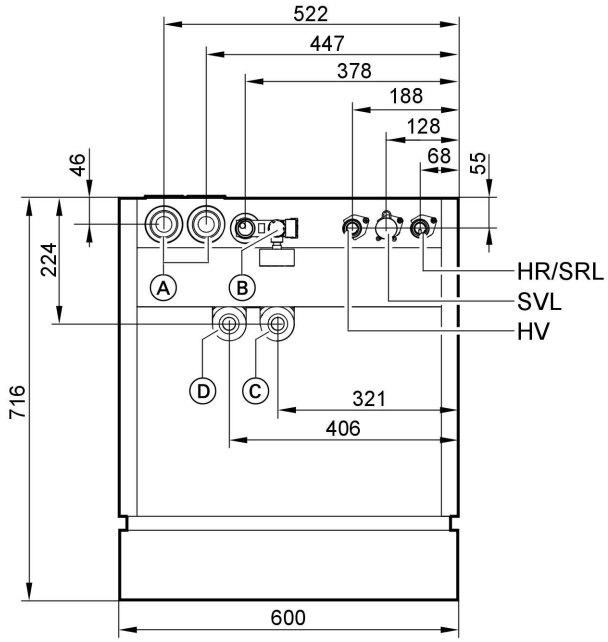
Installation



Wall clearances (plan view)

- To prevent structure-borne noise, never set up the unit on wooden ceilings in the attic.
- Observe required wall clearances as shown in the diagram.
- Level the unit horizontally (see also page 55).

Handling and installation (cont.)



Top panel dimensions (plan view)

Ⓐ Cable entries
Ⓑ Safety assembly
Ⓒ Primary flow (brine) IN
Ⓓ Primary return (brine) OUT
HR Heating return
HV Heating flow
SRL DHW return
SVL DHW flow

Summary of possible system versions

The following table provides an overview of **all** possible system versions. The designs on the following pages are **representative** for four typical heat pump systems.

5592 795 GB

Summary of possible system versions (cont.)

System layout inside the control unit	Standard equipment			Additional equipment (only one option per system design)		Natural cooling
	Direct heating circuit	Heating circuit with mixer	DHW cylinder	Buffer cylinder	Low loss header	
0			X			
1	X			X		X
					X	
2	X		X	X		X
					X	
3		X		X		X
4		X	X	X		X
5	X	X		X		X
					X	
6	X	X	X	X		X
					X	
F	The equipment only responds to external demand signals. All external sensors (e.g. room temperature sensors) and relay outputs are disabled. When a demand is issued by an external signal, primary pump, secondary pump and compressor start (pre-requisite: activation conditions such as temperature limits are complied with).					

Function description of systems

Note

*A pre-requisite for operating 230 V units in **some countries** is that **starting currents of up to 45 A** are permissible in the power grid of the country concerned (observe other country-specific regulations, if necessary).*

*The application examples are recommendations and must be **checked** for completeness and functionality **on site**. Please observe the applicable regulations and directives for design, installation and operation.*

5592 795 GB

Function description of systems (cont.)

Heating circuit

Heat pumps require a **minimum** heating water flow rate. **Please be sure to adhere to the values** specified in the relevant datasheet.
Accurately calculated radiator heating systems generally have a small system water content. With systems like these, use a heating water buffer cylinder with an appropriate capacity to prevent the heat pump from being switched on and off at frequent intervals.
Heat pumps can be shut off by the power supply utility at peak load times depending on the power tariff. For this reason a heating water buffer cylinder should be installed for rapidly cooling heating systems (radiators). The volume of the heating water buffer cylinder should be sufficient to prevent the stored heat from allowing the building to cool down during power-OFF periods.

System versions 2 to 4 do not use a secondary pump but a separate circulation pump as heating circuit pump. We recommend the use of a heating circuit pump with a slower flow rate than the secondary pump. Install a heating water buffer cylinder in parallel to the heating circuit to compensate for the difference between these water volumes.
Systems with large volumes, e.g. underfloor heating systems, will not necessarily require a heating water buffer cylinder. In these heating systems install an overflow valve at the underfloor heating system heating circuit distributor that is furthest away from the heat pump. This ensures that the minimum water circulation volume is provided, even in closed heating circuits.
Install a temperature limiter (accessory, part no. 7151 728 or 7151 729) in conjunction with an underfloor heating system circuit (particularly if an instantaneous heating water heater is installed). Install the temperature limiter, for example, on the underfloor heating circuit pump.

Heating water buffer cylinder operated in parallel

Heating water buffer cylinders provide a hydraulic separation between the media circulating in the heat pump and the heating circuits. For example, the flow rate in the heat pump circuit remains constant, even if the heating circuit flow rate is reduced by thermostatic valves.

The use of a heating water buffer cylinder offers the following advantages:
- Bridging power-OFF periods
- Constant flow rate through the heat pump
- Longer heat pump operating times

5592 795 GB

Function description of systems (cont.)

Systems without heating water buffer cylinder

Never install a mixer to safeguard the minimum heating water circulation volume.

Natural cooling function

During the summer months the temperature level of the primary circuit can be used to cool the building.
The natural cooling function is a method of cooling buildings that saves a considerable amount of energy. All that is needed is a small amount of electricity for the circulation pumps to access the "cooling source" in the ground.
During the cooling operation, the heat pump will only be started to provide DHW. The heat pump control system actuates the circulation pumps, changeover valves and mixers and records the temperature via the natural cooling extension kit.
Alternatively, this function can also be covered by on-site components (for an on-site wiring suggestion, see the Vitocal 200/343 technical guide).
A contact humidistat monitors the dew point.
The capability of the natural cooling function cannot generally be compared with air-conditioning equipment or water chillers. Natural cooling provides no dehumidification.

The cooling capacity depends on the heat source temperature, which itself is subject to seasonal fluctuations. Experience has shown that the cooling capacity is higher at the beginning of summer than at the end. In addition, the water source temperature curve is subject to the cooling demand of the building. Because of large window areas or internal sources (lighting, electrical equipment), the heat source temperature increases more rapidly during the course of a year than it does if less cooling is required.
Underfloor heating systems and concrete core tempering are available for cooling the building; radiator heating systems are unsuitable for this purpose. Ensure that any installed room thermostats are able to be opened manually or by servomotors when using the cooling function.

5592 795 GB

Function description of systems (cont.)

Instantaneous heating water heater

An instantaneous heating water heater can be installed in the unit (accessory, see separate installation instructions).
Subject to the available grid, the system may be supplied with 230 V or 400 V.

Protect the instantaneous heating water heater via a separate connection.
The heat pump control unit regulates this function.

Power-OFF (interruption by the power supply utility)

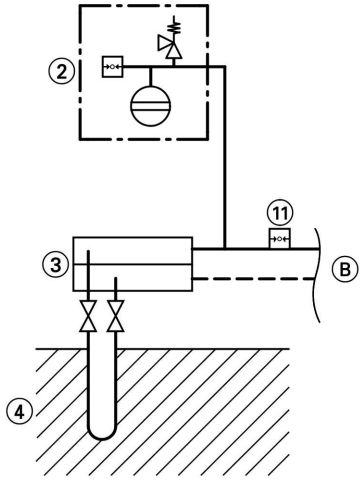
It is possible to have the compressor and the instantaneous heating water heater or just one of these shut off by the power supply utility.
This can be in the form of a "hard" shutdown (contactor shutdown) or a "soft" shutdown by the heat pump control software. For both shutdown methods, the "power-OFF" control unit input signal must be connected (see page 81).

The "hard" shutdown requires an additional control on site (see page 81). This must not shut down the control unit power supply.
For the "soft" shutdown, the component that is being switched off can be selected using the "power-OFF" parameter for the heat pump (see page 137) and/or for the instantaneous heating water heater ("Electric heating", see page 142).

5592 795 GB

System version on the primary side

Hydraulic diagram



Ⓑ Heat pump interface (see from page 16)
② Brine accessory pack
③ Brine distributor for ground probes/ground collectors
④ Ground probes/ground collectors
⑪ Brine circuit pressure switch

Electrical connection

Pressure switch connection for brine circuit, ⑪ see page 18.

Required equipment

Item	Description	Qty.
②	Brine accessory pack	1
③	Brine distributor for ground probes/ground collectors	as required
④	Ground probes/ground collectors	as required
⑪	Brine circuit pressure switch	1

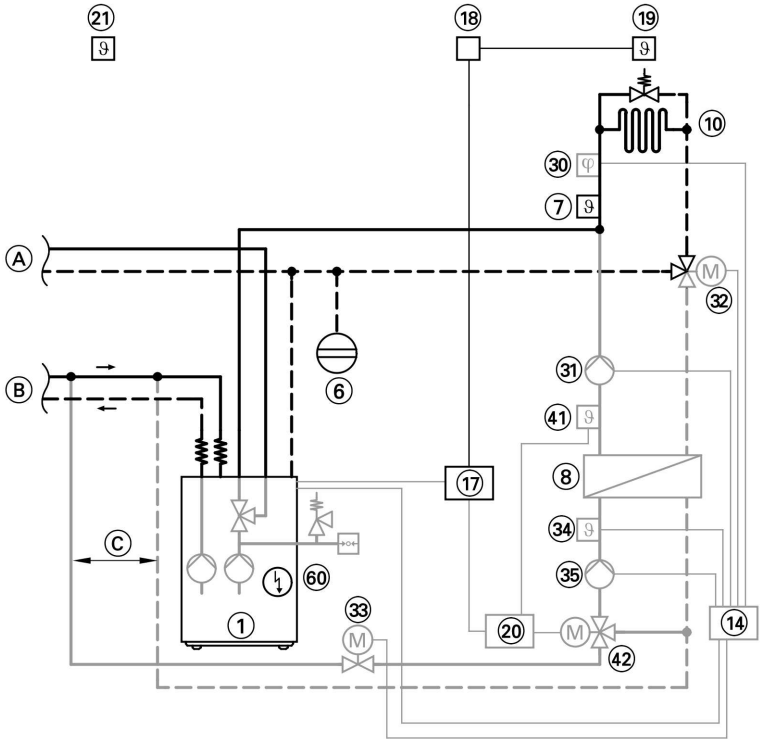
5592 795 GB

System version 1

One heating circuit without mixer, with DHW heating and natural cooling

Note
*To achieve this system version, select **system design 2** at the control unit.*

Hydraulic diagram



Ⓐ DHW cylinder interface (see from page 51)
Ⓑ Primary side interface (see from page 15)
Ⓒ Min. 500 mm (for hydraulic separation)
① Vitocal 200-G, type BWP
⑥ Diaphragm expansion vessel
⑦ Underfloor heating system temperature limiter
⑧ Plate-type heat exchanger
⑩ Underfloor heating circuit
⑭ Natural cooling extension kit
⑰ KM BUS distributor
⑱ Vitotrol 200 remote control
⑲ Room temperature sensor

System version 1 (cont.)

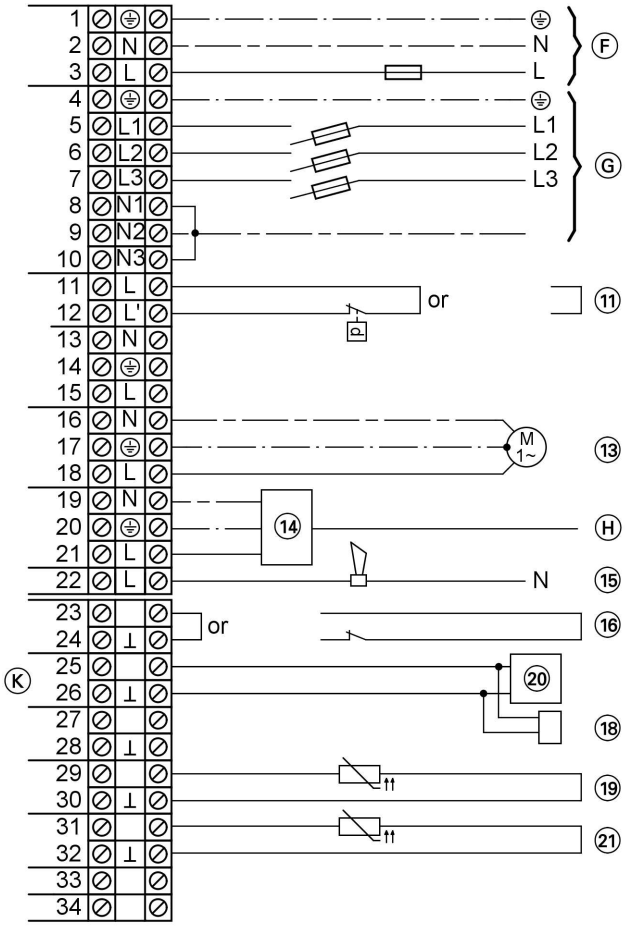
⑳ Extension kit for cooling circuit with mixer
㉑ Outside temperature sensor
㉚ Contact humidistat
㉛ Circulation pump (secondary cooling circuit pump)
㉜ Three-way diverter valve heating/ cooling
㉝ Two-way motorised ball valve
㉞ Frost stat
㉟ Circulation pump (primary cooling circuit pump)
㊶ Cooling circuit flow temperature sensor
㊷ Cooling circuit mixer motor
㊿ Instantaneous heating water heater

5592 795 GB

System version 1 (cont.)

Electrical connection (400 V versions)

Connections at the main connection area X60

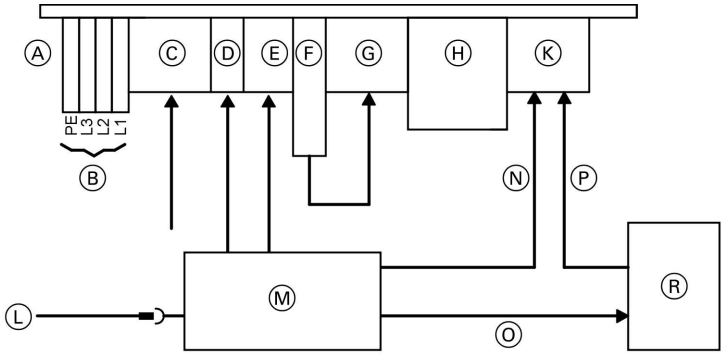


- (F) Control unit power supply (230 V)
- (G) Instantaneous heating water heater power supply cable
- (H) External connections at natural cooling extension kit
- (K) KM BUS
- (11) Brine circuit pressure switch (if the pressure switch is **not** installed, **use** the jumper provided)
- (13) DHW circulation pump
- (14) Natural cooling extension kit

System version 1 (cont.)

⑮ Central fault message (230 V)
⑯ Power-OFF
⑱ KM BUS: Vitotrol 200 remote control (with room temperature sensor), see also page 77
⑲ Room temperature sensor (if no remote control is installed), see also page 77
⑳ KM BUS: Extension kit for cooling circuit with mixer
㉑ Outside temperature sensor

Connections to control module X80, 400 V



Ⓐ Front of control module (with type plate)
Ⓑ Compressor power supply connection
Ⓒ Internal connection to control panel
Ⓓ Primary pump connection (230 V)
Ⓔ Compressor safety chain connection
Ⓕ Phase monitor plug-in location (accessories)
Ⓖ Strapping plug or phase monitor connection
Ⓗ Compressor contactor
Ⓚ Compressor or full wave soft starter connection
Ⓛ Primary temperature sensor (for control purposes)
Ⓜ Heat pump module
Ⓝ Direct connection only with BWP 106
Ⓞ Connection required as of BWP 108
Ⓟ Connection required as of BWP 108
Ⓡ Full wave soft starter (as of BWP 108)

Information regarding other connections

The primary pump, the secondary pump, and the heating/DHW three-way valve have already been connected in the factory.

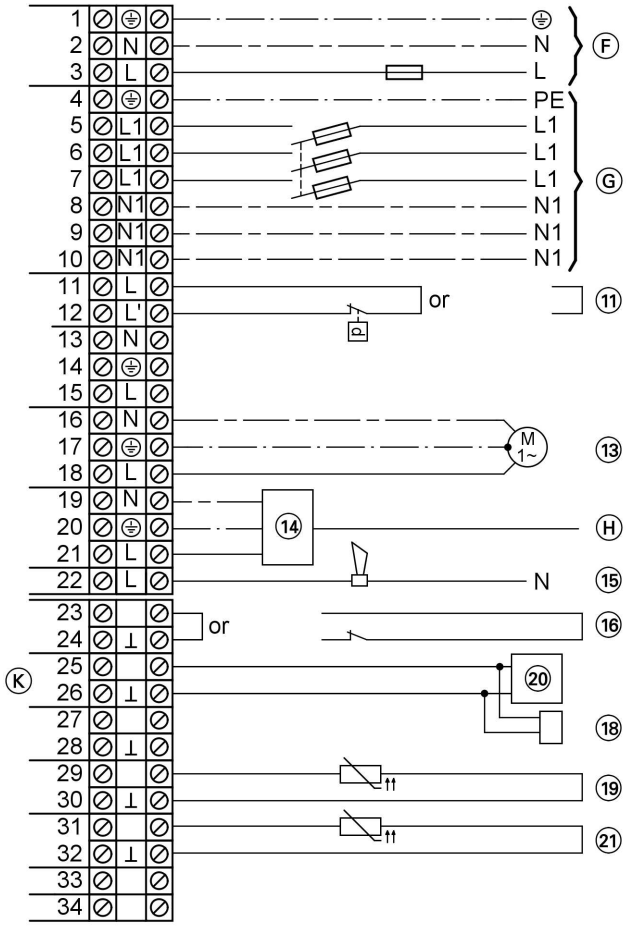
System version 1 (cont.)

Components to be connected	Connection description
Only when using an instantaneous heating water heater: Connect instantaneous heating water heater to main PCB and auxiliary PCB	See separate installation instructions
Only with natural cooling: Connect the required components to extension kit ⑳ and natural cooling ⑭ extension kit	See separate installation instructions
Only when using an underfloor heating system: Connect temperature limiter	see page 78
Only with external control (system design F): Make connection to main PCB	See Ⓗ on page 183

System version 1 (cont.)

Electrical connection (230 V versions)*1

Connections at the main connection area X60



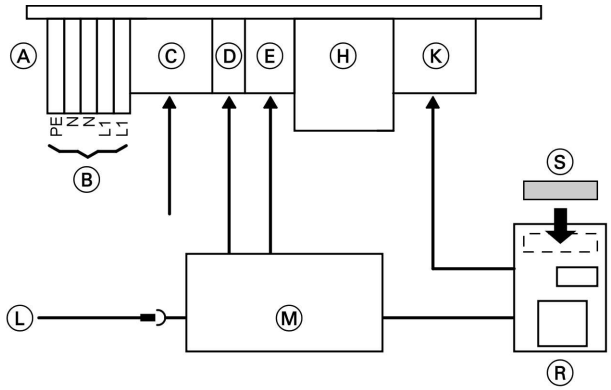
Ⓕ Control unit power supply
Ⓖ Instantaneous heating water heater power supply cable (circuit breakers **must** be blocked)
Ⓗ External connections at natural cooling extension kit
Ⓚ KM BUS

*1 *Never operate 230 V units in Ⓓ. For more information, see page 11.*

System version 1 (cont.)

⑪ Brine circuit pressure switch (if the pressure switch is **not** installed, **use** the jumper provided)
⑬ DHW circulation pump
⑭ Natural cooling extension kit
⑮ Central fault message
⑯ Power-OFF
⑱ KM BUS: Vitotrol 200 remote control (with room temperature sensor), see also page 77
⑲ Room temperature sensor (if no remote control is installed), see also page 77
⑳ KM BUS: Extension kit for cooling circuit with mixer
㉑ Outside temperature sensor

Connections to control module X80, 230 V



Ⓐ Front of control module (with type plate)
Ⓑ Compressor power supply connection
Ⓒ Internal connection to control panel
Ⓓ Primary pump connection
Ⓔ Compressor safety chain connection
Ⓗ Compressor contactor
Ⓚ Full wave soft starter connection
Ⓛ Primary temperature sensor (for control purposes)
Ⓜ Heat pump module
Ⓡ Full wave soft starter
Ⓢ Condenser

Information regarding other connections

The primary pump, the secondary pump, and the heating/DHW three-way valve have already been connected in the factory.

5592 795 GB

System version 1 (cont.)

Components to be connected	Connection description
Connect condenser to full wave soft starter	See page 68
Only when using an instantaneous heating water heater: Connect instantaneous heating water heater to main PCB and auxiliary PCB	See separate installation instructions
Only with natural cooling: Connect the required components to extension kit ⑳ and natural cooling ⑭ extension kit	See separate installation instructions
Only when using an underfloor heating system: Connect temperature limiter	see page 78
Only with external control (system design F): Make connection to main PCB	See Ⓗ on page 183

Required equipment

Item	Description	Qty.
①	Heat pump Vitocal 200, type BWP, with **integral** primary pump, secondary pump and three-way diverter valve (heating/DHW)	1
⑥	Diaphragm expansion vessel for the heating circuit	1
⑦	Temperature limiter (only required for underfloor heating circuits)	1
⑩	Underfloor heating circuit	1
⑰	KM BUS distributor	1
⑱	Vitotrol 200 remote control	1
⑲	Room temperature sensor	1
㉑	Outside temperature sensor	1
㊿	**Option "Instantaneous heating water heater"** **Option "DHW heating"** see page 51 **Option "Natural cooling" function**	1
⑧	Vitotrans 100 plate-type heat exchanger	1
⑭	Natural cooling extension kit	1
⑳	Extension kit for cooling circuit with mixer	1
㉚	Contact humidistat	1
㉛	Circulation pump (secondary cooling circuit pump)	1
㉜	Three-way diverter valve heating/cooling	1
㉝	Two-way motorised ball valve (brine circuit shut-off valve)	1
㉞	Frost stat	1
㉟	Circulation pump (primary cooling circuit pump)	1

5592 795 GB

System version 1 (cont.)

Item	Description	Qty.
㊶	Flow temperature sensor, mixer circuit	1
㊷	Cooling circuit mixer motor	1

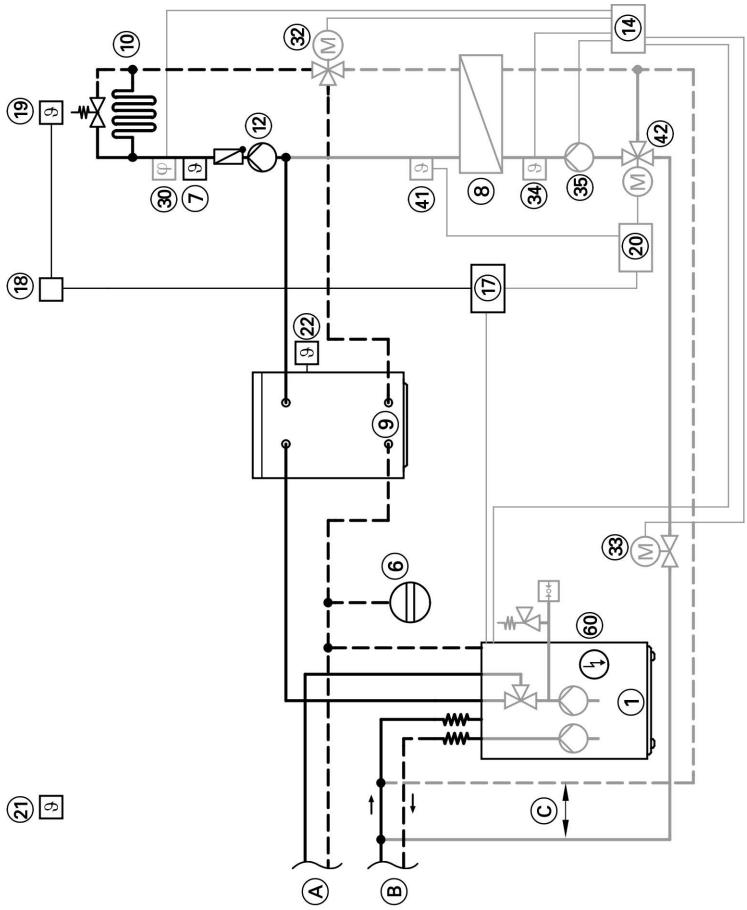
System version 2

One heating circuit without mixer, with heating water buffer cylinder, DHW heating and natural cooling

Note
*To achieve this system version, select **system design 2** at the control unit.*

System version 2 (cont.)

Hydraulic diagram



Ⓐ DHW cylinder interface (see from page 51)
Ⓑ Primary side interface (see from page 15)
Ⓒ Min. 500 mm (for hydraulic separation)
① Vitocal 200-G, type BWP
⑥ Diaphragm expansion vessel
⑦ Underfloor heating system temperature limiter
⑧ Plate-type heat exchanger
⑨ Heating water buffer cylinder
⑩ Underfloor heating circuit
⑫ Heating circuit pump, direct heating circuit
⑭ Natural cooling extension kit
⑰ KM BUS distributor

System version 2 (cont.)

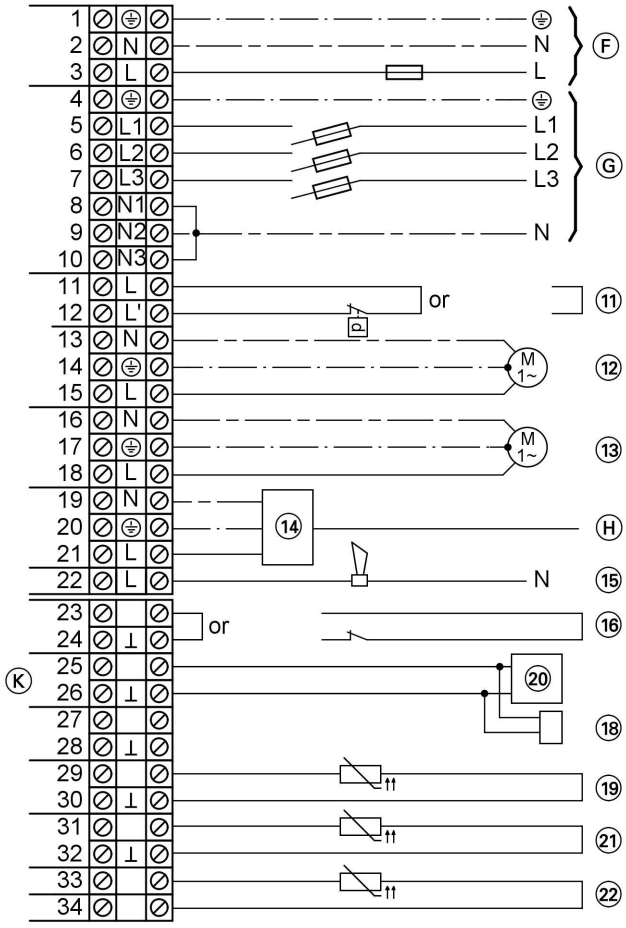
⑱ Vitotrol 200 remote control
⑲ Room temperature sensor
⑳ Extension kit for cooling circuit with mixer
㉑ Outside temperature sensor
㉒ Heating water buffer cylinder temperature sensor
㉚ Contact humidistat
㉜ Three-way diverter valve heating/cooling
㉝ Two-way motorised ball valve
㉞ Frost stat
㉟ Circulation pump (primary cooling circuit pump)
㊶ Cooling circuit flow temperature sensor
㊷ Cooling circuit mixer motor
㊿ Instantaneous heating water heater

5592 795 GB

System version 2 (cont.)

Electrical connection (400 V versions)

Connections at the main connection area X60

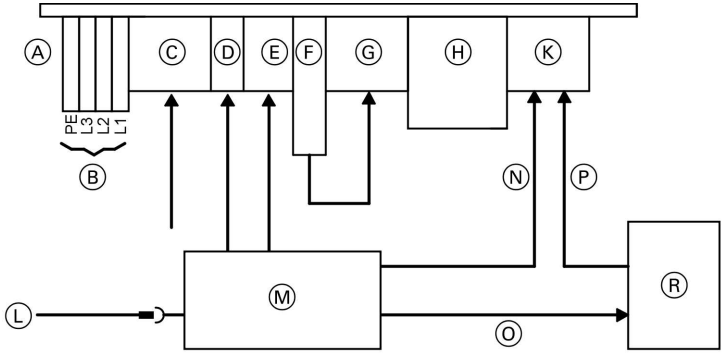


Ⓕ Control unit power supply (230 V)
Ⓖ Instantaneous heating water heater power supply cable
Ⓗ External connections at natural cooling extension kit
Ⓚ KM BUS
⑪ Brine circuit pressure switch (if the pressure switch is **not** installed, **use** the jumper provided)
⑫ Heating circuit pump, direct heating circuit

System version 2 (cont.)

⑬ DHW circulation pump
⑭ Natural cooling extension kit
⑮ Central fault message (230 V)
⑯ Power-OFF
⑱ KM BUS: Vitotrol 200 remote control (with room temperature sensor), see also page 77
⑲ Room temperature sensor (if no remote control is installed), see also page 77
⑳ KM BUS: Extension kit for cooling circuit with mixer
㉑ Outside temperature sensor
㉒ Heating water buffer cylinder temperature sensor

Connections to control module X80, 400 V



Ⓐ Front of control module (with type plate)
Ⓑ Compressor power supply connection
Ⓒ Internal connection to control panel
Ⓓ Primary pump connection (230 V)
Ⓔ Compressor safety chain connection
Ⓕ Phase monitor plug-in location (accessories)
Ⓖ Strapping plug or phase monitor connection
Ⓗ Compressor contactor
Ⓚ Compressor or full wave soft starter connection
Ⓛ Primary temperature sensor (for control purposes)
Ⓜ Heat pump module
Ⓝ Direct connection only with BWP 106
Ⓞ Connection required as of BWP 108
Ⓟ Connection required as of BWP 108
Ⓡ Full wave soft starter (as of BWP 108)

5592 795 GB

System version 2 (cont.)

Information regarding other connections

The primary pump, the secondary pump, and the heating/DHW three-way valve have already been connected in the factory.

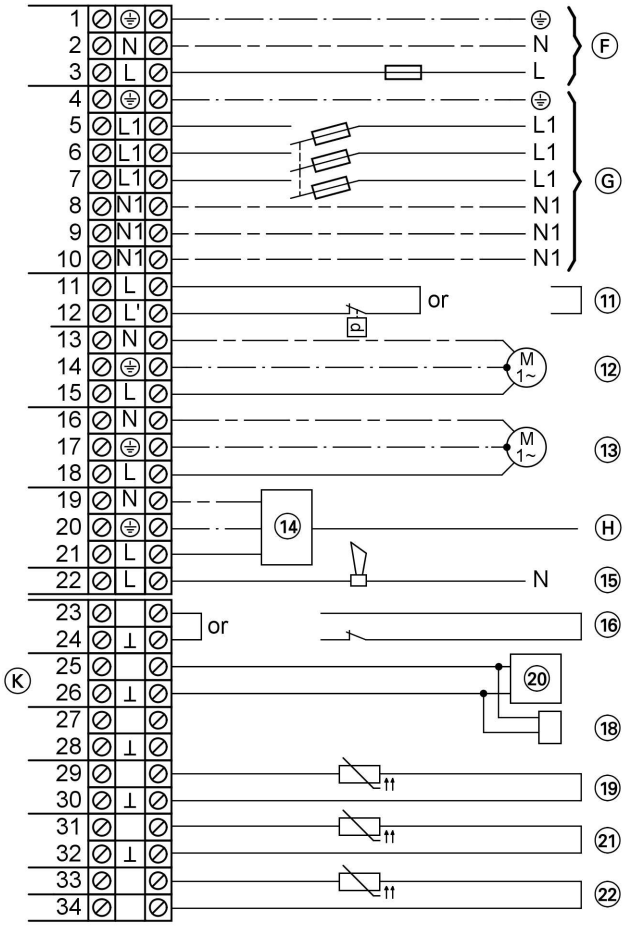
Components to be connected	Connection description
Only when using an instantaneous heating water heater: Connect instantaneous heating water heater to main PCB and auxiliary PCB	See separate installation instructions
Only with natural cooling: Connect the required components to extension kit ⑳ and natural cooling ⑭ extension kit	See separate installation instructions
Only when using an underfloor heating system: Connect temperature limiter	See separate installation instructions
Only with external control (system design F): Make connection to main PCB	See Ⓗ on page 183

5592 795 GB

System version 2 (cont.)

Electrical connection (230 V versions)*1

Connections at the main connection area X60



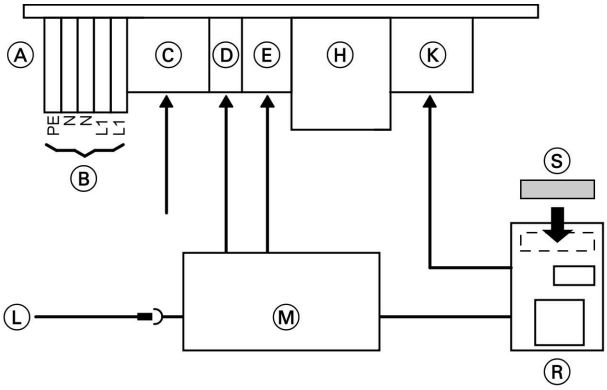
- (F) Control unit power supply
- (G) Instantaneous heating water heater power supply cable (circuit breakers **must** be blocked)
- (H) External connections at natural cooling extension kit
- (K) KM BUS

*1 *Never operate 230 V units in (D). For more information, see page 11.*

System version 2 (cont.)

⑪ Brine circuit pressure switch (if the pressure switch is **not** installed, **use** the jumper provided)
⑫ Heating circuit pump, direct heating circuit
⑬ DHW circulation pump
⑭ Natural cooling extension kit
⑮ Central fault message
⑯ Power-OFF
⑱ KM BUS: Vitotrol 200 remote control (with room temperature sensor), see also page 77
⑲ Room temperature sensor (if no remote control is installed), see also page 77
⑳ KM BUS: Extension kit for cooling circuit with mixer
㉑ Outside temperature sensor
㉒ Heating water buffer cylinder temperature sensor

Connections to control module X80, 230 V



Ⓐ Front of control module (with type plate)
Ⓑ Compressor power supply connection
Ⓒ Internal connection to control panel
Ⓓ Primary pump connection
Ⓔ Compressor safety chain connection
Ⓗ Compressor contactor
Ⓚ Full wave soft starter connection
Ⓛ Primary temperature sensor (for control purposes)
Ⓜ Heat pump module
Ⓡ Full wave soft starter
Ⓢ Condenser

Information regarding other connections

The primary pump, the secondary pump, and the heating/DHW three-way valve have already been connected in the factory.

5592 795 GB

System version 2 (cont.)

Components to be connected	Connection description
Connect condenser to full wave soft starter	See page 68
Only when using an instantaneous heating water heater: Connect instantaneous heating water heater to main PCB and auxiliary PCB	See separate installation instructions
Only with natural cooling: Connect the required components to extension kit ⑳ and natural cooling ⑭ extension kit	See separate installation instructions
Only when using an underfloor heating system: Connect temperature limiter	See separate installation instructions
Only with external control (system design F): Make connection to main PCB	See Ⓗ on page 183

Required equipment

Item	Description	Qty.
①	Heat pump Vitocal 200, type BWP, with **integral** primary pump, secondary pump and three-way diverter valve (heating/DHW)	1
⑥	Diaphragm expansion vessel for the heating circuit	1
⑦	Temperature limiter (only required for underfloor heating circuits)	1
⑩	Underfloor heating circuit	1
⑫	Heating circuit pump, direct heating circuit	1
⑰	KM BUS distributor	1
⑱	Vitotrol 200 remote control	1
⑲	Room temperature sensor	1
㉑	Outside temperature sensor	1
㊿	**Option "Instantaneous heating water heater"**	1
	Option "DHW heating" see page 51	
	Option "Heating water buffer cylinder"	
⑨	Vitocell 050 heating water buffer cylinder	1
㉒	Heating water buffer cylinder temperature sensor	1
	Option "Natural cooling" function	
⑧	Vitotrans 100 plate-type heat exchanger	1
⑭	Natural cooling extension kit	1
⑳	Extension kit for cooling circuit with mixer	1
㉚	Contact humidistat	1
㉜	Three-way diverter valve heating/cooling	1

System version 2 (cont.)

