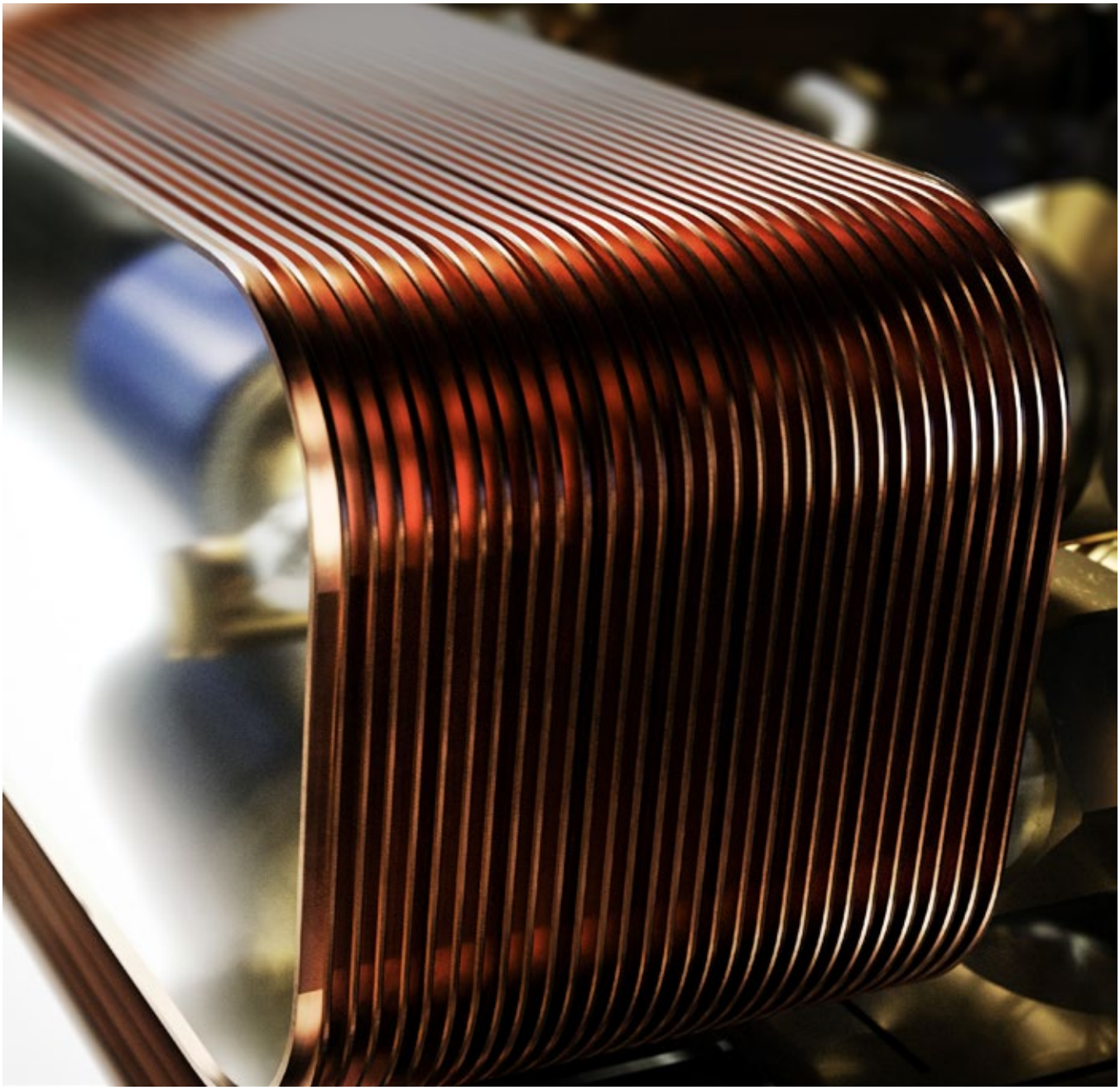
Uponor Combi Port and Aqua Port

EN Technical Information



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Foreword

General guidelines for the installation of heating and sanitary systems from the 2-pipe concept with heat interface units.

Energy efficiency and sustainability are becoming increasingly important due to rising energy prices. In order to meet these targets and to keep them up to date in the future, it is necessary to create guidelines for maintaining economic efficiency.

These guidelines are not simply notional or arbitrary, but are the result of many years of actual recordings and experiences and are reinforced by the use of monitoring with professionally sound values for how heating systems should/ should not be operated.

After all, we need data and facts to draw conclusions on choosing the perfect heating hot water supply system or better still on how systems should be modified, adjusted and optimised.

