

Installation and maintenance instructions for specialists

# Heat Interface Unit

## Greenstar

HIU / HIU E / HIU KE



---

**Table of contents**


---

<b>1</b>	<b>Explanation of symbols and safety instructions</b>	<b>3</b>
1.1	Explanation of symbols	3
1.2	General safety instructions	3
<b>2</b>	<b>Product Information</b>	<b>4</b>
2.1	Scope of delivery	4
2.2	Product description	4
2.3	Type Plate	5
2.4	Appliance type overview and accessories	5
2.5	Product dimensions and minimum clearances	5
2.6	Declaration of conformity	6
<b>3</b>	<b>Regulations</b>	<b>6</b>
<b>4</b>	<b>Preparatory work</b>	<b>7</b>
4.1	Observe general notices	7
4.2	Pipework installation	7
4.3	Installing the discharge pipe	7
4.4	Mounting the filling device	8
<b>5</b>	<b>Assembly</b>	<b>8</b>
5.1	Quick reference guide	8
5.2	Mounting wall mounting bracket	9
5.3	Installing the mounting plate (accessory)	10
5.4	Hanging the HIU	10
<b>6</b>	<b>Electrical connection</b>	<b>10</b>
6.1	Opening the control unit	11
6.2	Control unit terminals	11
6.3	Examples: wiring the control unit	11
6.4	Cable preparations	12
6.5	Connecting and securing the cable	12
<b>7</b>	<b>Commissioning</b>	<b>13</b>
7.1	Filling, flushing and venting the system	13
7.2	Adjusting the control unit	14
7.3	Control valve status indicators	15
7.4	Setting the heating pump	15
7.5	Heat meter (Option)	16
7.6	Commissioning checklist	17
<b>8</b>	<b>Shutdown</b>	<b>18</b>
<b>9</b>	<b>Environment/disposal</b>	<b>18</b>
<b>10</b>	<b>Inspection and service</b>	<b>19</b>
10.1	Inspection and maintenance report	19
10.2	Cleaning the primary strainer	20
10.3	Replacing components	20
<b>11</b>	<b>Troubleshooting</b>	<b>23</b>
11.1	Central Heating trouble shooting guide	23
11.2	Domestic Hot Water trouble shooting guide	24
11.3	LED displays at the control unit	26
11.4	Fault display control valves	26
11.5	Display Error codes heat meter	26
11.6	Heating pump fault display	27
11.7	Sense II diagnosis functions	27

<b>12</b>	<b>Data Protection Notice</b>	<b>27</b>
<b>13</b>	<b>Appendix</b>	<b>27</b>
13.1	Central Heating pump characteristics	27
13.2	Tech data	28
13.3	Domestic Hot Water performance chart	30
13.4	Heating circuit performance chart	31


## 1 Explanation of symbols and safety instructions

### 1.1 Explanation of symbols


#### Warnings

In warnings, signal words at the beginning of a warning are used to indicate the type and seriousness of the ensuing risk if measures for minimizing danger are not taken.


The following signal words are defined and can be used in this document:


**DANGER**

**DANGER** indicates that severe or life-threatening personal injury will occur.


**WARNING**

**WARNING** indicates that severe to life-threatening personal injury may occur.



**CAUTION**

**CAUTION** indicates that minor to medium personal injury may occur.

**NOTICE**

**NOTICE** indicates that material damage may occur.

#### Important information



The info symbol indicates important information where there is no risk to people or property.

#### Additional symbols

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

Table 1

### 1.2 General safety instructions

#### ⚠ Notices for the target group

These installation instructions are intended for heating and electrical contractors. All instructions must be observed. Failure to comply with instructions may result in material damage and personal injury, including danger to life.

- ▶ Read the installation, service and commissioning instructions (heat source, heating controller, pumps, etc.) before installation.
- ▶ Observe the safety instructions and warnings.
- ▶ Follow national and regional regulations, technical regulations and guidelines.
- ▶ Record all work carried out.

#### ⚠ Transport information

- ▶ Only remove packaging just before assembly.
- ▶ Wear protective gloves when transporting the HIU.
- ▶ Use suitable means of transportation (e.g. sack truck).

#### ⚠ Mounting method

- ▶ Do not shut off pressure-relief valves.

Risk of fire from soldering and welding!

High pressures and high temperatures may occur on the primary side.

- ▶ Wear suitable protective equipment.

#### ⚠ Packaging

The following points should be observed during unpacking.

- ▶ Check the delivery immediately upon receipt for completeness and possible transport damage.
- ▶ In the event of transport damage, the delivery should only be accepted conditionally.
- ▶ Do not use damaged components for assembly.
- ▶ Carefully unpack the unit.
- ▶ Ensure that all packaging material is removed and that the unit is free from all materials that may prevent the unit from operating correctly.

#### ⚠ Health and safety

The appliance contains no asbestos and no substances have been used in the construction process that contravene the COSHH Regulations (Control of Substances Hazardous to Health Regulations 1988).

#### ⚠ Danger of burns and scalds

- ▶ Surfaces of individual components, connections and leaking water can be very hot and cause severe burns and scalds.
- ▶ Do not touch hot surfaces.
- ▶ Caution should be taken not to touch any leaking water or drained system water unless the temperature is known and safe.

#### ⚠ Intended use

The HIU provides DHW and heating energy to buildings that are supplied indirectly by district heating or heat network systems.

- ▶ Only use the HIU in sealed systems for central heating and DHW heating.
- ▶ To ensure compliance with the intended use, observe the information on the data plate and the specifications.
- ▶ Only install the HIU in frost-free room or enclosure. Ensure a ambient temperature range of 2 °C to 30 °C.
- ▶ Only install the HIU straight and vertically upright, as described in these instructions.

#### ⚠ Danger of burns and scalds

Individual components and discharging water can be very hot and inflict burns.

- ▶ Do not touch hot surfaces.
- ▶ Unless you know what the temperature of the discharging water is, you should not touch it.

#### ⚠ Inspection and maintenance

Regular inspection and maintenance are prerequisites for safe and energy efficient operation of the heating system.

We recommend you inspect the HIU at least every three years in line with BSRIA guidance.

- ▶ Have work carried out only by an approved installer.
- ▶ If any faults are discovered, have them remedied immediately.

#### ⚠ Handover to the user

When handing over the heating system, explain the operation and operating conditions to the operator.

- ▶ Explain operation – with particular emphasis on all safety-related actions.
- ▶ Highlight the following points in particular:
  - Point out that modifications or repairs may be carried out only by an competent contractor.
  - To ensure safe and environmentally compatible operation, an inspection every three years, and also cleaning and maintenance if required, must be carried out.
- ▶ Point out the possible consequences (personal injury and possible danger to life or material damage) of not carrying out inspection, cleaning and maintenance correctly, or omitting it altogether.

- ▶ Hand over the installation and operating instructions to the user for safekeeping.

## 2 Product Information

### 2.1 Scope of delivery

- ▶ Check that the delivery is complete and undamaged.

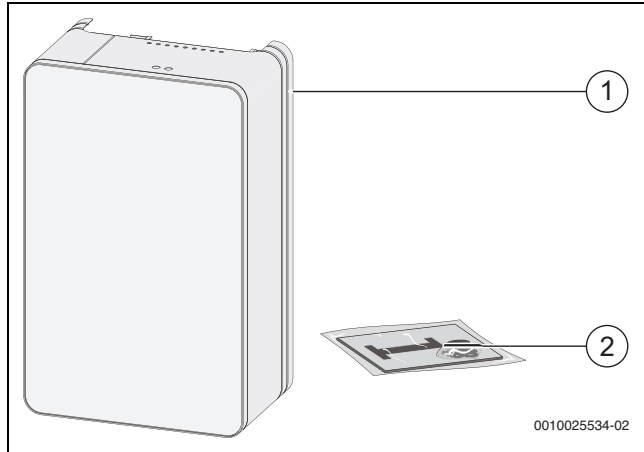


Fig. 1 Scope of delivery of heat interface unit

- [1] Heat Interface Unit
- [2] Installation and maintenance instructions, gaskets (10 x), drilling template

### 2.2 Product description

The heat interface unit (HIU) is used to provide heating energy and potable hot water in buildings supplied by district heating or central heating systems.

The HIU complies with the COSHH regulations (Control of Substances Hazardous to Health Regulations 1988).

To remove the cover of the wall mounted HIU:

- ▶ Undo the screws at the bottom [2] and lift cover [1] up and out of the frame.

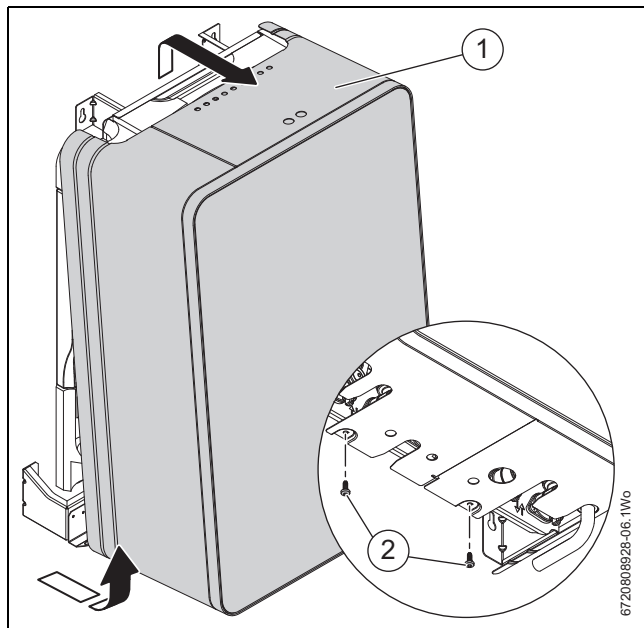


Fig. 2 Removing the cover of the wall mounted station

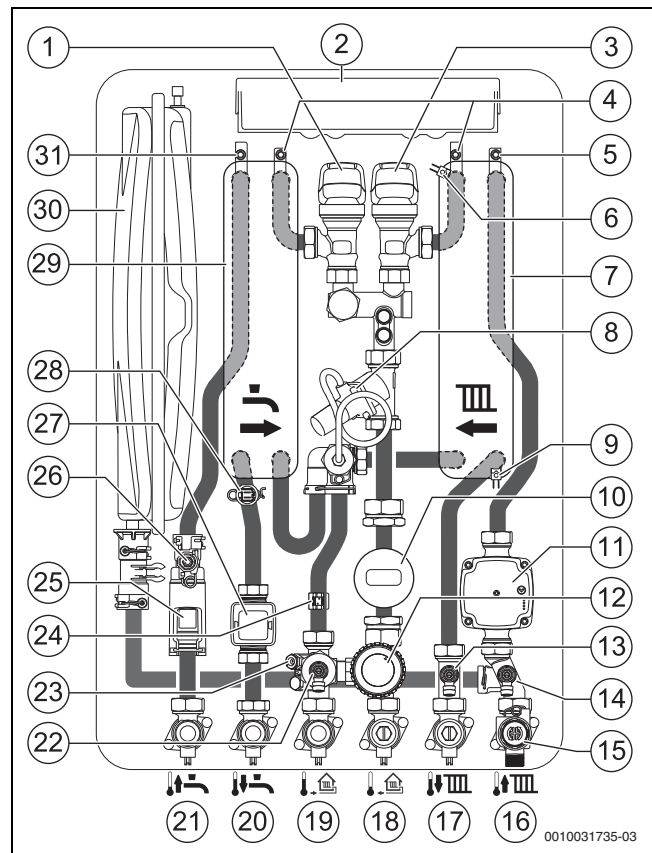


Fig. 3 Station with heating circuit with mixer

- [1] DHW control valve
- [2] Control unit
- [3] Heating control valve
- [4] Primary circuit air vent valve
- [5] Heating circuit air vent valve
- [6] Return temperature sensor NTC for heating circuit (primary side)
- [7] Heating circuit plate heat exchanger (brazed stainless steel)
- [8] Differential pressure control valve, do not change adjusting screw! (optional)
- [9] Flow temperature sensor NTC for heating circuit
- [10] Heat meter (optional)
- [11] Heating circulation pump
- [12] Thermal bypass (optional)
- [13] Heating circuit drain valve, flow
- [14] Heating circuit drain valve, return
- [15] Heating circuit pressure relief valve
- [16] Heating circuit return connection 22 mm compression ring fitting
- [17] Heating circuit flow connection 22 mm compression ring fitting
- [18] Primary circuit return connection 22 mm compression ring fitting (option: flat face fitting)
- [19] Primary circuit flow connection 22 mm compression ring fitting (option: flat face fitting)
- [20] Hot water connection (DHW) 22 mm compression ring fitting
- [21] Cold water connection (CWC) 22 mm compression ring fitting
- [22] Primary circuit drain valve and strainer
- [23] Heat meter flow sensor connection M10x1
- [24] Flow temperature sensor NTC primary circuit
- [25] Flow turbine and limiter with strainer
- [26] DHW pressure-relief valve
- [27] DHW over temperature valve
- [28] NTC temperature sensor DHW
- [29] DHW plate heat exchanger (brazed stainless steel)
- [30] Expansion Vessel
- [31] DHW air vent valve

**System separation**

- The two heat exchangers for DHW and heating hydraulically disconnect the primary heating circuit from the heating circuit.

**DHW mode**

- Opening the water tap activates the flow turbine [31]. The minimum volumetric flow rate is 2 l/min.
- The DHW control valve [1] modulates the heating water on the primary side to achieve the preset DHW temperature.
- The control valve for the heating remains closed [3] (DHW priority function).
- Primary side heating water flows through the plate heat exchanger [32] and heats the potable water instantaneously.
- If there is a risk of scalding, the thermal overload protection [25] interrupts the flow. The valve opens automatically following a cool down time.

**Heating mode**

- The control valve for the DHW [1] remains closed until DHW is requested (DHW priority function).
- The heating control valve [3] modulates according to the required heating capacity. The flow temperature remains the same and corresponds to the flow temperature of the primary circuit.

**Summer bypass function**

- This function bypasses the longer heating-up period of the pipework in the primary circuit which occurs when the heat interface unit has been inactive for a longer period. This reduces the DHW heating waiting times. The heat exchanger is not kept warm continuously. The summer bypass function can be activated in two ways.
- Variant 1 (standard) - electronic keep hot without thermal bypass, using the default electronic bypass. The DHW control valve [1] is used to allow water to run through HIU. The trigger temperature for this function is fixed at 41°C and can only be changed by a Sense II room controller (accessory). With this version, the quantity of heat is recorded by the heat meter (option) [10].
- Variant 2 (accessory) - using the thermal bypass option [12]: the heating water in the primary circuit flows through the bypass valve. This ensures that the temperature of the hot water at the heat interface unit is 30-70 °C. In this case the quantity of heat is **not** recorded by the heat meter (accessory) [12]!

**i**  
If the bypass valve is installed, the electronic bypass function must **not** be selected in the room controller and the jumper must be removed (→Fig. 53, page 29 [19]).

**i**  
The BESA requirements are only achieved with the electronic bypass - not with the thermal bypass (accessory).

**Frost protection**

- System frost protection: as soon as the temperature sensor [10] sends a frost protection signal, the heating pump is activated.
- Device frost protection: as soon as the temperature at the flow temperature sensor [24] for the heating is below 5 °C, the control valve opens the heating.

**Limiting the return temperature in the heating circuit**

- If the system is designed correctly, it is not necessary to limit the return temperature [8].
- The return temperature limit is set to 50 °C at the factory.
- This temperature can only be changed with the room controller Sense II.
- When the room controller is removed, the set value is saved.

**2.3 Type Plate**

The data plate includes the performance information, approval data and serial number of the product [2]. There is an additional data plate behind the control unit [1].

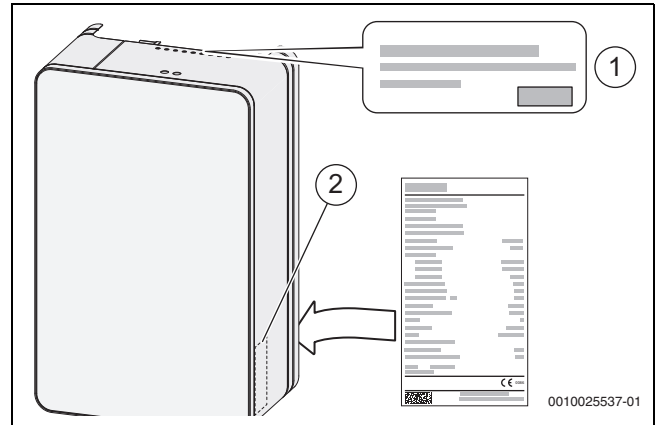


Fig. 4 Type plate and data plate

**2.4 Appliance type overview and accessories**

Example appliance: HIU KE

- HIU = heat interface unit
- E = differential pressure control valve (DPCV)
- K = higher DHW output

Typ	Typ-Nr.	Accessory NOT possible
HIU	7735600658	Heat meter wired Mbus
HIU <sup>1)</sup>	7735600726	Heat meter adapter kit
HIU E	7735600659	Heat meter wired Mbus
HIU E <sup>1)</sup>	7735600724	Heat meter adapter kit
HIU KE	7735600661	Heat meter wired Mbus
HIU KE <sup>1)</sup>	7735600725	Heat meter adapter kit

1) with heat meter wired Mbus (standard)

Table 2 Appliance type overview

Refer to the Technical product brochure for a complete overview of all available accessories. Information on assembly is enclosed with the accessories.

Flushing valve
Vertical connector pipes (set)
Heat meter adapter kit
Thermal overload protection
Sense II (room controller)
Security fixings
Keyless filling loop
Summer bypass valve
Mounting plate

Table 3 Accessory part

**2.5 Product dimensions and minimum clearances**

The protection class of the station is IPX4D.