Item	Description	Qty.
㉝	Two-way motorised ball valve (brine circuit shut-off valve)	1
㉞	Frost stat	1
㉟	Circulation pump (primary cooling circuit pump)	1
㊶	Flow temperature sensor, mixer circuit	1
㊷	Cooling circuit mixer motor	1

System version 3

One heating circuit with mixer, with heating water buffer cylinder, DHW heating and natural cooling

Note
To achieve this system version, select ***system design 4*** *at the control unit.*

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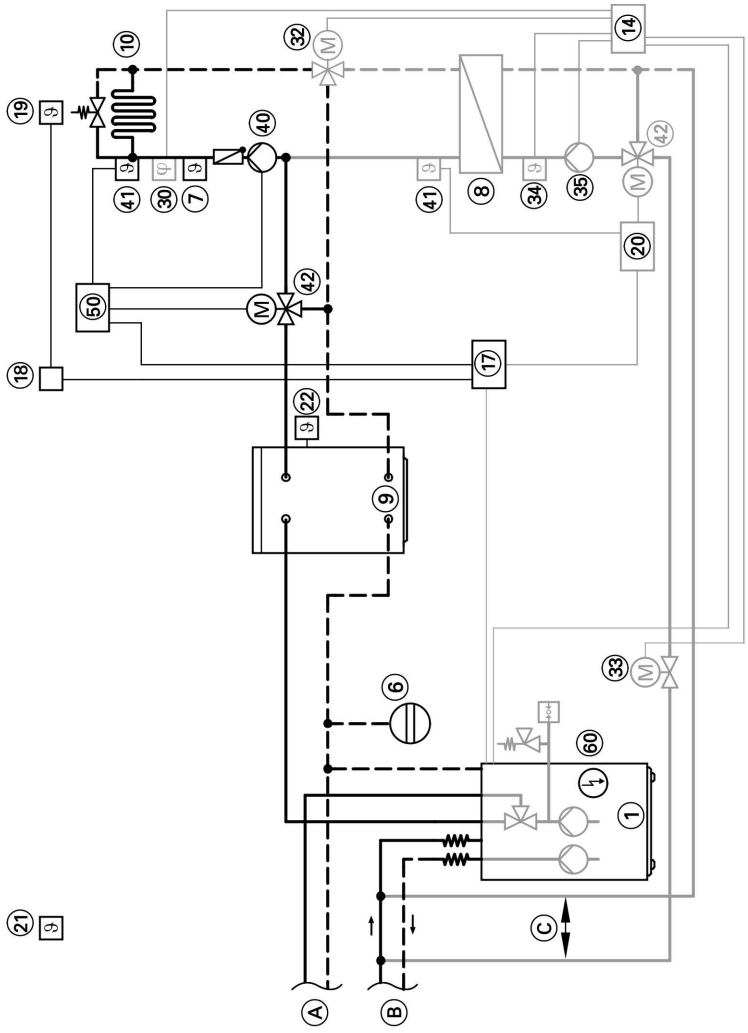
System version 3 (cont.)

Hydraulic diagram



Ⓐ DHW cylinder interface (see from page 51)
Ⓑ Primary side interface (see from page 15)
Ⓒ Min. 500 mm (for hydraulic separation)
① Vitocal 200-G, type BWP
⑥ Diaphragm expansion vessel

5592 795 GB

System version 3 (cont.)

⑦ Underfloor heating system temperature limiter
⑧ Plate-type heat exchanger
⑨ Heating water buffer cylinder
⑩ Underfloor heating circuit
⑭ Natural cooling extension kit
⑰ KM BUS distributor
⑱ Vitotrol 200 remote control
⑲ Room temperature sensor
⑳ Extension kit for cooling circuit with mixer
㉑ Outside temperature sensor
㉒ Heating water buffer cylinder temperature sensor
㉚ Contact humidistat
㉜ Three-way diverter valve heating/cooling
㉝ Two-way motorised ball valve
㉞ Frost stat
㉟ Circulation pump (primary cooling circuit pump)
㊵ Heating circuit pump, mixer circuit
㊶ Flow temperature sensor, mixer circuit
㊷ Three-way mixer - mixer motor
㊿ Extension kit for one heating circuit with mixer
㊿ Instantaneous heating water heater

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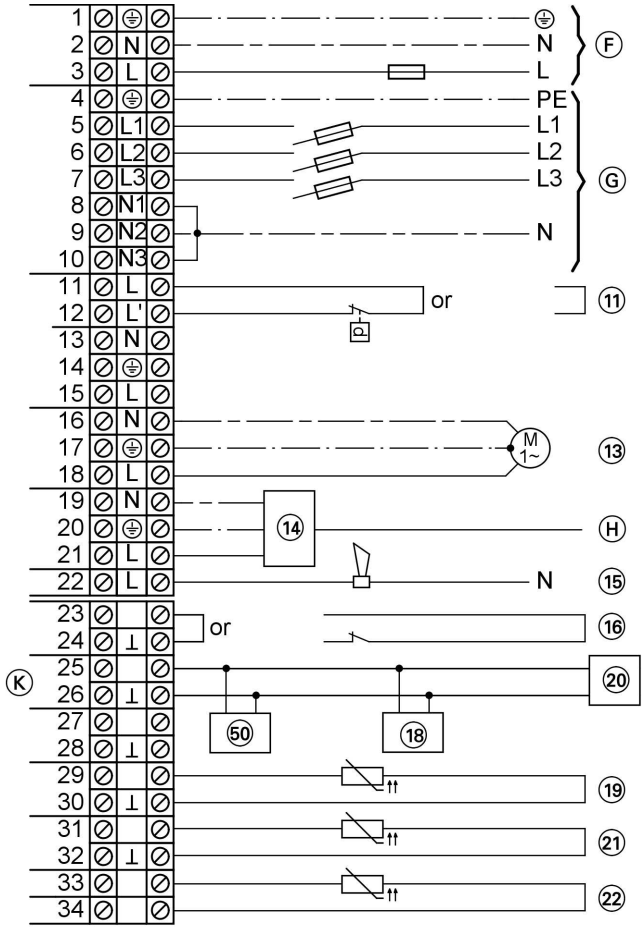
System version 3 (cont.)

Electrical connection (400 V versions)

Connections at the main connection area X60



Ⓕ Control unit power connection (230 V)
Ⓖ Instantaneous heating water heater power supply cable
Ⓗ External connections at natural cooling extension kit
Ⓚ KM BUS
⑪ Brine circuit pressure switch (if the pressure switch is **not** installed, **use** the jumper provided)
⑬ DHW circulation pump

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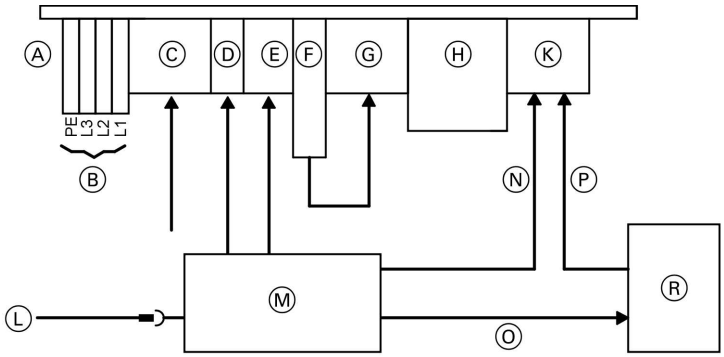
System version 3 (cont.)

⑭ Natural cooling extension kit
⑮ Central fault message (230 V)
⑯ Power-OFF
⑱ KM BUS: Vitotrol 200 remote control (with room temperature sensor), see also page 77
⑲ Room temperature sensor (if no remote control is installed), see also page 77
⑳ KM BUS: Extension kit for cooling circuit with mixer
㉑ Outside temperature sensor
㉒ Heating water buffer cylinder temperature sensor
㊿ Extension kit for one heating circuit with mixer

Connections to control module X80, 400 V



Ⓐ Front of control module (with type plate)
Ⓑ Compressor power supply connection
Ⓒ Internal connection to control panel
Ⓓ Primary pump connection (230 V)
Ⓔ Compressor safety chain connection
Ⓕ Phase monitor plug-in location (accessories)
Ⓖ Strapping plug or phase monitor connection
Ⓗ Compressor contactor
Ⓚ Compressor or full wave soft starter connection
Ⓛ Primary temperature sensor (for control purposes)
Ⓜ Heat pump module
Ⓝ Direct connection only with BWP 106
Ⓞ Connection required as of BWP 108
Ⓟ Connection required as of BWP 108
Ⓡ Full wave soft starter (as of BWP 108)

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System version 3 (cont.)

Information regarding other connections

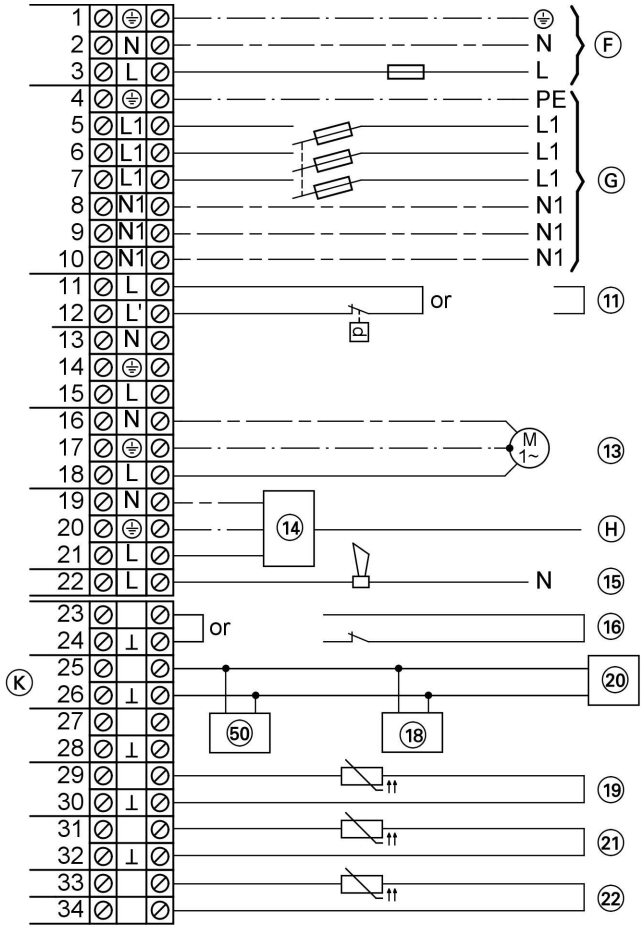
The primary pump, the secondary pump, and the heating/DHW three-way valve have already been connected in the factory.

Components to be connected	Connection description
Connect components for heating circuit with mixer to extension kit ⑤⓪	See separate installation instructions
Only when using an instantaneous heating water heater: Connect instantaneous heating water heater to main PCB and auxiliary PCB	See separate installation instructions
Only with natural cooling: Connect the required components to extension kit ②⓪ and natural cooling ①④ extension kit	See separate installation instructions
Only when using an underfloor heating system: Connect temperature limiter	See separate installation instructions
Only with external control (system design F): Make connection to main PCB	See Ⓗ on page 183

System version 3 (cont.)

Electrical connection (230 V versions)*1

Connections at the main connection area X60



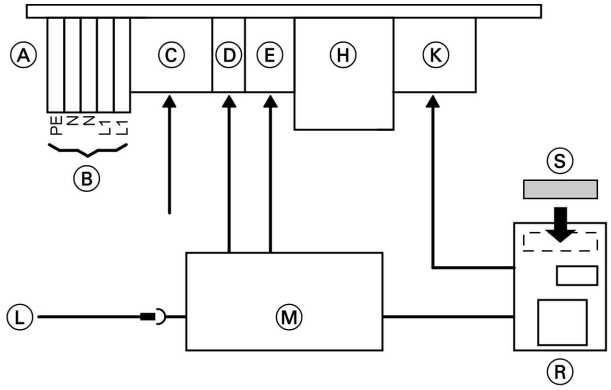
Ⓕ Control unit power supply
Ⓖ Instantaneous heating water heater power supply cable (circuit breakers **must** be blocked)
Ⓗ External connections at natural cooling extension kit
Ⓚ KM BUS

*1 *Never operate 230 V units in Ⓓ. For more information, see page 11.*

System version 3 (cont.)

⑪ Brine circuit pressure switch (if the pressure switch is **not** installed, **use** the jumper provided)
⑬ DHW circulation pump
⑭ Natural cooling extension kit
⑮ Central fault message
⑯ Power-OFF
⑱ KM BUS: Vitotrol 200 remote control (with room temperature sensor), see page 77
⑲ Room temperature sensor (if no remote control is installed), see page 77
⑳ KM BUS: Extension kit for cooling circuit with mixer
㉑ Outside temperature sensor
㉒ Heating water buffer cylinder temperature sensor
㊿ Extension kit for one heating circuit with mixer

Connections to control module X80, 230 V



Ⓐ Front of control module (with type plate)
Ⓑ Compressor power supply connection
Ⓒ Internal connection to control panel
Ⓓ Primary pump connection
Ⓔ Compressor safety chain connection
Ⓗ Compressor contactor
Ⓚ Full wave soft starter connection
Ⓛ Primary temperature sensor (for control purposes)
Ⓜ Heat pump module
Ⓡ Full wave soft starter
Ⓢ Condenser

Information regarding other connections

The primary pump, the secondary pump, and the heating/DHW three-way valve have already been connected in the factory.

5592 795 GB

System version 3 (cont.)

Components to be connected	Connection description
Connect condenser to full wave soft starter	See page 68
Connect components for heating circuit with mixer to extension kit ⑤⓪	See separate installation instructions
Only when using an instantaneous heating water heater: Connect instantaneous heating water heater to main PCB and auxiliary PCB	See separate installation instructions
Only with natural cooling: Connect the required components to extension kit ②⓪ and natural cooling ①④ extension kit	See separate installation instructions
Only when using an underfloor heating system: Connect temperature limiter	See separate installation instructions
Only with external control (system design F): Make connection to main PCB	See Ⓗ on page 183

Required equipment

Item	Description	Qty.
①	Heat pump Vitocal 200, type BWP, with **integral** primary pump, secondary pump and three-way diverter valve (heating/DHW)	1
⑥	Diaphragm expansion vessel for the heating circuit	1
⑦	Temperature limiter (only required for underfloor heating circuits)	1
⑩	Underfloor heating circuit	1
⑰	KM BUS distributor	1
⑱	Vitotrol 200 remote control	1
⑲	Room temperature sensor	1
㉑	Outside temperature sensor	1
㊵	Heating circuit pump, mixer circuit	1
㊶	Flow temperature sensor, mixer circuit	1
㊷	Three-way mixer - mixer motor	1
⑤⓪	Extension kit for one heating circuit with mixer	1
⑥⓪	**Option "Instantaneous heating water heater"** **Option "DHW heating"** see page 51 **Option "Heating water buffer cylinder"**	1
⑨	Vitocell 050 heating water buffer cylinder	1
㉒	Heating water buffer cylinder temperature sensor	1

System version 3 (cont.)

Item	Description	Qty.
	Option "Natural cooling" function	
⑧	Vitotrans 100 plate-type heat exchanger	1
⑭	Natural cooling extension kit	1
⑳	Extension kit for cooling circuit with mixer	1
㉚	Contact humidistat	1
㉜	Three-way diverter valve heating/cooling	1
㉝	Two-way motorised ball valve (brine circuit shut-off valve)	1
㉞	Frost stat	1
㉟	Circulation pump (primary cooling circuit pump)	1
㊶	Flow temperature sensor, mixer circuit	1
㊷	Three-way mixer - mixer motor	1

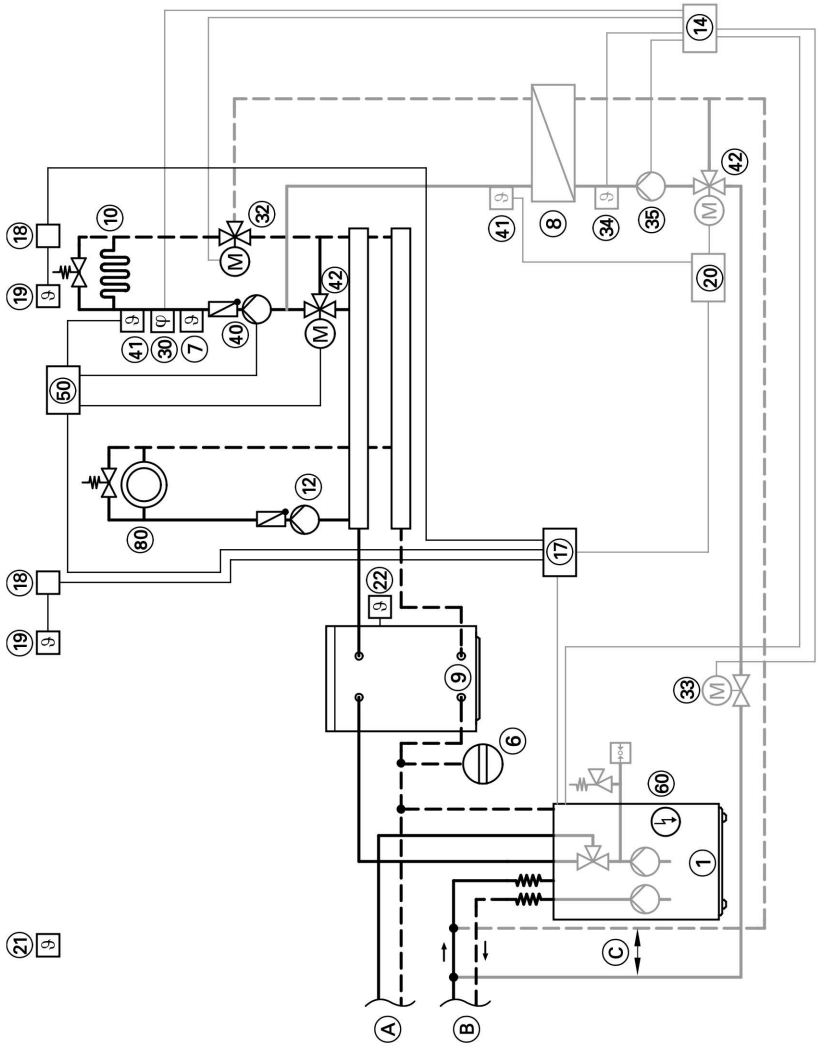
System version 4

One heating circuit without mixer, one heating circuit with mixer, heating water buffer cylinder, DHW heating and natural cooling

Note
*To achieve this system version, select **system design 6** at the control unit.*

System version 4 (cont.)

Hydraulic diagram



Ⓐ DHW cylinder interface (see from page 51)
Ⓑ Primary side interface (see from page 15)
Ⓒ Min. 500 mm (for hydraulic separation)
① Vitocal 200-G, type BWP
⑥ Diaphragm expansion vessel

5592 795 GB

System version 4 (cont.)

⑦ Underfloor heating system temperature limiter
⑧ Plate-type heat exchanger
⑨ Heating water buffer cylinder
⑩ Underfloor heating circuit
⑫ Heating circuit pump, direct heating circuit
⑭ Natural cooling extension kit
⑰ KM BUS distributor
⑱ Vitotrol 200 remote control
⑲ Room temperature sensor
⑳ Extension kit for cooling circuit with mixer
㉑ Outside temperature sensor
㉒ Heating water buffer cylinder temperature sensor
㉚ Contact humidistat
㉜ Three-way diverter valve heating/cooling
㉝ Two-way motorised ball valve
㉞ Frost stat
㉟ Circulation pump (primary cooling circuit pump)
㊵ Heating circuit pump, mixer circuit
㊶ Flow temperature sensor, mixer circuit
㊷ Three-way mixer - mixer motor
㊿ Extension kit for one heating circuit with mixer
㊿ Instantaneous heating water heater
㊽ Radiator heating circuit

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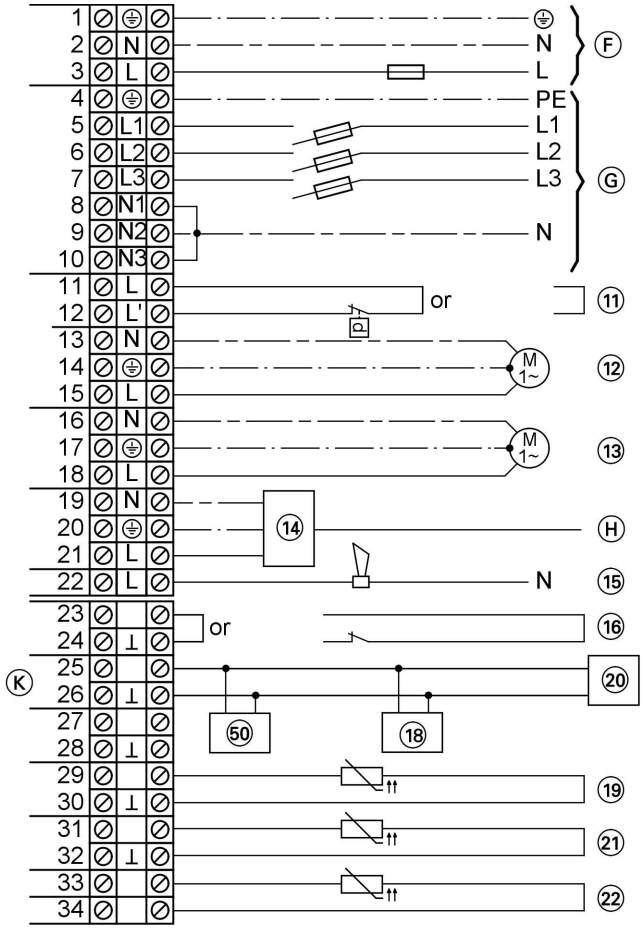
System version 4 (cont.)

Electrical connection (400 V versions)

Connections at the main connection area X60

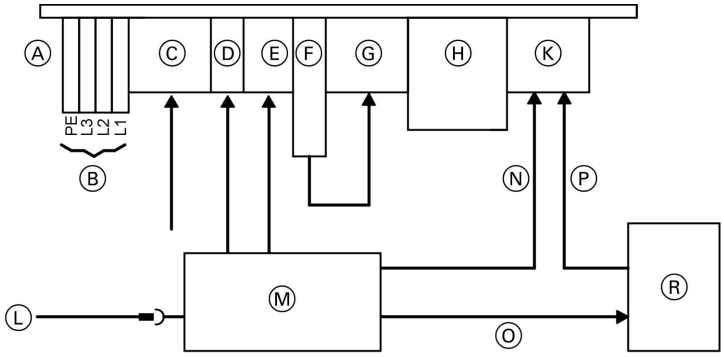


Ⓕ Control unit power connection (230 V)
Ⓖ Instantaneous heating water heater power supply cable
Ⓗ External connections at natural cooling extension kit
Ⓚ KM BUS
⑪ Brine circuit pressure switch (if the pressure switch is **not** installed, **use** the jumper provided)

System version 4 (cont.)

⑫ Heating circuit pump, direct heating circuit
⑬ DHW circulation pump
⑭ Natural cooling extension kit
⑮ Central fault message (230 V)
⑯ Power-OFF
⑱ KM BUS: Vitotrol 200 remote control (with room temperature sensor), see also page 77
⑲ Room temperature sensor (if no remote control is installed), see also page 77
⑳ KM BUS: Extension kit for cooling circuit with mixer
㉑ Outside temperature sensor
㉒ Heating water buffer cylinder temperature sensor
㊿ Extension kit for one heating circuit with mixer

Connections to control module X80, 400 V



Ⓐ Front of control module (with type plate)
Ⓑ Compressor power supply connection
Ⓒ Internal connection to control panel
Ⓓ Primary pump connection (230 V)
Ⓔ Compressor safety chain connection
Ⓕ Phase monitor plug-in location (accessories)
Ⓖ Strapping plug or phase monitor connection
Ⓗ Compressor contactor
Ⓚ Compressor or full wave soft starter connection
Ⓛ Primary temperature sensor (for control purposes)
Ⓜ Heat pump module
Ⓝ Direct connection only with BWP 106
Ⓞ Connection required as of BWP 108
Ⓟ Connection required as of BWP 108
Ⓡ Full wave soft starter (as of BWP 108)

5592 795 GB

System version 4 (cont.)

Information regarding other connections

The primary pump, the secondary pump, and the heating/DHW three-way valve have already been connected in the factory.

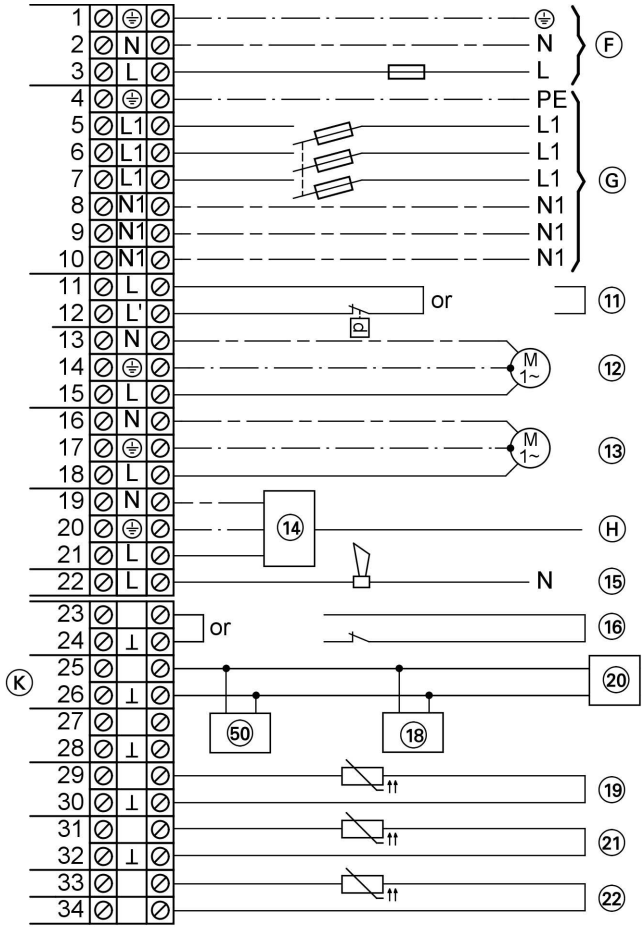
Components to be connected	Connection description
Connect components for heating circuit with mixer to extension kit ⑤⓪	See separate installation instructions
Only when using an instantaneous heating water heater: Connect instantaneous heating water heater to main PCB and auxiliary PCB	See separate installation instructions
Only with natural cooling: Connect the required components to extension kit ② and natural cooling ① extension kit	See separate installation instructions
Only when using an underfloor heating system: Connect temperature limiter	See separate installation instructions
Only with external control (system design F): Make connection to main PCB	See Ⓗ on page 183

5592 795 GB

System version 4 (cont.)

Electrical connection (230 V versions)*1

Connections at the main connection area X60



Ⓕ Control unit power supply
Ⓖ Instantaneous heating water heater power supply cable (circuit breakers **must** be blocked)
Ⓗ External connections at natural cooling extension kit
Ⓚ KM BUS

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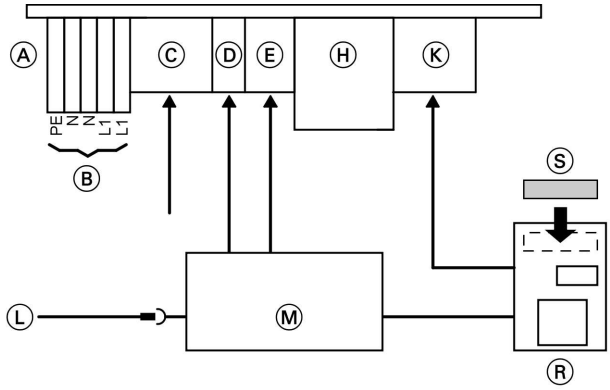
*1 *Never operate 230 V units in Ⓓ. For more information, see page 11.*

System version 4 (cont.)

⑪ Brine circuit pressure switch (if the pressure switch is **not** installed, **use** the jumper provided)
⑫ Heating circuit pump, direct heating circuit
⑬ DHW circulation pump
⑭ Natural cooling extension kit
⑮ Central fault message
⑯ Power-OFF
⑱ KM BUS: Vitotrol 200 remote control (with room temperature sensor), see also page 77
⑲ Room temperature sensor (if no remote control is installed), see also page 77
⑳ KM BUS: Extension kit for cooling circuit with mixer
㉑ Outside temperature sensor
㉒ Heating water buffer cylinder temperature sensor
㊿ Extension kit for one heating circuit with mixer

Connections to control module X80, 230 V



Ⓐ Front of control module (with type plate)
Ⓑ Compressor power supply connection
Ⓒ Internal connection to control panel
Ⓓ Primary pump connection
Ⓔ Compressor safety chain connection
Ⓗ Compressor contactor
Ⓚ Full wave soft starter connection
Ⓛ Primary temperature sensor (for control purposes)
Ⓜ Heat pump module
Ⓡ Full wave soft starter
Ⓢ Condenser

5592 795 GB

System version 4 (cont.)

Information regarding other connections

The primary pump, the secondary pump, and the heating/DHW three-way valve have already been connected in the factory.

Components to be connected	Connection description
Connect condenser to full wave soft starter	See page 68
Connect components for heating circuit with mixer to extension kit ⑤⓪	See separate installation instructions
Only when using an instantaneous heating water heater: Connect instantaneous heating water heater to main PCB and auxiliary PCB	See separate installation instructions
Only with natural cooling: Connect the required components to extension kit ②⓪ and natural cooling ①④ extension kit	See separate installation instructions
Only when using an underfloor heating system: Connect temperature limiter	See separate installation instructions
Only with external control (system design F): Make connection to main PCB	See Ⓗ on page 183

Required equipment

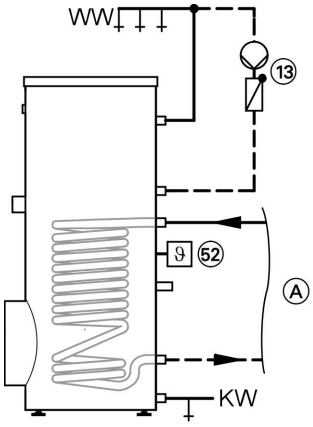
Item	Description	Qty.
①	Heat pump Vitocal 200, type BWP, with **integral** primary pump, secondary pump and three-way diverter valve (heating/DHW)	1
⑥	Diaphragm expansion vessel for the heating circuit	1
⑦	Temperature limiter (only required for underfloor heating circuits)	1
⑩	Underfloor heating circuit	1
⑫	Heating circuit pump, direct heating circuit	1
⑰	KM BUS distributor	1
⑱	Vitotrol 200 remote control	2
⑲	Room temperature sensor	2
㉑	Outside temperature sensor	1
㊵	Heating circuit pump, mixer circuit	1
㊶	Flow temperature sensor, mixer circuit	1
㊷	Three-way mixer - mixer motor	1
⑤⓪	Extension kit for one heating circuit with mixer	1

System version 4 (cont.)

Item	Description	Qty.
⑧⓪	Radiator heating circuit	1
⑥⓪	**Option "Instantaneous heating water heater"**	1
	Option "DHW heating" see page 51	
	Option "Heating water buffer cylinder"	
⑨	Vitocell 050 heating water buffer cylinder	1
㉒	Heating water buffer cylinder temperature sensor	1
	Option "Natural cooling" function	
⑧	Vitotrans 100 plate-type heat exchanger	1
⑭	Natural cooling extension kit	1
⑳	Extension kit for cooling circuit with mixer	1
㉚	Contact humidistat	1
㉜	Three-way diverter valve heating/cooling	1
㉝	Two-way motorised ball valve (brine circuit shut-off valve)	1
㉞	Frost stat	1
㉟	Circulation pump (primary cooling circuit pump)	1
㊶	Flow temperature sensor, mixer circuit	1
㊷	Three-way mixer - mixer motor	1

System versions on the DHW side

Hydraulic diagrams



Connection Vitocell-V 100, type CVW

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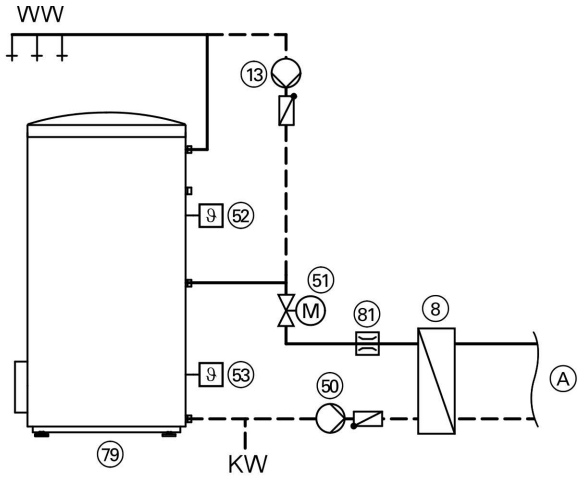
System versions on the DHW side (cont.)

Ⓐ Heat pump interface (see page 16, 25, 34 or 43)



Cylinder primary system connection

Ⓐ Heat pump interface (see page 16, 25, 34 or 43)

Note
During cylinder heating, the control unit switches DHW circulation pump ⑬ OFF, to prevent the cylinder heating being hampered.

Electrical connection

Components to be connected	Connection description
Connect DHW circulation pump ⑬ to main connection area X60	See page 80
Connect **upper** cylinder temperature sensor ⑫ for DHW cylinder to main PCB	See page 62
Connect **lower** cylinder temperature sensor ⑬ for DHW cylinder to main PCB	See page 62

System versions on the DHW side (cont.)

Components to be connected	Connection description
Only for cylinder loading system: Connect cylinder primary pump ⑤⓪ and two-way valve ⑤① to additional connecting area X50	See page 60

Required equipment

Item	Description	Qty.
⑧	Vitotrans 100 plate-type heat exchanger	1
⑬	DHW circulation pump	1
⑤⓪	Cylinder primary pump	1
⑤①	Two-way valve, normally closed (on-site)	1
⑤②	Upper cylinder temperature sensor	1
⑤③	Lower cylinder temperature sensor	1
⑦⑨	DHW cylinder	1
⑧①	Flow limiter ("Taco setter"), on-site	1

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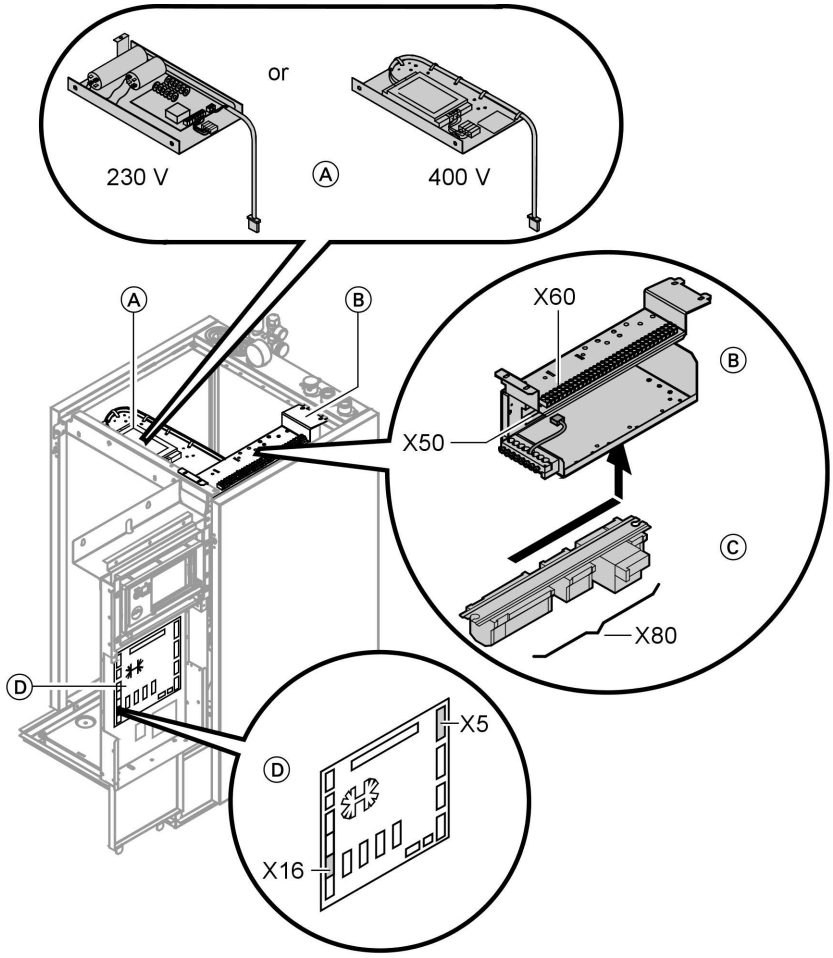
Summary of electrical connections

The following table provides an overview of all electrical connecting areas.



