

Uponor Combi Port PRO XU

EN Installation and Operation Manual

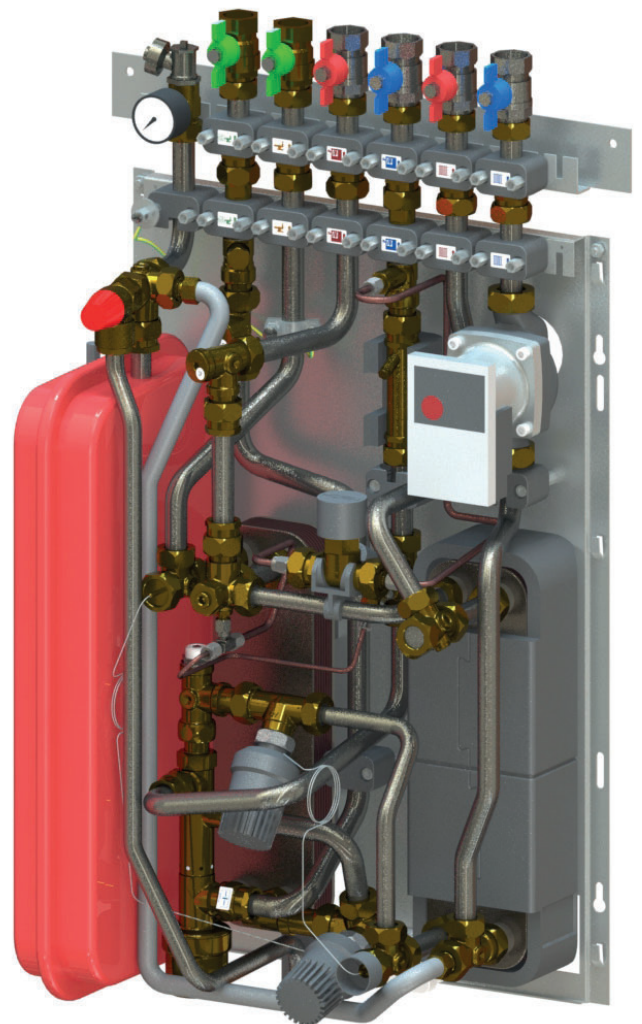


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1 Appliance Information

Dear Customer,

Before installing the system, the installer must read, understand and comply with these installation and operating instructions. We reserve the right to make technical changes. Please keep these instructions for future use!

- 1 This unit and its accessories may only be installed by qualified specialist personnel.
- 2 The heating system must be planned and implemented in accordance with generally accepted engineering practices, as well as the country-specific standards and guidelines.

The list below shows some of the country-specific regulations and standards. (The list is not necessarily complete.)

| | |
|----------------------|---|
| DIN 18380 | German construction contract procedures (VOB) - Part C |
| DIN 4109 | Sound insulation in buildings |
| DIN EN 6946 | Building components and building elements - Thermal resistance and thermal transmittance - Calculation method |
| DIN EN 12831 | Heating systems in buildings - Method for calculation of the design heat load |
| DIN EN 128282 | Heating systems in buildings - Planning of water-based heating systems |
| DIN EN 14868 | Protection of metallic materials against corrosion |
| DIN EN 14336 | Installation and commissioning of water based heating systems |
| VDI 2035 | Prevention of damage in water heating installations |
| VDI 4704 | Water heating installations - Water quality, pressure maintenance, deaeration - Trainings |
| VDI/DVGW 6023 | Hygiene in drinking-water installations DIN EN 1717 with national supplements DIN 1988-100 Codes of practice for drinking water installations |
| TRGI | Technical Rules for Gas Installation |
| EneV | Energy Saving Directive |

Please note that, according to EneV, the heating load of the building must be recalculated in the event of a major renovation of the heating system (boiler replacement). The system must be provided with equipment to enable automatic control according to time and temperature.

A water analysis is recommended for every drinking water delivery installation. In the case of warranty claims, water analysis is mandatory.

- 3 The necessary electrical connections, installation, commissioning and maintenance work may only be carried out by qualified specialist personnel. IEC 364 and/or CENELEC HD 384 or DIN VDE 0100, DIN VDE 0190 and IEC Report 446 or DIN VDE 0110 and EN 50178, EN 60204, EN 60335/Part 1 and Part 51 and/or local or national provisions must be satisfied.

Hazard warning: Before performing any work on the controller or the components connected to it, disconnect the controller from the power supply as instructed. The outlets are also in an inactive state under mains voltage.

We would also ask you to install the systems supplied by us according to the installation instructions. Our warranty shall be rendered void in the event of damage caused to the systems or to the heating system or building due to violation of these instructions. Refurbishments or alterations are only permitted after consultation with the manufacturer. The manufacturer accepts no liability for any damage resulting from improper use of the units.

- 4 This product comes in contact with our most precious foodstuff, drinking water. We therefore wish to point out some important installation and operating conditions.

The drinking water installation must be planned and implemented in accordance with the German Infection Protection Act, in particular Article 37 of the Drinking Water Ordinance, DIN 1988, DIN 50930 Part 6, DIN 2000, DIN 2001 and DIN 18381 as well as VDI 6003 and VDI/DVGW 6023 and the DVGW Worksheets quoted below, as well as generally accepted engineering practices. (The list is not necessarily complete.)

These are:

| | |
|-------------------|---|
| W 551 | Drinking water heating and drinking water piping systems - Technical measures to reduce Legionella growth |
| W 553 | Dimensioning of circulation-systems in central drinking water heating systems |
| W 291 | Cleaning and disinfection of water distribution systems |
| DVGW W 557 | Cleaning and disinfection of drinking water installations |

Regulations of local water supply companies The applicable and comparable country-specific regulations and standards.

There are a few specific points that we would like to point out, but note that they are not necessarily complete.

- This system may only be installed by qualified specialist personnel.
- During installation, make sure that the open ends of the pipes are protected against dirt during work breaks.
- The safety equipment of the drinking water delivery installation must comply with DIN EN 806-2 and DIN 1988-200 or the comparable national regulations or standards.
- The system must be flushed and disinfected before being commissioned and handed over to the user.
- Hot drinking water pipes must be provided with the prescribed thermal insulation in accordance with EneV and DIN 1988-200.
- The drinking water pipes must be insulated in accordance with recognised engineering practices.
- The cold water pipes should not be insulated together with the heating pipes. Thermal separation or, preferably, spatial separation is required.

In the case of installations in the public sector (multi family homes, hotels, retirement homes, hospitals, sports halls, etc.) care must be taken to ensure that the heated drinking water temperature does not fall below 60°C and the circulating water re-entering the unit reaches a minimum temperature of 55°C. This requires accurate calculation and precise adjustment of the circulating line.

The system is maintained in compliance with DIN EN 806-5 or, outside Germany, in accordance with national regulations or standards.

Use-related wear of wearing parts, such as pumps, built-in valves (moving parts, PM valves, etc.) are not considered as defects.

We recommend a maintenance cycle especially for example for the built-in heat exchanger (test, dirt, sludge, lime), PM valve (functional test), dirt filter, shut-off valves (functional test), valves such as a thermostatic lead module, thermostatic hot water temperature limiter, zone valves, injection valve, differential pressure regulator, pump, volume measuring unit, thermal premixer or other parts.

5 Please instruct the system users properly and provide them with these installation and operating instructions together with the inventory documents.

Please check that the units are complete. Any screws that are loosened during transport should be retightened.

In the event of leaks that occur during the pressure test, be sure to depressurise the unit before replacing any affected components.

Never remove individual parts of the unit (or any other built-in components) while the system is still under pressure (risk of injury).

If you have any questions about correct operation or function, please contact your supplier. Of course you are also welcome to contact us directly anytime.

1.1 Validity of the instructions

These installation and operating instructions apply exclusively to the manufacturer's unit. The type can be found on the ID plate.

The ID plate is located on the base plate of the unit. The ID plate contains the following information.

- Sales
- Created by
- Device type
- Technical data
- Year built
- Serial number
- Order number
- Production location

1.2 ID plate (example)

| | |
|------------------------|----------------------------|
| Device type: | Combi Port PRO XU |
| Hz-VI temperature: | max. 95°C |
| TWW flow rate: | Exchanger type 1; 15 l/min |
| Pressure level Hz/TWW: | PN 10/PN 6 |
| Year built: | 2020 |

| |
|-----------------------------|
| Serial number: D-10-0026036 |
| Order number: 102628 |
| Made in Germany |

1.3 Related documents and regulations

- Additional documents are valid in conjunction with these installation and operating instructions.
- When carrying out service work on the unit, it is essential to observe all instructions for supplementary components and components of the heating system.
- In all service work pay attention to:
 - the recognised technical rules for safe and professional operations
 - the statutory regulations for accident prevention
 - the statutory environmental protection regulations
 - the stipulations of employer's liability insurance associations
 - the relevant safety conditions of the DIN, EN, DVGW, DWGW, VDE and AGFW standards
 - the relevant national and EU regulations for other countries
 - and the relevant specifications for the recognised rules of engineering

1.4 Document retention

- You should keep these instructions and all other applicable documents in a safe place, so that they are always available.
- Make sure to hand over all the documents to the operator.

1.5 Correct operation

The heat interface unit is intended exclusively for drinking water heating, control of the downstream domestic heating system and the measurement of heating energy and cold water consumption for an apartment or similar unit.

Any other or further use is considered improper use. The manufacturer/supplier is not liable for resulting damages. The risk is borne solely by the user. Intended use also includes observance of all relevant documents and compliance with the inspection and maintenance conditions.

Under no circumstances should you deviate from the values given in the technical data.

1.6 Personnel and qualifications

The heat interface unit may be operated by the operator or by personnel authorised by the operator. Service work (assembly, commissioning and maintenance) on the heat interface unit requires specialist knowledge. In general, only authorised specialist tradesmen are allowed to carry out service work on the heat interface unit.

1.7 Operator

The operator is responsible for the correct operation of the heating system.

The operator must:

- have read and understood the operating instructions,
- have reached a statutory minimum age,
- ensure that the heating system is regularly maintained by an installer.

1.8 Specialised installers

The installer is authorised to carry out installation, commissioning and maintenance work (service and repair).

Authorised installers must have a recognised qualification or knowledge of the relevant area of expertise and are responsible for compliance with existing regulations, rules and guidelines.

Work on electrical equipment belonging to the system may only be carried out by a qualified electrician in accordance with the electrical engineering regulations. Only personnel with special knowledge and experience in hydraulics may work on hydraulic equipment.

1.9 Installation, commissioning and maintenance

For your own safety, please note that the installation, commissioning and maintenance of the heat interface unit must be carried out by sufficiently qualified personnel.

1.10 Basic safety information

Observe the following instructions for your own safety and the safety of your environment.

1.11 Danger from electric shock

Controllers and pumps are under mains voltage. Contact with live parts can be fatal or cause serious injury.

- Switch off the power supply immediately when working on electrical components.
- Work on the electrical system may only be carried out by qualified electricians.
- Never touch electrical components with wet or damp body parts.
- Never pull on electrical cables.

1.12 Avoid the risk of burning and scalding

The surfaces of individual components and the water at the tap can become very hot.

- Avoid contact with hot surfaces.
- Carefully check the water temperature with a gauge before touching it

1.13 Leaks

If leaks occur, you must follow the instructions below.

- Close all shut-off valves immediately.
- Repair the leak in the appropriate manner.

1.14 Avoid frost damage

Without hot water and power supplies, the heat interface unit is not protected against frost.

- Take the appropriate steps to ensure supply and notify the operator that the heat interface unit is in operation during a period of frost (even when the operator is away).
- Take the appropriate steps to ensure supply and notify the operator that a sufficient temperature must be maintained at the installation site of the heat interface unit and in the accommodation.
- Avoiding property damage due to improper maintenance
- Perform yearly maintenance on the station.

1.15 Information displayed on the device

- Observe the instructions displayed directly on the device.
- Maintain such displayed instructions in a fully legible state.

Material damage due to incorrect additional components, avoidance of spare and wearing parts, use of unauthorised components, spare parts and wear parts that have not been tested with the system can damage the heat interface unit.

The installation of non-approved components, spare parts and wear parts, as well as unauthorised modifications and alterations are considered to be improper and may restrict the function, safety and warranty. We accept no liability in such cases.

- Use only original parts from the manufacturer or spare parts approved by the manufacturer for replacement purposes.

Recommendations, optimum values for water

| | |
|---------|--------|
| °dH | 6...15 |
| pH-Wert | 7-10 |

1.16 Technical data

Materials

| | |
|----------------|--|
| Fittings | Brass/dezincing resistant brass |
| Pipes | Stainless steel 1.4401 |
| Heat exchanger | Stainless steel 1.4404/copper solder and diffusion |

General information

| | |
|----------------------------|--|
| Max. operating temperature | 95°C |
| Operating pressure | PN10 |
| Min. cold water pressure | approx. 2 bar |
| Max. cold water pressure | approx. 4 bar |
| Connections | 3/4" or 1" IG, flat-sealing |
| Weight | approx. 30 kg unit with cover approx. 22 kg unit only |

2 Device and functional description

2.1 Functional description

The Apartment unit supplies an accommodation unit with hot water and heating. Heating of the drinking water is only effected when required via a stainless-steel plate heat exchanger **1** following the flow-through principle. The large thermal length of the heat exchanger ensures excellent cooling of the heating water and low return flow temperatures. The energy is supplied by heating water with a supply temperature of at least 55 °C via the heating water supply line.

Provided the supply temperature is constant, the same tapping temperature is achieved at large and small tapping quantities through the proportional flow rate control.

Through the thermostatic hot water limiter (TWB) **13** a stable tapping temperature can be achieved even at fluctuating supply temperatures (option).

2.2 Function PM-controller

The PM-controller **2** is a brass valve for the control of the volume flows of domestic hot water over a stainless steel plate heat exchanger. With an orifice (flow restriction plate) on the heating side, the PM-controller supplies a heat volume flow in proportion to the required domestic hot water quantity.

The PM-controller ensures the priority for the production of domestic hot water over the apartment heating. By means of the slight resistance of the preparation of domestic hot water over the apartment heating circuit the heating volume flow is restricted during the tapping process. The return of the heating circuit flows through the PM-controller.

Operation:

The PM-controller is a self-activating valve. For the operation, no interference is necessary.

Once per year, a visual check on the PM-controller shall be carried out. Here, in particular leakages on the control holes (B) shall be checked. Emerging water from the control holes does not lead to functional loss. However, the PM-controller shall be replaced immediately on the occurrence of leakages in order to avoid water damages.