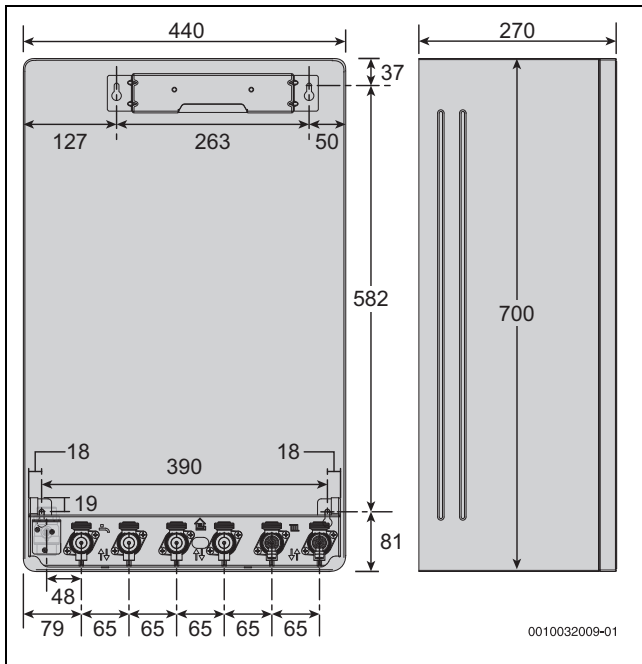


Fig. 5 Dimensions, sizes in mm

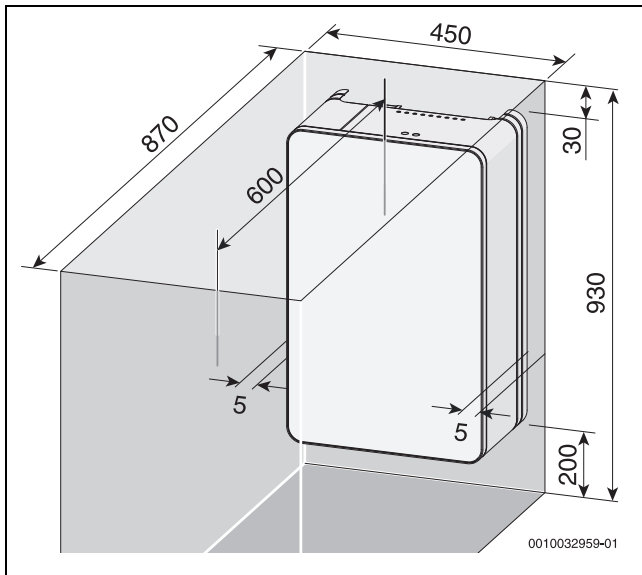


Fig. 6 Minimum clearances in mm for assembly and maintenance

**Assembly in a cabinet**

The minimum clearances specified below apply in addition to the normal minimum clearances.

- ▶ Make sure that the temperature in the cabinet does not exceed 35 °C.

- ▶ Provide ventilation openings at the top and bottom each of which are at least 240 cm<sup>2</sup>.

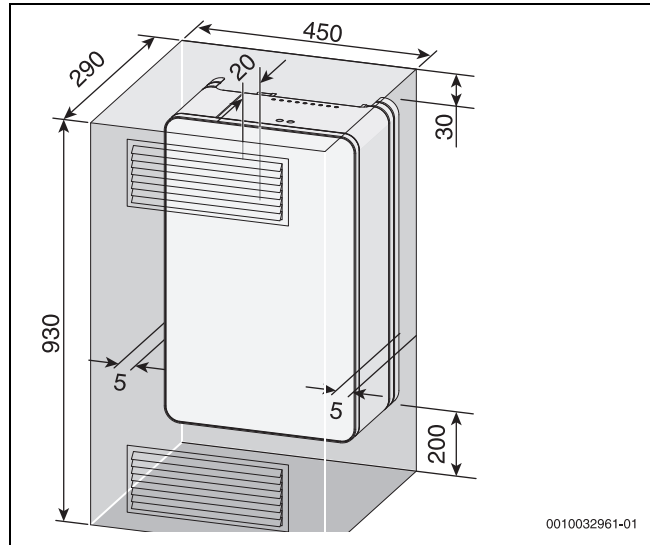


Fig. 7

**2.6 Declaration of conformity**

The design and operating characteristics of this product comply with the British requirements.



The UKCA marking declare that the product complies with all the applicable British legislation, which is stipulated by attaching these markings.

The complete text of the Declaration of Conformity is available on the Internet: [worcester-bosch.co.uk](http://worcester-bosch.co.uk).

**3 Regulations**

- ▶ Observe updated regulations or supplements. These regulations also apply at the time of installation.
- ▶ Observe all standards and guidelines applicable to the installation and operation of the system in your country and region.

**Standards and Guidelines**

- **Building Regulations Part L** (conservation of energy in buildings)
- **BS12502** Part 1 and 2
- **HSG85** (electrical separation)
- **GS38** (test equipment)
- **BS7671** (IET wiring regulations)
- CIBSE CP1(2020) Heat networks code of practice for the UK
- Local standards and regulations for the electrical connection and safety equipment of the water-filled heating system.

## 4 Preparatory work

### 4.1 Observe general notices

- ▶ Remove the packaging, observing all notices in the packaging.
- ▶ Mount the HIU as close as possible to the most frequently used water draw-off point.
- ▶ When assembling the pipework, secure the connections at the HIU to prevent twisting.

#### Other components required

**NOTICE**

#### Push by due to excessively high differential pressure

The maximum differential pressure in the primary circuit of heat interface units with integrated differential pressure control valve is 400 kPa (4000 mbar), and 80 kPa (800 mbar) without integrated differential pressure control valve.

- ▶ Where necessary, install a suitable control to limit the differential pressure.
- ▶ Protect the primary heating circuit with an expansion vessel and pressure-relief valve in accordance with BS EN 12828.



As the heat interface unit is not always accessible, we recommend using a central automatic air separator or a deaerator in the primary circuit.

- ▶ Install drain valves at all the low points in the system.
- ▶ Install air vents at all the highest points in the system.
- ▶ Install thermostatic radiator valves in accordance with CIBSE CP1.

#### DHW - water quality

- ▶ Comply with limits in the following table.
- ▶ Comply with UK Water Regulations.



**CAUTION**

#### Failure of the station due to calcification of heat exchanger.

- ▶ If the water hardness is 20°dH or more, install a water softener unit.

To minimise calcification of the heat exchanger, we recommend you install a water softener unit if the water hardness is **14°dH** or more.

	Unit	Value
Water hardness	°dH	< 20
pH value		6.0 - 9.5
Conductivity	µS/cm	10 - 2790
Sulphate	mg/l	< 250
Chloride	mg/l	< 80

Table 4 Suitability of the water supply

#### Heating water quality

Water treatment and quality for both the primary heat network and tertiary heating circuit should comply with the water treatment guidance contained within CIBSE CP1. Additionally, the below additives are suitable for use with this product.

BASF Glythermin NF (20-62%)	Sentinel X100 (1-2%)
Fernox F1	Sentinel X200
Fernox F1 express	Sentinel X400
Fernox Alpha-11	Tyfocor Tyfocor L (25-80%)
Hoechst Antifrogen N (25-40%)	MC1+ Protector
Hoechst Antifrogen N+L (40%)	MC3+ Cleaner
Nalco Nalco (1-2%)	MC2 Silencer

Nalco Varidos 1+1 (1-2%)	MC ZERO (25-40%)
Nalco Varidos FSK (22-55%)	

Table 5 Typical additives for the heating water

#### Floor heating

To protect the underfloor circuit in the event of faults:

- ▶ Mount thermal protection valve.
- or-
- ▶ Temperature switch on the flow pipe to the underfloor circuit
- ▶ Set the switching point of the temperature switch (minimum temperature setpoint of underfloor heating circuit + 10 K).

### 4.2 Pipework installation

Any plastic pipe-work used on the central heating system must have a polymeric oxygen barrier coating.

- ▶ Carry out a pipe network calculation to determine the pipework sizes. Observe specified pressure losses of the HIU.
- ▶ Fit pipework and connections without stress.
- ▶ Sufficiently insulate all pipework leading to the HIU (according to CIBSE CP1 guidance).

#### Showers/bidets

- Ensure that the shower is suitable for use with mains water pressure.
- If a shower head can be immersed in water or comes closer than 25mm from the top edge of a bath or shower tray spill over level then an anti-siphon device must be fitted to the shower hose.
- Bidets with direct hot and cold mains water can be used (with the approval of the local water authority) and must be the over rim flushing type with shrouded outlets to prevent the fitting of hand held sprays.

#### Water pressure

- ▶ Observe water pressure limits (→ specifications).

**NOTICE**

#### Risk of damage to household appliances!

Non-return, back flow prevention devices (including those associated with water meters) fitted to the mains water supply can cause a pressure build up which could damage the appliance and other household appliances.

- ▶ Fit a mini expansion between the non-return valve, back flow prevention device.

### 4.3 Installing the discharge pipe



**CAUTION**

#### Risk of scalding due to incorrectly installed discharge pipe!

- ▶ Mount discharge pipe so it cannot pose a danger when discharging into a drain or tundish.



When the tundish is installed indoors it should have an odour trap. If the temperatures in the primary circuit are higher than 85°C, we recommend using a Hotun-Hiflun tundish.

- ▶ Install discharge pipe from the safety valve [1,3] in a pipe that is suitable for the maximum operating temperature. Discharge into a suitable drain or tundish internally. For external discharge, install as set out in the figure.
- ▶ Install a partial elbow on the end to prevent freezing.



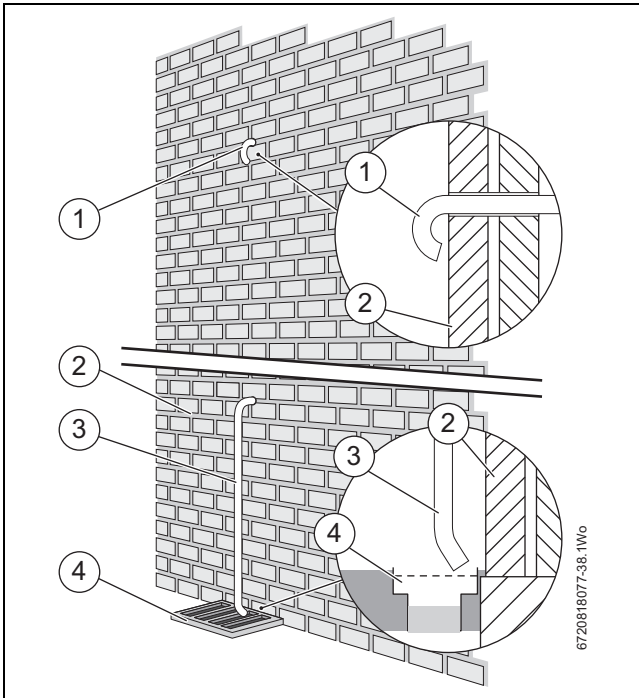


Fig. 8 Discharge pipe

- [1] Discharge pipe (turned back onto external wall example)
- [2] Outside wall
- [3] Discharge pipe (into drain or gully example)
- [4] External drain

#### 4.4 Mounting the filling device

You have the following options for filling the system:

- Keyless filling loop (accessory, see separate instructions)
- Filling loop provided by the customer on the cold mains inlet
- Filling loop provided by the customer on the primary side return



System separator provided by the customer

- ▶ The sealed heating system must be filled using a WRAS approved filling loop. See the following figure.
- ▶ Make sure the heating system is treated using a suitable inhibitor (→ Appendix, Specifications).

- ▶ Mount filling loop between the pipes of the primary side return or cold water inlet and the heating flow.

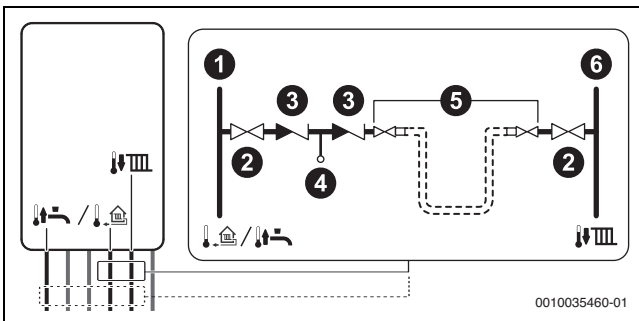


Fig. 9 Filling loop provided by the customer

- [1] Primary circuit return / cold mains inlet
- [2] Shut-off valve
- [3] Non-return component
- [4] Test point
- [5] Pipework (filling loop)
- [6] Heating circuit flow

## 5 Assembly

### 5.1 Quick reference guide

▶ For detailed information, refer to the following chapters.

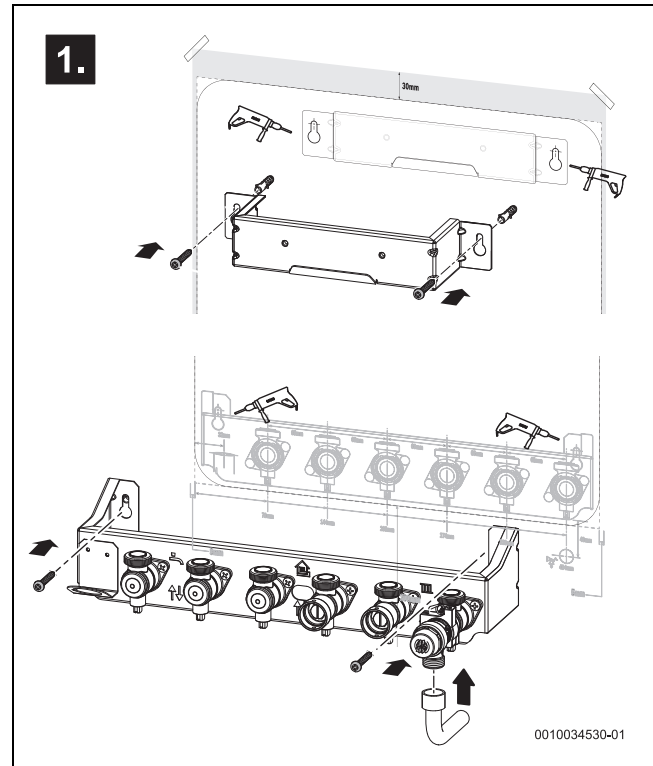


Fig. 10 Attach template, drill holes, install wall mounting bracket and mounting plate

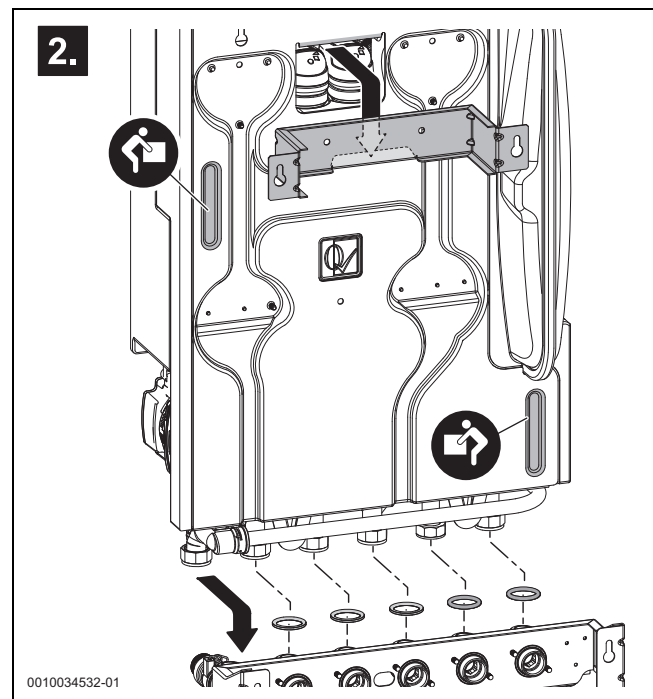


Fig. 11 Insert gaskets and hang HIU



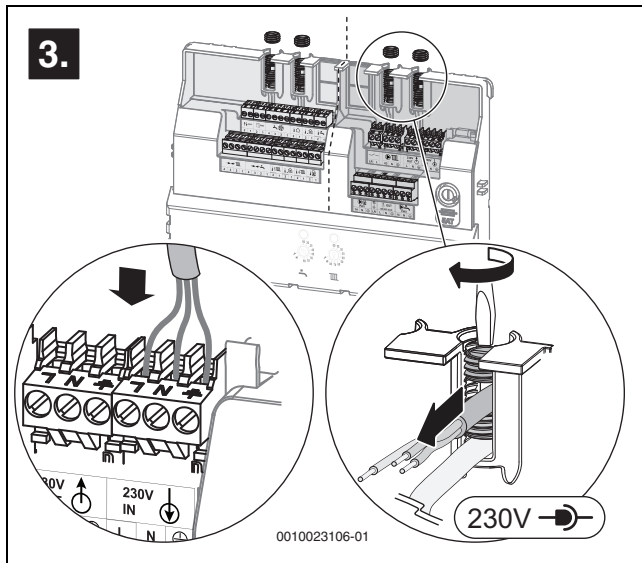


Fig. 12 Electric connection

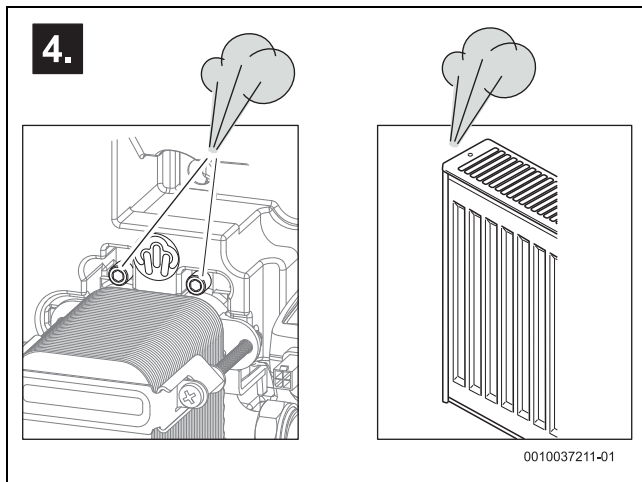


Fig. 13 Vent: HIU and radiator

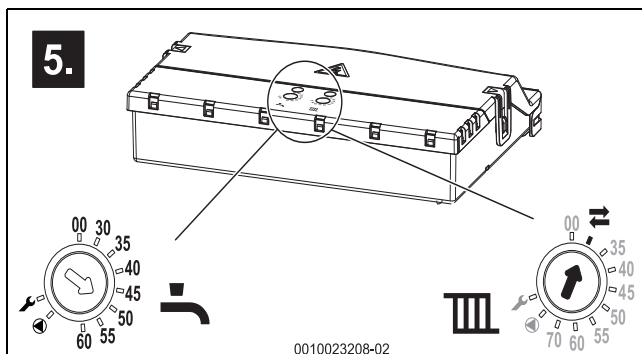


Fig. 14 Set rotary selector on control unit

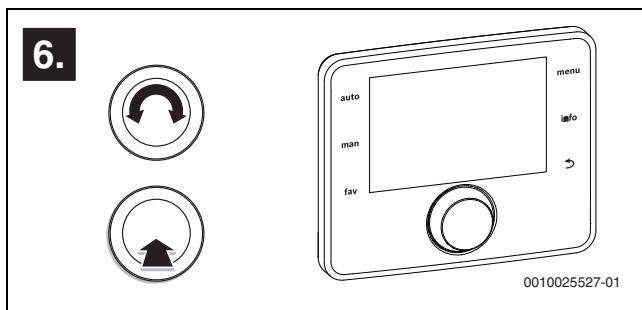


Fig. 15 Set room controller, if installed

## 5.2 Mounting wall mounting bracket

### NOTICE

#### Incorrect assembly can cause material damage.

If the device is assembled incorrectly, it may fall off the wall.