Ⓐ Full wave soft starter, 400 or 230 V version
Ⓑ Junction box with main connection area X60, internal connection area X50 and control module underneath Ⓒ
Ⓒ Control module with X80 connecting area
Ⓓ Main PCB with connection areas X5 and X16

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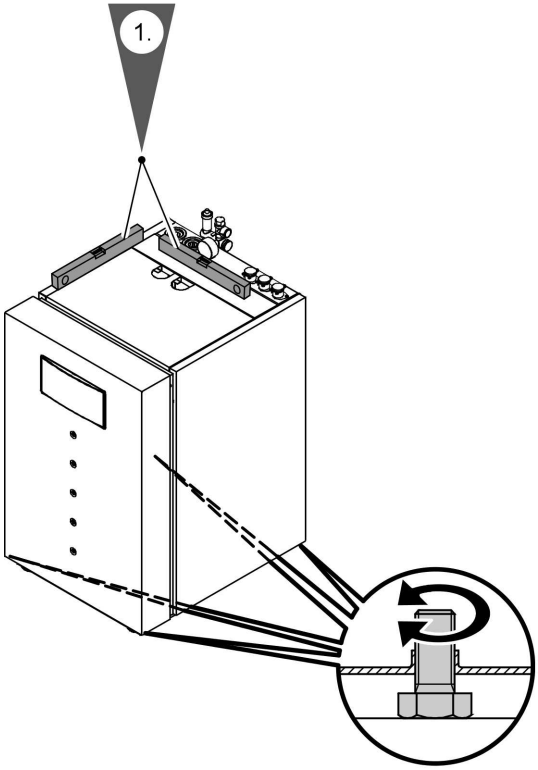
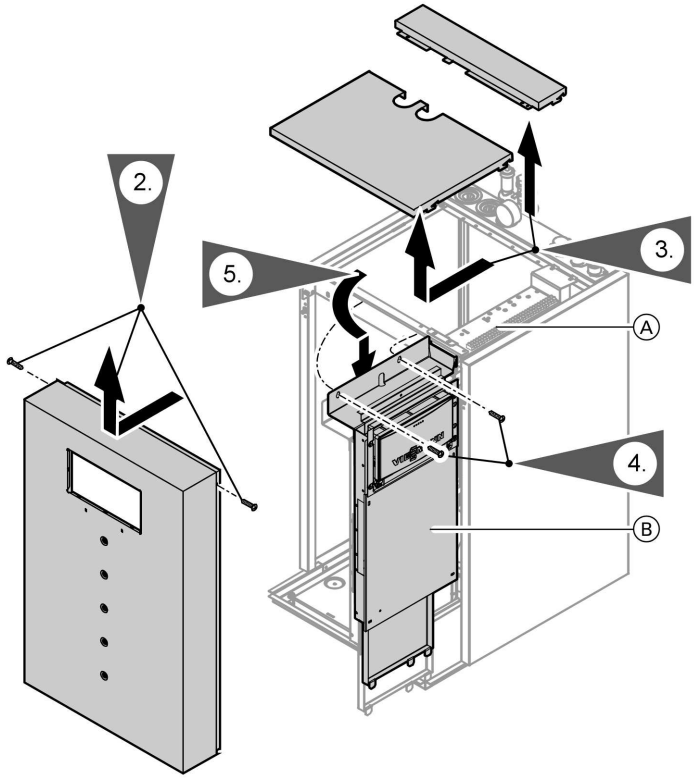
Preparing the installation



1. Position units and perform horizontal alignment as described on page 9.

Preparing the installation (cont.)



Ⓐ Control panel

2. Undo screws from front panel. Pull the front panel forward at its upper edge and lift out upwards.

3. Lift both top panels forward and up and release their respective earth strap.

Ⓑ Main PCB cover

4. Undo the screws at the upper crossbar.

5. Remove the control unit retainer and hook it into the r.h. front edge of the equipment, i.e. into the service position.

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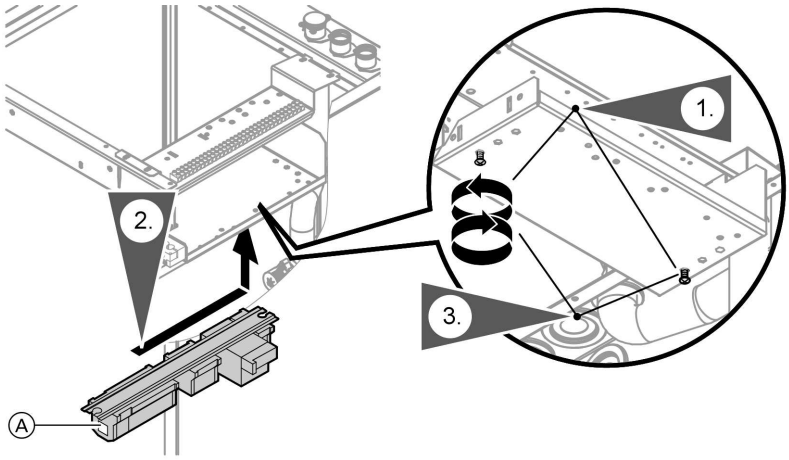
Installing the control module



Ⓐ Type plate

1. Undo 2 pre-installed screws on the underside of the control panel, but do **not** unscrew.

2. Suspend control module (with type plate at the front) over the undone screws.

Note
If the control module cannot be fitted without touching internal components, the 2 screws must be relocated in one of the two additional holes.

3. Tighten the screws.

4. Fit the control panel connecting cable (7-pin) to pos. Ⓒ of the control module (see page 19).

Note
The plug must click home.

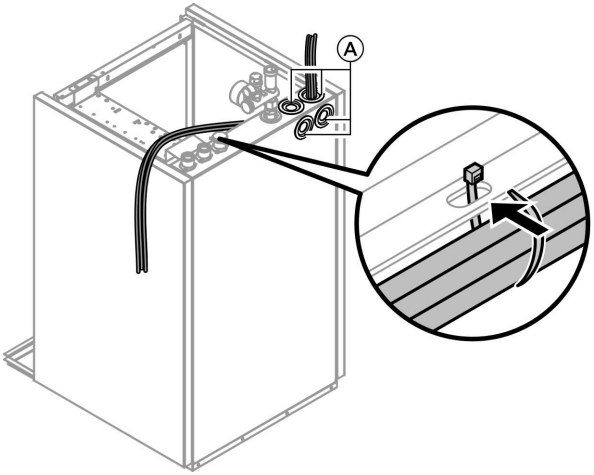
Installing the instantaneous heating water heater (accessories)

If the instantaneous heating water heater accessory is used, it is advisable to install it at this stage of the installation procedure.

Instantaneous heating water heater installation instructions

5592 795 GB

Inserting the electrical cables and power supply connections



Ⓐ Inserting the external electrical cables

1. Route external electrical cables to the rear left upper edge of the unit and cut to length, leaving approx. 1800 mm of cable **inside the unit**.

2. **Please note**
   Damage to the insulation of the electrical cables can result in short circuits. Route cables so that they cannot touch very hot, vibrating or sharp-edged components. Secure cables with cable ties.

   Route cables to control panel through one of the available cable entries Ⓐ. In doing this, separate the LV cables from those carrying mains voltage, and tie up both types of cable separately.

Inserting the electrical cables and power supply . . . (cont.)

3. **Please note**
With 400 V units, the wrong phase sequence can damage the equipment.
The power supply connection must have a **clockwise** rotary field in the phase sequence that is specified at the terminals.

Note
For possible power supply connection versions, see page 88 onwards.

400 V connection:
Make power supply connection to the terminals marked PE, L1, L2 and L3 at pos. Ⓑ of the control module (see page 19).

230 V connection:
Make power supply connection to the terminals marked L1, N and PE at pos. Ⓑ of the control module (see page 22).

Checking the rotary field of the power supply connection (400 V units only)

Please note
With 400 V units, the wrong phase sequence can damage the equipment. The power supply connection must have a **clockwise** rotary field in the phase sequence that is specified at the terminals.

With phase monitor installation

1. Fit phase monitor (accessory) to pos. Ⓕ (see page 19) on top-hat rail of control module.
2. Fit plug of phase monitor to pos. Ⓖ of the control module (see page 19).

Checking the rotary field of the power supply . . . (cont.)

3. Switch ON the power.
   Remedy any faults that may be signalled by the phase monitor (see page 84) and re-check the rotary field.
4. **Isolate** the system from the power supply and **safeguard against reconnection**.

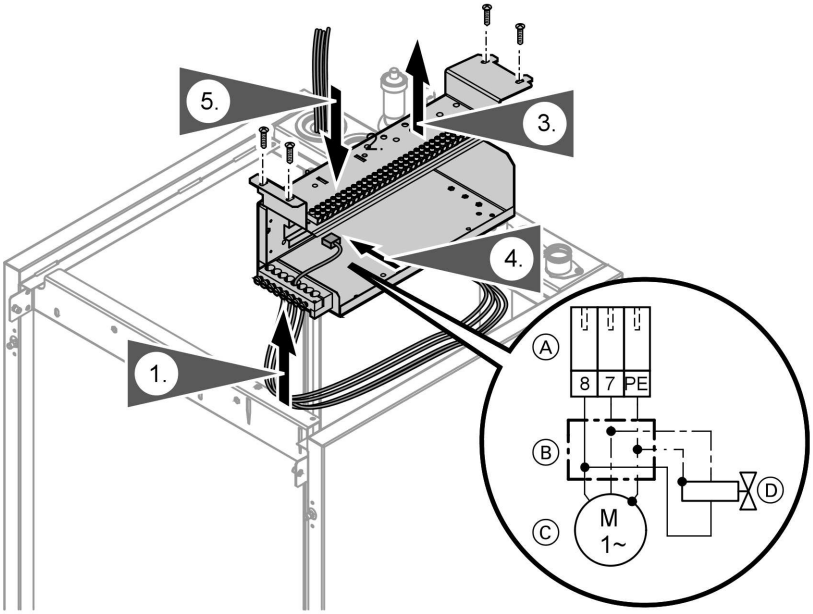
Without phase monitor installation

1. Switch ON the power.
2. Check rotary field of power supply connection and correct if necessary.
3. **Isolate** the system from the power supply and **safeguard against reconnection**.
4. Fit strapping plug from pack to pos. Ⓖ of the control module (see page 19).

Making the electrical connections of the cylinder loading system

Note
*This connection must **only** be made if a **cylinder loading system** is used for DHW heating.*
*Using a **directly** heated cylinder requires **no** additional pump.*

Making the electrical connections of the cylinder . . . (cont.)



Ⓐ Plug from the pack
Ⓑ Distributor (on-site)
Ⓒ Cylinder primary pump
Ⓓ Two-way valve (normally closed, ⑤① see page 53)

1. Route the connecting cable of the cylinder primary pump through the strain relief at the front of the control panel.

2. Connect the cylinder primary pump cable and the two-way valve, in accordance with the illustration, with the 3-pin plug with the contact designation PE, 7, 8 (in the pack).

3. Undo the four screws and lift out the control panel upwards.

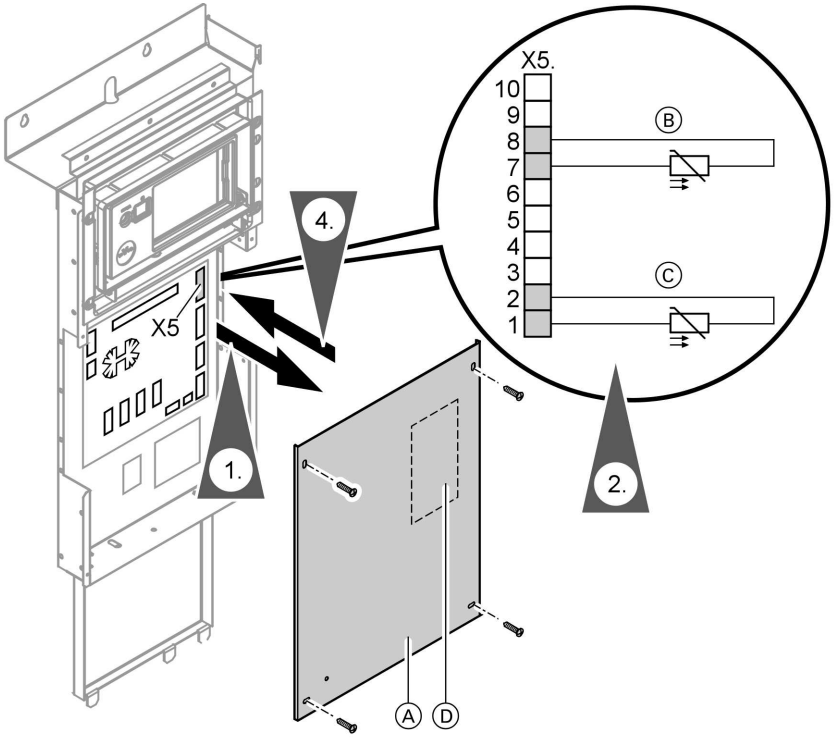
4. Fit the connecting cable in front position to mating plugs on top-hat rail marked PE, 7 and 8 (connecting area X50).

5. Re-insert the control panel and secure with the four screws.

5592 795 GB

Electrical connection of the cylinder temperature sensor(s)

Note
Subject to the DHW cylinder version, either one or two cylinder temperature sensor(s) can be connected.



Ⓐ Remove main PCB cover
Ⓑ Lower cylinder temperature sensor
Ⓒ Upper cylinder temperature sensor
Ⓓ Attach type plate here (see page 74)

1. Remove main PCB cover by undoing 4 screws and disconnecting the earth strap.

2. Connect sensor cable(s) to terminal strip X5 at top right on main PCB as shown in illustration. When only **one** cylinder temperature sensor is used, connect the lead across **X5.1** and **X5.2**.

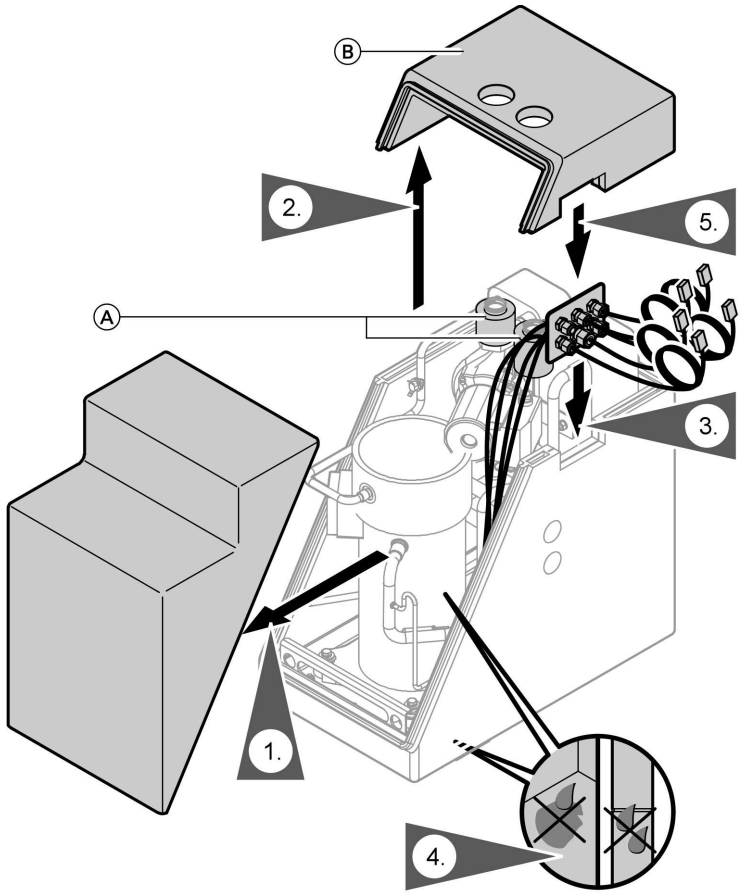
5592 795 GB

Electrical connection of the cylinder temperature . . . (cont.)

3. Secure the lead(s) with cable ties to the existing cables/leads.

4. Re-connect earth strap, fit main PCB cover and secure using 4 screws.

Installing the heat pump module and making the electrical connections



Installing the heat pump module and making the . . . (cont.)

Please note
If the compressor is at a steep angle in the heat pump module, the introduction of lubricant into the refrigerant circuit will damage the equipment. The heat pump module must not be tilted more than 30° during installation.

1. Remove the front part of the thermal insulation.

2. Remove the top part of the thermal insulation.

3. Insert the strain relief with inserted cables (lying at the bottom of the thermal insulation) into the groove of the recess in the lower part of the thermal insulation.

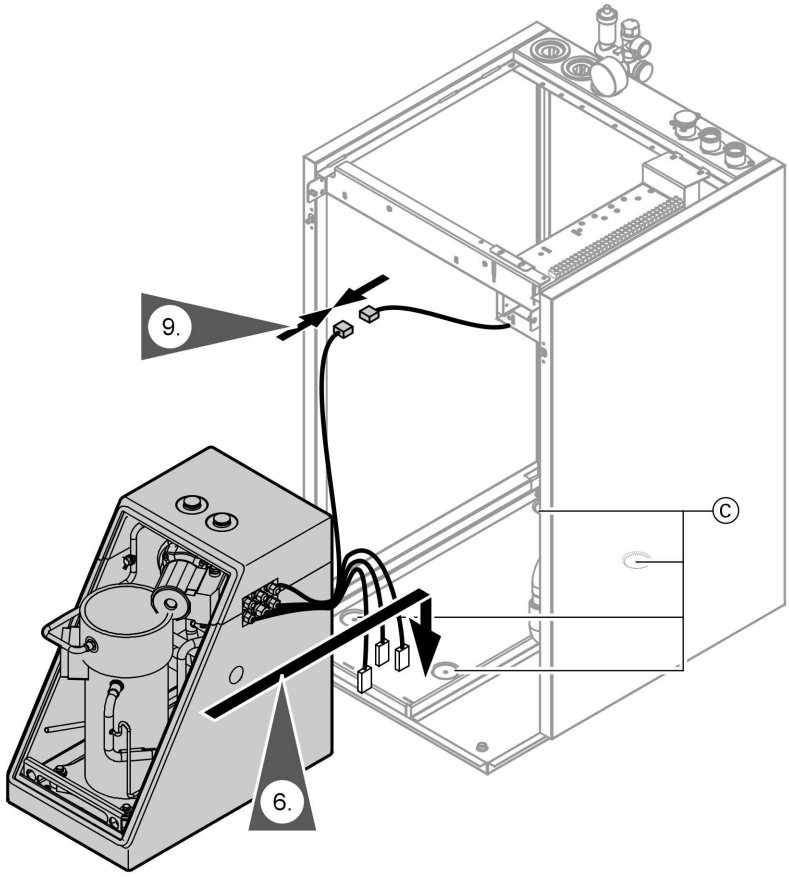
4. Check the floor area, valves and all visible solder joints of the heat pump for traces of oil.

   Note
   Traces of oil indicate a leaking refrigerant circuit. Ask a refrigeration engineer to check the heat pump.

5. Lead the thermal insulation Ⓐ of the primary inlets and outlets through the openings in the top part of the thermal insulation Ⓑ. Position the top part of the thermal insulation.

   Note
   Do not push the thermal insulation together when doing this.

Installing the heat pump module and making the . . . (cont.)



Installing the heat pump module and making the . . . (cont.)

6. **Please note**
Putting the components of the heat pump module and the thermal insulation under mechanical strain can cause damage.
The heat pump module must only be lifted beneath the thermal insulation, at the front edge of the bottom plate or at the brace (with lifting eye) located in the middle of the unit.

Note
Position the heat pump mounts in the four indentations Ⓒ provided for this purpose in the floor plate.

Lift the heat pump with the thermal insulation into the equipment.

7. Only with BWP 106/400 V:
Push the compressor connection into pos. Ⓚ at the control module (see page 19).

8. Push the safety chain connection (4-pin plug with designation 1, 2, 3, 4) into pos. Ⓔ at the control module (see page 19).
Push the primary pump connection (3-pin plug with designation PE, 5, 6) into pos. Ⓓ at the control module (see page 19).

Note
The plugs must click home.

9. Push the primary temperature sensor connection (2-pin, LV, see illustration on page 65) into the mating plug dangling from the control panel.

10. **Please note**
Damage to the insulation of the electrical cables can result in short circuits.
Route cables so that they cannot touch very hot, vibrating or sharp-edged components. Secure cables with cable ties.

Bundle the cables and secure with cable tie below the control panel. Fit transfer plugs at control module with strain reliefs.

11. Check that the unit is horizontal, re-adjusting the adjustable feet if necessary (see page 55).

5592 795 GB

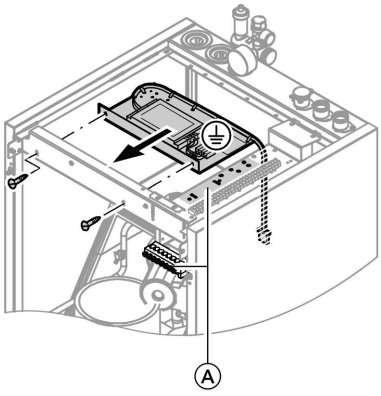
Connecting the external electrical components

1. Fit strain reliefs (from pack) to top left of control panel (see Ⓐ in illustration on page 67).
2. Make the electrical connections of the components in accordance with the description from page 76 at the terminals in the top of the control panel.
3. Secure all cables inside the strain reliefs at the control panel.

   Note
   The plug must click home.

Installing a 400 V full wave soft starter (as of BWP 108)

Note
*In accordance with the previously described installation procedure, the **heat pump module** must already be **installed**. The heat pump module **cannot** be installed **after** the full wave soft starter has been installed.*



Ⓐ Strain relief installation positions

1. ⚠ **Danger**
   The absence of component earthing can transfer dangerous body currents, should an electrical fault occur.
   It is important to connect the earth strap from the crossbar to the full wave soft starter.

   Attach full wave soft starter to upper crossbar with 2 screws.
2. Fit connector from compressor (4-pin or 6-pin plug with designation PE 9, 10, 11) to the right side of full wave soft starter.

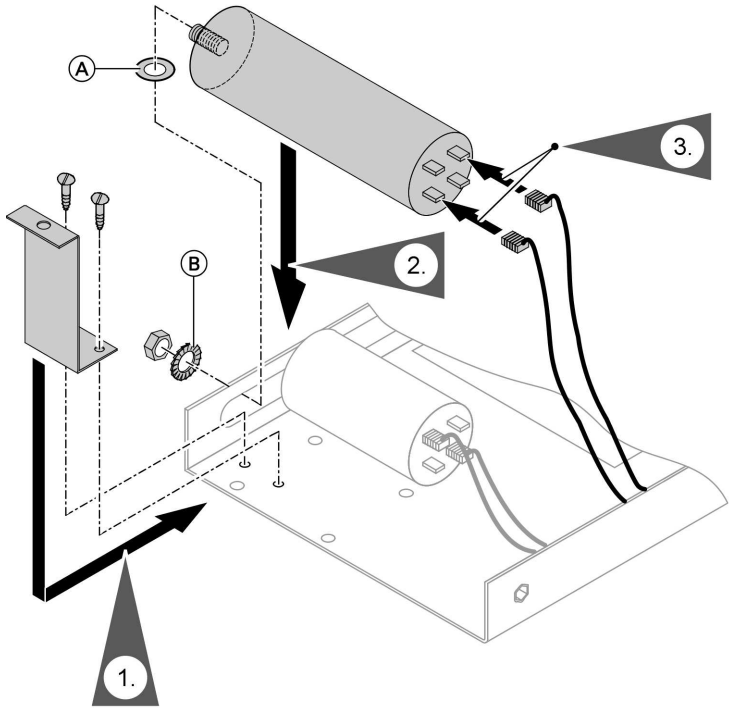
Installing a 400 V full wave soft starter (as of BWP . . . (cont.)

3. Plug cables from the left side of the full wave soft starter to pos. Ⓚ of the control module (see page 19).

Note
The plug must click home.

Installing a 230 V full wave soft starter (all models)

Note
*In accordance with the previously described installation procedure, the **heat pump module** must already be **installed**. The heat pump module **cannot** be installed **after** the full wave soft starter has been installed.*

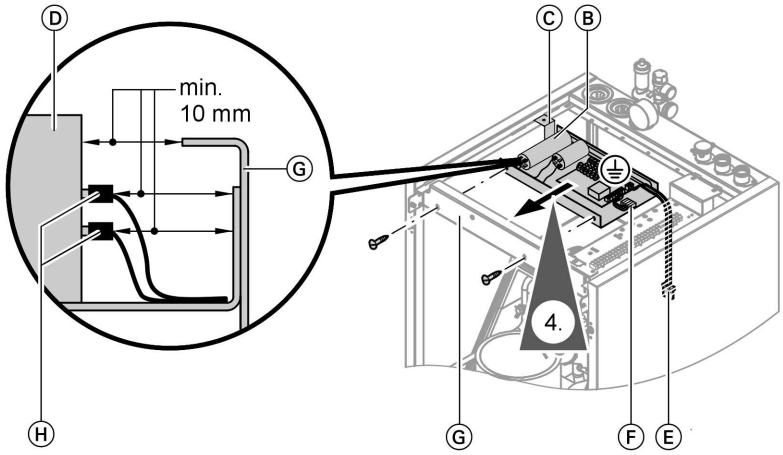


Installing a 230 V full wave soft starter (all . . . (cont.)

1. Attach the retaining bracket to the base plate of the full wave soft starter with 2 sheet metal screws.

2. Attach separately packed condenser with washer Ⓐ and serrated lock washer Ⓑ to base plate of full wave soft starter.

3. Fit cables to tabs of condenser in a diagonally offset position (like the condenser that is already installed).



Installing a 230 V full wave soft starter (all . . . (cont.)

4. **Danger**
The absence of component earthing can transfer dangerous body currents, should an electrical fault occur.
It is important to connect the earth strap from the crossbar to the full wave soft starter.

Attach the full wave soft starter to upper crossbar Ⓖ with 2 screws. Retaining bracket Ⓒ must be lying against the edge of the left side panel.

Note
Pay attention to distance between condenser Ⓓ with cables attached Ⓗ and crossbar Ⓖ and the edge of the crossbar as shown in illustration.

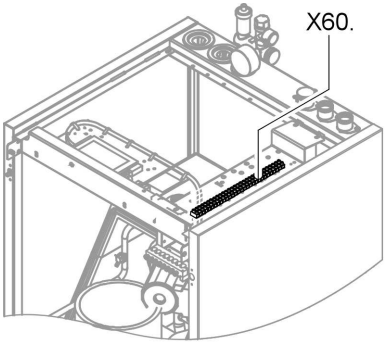
5. Plug connector from compressor (6-pin plug with designation PE, N, L, S, 230, 231) to mating plug Ⓕ on the right side of the full wave soft starter.

Note
The plug must click home.

6. Plug cable Ⓔ of the full wave soft starter to pos. Ⓚ of control module (see page 22).

Note
The plug must click home.

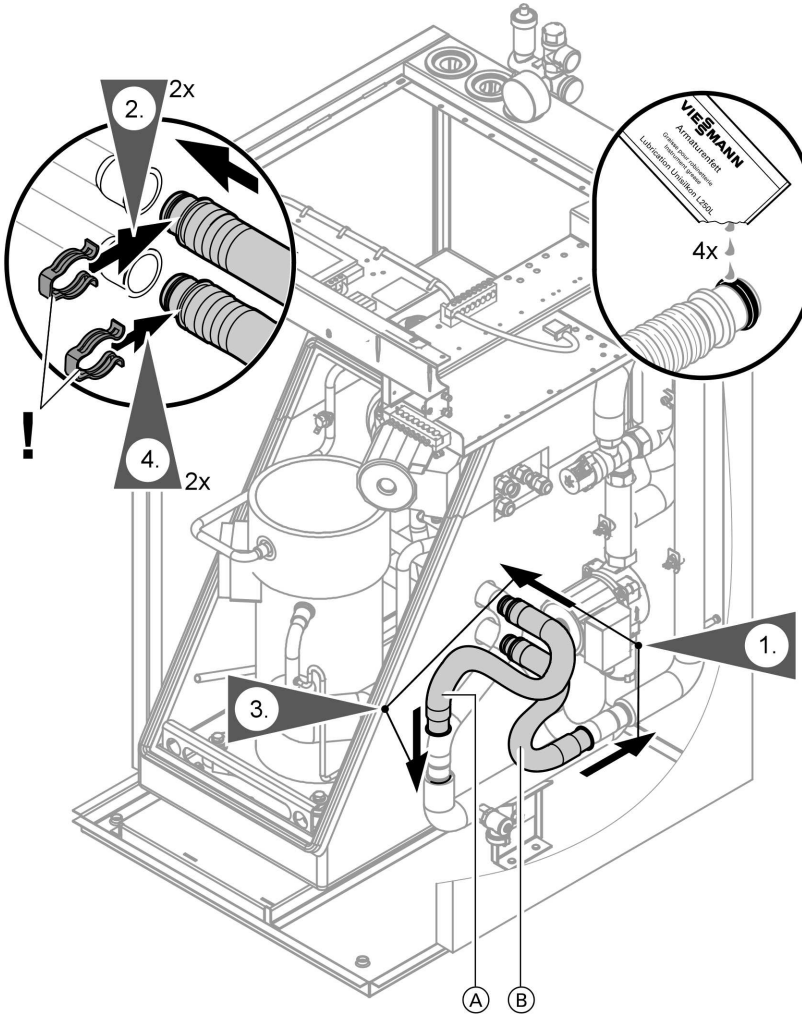
Connecting the brine pressure switch or a jumper



The brine pressure switch is connected across terminals X60.11 and X60.12 at the top of the control panel (see also page 79).
If **no** brine pressure switch is connected, **always** connect the jumper in the pack across these terminals.

5592 795 GB

Connections on the secondary side of the heat pump



Ⓐ Corrugated stainless steel pipe for secondary circuit flow

Ⓑ Corrugated stainless steel pipe for secondary circuit return

Connections on the secondary side of the heat . . . (cont.)

1. Fit corrugated stainless steel pipe (from pack) to rear connector at the bottom right in the heat pump enclosure.
   Then route the corrugated stainless steel pipe Ⓑ through the lower opening in the thermal insulation of the heat pump and fit to the connector behind it.

2. **Secure** the corrugated pipe at the connector with the clamps provided.

3. Fit corrugated stainless steel pipe Ⓐ (from pack) to front connector at the bottom right in the heat pump enclosure.
   Then route the corrugated stainless steel pipe Ⓐ through the upper opening in the thermal insulation of the heat pump and fit to the connector behind it.

4. **Secure** the corrugated pipe at the connector with the clamps provided.

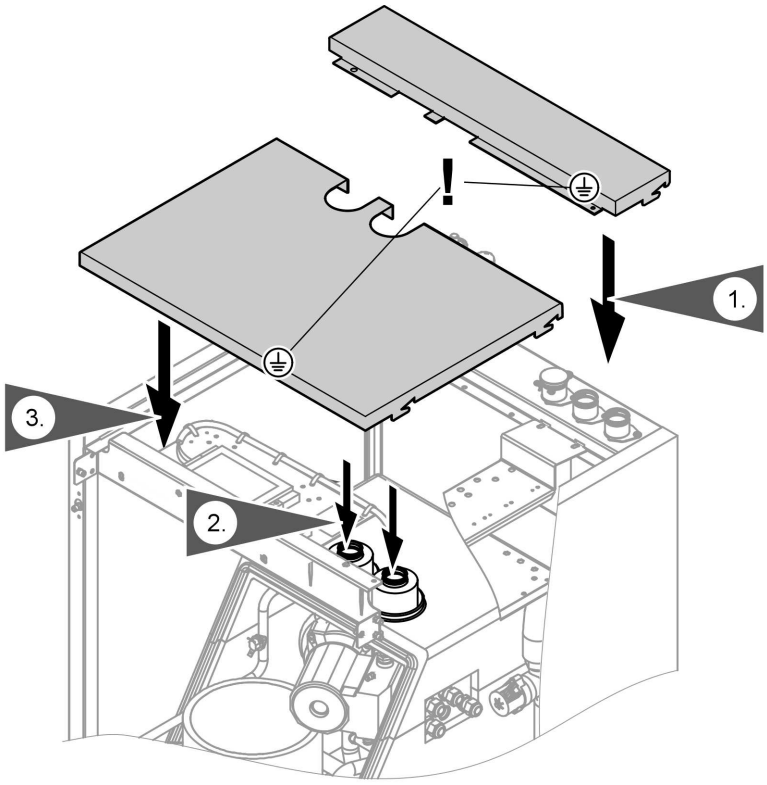
Connections on the primary side of the heat pump

General brine circuit (primary circuit) requirements:

- The components used must be resistant to the "Tyfocor" heat transfer medium (**never use galvanised** pipes).
- To ensure the perfect operation of the brine circuit, route pipes so that air pockets cannot form and that complete venting is ensured.
- Equip brine circuit with diaphragm expansion vessel and safety valve as described in DIN 4757.
- The diaphragm expansion vessel must be approved in accordance with DIN 4807. The diaphragms and seals of the expansion vessel and the safety valve must be suitable for the heat transfer medium.
  For calculating the inlet pressure of the diaphragm expansion vessel, see "Vitocal 200/343" technical guide.
- Ensure adequate thermal and sound insulation of all pipes routed through walls.
- Insulate lines inside the building to provide protection from heat and vapour diffusion.
- Blow-off and drainage lines must converge in one container that can hold the maximum possible expansion volume of the heat transfer medium.

5592 795 GB

Connections on the primary side of the heat . . . (cont.)



Danger
The absence of component earthing can transfer dangerous body currents, should an electrical fault occur.
Always connect the earth straps to the top panels.

1. Fit the rear top panel.

Connections on the primary side of the heat . . . (cont.)

2. Insert the corrugated pipes of the connection set for the brine circuit (supplied with the heat pump) into the pipe sleeves of the heat pump.

   Note
   *Do **not shorten** the corrugated pipes. It will **not be possible to seal** the connector at the shortened end of the corrugated pipe.*

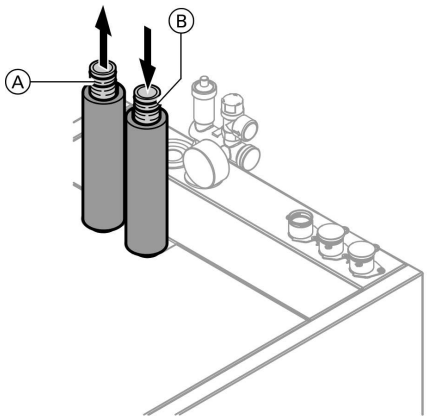
   Then **secure** the corrugated pipes using the clamps provided and connect to the on-site brine circuit installation (see page 15).

   
   Installation information - brine circuit connection set.

3. Fit the front top panel.

4. Affix type plate to main PCB cover (for position see illustration on page 62).

Connections on the primary side of the heat . . . (cont.)



Ⓐ Primary return (brine) OUT
Ⓑ Primary flow (brine) IN

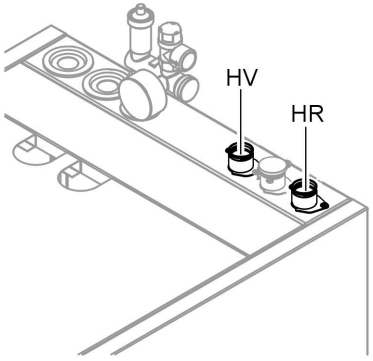
5. Connect corrugated pipes to on-site primary circuit.