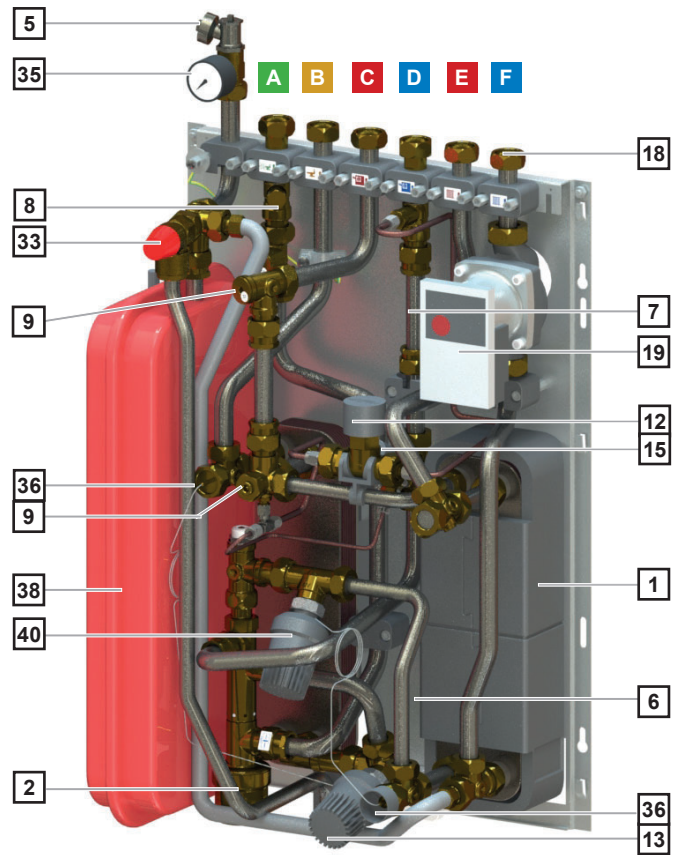
Unauthorized interferences on the PM-controller are not allowed.

2.3 Components and device connections

Equipment

- A CW from riser
- B DHW to apartment
- C Primary heating supply
- D Primary heating return
- E Secondary heating supply
- F Secondary heating return

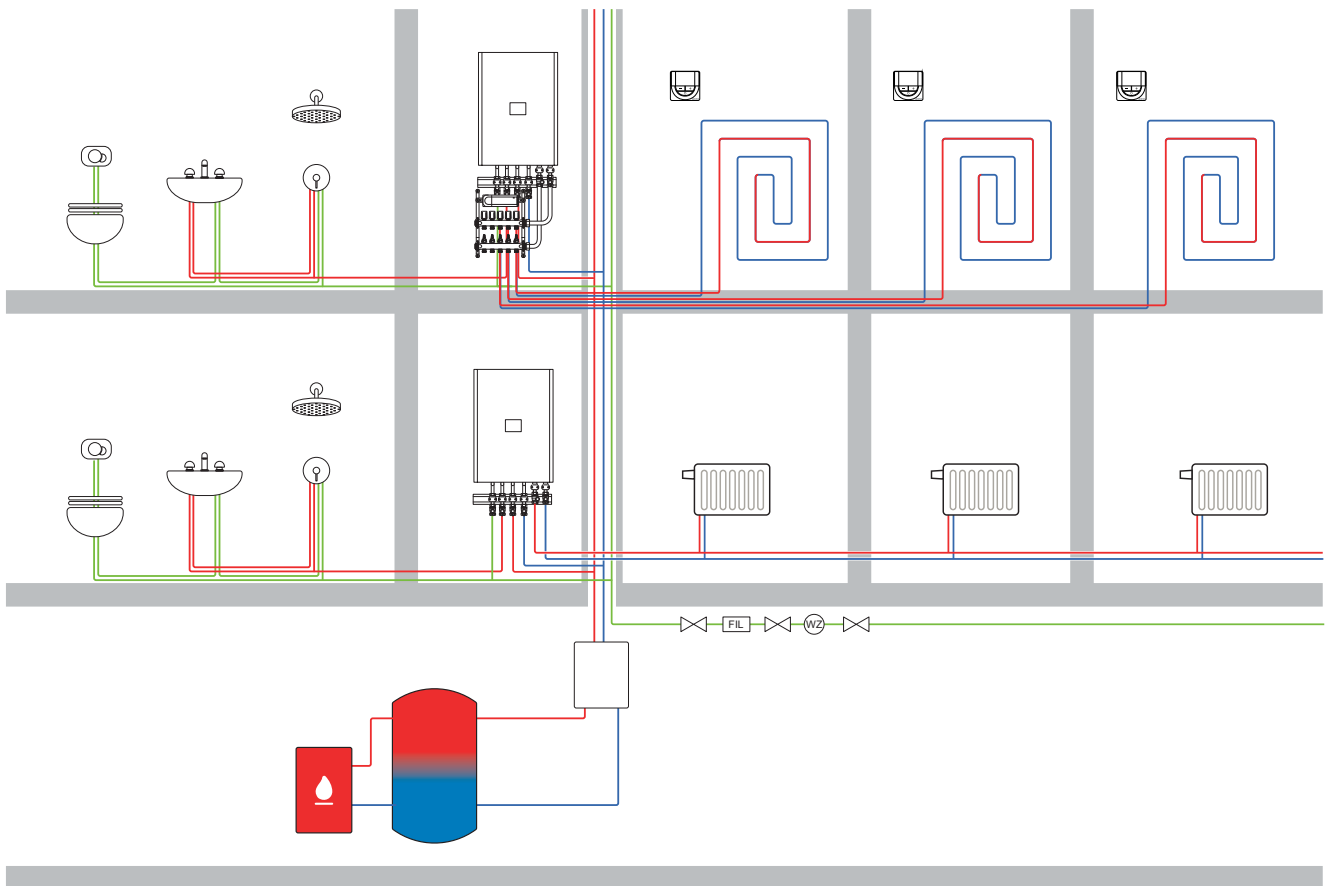
- 1 Plate heat exchanger
- 2 Proportional volume controller (PM controller)
- 4 Sensor pocket HM M10x1, wet-diving
- 5 Air vent
- 6 Electric box
- 7 HM distance piece
- 9 Strainer
- 12 Thermostatic temperature retention module (TTV)
- 13 DHW temperature controller (TWB)
- 15 Differential pressure control
- 18 Union nut 3/4"
- 19 Pump
- 33 Safety valve
- 35 Pressure gauge
- 36 Temperature sensors
- 38 Membrane expansion vessel (MAG)
- 40 Thermostatic heating limiter



Note:

The illustration shows a sample set-up.
Individual modules may vary in appearance.
The legend-based numbering is not continuous.

2.4 System example



2.5 Accessoires

2.5.1 Back plate or ball valves on rail

Depends on connecting version of the primary lines, the installation of Combi Port PRO XU will start with back plate or ball valve rail:

- 1 When all lines have to be connected from top to the Combi Port PRO XU, then the ball valve rail has to be used.
- 2 When the connection to the station should be done from the bottom or both, from top and bottom, then the back plate is required.

Please consider the installation steps in chapter "Installation".



2.5.2 UFH manifolds

An complete portfolio of Uponor underfloor heating manifolds is available:

Uponor Vario S Manifolds with top meters, 2 to 15 loops

Uponor Vario S Manifolds with lock shield valves, 2 to 15 loops

The manifolds includes wall brackets. Actuators are adaptable on the return barr.

Setting of lock shield valves is described in chapter "Operation".

Installation steps of the in wall or on wall cabinet are described in chapter "Installation".

Different single room controller can be connected. See available controller later in this chapter.



2.5.3 Connecting pipes

When connection from down is required, then additional connecting pipes has to be installed for this reason.

Please consider the installation steps in chapter "Installation".



2.5.4 Filling loop

The filling loop can be used for filling the heating system.

See installation in chapter "Installation".



2.5.5 Flushing bypass

The flushing bypass can be connected to the Combi Port PRO XU for flushing of the primary heating riser system.

Please consider the installation steps in chapter "Installation".



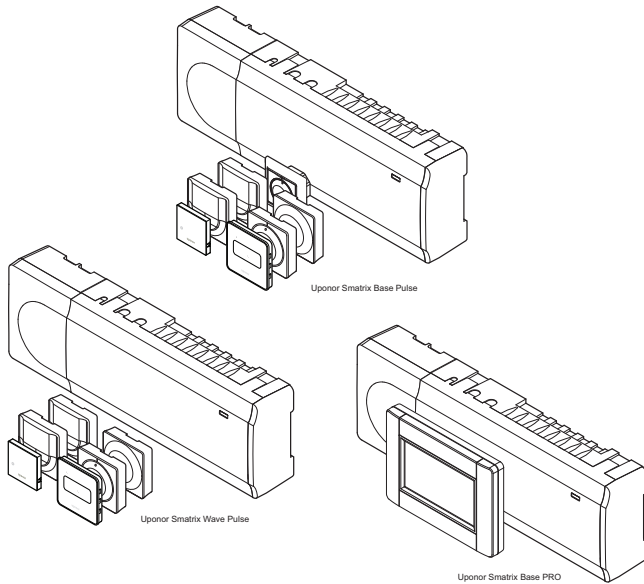
2.5.6 Room temperature control



Note

Thermostats and remote-control modules are not part of the Combi Port delivery. They must be ordered separately.

Uponor Smatrix



Uponor Smatrix is a fully equipped range of components for room temperature control, optionally via radio or wired. The unique auto-balancing technology eliminates the need for manual balancing of the loops. The smart system accurately determines and controls the exact energy needed for an optimal room temperature. The result is highly comfortable underfloor heating and cooling with reduced energy consumption.

Room control functions

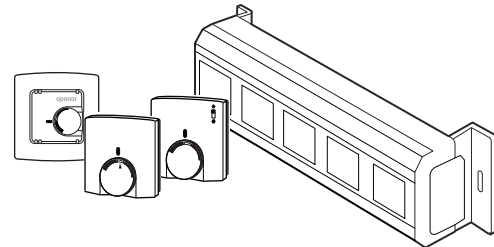
This list shows available functions for the different systems.

| Basic Function | Wave Pulse | Base Pulse | Base PRO |
|--|------------|------------|----------|
| Autobalancing | ✓ | ✓ | ✓ |
| Cooling function | ✓ | ✓ | ✓ |
| Modularity | ✓ | ✓ | ✓ |
| Installation and configuration functions | Wave Pulse | Base Pulse | Base PRO |
| Installation wizard | ✓ | ✓ | |
| Offline configuration | ✓ | ✓ | |
| Over-the-air updates | ✓ | ✓ | |
| Third-party remote support | ✓ | ✓ | |
| Comfort function | Wave Pulse | Base Pulse | Base PRO |
| Mobile app | ✓ | ✓ | |
| Smart notifications | ✓ | ✓ | |
| Trend visualization | ✓ | ✓ | ✓ |
| Multi home control | ✓ | ✓ | |
| Smart home integration | ✓ | ✓ | |
| Comfort settings | ✓ | ✓ | ✓ |

| | | | |
|---------------------------------------|---|---|---|
| ECO profiles | ✓ | ✓ | ✓ |
| Electrical underfloor heating control | ✓ | ✓ | |
| Ventilation integration | ✓ | ✓ | |
| Fan coil integration | ✓ | | |

| Technical function | Wave Pulse | Base Pulse | Base PRO |
|-----------------------|------------|------------|----------|
| Uponor cloud services | ✓ | ✓ | |
| Data storage | ✓ | ✓ | ✓ |
| Pump management | ✓ | ✓ | ✓ |
| System diagnostics | ✓ | ✓ | ✓ |
| HP integration | | | ✓ |
| Room bypass | ✓ | ✓ | ✓ |
| Room check | | | ✓ |
| BMS integration | | | ✓ |
| SMS module | | | ✓ |

Uponor Base flexiboard



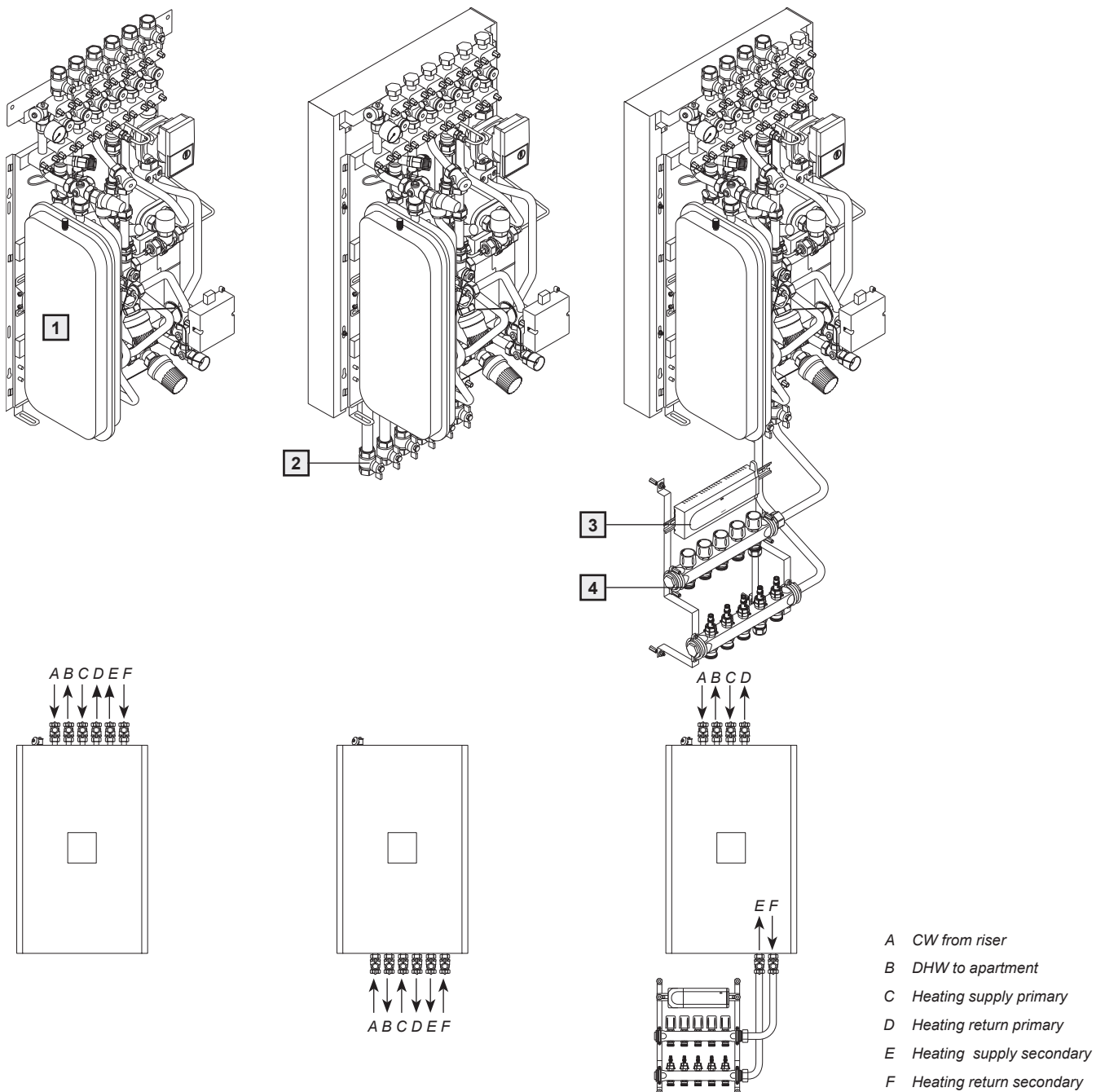
Uponor Base Flexiboard is a 230 V control that enables individual room control for 6 or 8 rooms. There are also 2 variants with integrated pump logic available. This switches the circulating pump on or off as required and enables an energy-efficient operation.