- ▶ Only install the device on a rigid, solid wall. This wall must be able to carry the weight of the device and must at least be as large as the bearing surface of the device.
- ▶ Only use screws and rawl plugs that are suitable for the wall type and weight of the device.

The following hole patterns are printed on both sides of the drilling template:

- Installation on finished wall, wall mounting bracket at top, mounting plate at bottom.
- Installation on unfinished wall, hole at top for hanging the HIU when installing cabinet provided by the customer on unfinished wall, mounting plate at bottom.
- ▶ Align template with spirit level [1] and attach to wall [2]. Observe the minimum clearances.
- ▶ Drill holes for wall mounting bracket [3] and mounting plate (accessory).

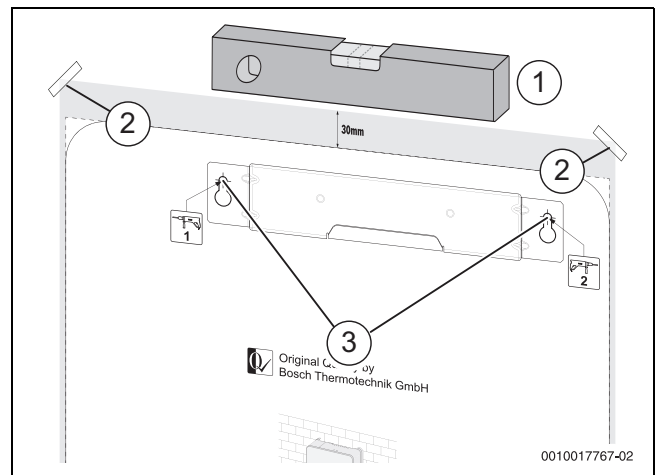


Fig. 16 Drilling template (wall mounting bracket at top), on finished walls

- ▶ Attach wall mounting bracket [1] securely to wall. Use appropriate screws [2] and anchors for this.

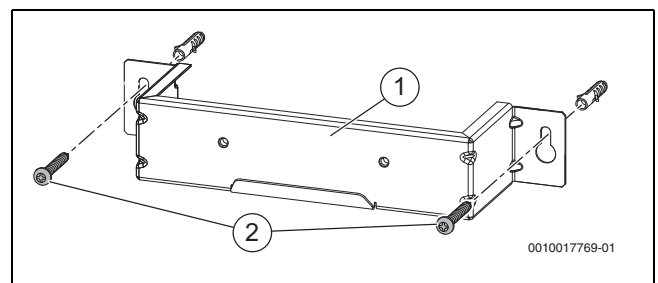


Fig. 17 Installing the wall mounting bracket

### 5.3 Installing the mounting plate (accessory)

The mounting plate makes it easier to connect the pipework to the HIU and is a necessary accessory.

- ▶ Attach mounting plate securely.
- ▶ Connect pipework to mounting plate.

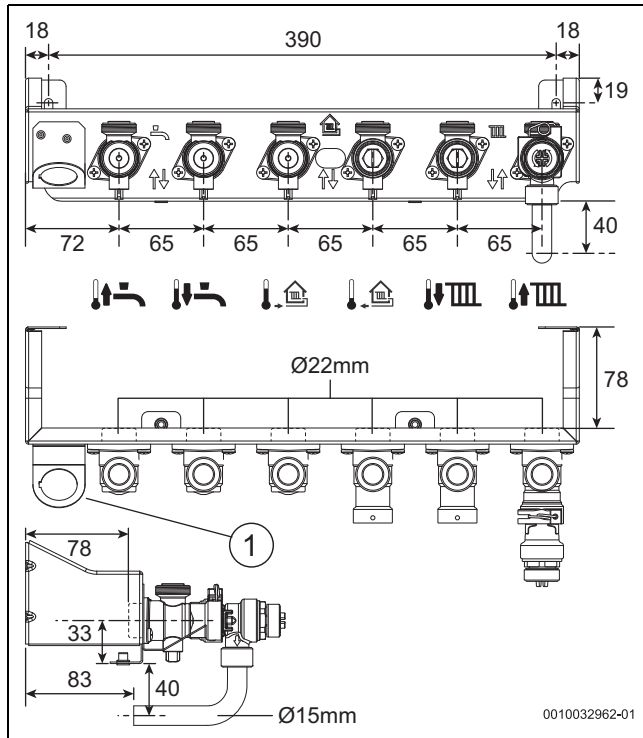


Fig. 18 Mounting plate, dimensions in mm

[1] Optional position for pressure gauge

- ▶ Mount connection elbow [1] on heating return connection.

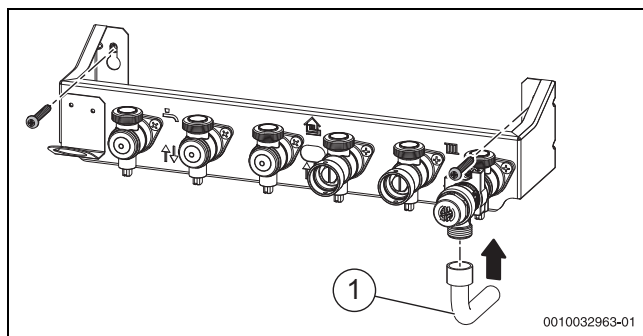


Fig. 19 Mounting connection elbow

### 5.4 Hanging the HIU

- ▶ Insert the enclosed gaskets before hanging the HIU. The blue gaskets [4] are for the potable water connections.
- ▶ Place the suspension point of the HIU [1] on the hook [3] of the wall mounting bracket [2].

- ▶ Tighten the connections [5].

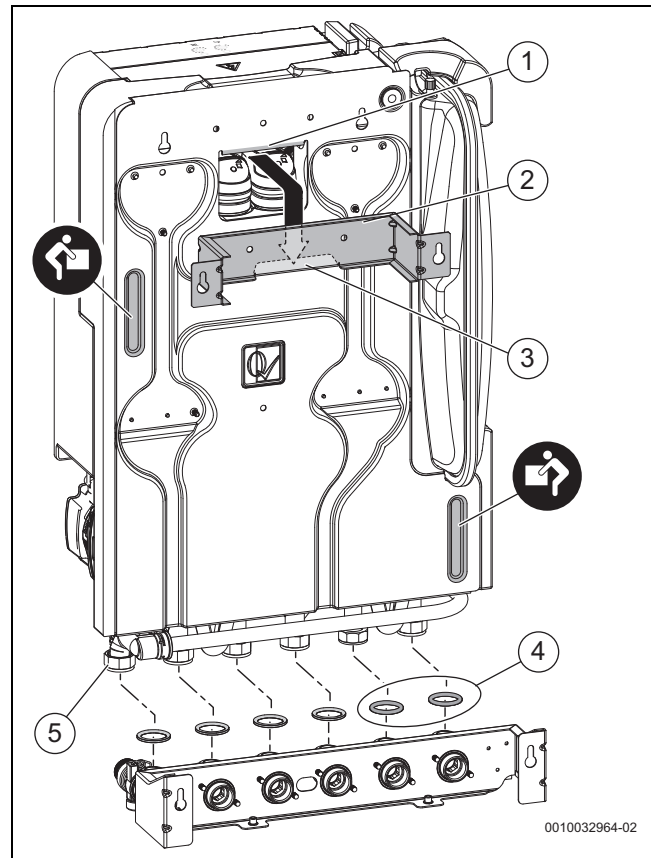


Fig. 20 Place the HIU on the wall mounting bracket

## 6 Electrical connection

**! WARNING**

**Danger to life from electric shock!**

Touching live electrical parts can cause an electric shock.

- ▶ Before installing accessories: Disconnect the power supply to the heat generator, building management system and any other BUS systems (all poles) and secure against unintentional reconnection.

You can also find information on safe electrical isolation in the Health and Safety Executive guidance HSG85 and in the GS38.

**NOTICE**

**Overload damage**

Never exceed the specified maximum power input (→ specifications).

- ▶ Install a standard all-pole isolator (to EN60335-1) to disconnect the mains voltage.

Electrical work may only be performed by electricians.

- ▶ Only connect to a single phase and earth system.
- ▶ Any system/appliances connected to the HIU must not have a separate power supply.
- ▶ Use a Type A residual current device if additional protection is required.

The module is prewired. All you need to do is connect the accessories (if applicable) and connect to the mains power supply.

**6.1 Opening the control unit**

To access the unit:

- ▶ Pull the unit [1] forwards and attach to the holder of the heat exchanger [2].

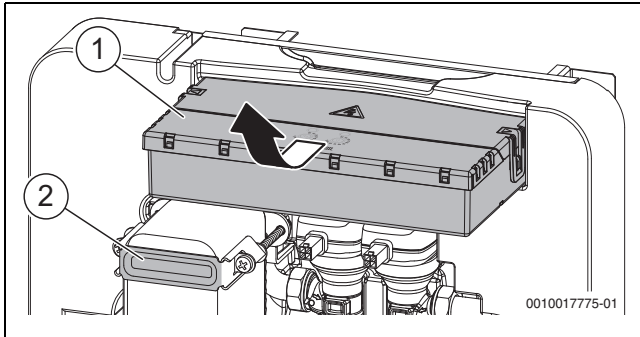


Fig. 21 Move the unit into the service position

- ▶ Release locking devices [4].
- ▶ Fold up cover [3].

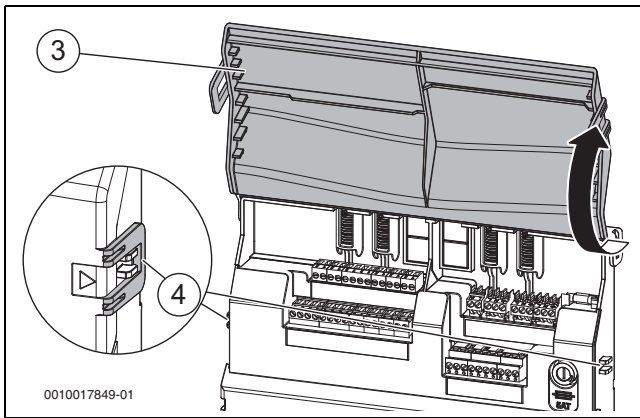


Fig. 22 Fold up cover

**6.2 Control unit terminals**

In this chapter, you will find an overview of the components that are connected at the factory and the components you need to connect yourself (→ chapter: specifications, wiring diagram).

The following chapters show how to establish the connection itself and secure the cable.

**Connections made to the control unit at the factory**

Connection	Function	Cables/wires
	Heating pump (only with HIU with integrated pump)	<ul style="list-style-type: none"> <li>• Phase (63, brown)</li> <li>• PEN conductor (N, blue)</li> <li>• Earthing (green/yellow)</li> </ul>
	Turbine, DHW flow rate	<ul style="list-style-type: none"> <li>• Red (4)</li> <li>• Yellow (2)</li> <li>• Black (1)</li> </ul>
	NTC temperature sensor, primary circuit	<ul style="list-style-type: none"> <li>• White (2)</li> <li>• White (1)</li> </ul>
	NTC temperature sensor DHW	<ul style="list-style-type: none"> <li>• Blue (2)</li> <li>• Blue (1)</li> </ul>
	Heating control valve	<ul style="list-style-type: none"> <li>• Brown (4)</li> <li>• Black (3)</li> <li>• White (2)</li> <li>• Yellow (1)</li> </ul>

Connection	Function	Cables/wires
	DHW control valve	<ul style="list-style-type: none"> <li>• Blue (4)</li> <li>• Green (3)</li> <li>• Grey (2)</li> <li>• Red (1)</li> </ul>
	Flow temperature sensor NTC, heating circuit	<ul style="list-style-type: none"> <li>• Yellow (2)</li> <li>• Yellow (1)</li> </ul>
	Return temperature sensor NTC, heating circuit	<ul style="list-style-type: none"> <li>• Green (2)</li> <li>• Green (1)</li> </ul>
	Electronic summer bypass	<ul style="list-style-type: none"> <li>• Jumper</li> </ul>

Table 6 Components connected to the control unit at the factory

**Accessory connections to be established on site (if available)**

Connection	Function	Cables/wires
	Temperature limiter, underfloor heating system	<ul style="list-style-type: none"> <li>• Volt free</li> </ul>
	External control modules 230 V (output)	<ul style="list-style-type: none"> <li>• Phase (L)</li> <li>• PEN conductor (N)</li> <li>• Earthing</li> </ul>
	Mains power supply to HIU (input)	<ul style="list-style-type: none"> <li>• Phase (L)</li> <li>• PEN conductor (N)</li> <li>• Earthing</li> </ul>
	External time and temperature control (e.g. 230 V room thermostat)	<ul style="list-style-type: none"> <li>• On-off switch (LR)</li> <li>• Phase (L)</li> <li>• PEN conductor (N)</li> <li>• Earthing</li> </ul>

Table 7 Accessory connections to 230 V mains voltage, if available

Connection	Function	Cables/wires
	BUS connection, Sense II room temperature-dependent controller	<ul style="list-style-type: none"> <li>• Not polarity sensitive</li> </ul>
	Outdoor ambient temperature sensor	<ul style="list-style-type: none"> <li>• Not polarity sensitive</li> </ul>

Table 8 Accessory connections to low voltage (signal cable), if available

**6.3 Examples: wiring the control unit**

The two examples below show which connections you can use to connect accessories to the control unit.

**Heating circuit with radiator**

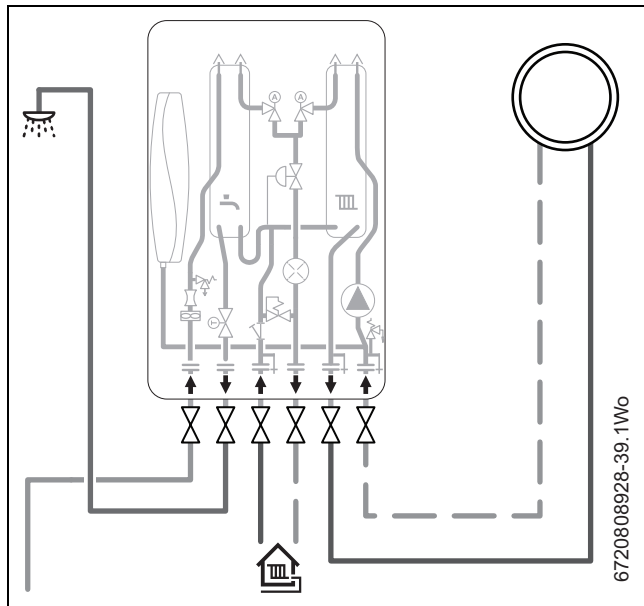


Fig. 23 Example - heating with radiators

Connection	Function
	Outdoor ambient temperature sensor
	BUS connection for Sense II room temperature-dependent controller

Table 9 Option 1: Sense II room controller connection

Connection	Function
	External time and temperature control (e.g. 230 V room thermostat)

Table 10 Option 2: 230 V programmable room thermostat

**Heating circuit without mixer with underfloor heating system**

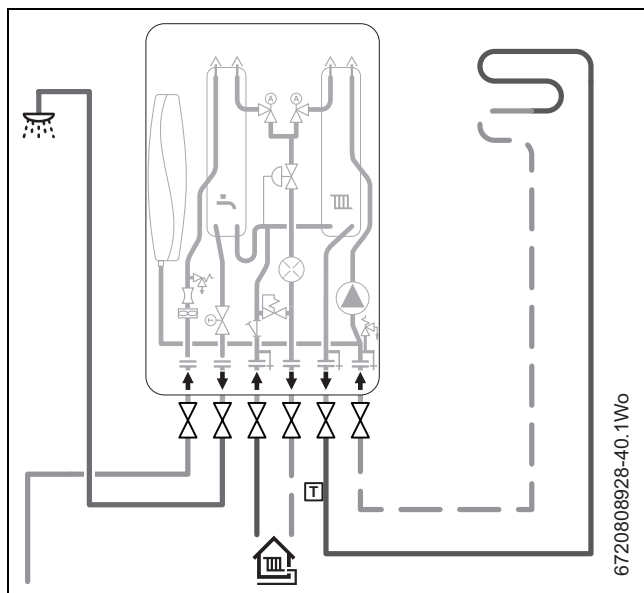


Fig. 24 Example - underfloor heating system

Connection	Function
	Outdoor ambient temperature sensor
	BUS connection for Sense II room temperature-dependent controller
	Temperature switch, underfloor heating system

Table 11 Option 1: Sense II room controller connection

Connection	Function
	Temperature switch, underfloor heating system
	External time and temperature control (e.g. 230 V room thermostat)

Table 12 Option 2: 230 V programmable room thermostat

**6.4 Cable preparations**

**! WARNING**

**Risk of fire due to damaged cables!**

Hot appliance parts in the HIU can damage the cables and cause fire.