6. Fill primary circuit with Viessmann "Tyfocor" heat transfer medium (ethylene glycol/water mixture with frost protection down to −15 °C).

! **Please note**
To prevent the brine circuit pump from being destroyed (primary circuit pump), never exceed a glycol concentration in the heat transfer medium of 30 % (not even for short periods, i.e. during filling).
Also, never use the pump for filling the system (air pockets in conjunction with the glycol/water mixture can destroy the pump).

5592 795 GB

Connecting the heating circuits



HR Heating water return (Multi-connect system)
HV Heating water flow (Multi-connect system)

Please note
With **underfloor heating circuits**, there is a risk of building damage through overheating the screed, if the control fails. Equip **underfloor heating circuits** with a temperature limiter.

1. Thoroughly flush the heating system (particularly when connecting to an existing system) and connect the heating water flow and return in accordance with the adjacent diagram.

2. Carry out a leak/soundness test.

Operating pressure:	3 bar
Max. test pressure:	4 bar

Making the electrical connections to external components

Note
The unit's external electrical connections are located together on the control panel in the top r.h. area of the unit (see X60 on Ⓑ in illustration on page 54).

Sensor connections

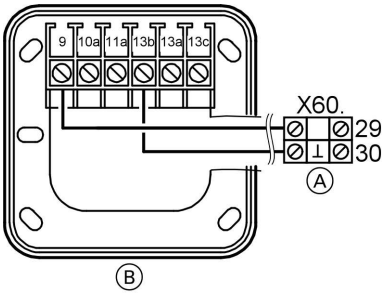
With the exception of the outside temperature sensor, we recommend the use of screened cable (e.g. J-Y(St)Y, 2 x 0.8 mm, max. 10 m long).

Note
Never run LV cables immediately next to 230/400 V cables.
For cable runs > 10 m, use a larger cross-section or terminate several cores together.

5592 795 GB

Making the electrical connections to external . . . (cont.)

Room temperature sensor (type Ni 500)



Note
Release snap fasteners to open room temperature sensor.

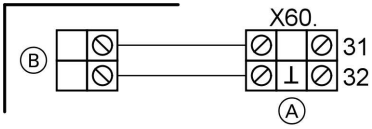
Room temperature sensor installation instructions

Ⓐ Terminals in the control panel
Ⓑ Room temperature sensor enclosure

Information regarding use of room temperature sensors and remote controls

- If a room temperature sensor is being installed for a heating circuit without a remote control, the room temperature sensor must be connected as shown in the illustration above.
- If a remote control has been connected for a heating circuit, the room temperature sensor for this heating circuit must be connected to the remote control.
- If 2 remote controls have been connected, connection X60.29/X60.30 on the control panel will be disabled.
- Both the remote control units and the room temperature sensors must be activated independently (see control settings, pages 154 and 157).

Outside temperature sensor (type Ni 500)



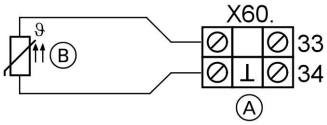
Fit the outside temperature sensor to a wall facing the north or the north-west at a height of approx. 2.5 m; never render it over.
Lead: 2 x 1.5 mm^2, max. 35 m long, copper.
Cores are interchangeable.

Ⓐ Terminals in the control panel
Ⓑ Terminals at the outside temperature sensor

5592 795 GB

Making the electrical connections to external . . . (cont.)

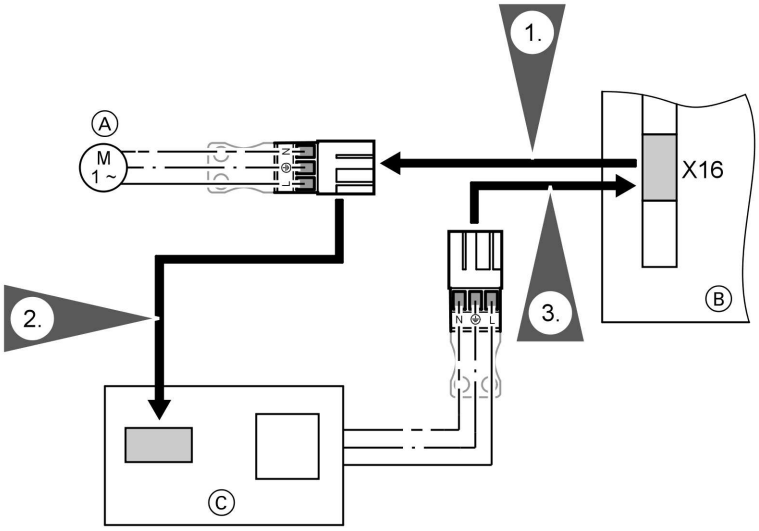
Temperature sensor (type Pt 500) in the heating water buffer cylinder



Ⓐ Terminals in the control panel
Ⓑ Buffer cylinder sensor

Connect temperature limiter to underfloor heating system

When using the integral secondary circuit pump as a heating circuit pump



1. Unplug connector or built-in secondary circuit pump Ⓐ from X16 of main PCB Ⓑ (see page 54).

2. Plug connector of built-in secondary circuit pump into socket on temperature limiter Ⓒ.

3. Plug connector of temperature limiter to X16 on main PCB.

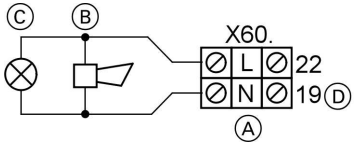
5592 795 GB

Making the electrical connections to external . . . (cont.)

When using a separate heating circuit pump

Temperature limiter installation instructions

Central fault message



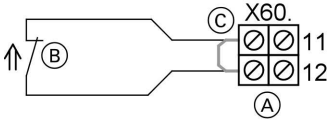
Ⓐ Terminals in the control panel
Ⓑ Acoustic alarm
Ⓒ Optical alarm
Ⓓ Alternatively, the neutral conductor can also be connected across terminals X60.13 or X60.16

Breaking capacity: 230 V~, 0.7 A

Note
*This contact is **not** at zero volt. 230 V~ will be present if there is a fault.*

Pressure switch, brine circuit

Note
*If **no** brine circuit pressure switch is connected, **always** connect the jumper in the pack downstream of the power supply. Always check the rotary field prior to inserting the jumper.*



Ⓐ Terminals in the control panel
Ⓑ Brine pressure switch
Ⓒ Jumper

The contact must be able to switch at least 230 V and 0.7 A.

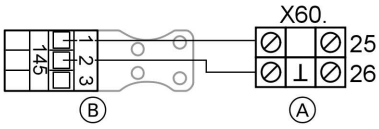
Note
Only use components in the safety chain that do not automatically restart (reset). Where required, ensure this through a mechanical interlock.

5592 795 GB

Making the electrical connections to external . . . (cont.)

Extension kit for a mixer circuit and/or Vitotrol 200 remote control (via KM BUS)

Note
General information regarding the room temperature sensors and remote controls, see page 77.

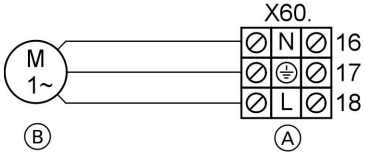


Ⓐ Terminals in the control panel
Ⓑ Connection extension kit or KM BUS distributor

Connection via KM BUS data cable.
Connect the mixer circuit pump to the extension kit.
The connecting plug and cable (3 m long) are supplied with the extension kit. If several users are to be connected to the KM BUS we recommend the use of a KM BUS distributor (accessory).
Cores are interchangeable.

Extension kit installation instructions

DHW circulation pump



Ⓐ Terminals in the control panel
Ⓑ DHW circulation pump

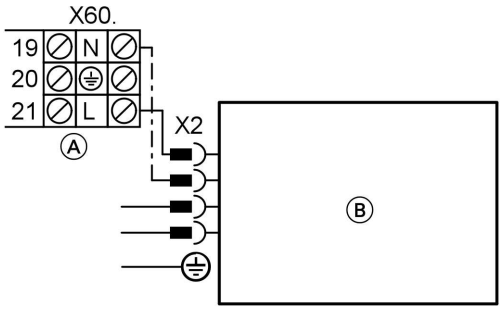
Breaking capacity: 230 V~, 0.7 A

Natural cooling extension kit

The control unit provides a control signal, with which the natural cooling extension kit and the components connected to it can be regulated.

Extension kit installation instructions

Making the electrical connections to external . . . (cont.)

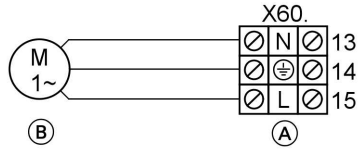


Ⓐ Terminals in the control panel

Ⓑ Natural cooling extension kit

Suggestion for on-site wiring of the connections for the natural cooling function:
Vitocal 200/343 technical guide.

Pump of the heating circuit without mixer



Breaking capacity: 230 V~, 0.7 A

Note
*The heating circuit pump **with** mixer is connected to the extension kit (for one heating circuit with mixer).*

Ⓐ Terminals in the control panel
Ⓑ Pump of the heating circuit without mixer

Power-OFF connection (400/230 V)

The signal from the power-OFF contact has the following effects:
- Notification to control unit (via junction box terminal strip X60)
- Shutting down the supply voltage ("hard shutdown") of the respective operating component

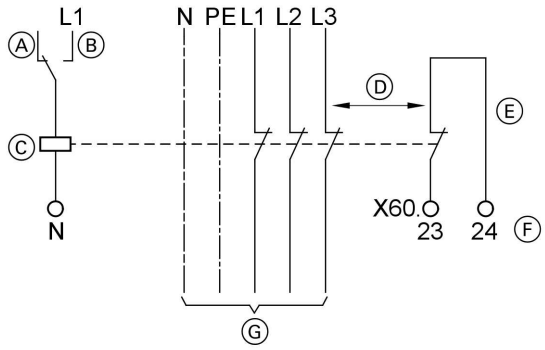
5592 795 GB

Making the electrical connections to external . . . (cont.)

Version 1

"Hard shutdown" of power supply for compressor and/or instantaneous heating water heater and OFF contact to control unit (see also page 14).

Power-OFF with 400 V power connection (version 1)



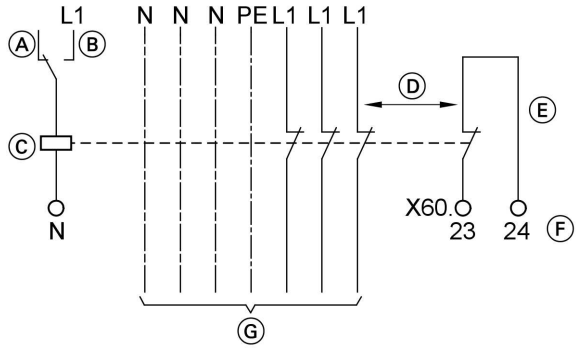
Ⓐ No power-OFF in this position
Ⓑ Control contact ripple control receiver "power-OFF"
Ⓒ Contactor (part no. 7814 681)
Ⓓ The air and creepage gap must exceed 8 mm, since the control input is a low voltage input
Ⓔ Power-OFF contact for control unit
Ⓕ Terminals in the control panel
Ⓖ **Compressor** or **instantaneous heating water heater** (400 V) power supply connection

5592 795 GB

Making the electrical connections to external . . . (cont.)

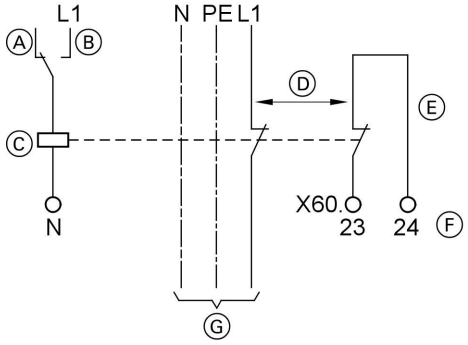
Power-OFF with 230 V power connection (version 1)

Instantaneous heating water heater



Ⓐ No power-OFF in this position
Ⓑ Control contact ripple control receiver "power-OFF"
Ⓒ Contactor (part no. 7814 681)
Ⓓ The air and creepage gap must exceed 8 mm, since the control input is a low voltage input
Ⓔ Power-OFF contact for control unit
Ⓕ Terminals in the control panel
Ⓖ **Instantaneous heating water heater** (230 V) power supply connection

Compressor



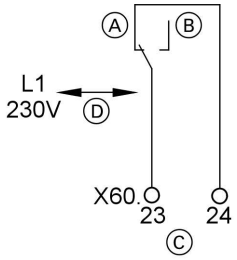
Ⓐ No power-OFF in this position

Making the electrical connections to external . . . (cont.)

Ⓑ Control contact ripple control receiver "power-OFF"
Ⓒ Contactor
Ⓓ The air and creepage gap must exceed 8 mm, since the control input is a low voltage input
Ⓔ Power-OFF contact for control unit
Ⓕ Terminals in the control panel
Ⓖ **Compressor** (230 V) power supply connection

Version 2 (400/230 V)

If the power supply utility does not require a "hard" shutdown of the **compressor** and/or the **instantaneous heating water heater**, it is sufficient to connect the power-OFF contact to the junction box (Ⓓ mandatory requirement). The operating component is blocked by the control unit, i.e. the control-internal relay is not actuated.



Ⓐ No power-OFF in this position
Ⓑ Control contact ripple control receiver "power-OFF"
Ⓒ Terminals in the control panel
Ⓓ The air and creepage gap must exceed 8 mm, since the control input is a low voltage input

Phase monitors (only with 400 V units, accessory)

The phase monitor available as an accessory can be used to monitor the compressor power supply.
For this, the phase monitor is plugged into the control module below the heat pump control panel (see page 59).

Two versions may be used (see illustrations on pages 86 and 87).
The following power supply deviations are permitted in the delivered condition:

5592 795 GB

Making the electrical connections to external . . . (cont.)

Over/undervoltage	15 %
Phase asymmetry	15 %
Switching delay	4 s

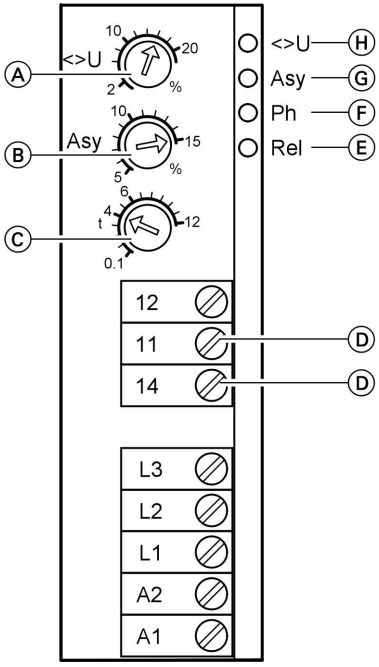
The phase monitor shuts off if these tolerance ranges are exceeded.

If the values are within the tolerance range again, the phase monitor automatically re-enables the power supply.

5592 795 GB

Making the electrical connections to external . . . (cont.)

Version 1



Ⓐ Over/undervoltage in %
Ⓑ Phase asymmetry in %
Ⓒ Switching delay in s
Ⓓ Contact used in the safety chain (N/O)
Ⓔ Operating display ("Rel")
Ⓕ Fault display phase failure/phase sequence ("Ph")
Ⓖ Fault display asymmetry ("Asy")
Ⓗ Fault display over/undervoltage ("<>U")

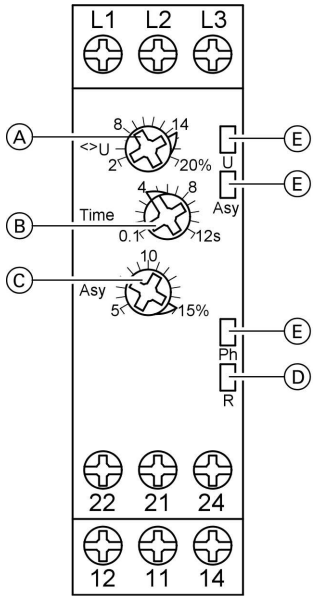
LEDs explained

- LED "Rel" illuminates green:
  All voltages and the rotary field (clockwise) are healthy.
- LED "Ph" illuminates red:
  The relay has responded; the rotary field is anti-clockwise.
- All LED's off:
  One or several phases have dropped out.
- LED "<>U" illuminates red:
  Incorrect voltage on one/several phase(s).
- LED "Asy" illuminates red:
  Incorrect voltage on one/several phase(s).

5592 795 GB

Making the electrical connections to external . . . (cont.)

Version 2



Ⓐ Over/undervoltage in %
Ⓑ Switching delay in s
Ⓒ Phase asymmetry in %
Ⓓ Green LED
Ⓔ Yellow LED

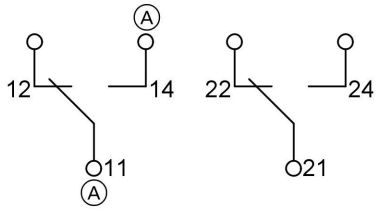
LEDs explained

- LED "R" illuminates green:
  All voltages and the rotary field (clockwise) are healthy.
- LED "Ph" flashes yellow:
  The relay has responded; the rotary field is anti-clockwise.
- All LED's off:
  One or several phases have dropped out.
- LED "U" flashes yellow:
  Undervoltage on one/several phase (s).
- LED "U" illuminates yellow:
  Overvoltage on one/several phase (s).
- LED "Asy" illuminates yellow:
  Incorrect voltage on one/several phase(s).

5592 795 GB

Making the electrical connections to external . . . (cont.)

Relay switch contacts for activating signalling equipment or for blocking the heat pump:



Ⓐ Contact used in the safety chain (N/O)

Power supply

Danger
Incorrectly executed electrical installations can lead to injury through the transmission of dangerous body currents and result in equipment damage.
Carry out the power supply connection and all earthing measures (i.e fault current circuit) in accordance with IEC 364, the requirements of your local power supply utility, VDE or local and national regulations.

Main isolator requirements (if necessary)

If a main isolator is set, it must isolate the power circuit with at least 3 mm contact separation.

If no main isolator is set, all non-earthed cables must be isolated by the upstream cable protection switch with at least 3 mm contact separation.

General information regarding the power supply

The power supply is separated into three areas:
- Control unit feed (electronics)
- Instantaneous heating water heater feed (main power circuit)
- Heat pump compressor feed (main power circuit)

Subject to heat pump, the equipment is connected to a 400 V three phase AC or 230 V single phase AC supply.

5592 795 GB

Power supply (cont.)

The feed for the control unit and the instantaneous heating water heater is provided on the main connecting area X60. The compressor feed comes from control module X80 (see also page 54).
The power supply cables to the main power circuits must have a suitable cross-section for the rated current (see specification from page 195 onwards).
Protect the power supply cable to the control unit with a fuse of max. 16 A.
The power fuses for the compressor must have Z characteristics.

Note
We recommend making the power connection for accessories and external components to the same fuse, with at least the same phase as the control unit.
Connection to the same fuse provides additional safety when the power is switched off. However, please pay attention to the power consumption of the consumers that are connected when doing this (control unit feed fuse protection max. 16 A).

Danger
The absence of component earthing can transfer dangerous body currents, should an electrical fault occur.
The equipment and the pipework must be connected to the earth bonding of the house in question.

Please note
Only for 400 V units: An incorrect phase sequence can cause damage to the unit.
The power supply connection to the compressor **must** have a **clockwise** rotary field in the phase sequence that is specified at the terminals.

In negotiations with your power supply utility, different feed tariffs for the main power circuits may be offered. The **control unit/electronics** feed must be implemented **without** possible block from the power supply utility; tariffs that are subject to possible shutdowns must not be applied to these feeds.

The allocation of the power-OFF (for compressor and/or instantaneous heating water heater) is made via the control unit settings (see pages 137 and 142). Blocking of the main supply is limited to max. 3 times 2 hours per day (24 h) in Germany.

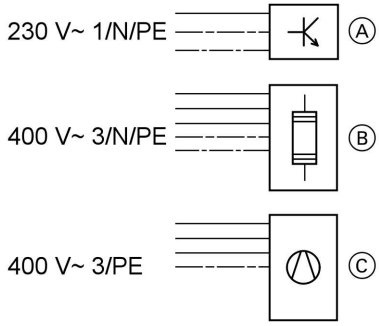
5592 795 GB

Power supply (cont.)

Power supply 400 V~, various tariffs

- Three separate supply cables
- Selective power-OFF for compressor and instantaneous heating water heater possible

The cross-section of the power supply lines must be appropriate for the connected load of the relevant unit.

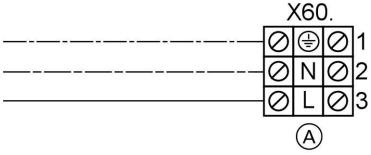


Ⓐ Control unit
Recommended power supply cable: 3 x 1.5 mm^2

Ⓑ Instantaneous heating water heater
Recommended power supply cable: 5 x 2.5 mm^2

Ⓒ Compressor
Recommended power supply cable: 4 x 1.5 mm^2

Control unit power supply



Note
*This supply must **never** be blocked*

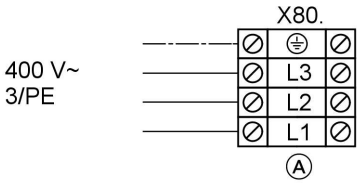
Max. fuse rating 16 A

Ⓐ Terminals in the control panel

5592 795 GB

Power supply (cont.)

Compressor power supply connection

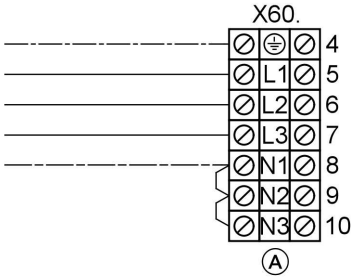


Recommended core cross-section: 1.5 mm^2

Note
The upstream fuses must have Z characteristics.

Ⓐ Terminals at the control module

Instantaneous heating water heater power supply



Max. fuse rating 16 A
Recommended core cross-section: 2.5 mm^2

The three heating elements are switched by inserting jumpers across X60.8, X60.9 and X60.10 in star formation and must be connected to N.

Ⓐ Terminals in the control panel

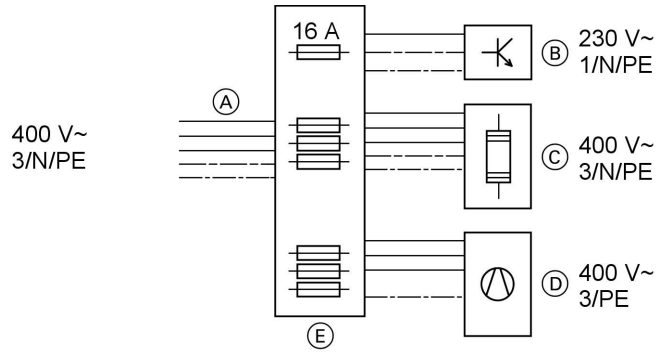
Power supply 400 V~, one tariff

- One common supply cable with a large cross-section up to the vicinity of the heat pump.
- The common supply cable cannot be blocked. Selective blocking of the individual supply cables must take place downstream of the sub-distribution, which means additional sub-distribution costs.

Adapt the cross-section of common supply cable to the connected load of the instantaneous heating water heater and the compressor. The connected load of the control unit does not have to be taken into consideration.

5592 795 GB

Power supply (cont.)



Ⓐ Common heat pump supply cable
Recommended power supply cable: 5 x 4 mm^2

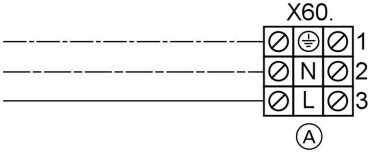
Ⓑ Control unit, no power-OFF permissible
Recommended power supply cable: 3 x 1.5 mm^2

Ⓒ Instantaneous heating water heater
Recommended power supply cable: 5 x 2.5 mm^2

Ⓓ Compressor
Recommended power supply cable: 4 x 1.5 mm^2

Ⓔ Sub-distribution (direct for the Vitocal 200)

Control unit power supply



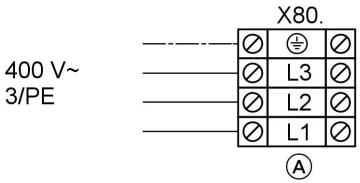
Note
*This supply must **never** be blocked.*

Max. protection 16 A.

Ⓐ Terminals in the control panel

Power supply (cont.)

Compressor power supply connection

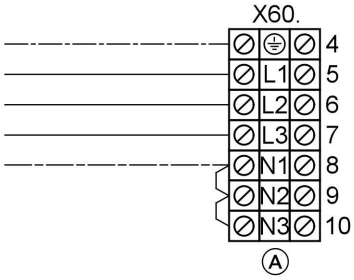


Recommended core cross-section: 1.5 mm^2

Note
The upstream fuses must have Z characteristics.

Ⓐ Terminals at the control module

Instantaneous heating water heater power supply



Max. fuse rating 16 A
Recommended core cross-section: 2.5 mm^2

The three heating elements are switched by inserting jumpers across X60.8, X60.9 and X60.10 in star formation and must be connected to N.

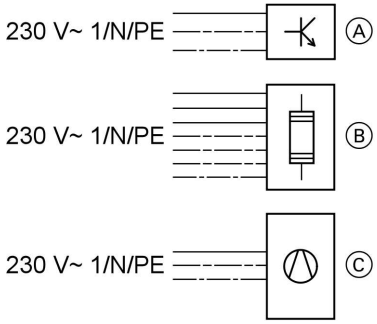
Ⓐ Terminals in the control panel

Power supply 230 V~, various tariffs

- Three separate supply cables
- Selective power-OFF for compressor and instantaneous heating water heater possible

The cross-section of the power supply lines must be appropriate for the connected load of the relevant unit.

Power supply (cont.)

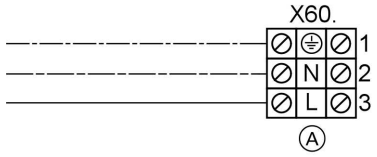


Ⓐ Control unit
Recommended power supply cable: 3 x 1.5 mm^2

Ⓑ Instantaneous heating water heater
Recommended power supply cable: 7 x 2.5 mm^2

Ⓒ Compressor
Recommended power supply cable: 3 x 4 mm^2

Control unit power supply



Note
*This supply must **never** be blocked.*

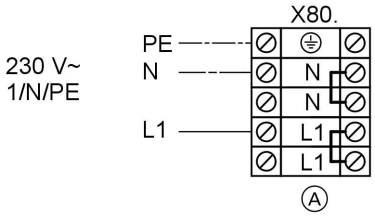
Max. protection 16 A.

Ⓐ Terminals in the control panel

5592 795 GB

Power supply (cont.)

Compressor power supply connection

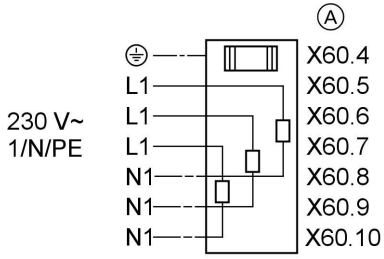


Recommended power supply cable: 3 x 4 mm^2

Note
The upstream fuses must have Z characteristics.

Ⓐ Terminals at the control module

Instantaneous heating water heater power supply



Each heater winding requires its own neutral conductor. **Never** bridge the neutral conductor without increasing the cross-section.
Blue flexible tubing has been provided with the unit for marking the neutral conductors in accordance with VDE 0100, part 430.

Ⓐ Terminals in the control panel
Max. fuse rating 16 A
Recommended power supply cable: 7 x 2.5 mm^2
Max. lead length: 30 m

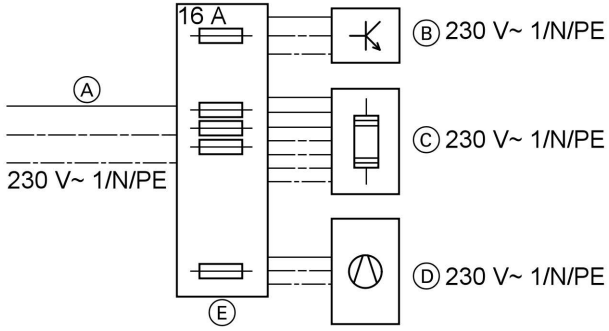
Danger
Incomplete phase shutdowns can lead to the transfer of dangerous body currents, should an electrical fault occur.
The circuit breakers must be mechanically **blocked** together. The use of individual circuit breakers is not acceptable.

Power supply 230 V~, one tariff

- One common supply cable with a large cross-section up to the vicinity of the heat pump.
- The common supply cable cannot be blocked. Selective blocking of the individual supply cables must take place downstream of the sub-distribution, which means additional sub-distribution costs.

Power supply (cont.)

Adapt the cross-section of common supply cable to the connected load of the instantaneous heating water heater and the compressor. The connected load of the control unit does not have to be taken into consideration.



Ⓐ Common heat pump supply cable
Recommended power supply cable: 4 x 10 mm^2

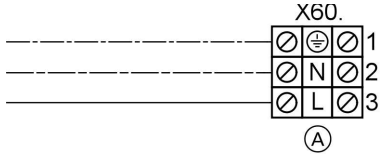
Ⓑ Control unit, no power-OFF permissible
Recommended power supply cable: 3 x 1.5 mm^2

Ⓒ Instantaneous heating water heater
Recommended power supply cable: 7 x 2.5 mm^2

Ⓓ Compressor
Recommended power supply cable: 3 x 4 mm^2

Ⓔ Sub-distribution (direct for the Vitocal 200)

Control unit power supply



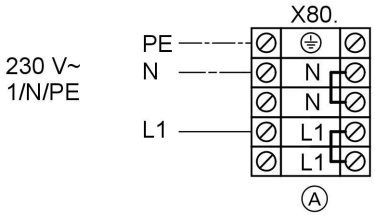
Note
*This supply must **never** be blocked.*

Max. protection 16 A.

Ⓐ Terminals in the control panel

Power supply (cont.)

Compressor power supply connection

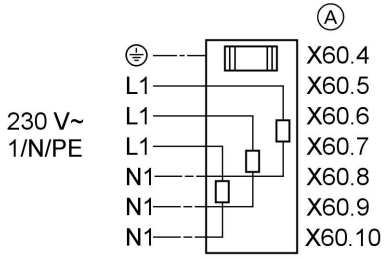


Recommended power supply cable:
3 x 4 mm^2

Note
The upstream fuses must have Z characteristics.

Ⓐ Terminals at the control module

Instantaneous heating water heater power supply



Each heater winding requires its own neutral conductor. **Never** bridge the neutral conductor without increasing the cross-section.
Blue flexible tubing has been provided with the unit for marking the neutral conductors in accordance with VDE 0100, part 430.

Danger
Incomplete phase shutdowns can lead to the transfer of dangerous body currents, should an electrical fault occur.
The circuit breakers must be mechanically **blocked** together. The use of individual circuit breakers is not acceptable.

Ⓐ Terminals in the control panel
Max. fuse rating 16 A
Recommended power supply cable:
7 x 2.5 mm^2
Max. lead length: 30 m

Steps - commissioning, inspection and maintenance

For further information regarding the individual steps, see the page indicated

Commissioning steps	Inspection steps	Maintenance steps		Page
•	•	•	**1. Removing the front panel**	99
•			**2. Maintaining service reports**	99
•	•	•	**3. Switching OFF/disconnecting the main fuse**	
	•	•	**4. Checking the refrigerant circuit for leaks**	99
•	•	•	**5. Filling the primary circuit, venting it and checking its pressure**	100
•			**6. Filling and venting the secondary equipment**	101
•			**7. Filling the DHW cylinder from the DHW side**	
•	•	•	**8. Checking the diaphragm expansion vessel of the heating circuit and its pressure**	103
•	•	•	**9. Checking all connections on the heating water and DHW sides for leaks**	
•	•		**10. Checking the safety valve function**	
•			**11. Checking the external connections at the control panel for tightness and correct terminal allocation**	
•	•	•	**12. Switching ON/connecting the main fuse**	
•			**13. System configuration**	103
•	•	•	**14. Checking the antifreeze concentration in the brine circuit**	107
•			**15. Checking the sensor connections**	107
•		•	**16. Checking the secondary pump**	107
•		•	**17. Checking the external heating circuit pumps**	108
•		•	**18. Checking the primary pump**	109
•		•	**19. Checking mixers, heat pump and cylinder heating**	110
		•	**20. Checking the high pressure limiter**	112
		•	**21. Checking the compressor casing temperature**	112
•			**22. Setting the control parameters**	112

5592 795 GB

Further details regarding the individual steps

Removing the front panel

Danger
Touching 'live' components can result in the transfer of dangerous body currents.
Never touch the connections inside control panel Ⓐ (see page 56) and in the control module below.
If the unit is live, the **cover** Ⓑ of the electrical components (see page 56) must be **fitted**.

Danger
The absence of earthing on the components can transfer dangerous body currents and may damage the equipment, should an electrical fault occur.
Always re-connect the earth straps to the top panels, when these are re-fitted.

Please note
Wait **at least 30 min** between the installation and the commissioning of the equipment in order to prevent equipment damage.
Work on the **refrigeration circuit** must only be carried out by a qualified **refrigeration engineer**.

For work in connection with commissioning, inspection and maintenance, remove the front panel and place the control unit into its service position (see page 56).

Observe the operating instructions when commissioning the equipment.

Maintaining service reports

Enter measurements taken during commissioning described in the following in the reports from page 189 onwards.

Checking the refrigerant circuit for leaks

Check the heat pump interior with a refrigerant leak detector or leak detection spray for refrigerant leaks.

1. Remove the front panel and place the control unit into its service position (see page 56).

Further details regarding the individual steps (cont.)

2. Remove the front part of the heat pump thermal insulation (see page 63).
3. Check the floor area, valves and all visible solder joints for traces of oil.

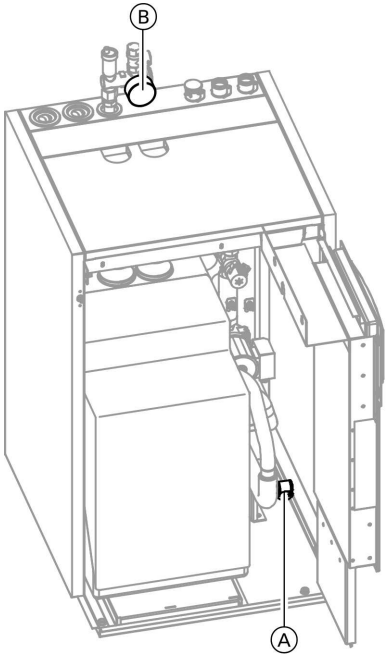
Filling the primary circuit, venting it and checking its pressure

Please note
To prevent equipment damage, it is **vital** to prevent the compressor from being switched on if the primary circuit **has not been filled**.
For this, pull the plug-in connector from the compressor (see page 65).

1. **Only for commissioning:**
   Flush the primary circuit.
2. **Only for commissioning:**
   Fill the primary circuit with heat transfer medium "Tyfocor -15 ° C" and vent the circuit.
3. Check the primary circuit pressure. The pressure should be approx. 2 bar.
4. Check the inlet pressure of the diaphragm expansion vessel and adjust if required (see page 103).

Further details regarding the individual steps (cont.)

Filling and venting the secondary equipment



Ⓐ Fill & drain valve
Ⓑ Pressure gauge

1. Open any non-return valves installed on site.

2. Check the inlet pressure of the diaphragm expansion vessel (see page 103).

3. Thoroughly flush the on-site pipework.

4. Fill the heating circuit via fill & drain valve Ⓐ with water; during filling, check the system pressure at pressure gauge Ⓑ.

Minimum system pressure	0.8 bar
Permissible operating pressure	3 bar

5. Close fill & drain valve Ⓐ.

6. Open a suitable air vent valve in the heating circuit.

7. Switch ON the power.

8. Setting the operating mode selector (Ⓓ on page 113) to "⏻".

9. Start the equipment at the system ON/OFF switch (see page 173).

5592 795 GB

Further details regarding the individual steps (cont.)