2.6 Installation variances

The pictures below shows the typical installation with Combi Port PRO XU with underfloor heating manifold. Single room control unit Smatrix is mounted and wired at the manifold.

System components:

- 1 Combi Port PRO XU
- 2 Connecting pipes to down and ball valves
- 3 Single room controller
- 4 UFH manifold



3 Installation

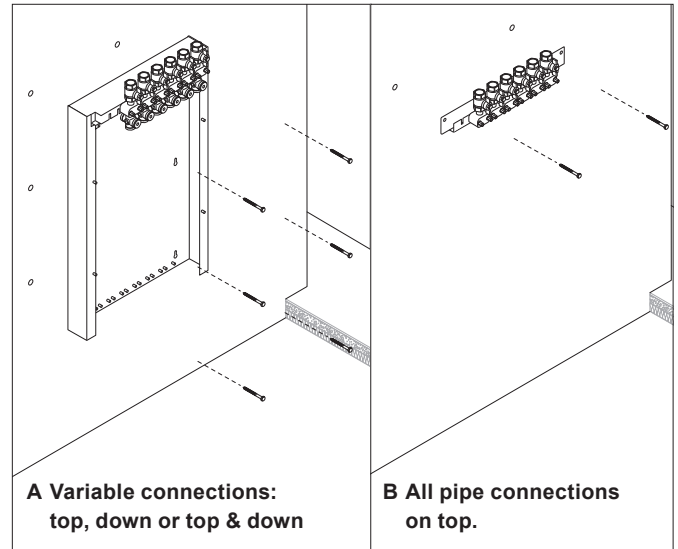
3.1 Mounting back plate or rail

- 1 Mark for drilling.

Note

Pay attention to horizontal alignment!

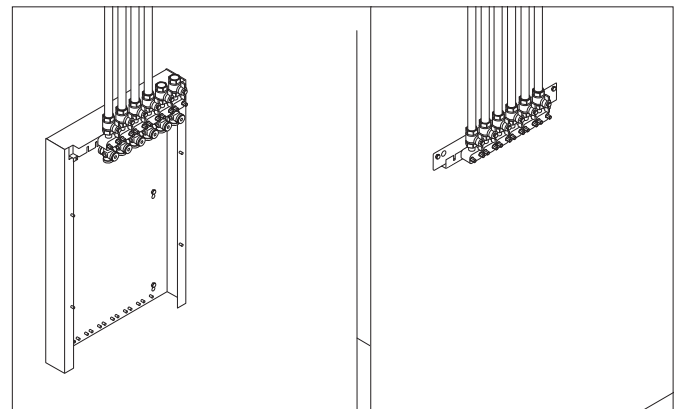
- 2 Drill holes.
- 3 Screw back plate with enclosed fixing material to the wall.



Note

The corresponding primary supply lines must be installed at the ball valves $\frac{3}{4}$ ":

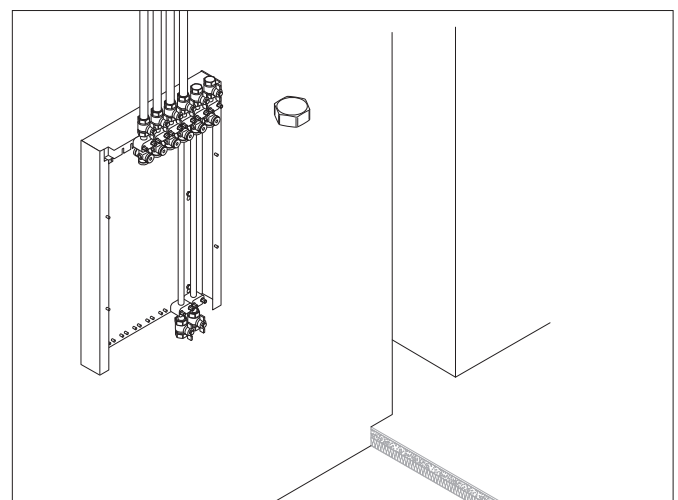
When it is required to connect pipes variable on top, down or both top&down, then the back plate to be used
For pipe connections all on top, the rail to be mounted.



In this mounting instruction the case A will be shown, as this is the more advanced one.

3.2 Mounting connection pipes for UFH manifold

- 1 Screw down 2 ball valves (right site, heating connections) and close the 2 pipes with caps $\frac{3}{4}$ ".
- 2 Fix the ball valves down to the connecting pipes.
- 3 Fix the connecting pipes on the back plate.



3.3 Mounting station

- 1 Screw station to the wall with enclosed fixing material.

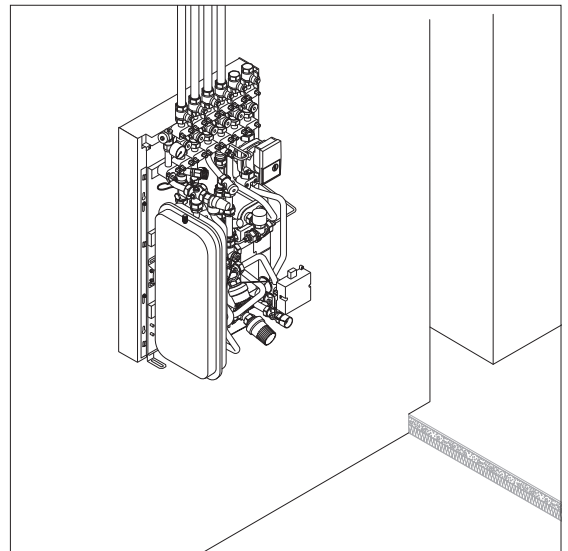
Note

The 3/4 " connection of the station (3/4" swivel nut) must be screwed to the ball valves on the rail (3/4 "FT).

Enclosed flat gaskets must be inserted before joining. The fittings are to be tightened by tightening (detail A)

Note

Tightness of the screwed connections must be checked!



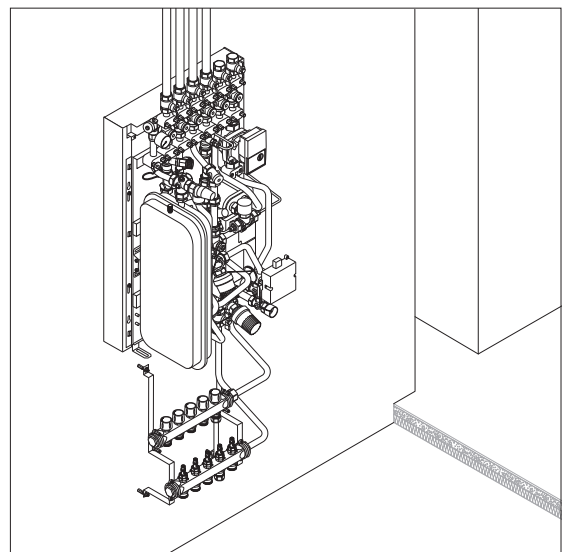
3.4 Mounting UFH manifold

- 1 Mark for drilling wholes for UFH manifold.

Note

Pay attention to horizontal alignment!

- 2 Drill holes.
- 3 Screw Vario S manifold to the wall. Connect supply and return of the Vario S manifold to the ball valves on the station.

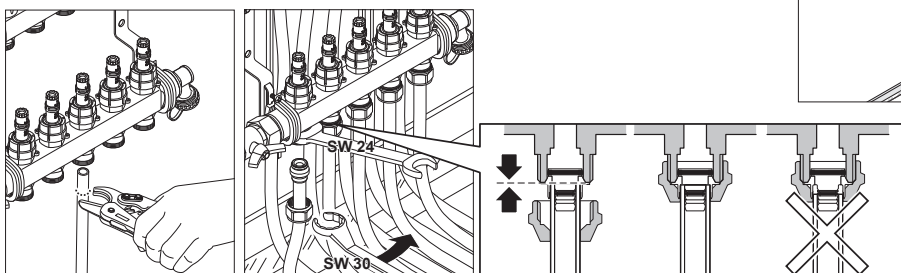
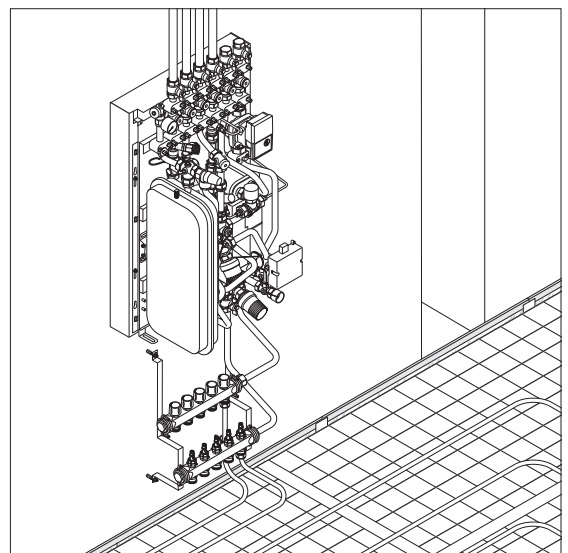


3.5 Connection underfloor heating pipes

Please consider:

Construction and installation of underfloor heating acc EN 1264.

Connection of underfloor heating pipes on the manifold.
Protocol the loop lengths of each loop.



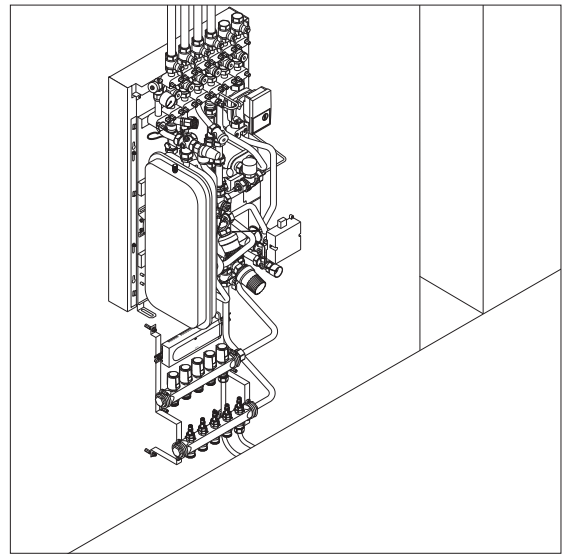
3.6 Connection single room controller

- 1 Mount the single room controller above the manifold on desired L-brackets.
- 2 Install the actuators on the UFH manifold return.

Electrical connection see chapter 4.3

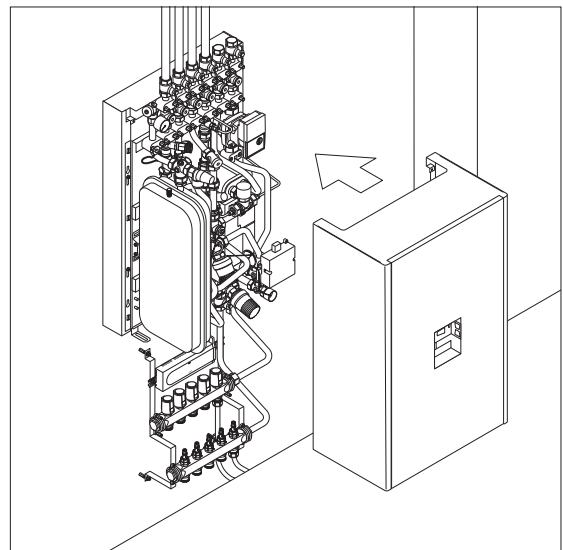
Note

Install the Interface unit allways outside the cabinet (wireless connection).



3.7 Mounting cabinet cover

- 1 The cover is to be hung with the suspension hooks on the back plate.



4 Operation

4.1 Start up

4.1.1 Connecting the hydraulic system

Risk of injury due to improper installation!

Leaking connections can cause personal injury.

- Make sure to connect the hydraulics correctly.
- When connecting the pipes, make sure to use the supplied seals.

To ensure the proper functioning of the heating system, you must not reduce the specified cable cross-sections. The connections for optional components (e.g. meters) are capped with black plastic adaptors in the device.

If the fittings are not to be replaced with optional components, you must replace the plastic fittings with stainless steel 1.4401 pipes. These can be obtained from your supplier.

- Make sure to connect the heating supply and return as well as the hot and cold water correctly.
- To fill the central heating system, install a filling and draining valve on site at a suitable central point.
- Observe the hydraulic diagram as an installation guide.

4.1.2 Connect the hydraulics in the following steps:

1 Prepare pipelines.

Prepare the pipelines according to your plan.

2 Install the pipelines.

Install the pipelines in the heat interface unit according to your plan.

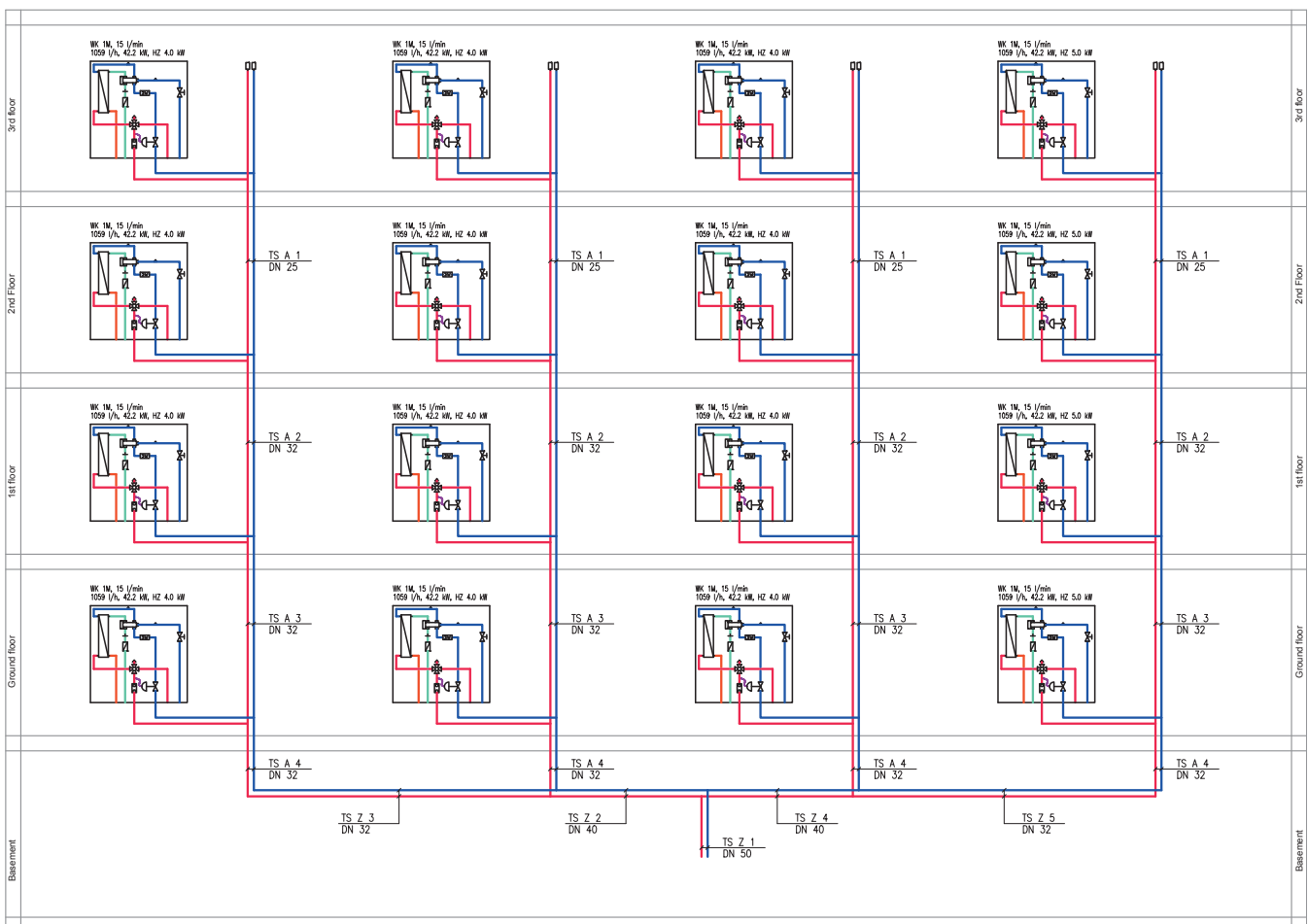
3 Insulate pipes according to national regulations.