- ▶ Do not route cables along hot appliance components.

**NOTICE**

**Damage to control unit!**

Small pieces of wire can cause shorts and damage to electronics.

- ▶ Make sure when stripping the cables that copper strands do not fall into the module.

- ▶ Strip the cable so that the earth conductor is longer than the other wires.

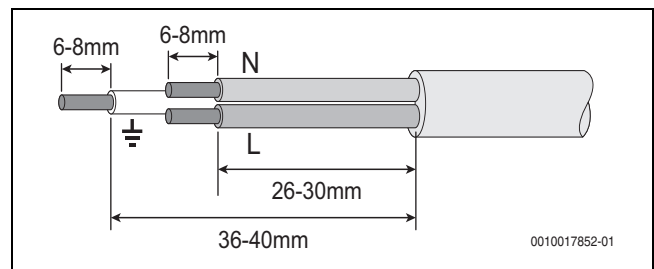


Fig. 25 Cable preparations (here: power cable)

**6.5 Connecting and securing the cable**

**i**

Each cable entering the control unit must pass through and be secured by a cable clamp.

To remove the cover [1]:

- ▶ Release locking devices [2] with a screwdriver.

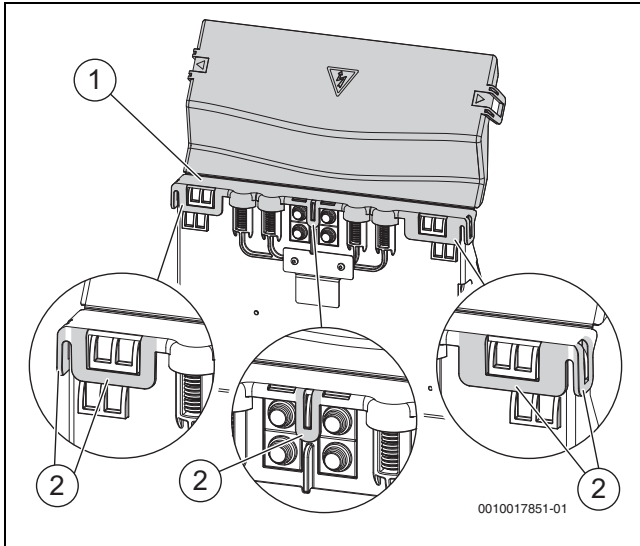


Fig. 26 Remove cover

- ▶ Undo locking screw [3].
- ▶ Feed the cable [4] through the cable clamp. Make sure that the cable is long enough to reach the connections.
- ▶ Fix cable with locking screw [3].
- ▶ Connect the cable to the terminals.

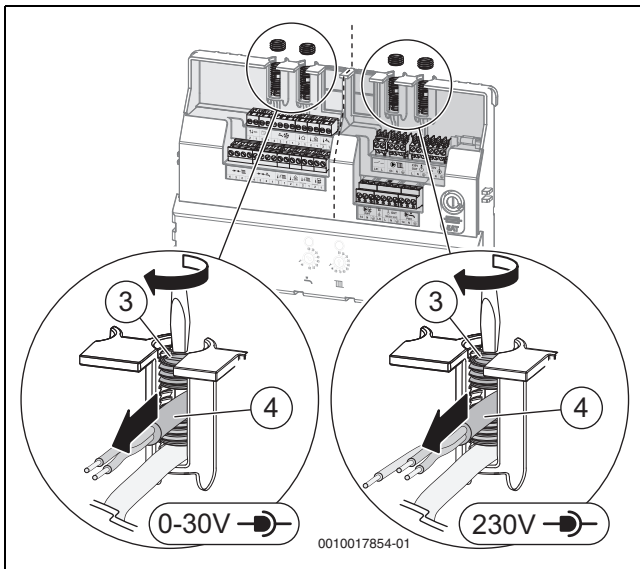


Fig. 27 Securing the cables

## 7 Commissioning



Make all electrical connections in accordance with the wiring diagram and then carry out the commissioning!

- ▶ Observe the installation instructions for all components and assemblies in the system.

### CAUTION

#### Risk of damage to system through pump failure!

- ▶ Fill and vent the system before switching it on so that the pumps do not run dry.

#### Procedure:

To commission the overall system, follow the sequence of steps below (described in the following chapters):

1. Fill flush and vent the system.
2. Adjust the control unit at the rotary selector
3. Adjust the heating circuit pump (if required).
4. Adjust the room control for the heat interface unit and the heating circuit (if room control is installed).
5. Fill out the commissioning checklist.

### 7.1 Filling, flushing and venting the system

#### Purging the primary circuit

- ▶ Refer to CIBSE CP1 for water quality requirements and to BSRIA BG29 for system flushing.

The primary circuit can be flushed without heat interface unit using the flushing kit which is available as an accessory.

- ▶ Close the shut-off valves on the primary side.
- ▶ Open the shut-off valve on the flushing kit to flush the pipework.
- ▶ Close the isolation valve once flushing is complete.

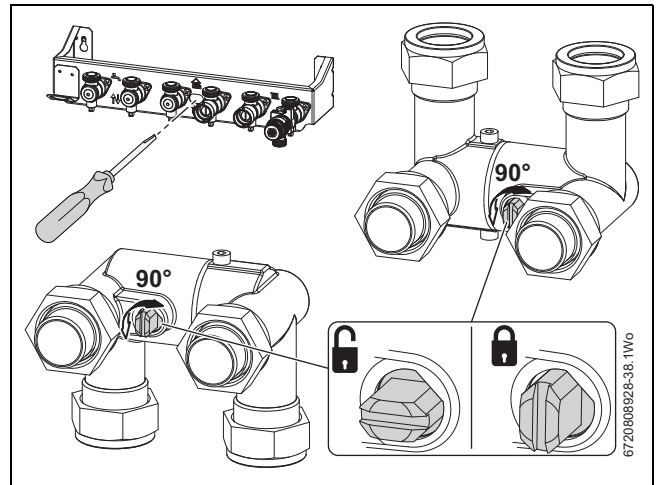


Fig. 28 Flushing kit shut-off valve (accessory)

#### Heat Interface Unit

### CAUTION

#### Failure of the flow turbine

- ▶ Open several DHW draw-off points to prevent the formation of compressed air pockets in the pipework.
- ▶ Carefully fill the system: slowly open the shut-off devices.
- ▶ To avoid water hammer: **slowly** open the shut-off valves at the cold water inlet and hot water outlet.
- ▶ Flush the system correctly.



- ▶ Clean strainer (→ chapter "Inspection and maintenance").
- ▶ Fill the system and check for tightness.
- ▶ Close the shut-off valves once the pressure gauge has reached between 1 and 1.5 bar.
- ▶ Switch on the power supply.
- ▶ Ensure the correct primary flow rates are available to the HIU (→ chapter Heat meter (Option)).

**i**  
Control valves: the valves can be fully opened via the service function . The valve is calibrated first and then after 10 seconds the valve is opened for 10 minutes. When the power supply is interrupted, the valves remain in position.

**i**  
When the air vent valves are opened, water may be discharged from the valves.  
▶ Collect discharging water with a vessel or cloth.

- To vent the DHW circuit:
- ▶ Open the water tap. Open the air vent valve on the DHW heat exchanger to allow air to escape.
- To vent the secondary circuit (heating circuit):
- ▶ Open the thermostatic valves to open the control valve.
  - ▶ Vent the radiators.
- To vent the heating circuit:

**i**  
If the heat meter is reading Error Code E7 the venting process needs to be repeated (→ page 16).

- ▶ Open both control valves with the service function . Open the air vent valve on the heating circuit heat exchanger to allow air to escape.
- ▶ Make sure that the air vents are fully closed after venting.

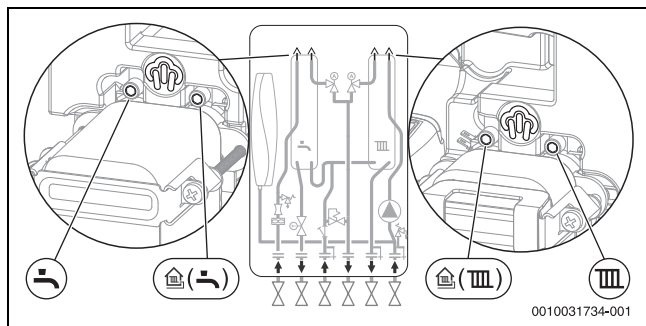


Fig. 29 Manual vent points

**Overall system**

**i**  
Air bound in the water is only released after a specific time as a result of pressure fluctuations as well as solution and degassing processes.  
▶ After 1-2 weeks, vent the system again and top up if required.

- ▶ Vent at every highest point in the system.

**7.2 Adjusting the control unit**

The LED On/Off indicators of the module are visible through the enclosure.

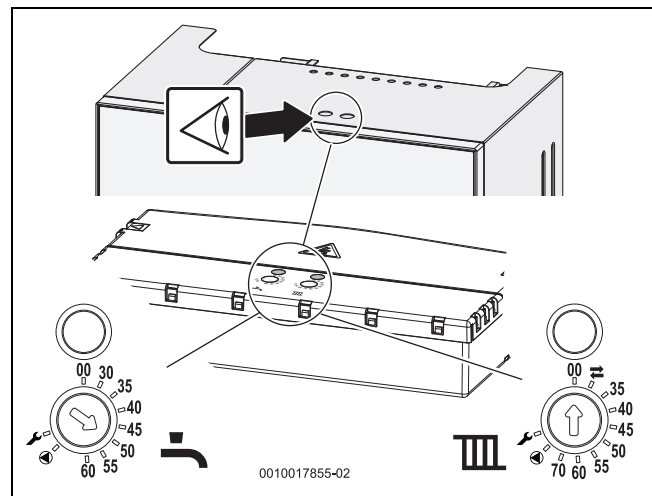


Fig. 30 LED On/Off indicators, rotary selectors on the control unit

**i**  
If different values are set at the control unit and the room controller (e.g. Sense II), the **lower** value is used for control.

**i**  
To set the required set DHW temperature, observe the DHW output. CIBSE CP1 recommends for the DHW temperature to be set at 50. (→ Specifications).

**control unit LED display**

- ▶ Set the required values at both rotary selectors.

	Description
LED red	→ Fault chapter
LED yellow	Rotary selector at 00 Rotary selector at 30 - 70: → Fault chapter
LED green	Normal mode with set value (30 - 70)
LED flashes red	Invalid position (bypass, DHW and circulation pump function, heating function deactivated)
LED flashes yellow	Heat interface unit starts
LED flashes green	Calibration or Service mode (  /  )
	Calibration and test mode of the control valve (once 10 seconds have elapsed, the valve is opened for 10 minutes).
	Service mode of DHW circulation pump
	Heating circuit without mixer. For the heating circuit without mixer the rotary selector <b>must</b> be at this position!
00	Function off
30 - 60 (35 - 70)	Setting the temperature

Table 13 LED displays and positions on rotary selectors

**i**  
Calibration of the control valves is **not** required during commissioning - only when a control valve fault is displayed (→ chapter "Faults").



**7.3 Control valve status indicators**

To be able to see the On/Off indicators of the control valves:  
 ▶ Remove the enclosure, insulation and control unit.



LED power-saving mode: if the position of the valves does not change for 15 seconds, the LED displays are not visible.

Indicators	Description
Orange, blue, green	Valve in start up mode. Calibration in progress.
Green	Valve is completely open.
Green and blue	Valve is open between 60 and 99,9 %.
Blue	Valve is open between 40 and 60 %.
Blue and orange	Valve is open between 0.1 and 40 %.
Orange	Valve is completely closed.

Table 14 Control valve status indicators

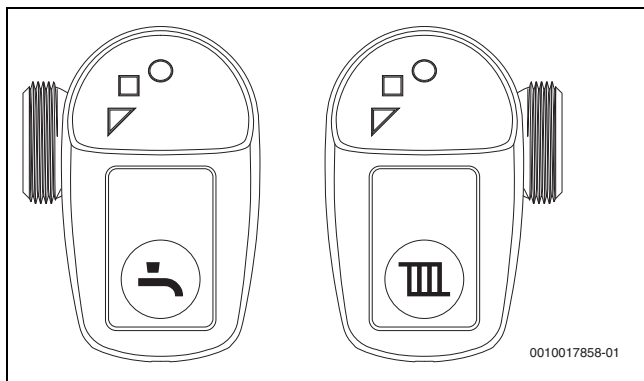


Fig. 31 Circle = green, square = blue, triangle = orange

**7.4 Setting the heating pump**

The heating circulation pump has five LED indicators.

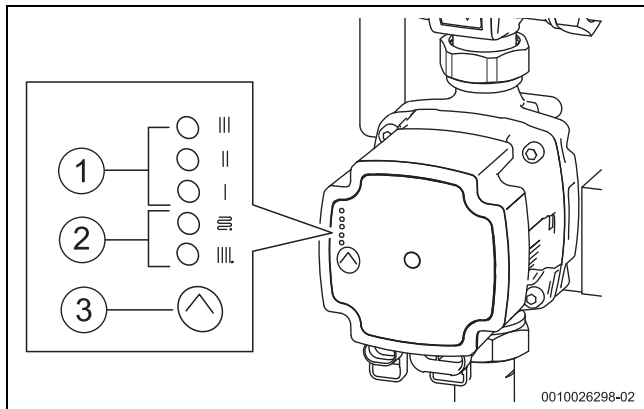


Fig. 32 Status displays of the integrated heating circulation pump

- [1] Yellow LED
- [2] Green LED
- [3] Selection button

**Available hydraulic pressure**

Default pump curve setting: PP3 (highest proportional pressure curve).

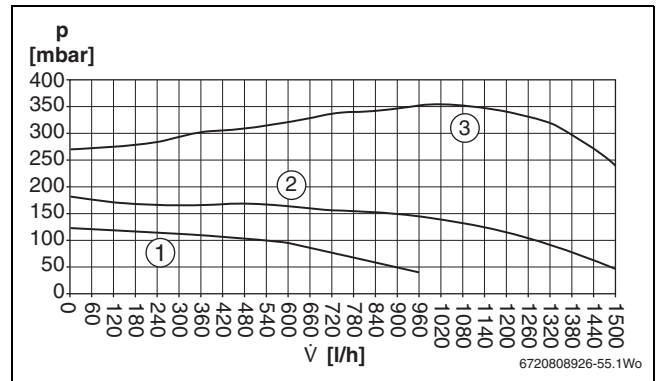


Fig. 33 Available hydraulic pressure

- [1] PP1: lowest proportional pressure curve
- [2] PP2: intermediate proportional pressure curve
- [3] PP3: highest proportional pressure curve

The head (pressure) falls as the heating load reduces and rises as the heating load increases.

**Settings**

Momentary presses of the selection button will cycle through the available pump curves. After 10 seconds of inactivity the selected setting will be activated.

- ▶ To change the setting press and hold the selection button for 2 seconds to enter setting mode.

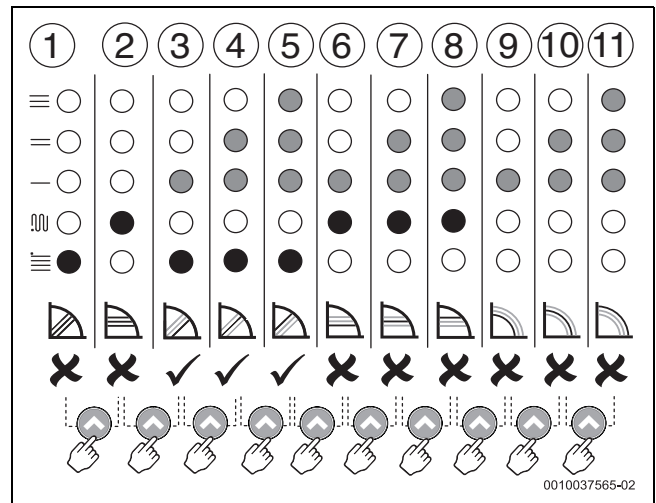


Fig. 34 Pump curve adjustment

- [1] Proportional pressure curve auto adapt
- [2] Constant pressure auto
- [3] Proportional pressure curve PP1
- [4] Proportional pressure curve PP2
- [5] Proportional pressure curve PP3 max
- [6] Constant pressure curve PP1
- [7] Constant pressure curve PP2
- [8] Constant pressure curve PP3 max
- [9] Constant curve CC1
- [10] Constant curve CC2
- [11] Constant curve CC3 max

### 7.5 Heat meter (Option)

The energy meter uses an ultrasonic flow sensor to record all billing-relevant data for measuring the energy consumed by heating and hot water. The data read out is displayed on different loops in the display.

**i** The seal on the energy meter **must not be damaged!** A damaged seal will result in immediate invalidation of the factory warranty and verification. The cables supplied with the meter must neither be shortened, extended nor changed in any other way.

**i** Legal regulations and operating instructions for the use of energy meters must be observed! The installation must only be carried out by a specialist energy meter installation and electrical company. The personnel must be trained in the installation and handling of energy meters and electrical devices as well as the applicable guidelines. Medium: Water, according to CEN/TR 16911. If water additives are used (e.g. corrosion protection), the user must make sure that the corrosion resistance is adequate.

**i** If the flow sensor is insulated with the pipeline, the calculator must be accessible.

#### Sensor

The connecting cables must not be shortened or extended!

#### Communication general

**i** Communication modules must be secured so that opening of meters is only possible by destroying the securing points (e.g. with locking varnish).

#### Communication via radio

The integrated radio function is for communication via 868 MHz or 434 MHz OMS/M-Bus (Open Metering System) and has the following specifications:

- The module transmits every 8 ... 256 s (send period max. 0.1 % of duty cycle (min. 8s); variable, depending on protocol length and programming).
- The communication always transfers the currently measured data.
- Transmission frequencies: 434 MHz, transmission power (EN 300 220-2 V3.2.1): 10mW e.r.p. 868 MHz, transmission power (EN 300 220-2 V3.2.1): 25mW e.r.p.
- Encrypted protocol: Real Data Radio or Open Metering Standard.
- Reading modes: Walk-By, Drive-By, Fixed-Network
- For problematic radio installations (shielding) the external wireless module set can also be used.