10. ***Note***
*Pay attention to information concerning control operation (from page 129), select language if necessary (see page 103, default setting "**German**").*

Start the commissioning program for the heating circuit:

Menu item
- "**System settings**"
- "**Tech. service level**"
  Enter the **code** for "**Heating engineer**" (see page 129).
- "**Commissioning**"
- "**Heating circuit**" (for system without external heating circuit pumps)
  or
- "**Heat. circuit 1 pump**" and/or "**Heat. circuit 2 pump**" (subject to system version)

! **Please note**
In order to prevent equipment damage, check the flow and return connections of the secondary heat pump circuit for leaks (see page 71).
In case of leaks, immediately shut off the equipment, drain the water and check the seating of the seal rings. Replace all seal rings that may have slipped.

11. Let the commissioning program run until the equipment is fully vented. For this, observe the system pressure; should that drop below 0.8 bar, top up with water.

12. Close the air vent valve.

13. Terminate the commissioning program with key "**BACK**".

14. Only for commissioning:
Fit the front part of the heat pump thermal insulation (see page 63).

5592 795 GB

Further details regarding the individual steps (cont.)

Checking the diaphragm expansion vessel of the heating circuit and its pressure

Carry out this test on a cold system.

Note
Only use anti-corrosion agents that have been approved for heat pumps with DHW heating via single-walled heat exchangers (DHW cylinders).

1. Drain the heating water side of the boiler system and reduce the pressure until the pressure gauge indicates "0".

2. If the inlet pressure of the diaphragm expansion vessel is lower than the static system pressure, top up with sufficient nitrogen to raise the inlet pressure higher than the static system pressure.

   Example:

Static head (distance between the heat source and the highest heating surface)	10 m
= static pressure	1 bar

3. Top up with water, until the filling pressure exceeds the inlet pressure of the diaphragm expansion vessel.
   On a cold system, the filling pressure must be approx. 0.2 bar higher than the static pressure.
   Max. operating pressure: 3.5 bar.

4. During commissioning, mark this value on the pressure gauge as minimum filling pressure.

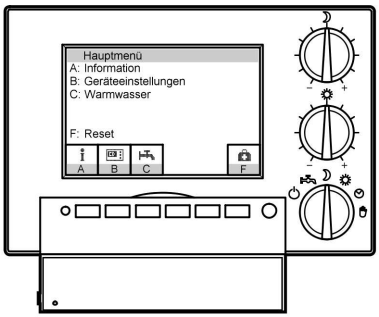
System configuration

Enable the system design used (see from page 16) and any optional components and functions at the control unit.

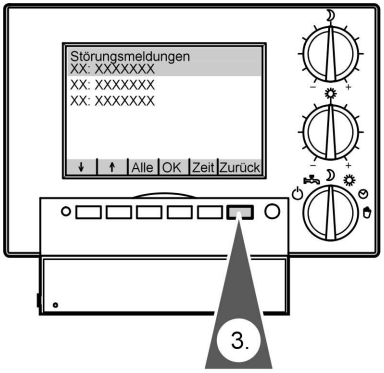
Only required outside German-speaking countries: Language selection

1. Open cover of programming unit (see page 113 and operating instructions).

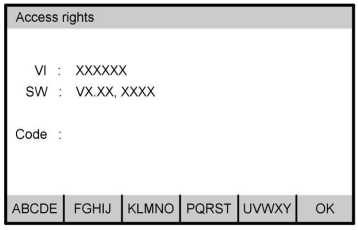
Further details regarding the individual steps (cont.)



2. If the adjacent display appears:
Continue with point 4.

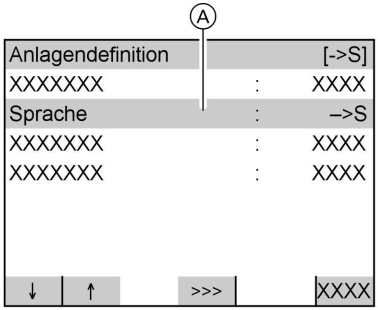


3. If the adjacent display appears (fault messages present):
Press key marked in diagram.



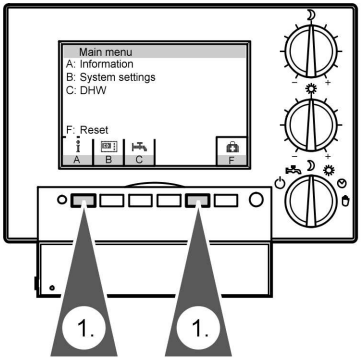
4.
- Press the following keys one after the other: "**B**", "**B**", "**E**".
- Enter the code for heating contractors (see page).
- Press "**A**".

Further details regarding the individual steps (cont.)



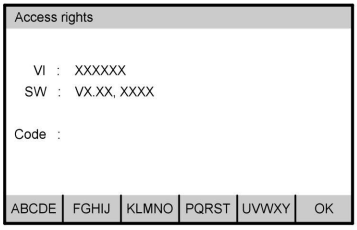
5. Select language:
- Select area marked Ⓐ in diagram using ↓.
- Press **>>>**.
- Select the required language using ↓.
- Confirm language selection using **OK**.
- Press **OK** and ↶ several times to return to "**main menu**".

Selecting a system design



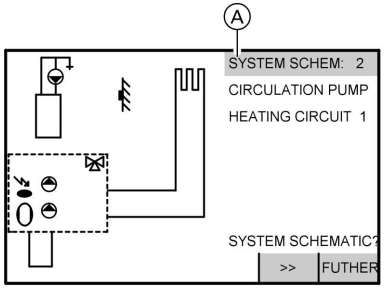
1. Briefly and simultaneously press the keys shown in the diagram.

Note
Alternative adjustment options for the system design, see page 134.



2. Only if the code request is displayed:
Enter the code for heating contractors (see page 129).

Further details regarding the individual steps (cont.)

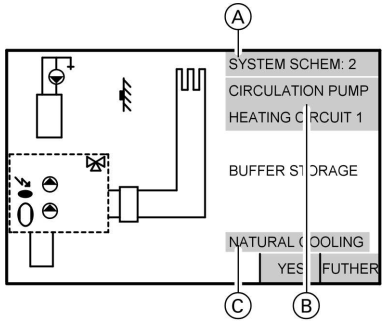


3. Select the required system design (2, 4 or 6) with **>>**.

Note
The selected system design is shown in the display area marked Ⓐ.

Select the installed auxiliary components or functions

Note
With system designs 1 to 6, the natural cooling option can also be selected or deselected.
For system designs 1 and 2, a heating water buffer cylinder can also be selected or deselected.



1. Start the selection or deselection of auxiliary components for the displayed system design with "**CONTINUE**".

2. Select or deselect the component displayed above the keys (area Ⓒ, see diagram) with "**YES**"/"**NO**".

Note
*The relevant component is not yet selected if the key function "**YES**" is displayed.*
*If you then press the key, the component will be selected and the key function changes to "**NO**".*
You can deselect that component by pressing the key again.
The selected components are listed in the display area marked Ⓑ.
*In the example for system design 2 (area Ⓐ), the "**Buffer storage**" function (area Ⓑ) has already been selected, the **natural cooling** function, however, has not (area Ⓒ).*
*Pressing "**CONTINUE**" in the example shown will lead to the natural cooling function being excluded from the system design.*

Further details regarding the individual steps (cont.)

3. Confirm your choice by pressing "**CONTINUE**" (component selected or "ignored") and continue to the next available component for possible selection.
4. Pressing "**CONTINUE**" again saves the system configuration once all available components for the specific system design have either been selected or deselected ("ignored").
   The configuration program is terminated automatically.

Checking the antifreeze concentration in the brine circuit

Check the antifreeze concentration and record it in the service report from page 189.

The system must be protected against frost down to −15 °C. Otherwise, replace the heat transfer medium.

Checking the sensor connections

Check whether all sensors have been connected as per the connection diagram on page 175.

For this, scan "Sensor temperatures".

 Operating instructions

Checking the secondary pump

Note

This check can only be carried out if an instantaneous heating water heater (accessories) is installed.
Otherwise, check the secondary pump with the heat pump (see page 110).

5592 795 GB

Further details regarding the individual steps (cont.)

1. Start the test program:

Menu item
- **"System settings"**
- **"Tech. service level"**
- **"Commissioning"**
- **"Secondary pump"**

Note
The time elapsed since the start of the test program is shown in the top r.h. corner of the display. Furthermore, the status of all components that are part of the test procedure is displayed.

2. Observe the temperatures at the "**Secondary flow**" and the "**Secondary return**". The temperatures must rise.
Otherwise check the instantaneous heating water heater (see page 118, fault message "D7").
The flow rate is too low if, after prolonged operation (10 to 30 min), the temperature differential ΔT > 3 K.
Increasing the flow rate:
- Vent the equipment again (see page 100)
- Increase the speed of the secondary pump
- Replace pump if necessary

3. Set the "**Heat / DHW**" mixer with **0%** to "**0**".

4. See item 2.

5. Terminate the test program with "**BACK**".

Checking the external heating circuit pumps

Note
The following test program is not required for system versions without external heating circuit pump.
In system versions without instantaneous heating water heaters (accessories) the heating water buffer cylinder must be heated up to at least 35 °C by the heat pump (see page 110).

Further details regarding the individual steps (cont.)

1. Start the test program:

   Menu item
   - **"System settings"**
   - **"Tech. service level"**
   - **"Commissioning"**
   - **"Heat. circuit 1 pump"**
     or
     "Heat. circuit 2 pump"
     (if installed)

   Note
   The time elapsed since the start of the test program is shown in the top r.h. corner of the display. Furthermore, the status of all components that are part of the test procedure is displayed.

2. Determine the temperature differential between the heating flow and return of the respective heating circuit using a contact thermometer.

3. Determine and enter the actual values and test conditions in accordance with the commissioning/service report from page 189.

4. The heating flow temperature must reach the temperature at the **"Buffer storage"** ± 2 K; the heating return temperature must be higher than the room temperature.
   Otherwise the flow rate is too low.
   Increasing the flow rate:
   - Vent the heating circuits
   - Increase the speed of the external heating circuit pump
   - Replace pump if necessary

5. Terminate the test program with **"BACK"**.

Checking the primary pump

1. Start the test program:

   Menu item
   - **"System settings"**
   - **"Tech. service level"**
   - **"Commissioning"**
   - **"Primary pump"**

   Note
   The time elapsed since the start of the test program is shown in the top r.h. corner of the display. Furthermore, the status of all components that are part of the test procedure is displayed.

2. Check the circulation on the primary side (brine circuit):
   - The primary inlet (display **"Primary input"**) and outlet (no display, use contact thermometer) must show identical, low temperatures.
   - The pump casing of the primary cooling circuit pump must not heat up (check by touching the casing).

   Otherwise:
   - Vent the primary circuit
   - Check the pump connections
   - Change the pump stage
   - If required, use a larger pump

Further details regarding the individual steps (cont.)

3. Start the compressor by pressing "**ON**".

   Note
   The compressor will start automatically after expiry of 250 s test.

4. Determine the temperature differential ΔT between the primary inlet (display "**Primary input**") and outlet (no display, use contact thermometer).
   Set values ΔT:
   - 3 to 5 K at 35 °C for "**Secondary flow**" and 10 °C for "**Primary input**"
   - 2 to 4 K at 35 °C for "**Secondary flow**" and 0 °C for "**Primary input**"

5. Record the results in the service report from page 189.
   If the set values are not achieved:
   - Vent the primary circuit
   - Check the pump connections
   - Change the pump stage
   - If required, use a larger pump

6. Terminate the test program with "**BACK**".

Checking mixers, heat pump and cylinder heating

Checking the mixer and heat pump

1. Start the test program:

   Menu item
   - "**System settings**"
   - "**Tech. service level**"
   - "**Commissioning**"
   - "**Compressor**"

2. Start the compressor by pressing "**ON**".

   Note
   The compressor will start automatically after expiry of 250 s test.

Further details regarding the individual steps (cont.)

3. Check the following temperatures and record them in the service report from page 189:
   - The temperature at "**DHW cylinder top**" must remain constant (tolerance: ±1 K).
     Otherwise:
     – Check whether the mixer is correctly adjusted
     – Check the electrical mixer connections (see page 182)
     – Replace the mixer, if required
   - The temperature at "**Secondary flow**" must rise (observe a rise up to approx. 30 °C).
     Otherwise:
     – Check the primary pump
     – Check the electrical connections of the components concerned
     – Check the casing temperature of the heat pump compressor (see page 112).
   - The spread between the secondary flow and the secondary return must be 6 to 8 K.
     Otherwise, match the stage of the secondary pump to requirements.

Checking the cylinder heating by the heat pump

1. Set the "**Heat / DHW**" mixer for cylinder heating with key "**100%**" to "**100%**".
2. Observe the temperatures at the "**Secondary flow**" and the "**DHW cylinder top**" for approx. 10 min.
   Both temperatures must rise.
   Otherwise:
   - Check whether the mixer is correctly adjusted
   - Check the electrical mixer connections (see page 182)
   - Replace the mixer, if required

Further details regarding the individual steps (cont.)

3. Terminate the test program with "**BACK**".

Checking the high pressure limiter

1. Switch on heat pump (see section entitled "Checking the mixer and the heat pump" on page 110, points 1 and 2).
2. Choke the heating flow, until the flow temperature rises above 60 °C (but no higher than 70 °C). The high pressure limiter must shut the compressor off.

Checking the compressor casing temperature

1. Start the heat pump and let it run for at least 10 min (see page 110, point 1 and 2).
2. Measure the temperature of the compressor casing exterior while it is in operation.
   Ice must not form on the outside of the compressor, and the housing must not become warmer than 60 °C (otherwise consult the Technical Service department at Viessmann).

Setting the control parameters

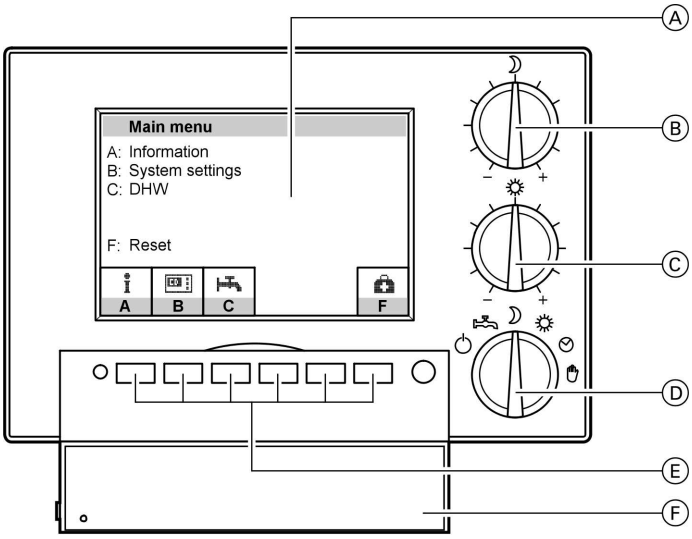
1. Activate the "**Tech. service level**". For information regarding the "**Tech. service level**" and regarding control parameters, see chapter "Control settings" from page 129.
2. Check the control settings using the details regarding standard settings (from page 190).
   Record only modified values in the service report from page 190.
3. Acknowledge all fault messages (see page 114).

   Note
   In this case, the fault messages are not notifications of equipment faults. These will have been created by the manual control of some equipment components during commissioning.

5592 795 GB

Control unit diagnostics

Programming unit overview



Ⓐ Display
Ⓑ Rotary selector
"Reduced room temperature"
Ⓒ Rotary selector
"Standard room temperature"
Ⓓ Operating mode selector
Ⓔ Menu keys
Ⓕ Programming unit flap

Fault messages

Internal faults are captured, displayed and saved by the equipment.
If there are active faults:

- The red LED to the left of the Opto-link interface flashes (Ⓒ in fig. on page 173)

Note
If a Vitotrol 200 remote control is connected, its red fault indicator also flashes.

- When the flap of the programming unit is closed, the fault symbol "ϟ" flashes on the display

A maximum of eight faults can be stored. If more faults than that have occurred, the control unit acts as follows:

Control unit diagnostics (cont.)

- Messages with lower priority will be deleted if there are messages with higher priority (than those already stored).
- In case of messages with the same priority (as those already stored), older messages will be deleted.
- Messages with lower priority (than those already stored) will not be stored.

Active faults are displayed in accordance with their respective priority.

Acknowledging fault messages

Any active fault messages will be displayed after opening the programming unit flap. These can be acknowledged, as soon as their cause has been removed. Following acknowledgement, the control unit checks whether the fault has been remedied. If this is not the case, the fault is re-displayed as not acknowledged.

Acknowledged faults remain in the list, until the control unit has recognised that the cause of the fault has been removed.

- Press "**OK**" to acknowledge the highlighted fault message
- Press "**ALL**" to acknowledge **all** fault messages

Scanning fault messages

There are two different options for scanning fault messages.

Scanning all fault messages

Menu item

- **"Information"**
- **"Fault messages"**
  The fault messages can be acknowledged as described on page 114.
- **"BACK"**

5592 795 GB

Control unit diagnostics (cont.)

Scanning all stored ("historic") fault messages

Menu item
- "**Information**"
- "**Statistics**"
- "**Error history**"
  – Press "**TIME**", to display the time of the fault occurrence
  – Press "**FAILURE**" to return to the fault description.
- "**BACK**"

Note
The fault messages cannot be acknowledged in the fault history.

Skipping fault messages

To enable adjustments/scans at the control unit:

1. Open the programming unit flap. All current fault messages will be displayed.
2. Press "**BACK**".
   The main menu will be displayed. You can now make adjustments and scans.

Displaying fault messages

Fault messages		Cause	Measures
System fault		Control unit processor faulty	Replace programming unit
10	Outside sensor	Short circuit	Check the sensor; replace if required
18	Outside sensor	Lead break	Check the terminals; replace the sensor, if required
20	Sec. flow sensor	Short circuit	Check the sensor; replace if required
28	Sec. flow sensor	Lead break	Check the terminals; replace the sensor, if required
30	Primary On	Short circuit	Check the sensor; replace if required
38	Primary On	Lead break	Check the terminals; replace the sensor, if required
40	Inlet sensor HK 2	Short circuit	Check the sensor; replace if required
44	Inlet sensor NC		

Control unit diagnostics (cont.)

Fault messages		Cause	Measures
48	Inlet sensor Hk 2	Lead break	Check the terminals; replace the sensor, if required
4C	Inlet sensor NC		
50	HW sensor top	Short circuit	Check the sensor; replace if required
52	HW sensor bottom		
58	HW sensor top	Lead break	Check the terminals; replace the sensor, if required
5A	HW sensor bottom		
60	Buffer storage sensor	Short circuit	Check the sensor; replace if required
61	Sec. return sensor		
68	Buffer storage sensor	Lead break	Check the terminals; replace the sensor, if required
69	Seco. return sensor		
A6	Secondary pump	Secondary pump faulty	Check the secondary pump (see page 107), replace the pump, if required
A8	Pump HC 1	No DHW circulation	Check the external heating circuit pump (see page 108); replace the pump, if required
A9	Heat pump	Heat pump	Check the heat pump, the primary pump and the secondary pump (see page 110), and replace if required. If an instantaneous heating water heater is installed, the unit goes into reduced mode until the fault message has been acknowledged. After the repair has been carried out, the heat pump restarts only after the equipment was first turned OFF.
AB	Electric heating	The flow temperature does not rise; the instantaneous heating water heater may be faulty	Check the high limit safety cut-out and the heater elements; replace, if required

5592 795 GB

Control unit diagnostics (cont.)

Fault messages		Cause	Measures
AC	Natural cooling	Faulty function	As part of the relay test (see page 131), check the natural cooling connection extension and the continuity to the pumps
AD	Mixer heat./DHW	Mixer faulty	Check the mixer (see page 110); replace, if required
AF	Cylinder charge pump	Faulty cylinder primary pump	Check the pump (see page 110); replace, if required
B1	Int. KM comms error	Communication error programming unit	Check connections and replace the programming unit, if required
BA	HK 2 mixer bus error	Communication fault mixer HC 2	Check the extension kit connections; start the extension kit
BB	NC mixer bus error	Communication fault natural cooling mixer	
BC	HK1 R/C KM bus error	Fault KM BUS remote control; heating circuit 1	Check connections and cables/leads
BD	HK2 R/C KM bus error	Fault KM BUS remote control; heating circuit 2	
C1	El. net/compressor	The compressor power supply is not OK (e.g. rotational direction, asymmetrical, phase failure). Compressor fuse, main isolator, phase monitor or motor overload faulty	Check the power supply and components; replace, if required
C4	EVU blocage contact	Power-OFF contact enabled longer than 12 h	Check the Power-OFF contact and replace if required
C8	Safety circuit	Fault at one of the connected components	External safety chain; check connected components and circuits (e.g. brine pressure or jumper)

5592 795 GB

Control unit diagnostics (cont.)

Fault messages		Cause	Measures
C9	Cooling circuit	High pressure limiter, low pressure limiter or hot gas switch has responded	Check the flow and return temperature sensors, test the high pressure (see page 112), check the primary and secondary circuits for pressure and flow rate; ask your local refrigeration engineer to check the heat pump, if required
CA	Primary pump	Primary flow rate too low or none present	Check the primary pump (see page 109); replace, if required
CB	Primary temp.	Primary inlet temperature below its minimum level	Check the brine circuit for flow rate
D3	Safety circuit	Fault at one of the connected components	External safety chain; check connected components and circuits (e.g. brine pressure or jumper)
D5	DHW SHK	Break in jumper X 6.5 – X 6.6	Check any possibly connected switching contact or bridge (connection on the power PCB)
D7	E heating K6	Heating element connected to K6 faulty	Check heating elements as per the specifications in the separate documents
D8	E heating K7	Heating element connected to K7 faulty	
D9	E heating K8	Heating element connected to K8 faulty	
DA	Room sensor HK 1	Short circuit	Check the sensor; replace if required
DB	Room sensor HK 2		
DD	Room sensor HK 1	Lead break	Check the terminals; replace the sensor, if required
GB	Room sensor HK 2		

5592 795 GB

Diagnosis

Measures in case the room temperature is constantly too low

Carry out the following steps to troubleshoot the problem.

1. Increase the set room temperature for standard operation (see operating instructions).
2. Check the outside temperature sensor (see page 107).
3. Adjust the heating curves (see operating instructions).
4. Vent the heating circuit.
5. Hydraulically balance the connected heating circuit(s).
6. Check the flow rate of the heating circuit(s) concerned.
7. Allow heating operation via the optional instantaneous heating water heater (see page 142).

No display in the display field of the programming unit

Carry out the following steps to troubleshoot the problem.

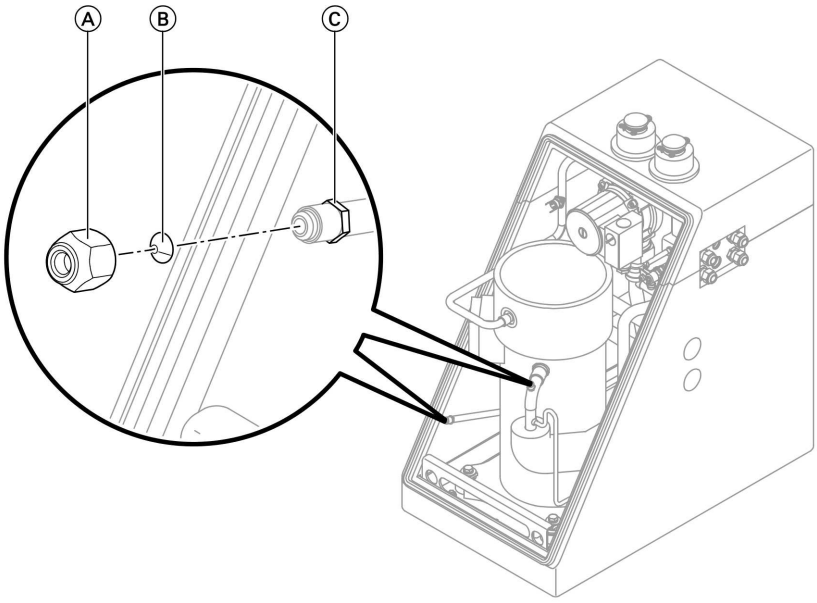
1. Switch the system ON/OFF switch ON (see page 173).
2. Check the fuse; replace it if required (see page 173).
3. Check whether there is voltage at the power feed to the control unit/ electronics; provide power if required.
4. Check the plug-in and threaded connections.
5. Replace the power supply unit.
6. Replace the programming unit.
7. Replace the main PCB.

Refrigerant circuit service valves

! **Please note**
If work on the refrigerant circuit is carried out incorrectly, there is a risk of equipment damage.
The following steps must only be carried out by authorised contractors.

5592 795 GB

Diagnosis (cont.)



Opening the service valve

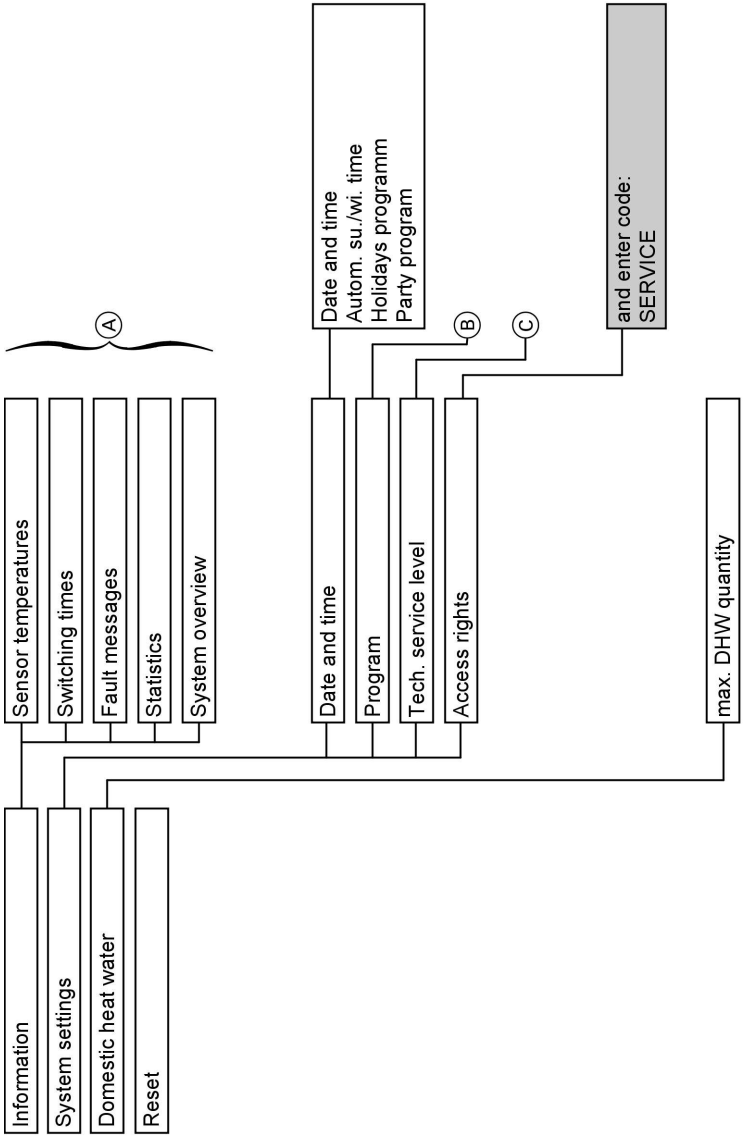
When removing sealing cap Ⓐ counterhold hexagon Ⓒ with a spanner.

Closing the service valve

- Use a new copper seal Ⓑ.
- When refitting sealing cap Ⓐ, counterhold hexagon Ⓒ with a spanner.
  Required torque: 11 Nm

5592 795 GB

Menu structure overview – main menu



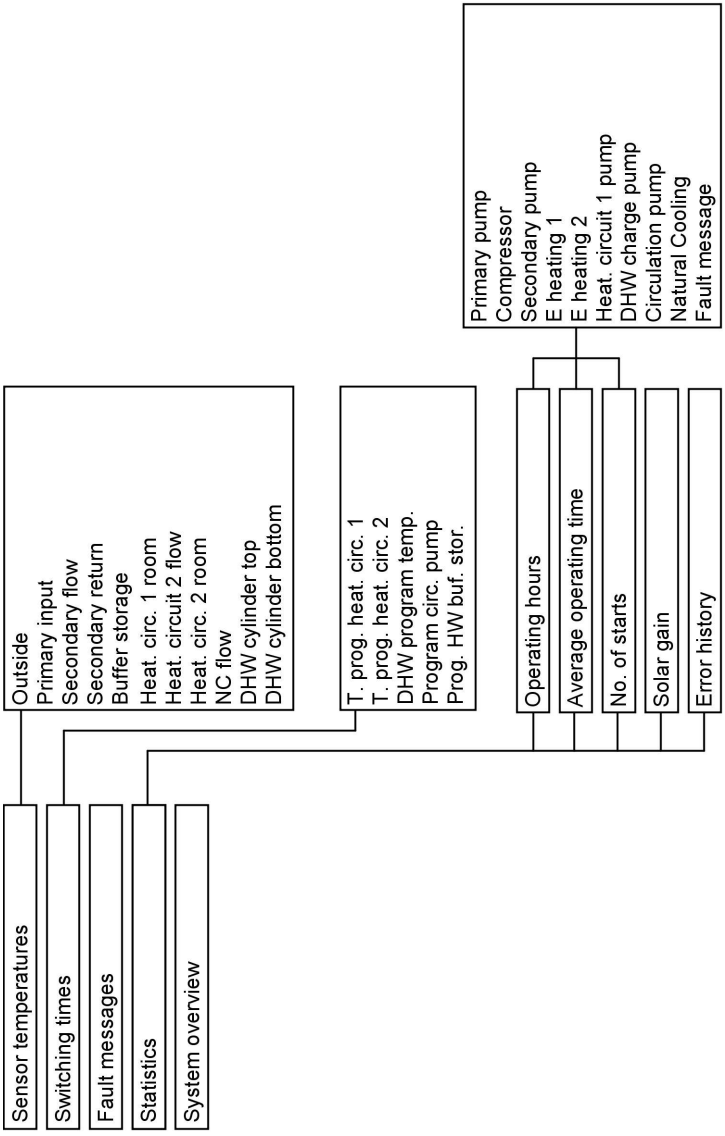
Ⓐ see page 122

Ⓑ see pages 123 and 124
Ⓒ see pages 125, 126, 127 and 128

5592 795 GB

Menu structure overview – information

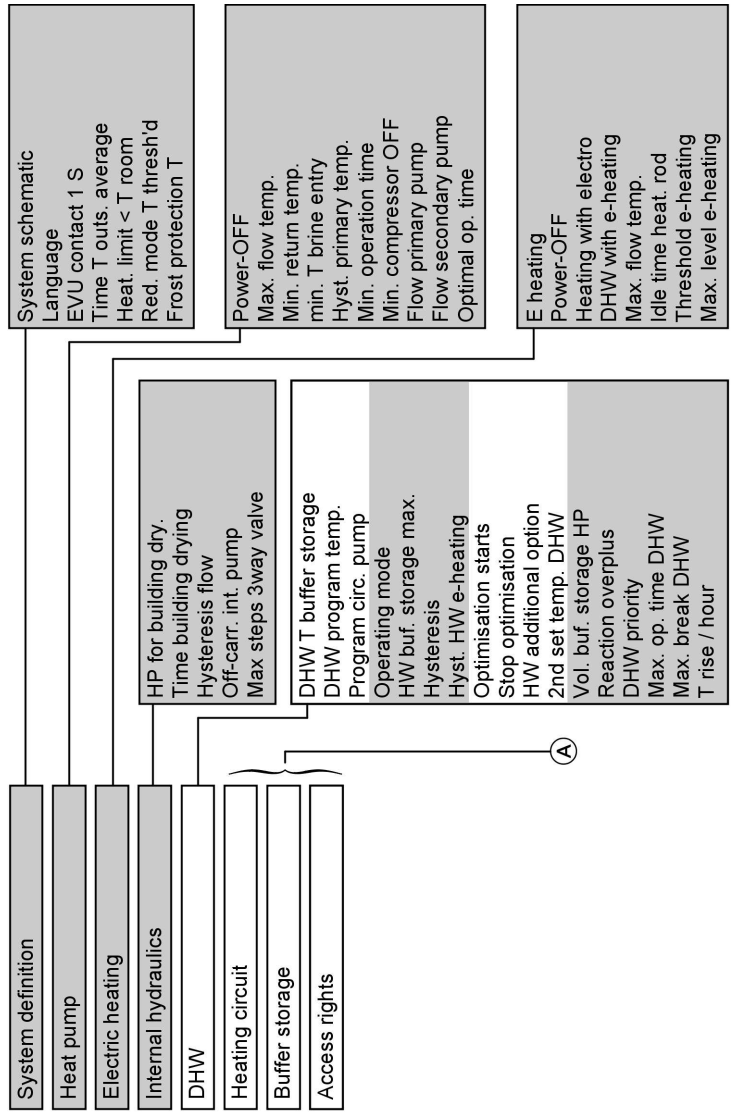
Main menu > Information



5592 795 GB

Menu structure overview – programming

Main menu > Equipment settings > Programming

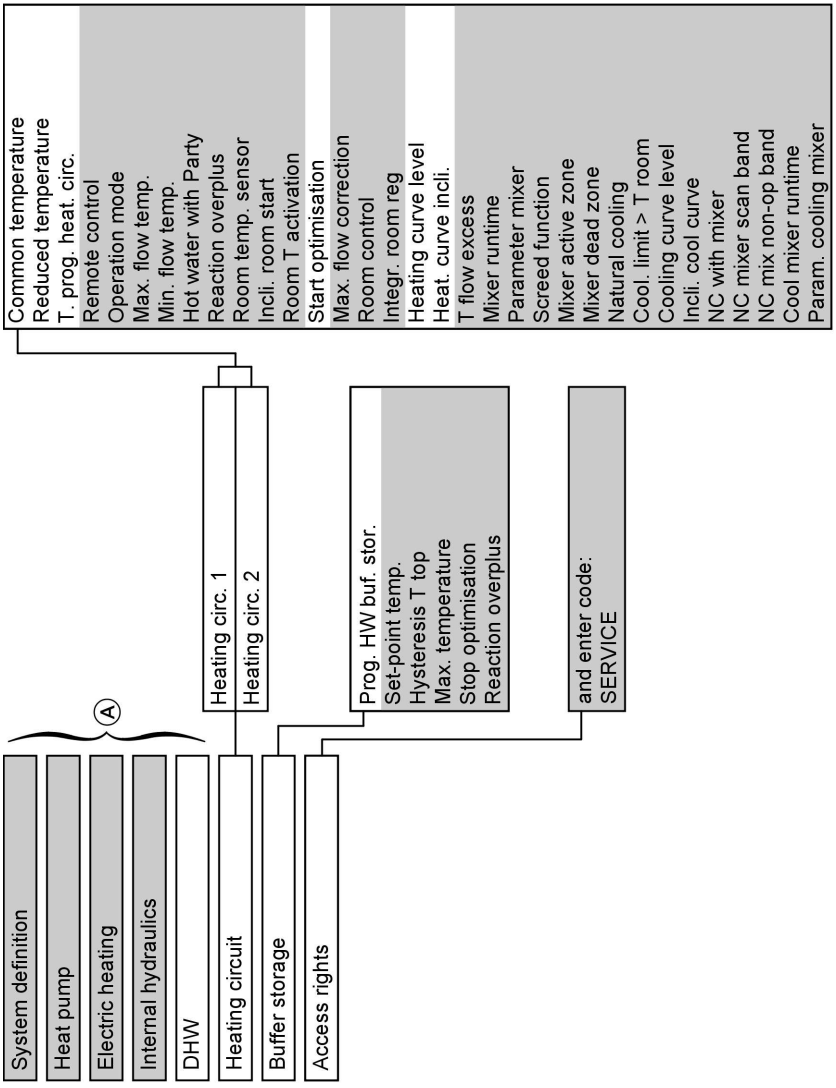


Ⓐ see page 124

5592 795 GB

Menu structure overview – programming (cont.)