Insulate the pipes with thermal insulation.

4 When designing the facility, it should be noted that the primary heating supply temperature is approx. 8-10°C above the domestic hot water temperature.

The heat interface unit is connected hydraulically.

4.1.3 Sample application: Implementation with a flow rate up to 1 m³

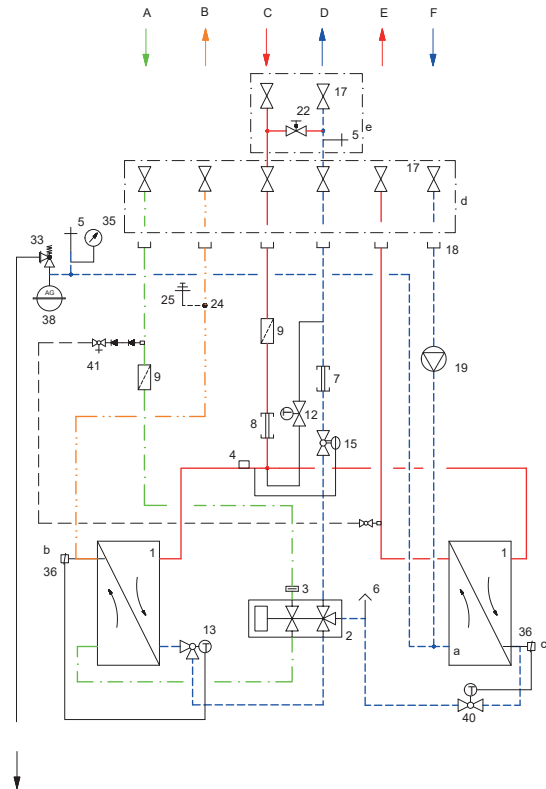


4.2 Hydraulic scheme

Equipment

- A Cold water from riser
- B Cold water apartment
- C Primary heating supply
- D Primary heating return
- E Secondary heating supply
- F Secondary heating return

- 1 Plate heat exchanger
- 2 Proportional volume controller (PM controller)
- 4 Sensor pocket heat meter M10x1
- 5 Air vent
- 7 HM distance piece
- 9 Strainer
- 12 Thermostatic temperature retention module (TTV)
- 13 DHW temperature controller (TWB)
- 15 Differential pressure control
- d Ball valves rail
- e Flushing bypass
- 18 Union nut 3/4"
- 19 Pump
- 24 Connection equipotential bonding
- 25 Grounding on site
- 33 Safety valve
- 35 Pressure gauge
- 36 Temperature sensors
- 38 Membrane expansion vessel
- 40 Thermostatic heating limiter
- 45 Junction box



| HIU | Plate heat exchanger | |
|-----------|----------------------|---------------|
| 15 l/min. | domestic water | (GKE-228H-24) |
| | heating | (GKE-228H-24) |
| 21 l/min. | domestic water | (GVH-228H-40) |
| | heating | (GKE-228H-24) |

a Plate heat exchanger incl. insulation

b Temperature sensor TWW 35-70 °C (limited at 60 °C), default setting 4-5 = 50-55 °C

c Temperature sensor Heating 35-70 °C, setting default setting 4 = 50 °C (consider: set 5 °C above required heating return secondary).

4.3 Electrical connection

The valid standards and country-specific regulations must be observed for the electrical wiring (e. g. DIN VDE 0100-540).

Please connect the station as follow:

- 1 Connect Combi Port XU electrically (see wiring diagram)
- 2 Connect individual room controller: please follow to the corresponding instruction Smatrix or Flexiboard
- 3 Coding of actuator: please follow to the corresponding instruction Smatrix or Flexiboard.
- 4 Establish equipotential bonding by using a copper equipotential bonding conductor (cross-section at least 6mm²). Connect the earthing clamp to a suitable equipotential bonding rail in the building.

STOP

Warning!

Danger to life due to electric current!
Contact with live parts may cause fatalities.

Disconnect the distribution station from the power supply and secure it against being switched back on.
Test for absence of voltage.

The pump may only be connected by a qualified electrician.

4.4 Installed parts



Caution!

Property damage due to improper commissioning!

Improper commissioning can lead to damage to property.

- Only an authorised specialist can carry out commissioning.

Observe the following flushing instructions during commissioning:

Before filling the device, you must first thoroughly and carefully flush the entire heating system and the apartment heating system. Before commissioning, you must check the strainers and, if necessary, flush/clean them. Check the tightness of the flat-seal connections in the heat interface unit. If necessary tighten the connections. When tightening connections, always lock the opposite side.

Vent the accumulated air in the heat interface unit by opening the venting screw. Observe the system operating pressure.

To commission the heat interface unit, follow these steps:

- 1 Testing the device prior to commissioning
- 2 Filling
- 3 Flushing
- 4 Venting
- 5 Checking settings
- 6 Completing the acceptance protocol (commissioning)
- 7 Handing over the device to the operator

4.5 Heat meter

The Combi Port PRO XU contains distance pieces which can be replaced by heat meter.

The heat meter with $Q_n = 1.5 \text{ m}^3/\text{h}$ and an overall length of 110 mm and 3/4" connection can be accommodated. Heat meters $Q_n = 1,5$ with a very fast sampling rate are to be used (1,5 - 2 sec. volume flow measurement). A sensor pocket for the M10x1 is available for the flow sensor. When delivered, you must remove a plug with a hexagon socket wrench (6 mm).

Testing the device prior to commissioning

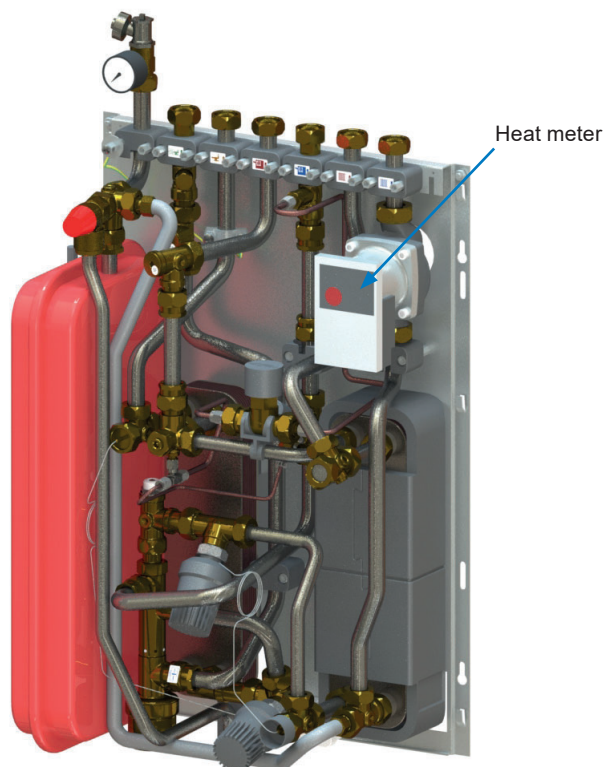
Prior to commissioning, you must verify proper installation through visual inspection as follows:

- Check that any dirt accumulated during installation and the dust on the unit have been removed properly.
- Check the seals on all pipes and device connections.
- Optional: Check that the electrical connections have been made correctly, that the polarity of the mains connection is correct and that grounding is assured.

If you find an installation error during visual inspection, you must temporarily stop commissioning and rectify the error.

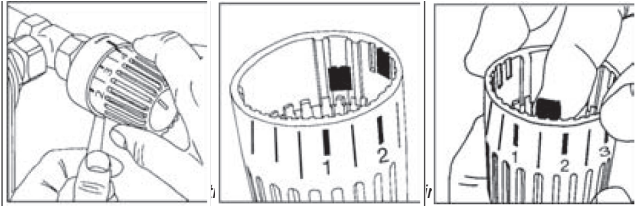
At the end of each line, you must perform a line vent. This prevents the units from drawing in air, which can cause interference on the units.

To optimally vent the heat exchanger, this must be carried out during WW dispensing.

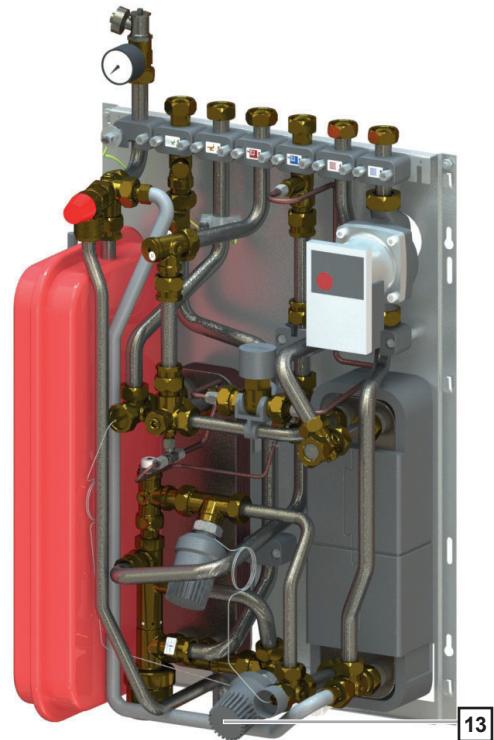


4.6 DHW temperature controller (TWB)

With the TWB **13** a stable tapping temperature can be achieved even at fluctuating supply temperatures. At a very high supply temperature the volume flow in the heating return line is reduced in accordance with the setpoint value (hot water temperature). This keeps the return temperature in the system low, providing scalding protection. Every thermostat needs a response time (<3 seconds) before it regulates exactly.



| Scale values | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------------------------|----|----|----|----|----|----|----|----|
| Hot water temperature 35-70 °C | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 |
| Supply temperature 20-50 °C | 20 | 25 | 30 | 35 | 40 | 45 | 50 | |



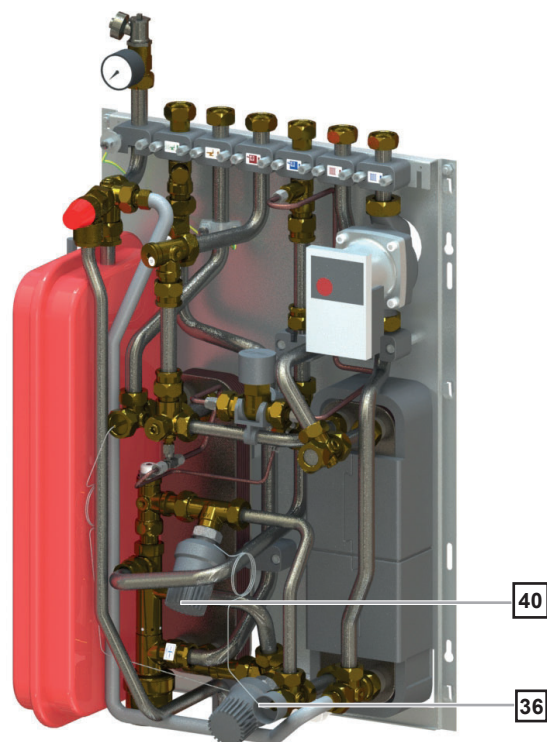
To change the default setting, follow these steps:

- 1 Remove the thermostatic tip from the valve.
 - Please note: Make sure not to bend or break the capillary line.
 - Using a welding wire, slide out the locking tabs next to the adjustment number on the left and right in the direction of the union nut. If the valve tip is only restricted in an upward direction (valve can be closed), then you only need to remove one locking tab.
- 2 Remove the top part of the valve head.
 - Lift out the internal anchor using a strong round object.
- 3 Adjust the hand wheel.
 - Line up the white marking on the toothed sleeve with the white alignment mark underneath the lettering.
 - Gently turn the hand wheel to setting 5.
 - Turn the hand wheel from setting 5 to the desired setting
Adjustment example: for 50°C set to scale value 4.
- 4 Block the setting.
 - Insert the clips behind the number set on the hand wheel.
 - Reinstall the hand wheel to the set value so that the hand wheel is blocked with the new setting.
- 5 Install the thermostatic tip.
 - Screw the valve tip onto the valve. The standard setting is changed.

4.7 Thermostatic heating limiter

- Through the thermostatic heating limiter **40** in the heating circuit the return temperature of the primary heating return is limited.
- Temperature sensor **36** is placed at heating-return-primary side. This placement is recommended for radiator heating (then the thermostatic head **40** has to be set +5°C above desired temperature).

Please move the temperature sensor **36** to heating-supply-secondary in case of under floor heating.