#### M-Bus Communication module

The wired M-Bus communication module is a serial interface for communication with external M-Bus monitoring devices and billing systems supporting connection via the M-Bus standard.

- The connection is not polarity-sensitive and is electrically isolated. M-Bus protocol standardised according to EN 1434;
  - 300 or 2400 baud (auto baud detect).
  - Connection for 2 x 2.5 mm<sup>2</sup>. Power consumption: One M-Bus load
- Connect the heat meter M-Bus cable and cable used to connect to the M-Bus compatible external equipment into the connector block [1] in the control unit.

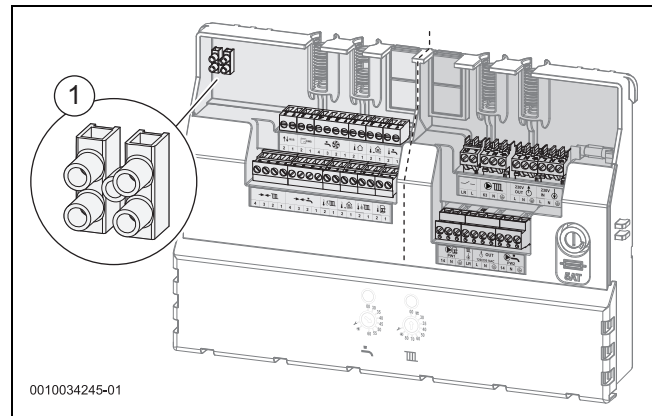


Fig. 35 M-Bus connection

#### Operation

Pressing the button awakens the meter from power saving mode and activates the display.

- Short button press (< 3 seconds): shift within one loop.
- Long button press (> 3 seconds): switches to the next loop.
- If the button is not pressed for more than 4 minutes, the controller switches off and switches to power save mode.

#### Display

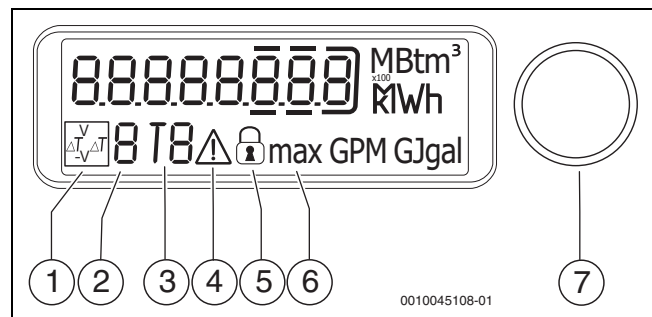


Fig. 36 Display

- [1] Quadrant display
- [2] Loop number
- [3] Tariff loop
- [4] Fault symbol
- [5] Calibrated value
- [6] Maximum value
- [7] Button

#### Menu structure - display sequences

The energy meter has 5 different display sequences (loops). The loops are labelled 1 to 5 in the display.

Window 1	
1.1	Accumulated energy
1.2	Volume
1.3	Accumulated cooling energy (only for cooling tariff)
1.4	Flow
1.5	Power
1.6	Flow/return flow temperature
1.7	Differential temperature
1.8	Operating days
1.9	Error status
1.10	Display test

Table 15 Loop 1- main loop

	Window 1	Window 2	Window 3
2.1	Accounting date 1 Date	Accounting date 1 Energy kWh	Accd 1 A
2.2	Accd. 1	Date of future accounting date 1	
2.3	Accounting date 1 previous year date	Accounting date 1 previous year energy	Accd 1L
2.4	Accounting date 2 date	Accounting date 2 energy	Accd 2A
2.5	Accd 2	Future accounting date	
2.6	Accounting date 2 previous year date	Accounting date 2 previous year energy	Accd 2L
2.7	Accounting date 1	Pulse input 1	Volume pulse input 1

Table 16 Loop 2 - Effective date

	Window 1	Window 2
3.1	Current date	Current time
3.2	Sec_Adr	Secondary address
3.3	Pri_Adr 1	Primary address 1
3.4	Pri_Adr 2	Primary address 2
3.5	Installation position (cold pipe/ return pipe as standard)	(depending on the setting)
3.6	Port 1	0 (no. of installed module in port 1)
3.7	Port 2	1 (no. of installed module in port 2)
3.8	Status of the integrated radio	
3.9	Software version	Check sum

Table 17 Loop 3- Information loop

	Window 1	Window 2	Window 3
4.1	Pulse input 1	Cumulative value pulse input 1	Value of pulse (L/P)
4.2	Pulse input 2	Cumulative value pulse input 2	Value of pulse (L/P)
4.3	Pulse output 1	Value of pulse (L/P)	
4.4	Pulse output 2	Value of pulse (L/P)	

Table 18 Loop 4- Pulse loop

	Window 1	Window 2	Window 3	Window 4
6.1	"LOG"	Date-1	Energy	Max. flow rate
6.2	"LOG"	Date-2	Energy	Max. flow rate
....				
6.24	"LOG"	Date-24	Energy	Max. flow rate

Table 19 Loop 6- Month loop

## 7.6 Commissioning checklist

► Complete and sign checklist following assembly and commissioning.

User:
System location:
Installer:
Heat interface unit type:

Table 20 General information on the system

Commissioning checklist	
Mains power supply compliant with standards?	<input type="checkbox"/>
<b>1. System hydraulics / primary circuit</b>	
Heating flushed, filled and checked for leaks?	<input type="checkbox"/>
Vented the system?	<input type="checkbox"/>
Differential pressure and volumetric flow rate of the central primary pump checked?	<input type="checkbox"/>
If fitted, has the flushing valve been closed?	<input type="checkbox"/>
Operating pressure in primary circuit measured?	____ bar
Central pressure-relief valve installed?	<input type="checkbox"/>
Strainer checked and cleaned?	<input type="checkbox"/>
<b>2. Heating / tertiary circuit</b>	
Heating system flushed, cleaned and vented?	<input type="checkbox"/>
Has power been left switched on to ensure the pump anti seize function can operate?	<input type="checkbox"/>
Have radiator flow rates been balanced?	<input type="checkbox"/>
Heating circuit with mixer: position of rotary selector?	_____
Underfloor heating system: overheating protection installed?	<input type="checkbox"/>
Setting of heating circuit pump checked?	<input type="checkbox"/>
Does lowering the room thermostat remove the demand for HTG?	<input type="checkbox"/>
Heating flow temperature (at HIU) measured?	____ °C
Heating return temperature (at HIU) measured?	____ °C
Have TRV's been mounted horizontally on radiators?	<input type="checkbox"/>
Record the return temperature limiter set point (default 50) if adjusted?	____ °C
Primary circuit flow temperature measured?	____ °C

Commissioning checklist	
Primary circuit average return temperature measured?	____ °C
Is the average return temperature 40 degrees or below?	____ °C
Volumetric flow rate of primary circuit? ▶ Record the average primary flow rate over a two minute period, during a DHW demand at the kitchen sink.	____ l/min
<b>3. DHW</b>	
Bypass valve installed? Yes/No	_____
Bypass valve setting?	_____
DHW circulation pump setting?	_____
Position of DHW rotary selector?	_____
Cold water temperature at inlet measured?	____ °C
DHW temperature at outlet measured?	____ °C
DHW volumetric flow rate measured? ▶ Make sure that the required volumetric flow rate and temperature increase is achieved for each outlet.	____ l/min
Primary circuit average return temperature measured?	____ °C
Volumetric flow rate of primary circuit?	____ l/min

Table 21 Commissioning checklist

Signature of operator:
Signature of installer:
Other:
Date:

Table 22

## 8 Shutdown

### NOTICE

#### Damage due to freezing!

- ▶ Leave the heating system switched on if there is a risk of frost.

If the heating system is decommissioned for a longer period:

- ▶ Interrupt the power supply to the HIU.
- ▶ When there is a risk of frost and the HIU is decommissioned, completely drain it on the heating and on the potable water side.

## 9 Environment/disposal

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

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

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

### Packaging

Where packaging is concerned, we participate in country-specific recycling processes that ensure optimum recycling.

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

### Used appliances

Used appliances contain valuable materials that can be recycled.

The various assemblies can be easily dismantled. Synthetic materials are marked accordingly. Assemblies can therefore be sorted by composition and passed on for recycling or disposal.

### Old electrical and electronic appliances



This symbol means that the product must not be disposed of with other waste, and instead must be taken to the waste collection points for treatment, collection, recycling and disposal.

The symbol is valid in countries where waste electrical and electronic equipment regulations apply, e.g. "(UK) Waste Electrical and Electronic Equipment Regulations 2013 (as amended)". These regulations define the framework for the return and recycling of old electronic appliances that apply in each country.

As electronic devices may contain hazardous substances, it needs to be recycled responsibly in order to minimize any potential harm to the environment and human health. Furthermore, recycling of electronic scrap helps preserve natural resources.

For additional information on the environmentally compatible disposal of old electrical and electronic appliances, please contact the relevant local authorities, your household waste disposal service or the retailer where you purchased the product.

You can find more information here:

[www.weee.bosch-thermotechnology.com/](http://www.weee.bosch-thermotechnology.com/)

**10 Inspection and service**



**WARNING**

**Risk to life from electric shock!**

Touching live electrical parts can cause an electric shock.

- ▶ Before working on electrical parts, disconnect all phases of the power supply (fuse/circuit breaker) and lock the isolator switch to prevent unintentional reconnection.

**10.1 Inspection and maintenance report**



To safeguard the functional reliability of the system and the validity of guarantee claims:

- ▶ Check the system every 3 years (inspection). Immediately remedy all faults (maintenance).
- ▶ Observe instructions for the components!
- ▶ Perform the tasks listed below.

- ▶ Use the table as a template for further documentation.

User:	System location:
Heat interface unit type:	Room controller (if installed):

Table 23 General information on the system

Inspection and maintenance work	Inspection/maintenance					
	1.	2.	3.	4.	5.	6.
<b>Date:</b>						
Average return temperature on primary side	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C
Secondary heating Δ T	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C
Flow temperature on primary side with DHW draw-off	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C
Return temperature on primary side with DHW draw-off	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C
Primary circuit: volumetric flow rate with DHW draw-off (measure or read off at heat meter)	_____ l/h	_____ l/h	_____ l/h	_____ l/h	_____ l/h	_____ l/h
Potable Hot Water outlet temperature	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C
Potable hot water flow rate	_____ l/min	_____ l/min	_____ l/min	_____ l/min	_____ l/min	_____ l/min
Filter checked/cleaned?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visual inspection and function check carried out?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Setting/time at DHW circulation pump checked (if installed)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:						
Company stamp / date / signature						

Table 24 Inspection and maintenance work

## 10.2 Cleaning the primary strainer

### Draining the appliance

To drain the primary circuit and the heating system:

- ▶ Disconnect heat interface unit with shut-off valves from the primary circuit and the heating system.
- ▶ Connect hose [3] to the drain valve.

To drain the heat interface unit:

- ▶ Open the air vents at the top of the desired circuit.
- ▶ Close the air vents again after draining!
- ▶ Turn the drain valve [1] anti-clockwise to open [2].

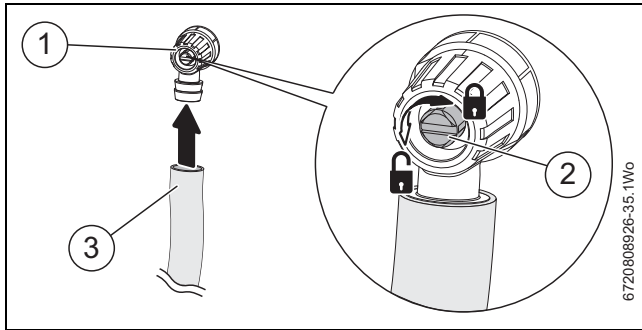


Fig. 37 Drain point connection

### Remove the strainer in the primary circuit

- ▶ Remove the drainage assembly from the connection [2].
- ▶ Replace the gasket [3] if required.
- ▶ Clean the strainer [1].

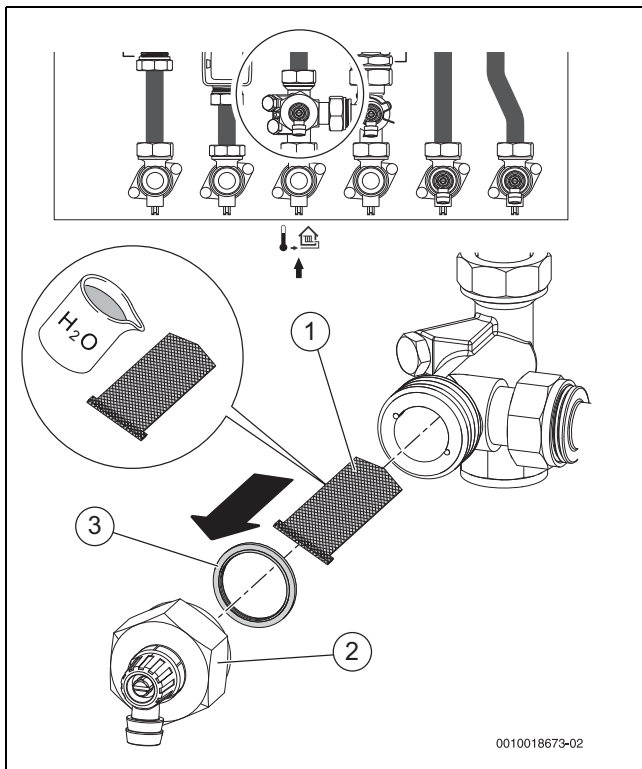


Fig. 38 Remove and clean the strainer

## 10.3 Replacing components

### Draining the appliance

To drain the primary circuit and the heating system:

- ▶ Disconnect heat interface unit with shut-off valves from the primary circuit and the heating system.
- ▶ Connect hose [3] to the drain valve.

To drain the heat interface unit:

- ▶ Open the air vents at the top of the desired circuit.

- ▶ Close the air vents again after draining!
- ▶ Turn the drain valve [1] anti-clockwise to open [2].

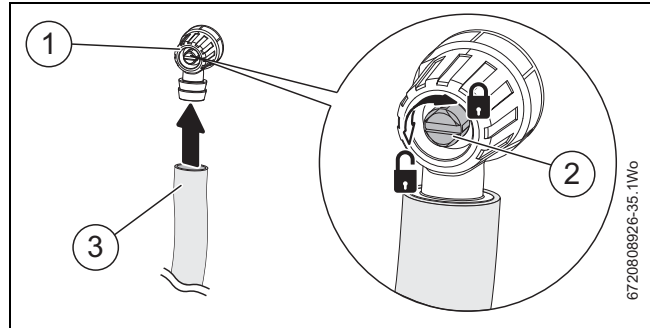


Fig. 39 Drain point connection

To drain the domestic water system:

- ▶ Isolate the cold mains inlet isolation valve.
- ▶ Drain the domestic water system.

### Heat exchanger

#### NOTICE

#### Material damage and leaks due to incorrect installation!

If the retention bracket is loosened or tightened unevenly this could cause damage and leaks.

- ▶ Loosen or tighten the screws on the retention brackets evenly.
- ▶ Drain the HIU completely.
- ▶ Loosen the screws on the retention brackets [2] evenly.
- ▶ Pull the retention brackets off the heat exchanger [1].
- ▶ Replace the gaskets [3] of the connecting plates [4, 5] if required.
- ▶ Install the new heat exchanger so the arrow points towards the centre of the appliance.
- ▶ Purge the system correctly and check for leaks.
- ▶ Vent water circuits sufficiently (follow the procedure set out in the commissioning instructions).

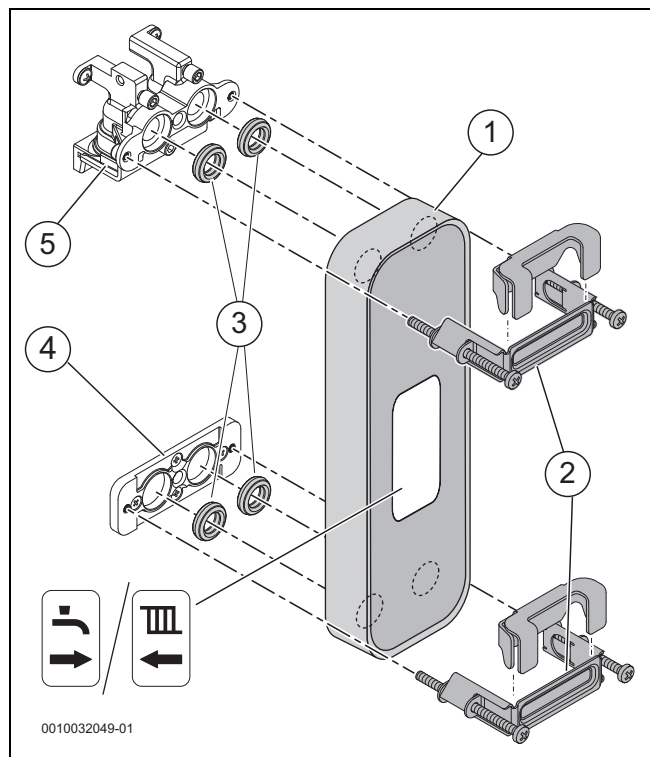


Fig. 40 Removing the heat exchanger



**Control valves**

- ▶ Drain the HIU completely.
- ▶ Unplug the connecting lead [2] from the control valve [1].
- ▶ Undo screw fittings [3] and remove control valve.
- ▶ Install new parts.
- ▶ Purge the system correctly and check tightness.
- ▶ Vent water circuits sufficiently.