Main menu > Equipment settings > Programming

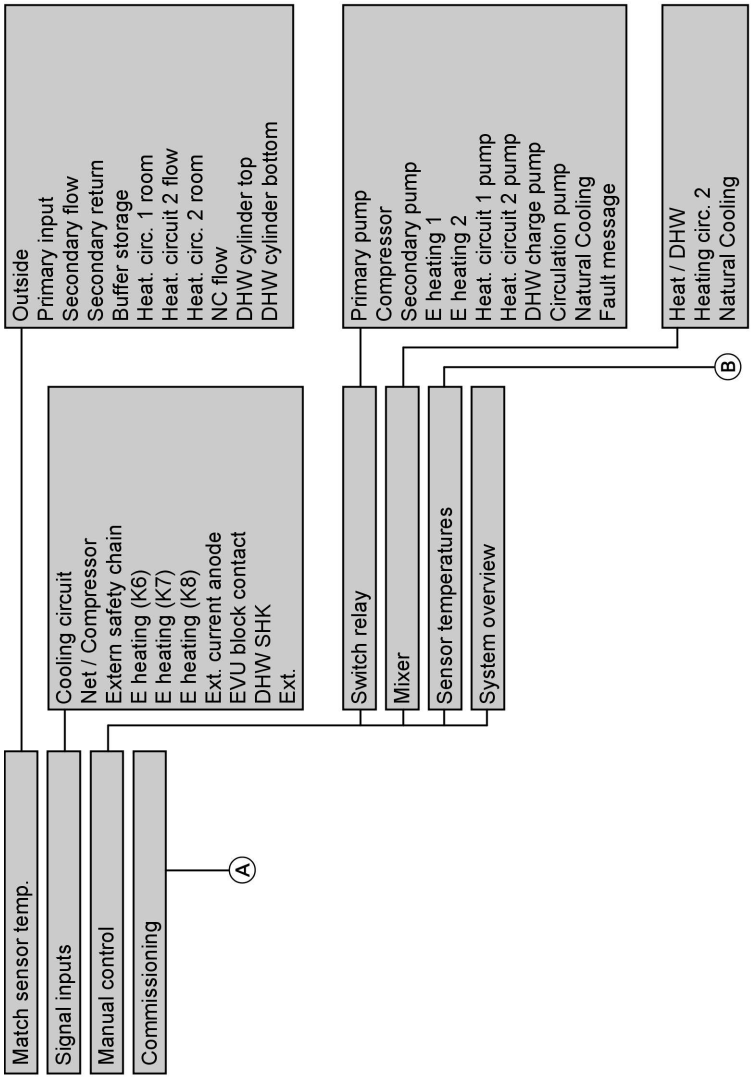


Ⓐ see page 123

5592 795 GB

Menu structure overview – technical service level

Main menu > Equipment settings > Technical service level



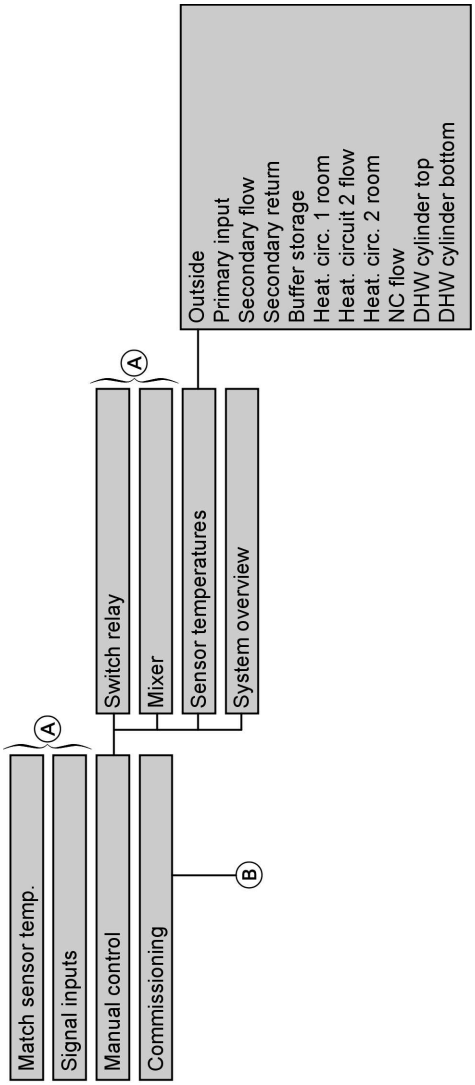
Ⓐ see pages 127 and 128

Ⓑ see page 126

5592 795 GB

Menu structure overview – technical service level (cont.)

Main menu > Equipment settings > Technical service level



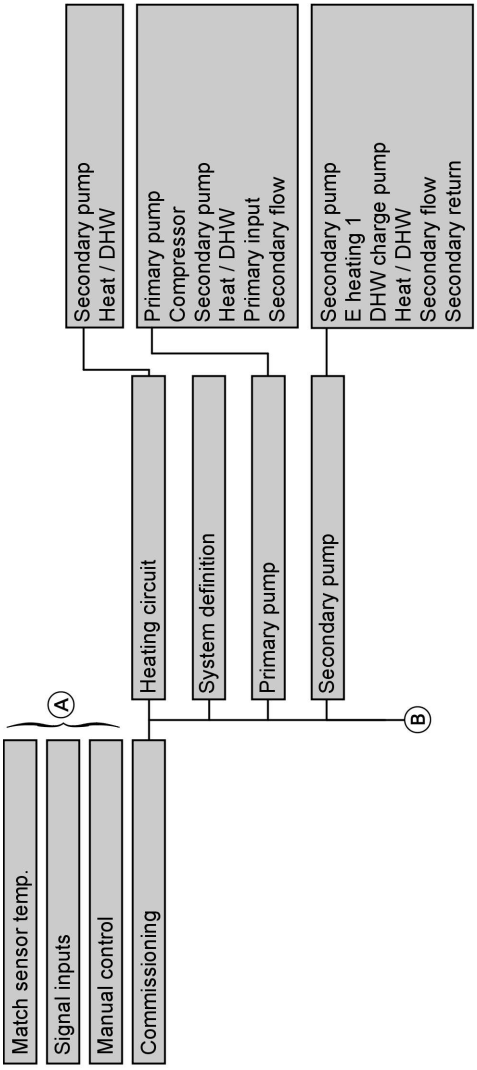
Ⓐ see page 125

Ⓑ see pages 127 and 128

5592 795 GB

Menu structure overview – technical service level (cont.)

Main menu > Equipment settings > Technical service level



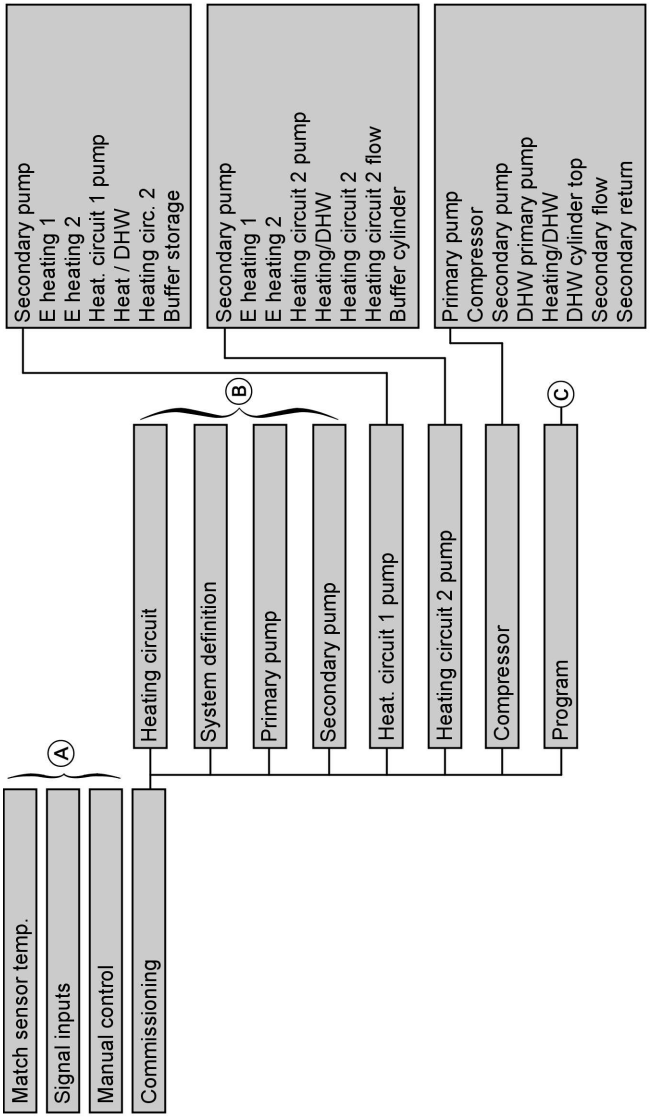
Ⓐ see pages 125 and 126

Ⓑ see page 128

5592 795 GB

Menu structure overview – technical service level (cont.)

Main menu > Equipment settings > Technical service level



Ⓐ see page 125

Menu structure overview – technical service level (cont.)

Ⓑ see page 127
Ⓒ see pages 123 and 124

Control settings by contractors

Only those settings are described on the following pages that are the **exclusive** domain of specialists operating at the technical service level. Enter a code to access the technical service level (see page 129). Parameters that are explained in the **operating instructions**, are **not** explained here. However, they are listed in the order in which they appear in the control menu.

Note
Incorrect operation at the technical service level by system users will invalidate our warranty.

The description of the control settings is structured as follows:

- Descriptions of the "**Tech. service level**" menu (see also pages 125 to 128) are listed on pages 129 to 132.
  This section has the header headline "Control settings".
- The settings in the "**Program**" menu (see also pages 123 and 124) are described on pages 134 to 171.
  The header includes the descriptions of the individual sub-menus ("**System definition**", "**Heat pump**" etc.) ("Control settings system definition" etc.).

Activating the technical service level

Note
Incorrect operation at the technical service level by system users will invalidate our warranty.

1. Open the programming unit flap.

5592 795 GB

Activating the technical service level (cont.)

2. Enter code:

Menu item
- **"System settings"**
- **"Access rights"**
- Enter code: SERVICE
  press each 1 x

- 2 x **"OK"**

Note
Access to the technical service level is blocked if the programming unit flap is closed or the standard display key is pressed.
The code needs to be re-entered if additional adjustments are to be made at the technical service level.

Adjusting sensor temperatures

Sensor deviations caused by differing line resistances can be compensated for using this function.
Data is saved even during power failures.

Menu item
- **"System settings"**
- **"Tech. service level"**
- **"Match sensor temp."**
  Enter current temperature measurement for each sensor.
  Pressing **"RESET"** reverses the adjustment entered for the highlighted sensor.
- **"OK"**

5592 795 GB

Checking signal inputs

The system can be checked using this menu. For example, in case of a fault, you can check whether the cause has been removed. This check can only be carried out with the relay switched OFF.
In standard mode, all monitoring inputs are "**OFF**". In case of a fault, they change into the "**ON**" condition.
Any changes into the "**ON**" condition are saved and will be displayed in the menu "**Information**" > "**Statistics**" > "**Error history**".
An exception is the display in case of "**EVU block contact**". If the power-OFF contact operates as an N/O contact (see page 134), "**On**" means that power-OFF is active. If the power-OFF contact operates as an N/C contact (see page 134), "**Off**" means that the power-OFF is active.

Menu item
- "**System settings**"
- "**Tech. service level**"
- "**Signal inputs**"
- "**BACK**"

Manual control of relays and mixers

The "manual control" facility can be used to switch the relays and mixers (generic term: "actuators") for starting or testing individual components.
All control functions are disabled as long as the "**Manual control**" menu or one of its sub-menus is called up.
All actuators are manually controlled for as long as the programming unit flap is open.
Upon leaving the "**Manual control**" menu (e.g. by closing the programming unit flap), all actuators that are currently not required for standard control mode, are switched off by the control unit, and the control sequences are restarted.

Menu item
- "**System settings**"
- "**Tech. service level**"
- "**Manual control**"

The following sub-menus are available from the "**Manual control**" menu:

Menu item
- "**Switch relay**"
- "**Mixer**"
- "**Sensor temperatures**"
- "**System overview**"

The sub-menus "**Sensor temperatures**" and "**System overview**" can also be called up from the main menu via "**Information**". For further information regarding the sub-menus, see the operating instructions.

Manual control of relays and mixers (cont.)

"Switch relay" sub-menu

Note
Here, the relays can be activated at random.
Some actuators may still be switched ON when this menu is called up.

! **Please note**
Unintentional conflicting operating situations can be created using "manual control" (e.g. "**E heating 1: On**" and "**secondary pump: Off**"). This can lead to equipment damage.
For this reason, first set **all** actuators to "**Off**" during every operating procedure, then set the **required** actuators to "**On**".

! **Please note**
If the intervals between manually switching the compressor off and on again are too short, the compressor and the full wave soft starter may be damaged.
After switching the compressor off, wait for at least 10 minutes before switching it on again.

Menu item
- "**System settings**"
- "**Tech. service level**"
- "**Manual control**"
- "**Switch relay**"
  – The "**RESET**" key switches all relays OFF, that are currently switched ON.
  – Select a relay by pressing ↑ and ↓, then switch the relay with the keys "**ON**" and "**OFF**".
- "**OK**"

"Mixer" sub-menu

The motors for the internal and external mixers (max. 3) can be manually adjusted here.

Valve position in %	Three-way valve Heating/DHW (internal)	Three-way mixer Heating circuit 2 (mixer circuit)	Three-way mixer "Natural cooling"
0	Heating	closed	closed
50	Heating/DHW	—	—
100	DHW heating	open	open

Menu item
- "**System settings**"
- "**Tech. service level**"
- "**Manual control**"

Manual control of relays and mixers (cont.)

■ **"Mixer"**
– Select a mixer by pressing ↑ and ↓, then select the required mixer position in % using the keys **+1%** / **–1%**.
– Key **0%** puts the mixer in its zero position.

■ **"OK"**

5592 795 GB

System design

As well as the procedure described in "system configuration" (see page 103), the system design can be modified at this point or additional components and/or functions selected or deselected.

Access
- **"System settings"**
- **"Program"**
- **"System definition"**
- **"System schematic"**

The required procedure is described from page 103.

Language

Adjusting the required language, see page 103.

Power-OFF contact: 1S

This setting determines whether the power-OFF contact acts as N/O ("**YES**") or N/C ("**NO**") contact.

Access
- **"System settings"**
- **"Program"**
- **"System definition"**
- **"EVU contact: 1S"** ("**YES**", "**NO**")

Standard setting	NO
Setting range	YES/NO

Average time; outside temperature

This parameter determines the filtering of the outside temperature by a time constant of 22 hours (standard setting). This compensates for short-term temperature fluctuations.

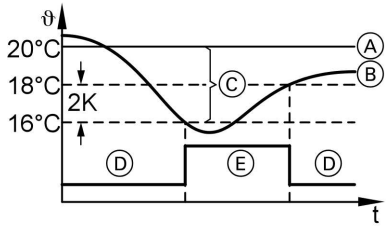
Access
- **"Syatem settings"**
- **"Program"**
- **"System definition"**
- **"Time T outs. average"** (–10 / +10)

Standard setting	22:00 h
Setting range	00:10 to 100:00 h

5592 795 GB

Heating limit < T room (heating limit temperature)

The heating limit temperature defines the value of the outside temperature, below which central heating commences.
The heating limit temperature is the result of the selected set room temperature less the value entered under "**Heat. limit < T room**".
Example:
The selected set room temperature is 20 °C, the value entered under "**Heat. limit < T room**" is 4.0 K.
Central heating commences if the average outside temperature drops below 16 °C (heating limit temperature).
If the outside temperature exceeds 18 °C, central heating is adjusted because of the specified hysteresis of 2 K.



Ⓐ Set room temperature
Ⓑ Outside temperature
Ⓒ Selected value "**Heat. limit < T room**"
Ⓓ Heating OFF
Ⓔ Heating ON

Access
- "**System settings**"
- "**Program**"
- "**System definition**"
- **"Heat. limit < T room"**
  (+1,0 / -1,0)

Standard setting	4 K
Setting range	0 to 20 K

Temperature limit for reduced temperature mode

The reduced temperature mode (see operating instructions) will no longer be used, if the outside temperature drops **below** this temperature limit. The equipment heats up to the temperature selected for standard operation.
Operation will continue in accordance with the selected switching times, if the average outside temperature stays **above** this temperature limit.

Access
- "**System settings**"
- "**Program**"
- "**System definition**"
- **"Red. mode T thresh'd "**
  (+1,0 / -1,0)

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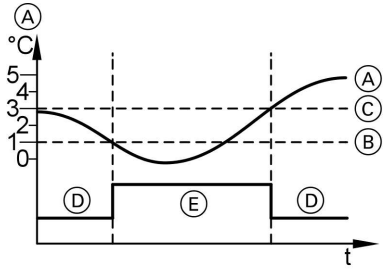
Temperature limit for reduced temperature mode (cont.)

Standard setting	−30 K	Setting range	−30 to +30 K

Frost protection temperature

The equipment enters reduced mode to protect itself against frost, as soon as the average outside temperature drops below this value. This will be implemented independent of the setting of the operating mode selector.
The OFF point of the frost protection is set 2 K higher than the ON point.



Access
- **"System settings"**
- **"Program"**
- **"System definition"**
- **"Frost protection T"** (+1,0/−1,0)

Standard setting	1 °C
Setting range	−15 to +15 °C

Ⓐ Outside temperature
Ⓑ Frost protection temperature (can be selected)
Ⓒ Frost protection OFF point (frost protection temperature + 2 K)
Ⓓ Reduced heating mode OFF
Ⓔ Reduced heating mode ON

5592 795 GB

Power-OFF compressor

With activated power-OFF ("power-OFF: YES") the power supply utility can switch off the **heat that is being generated** by the **heat pump**. This requires that the power-OFF contact has been connected (see page 81).
The **heat distribution** by the heating circuit pump and the cylinder primary pump are not affected by the power interruption.
If power-OFF has been activated, a buffer cylinder must be installed to cover the periods during which no heat can be generated.

Note
*The effect of the power interruption on the **instantaneous heating water heater** is determined separately (see page 142).*

Access
- **"System settings"**
- **"Program"**
- **"Heat pump"**
- **"Power-OFF"** ("YES"/"NO")

Standard setting YES
Setting range YES/NO

Maximum flow temperature

Setting the maximum heat pump flow temperature.

Access
- **"System settings"**
- **"Program"**
- **"Heat pump"**
- **"Max. flow temp."** (+1,0/–1,0)

Standard setting 60 °C
Setting range 25 to 60 °C

Minimum return temperature

Not the heat pump but the instantaneous heating water heater is started when the actual temperature drops below the minimum return temperature.
The instantaneous heating water heater stays ON until the minimum return temperature has been achieved.

5592 795 GB

Minimum return temperature (cont.)

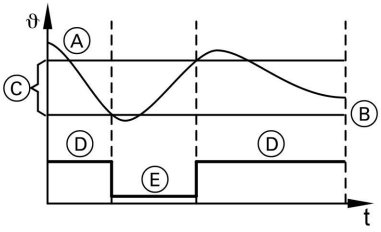
Note
If the minimum return temperature has been set too low, there is more compressor wear due to the increase in the number of low-pressure shutdowns.
If the minimum return temperature is set too high, the proportion of electrical heating increases and the degree of efficiency drops. This problem occurs primarily when heating up a cold building.

Access
- **"System settings"**
- **"Program"**
- **"Heat pump"**
- **"Min. return temp."** (+1,0/−1,0)

Standard setting	5 °C
Setting range	1 to 40 °C

Hysteresis T primary/min. T primary in

This setting determines the control range for starting and stopping the heat pump. The shutdown point of the heat pump is determined by the minimum brine entry temperature ("**Min. T brine entry**").



Access
- **"System settings"**
- **"Program"**
- **"Heat pump"**
- **"Hyst. primary temp."**
  or
  "Min. T brine entry" (+1,0/−1,0)

Ⓐ Brine inlet temperature
Ⓑ **"Min. T brine entry"**
Ⓒ **"Hyst. primary temp."**
Ⓓ Heat pump ON
Ⓔ Heat pump OFF

	Standard setting	Setting range
"Hyst. primary temp."	5 K	1 to 20 K
"Min. T brine entry"	−4 °C	−10 to +20 °C

5592 795 GB

Minimum runtime

Setting the minimum heat pump runtime. The heat pump only switches off when this time has elapsed.
This setting is designed to reach long heat pump runtimes to achieve high efficiency and low wear.

Access
- **"System settings"**
- **"Program"**
- **"Heat pump"**
- **"Min. operation time"** (+10 / –10)

Standard setting 2:00 min
Setting range 2:00 to 30:00 min

Min. compressor off

Setting the time that the compressor remains off before it can be restarted. This protects the heat pump from overload conditions (3 starts per hour are the maximum).

Access
- **"System settings"**
- **"Program"**
- **"Heat pump"**
- **"Min. compressor OFF"** (+10 / –10)

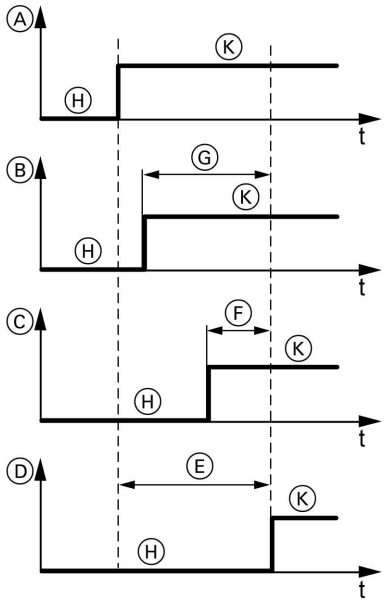
Standard setting 10:00 min
Setting range 00:20 to 30:00 min

Flow; primary/secondary pump

When the compressor starts, the following conditions must already be met:
- The primary pump must already be running, to enable the primary circuit to circulate brine.
- The secondary pump must already be running, to enable the heat to be transferred immediately via the heating water.

5592 795 GB

Flow; primary/secondary pump (cont.)



Access
- **"System settings"**
- **"Program"**
- **"Heat pump"**
- **"Flow primary pump"**
  or
  "Flow secondary pump" (+10 / –10)

Standard setting	2:00 min
Setting range	00:10 to 16:40 min

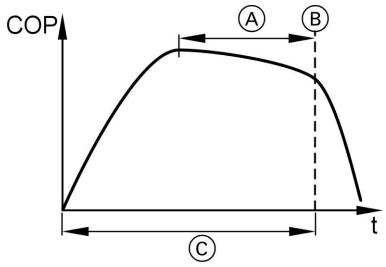
Ⓐ Heating command
Ⓑ Primary pump
Ⓒ Secondary pump
Ⓓ Compressor
Ⓔ Start delay
Ⓕ Secondary pump flow
Ⓖ Primary pump flow
Ⓗ OFF
Ⓚ ON

Optimum runtime

Setting the optimum heat pump runtime. Excessive runtimes (subject to the primary circuit layout) can lead to the ground probe icing up, which reduces the efficiency (COP).

5592 795 GB

Optimum runtime (cont.)



Access
- **"System settings"**
- **"Program"**
- **"Heat pump"**
- **"Optimal op. time"** (+10 / –10)

Standard setting	2:00 h
Setting range	00:20 to 24:00 h

Ⓐ Optimum operating range
Ⓑ Primary temperature drop
Ⓒ Optimum runtime

5592 795 GB

E heating

The instantaneous heating water heater that is available as an accessory must be activated by this parameter, if installed. Only that way can the instantaneous heating water heater be regulated by the control unit.

Access
- **"System settings"**
- **"Program"**
- **"Electric heating"**
- **"E heating"** (**"YES"**/**"NO"**)

Standard setting NO
Setting range YES/NO

Power-OFF; instantaneous heating water heater

This setting defines whether the power supply utility can shut off the power supply to the instantaneous heating water heater using a special control unit (setting: "**YES**"). This requires that the power-OFF contact has been connected (see page 81).
If the power supply utility is not to have this facility, select "**NO**".

Access
- **"System settings"**
- **"Program"**
- **"Electric heating"**
- **"Power-OFF"** ("YES"/"NO")

Standard setting YES
Setting range YES/NO

Heating with electric power

This setting enables or disables the boosting of the heating circuits by the instantaneous heating water heater.

Access
- **"System settings"**
- **"Program"**
- **"Electric heating"**
- **"Heating with electro"** (**"YES"**/**"NO"**)

Standard setting YES
Setting range YES/NO

5592 795 GB

DHW with electric power

This function makes it possible to deactivate DHW heating using an integrated instantaneous heating water heater that may be installed in the unit (e.g. if the water is subsequently heated by an on-site instantaneous water heater).
The instantaneous heating water heater then only affects the heating circuit.

Access
- **"System settings"**
- **"Program"**
- **"Electric heating"**
- **"DHW with e-heating"** (**"YES"**/ **"NO"**)

Standard setting: YES
Setting range: YES/NO

Maximum flow temperature

This determines the maximum flow temperature provided by the instantaneous heating water heater.

Access
- **"System settings"**
- **"Program"**
- **"Electric heating"**
- **"Max. flow temp."** (+1,0/–1,0)

Standard setting: 65 °C
Setting range: 5 to 75 °C

Heating rod delay

Adjustment of the time during which the electric heating is **not** switched ON after changing the operating mode (reduced/standard).

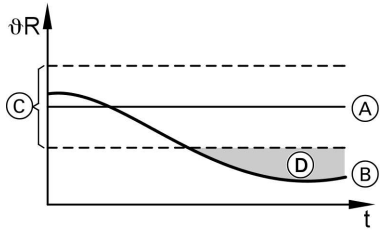
Access
- **"System settings"**
- **"Program"**
- **"Electric heating"**
- **"Idle time heat. rod"** (+10/–10)

Standard setting: 0:30 h
Setting range: 0:00 to 5:00 h

5592 795 GB

Electric heating threshold

This setting determines, after what "value" (integral comprising the duration and level of a temperature deviation from the set control temperature) the electric heating is switched ON. Brief temperature deviations will not cause the electric heating to be switched ON.



Ⓐ Set control temperature
Ⓑ Actual temperature
Ⓒ "**Hysteresis flow**" (see page 146)
Ⓓ "Value" (integral comprising the duration and level of a temperature deviation)

Access
- **"System settings"**
- **"Program"**
- **"Electric heating"**
- **"Threshold e-heating"** (+10 / –10)

Standard setting	300 K · min
Setting range	10 to 30000 K · min

Maximum stage; electric heating

This setting determines, with what output (stage 1, 2 or 3, see from page 195) DHW and heating water will be boosted.

Access
- **"System settings"**
- **"Program"**
- **"Electric heating"**
- **"Max. level e-heating"** (+1 / –1)

Standard setting	3
Setting range	1 to 3

5592 795 GB

Heat pump for drying buildings

This setting determines whether the heat pump is used to dry the building as well as the instantaneous heating water heater.
This function must be set to "**NO**" if the heat pump is not ready for operation because the heat pump primary circuit is not ready when building drying takes place.

Access
- "**System settings**"
- "**Program**"
- "**Internal hydraulic**"
- **"HP for building dry."** ("YES"/"NO")

Standard setting: NO
Setting range: YES/NO

Time for drying buildings

Selection of the number of days, during which the system for drying buildings is to be used exclusively with the instantaneous heating water heater.
With this setting, the heat pump will not start.
Heating will be implemented in accordance with the settings for set temperature and switching times for standard and reduced mode (see operating instructions).
The "**0**" setting switches this function OFF.
The remaining days for drying buildings will be shown on the display when the programming unit flap is closed.

Note
*If the **"Screed function"** (see page 162) has been activated, no intervention must occur here.*
*The settings under **"Screed function"** are directly related to this setting. The settings of both functions influence each other.*

Access
- "**System settings**"
- "**Program**"
- "**Internal hydraulic**"
- **"Time building drying"** (+01/–01)

Standard setting: 0 (function "**OFF**")
Setting range: 0 to 30 days

5592 795 GB

Flow hysteresis

The set flow temperature of the secondary circuit is determined by the control unit in accordance with the current heat demand.
The "**flow hysteresis**" setting defines the difference from an internally calculated set flow temperature at which one of the heat generators (heat pump, instantaneous heating water heater) is switched on and off.

Access
- **"System settings"**
- **"Program"**
- **"Internal hydraulic"**
- **"Hysteresis flow"** (+0,1/–0,1)

Standard setting 2 K
Setting range 0.5 to 5.0 K

Internal pump run-on

Secondary pump run-on, after the heat generation by the heat pump or the instantaneous heating water heater has been stopped.

Access
- **"System settings"**
- **"Program"**
- **"Internal hydraulic"**
- **"Off-carr. int. pump"** (+10/–10)

Standard setting 02:00 min
Setting range 00:10 to 05:00 min

Max. steps; three-way valve

Subject to the type of the three-way valve, the number of step pulses varies that the motor requires to drive the valve from one end stop to the opposite one.
This parameter will only need to be adjusted if the three-way valve has been replaced.
In the delivered condition, the number of step pulses is correctly adjusted.

Note
To activate the modified settings, first switch the system OFF and then ON again at the system ON/OFF switch.

Access
- **"System settings"**
- **"Program"**
- **"Heat pump"**
- **"Max steps 3way valve"** (+1/–1)

5592 795 GB

Max. steps; three-way valve (cont.)

Standard setting	320
Setting range	do not change

5592 795 GB

DHW cylinder temperature


Operating instructions

DHW program temperature


Operating instructions

DHW circulation pump program


Operating instructions

Operating mode

Determining the DHW cylinder operating mode.

Setting	Function
Standby	Equipment frost protection
Reduced	The control only utilises the upper cylinder temperature sensor
Standard	The control utilises the upper and lower cylinder temperature sensors
Fixed value	Operation as fixed value controller with a selected set temperature 2 for the DHW
Rotary selector	The settings of the operating mode selector, the programmed switching times and the settings of the remote control are taken into account **(standard setting)**
External	No function
Switching times	Only the settings made in conjunction with the programmed switching times are taken into consideration

Access
- **"System settings"**
- **"Program"**
- **"DHW"**
- **"Operation mode"** (**<<**/**>>**)

5592 795 GB

DHW cylinder maximum

Setting of the maximum temperature inside the DHW cylinder.
Renewed heating will be prevented after this temperature has been reached, until the temperature has dropped by at least 5 K.

Danger
DHW at temperatures > 60 °C will lead to scalding.
At these temperatures, install anti-scalding protection on site.

Access
- **"System settings"**
- **"Program"**
- **"DHW"**
- **"HW buf. storage max."**
  (+5,0/–5,0)

Standard setting	60 °C
Setting range	20 to 80 °C

Hysteresis; DHW instantaneous heating water heater/hysteresis

These settings determine the deviation from the set DHW cylinder temperature ("**DHW T buffer storage**") at which the cylinder heating is switched on and off by the heat pump ("**Hysteresis**").
If an instantaneous heating water heater is also installed, the "**Hyst. HW e-heating**" is also relevant.

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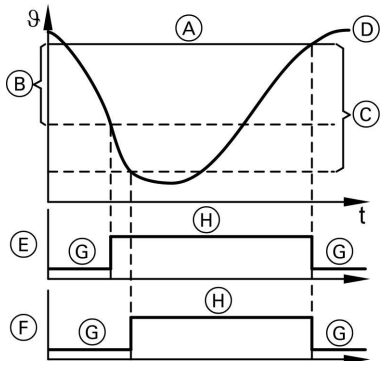
Hysteresis; DHW instantaneous heating water . . . (cont.)



Ⓐ Set DHW temperature
Ⓑ Heat pump switching hysteresis ("**Hysteresis**")
Ⓒ Instantaneous heating water heater switching hysteresis ("**Hyst. HW e-heating**")
Ⓓ Actual DHW temperature at the upper cylinder temperature sensor
Ⓔ Heat pump control state
Ⓕ Instantaneous heating water heater control state
Ⓖ OFF
Ⓗ ON

Note
*The value selected for "**Hysteresis**" should be higher than the expected temperature drop due to heat losses in a single night (approx. 5 K).*
*A lower value for "**Hyst. HW e-heating**" increases the proportion of electrical DHW heating, i.e. the system efficiency drops.*

Access
- "**System settings**"
- "**Program**"
- "**DHW**"
- "**Hysteresis**"
  or
  "**Hyst. HW e-heating**"
  (+0,5/–0,5)

	Standard setting	Setting range
"**Hysteresis**"	7.0 K	1.0 to 10.0 K
"**Hyst. HW e-heating**"	10.0 K	2.0 to 30.0 K

5592 795 GB

Start optimisation


Operating instructions

Stop optimisation


Operating instructions

DHW auxiliary function


Operating instructions

Set DHW temperature 2


Operating instructions

Heat pump cylinder volume

A second (lower) cylinder temperature sensor must be installed so that the entire volume of the connected DHW cylinder can be heated in "**Standard**" mode. This cylinder temperature sensor must be activated in the control unit using this parameter.

Note
*If the cylinder temperature sensor 2 is disabled, then the control unit will only regulate the cylinder temperature sensor 1 in the operating modes "**Upper**" and "**Standard**".*

Access
- "**System settings**"
- "**Program**"
- "**DHW**"
- **"Vol. buf. storage HP"** ("**YES**"/"**NO**")

Standard setting YES
Setting range YES/NO

Excess reaction

Coordination of the heat drawn off in the secondary circuit when the heat pump produces an excess of heat or the heat drawn by the secondary circuit is suddenly choked off.

Settings:

0	No heat drawn off
1	Heat will be drawn off only in case of a critical excess, i.e. if critical temperatures were reached in the heat pump circuit or the minimum heat pump runtime has not yet been reached
2	Heat will be drawn off, even if the excess heat being created is not critical for the heat pump

Access
- **"System settings"**
- **"Program"**
- **"DHW"**
- **"Reaction overplus"**
  (+1/–1)

Standard setting 2
Setting range 0 to 2

DHW priority

When DHW priority has been enabled, the DHW cylinder will be heated, until the selected DHW cylinder temperature (see operating instructions) has been reached or the time selected under "**Max. op. time DHW**" (see page 152) has expired. Only then will the heating circuit be provided with heat.

Access
- **"System settings"**
- **"Program"**
- **"DHW"**
- **"DHW priority"** (**"YES"**/**"NO"**)

Standard setting YES
Setting range YES/NO

Maximum DHW runtime

This value determines the time during which DHW will be heated up with enabled DHW priority. However, this only applies in case of a simultaneous heat demand from the heating circuit. Should the heating circuit not require any heat, then the DHW cylinder will be heated beyond this time until the selected DHW cylinder temperature has been reached (see operating instructions).

5592 795 GB

Maximum DHW runtime (cont.)

Access
- **"System settings"**
- **"Program"**
- **"DHW"**
- **"Max. op. time DHW"** (+10/–10)

Standard setting 04:00 h
Setting range 00:10 to 24:00 h

Maximum DHW interruption

This value determines the time, during which the heating circuit can be heated when DHW priority is enabled. If heat is still being requested from the heating circuit after this time has elapsed, the DHW cylinder is initially heated in spite of this (if necessary).

Access
- **"System settings"**
- **"Program"**
- **"DHW"**
- **"Max. break DHW"** (+10/–10)

Standard setting 01:30 h
Setting range 00:10 to 24:00 h

5592 795 GB

Standard temperature


Operating instructions

Reduced temperature


Operating instructions

Heating circuit program temperature


Operating instructions

Remote control

If a remote control is installed, it must be activated for the relevant heating circuit.

Note
*If a remote control is used, the "**Operation mode**" parameter (see following page) must be set to "**Remote control**". Otherwise the fault indicator will flash on the remote control.*
The remote control must also be programmed for the corresponding heating circuit. For more information on the use of room temperature sensors and remote controls, see page 77.