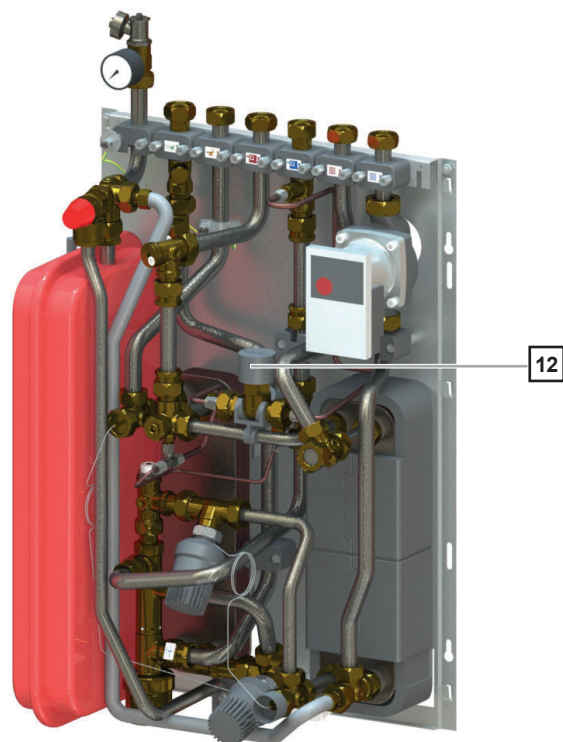


4.8 Thermostatic temperature retention module (TTV)

- A TTV **12** is inserted in the Apartment units or at the last unit in a line and ensures that the risers or supply lines do not cool off during the periods when heating is not required and during longer tapping breaks. At up to 5 residential unit over each other a TTV is required at the end. At more than 6 units the number has to be agreed. All residential units that are more than 5 meters from the line, should be equipped with a TTV. If a circulation is mounted, a TTV is not required (TTV is included in the scope of delivery).
- The thermostatic temperature retention module serves to maintain the heat in the supply line.
- The valve disposes of a setting scale. The setting range is printed on the cap. Temperature measuring is carried with a directly immersed sensor insert in the valve body. The setting is performed steplessly.
- "Comfort Setting TTV" (faster achieving of the DHW tapping temperature, however higher supply losses)
approx. 10-12°C (below the primary supply temperature)
Example: primary supply 70°C, TTV setting at approx. 60-58°C
- "Standard Setting TTV" (marginally longer waiting time until the DHW tapping temperature is achieved, smaller supply losses)
approx. 15°C (below the primary supply temperature)
Example: primary supply 70°C, TTV setting at approx 55°C

Please note:

- Connection to the capillary tube diameter 6 mm also changes the flow rates via the valve.
- Kvs value: 1.55



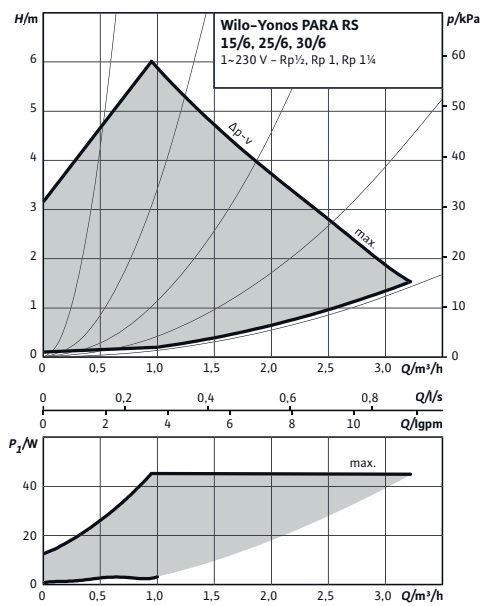
4.9 High efficiency circulation pump

Circulation pump with a cast iron pump housing and threaded connection or with specific composite pump housing. EC-motor with automatic power adjustment and self-protecting modes. Operation with the red controller or remote control via external PWM signal. Equipped with LED user interface.



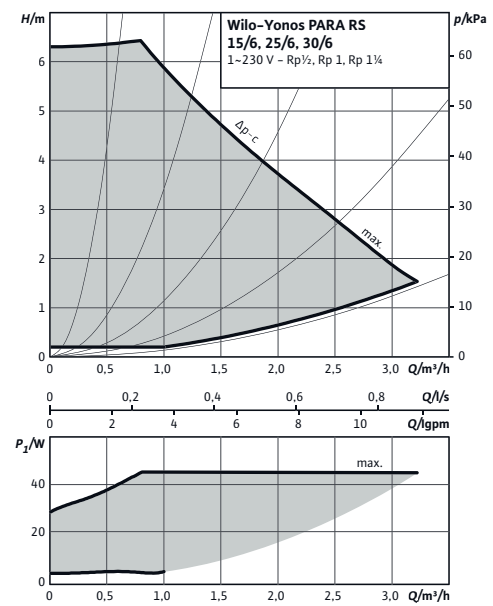
Wilo-Yonos PARA RS 15/6, 25/6, 30/6

Δp -v (variable)



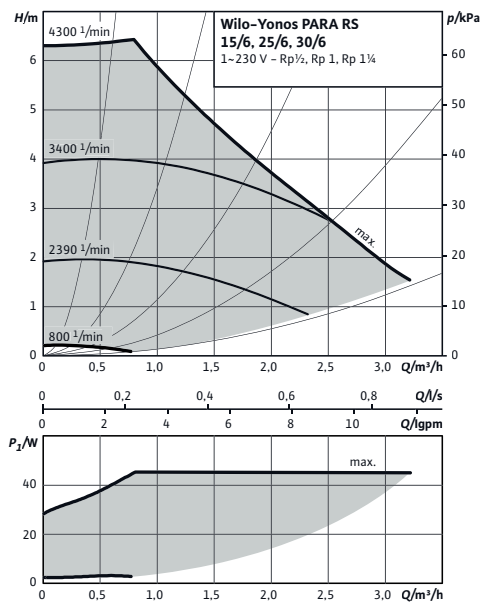
Wilo-Yonos PARA RS 15/6, 25/6, 30/6

Δp -c (constant)



Wilo-Yonos PARA RS 15/6, 25/6, 30/6

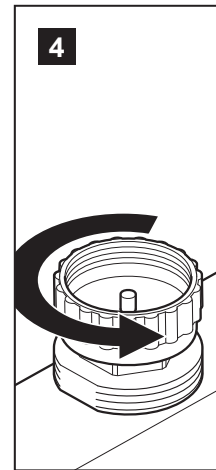
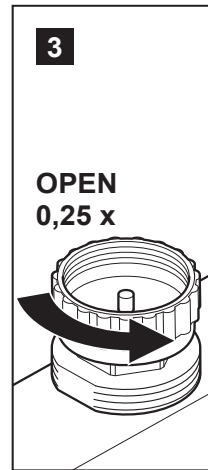
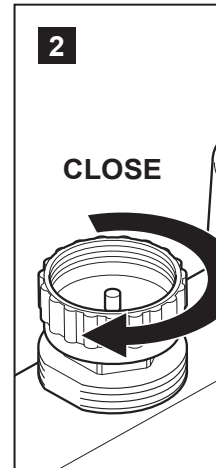
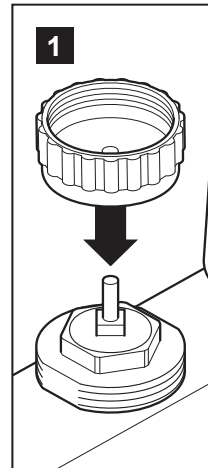
Constant speed I, II, III



4.10 Hydraulic balancing of UFH manifold

The heating manifold can be delivered in sizes of 2-15 loops. The necessary hydraulic balancing within the circuits have to be set at regulation valves placed in the return manifold as follow:

- 1 Remove the cap from the valve inlet in return manifold bar.
- 2 Turn the cap over so that the square connector is down. Put the cap on the regulation valve and close it.
- 3 Open the cap 0,25 x.
- 4 Open the cap as many turns as necessary until you reach the desired loop setting. The required flow rate to be found in the planning documentation.

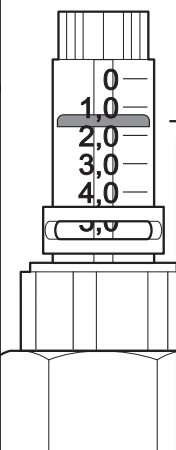


Warning!

Hazard to life due to valves under pressure:

When completely unscrewed, the valves will shoot out of the thread.

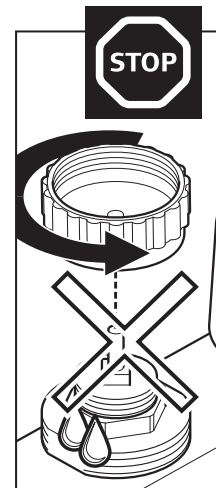
Never turn the valves counter clockwise more than 4 times.



1,5 L/min

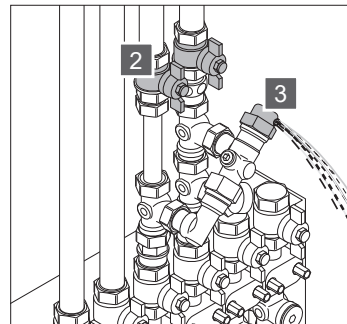
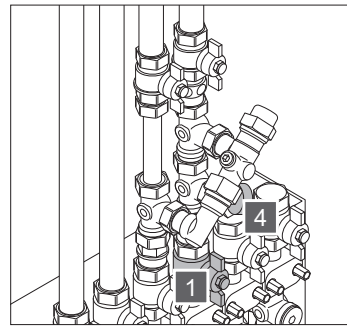
Uponor floor heating calculations
 Uponor Fußbodenheizungsber'ung
 Uponor vloerverwarmingberekening
 Calculation du chauffage par le sol Uponor
 Calcolo riscaldamento a pannelli radianti Uponor

| Room No. Raum-Nr. Ruimte-Nr. N° de la pièce Num. locale | Heating circuit No. Heizkreis-Nr. Verwarminggroep nr. N° du circuit de chauffage Num. circuito riscaldamento locale | Quantity of water Wassermenge Hoeveelheid water Quantité d'eau Quantità di acqua | Valve adjustment Ventilinstellung Ventielvoorstelling Réglage de la valve Taratura della valvola |
|---|---|--|--|
| | | L/min | |
| 1 | 1 | 2 | 0,5 |
| 1 | 2 | 5 | 3 |
| 2 | 3 | 2 | 1 |
| 3 | 4 | 4 | 4 |
| 4 | 5 | 1,5 | 2 |



4.11 Flush the primary heating system

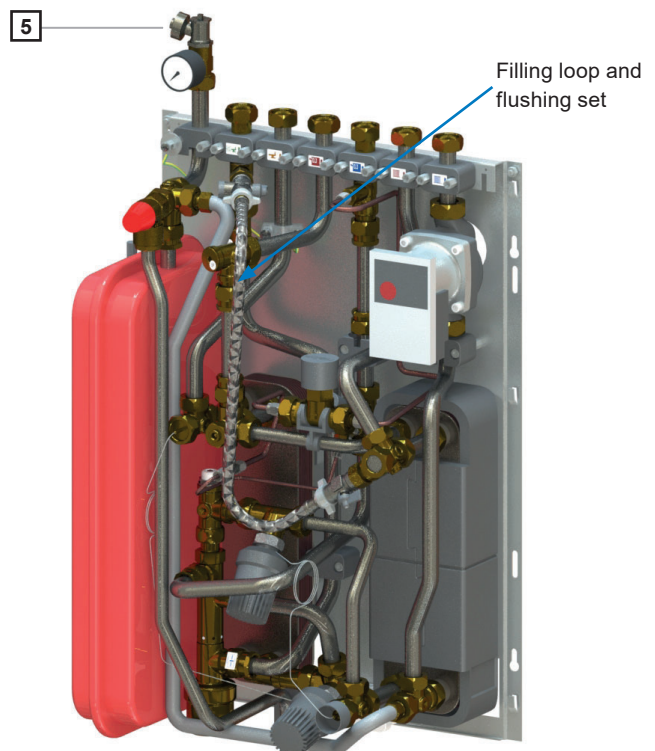
- 1 Check that the ball valves (1) and the drain cock (4) are closed on the station side.
- 2 Flush
 - Opening the ball valves on riser side (2)
 - Removal of the protection cap of the bypass fitting (3) (hexagon 32 mm)
 - Completely open the bypass fitting (3) (Allen key 6 mm)
 - As a result, water flows from the line via the bypass
- 3 End of flushing
 - Closing the bypass fitting (3) (Allen key 6 mm)
 - Assemble the protective cap (hexagon 32 mm)



4.12 Fill/flush and vent

Fill and flush the heating side with cold water using Combi Port PRO XU filling loop and flushing set. Therefore install this set between heating and cold water as shown in the picture.

Vent the heat interface unit at the ventilation valve **5**.



5 Occupant information

5.1 Important information about these instructions

These user instructions contain important information for the occupant on the operation of the system with a heat interface unit.

Following these instructions will help avoid hazards and downtime and increase the reliability and life of the heat interface unit. To ensure the correct and safe operation of the heat interface unit, you must read and follow the user information.

Document retention

You should keep this information and all other applicable documents in a safe place, so that they are always available. Make sure to hand over all the documents to the next occupants of the apartment.

Commissioning and installation

The installation and commissioning of the heat interface unit may only be installed and commissioned by a **specialist installation company**.

After commissioning, the heat interface unit operates automatically.

5.2 Function and energy savings

The heat interface unit is a compact station and can be operated in a system with several units or as a supplement to an existing heating system. The heat interface unit is assigned to a residential unit and is used to measure and control central heating and hydronic heating.

The heat interface unit combines:

- hydronic heating in the flow system via a plate heat exchanger (water heating is controlled without auxiliary energy),
- the metering of the energy consumption for central heating and hot water and, as an option, the amount of cold water,
- the option of controlling an apartment heating system.

Hot water is only prepared as needed. Service water is not stored. This is one of the most convenient ways to heat fresh water. This enables you to dispense unlimited amounts of hot water. Restrictions are only imposed by the central heating.

The heating lines or heat exchangers are permanently maintained at a basic temperature, usually 45°C.

To ensure the entire system is operated in an energy-efficient way, this temperature should not be increased.

Hydronic heating

The cold water supply for the apartment is provided via the central house connection and distribution line as far as your apartment.

At your heat interface unit there is a central shut-off ball valve for cold water (**C**) and a shut-off ball valve for installation purposes for your apartment distribution line (optional).

If you intend to be away for more than 72 hours, we recommend shutting off the cold water ball valve (**C**) and depressurising the lines by opening a tap and closing it once all the water in the pipe has run out.

All ball valves should be turned at regular intervals (about once a month). In other words they should be closed and re-opened.

The ball valve of the apartment distribution system (cold water (**A**) (optional) and hot water (**B**)) is only to be closed for assembly purposes!

All water pipes are filled and pressurised.

Water hygiene

Although you have a hot water system that follows the flow principle, which is the most hygienic method of water heating, you should

always flush your water pipes if you have been away from your home for several days and no water has been taken from the system (e.g. when returning from holidays). You should let the water run for one or two minutes. The water must be allowed to run for about 1-2 minutes at least every 7 days.

Heating

The pipes of the apartment heating system usually come from your heat interface unit. It is possible to completely shut off all the heating pipes of each apartment in the heat interface unit. It is possible to run the heating all year round. You can influence your energy consumption by the way you choose to use the heating system.

5.3 Closing off the heat interface unit

In the event of malfunctions, the shut-off ball valves must be closed:
A, C and D.

Caution: Make sure the system is protected against frost!

- A CW from riser
- B DHW to apartment
- C Primary heating supply
- D Primary heating return
- E Secondary heating supply
- F Secondary heating return

Malfunctions and maintenance

A visual inspection is required every 3 to 6 months.