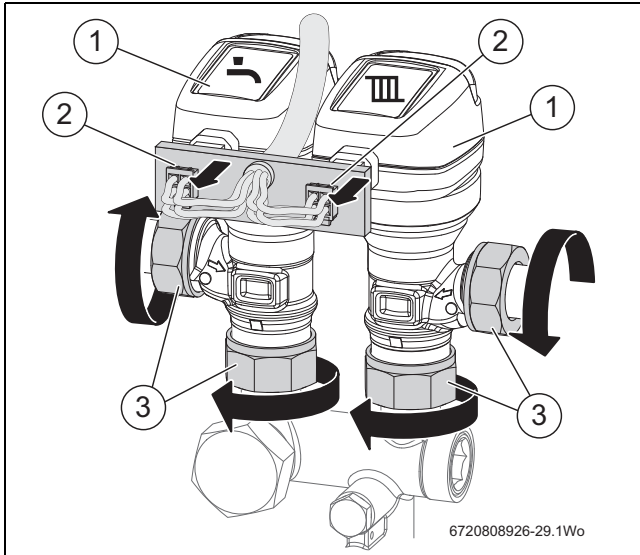


Fig. 41 Control valves

**Heating system circulation pump**

**WARNING**

**Risk to life from electric shock!**

Touching live electrical parts can cause an electric shock.

- ▶ Before working on electrical parts, disconnect all phases of the power supply (fuse/circuit breaker) and lock the isolator switch to prevent unintentional reconnection.

- ▶ Drain the HIU completely.
- ▶ Unplug connecting lead from the heating pump [1]. Use a screwdriver if required.
- ▶ Undo screw fittings [2] remove heating pump [1].
- ▶ Install new gaskets if required.
- ▶ Purge the system correctly and check tightness.
- ▶ Vent water circuits sufficiently.

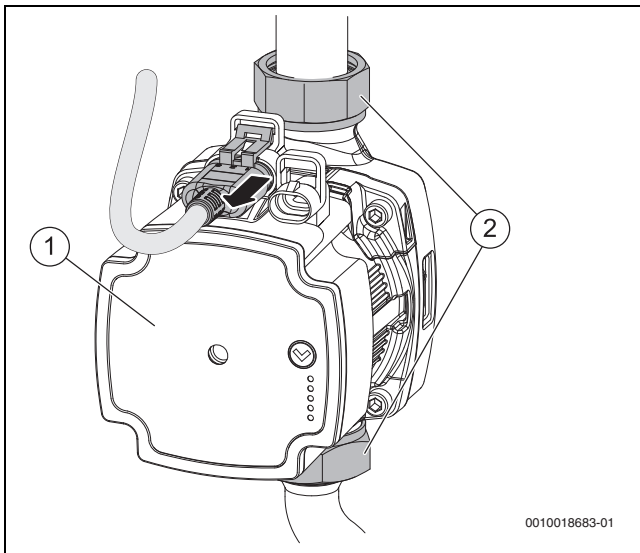


Fig. 42 Heating system circulation pump

**NTC-WW sensor and thermal overload protection (accessory)**

- ▶ Drain DHW circuit completely.
- ▶ To replace the sensor: unplug the connecting lead from the sensor [1].
- ▶ Remove the retaining spring [3] and pull off the sensor.

**WARNING**

**Risk of scalding**

The thermal overload protection only works if it is correctly installed.

- ▶ Install the thermal overload protection so the arrow on the appliance points in the flow direction.

- ▶ To replace the thermal overload protection: undo the screw fittings [2] and remove the thermal overload protection.
- ▶ Purge the system correctly and check tightness.
- ▶ Vent water circuits sufficiently.

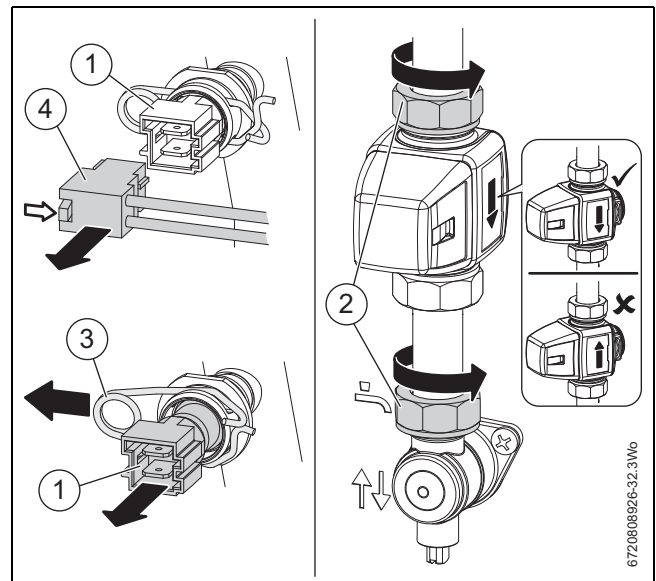


Fig. 43 DHW temperature sensor and thermal overload protection

**Thermal bypass (accessory)**

- ▶ Drain the HIU completely.
- ▶ Remove spring clip [2].
- ▶ Undo screw fittings [1] and remove bypass [3].
- ▶ Install new part.
- ▶ Purge the system correctly and check tightness.
- ▶ Vent water circuits sufficiently.

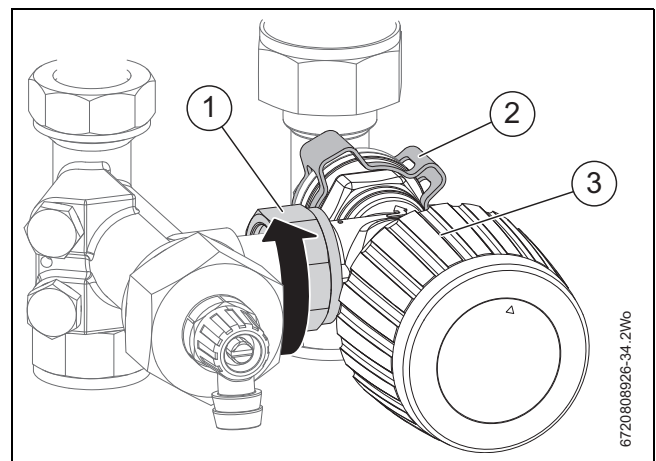


Fig. 44 Thermal bypass

Position	°C	Position	°C	Position	°C
	10	3	40	6	60
1	20	4	45	7	65
2	30	5	50	8	70

Table 25 Bypass valve positions

**Heat meter**

- ▶ Drain the HIU completely.
- ▶ Remove the connected sensor (primary circuit flow).
- 1. Remove the front cover by pulling forward.
- 2. Detach heat meter upwards from the holder.
- 3. Detach the holder from backstage insulation.
- 4. Unscrew connections.
- ▶ Use the new gaskets.

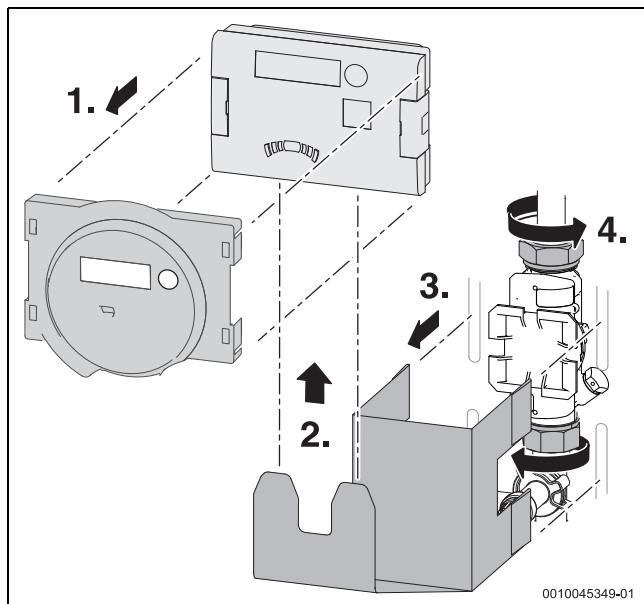


Fig. 45 Heat meter removal

**Expansion Vessel**

- ▶ Drain the HIU completely.
- ▶ Retract the securing clip [3] on the expansion vessel connection.
- ▶ Unscrew the screw [1] on the holder.
- ▶ Ease forward and then lift up the expansion vessel [2] out of the connector and foam insulation.

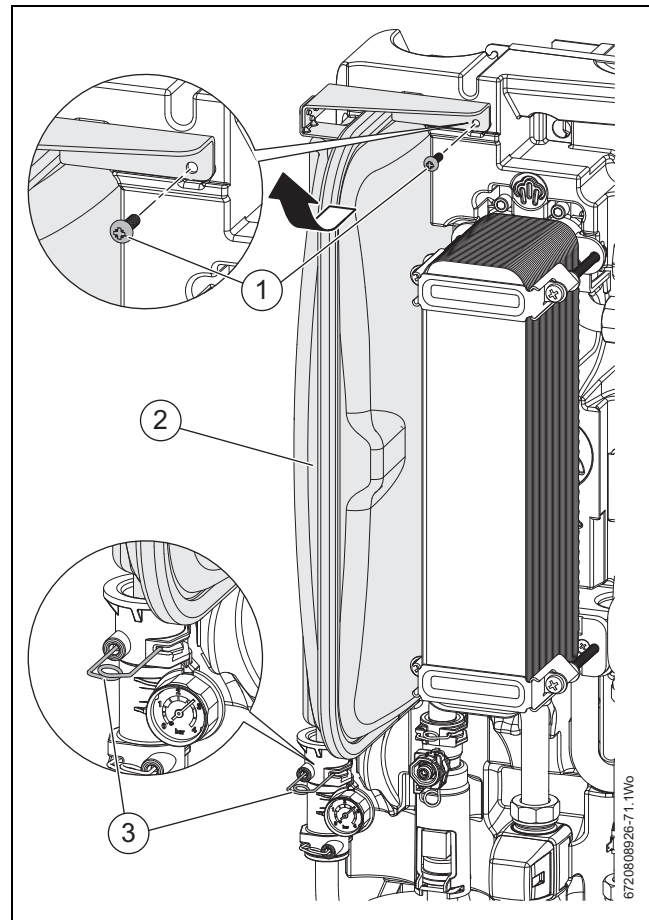


Fig. 46 Expansion vessel removal

**Flow turbine, flow limiter**

- ▶ Drain DHW circuit completely.
- ▶ Unplug the connecting lead from the turbine.
- ▶ Undo screw fittings [5].
- ▶ Remove clip [1] and pull off pipe [4].
- ▶ Remove strainer [3], clean thoroughly and re-install.
- ▶ Take flow turbine and limiter out of the enclosure [2].
- ▶ Take flow turbine [8] out of the flow regulator housing [7] and remove from the flow limiter [6].
- ▶ Apply silicone lubricant to the seals to ease assembly.
- ▶ Purge the system correctly and check for leaks.

- ▶ Vent water circuits sufficiently.

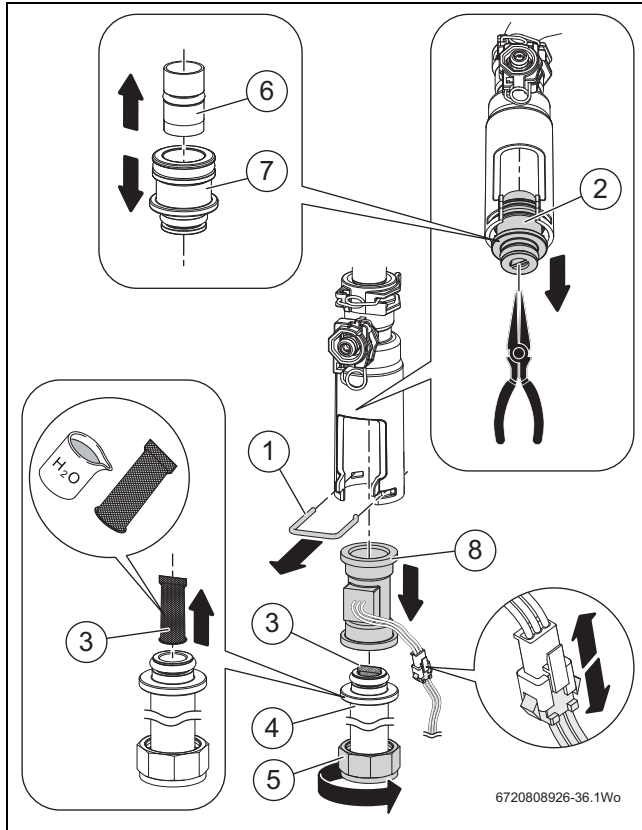


Fig. 47 Flow limiter and flow turbine (flow rate 35 kW: 14 l/min, bottom pink / 50 kW: 21 l/min, bottom red)

**Control unit**

**⚠ DANGER**

**Risk to life from electric current!**

- ▶ Prior to all electrical installation work, isolate all poles of the power supply and secure against unintentional reconnection.
- ▶ Pull control unit [1] out of the insulation and hang on the retention bracket of the heat exchanger [2] by the hook on the rear.
- ▶ Release locking devices [4, 6] with a thin bladed screwdriver.
- ▶ Open the cover [3].

- ▶ Release the locking devices [5] to remove the cover.

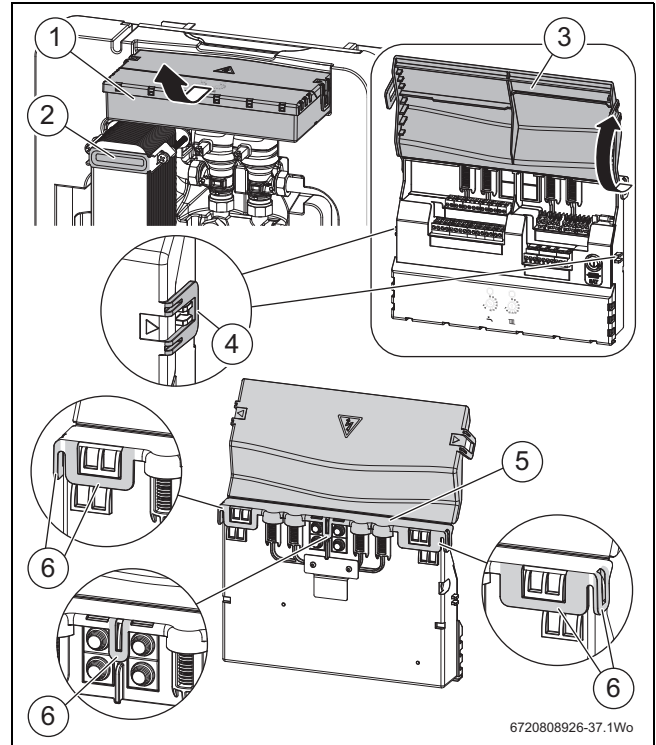


Fig. 48 control unit

- ▶ Unplug connections from the module.
- ▶ Remove cable and strain reliefs.

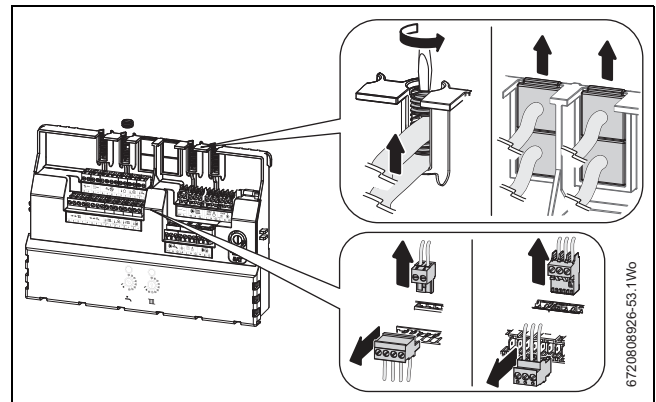


Fig. 49 control unit - unplug connections and release strain reliefs

**11 Troubleshooting**

**11.1 Central Heating trouble shooting guide**

Problem	Possible cause	Possibly solution/check
No heat output from HIU	Air in the heating system	<ul style="list-style-type: none"> <li>▶ Vent the heating system fully at the radiator manual air vents.</li> <li>▶ Vent the HIU fully at the manual air vents. Ensure system pressure is between 1 - 2 bar.</li> </ul>
	Central Heating pump faulty	<ul style="list-style-type: none"> <li>▶ Check that there is power to the pump → section 7.1 for instructions on venting the appliance.</li> <li>▶ Replace pump if necessary.</li> </ul>
	Pump setting set too low	▶ Adjust pump to correct setting. → section 7.4.
	District Heating strainer blocked	▶ Clean strainer
	Faulty Central Heating flow sensor	▶ Replace sensor
	Faulty Central Heating return sensor	▶ Replace sensor
	HIU room controller incorrectly set or faulty	<ul style="list-style-type: none"> <li>▶ Ensure that the flow temperature set-point is set correctly on the HIU room controller. → section 7.2.</li> <li>▶ Replace room controller if necessary.</li> </ul>