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Remote control"** (**"YES"**/**"NO"**)

Standard setting	NO
Setting range	YES/NO

Operating mode

You can set a fixed operating mode here that will take priority over the operating mode selected at the operating mode selector.

5592 795 GB

Operating mode (cont.)

Setting	Function
Standby	Equipment frost protection
Reduced	Constant reduced room temperature
Standard	Constant standard room temperature
Fixed value	Operation as fixed value controller
Rotary selector	The operating mode is selected via the operating mode selector (standard setting)
External	No function
Switching times	Operation in accordance with selected switching times
Remote control	Operation in accordance with the remote control settings. This setting can only be selected if the remote control was activated beforehand (see page 154).

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Operation mode"** (**<<** / **>>**)

Maximum flow temperature

Limiting the heating circuit flow temperature to a maximum value. The lowest available value represents the setting of the temperature at "**min. flow temp.**". (see following section).

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Max. flow temp."** (**+1,0** / **-1,0**)

Standard setting	40 °C
Setting range	10 to 70 °C

Minimum flow temperature

Limiting the heating circuit flow temperature to a minimum value. The highest available value represents the setting of the temperature at "**Max. flow temp.**".

5592 795 GB

Minimum flow temperature (cont.)

Note
*This setting influences the natural cooling function. If the setting is **too low**, the dew point monitor switches the cooling function off prematurely, subject to the cooling curve (see page 155).*

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Min. flow temp."** (+1,0/–1,0)

Standard setting	10 °C
Setting range	1 to 30 °C

DHW during party mode

This setting defines whether the DHW cylinder (setting "**Yes**") is heated first or whether the system switches directly to heating mode (setting "**No**") when party mode has been activated (see operating instructions).

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Hot water with Party"** ("**YES**"/"**NO**")

Standard setting	YES
Setting range	YES/NO

Excess reaction

Coordination of the heat drawn off in the secondary circuit when the heat pump produces an excess of heat or the heat drawn by the secondary circuit is suddenly choked off.

Settings:

0	No heat drawn off
1	Heat will be drawn off only in case of a critical excess, i.e. if critical temperatures were reached in the heat pump circuit or the minimum heat pump runtime has not yet been reached
2	Heat will be drawn off, even if the excess heat being created is not critical for the heat pump

Excess reaction (cont.)

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**

- **"Heating circ. 1/2"**
- **"Reaction overplus"**
  (+1/–1)

Standard setting	2
Setting range	0 to 2

Room temperature sensor

If a room temperature sensor is installed, it must be activated for the relevant heating circuit.
For more information on the use of room temperature sensors and remote controls, see page 77.

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**

- **"Heating circ. 1/2"**
- **"Room temp. sensor"**
  (**"YES"**/**"NO"**)

Standard setting	NO
Setting range	YES/NO

Slope; room temperature hook-up

The slope for room temperature hook-up can be selected, subject to a room temperature sensor being installed and enabled and room temperature hook-up being enabled (see page 158).
The higher the selected value, the greater the influence of the room temperature.

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**

- **"Heating circ. 1/2"**
- **"Incli. room start"**
  (+1/–1)

Standard setting	10
Setting range	0 to 10

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Room temperature hook-up

Precondition: Room temperature sensor installed and enabled.
This setting determines, when the room temperature hook-up should be enabled in addition to the weather-compensated control.

Settings:

0	No room temperature hook-up
1	Room temperature hook-up only in reduced mode
2	Room temperature hook-up only in standard mode
3	Room temperature hook-up in standard and in reduced mode

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Room T activation"**
  (+1 / –1)

Standard setting 0
Setting range 0 to 3

Start optimisation


Operating instructions

Maximum flow temperature correction

Precondition: Room temperature sensor installed and enabled.
Setting the maximum value, by which the flow temperature can be modified by the room temperature hook-up.

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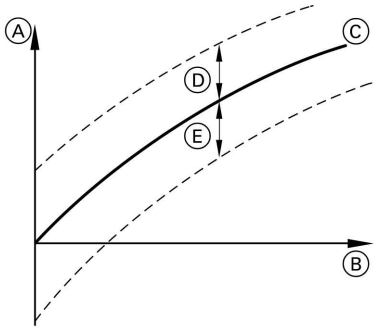
Maximum flow temperature correction (cont.)



Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Max. flow correction"** (+0,1/–0,1)

Standard setting	10.0 K
Setting range	0.1 to 10.0 K

Ⓐ Flow temperature
Ⓑ Differential between set room temperature and outside temperature
Ⓒ Heating curve
Ⓓ Possible positive correction range (0.1 to 10.0 K)
Ⓔ Possible negative correction range (0.1 to 10.0 K)

Room temperature control

A room temperature-dependent control is possible subject to a room temperature sensor being installed and enabled. This function must be enabled for this.

Note
*If **"Yes"** is selected for room control, the level and slope of the heating curve can no longer be adjusted (weather-compensated control unit parameters).*

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Room control"** (**"YES"**/**"NO"**)

Standard setting	NO
Setting range	YES/NO

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Adjusting the heating curve level and slope


Operating instructions

Integral room temperature controller

Precondition: "**Room temperature control**" set to "**Yes**".
Integral proportion of the room temperature control circuit. A high value results in a rapid response.

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Integr. room reg."** (+5 / –5)

Standard setting	100
Setting range	5 to 1000

Flow T excess

If a mixer circuit is connected (system designs 3, 4, 5 and 6), the temperature increase of the secondary circuit is adjusted with regard to the mixer circuit using this function.

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 2"**
- **"T flow excess"** (+1,0 / –1,0)

Standard setting	0.0 K
Setting range	-10 to 40.0 K

Mixer runtime

Note
*This setting is only used if parameter set **"1"** (free parameters) has been selected under "**Parameter mixer**".*

Setting of the time required by the servomotor of the external heating circuit mixer for a **complete changeover** from one operating state into another (90 degree movement).
Excessive runtimes can lead to the heating circuit mixer "Cycling".

Mixer runtime (cont.)

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 2"**
- **"Mixer runtime"** (+0,1/–0,1)

Standard setting 0:10 min
Setting range 0:05 to 4:15 min

Mixer parameters

At setting "**0**", the heat pump control unit utilises the function of the KM BUS mixer; the mixer only receives the required flow temperature.
At setting "**1**", the mixer parameters of the heat pump control unit (e.g. "Mixer runtime") are used to determine the mixer position.

Settings:

0	KM BUS mixer
1	Available parameters

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 2"**
- **"Parameter mixer"** (+1/–1)

Standard setting 0
Setting range 0 or 1

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Screed function

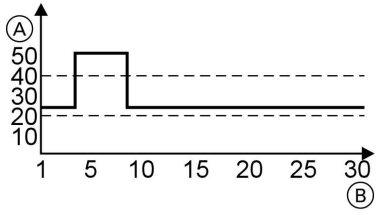
Note
Observe the specifications of EN 1264-4. The report to be provided by the heating contractor must contain the following heat-up details:
- *Heat-up data with respective flow temperatures*
- *Actual maximum flow temperature*
- *Operating condition and outside temperature during handover*

*The function continues after a power failure or after the control unit has been switched OFF. The selected heating program continues, if the screed function has terminated in accordance with the program or, before its expiry, the temperature/time profile "**0**" is selected.*
The temperature/time profiles 5 to 15 regulate to the maximum flow temperature.
Only one time program can be enabled, even if two heating circuits are connected.

Four different temperature/time profiles are available for screed drying.

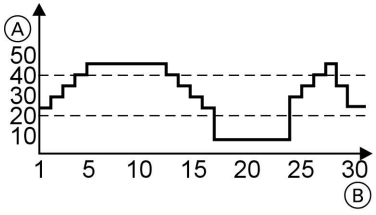
Note
*If "**Time building drying**" has been activated (see page 145), no intervention must occur here.*
*The settings under "**Time building drying**" are directly related to this setting. The settings of both functions influence each other.*

Temperature/time profile 1 (in acc. with EN 1264-4)



Ⓐ Flow temperature
Ⓑ Days

Temperature/time profile 2 (to ZV parquet and flooring technology)



Ⓐ Flow temperature
Ⓑ Days

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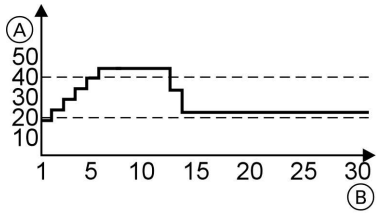
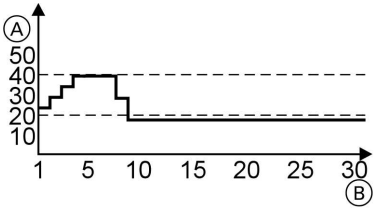
Screed function (cont.)

Temperature/time profile 3 (to ÖNORM)



Ⓐ Flow temperature
Ⓑ Days

Temperature/time profile 4



Ⓐ Flow temperature
Ⓑ Days

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**

- **"Heating circ. 2"**
- **"Screed function"** (+1 / –1)

Standard setting	0
Setting range	0 to 15

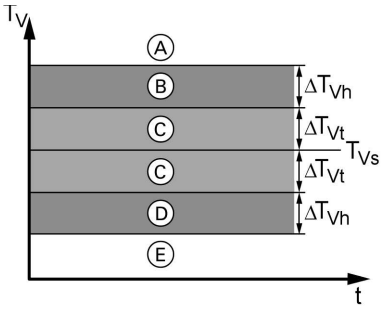
Mixer active zone/dead zone

Note
*This setting is only used if parameter set **"1"** (free parameters) has been selected under **"Parameter mixer"**.*

The dead zone Ⓒ determines the fluctuation range around the set flow temperature in which the mixer does not react (is at zero volts).
As soon as the flow temperature leaves this zone (above or below) the mixer motor starts to cycle with a certain pulse modulation (mixer active zone, Ⓑ and Ⓓ).
Outside the active zone, the mixer will be permanently closed Ⓐ (above the active zone) or open Ⓔ (below the active zone).

5592 795 GB

Mixer active zone/dead zone (cont.)



Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Mixer active zone"** (+0,5/–0,5)
  or
  "Mixer dead zone" (–0,1/+0,1)

Ⓐ Mixer permanently closed
Ⓑ Mixer closes (modulating)
Ⓒ Dead zone, mixer motor at zero volt
Ⓓ Mixer opens
Ⓔ Mixer permanently open
T_V Flow temperature
T_{Vs} Set flow temperature
ΔT_{Vh} Active zone
ΔT_{Vt} Dead zone
t Time

	Standard setting	Setting range
"Mixer active zone"	4.0 K	2.0 to 40.0 K
"Mixer dead zone"	1.0 K	0.5 to 3.0 K

Natural cooling

If all on-site components for the natural cooling function are installed, the system definition must be extended to be able to use that function.
This setting can also be effected via the system configuration (see page 103).

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Natural cooling"** (**"YES"**/**"NO"**)

Standard setting NO
Setting range YES/NO

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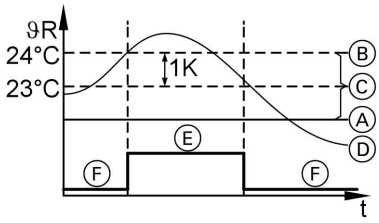
Cooling limit > T room (cooling limit temperature)

Precondition: The natural cooling function is enabled.
The cooling limit temperature defines the outside temperature, exceeding of which triggers the natural cooling function.
The cooling limit temperature is the result of the selected set room temperature and the temperature entered under "**Cool. limit > T room**".
Example:
The selected set room temperature is 20 °C; the temperature entered under "**Cool. limit > T room**" is 4.0 K. The natural cooling function starts if the average outside temperature exceeds 24 °C (cooling limit temperature).
If the outside temperature drops to less than 23 °C, the natural cooling function is switched off because of the specified hysteresis of 1 K.



Ⓐ Set room temperature
Ⓑ Cooling limit temperature
Ⓒ Selected value "**Cool. limit > T room**"
Ⓓ Average outside temperature
Ⓔ Cooling function ON
Ⓕ Cooling function OFF

Access
- "**System settings**"
- "**Program**"
- "**Heating circuit**"
- "**Heating circ. 1/2**"
- "**Cool. limit > T room**" (+0,5/-0,5)

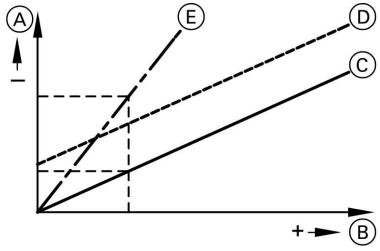
Standard setting	4.0 K
Setting range	2.0 to 20.0 K

Cooling curve level/slope

Precondition: The natural cooling function is enabled.
A specific outside temperature can be assigned to a certain cooling circuit flow temperature using the "**cooling curve level**" and **"slope "** parameters.
The cooling curve level parameter moves the cooling curve along the flow temperature axis, and the cooling curve slope parameter assigns a lower flow temperature to the same outside temperature if there is a greater slope.

5592 795 GB

Cooling curve level/slope (cont.)



Ⓐ Flow temperature
Ⓑ Outside temperature
Ⓒ Cooling curve
Ⓓ Cooling curve with a higher level (Ⓒ offset)
Ⓔ Cooling curve with a greater slope

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Cooling curve level"** (**"+LEV"**/**"−LEV"**) or **"Incli. cool curve"** (**"+SLOPE"**/**"−SLOPE"**)

	Standard setting	Setting range
"Cooling curve level"	0	−15 to 40
"Incli. cool. curve"	1.2	0.0 to 3.5

Natural cooling with mixer

If a mixer has been used for the natural cooling function and is actuated via the KM BUS, this setting must be set to "**Yes**". This enables the simultaneous fault monitoring.
If the mixer is not controlled via the KM BUS but via an on-site actuator (see Vitocal 200-G/343 technical guide), this setting must be set to "**No**".

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"NC with mixer"** (**"YES"**/**"NO"**)

Standard setting	NO
Setting range	YES/NO

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Active zone/dead zone natural cooling mixer

Note
*This setting is only used if parameter set "**1**" (free parameters) has been selected under "**Param. cooling mixer**".*

For function description see page 163

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"NC mixer contr. zone"** (**–0,5** / **+0,5**) or **"NC mixer dead zone"** (**–0,1** / **+0,1**)

	Standard setting	Setting range
"NC mixer contr. zone"	4.0 K	2.0 to 40 K
"NC mixer dead zone"	1.0 K	0.5 to 3.0 K

Cooling mixer runtime

Note
*This setting is only used if parameter set "**1**" (free parameters) has been selected under "**Param. cooling mixer**".*

Setting of the time required by the servomotor of the cooling mixer for a **complete** changeover from one operating state into another (90 degree movement). Runtimes that are too short, can lead to the cooling mixer "Cycling".

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Op. time cool. mixer"** (**–1** / **+1**)

Standard setting 0:10 min
Setting range 0:05 to 4:15 min

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Cooling mixer parameters

Precondition:
The "**NC mixer**" function is enabled.
At setting "**0**", the heat pump control unit utilises the function of the KM BUS mixer; the mixer only receives the required flow temperature.
At the setting "**1**", the mixer parameters of the heat pump control unit (e.g. "**Mixer runtime**") are used to determine the mixer position.

Settings:

0	KM BUS mixer
1	Available parameters

Access
- **"System settings"**
- **"Program"**
- **"Heating circuit"**
- **"Heating circ. 1/2"**
- **"Param. cooling mixer"** (+1 / –1)

Standard setting	0
Setting range	0/1

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Buffer cylinder

Note
*This function is only available for **system design 2**.*

When selecting system designs 4 and 6, the buffer cylinder will be defined automatically as a system component.
Should a heating water buffer cylinder be part of a system in accordance with design 2, either set it through selecting option "**Yes**", or via the system configuration (see page 103) or system definition (see page 134).

Access
- "**System settings**"
- "**Program**"
- "**Further menu items**"
- "**Buffer storage**"
- "**Buffer storage**" ("**YES**"/"**NO**")

Standard setting	NO
Setting range	YES/NO

Buffer cylinder program

Note
*This function is only available in case of **system design 2**, if the option **"Yes"** was selected under "**Buffer storage**" (see page 169).*


Operating instructions

Fixed temperature

Note
*This function is only available in case of **system design 2**, if the option **"Yes"** was selected under "**Buffer storage**" (see page 169).*
*The temperature cannot be set higher than that selected under **"Max. temperature"** (see page 170).*

Setting of the temperature to which the heating water buffer cylinder is heated, if it is to be heated up and if the "**Fixed value**" program was selected under "**Prog. HW buf. stor.**" (see operating instructions).

Access
- "**System settings**"
- "**Program**"
- "**Further menu items**"
- "**Buffer storage**"
- "**Set-point temp.**" (+1,0 / –1,0)

Standard setting	50 °C

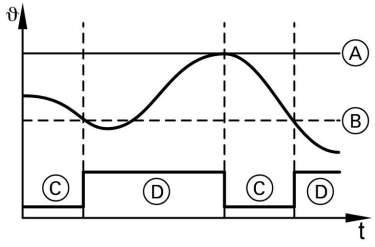
Fixed temperature (cont.)

Setting range 1 to 60 °C

Hysteresis temperature

Note
*This function is only available in case of **system design 2**, if the option "**Yes**" was selected under "**Buffer storage**" (see page 169).*

The setting determines the difference from the set temperature at which the cylinder heating is switched on and off.



Ⓐ Set temperature
Ⓑ Start hysteresis
Ⓒ Cylinder heating OFF
Ⓓ Cylinder heating ON

Access
- **"System settings"**
- **"Program"**
- **"Further menu items"**
- **"Buffer storage"**
- **"Hysteresis T top"** (+1,0 / –1,0)

Standard setting 5 K
Setting range 2 to 20 K

Maximum temperature

Note
*This function is only available in case of **system design 2**, if the option "**Yes**" was selected under "**Buffer storage**" (see page 169).*

Setting of the maximum temperature in the heating water buffer cylinder.

Access
- **"System settings"**
- **"Program"**
- **"Further menu items"**
- **"Buffer storage"**
- **"Max. temperature"** (+1,0 / –1,0)

Standard setting 60 °C
Setting range 1 to 70 °C

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Stop optimisation

Note
*This function is only available in case of **system design 2**, if the option **"Yes"** was selected under "**Buffer cylinder**" (see page 169).*

The stop optimisation ensures that, with the selected switching times (see operating instructions), the buffer cylinder is always fully heated at the end of standard mode.

Access
- **"System settings"**
- **"Program"**
- **"Further menu items"**
- **"Buffer storage"**
- **"Stop optimisation"** (**"YES"**/**"NO"**)

Standard setting	YES
Setting range	YES/NO

Excess reaction

Note
*This function is only available in case of **system design 2**, if the option **"Yes"** was selected under "**Buffer storage**" (see page 169).*

Coordination of the heat drawn off in the secondary circuit when the heat pump produces an excess of heat or the heat drawn by the secondary circuit is suddenly choked off.

Settings:

0	No heat drawn off
1	Heat will be drawn off only in case of a critical excess, i.e. if critical temperatures were reached in the heat pump circuit or the minimum heat pump runtime has not yet been reached.
2	Heat will be drawn off, even if the excess heat being created is not critical for the heat pump.

Access
- **"System settings"**
- **"Program"**
- **"Further menu items"**
- **"Buffer storage"**
- **"Reaction overplus"** (+1 / –1)

Standard setting	2
Setting range	0 to 2

Service

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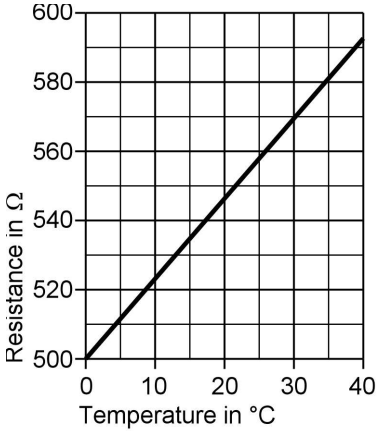
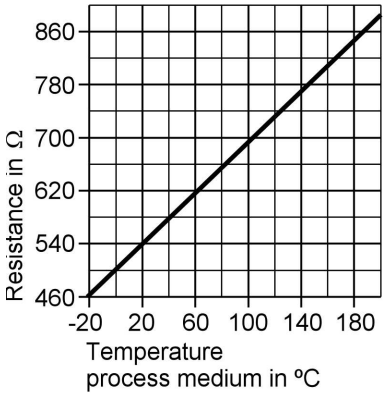
Sensor resistance curves

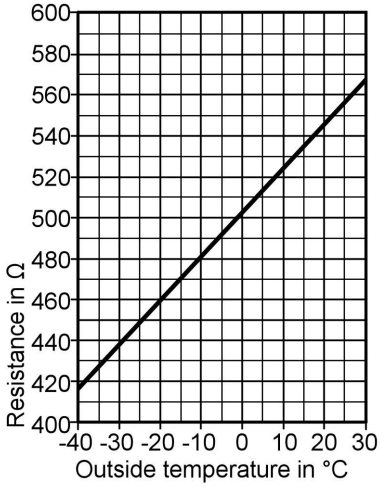
Room temperature sensor (Ni500)



Internal sensors, cylinder temperature sensor and heating water buffer cylinder temperature sensor (Pt500)



Outside temperature sensor (Ni500)



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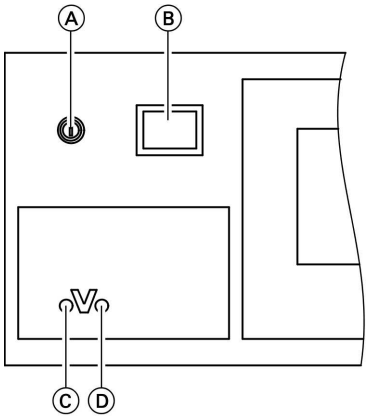
Fuse

The fuse is located inside the fuse holder next to the system ON/OFF switch in the programming unit.



Fuse: 6.3 A (slow), 250 V
max. power loss ≤ 2.5 W

Danger
Touching 'live' components can result in the transfer of dangerous body currents.
Before working on the equipment, always ensure that **the power circuit** is also at zero volt.
Removing the fuse from the programming unit does **not switch the power circuit to zero volt**.

Ⓐ Fuse holder
Ⓑ System ON/OFF switch
Ⓒ Red LED
Ⓓ Green LED

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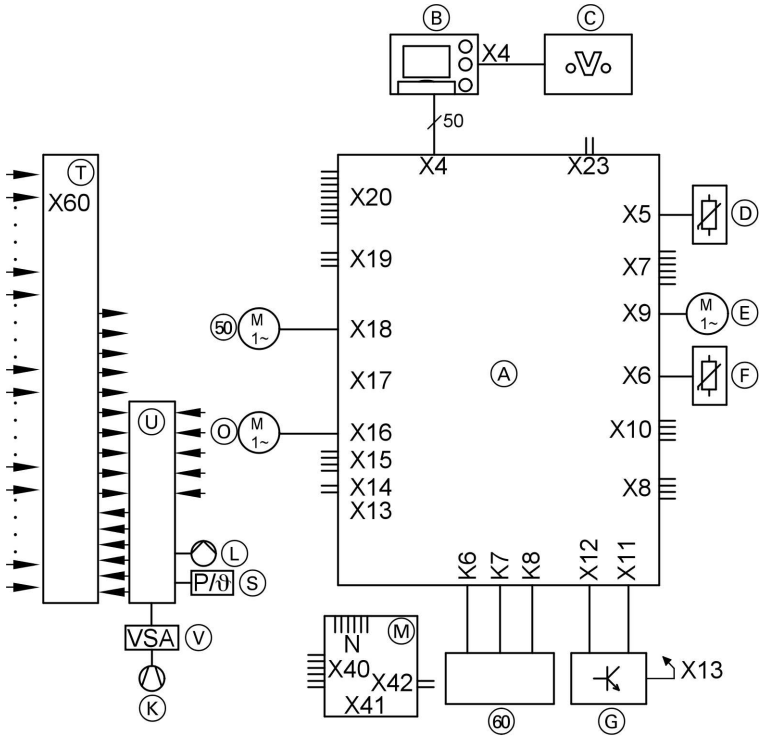
Overview of the PCBs and connection options

Note
***No** physical layout is shown in **any** of the following connection diagrams.*



- Ⓐ Main PCB
- Ⓑ Programming unit
- Ⓒ Optolink interface
- Ⓓ Sensors
- Ⓔ Stepper motor (internal)
- Ⓕ Sensors and control inputs
- Ⓖ Power supply unit
- Ⓚ Compressor with control
- Ⓛ Primary pump
- Ⓜ Auxiliary PCB
- Ⓞ Secondary pump
- Ⓢ Safety chain
- Ⓣ Main connecting area in control panel 400/230 V
- Ⓤ Control module (possibly with phase monitor, accessories)
- Ⓥ Full wave soft starter
- ⑤⓪ Cylinder primary pump
- ⑥⓪ Instantaneous heating water heater (accessories)
- X60. Main connection area for external connections on the control panel

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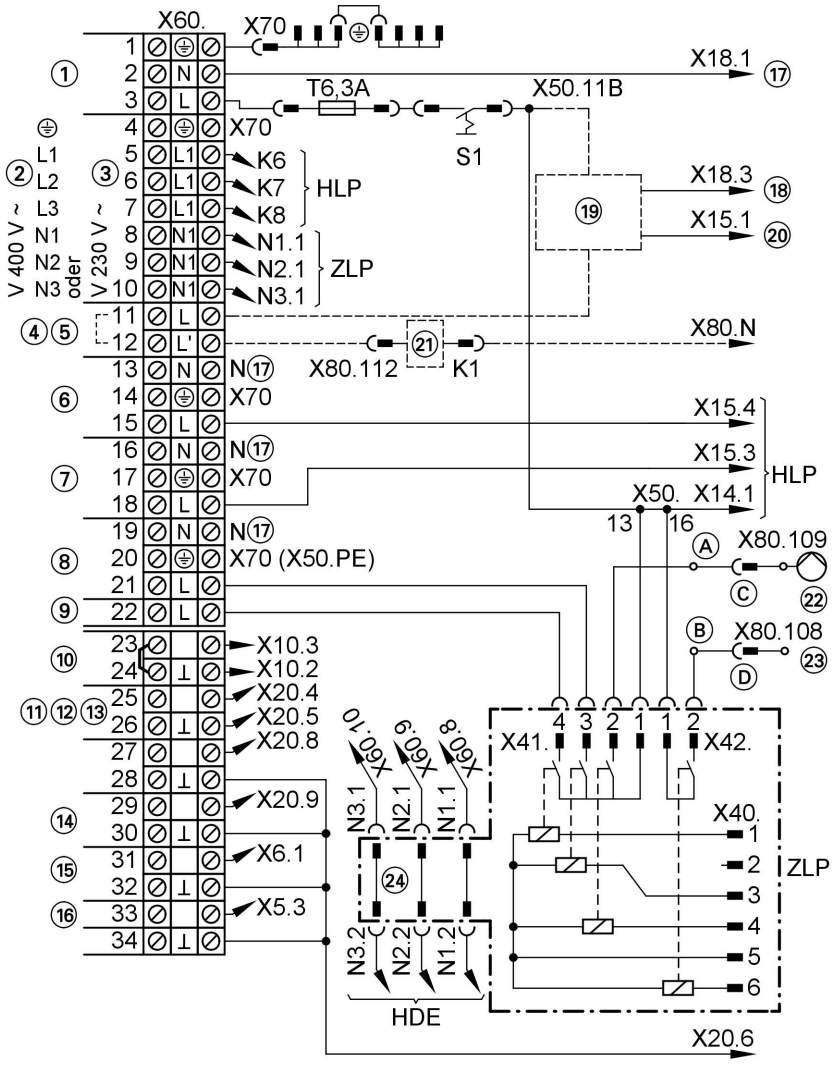
Main connection area



Ⓐ X50.109
Ⓑ X50.108
Ⓒ X90.109
Ⓓ X90.108

① Control unit power supply connection
② Instantaneous heating water heater (400 V) power supply connection

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Service

Main connection area (cont.)

③ Instantaneous heating water heater (230 V) power supply connection
⑤ Jumper for brine circuit pressure switch
④ Brine circuit pressure switch
⑥ Heating circuit pump, direct heating circuit
⑦ DHW circulation pump
⑧ Natural cooling extension kit
⑨ Central fault message
⑩ Power-OFF
⑪ KM BUS: KM BUS distributor
⑫ KM BUS: Vitotrol 200 remote control
⑬ KM BUS: Extension kit for one heating circuit with mixer, for example one connected to the KM BUS
⑭ Room temperature sensor
⑮ Outside temperature sensor
⑯ Heating water buffer cylinder temperature sensor
⑰ Neutral conductor for control with separate RCD circuits
⑱ Signal from refrigerant circuit
⑲ Safety chain, for detailed description see Ⓐ on pages 177 and 178
⑳ Signal from phase monitor (only with 400 V units)
㉑ Compressor contactor, for detailed description see Ⓑ on pages 177 and 178
㉒ Primary pump
㉓ Option
㉔ Neutral conductor, instantaneous heating water heater with separate RCD circuits
HDE To instantaneous heating water heater
HLP to the main PCB
S1 Control unit power switch
X50. Terminals on the inner top hat profile rail **in** the control panel
X60. Main connection area for external connections **on** the control panel
X70. PE support point
X80. **Terminals** at the control module **beneath** the control panel
X90. **Plug-in arrangement** between the control panel and the control module
APCB Auxiliary PCB

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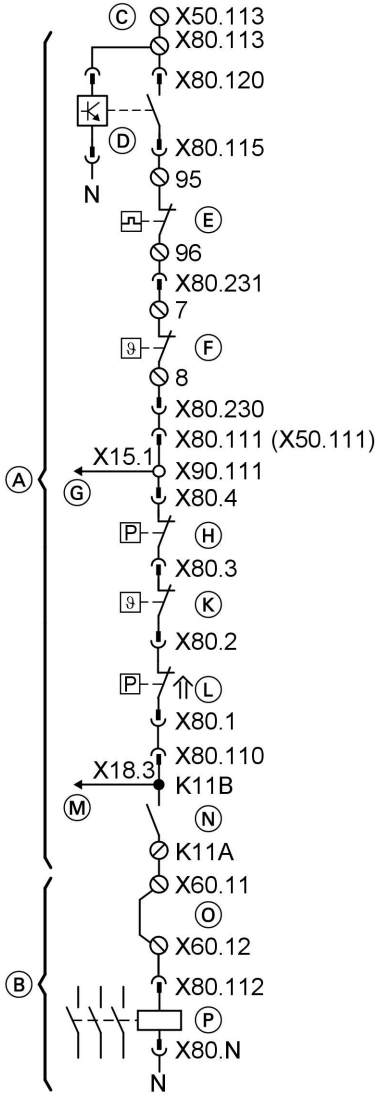
Safety chain, 400 V units



Ⓐ Corresponds to area ⑲ in fig. on page 175

Ⓑ Corresponds to area ⑤ and ㉑ in fig. on page 175
Ⓒ From the ON/OFF switch (see page 175)
Ⓓ Phase monitor
Ⓔ Compressor protective motor switch
Ⓕ Optional thermal contact
Ⓖ Feedback, three phase power monitor to main PCB
Ⓗ Controlled high pressure
Ⓚ Hot gas temperature limiter
Ⓛ Safety low pressure
Ⓜ Feedback, refrigerant circuit safety chain to main PCB
Ⓝ Compressor relay (PCB)
Ⓞ Brine pressure limiter jumper
Ⓟ Compressor contactor on control module

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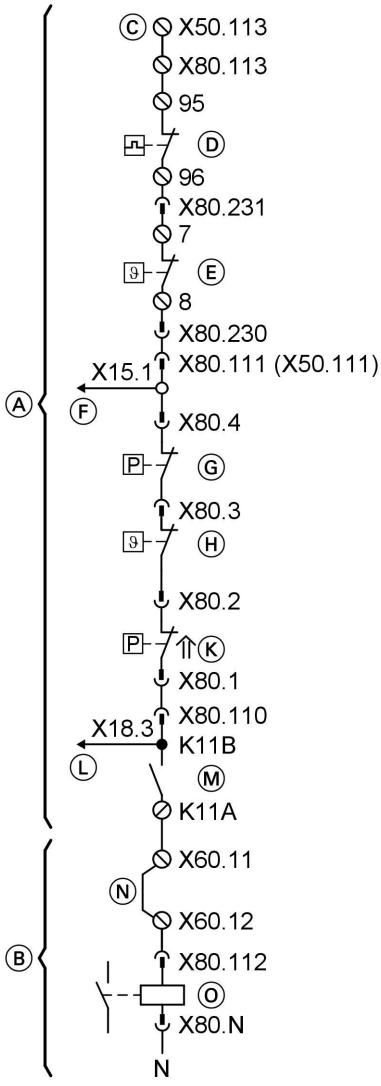
Safety chain, 230 V units

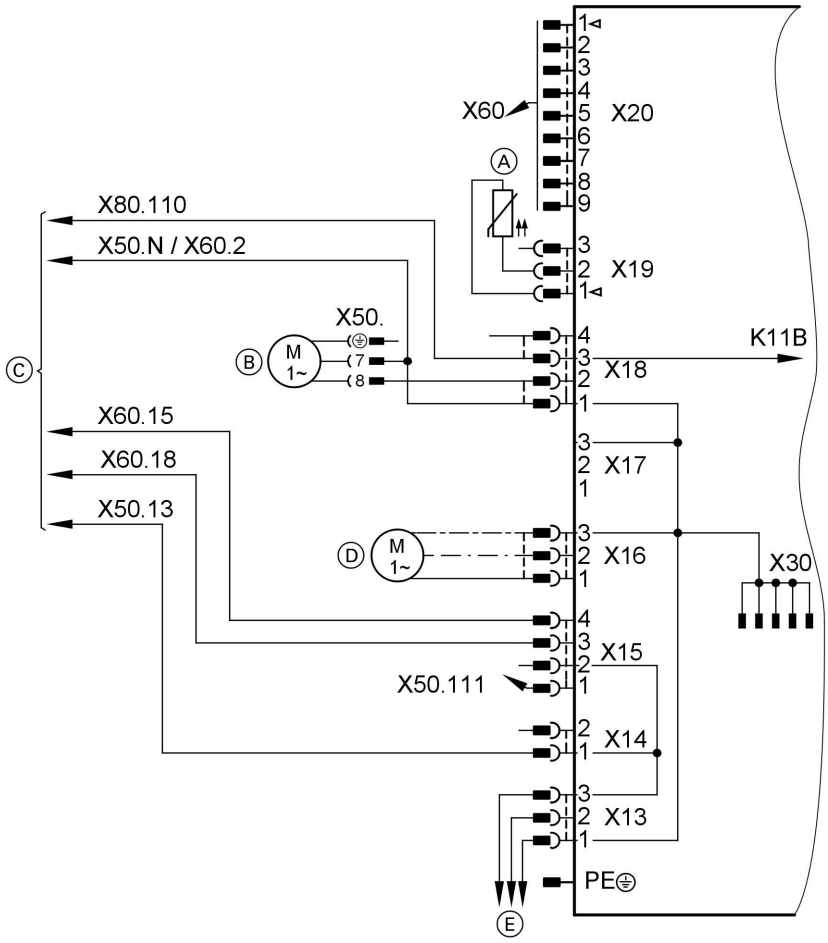


Ⓑ Corresponds to area ⑤ and ㉑ in fig. on page 175
Ⓒ From the ON/OFF switch (see page 175)
Ⓓ Compressor protective motor switch
Ⓔ Full wave soft starter thermal fuse
Ⓕ Signal transfer to main PCB
Ⓖ Controlled high pressure
Ⓗ Hot gas temperature limiter
Ⓚ Safety low pressure
Ⓛ Feedback, refrigerant circuit safety chain to main PCB
Ⓜ Compressor relay (PCB)
Ⓝ Brine pressure limiter jumper
Ⓞ Compressor contactor on control module