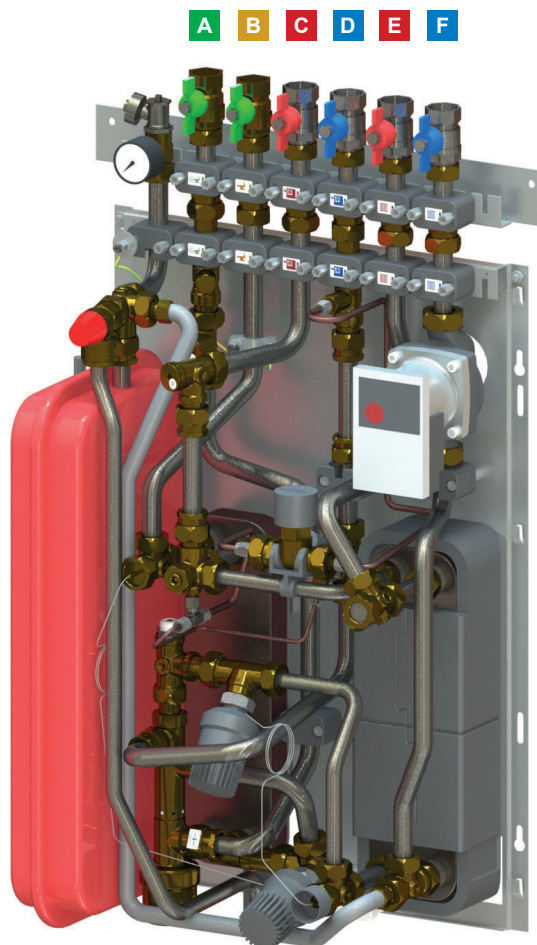
The device seal must be checked.

If drops form or water leaks out, immediately contact the installation specialist.

Longer absences

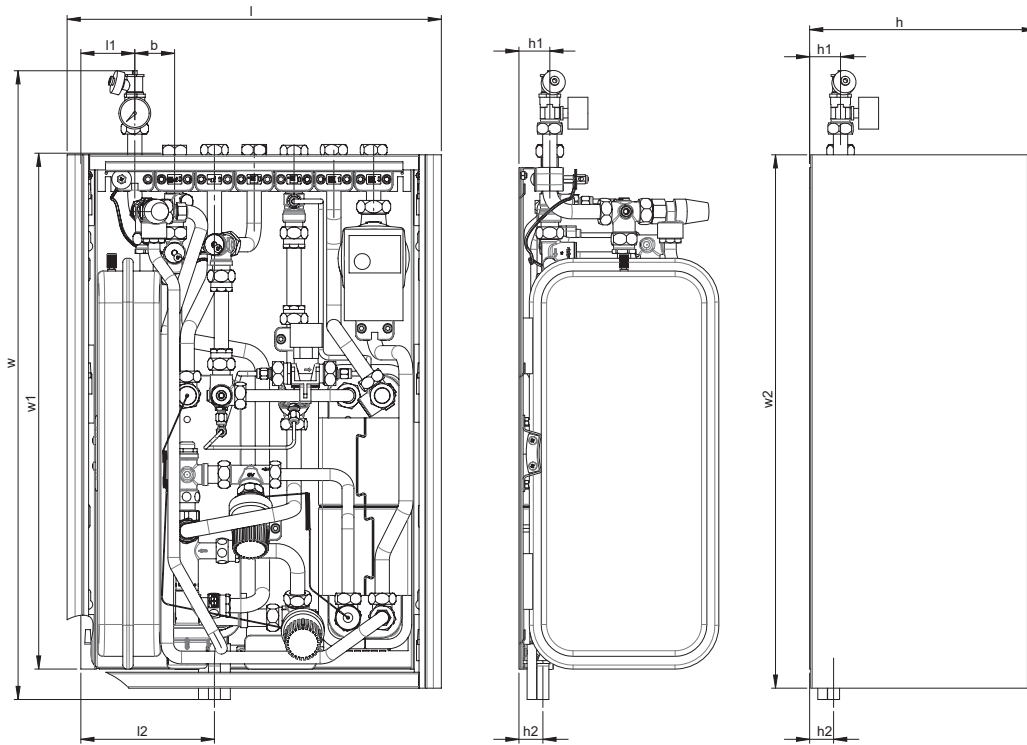
If you plan to be away for more than 3 days, shut off the cold tap and, after your return, let the hot water run for about 5 minutes.

Set the heating to frost protection! Make sure not to close ball-valves **A, C and D.**



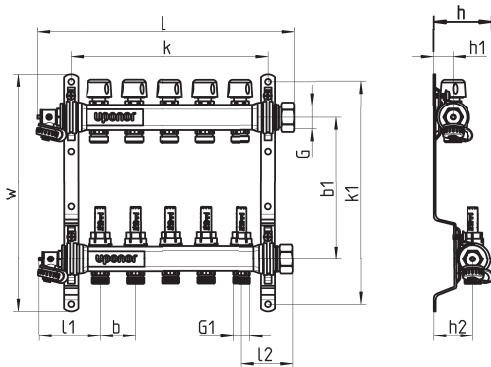
6 Dimensional drawings

6.1 Combi Port PRO XU



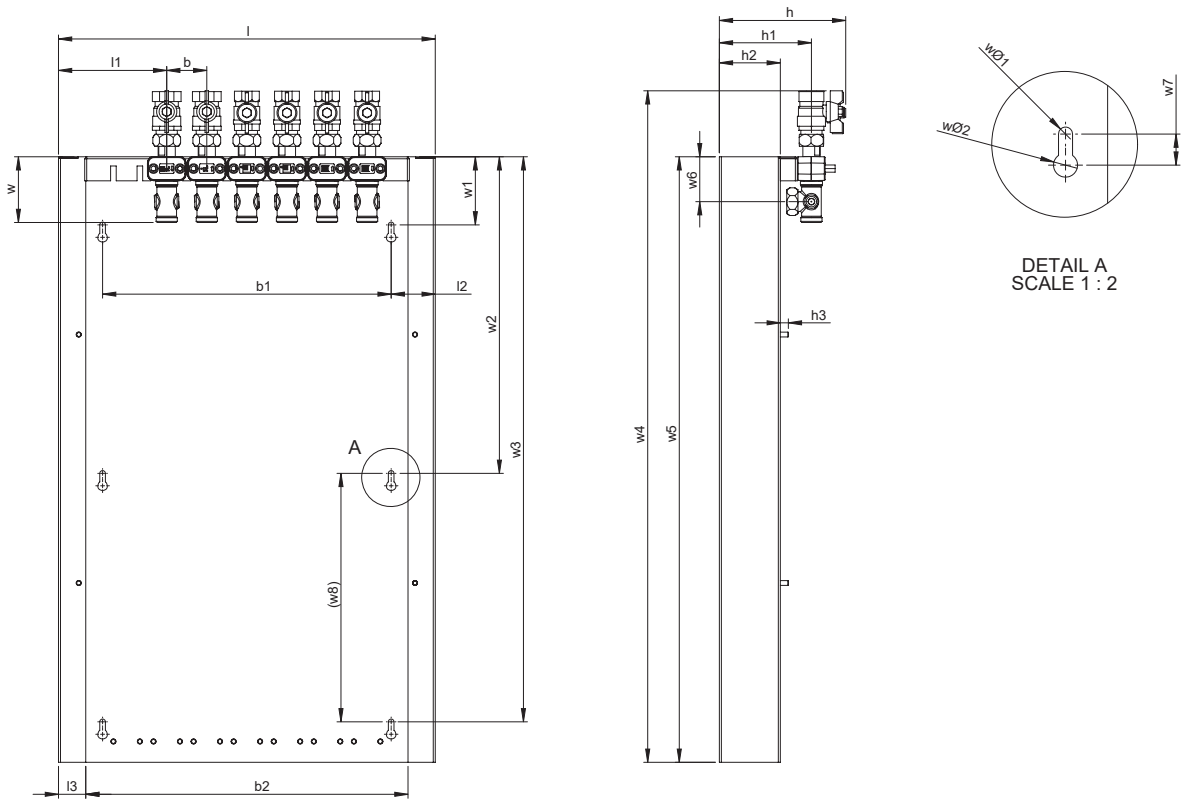
| l | l1 | l2 | w | w1 | w2 | h | h1 | h2 | b |
|-----|-------|--------|-----|-----|-----|-------|----|----|----|
| 470 | 67,75 | 167,75 | 790 | 648 | 670 | 283,5 | 39 | 30 | 50 |

6.2 UFH manifold



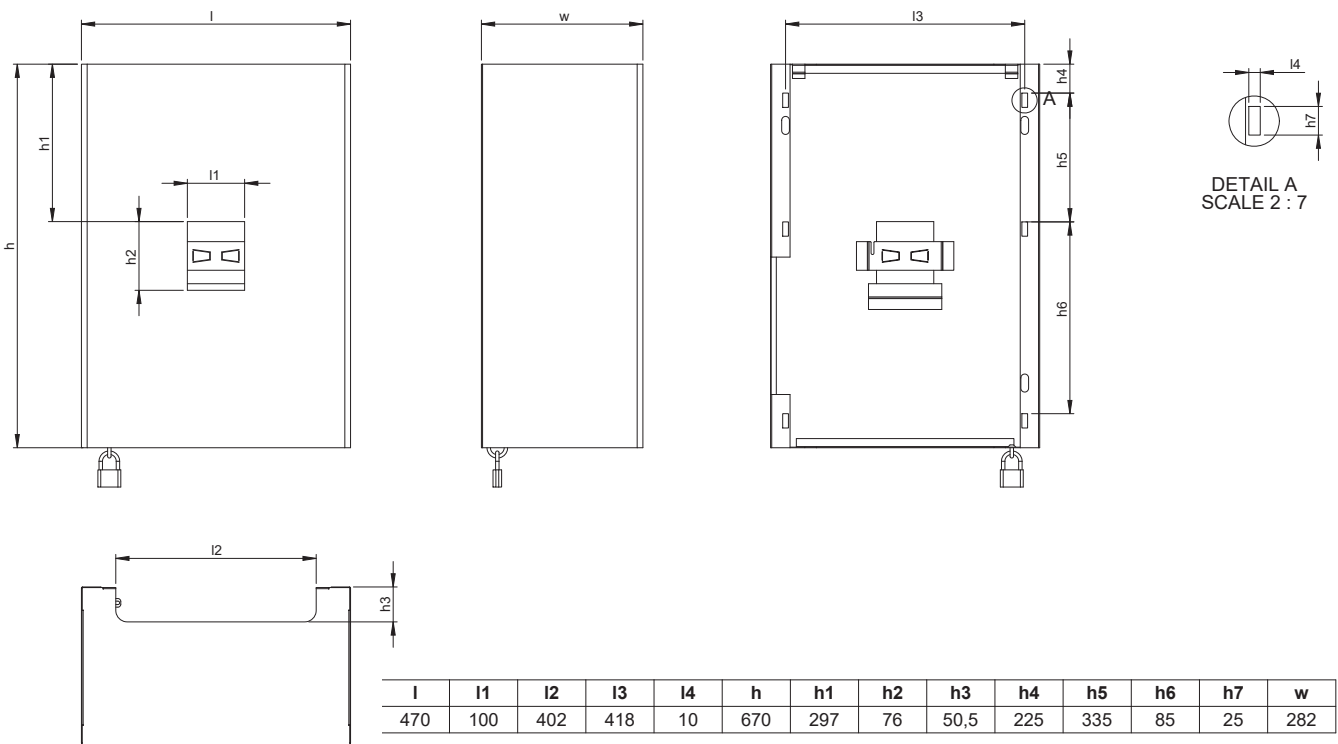
| Size | l | w | l1 | l2 | k | k1 | b | b1 | h | h1 | h2 | G | G1 |
|---------------|-----|-----|----|----|-----|-----|----|-----|----|----|----|----|-----------|
| 2 x 3/4 Euro | 210 | 355 | 87 | 73 | 135 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 3 x 3/4 Euro | 260 | 355 | 87 | 73 | 185 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 4 x 3/4 Euro | 310 | 355 | 87 | 73 | 235 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 5 x 3/4 Euro | 360 | 355 | 87 | 73 | 285 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 6 x 3/4 Euro | 410 | 355 | 87 | 73 | 335 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 7 x 3/4 Euro | 460 | 355 | 87 | 73 | 385 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 8 x 3/4 Euro | 510 | 355 | 87 | 73 | 435 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 9 x 3/4 Euro | 560 | 355 | 87 | 73 | 485 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 10 x 3/4 Euro | 610 | 355 | 87 | 73 | 535 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 11 x 3/4 Euro | 660 | 355 | 87 | 73 | 585 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 12 x 3/4 Euro | 710 | 355 | 87 | 73 | 635 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 13 x 3/4 Euro | 760 | 355 | 87 | 73 | 585 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 14 x 3/4 Euro | 810 | 355 | 87 | 73 | 635 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 15 x 3/4 Euro | 860 | 355 | 87 | 73 | 685 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |
| 16 x 3/4 Euro | 910 | 355 | 87 | 73 | 835 | 336 | 50 | 215 | 80 | 30 | 50 | 1" | 3/4" Euro |

6.3 Cabinet back plate



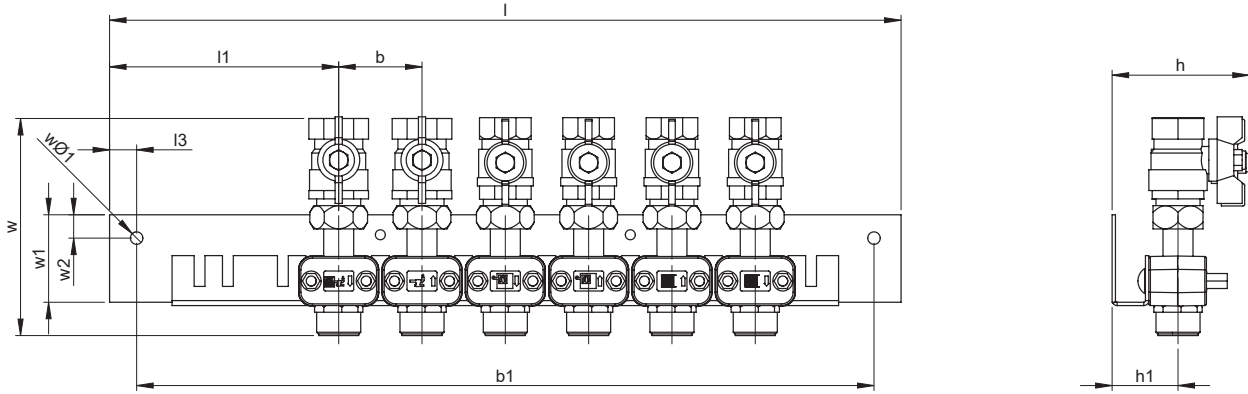
| | | | | | | | | | | |
|------|-------|-----|-----|-----|----|-----|-----|-----|-------|-----|
| l | l1 | l2 | l3 | w | w1 | w2 | w3 | w4 | w5 | w6 |
| 470 | 135 | 55 | 34 | 82 | 85 | 395 | 705 | 838 | 755,5 | 56 |
| w7 | w8 | wØ1 | wØ2 | h | h1 | h2 | h3 | b | b1 | b2 |
| 15,5 | (310) | 7 | 12 | 115 | 10 | 76 | 10 | 50 | 360 | 402 |