Problem	Possible cause	Possibly solution/check
	Room controller incorrectly set or faulty	<ul style="list-style-type: none"> <li>▶ Check that room controller is set correctly and is calling for heat.</li> <li>▶ Replace room controller if necessary.</li> </ul>
	Faulty Central Heating control valve or dirt inside valve body causing low flow or no flow through District supply circuit	<ul style="list-style-type: none"> <li>▶ Check that control valve is functioning correctly, → section 7.3.</li> <li>▶ Perform re-calibration of control valve, → section 7.2.</li> <li>▶ Open control valve manually using CH rotary switch on HIU control unit, → section 7.2.</li> <li>▶ Clean valve if necessary.</li> <li>▶ Replace control valve if necessary.</li> </ul>
	District supply temperature too low	▶ Check that the district supply temperature is correct for the required heat output.
	District flow rate is too low	▶ Check that the district flow rate is correct for the required heat output.
	District supply differential pressure is too low	<ul style="list-style-type: none"> <li>▶ Check that the supply differential pressure is correct for the required heat output.</li> <li>▶ Adjust any installed flow regulating valves at the heat interface unit to obtain the correct differential pressure.</li> <li>▶ Increase the supply differential pressure on the system.</li> </ul>
	Central Heating flow temperature too low	<ul style="list-style-type: none"> <li>▶ HIU control unit incorrectly set or faulty                             <ul style="list-style-type: none"> <li>▶ Adjust HIU control unit, → section 7.2.</li> <li>▶ Replace if necessary.</li> </ul> </li> <li>▶ Room controller incorrectly set or faulty                             <ul style="list-style-type: none"> <li>▶ Adjust room controller.</li> <li>▶ Replace if necessary.</li> </ul> </li> <li>▶ Outdoor sensor positioned incorrectly                             <ul style="list-style-type: none"> <li>▶ Position outdoor sensor correctly.</li> </ul> </li> <li>▶ District supply temperature too low                             <ul style="list-style-type: none"> <li>▶ Check that the District supply temperature is correct for the required heat output.</li> </ul> </li> <li>▶ District flow rate is too low                             <ul style="list-style-type: none"> <li>▶ Check that the District flow rate is correct for the required heat output.</li> </ul> </li> <li>▶ District supply differential pressure is too low                             <ul style="list-style-type: none"> <li>▶ Check that the supply differential pressure is correct for the required heat output.</li> <li>▶ Adjust any installed flow regulating valves at the heat interface unit to obtain the correct differential pressure.</li> <li>▶ Increase the supply differential pressure on the system.</li> </ul> </li> </ul>
Central Heating flow temperature too high	HIU control unit incorrectly set or faulty	<ul style="list-style-type: none"> <li>▶ Adjust HIU control unit. Ensure that the flow temperature set-point is set correctly on the HIU room controller, → section 7.2.</li> <li>▶ Replace if necessary.</li> </ul>
	Room controller incorrectly set or faulty	<ul style="list-style-type: none"> <li>▶ Adjust room controller. Ensure that the flow temperature set-point is set correctly on the HIU controller, → section 7.2.</li> <li>▶ Replace if necessary.</li> </ul>
	Central heating flow sensor out of position or faulty	<ul style="list-style-type: none"> <li>▶ Ensure sensor is in correct position.</li> <li>▶ Replace sensor</li> </ul>
	Faulty central heating control valve or dirt inside valve body causing valve to seize.	<ul style="list-style-type: none"> <li>▶ Check that control valve is functioning correctly, → section 7.3.</li> <li>▶ Perform re-calibration of control valve, → section 7.2.</li> <li>▶ Open control valve manually using CH rotary switch on HIU control unit, → section 7.2.</li> <li>▶ Clean valve if necessary.</li> <li>▶ Replace control valve if necessary</li> </ul>

Table 26 Central Heating trouble shooting

### 11.2 Domestic Hot Water trouble shooting guide

Problem	Possible cause	Possibly solution/check
No hot water output from HIU	Potable cold water inlet strainer blocked	<ul style="list-style-type: none"> <li>▶ Ensure minimum inlet water pressure is 1.5-2 bar.</li> <li>▶ Clean strainer.</li> </ul>
	Inlet water pressure too low	<ul style="list-style-type: none"> <li>▶ Increase domestic cold water supply pressure into HIU by consulting the water supply company.</li> <li>▶ Clean plate heat exchanger if there are signs of calcification.</li> </ul>
	DHW over temperature safety valve has closed due to a seized DHW control valve	<ul style="list-style-type: none"> <li>▶ Check that control valve is functioning correctly, → section 7.3.</li> <li>▶ Perform re-calibration of control valve, → section 7.2.</li> <li>▶ Open control valve manually using DHW rotary switch on HIU control unit, → section 7.2.</li> <li>▶ Clean valve if necessary.</li> <li>▶ Replace control valve if necessary.</li> </ul>
Hot Water flow temperature too low	HIU control unit incorrectly set or faulty	<ul style="list-style-type: none"> <li>▶ Ensure that the DHW temperature set-point is set correctly on the HIU controller, → section 7.2.</li> <li>▶ Replace control unit if necessary.</li> </ul>
	DHW flow turbine faulty	<ul style="list-style-type: none"> <li>▶ Check electrical connections to flow turbine.</li> <li>▶ Replace if necessary</li> </ul>

Problem	Possible cause	Possibly solution/check
	Faulty DHW control valve or dirt inside valve body causing low flow or no flow though district supply circuit	<ul style="list-style-type: none"> <li>▶ Check that control valve is functioning correctly, → section 7.3.</li> <li>▶ Perform re-calibration of control valve, → section 7.2.</li> <li>▶ Open control valve manually using DHW rotary switch on HIU room controller, → section 7.2.</li> <li>▶ Clean valve if necessary.</li> <li>▶ Replace control valve if necessary.</li> </ul>
	District supply temperature too low	▶ Check that the District supply temperature is correct for the required heat output, → section 13.3 "Domestic Hot Water performance chart".
	District flow rate is too low	▶ Check that the District flow rate is correct for the required heat output, → section 13.3 "Domestic Hot Water performance chart".
	District supply differential pressure is too low	<ul style="list-style-type: none"> <li>▶ Check that the supply differential pressure is correct for the required heat output, → section 13.3 "Domestic Hot Water performance chart".</li> <li>▶ Adjust any installed flow regulating valves at the heat interface unit to obtain the correct differential pressure.</li> <li>▶ Increase the supply differential pressure on the system.</li> </ul>
	Calcified plate DHW heat exchanger	<ul style="list-style-type: none"> <li>▶ Check heat exchanger.</li> <li>▶ Replace heat exchanger.</li> </ul>
	Cross leaking DHW plate heat exchanger	▶ Replace heat exchanger.
DHW temperature too high at the tap	HIU control unit incorrectly set or faulty	<ul style="list-style-type: none"> <li>▶ Ensure that the DHW temperature set-point is set correctly on the HIU room controller, → section 7.2.</li> <li>▶ Replace if necessary</li> </ul>
Time taken to get hot water at the tap is too long	Mechanical by-pass valve has dirt inside valve body	▶ Clean valve if necessary.
	Mechanical by-pass valve is set incorrectly, or is faulty	<ul style="list-style-type: none"> <li>▶ Adjust by-pass valve.</li> <li>▶ Replace if necessary</li> </ul>
	Electronic keep warm function	<ul style="list-style-type: none"> <li>▶ Adjust by-pass valve.</li> <li>▶ Replace if necessary</li> </ul>
	Faulty DHW control valve or dirt inside valve body causing low flow or no flow though district supply circuit	<ul style="list-style-type: none"> <li>▶ Check that control valve is functioning correctly, → section 7.3.</li> <li>▶ Perform re-calibration of control valve, → section 7.2.</li> <li>▶ Open control valve manually using DHW rotary switch on HIU control unit, → section 7.2.</li> <li>▶ Clean valve if necessary.</li> <li>▶ Replace control valve if necessary.</li> </ul>
	District supply temperature too low	▶ Check that the District supply temperature is correct for the required heat output, → section 13.3 "Domestic Hot Water performance chart".
	District flow rate is too low	▶ Check that the District flow rate is correct for the required heat output, → section 13.3 "Domestic Hot Water performance chart".
	District supply differential pressure is too low	<ul style="list-style-type: none"> <li>▶ Check that the supply differential pressure is correct for the required heat output, → section 13.3 "Domestic Hot Water performance chart".</li> <li>▶ Adjust any intalled flow regulating valves at the heat interface unit to obtain the correct differential pressure.</li> <li>▶ Increase the supply differential pressure on the system.</li> </ul>
DHW over temperature safety valve closed	DHW control valve stuck in open position	<ul style="list-style-type: none"> <li>▶ Check that control valve is functioning correctly, → section 7.3.</li> <li>▶ Perform re-calibration of control valve, → section 7.2.</li> <li>▶ Open control valve manually using DHW rotary switch on HIU control unit, → section 7.2.</li> <li>▶ Replace control valve if necessary.</li> </ul>
	Faulty DHW over temperature safety valve	▶ Replace DHW over temperature safety valve.
	Cross leaking DHW plate heat exchanger	▶ Replace DHW plate heat exchanger.
Bypass temperature higher than 41°C (+ 5 K)	Wrong setting point by room controller Bypass temperature higher than 41°C (+ 5 K)	▶ Use the room controller and reset the temperature setting to 41°C (default value) and/ or choose "off" for the bypass function.

Table 27 Domestic Hot Water trouble shooting



### 11.3 LED displays at the control unit

Left LED	Right LED	Cause	Conclusions
Off	Off	Outdoor temperature sensor error	No set value has been specified for weather-compensated control. The heating function is not detecting a heating load.
--	Red	Heating flow temperature sensor fault	Heating and frost protection functions are disabled
--	Red	If the HIU detects a heating module, a low loss header must be installed and its temperature sent to the HIU.	Heating function is deactivated.
--	Red	PWM signal indicates a heating control valve fault	Heating and frost protection functions are disabled
Red	--	DHW volumetric flow rate sensor fault	DHW and DHW circulation pump functions are disabled.
Red	--	Supply flow temperature sensor error	Bypass, DHW and DHW circulation pump functions are disabled.
Red	--	PWM signal indicates a DHW control valve fault	By-pass, DHW and circulation pump functions are disabled
--	Yellow	Supply return temperature sensor error	Return temperature limit function is not working.
Yellow	Yellow	Flow temperature on primary side is lower than heating or set DHW temperatures	Fault only detected, HIU will keep on trying to supply heat.
Red	Red	Flow temperature on primary side higher than allowed (95°C)	Control valves will be kept closed and so no function except heating pump operation can be executed.
--	Flashes red	Invalid position of the heating rotary selector	Heating function is deactivated.
Flashes red	--	Invalid position of DHW rotary selector	Bypass, DHW and DHW circulation pump functions are disabled

Table 28

### 11.4 Fault display control valves

To access the On/Off indicators of the control valves:

- Remove the enclosure, insulation and control unit.

**i** LED power-saving mode: if the position of the valves does not change for 15 seconds, the LED displays are not visible.

Display	Remedy
Green flashing	Valve is stuck completely open.
Green and Blue flashing	Valve is stuck open between 60 and 99,9 %.
Blue flashing	Valve is stuck open between 40 and 60 %.
Blue and Orange flashing	Valve is stuck open between 0.1 and 40 %.
Green and orange	Input signal fault. Valve is completely closed.
Green, Blue and Orange flashing	Valve fault.

Table 29 Fault displays

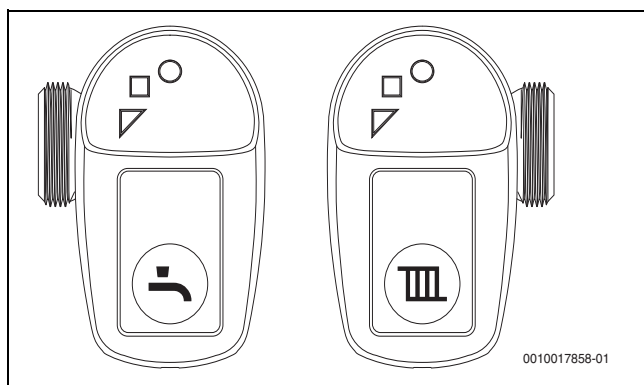


Fig. 50 Control valve displays

- [1] Circle - Green
- [2] Square - Blue
- [3] Triangle - Orange

### Action of control valve during an error

In the event of a fault, the affected valve independently attempts a recovery in order to unlock the fault.

### Calibrating the control valves

- Manually set the rotary selector for the control valve on the control unit to the calibration position .
- Valve initially moves to fully closed position.
- Valve then moves to fully open position.
- Valve then moves back to normal mode.
- Set the rotary selector for the control valve on the control unit to the required value.

### 11.5 Display Error codes heat meter

The error message disappears automatically as soon as the source of the error is corrected.

Error code	Description
C - 1	Basic parameter error in flash or RAM - meter must be replaced.
E 1	Temperature range outside (-19.9 °C...199.9 °C) e.g. sensor short-circuit, sensor fault.
E 3 <sup>1)</sup>	Flow/return temperature sensor reversed.
E 4	Hardware error flow measurement, e.g. transducer or control defective or short circuit.
E 5	Communication not possible (too frequent read-out).
E 6 <sup>1)</sup>	Flow direction incorrect.
E 7	Unstable ultrasonic signal, e. g. air in the measuring path.
E 8	No primary power supply (only with power supply unit); supply via backup battery.
E 9	Battery nearly discharged, design lifetime reached.
E A <sup>2)</sup>	Leak: leak detected in pipework.
E b <sup>2)</sup>	Leak: leak detected in energy meter.
E C <sup>2)</sup>	Leak: Leakage pulse input 1
E d <sup>2)</sup>	Leak: Leakage pulse input 2

1) Application dependent

2) Optional

Table 30



### 11.6 Heating pump fault display

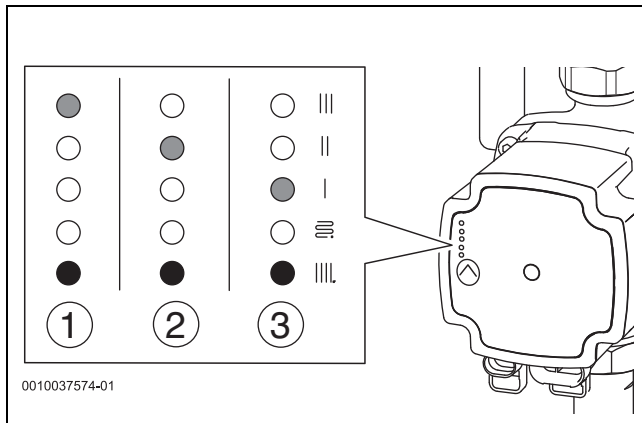



Fig. 51 Fault display at the heating pump

No.	Display	Fault	Pump operation	Remedy
1	red LED + yellow LED (LED 5)	Rotor is blocked	Restart attempt every 1.33 seconds	Wait or unblock the shaft.
2	red LED + yellow LED (LED 4)	Mains voltage too low	Warning only. Pump running.	Check mains voltage.
3	red LED + yellow LED (LED 3)	Electronics fault	Pump stops due to insufficient mains voltage or serious fault.	Check mains voltage, replace pump

Table 31 Fault display at the heating pump

#### Heating pump test

To check the heating pump operation:

- ▶ Turn the rotary selector on the control unit to the symbol .
- ▶ Make sure that the rotary selector is turned back to its original position.

### 11.7 Sense II diagnosis functions

For detailed information on menu guidance, refer to the instructions for the room controller.

#### Diagnosis functions of the heat interface unit

- ▶ Select menu: Service > Diagnosis > Monitor values > Heat interface unit.

The following data may be shown:

- **Status:** shows the current status of the heat interface unit (test operation, screed drying, DHW mode, heating mode, frost protection, no demand).
- **DHW volumetric flow rate:** in litres per minute
- **Supply temperature (primary side):** in °C
- **Return temperature (on the heat source side):** in °C
- **Heating circuit pump:** 0 % (not active), 100 % (active)
- **DHW circulation pump:** 0 % (not active), 100 % (active)
- **DHW control valve opening:** 0 % (valve closed) up to 100 % (fully open)
- **Htg. control valve opening:** 0 % (valve closed) up to 100 % (fully open)

#### Menu "Function check" of heat interface unit

- ▶ Select menu: Service > Diagnosis > Function check > Heat interface unit.

The following data may be shown:

- **TWS:** set DHW control valve (0 %: closed, 100 %: fully open)
- **Heating:** set heating control valve (0 %: closed, 100 %: fully open)

## 12 Data Protection Notice



We, **Bosch Thermotechnology Ltd., Cotswold Way, Warndon, Worcester WR4 9SW, United Kingdom**

process product and installation information, technical and connection data, communication data, product registration and client history data to provide product functionality (art. 6 (1) sentence 1 (b) GDPR

/ UK GDPR), to fulfil our duty of product surveillance and for product safety and security reasons (art. 6 (1) sentence 1 (f) GDPR / UK GDPR), to safeguard our rights in connection with warranty and product registration questions (art. 6 (1) sentence 1 (f) GDPR / UK GDPR) and to analyze the distribution of our products and to provide individualized information and offers related to the product (art. 6 (1) sentence 1 (f) GDPR / UK GDPR). To provide services such as sales and marketing services, contract management, payment handling, programming, data hosting and hotline services we can commission and transfer data to external service providers and/or Bosch affiliated enterprises. In some cases, but only if appropriate data protection is ensured, personal data might be transferred to recipients located outside of the European Economic Area and the United Kingdom. Further information are provided on request. You can contact our Data Protection Officer under: Data Protection Officer, Information Security and Privacy (C/ISP), Robert Bosch GmbH, Postfach 30 02 20, 70442 Stuttgart, GERMANY.

You have the right to object, on grounds relating to your particular situation or where personal data are processed for direct marketing purposes, at any time to processing of your personal data which is based on art. 6 (1) sentence 1 (f) GDPR / UK GDPR. To exercise your rights, please contact us via [privacy.ttg@bosch.com](mailto:privacy.ttg@bosch.com) To find further information, please follow the QR-Code.

## 13 Appendix

### 13.1 Central Heating pump characteristics

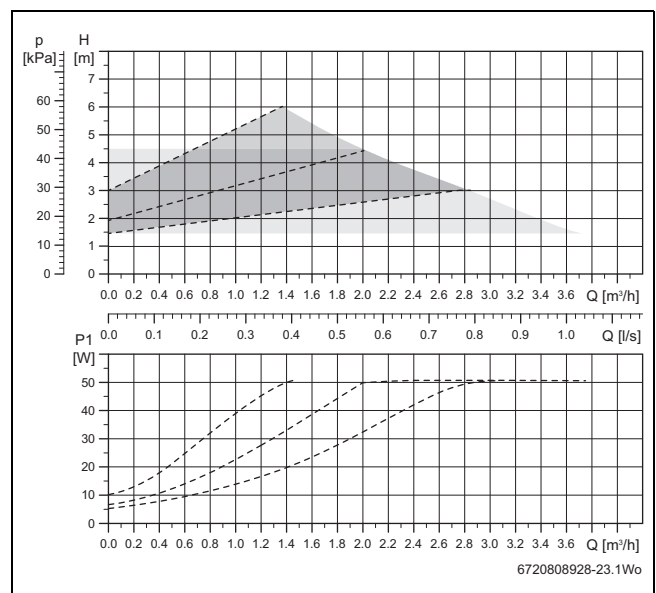


Fig. 52 Modulating speed characteristics

- [P] Head (kPa)
- [H] Head (m)
- [Q] Flow rate, (m<sup>3</sup>/h or l/s)
- [P1] Power (W)

- PP1: lowest proportional pressure curve.
- PP2: intermediate proportional pressure curve.
- PP3: highest proportional pressure curve. (default setting)

Setting	Maximum head (nominal)	Maximum P1 (nominal)
Curve 1	4 m	25 W
Curve 2	5 m	33 W
Curve 3	6 m	39 W

Table 32 Modulating speed characteristics

The head (pressure) is reduced at falling heat demand and increased at rising heat demand.