Ⓐ Corresponds to area ⑲ in fig. on page 175

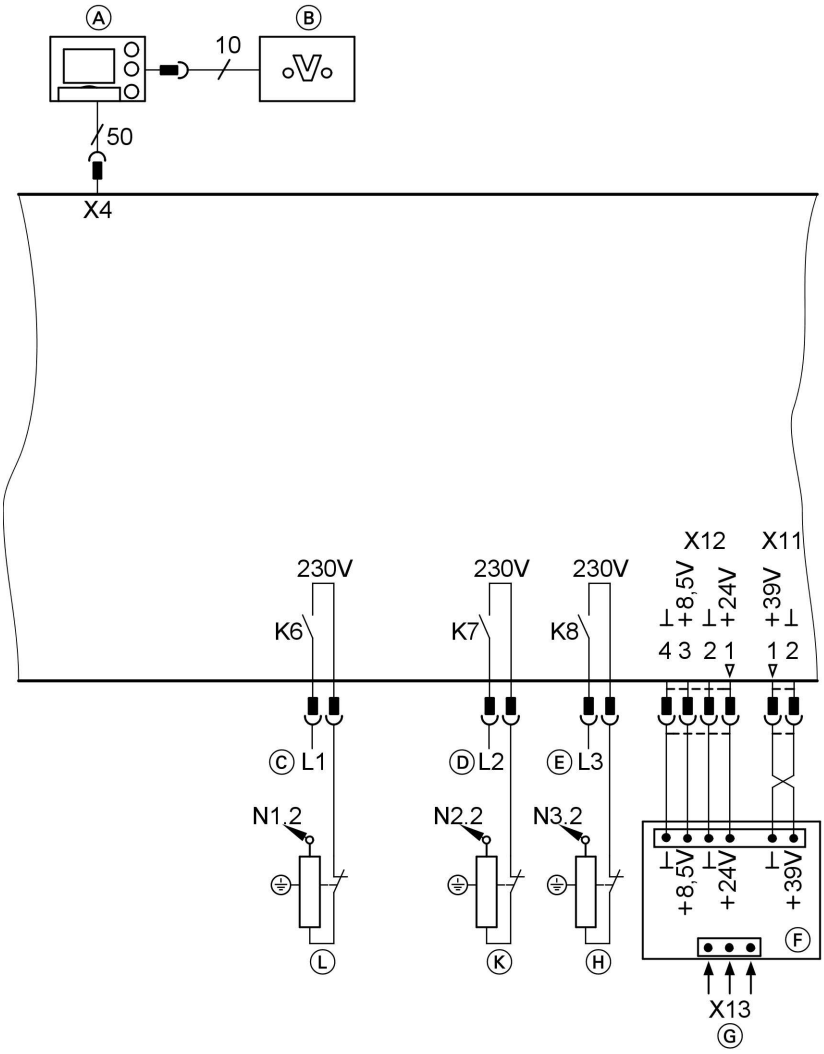
5592 795 GB

Left part of the main PCB



- Ⓐ Secondary return temperature sensor
- Ⓑ Cylinder primary pump (only required for cylinder loading system)
- Ⓒ to X50. and X60. (for the cylinder primary system)
- Ⓓ Secondary pump (only required for cylinder loading system)
- Ⓔ to the power supply unit (see the lower part of the main PCB on page 180)
- X50. Terminals on the inner top hat profile rail in the control panel
- X60. Main connection area for external connections on the control panel

Upper and lower part of the main PCB



Ⓐ Programming unit
Ⓑ Optolink interface
Ⓒ Supply (L1) heating element 1*1
Ⓓ Supply (L2) heating element 2*1
Ⓔ Supply (L3) heating element 3*1
Ⓕ Power supply unit
Ⓖ Power supply to the power supply unit 230 V~

*1 *Central PE conductor point inside the electronics enclosure*

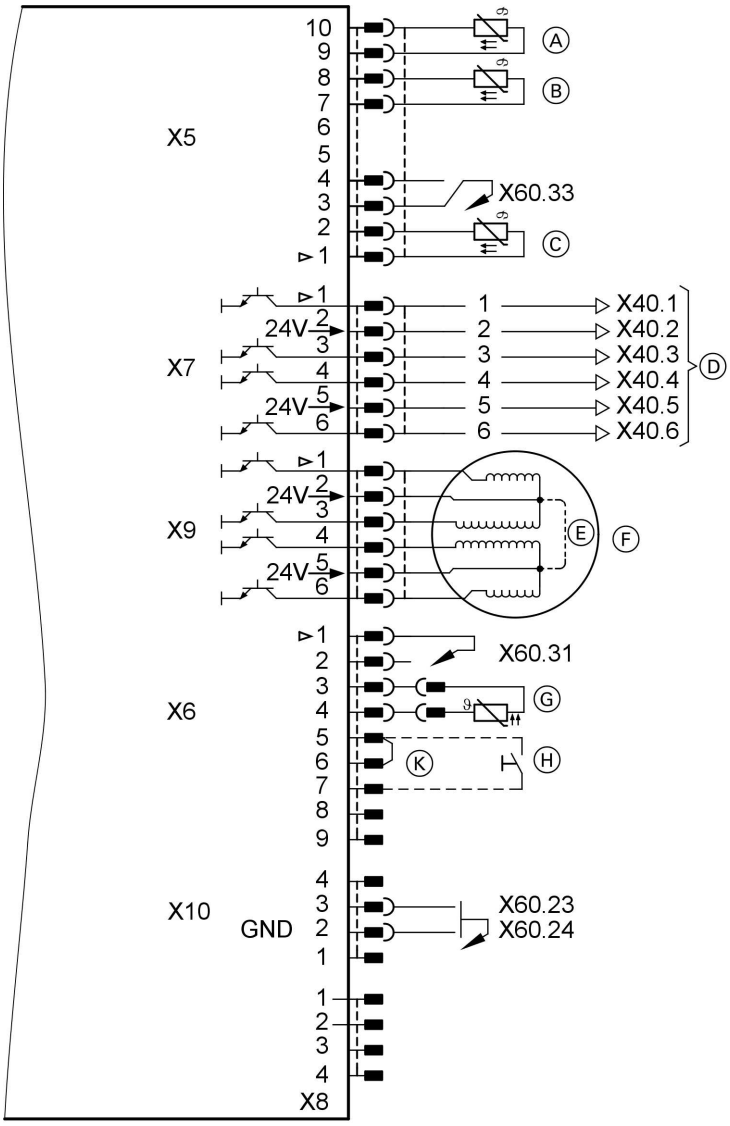
5592 795 GB

Upper and lower part of the main PCB (cont.)

Ⓗ Heating element 3 to K8
Ⓚ Heating element 2 to K7
Ⓛ Heating element 1 to K6
X60. Main connection area for external connections on the control panel

5592 795 GB

R.h. part of the main PCB



Ⓐ Flow temperature sensor, secondary circuit

Ⓑ Lower cylinder temperature sensor

5592 795 GB

R.h. part of the main PCB (cont.)

Ⓒ Upper cylinder temperature sensor
Ⓓ to the auxiliary PCB
Ⓔ alternatively with an internal jumper
Ⓕ Stepper motor mixer heating/ DHW
Ⓖ Flow temperature sensor, primary circuit
Ⓗ External control connection, system design F
Ⓚ Safety chain jumper (DHW SHK)
X60. Main connection area for external connections on the control panel

5592 795 GB

Parts lists

When ordering spare parts:
Quote the part and serial no. (see type plate) and the item no. of the required part (as per this parts list).

Obtain standard parts from your local supplier.

Parts

001 Heat pump module 200/106, 400 V
002 Heat pump module 200/108, 400 V
003 Heat pump module 200/110, 400 V
004 Corrugated pipe pack
005 Safety equipment block
006 Brine circulation pump motor, BWP 108/110, 400 V
007 Brine/heater circulation pump, BWP 106, 400/230 V and standard unit HVL
012 Retainer, plug-in connector
013 Three-way valve with stepper motor
014 Gasket set R 3/4"
015 Gasket set R 1"
016 O-ring sealing kit
017 CD 70 power PCB
018 Fuse cap
019 Fuse holder
020 Rocker switch, ON/OFF
021 Programming unit
022 Temperature sensor
023 Room temperature sensor
024 PCB with four relays
025 Outside temperature sensor
026 Power supply unit
027 Control module AS2 for BWP 106, 400 V
028 Control module AS3 for BWP 108, 400 V
029 Control module AS4 for BWP 110, 400 V
030 Full wave soft starter, BWP 108/110, 400 V
031 Three phase power monitor
032 Three-phase current monitor strapping plug, 400 V
033 Logo
034 L.h. side panel
035 R.h. side panel
036 Front panel
037 Back top panel
038 Top front panel
039 Top brace
040 Mounting panel
041 Fixing elements
042 Decorative cap (10 pieces)
043 Hinged flap
044 Support panel; control unit
045 Thermocouple
046 Temperature sensor
047 Safety spring
048 Heat pump module 200/106, 230 V
049 Heat pump module 200/108, 230 V
050 Heat pump module 200/110, 230 V
051 Brine circulation pump motor, BWP 108/110, 230 V
052 Control module AS7 for BWP 106, 230 V
053 Control module AS8 for BWP 108, 230 V
054 Control module AS9 for BWP 110, 230 V
055 Full wave soft starter, BWP 106/108/110, 230 V
056 Heat pump module condenser for BWP 106, 230 V

Parts lists (cont.)

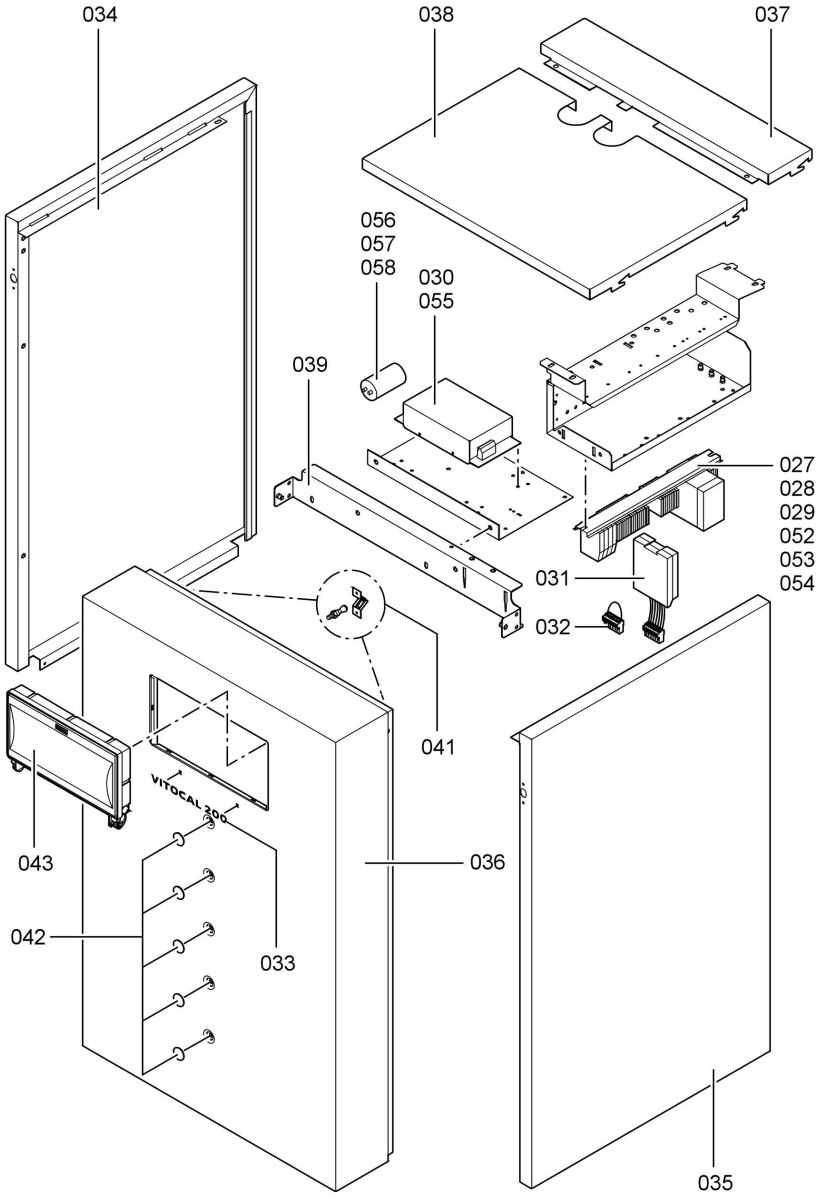
057 Heat pump module condenser for BWP 108, 230 V
058 Heat pump module condenser for BWP 110, 230 V

Parts not shown
008 Operating instructions
009 Installation and service instructions
010 Touch-up paint stick, Vitosilver
011 Touch-up spray, Vitosilver

Ⓐ Type plate; refrigeration module
Ⓑ Type plate, enclosure

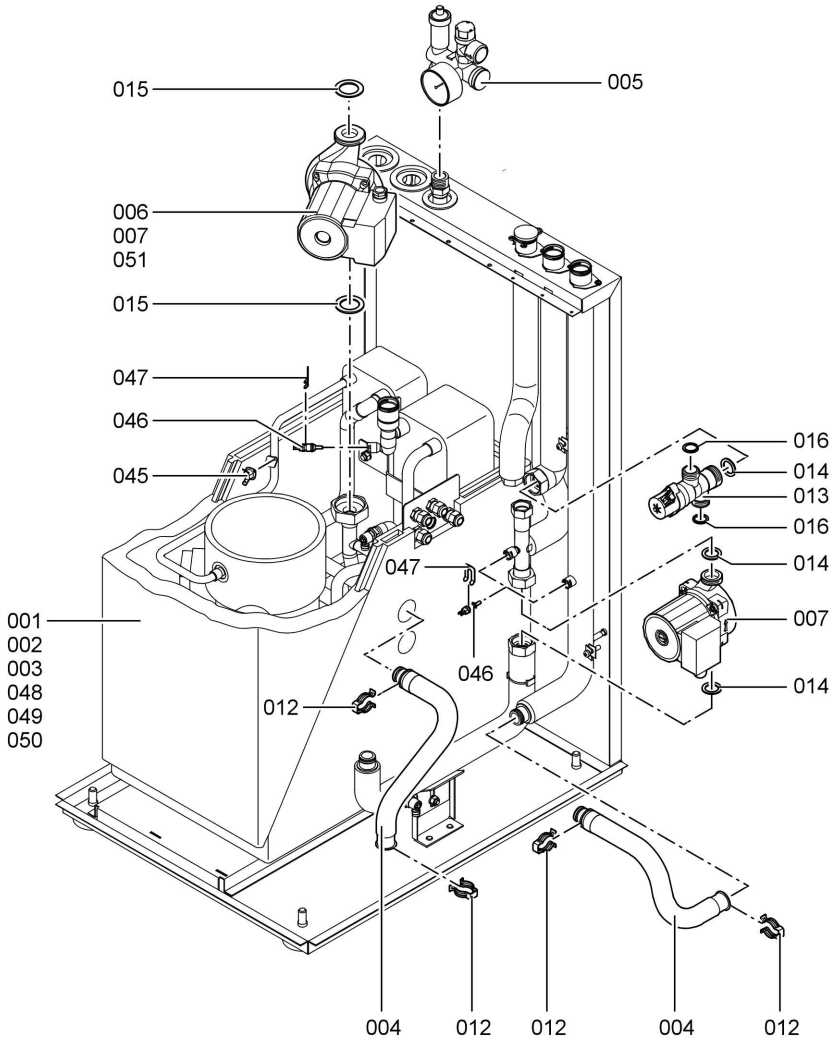
5592 795 GB

Parts lists (cont.)



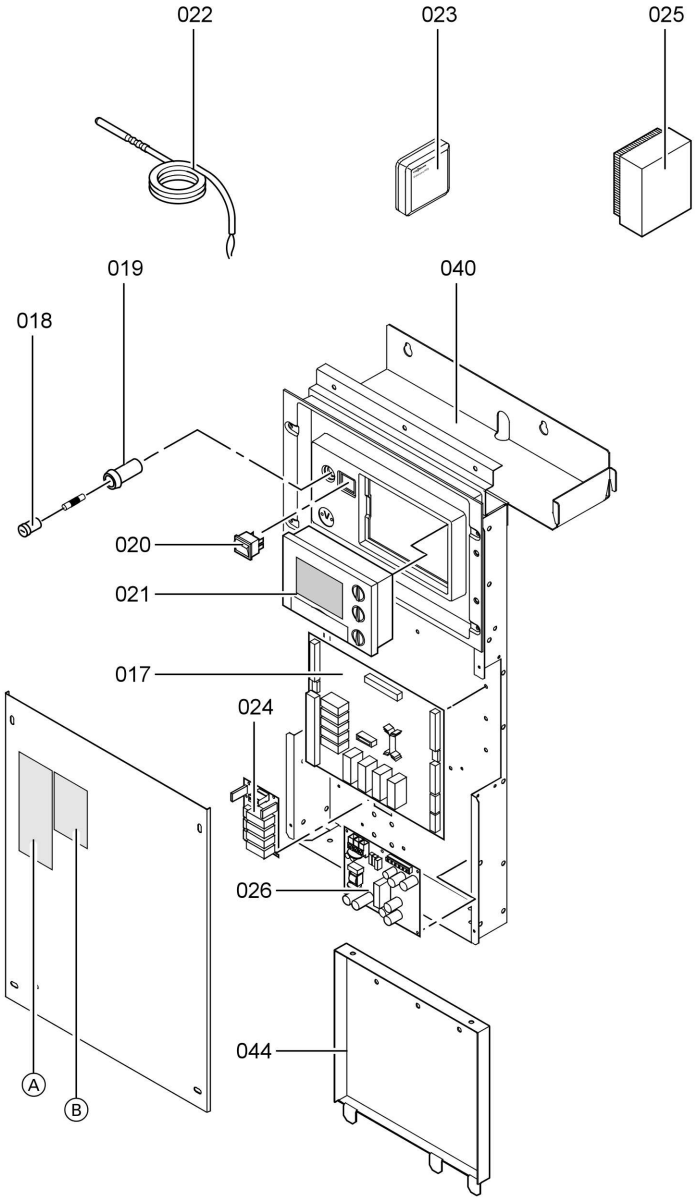
5592 795 GB

Parts lists (cont.)



5592 795 GB

Parts lists (cont.)



5592 795 GB

Hydraulic parameter reports

Setting and test values		Set value	Initial start-up
Antifreeze concentration (brine medium)	°C	–15	
Testing the secondary pump			
Temperature "**Secondary flow**" increased?		Yes	
Temperature "**Secondary return**" increased?		Yes	
Temperature differential ΔT		≤ 3 K	
Testing the external heating circuit pumps			
Heating flow temperature	°C		
Heating return temperature	°C		
Room temperature	°C		
Temperature differential heating flow/ "**Buffer storage**"	K	±2	
Heating return temp. > room temp.		Yes	
Checked under the following conditions:			
Circulation pump type			
Circulation pump stage			
Overflow valve setting			
Testing the primary pump			
"**Primary input**" temperature	°C		
Primary outlet temperature	°C		
Temperature differential ΔT at: " **Secondary flow** " = 35 °C and "**Primary input**" = 10 °C	K	3 to 5	
or			
" **Secondary flow** "= 35 °C and "**Primary input**" = 0 °C	K	2 to 4	
The pump enclosure of the primary cooling circuit pump heats up?		No	
Testing the mixer, heat pump and cylinder heating			
Checked under the following conditions:			
Room temperature	°C		
Outside air temperature	°C		
Mixer and heat pump heating mode			
Temperature "**DHW cylinder top**" constant?		Yes (±1 K)	
Temperature "**Secondary flow**"	°C	increasing	from: to:
Temperature differential ΔT "**Secondary flow**" / "**secondary return**"		6 to 8 K	

Hydraulic parameter reports (cont.)

Setting and test values		Set value	Initial start-up
Heat pump cylinder heating			
Temperature "**Secondary flow**"	°C	increasing	from: to:
Temperature "**DHW cylinder top**"	°C	increasing	from: to:

Control parameter report

Setting parameters	Setting range	Standard setting	Initial start-up
System definition			
System design	0, 1 to 6 and F*1	2	
Language	*2	German	
(EVU) Power-OFF contact: 1S	No/Yes	No	
Time temperature outside, average	00:10 to 100:00 h	22:00 h	
Heating limit < T room	0 to 20 K	4 K	
Reduced operation temperature limit	–30 to 30 K	–30 K	
Frost protection temperature	–15 to 15 ° C	1 °C	
Heat pump			
Power-OFF/EVU blockage	No/Yes	Yes	
Max. flow temperature	25 to 60 °C	60 °C	
Min. return temperature	1 to 40 °C	5 °C	
Hysteresis primary temp.	1 to 20 K	5 K	
Min. T brine entry	–10 to 20 ° C	–4 °C	
Min. operation time	2:00 to 30:00 min	2:00 minutes	
Min. compressor off (display 'on')	00:20 to 30:00 min	10:00 minutes	
Flow, primary pump	00:10 to 16:40 min	2:00 minutes	
Flow, secondary pump	00:10 to 16:40 min	2:00 minutes	
Optimum operation time	00:20 to 24:00 h	2:00 h	

*1 *See page 10 and 103.*

*2 *German; English; French; Italian; Swedish; Dutch; Finnish; Polish.*

Control parameter report (cont.)

Setting parameters	Setting range	Standard setting	Initial start-up
Instantaneous heating water heater			
Electric heating	No/Yes	No	
Power-OFF/EVU blockage	No/Yes	Yes	
Heating with electric power	No/Yes	Yes	
DHW with electric heating	No/Yes	Yes	
Max. flow temperature	5 to 75 °C	65 °C	
(Idle time) Heating rod delay	0:00 to 5:00 h	0:30 h	
Threshold, electric heating	10 to 30000 K · min	300 K · min	
E-heating max. stage	1 to 3	3	
Internal hydraulics			
Heat pump for building drying	No/Yes	No	
Time for building drying	0 to 30 days	0 days ("Off")	
Hysteresis, flow	0.5 to 5.0 K	2.0 K	
(Off-carr.) Internal pump run-on	00:10 to 05:00 min	02:00 minutes	
Max. steps, three-way valve	–30000 to 30000	320	
DHW			
DHW temperature buffer storage	10 to 70 °C	50 °C	
DHW program temperature	7-day program	OFF	
Program, DHW circulation pump	7-day program	OFF	
Operation mode	0 to 6*[1]	4	
DHW buffer storage max.	20 to 80 °C	60 °C	
Hysteresis, DHW electric heating	2 to 30 K	10 K	
Hysteresis	1 to 10 K	7 K	

*[1] *0: Standby; 1: Reduced; 2: Standard; 3: Fixed value; 4: Rotary selector; 5: External; 6: Switching times.*

Control parameter report (cont.)

Setting parameters	Setting range	Standard setting	Initial start-up
Start optimisation/Optimisation starts	No/Yes	Yes	
Stop optimisation	No/Yes	Yes	
DHW additional function	No/Yes	No	
2nd Set temperature DHW	10 to 70 °C	60 °C	
Volume, buffer storage, for HP	No/Yes	Yes	
Excess reaction (overplus)	0 to 2*[1]	2	
DHW priority	No/Yes	Yes	
Max. operation time, DHW	00:10 to 24:00 h	04:00 h	
Max. break DHW	00:10 to 24:00 h	01:30 h	
Heating circuit			
(Common) Standard temperature	10 to 30 °C	20 °C	
Reduced temperature	10 to 30 °C	14 °C	
Temp. program, heating circuit	7-day program	OFF	
Remote control	No/Yes	No	
Operation mode	0 to 7*[2]	4	
Max. flow temperature	10 to 70 °C	40 °C	
Min. flow temperature	1 to 30 °C	10 °C	
Hot water with party mode	No/Yes	Yes	
Excess reaction (overplus)	0 to 2*[1]	2	
Room temperature sensor	No/Yes	No	
(Incli.) Slope, room temp. hook-up	0 to 10	10	
Room temperature activation	0 to 3*[3]	0	

*[1] *0: no reaction; 1: Draw-off only in case of critical excess; 2: Always draw-off.*

*[2] *0: Standby; 1: Reduced; 2: Standard; 3: Fixed value (at max. flow temperature); 4: Rotary selector; 5: External (no function); 6: Switching times; 7: Remote control.*

*[3] *0: never; 1: only reduced mode; 2: only standard mode; 3: in reduced and in standard mode.*

5592 795 GB

Control parameter report (cont.)

Setting parameters	Setting range	Standard setting	Initial start-up
Start optimisation/Optimisation starts	No/Yes	No	
Max. flow correction	0.1 to 10.0 K	10.0 K	
Room temperature control	No/Yes	No	
Heating curve level	–15 to 40 K	0 K	
Heating curve slope (incli.)	0.0 to 3.5	0.6	
Integral room temperature controller	5 to 1000	100	
Flow T excess (Super-elev. flow temp)	–10 to 40 K	0 K	
Mixer (operation) runtime	0:05 to 4:15 min	0:10 minutes	
Parameters, mixer	0/1	0	
Screed function	0 to 15	0 (passive)	
Mixer active zone (Heat mixer scan band)	2 to 40 K	4 K	
Mixer dead zone (Heat mix non-op band)	0.5 to 3 K	1 K	
Natural cooling	No/Yes	No	
Cooling limit > T-room	2 to 20 K	4 K	
Cooling curve level	–15 to 40	0	
(Incli.) Slope, cooling curve	0.0 to 3.5	1.2	
Natural cooling with mixer	No/Yes	No	
Natural cooling mixer control zone/scan band	2 to 40 K	4 K	
Natural cooling mixer dead zone/non-op band	0.5 to 3 K	1 K	
Cooling mixer (op.) runtime	0:05 to 4:15 min	0:10 minutes	
Parameters, cooling mixer	0/1	0	
DHW buffer cylinder			
DHW buffer storage	No/Yes	No	

Control parameter report (cont.)

Setting parameters	Setting range	Standard setting	Initial start-up
Program, DHW buffer storage	7-day program	OFF	
(Set-point) Fixed temperature	1 to 60 °C	50 °C	
Temperature hysteresis	2 to 20 K	5 K	
Max. temperature	1 to 70 °C	60 °C	
Stop optimisation	No/Yes	Yes	
Excess reaction (overplus)	0 to 2*[1]	2	

*[1] *0: No reaction; 1: Draw-off only in case of critical excess; 2: Always draw-off.*

5592 795 GB

Specification for 400 V units

Vitocal	Type	BWP 106	BWP 108	BWP 110
Heat pump performance details*1				
Heat pump module	Type	200/106	200/108	200/110
Rated output	kW	6.1	7.7	9.7
Refrigeration capacity	kW	4.7	6.9	7.5
Power consumption	kW	1.4	1.8	2.2
Coefficient of performance ∈ (COP) during heating operation		4.3	4.3	4.3
Instantaneous heating water heater performance details (accessories) Output	kW	stepped 3/6/9		
Total output with instantaneous heating water heater	kW	15	17	18.7
Brine (primary)				
Capacity	litres	1.6	2.1	2.6
Min. flow rate*2	l/h	1200	1400	1800
Max. external pressure drop	mbar	400	480	380
Max. inlet temperature	°C	25	25	25
Min. inlet temperature	°C	–5	–5	–5
Heating water (secondary)				
Content, heat pump	litres	1.6	1.8	2.0
Content, total	litres	7.0	7.2	7.4
Min. flow rate*2	l/h	800	800	800
Max. external pressure drop	mbar	450	450	450
Max. flow temperature	°C	60	60	60
Electrical values				
Rated voltage (heat pump)		3/N/PE 400 V~/50 Hz		
Rated voltage (instantaneous heating water heater)		3/N/PE 400 V~/50 Hz		
Rated voltage (control circuit)		230 V~/50 Hz		
Rated current (compressor)	A	5.5	6.0	8.0

*1 *At operating point B0/W35 to EN 255: B0 = Brine inlet temperature 0 °C / W 35 = Heating water flow temperature 35 °C.*

*2 *Always safeguard the min. flow rate.*

5592 795 GB

Specification for 400 V units (cont.)

Vitocal	Type	BWP 106	BWP 108	BWP 110
Starting current (compressor)	A	25.0	14.0*1	20.0*1
Starting current (compressor with stalled armature)	A	32	35	48
Power consumption				
■ Control unit	W	<10	<10	<10
■ Solar circuit pump for stage 1/2/3	W	62/92/132	195/175/120	195/175/120
■ Heating circuit pump for stage 1/2/3	W		62/92/132	
Fuse (slow)*2	A		3 × 16	
Protection			IP 20	
Fuse (internal)			6.3 A H slow	
Refrigerant circuit				
Process medium			R 410 A	
Fill volume	kg	1.05	1.20	1.35
Compressor	Type	Hermetically sealed scroll compressor		
Dimensions				
■ Total length	mm	716	716	716
■ Total width	mm	600	600	600
■ Total height	mm	1113	1113	1113
Weights				
■ Total weight	kg	120	130	135
■ Standard equipment weight	kg	70	70	70
■ Heat pump weight	kg	50	60	65
Permissible operating pressure				
Brine circuit (primary)	bar	4.0	4.0	4.0
Heating water circuit (secondary)	bar	3.0	3.0	3.0
DHW cylinder (DHW side)	bar	10.0	10.0	10.0

*1 *With full wave soft starter.*

*2 *Required Z characteristics.*

5592 795 GB

Specification for 400 V units (cont.)

Vitocal Type		BWP 106	BWP 108	BWP 110
Connections				
Primary flow and return (brine)		optional Rp ¾" **or** Multi-connect system DN 20		
Heating flow and return		Multi-connect system DN 20		
DHW		Multi-connect system DN 20		
Product parameters (to EnEV [Germany], heating mode without instantaneous heating water heater)				
Rated output	kW	6.1	7.7	9.7
Coefficient of performance ∈N at 0 °C/35 °C		4.3	4.3	4.3
Correction factor "0 °C"		1.087	1.087	1.087
Factor Δt = 7 K		0.995	0.987	0.956
Heating energy expenditure value at 0 °C/35 °C		0.215	0.217	0.221
DHW energy expenditure value at 0 °C/35 °C		0.256	0.257	0.262

5592 795 GB

Specification for 230 V units

Vitocal	Type	BWP 106	BWP 108	BWP 110
Heat pump performance details*1				
Heat pump module	Type	200/106	200/108	200/110
Rated output	kW	6.2	7.6	9.7
Refrigeration capacity	kW	4.6	5.7	7.3
Power consumption	kW	1.6	1.9	2.4
Coefficient of performance ∈ (COP) during heating operation		3.9	4.0	4.0
Instantaneous heating water heater performance details (accessories) Output	kW	stepped 3/6/9		
Total output with instantaneous heating water heater	kW	15	17	18.7
Brine (primary)				
Capacity	litres	1.6	2.1	2.6
Min. flow rate	l/h	1200	1400	1800
Max. external pressure drop	mbar	400	480	380
Max. inlet temperature	°C	25	25	25
Min. inlet temperature	°C	–5	–5	–5
Heating water (secondary)				
Content, heat pump	litres	1.6	1.8	2.0
Content, total	litres	7.0	7.2	7.4
Min. flow rate*2	l/h	800	800	800
Max. external pressure drop	mbar	450	450	450
Max. flow temperature	°C	60	60	60
Electrical values				
Rated voltage (heat pump)		1/N/PE 230 V~/50 Hz		
Rated voltage (instantaneous heating water heater)		1/N/PE 230 V~/50 Hz		
Rated voltage (control circuit)		230 V~/50 Hz		
Rated current (compressor)	A	16	19	23

*1 *At operating point B0/W35 to EN 255: B0 = Brine inlet temperature 0 °C / W 35 = Heating water flow temperature 35 °C.*

*2 *Always safeguard the min. flow rate.*

Specification for 230 V units (cont.)

Vitocal	Type	BWP 106	BWP 108	BWP 110
Starting current (compressor)*1	A	< 45	< 45	< 45
Starting current (compressor with stalled armature)	A	61	82	97
Power consumption				
■ Control unit	W	<10	<10	<10
■ Solar circuit pump for stage 1/2/3	W	62/92/132	165/133/87	165/133/87
■ Heating circuit pump for stage 1/2/3	W	62/92/132		
Fuse (slow)*2	A	1 × 25		
Protection		IP 20		
Fuse (internal)		6.3 A H slow		
Refrigerant circuit				
Process medium		R 410 A		
Fill volume	kg	1.05	1.20	1.35
Compressor	Type	Hermetically sealed scroll compressor		
Dimensions				
■ Total length	mm	716	716	716
■ Total width	mm	600	600	600
■ Total height	mm	1113	1113	1113
Weights				
■ Total weight	kg	120	130	135
■ Standard equipment weight	kg	70	70	70
■ Heat pump weight	kg	50	60	65
Permissible operating pressure				
Brine circuit (primary)	bar	4.0	4.0	4.0
Heating water circuit (secondary)	bar	3.0	3.0	3.0
DHW cylinder (DHW side)	bar	10.0	10.0	10.0
Connections				
Primary flow and return (brine)		optional Rp ¾" **or** Multi-connect system DN 20		
Heating flow and return		Multi-connect system DN 20		
DHW		Multi-connect system DN 20		

*1 *With full wave soft starter.*

*2 *Required Z characteristics.*

5592 795 GB

Order to commission the Vitocal 200-G

Please send the following order, together with the enclosed system layout, by fax to your local Viessmann sales office.

We would ask that a competent employee of yours be present during the commissioning.

Client: .....
.....

System location: .....
.....
.....

Please tick these checkpoints:

□ Hydraulic diagram for system versions 1□ 2□ 3□ 4□ enclosed. In case of alternative designs: Diagram enclosed □.
□ Heating circuit completed and filled.
□ Electrical installation completed.
□ Pipework fully insulated.

□ Windows and external doors fully set and sealed in.
□ Solar option completed.
□ Cooling option completed.
□ Ground probes and interconnecting lines completed.

Requested date:

1. **Date:** ..... **Time:** .....
2. **Date:** ..... **Time:** .....

All work ordered from Viessmann will be charged to me/us in accordance with the current Viessmann pricelist..

Place/Date: .....
Signature: .....

5592 795 GB

Declaration of conformity

We, Viessmann Werke GmbH & Co KG, D-35107 Allendorf, declare as sole responsible body that the product **Vitocal 200, type BWP incl. CD70 heat pump control unit** complies with the following standards:

DIN 7003
DIN 8901
DIN 8975
EN 292/T1/T2
EN 294
EN 349
EN 378
EN 55 014-1
EN 55 014-2
EN 60 252-1
EN 60 335-1
EN 60 335-2-40
EN 60 529
EN 61 000-3-2
VDE 0100-430
VDE 0298-4
VGB 20

In accordance with the following Directives, this product is designated with CE:

73/ 23/EEC
89/336/EEC
97/ 23/EC
98/ 37/EC

Cylinder details according to the Pressure Equipment Directive (97/ 23/EC):
Category I, module A
The product characteristics determined as system values for the product **Vitocal 200**–G as part of **EC type testing according to the Efficiency Directive** (see specification table), can be utilised to assess the energy consumption of heating and ventilation equipment to DIN V 4701-10 specified by the EnEV [Germany].

Allendorf, 10. September 2005

Viessmann Werke GmbH&Co KG

pp. Manfred Sommer

5592 795 GB

Keyword index

5592 795 GB

Keyword index (cont.)

5592 795 GB

Keyword index (cont.)

5592 795 GB

Keyword index (cont.)

5592 795 GB

Applicability

Applicable for heat pumps:
Brine/water heat pump
Vitocal 200-G, type BWP 106, 108 and 110
400 V and 230 V

With the **standard equipment** from serial no:
7276 401 5 01000 ...
With the **heat pump module** from serial no:
7276 397 5 01000 ... (200/106, 400 V)
7276 398 5 01000 ... (200/108, 400 V)
7276 399 5 01000 ... (200/110, 400 V)
7278 656 6 01000 ... (200/106, 230 V)
7278 657 6 01000 ... (200/108, 230 V)
7278 658 6 01000 ... (200/110, 230 V)
7282 751 6 01000 ... (200/106, 400 V)
7282 752 6 01000 ... (200/108, 400 V)
7282 753 6 01000 ... (200/110, 400 V)

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