6.4 Cabinet cover



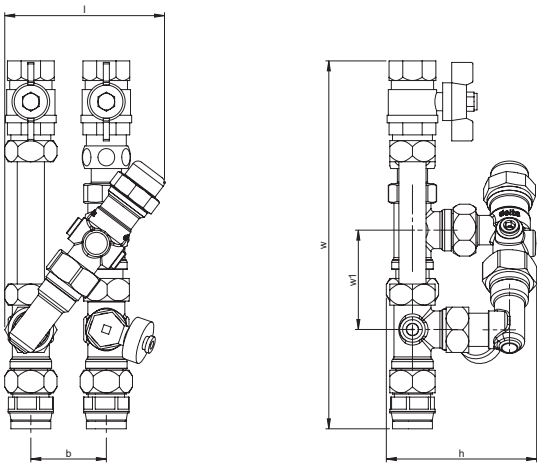
| | | | | | | | | | | | | | |
|-----|-----|-----|-----|----|-----|-----|----|------|-----|-----|----|----|-----|
| l | l1 | l2 | l3 | l4 | h | h1 | h2 | h3 | h4 | h5 | h6 | h7 | w |
| 470 | 100 | 402 | 418 | 10 | 670 | 297 | 76 | 50,5 | 225 | 335 | 85 | 25 | 282 |

6.5 Ball valves on rail top 6x



| l | l1 | l2 | l3 | w | w1 | w2 | wØ1 | h | h1 | b |
|-----|-------|----|----|-----|------|----|-----|----|----|----|
| 475 | 137,5 | 50 | 16 | 130 | 52,5 | 14 | 7 | 83 | 40 | 50 |

6.6 Flushing valve



| l | h | w | w1 | b |
|-----|-----|-----|----|----|
| 106 | 100 | 244 | 66 | 50 |

7 Troubleshooting

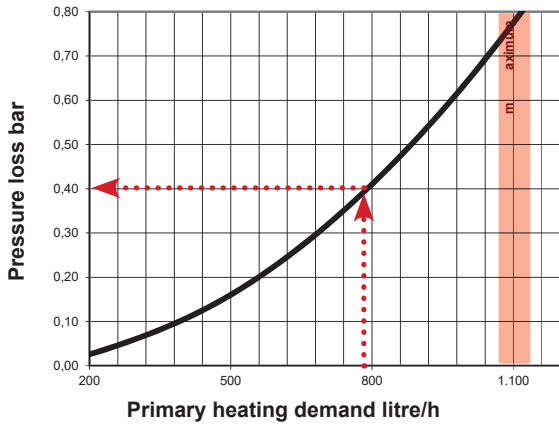
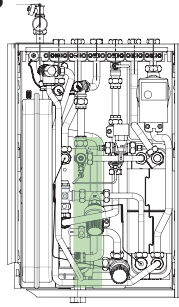
| Fault description | Cause | Solution |
|---|--|--|
| Hot water function | | |
| Hot water temperature too low or volatile | Central heating | |
| | Buffer temperature too low | Buffer temperature must be 5-10 K above hot water setpoint. |
| | Heating circuit pump type not supported | The following pump type is supported: - Wilo Yonos Para |
| | Setting for heating circuit pump is not correct | Heating circuit pump setting: Constant pressure |
| | Pump performance too low | Check pump performance |
| | Mixing valve faulty | Check mixing valve function |
| | Setting for heating circuit control is not correct | Check heating circuit control setting |
| | Heating circuit control faulty | Check heating control function |
| | Air trapped in buffer storage | Vent buffer storage tank |
| | Cold water pressure too low/too high | Cold water pressure at unit: min. 2 bar, max. 4 bar |
| | Combination heat interface unit | |
| | Strainer in primary flow dirty | Clean the strainer in the primary flow |
| | Strainer in cold water input dirty | Clean the strainer in the cold water input |
| | Insufficient differential pressure | Clean the capillary of the differential pressure control, check the differential pressure control is working |
| | Air in the system | Vent the system while dispensing |
| | Insufficient heating volume flow passes through the heat exchanger | Check the volume flow during maximum dispensing using heat meters: Combi Port PRO XU: 15 l/min Combi Port PRO XU: 21 l/min |
| | Heat meter type not supported | Use heat meter type with Qn 1.5, ultrasound |
| | Insufficient heating volume flow | Increase differential pressure |
| | Heat exchanger dirty | Clean the heat exchanger |
| | Thermostatic hot water temperature limiter: Setting is not correct | Check the thermostatic hot water temperature limiter is working and correctly set |
| PM valve does not switch over | Replace the PM valve | |
| Waiting time for hot water is too long | Check the pump setting in the central heating system | Pump setting: Constant pressure |
| | The temperature setting on the thermostatic lead module is too low | Increase the temperature setting on the thermostatic lead module |
| | The capillary on the thermostatic lead module is dirty | Clean the capillary on the thermostatic lead module |
| | No thermostatic lead module available | Retrofit the thermostatic lead module |
| Noise generation | | |
| Noise generated in the station | Pipe clamps too tight | Loosen pipe clamps |
| Whistling noises during dispensing | Cold water strainer is dirty | Clean the cold water strainer |
| | Cold water throttle valve is dirty | Clean the cold water throttle valve |
| Noise generated in the PM valve | Noise generated via a third route | Replace the MS disc, spring and locking ring using a replacement kit for PM valves, 3rd route |

| Fault description | Cause | Solution |
|---|---|--|
| Heating function | | |
| Heating system does not heat up | General | |
| | Supply temperature too low at the heat source | Check the supply temperature at the heat source |
| | Volumetric flow rate is too low | Check the fittings in the device |
| | Check the heat meter type | The heat meter type must be Qn 1.5 |
| | Check the pump setting in the central heating system | Pump setting: Constant pressure |
| | Air trapped in buffer storage | Vent buffer storage tank |
| | Insufficient differential pressure | Clean the capillary of the differential pressure control, check the differential pressure control is working |
| | Air in the system | Vent the system |
| | Radiator supply | |
| | Zone valve flow too low/too high | Check the Kv value on the zone valve |
| | Setting for room temperature controller is not correct | Check the setting for the room temperature controller |
| | Strainer is dirty | Clean the strainer |
| | Room temperature controller wiring is not correct | Check the wiring for the room temperature controller |
| | Actuator not connected to the zone valve | Actuator closed without current on the zone valve Connect this electrically |
| | Radiator thermostatic valves or return screw connections closed | Check thermostatic valves and return screw connections |
| | Heating system does not heat up | Underfloor heating controlled by setpoint values |
| Setting for setpoint value control head not correct | | Check setpoint value control head setting |
| Actuator for "second safety" not connected electrically | | Actuator for "second safety" closed without current Connect this electrically |
| Setting Kv value of zone valve is not correct | | Check the Kv value setting on the zone valve |
| Regulating screw connection bypass closed | | Check regulating screw connection bypass |
| Safety temperature limiter(STB) contact open | | Check the safety temperature limiter (STB) setting |
| Pump not connected | | Check the pump connection |
| Strainer is dirty | | Clean the strainer |
| Pump setting is not correct | | Check pump setting |
| Water underfloor heating, weather compensated | | |
| Controller setting is not correct | | Check controller setting |
| Actuator for "second safety" not connected electrically | | Actuator for "second safety" connected without current Connect this electrically |
| Setting Kv value of zone valve is not correct | | Check the Kv value setting on the zone valve |
| Regulating screw connection bypass closed | | Check regulating screw connection bypass |
| Safety temperature limiter(STB) contact open | | Check the safety temperature limiter (STB) setting |
| Probe faulty | | Replace probe |
| 3-point actuator not connected correctly | | Check the 3-point actuator connection |
| Pump not connected | | Check the pump connection |
| No hot water and no heating | | No heating/no hot water |
| | Ball valves/locking devices closed | Open locking devices |
| | Central heating circuit pump not working | Check the central heating circuit pump is working and correctly set |
| | Central strainer is dirty | Clean the central strainer |
| | Heating system is not working correctly | Check the heating system |
| Buffer storage tank is not filled | Check buffer storage tank filling | |

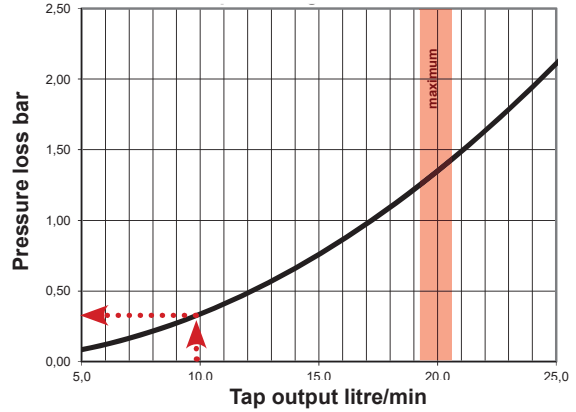
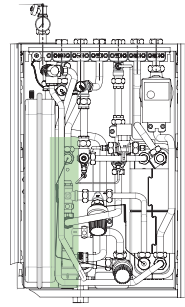
8 Performance curves

Pressure losses domestic water heat exchanger 24 plates

Heating side (primary)



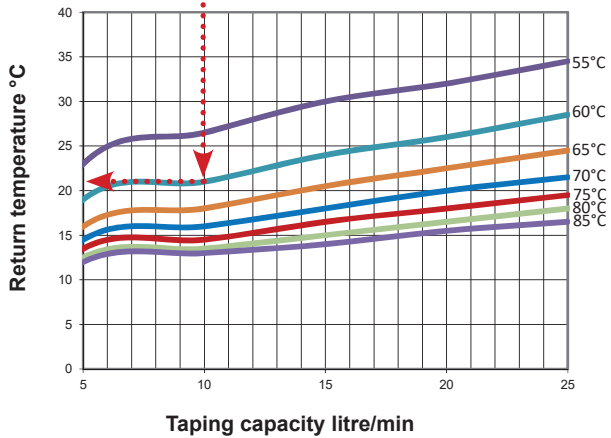
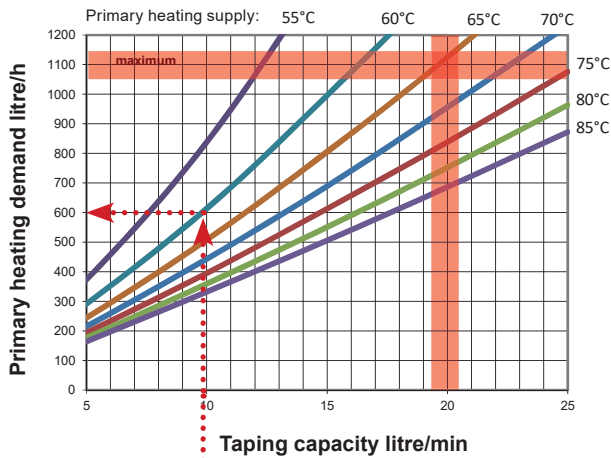
Domestic water side (secondary)



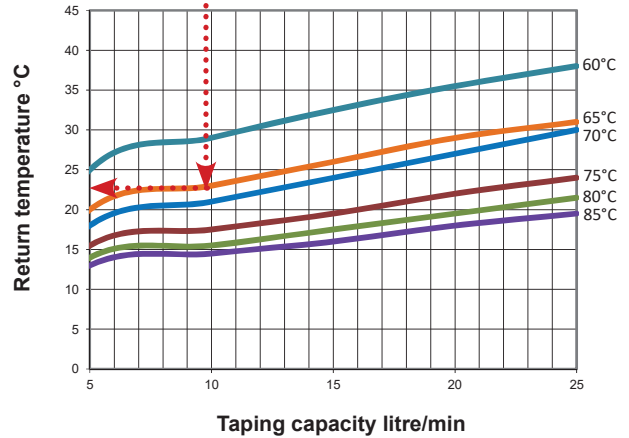
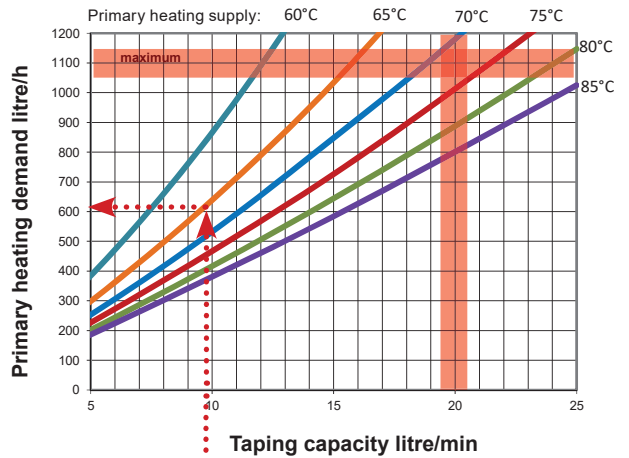
Pressure losses, e.g. 0,05 bar for heat meter Qn 1,5, have to be added.

Primary heating demand and return temperatures

Cold water warming 40 K (10 - 50 °C)

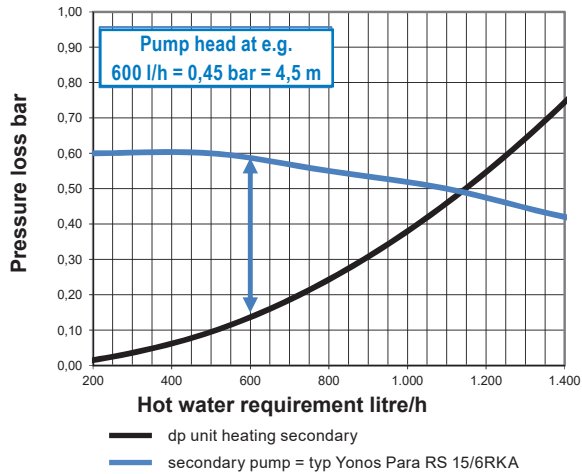
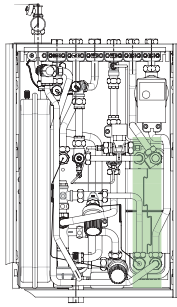


Cold water warming 45 K (10 - 55 °C)



Heat exchanger heating 24 plates

(max. primary flow rate 800 l/h PM-valve)