### 13.2 Tech data

		HIU (...)	HIU K (...)
Weight excluding packaging	kg	31	33
Weight including packaging	kg	34	36
Minimum inlet pressure to achieve nominal DHW flow rate	bar	1.5	2.0
DHW output (50°C @ 40 K rise)	kW	41.8	58.6
DHW output (90°C primary, 60°C DHW)	kW	52,3	73,3
Heating output	kW	1 - 15	
Maximum flow temperature of primary circuit	°C	70	
Maximum flow temperature of heating circuit	°C	70	
Maximum DHW temperature	°C	60	
Maximum operating pressure	bar	10	
pH value range, approx. (heating)		6 - 9.5	
Maximum primary differential pressure (with internal DPCV)	bar	4 (without internal DPCV: 0,8)	
Maximum DHW volumetric flow rate	L/min	15	21
Maximum volumetric flow rate of primary circuit	l/s	0.35	0.38
Max. ambient temperature	°C	35	
Expansion vessel	l	5	
Expansion vessel charge	bar	0.75	
<b>electric</b>			
Electrical power supply voltage	AC V	230	
Frequency	Hz	50	
Maximum power consumption	W	41.3	
Standby power consumption	W	3.1	
Appliance protection rating	IP	X4D	

Table 33 Heat interface unit specifications

		Primary circuit		
		65 °C <sup>1)</sup>	70 °C <sup>2)</sup>	80 °C <sup>3)</sup>
<b>HIU (...)</b>				
Potable Hot Water output	kW	31.3	36.6	41.8
Volumetric flow rate of primary circuit	l/s	0.17	0.18	0.17
Primary circuit return temperature	°C	19.3	21.9	22.3
Primary circuit pressure loss without heat meter	kPa	14	16	15
Primary circuit pressure loss with heat meter	kPa	20.5	24	21
<b>HIU E (...)</b>				
Potable Hot Water output	kW	31.3	36.6	41.8
Volumetric flow rate of primary circuit	l/s	0.17	0.18	0.17
Primary circuit return temperature	°C	19.3	21.9	22.3
Primary circuit pressure loss without heat meter	kPa	22	26	22
Primary circuit pressure loss with heat meter	kPa	28	33	30,5
<b>HIU KE (...)</b>				
Potable Hot Water output	kW	44.0	51.3	58.6
Volumetric flow rate of primary circuit	l/s	0.23	0.25	0.24
Primary circuit return temperature	°C	18.6	20.8	21.1
Primary circuit pressure loss without heat meter	kPa	37.4	45.1	41.3
Primary circuit pressure loss with heat meter	kPa	51	61.5	56.4

1) DHW temperature 40°C with 30 K increase

2) DHW temperature 45°C with 35 K increase

3) DHW temperature 50°C with 40 K increase

Table 34 Measured temperatures and volumetric flow rates

<b>Integrator</b>	
<b>Temperature Sensor</b>	
Temperature sensors	PT500
Diameter	Ø 5.2 mm
Cable length	1.5 m
Temperature range	5...130 °C
Starting temperature differential $\Delta\theta$	0.125 K
Flow measurement cycle with mains supply	1/8 s; with D-cell battery: 1 s
<b>Permissible temperature</b>	
Operation (<35 °C has a positive effect on lifetime)	5...55 °C
Storage (>35 °C max. 4 weeks)	-25...60 °C
Min. temperature difference $\Delta\theta$ min	3 K
Max. temperature difference $\Delta\theta$ max	177K

Table 35 Heat meter integrator technical data

#### Temperature Sensor

Resistance $\Omega$	Temperature °C	Resistance $\Omega$	Temperature °C
29529	0	8186	30
18787	10	5586	40
12257	20	3889	50

Table 36 Primary circuit NTC central heating flow and return temperature sensor

Resistance $\Omega$	Temperature $^{\circ}\text{C}$	Resistance $\Omega$	Temperature $^{\circ}\text{C}$
14772	20	2744	65
11981	25	2322	70
9786	30	1990	75
8047	35	1704	80
6653	40	1464	85
5523	45	1262	90
4608	50	1093	95
3856	55	950	100
3243	60		

Table 37 DHW temperature sensor NTC in sensor pocket

Resistance $\Omega$	Temperature $^{\circ}\text{C}$	Resistance $\Omega$	Temperature $^{\circ}\text{C}$
95893	-20	19860	10
72228	-15	15693	15
54889	-10	12486	20
42069	-5	10000	25
32506	0	8060	30
25313	5	8060	35

Table 38 Outdoor ambient temperature sensor

**Circuit diagram**

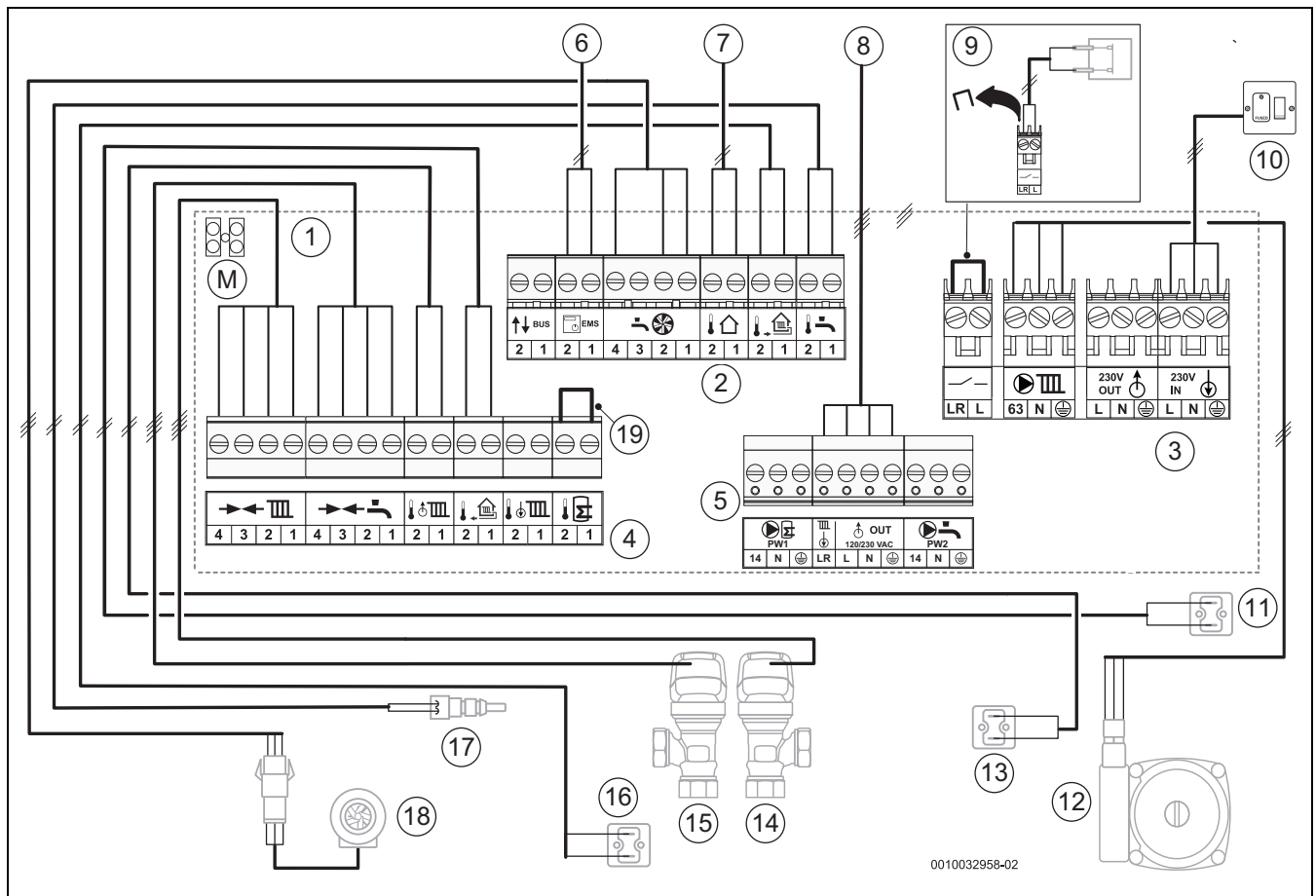


Fig. 53 Circuit diagram

- [1] Control unit
- [2] Low voltage connections
- [3] Mains power supplies
- [4] Low voltage connections
- [5] Mains power supplies
- [6] EMS-BUS controller connection
- [7] Temperature sensor NTC outside temperature
- [8] 230V external control system
- [9] Limiter thermostat (only for station with integrated pump)  
remove jumper to connect the high limit safety cut-out (for underfloor heating circuit protection)
- [10] Mains 230V supply
- [11] Flow temperature sensor NTC primary circuit
- [12] Circulating pump
- [13] Flow temperature sensor NTC heating circuit
- [14] Heating control valve
- [15] DHW control valve
- [16] Return temperature sensor NTC heating circuit
- [17] Domestic Hot Water outlet sensor NTC
- [18] Flow turbine
- [19] Jumper (electronic summer bypass function)
- [M] M-Bus connection for heat meter

13.3 Domestic Hot Water performance chart

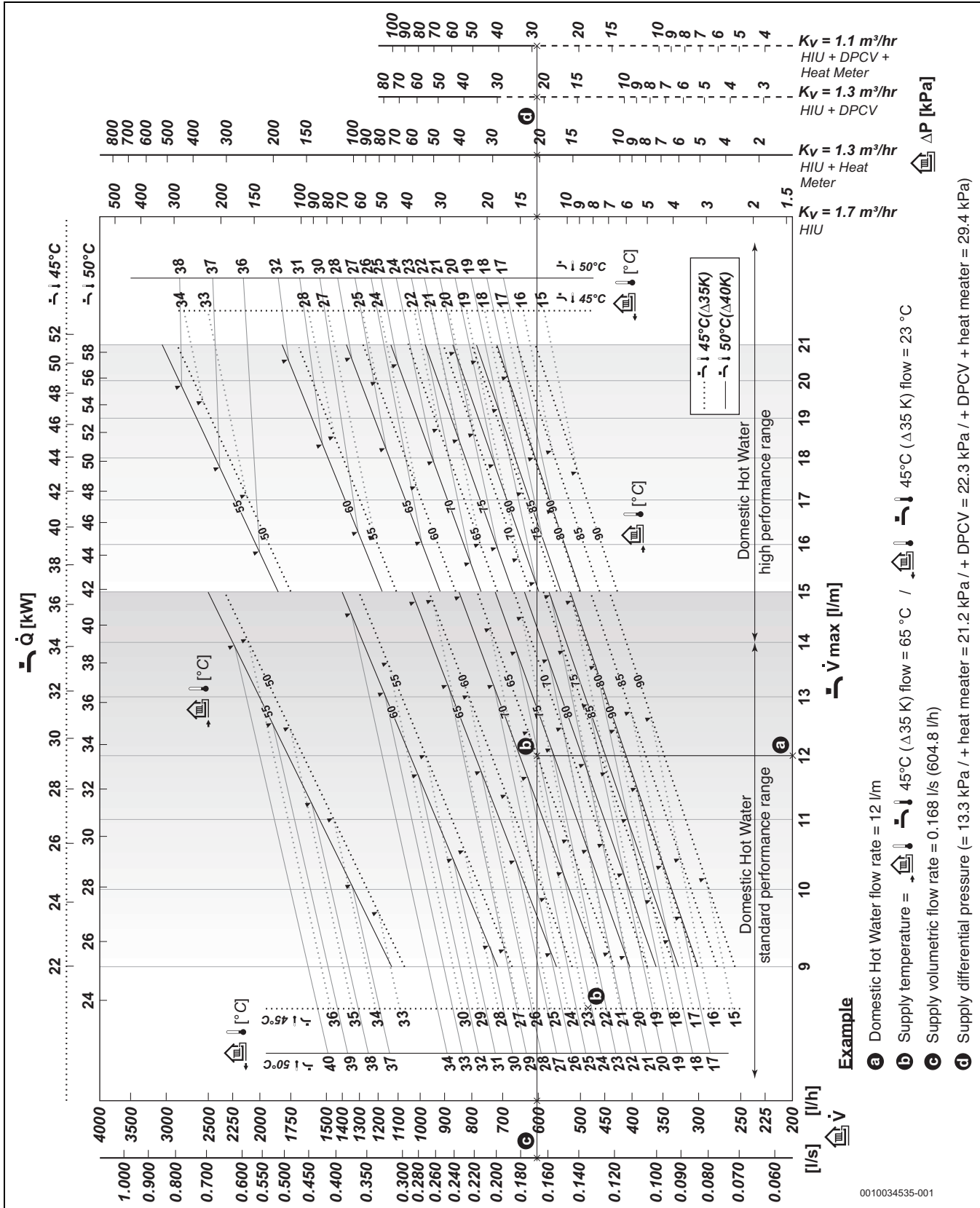


Fig. 54 DHW performance chart (DPCV = Differential Pressure Control Valve)

**13.4 Heating circuit performance chart**

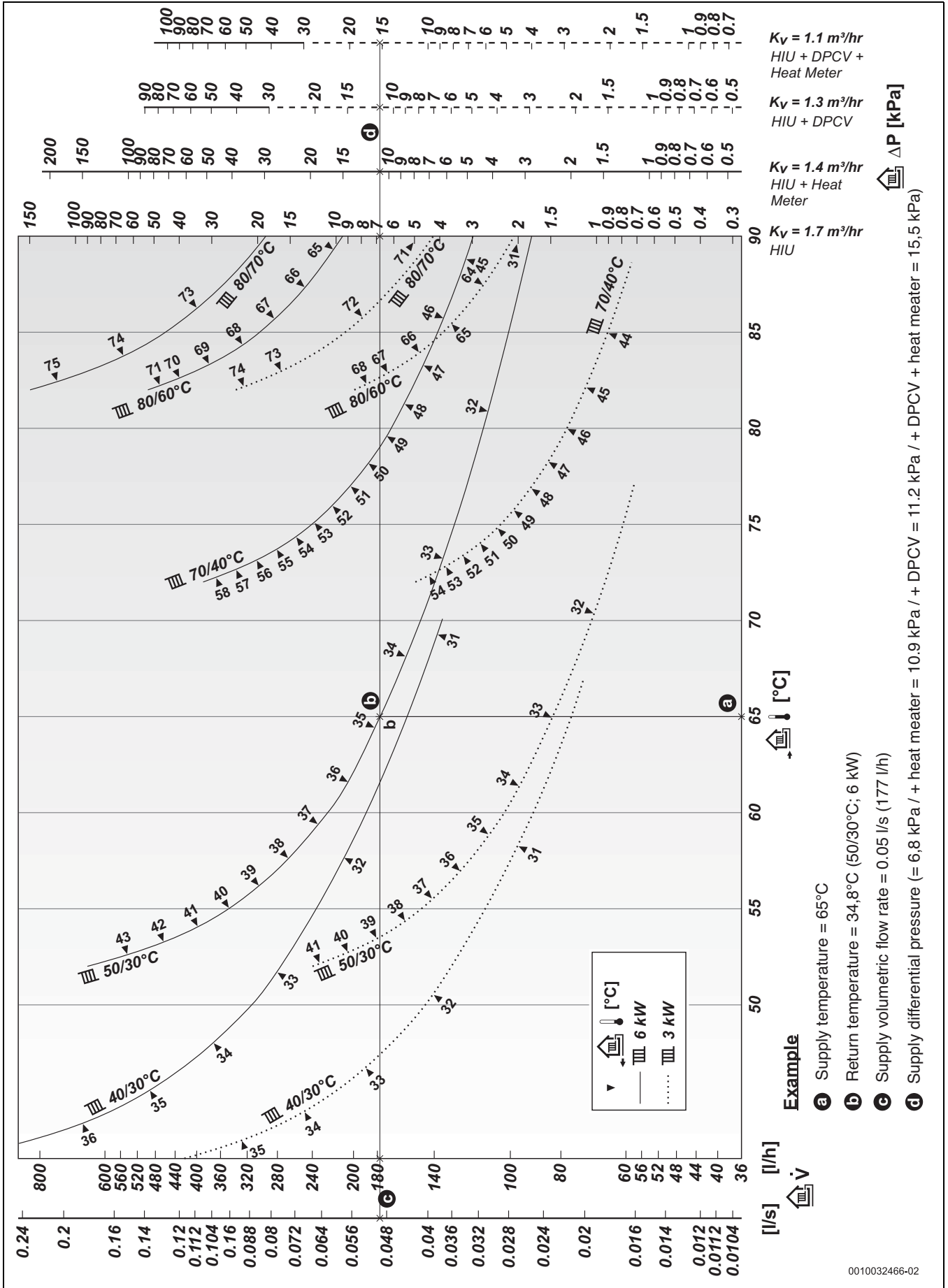


Fig. 55 Heating circuit performance chart for 3 kW and 6 kW (DPCV = Differential Pressure Control Valve)

TECHNICAL SUPPORT: 0330 123 3366  
RENEWABLE SUPPORT: 0330 123 9229  
CONTROLS AND CONNECTIVITY TEAM: 0330 123 3641  
APPOINTMENTS: 0330 123 9339  
SPARES: 0330 123 9779  
LITERATURE: 0330 123 9119  
TRAINING: 0330 123 0166  
SALES: 0330 123 9669

Bosch Thermotechnology Ltd.  
Cotswold Way, Warndon  
Worcester WR4 9SW  
United Kingdom  
Tel. 0330 123 9559  
[worcester-bosch.co.uk](http://worcester-bosch.co.uk)

 **WORCESTER**

 **BOSCH**