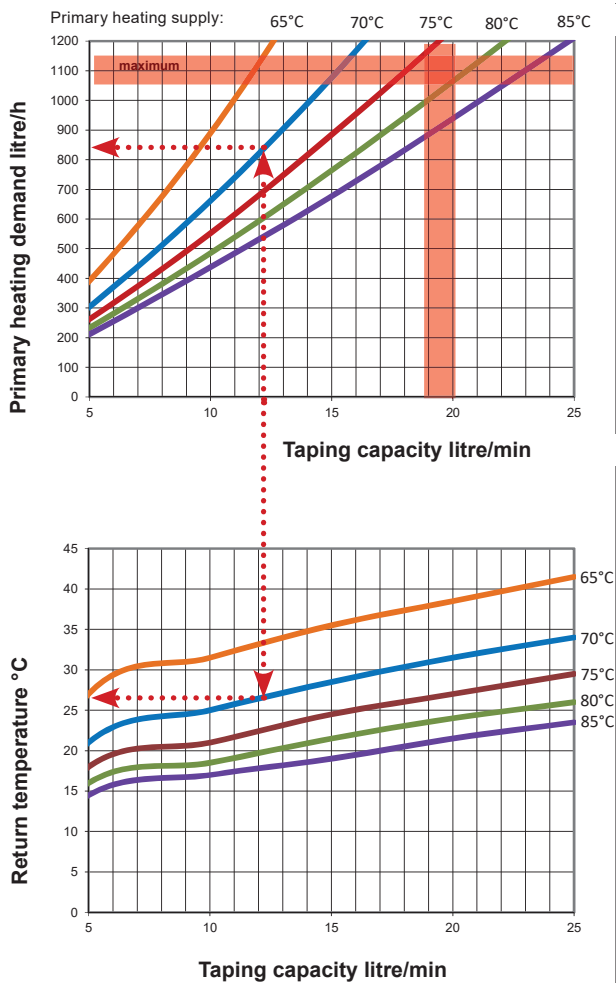


| Primary heating supply 70 °C | | | | | | | | |
|------------------------------|---------|-------|------|-------|-----------|-------|------|-----|
| | primary | | | | secondary | | | |
| KW | VL °C | RL °C | dT | l/h | VL °C | RL °C | dT | l/h |
| 1,0 | 70,0 | 41,0 | 29,0 | 29,6 | 60,0 | 40,0 | 20,0 | 43 |
| 2,0 | 70,0 | 41,0 | 29,0 | 59,3 | 60,0 | 40,0 | 20,0 | 86 |
| 4,0 | 70,0 | 41,0 | 29,0 | 118,6 | 60,0 | 40,0 | 20,0 | 172 |
| 8,0 | 70,0 | 41,5 | 28,5 | 241,4 | 60,0 | 40,0 | 20,0 | 344 |
| 10,0 | 70,0 | 42,0 | 28,0 | 307,1 | 60,0 | 40,0 | 20,0 | 430 |
| 12,0 | 70,0 | 42,0 | 28,0 | 368,5 | 60,0 | 40,0 | 20,0 | 516 |
| 15,0 | 70,0 | 43,0 | 27,0 | 477,7 | 60,0 | 40,0 | 20,0 | 645 |

| primary heating supply 60 °C | | | | | | | | |
|------------------------------|---------|-------|------|-------|-----------|-------|------|-------|
| | primary | | | | secondary | | | |
| KW | VL °C | RL °C | dT | l/h | VL °C | RL °C | dT | l/h |
| 1,0 | 60,0 | 35,5 | 24,5 | 35,1 | 45,0 | 35,0 | 10,0 | 86 |
| 2,0 | 60,0 | 35,5 | 24,5 | 70,2 | 45,0 | 35,0 | 10,0 | 172 |
| 4,0 | 60,0 | 35,5 | 24,5 | 140,4 | 45,0 | 35,0 | 10,0 | 344 |
| 8,0 | 60,0 | 35,5 | 24,5 | 280,8 | 45,0 | 35,0 | 10,0 | 688 |
| 10,0 | 60,0 | 35,5 | 24,5 | 351,0 | 45,0 | 35,0 | 10,0 | 860 |
| 12,0 | 60,0 | 35,5 | 24,5 | 421,1 | 45,0 | 35,0 | 10,0 | 1.032 |
| 15,0 | 60,0 | 35,5 | 24,5 | 526,4 | 45,0 | 35,0 | 10,0 | 1.290 |

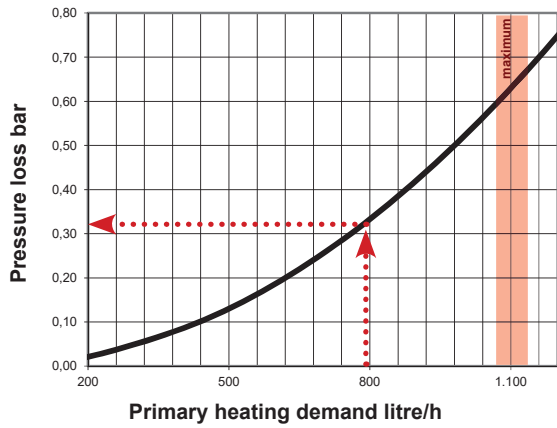
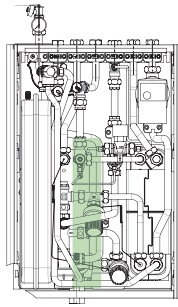
Primary heating demand and return temperatures

Cold water warming 50 K (10 - 60 °C)

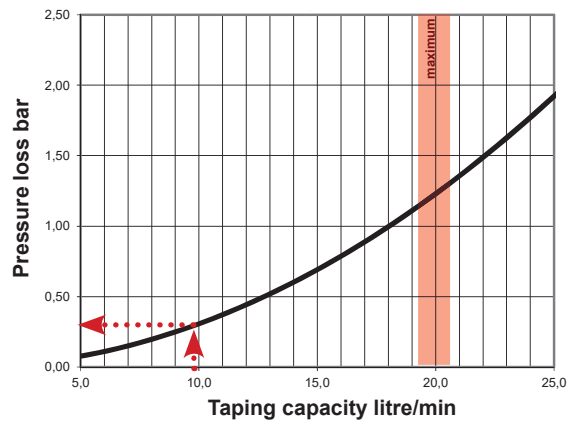
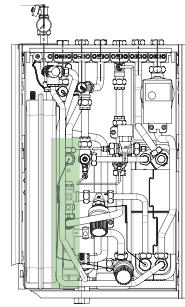


Pressure losses domestic water heat exchanger 40 plates

Heating side (primary)



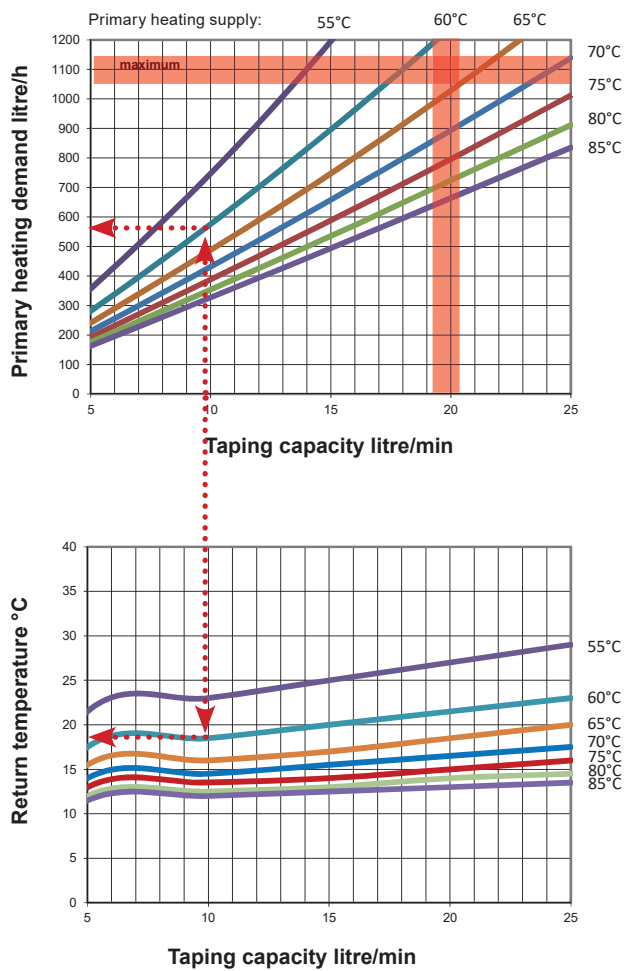
Domestic water side (secondary)



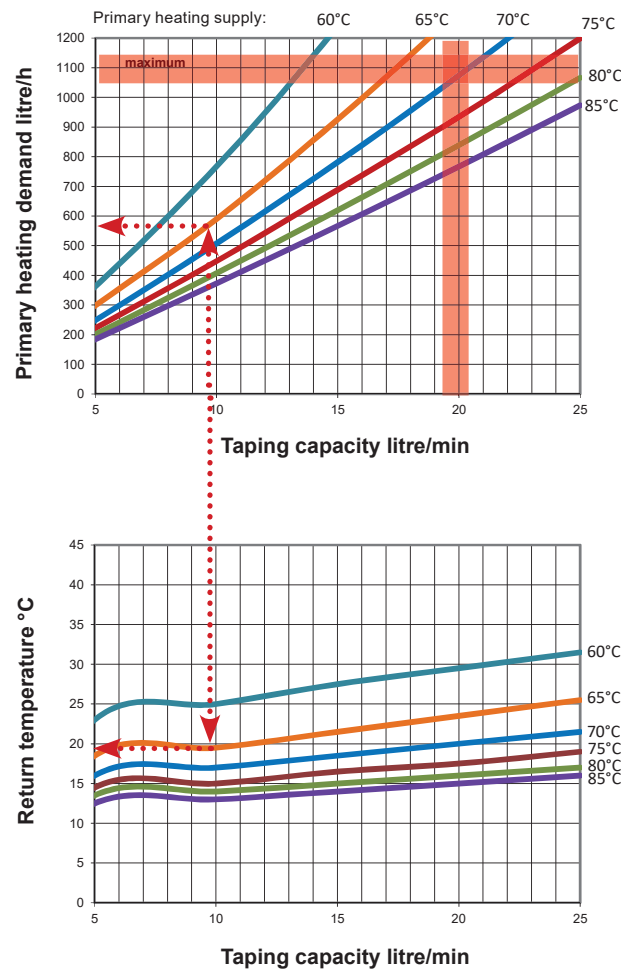
Pressure losses, e.g. 0,05 bar for heat meter Qn 1,5, have to be added.

Primary heating demand and return temperatures

Cold water warming 40 K (10 - 50 °C)

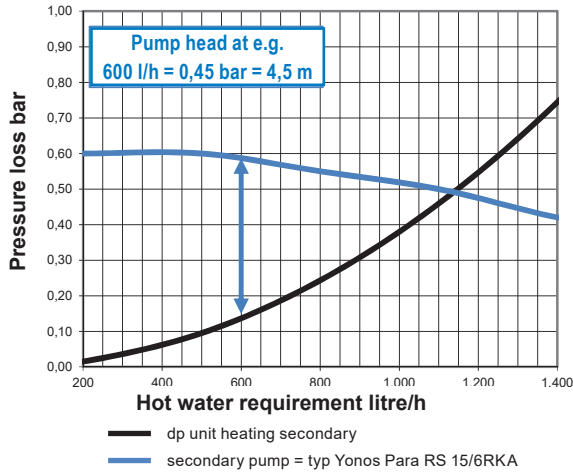
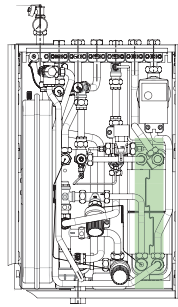


Cold water warming 45 K (10 - 55 °C)



Heat exchanger heating 24 plates

(max. primary flow rate 800 l/h PM-valve)

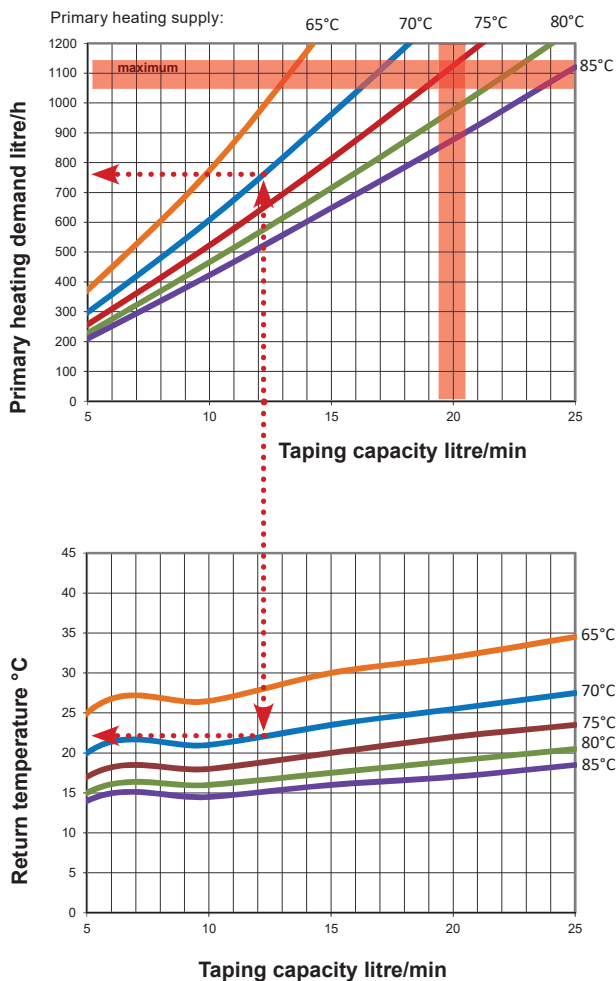


| Primary heating supply 70 °C | | | | | | | | |
|------------------------------|---------|------|------|-------|-----------|------|------|-----|
| KW | primary | | | | secondary | | | |
| | VL°C | RL°C | dT | l/h | VL°C | RL°C | dT | l/h |
| 1,0 | 70,0 | 41,0 | 29,0 | 29,6 | 60,0 | 40,0 | 20,0 | 43 |
| 2,0 | 70,0 | 41,0 | 29,0 | 59,3 | 60,0 | 40,0 | 20,0 | 86 |
| 4,0 | 70,0 | 41,0 | 29,0 | 118,6 | 60,0 | 40,0 | 20,0 | 172 |
| 8,0 | 70,0 | 41,5 | 28,5 | 241,4 | 60,0 | 40,0 | 20,0 | 344 |
| 10,0 | 70,0 | 42,0 | 28,0 | 307,1 | 60,0 | 40,0 | 20,0 | 430 |
| 12,0 | 70,0 | 42,0 | 28,0 | 368,5 | 60,0 | 40,0 | 20,0 | 516 |
| 15,0 | 70,0 | 43,0 | 27,0 | 477,7 | 60,0 | 40,0 | 20,0 | 645 |

| Primary heating supply 60 °C | | | | | | | | |
|------------------------------|---------|------|------|-------|-----------|------|------|-------|
| KW | primary | | | | secondary | | | |
| | VL°C | RL°C | dT | l/h | VL°C | RL°C | dT | l/h |
| 1,0 | 60,0 | 35,5 | 24,5 | 35,1 | 45,0 | 35,0 | 10,0 | 86 |
| 2,0 | 60,0 | 35,5 | 24,5 | 70,2 | 45,0 | 35,0 | 10,0 | 172 |
| 4,0 | 60,0 | 35,5 | 24,5 | 140,4 | 45,0 | 35,0 | 10,0 | 344 |
| 8,0 | 60,0 | 35,5 | 24,5 | 280,8 | 45,0 | 35,0 | 10,0 | 688 |
| 10,0 | 60,0 | 35,5 | 24,5 | 351,0 | 45,0 | 35,0 | 10,0 | 860 |
| 12,0 | 60,0 | 35,5 | 24,5 | 421,1 | 45,0 | 35,0 | 10,0 | 1.032 |
| 15,0 | 60,0 | 35,5 | 24,5 | 526,4 | 45,0 | 35,0 | 10,0 | 1.290 |

Primary heating demand and return temperatures

Cold water heat up 50 K (10 - 60 °C)





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Uponor GmbH

Industriestraße 56

D-97437 Hassfurt, Germany

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Production Uponor/KeL

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