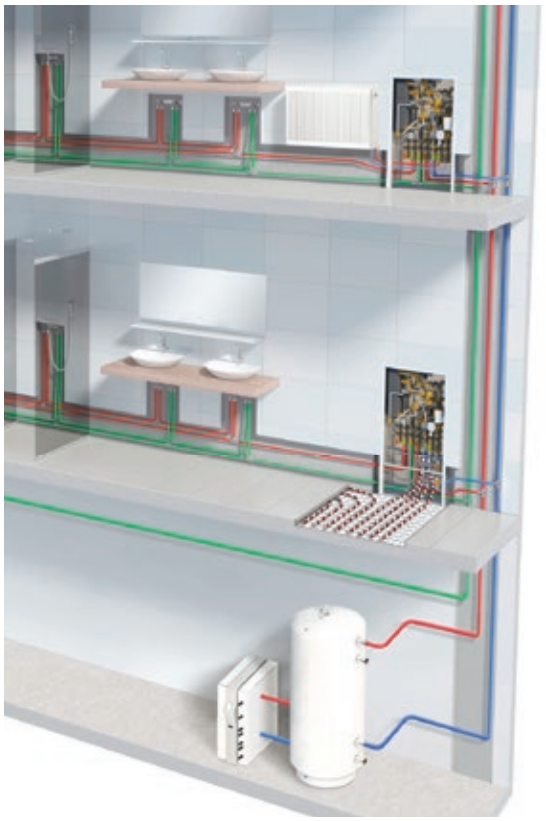
In order to achieve overall satisfaction, all players must pull together, starting with the industry which must provide optimum system concepts, engineering planning which must develop these concepts, the builders who are prepared to implement forward-looking projects across generations, and, last but not least the installers who carry out the work to a high level of quality.

The benefits of decentralised generation of hot drinking water

Comparison between a 2-pipe system with heat interface units and a conventional 4-pipe system with central hot water preparation.

Decentralised heating of drinking water

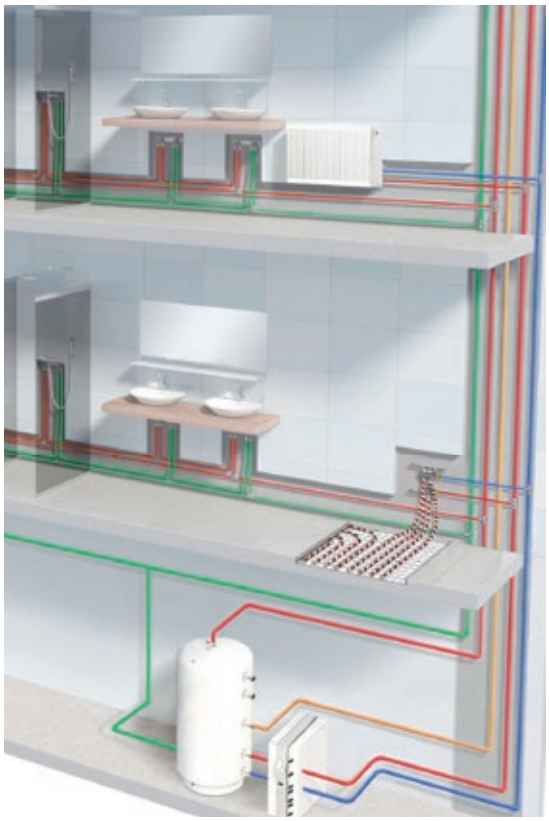
- Decentralised flow heater, giving legal security to residential development operating companies.
- Saving on hot drinking water and circulation pipes from the central heating system to the residential units.
- Low system temperatures in the building piping network, as hot drinking water pipes and circulation pipes are not required.



Centralised drinking water storage

- Large system* subject to mandatory testing by residential development operating companies.
- Increased effort for pipe network, as hot drinking water pipes and circulation pipes are required.
- High temperatures in the building piping network in order to maintain drinking water hygiene.

*according to German Federal Drinking Water Ordinance (TrinkwV) Article 14



58 % energy saving with 2-pipe systems compared to central domestic hot water systems*

* Final report on the project: "Methods for reducing conventionally generated heat distribution losses in solar-supported multi-family homes", acronym: "MFH-re-Net", funding code: 03ET1194A.

The report is available to download from www.uponor.com.

Further benefits

- No need to store drinking water in service water tanks
- No need for mandatory testing according to the German Federal Drinking Water Ordinance (TrinkwV)
- Drinking water heating using the through-flow principle
- Heating distribution circuit integrated in the station ready for installation
- Pump modules with injection circuit for radiant heating systems
- Residential unit heating system available all year round with individual regulation

Securing decentralised water quality - hot water without the risk of legionella

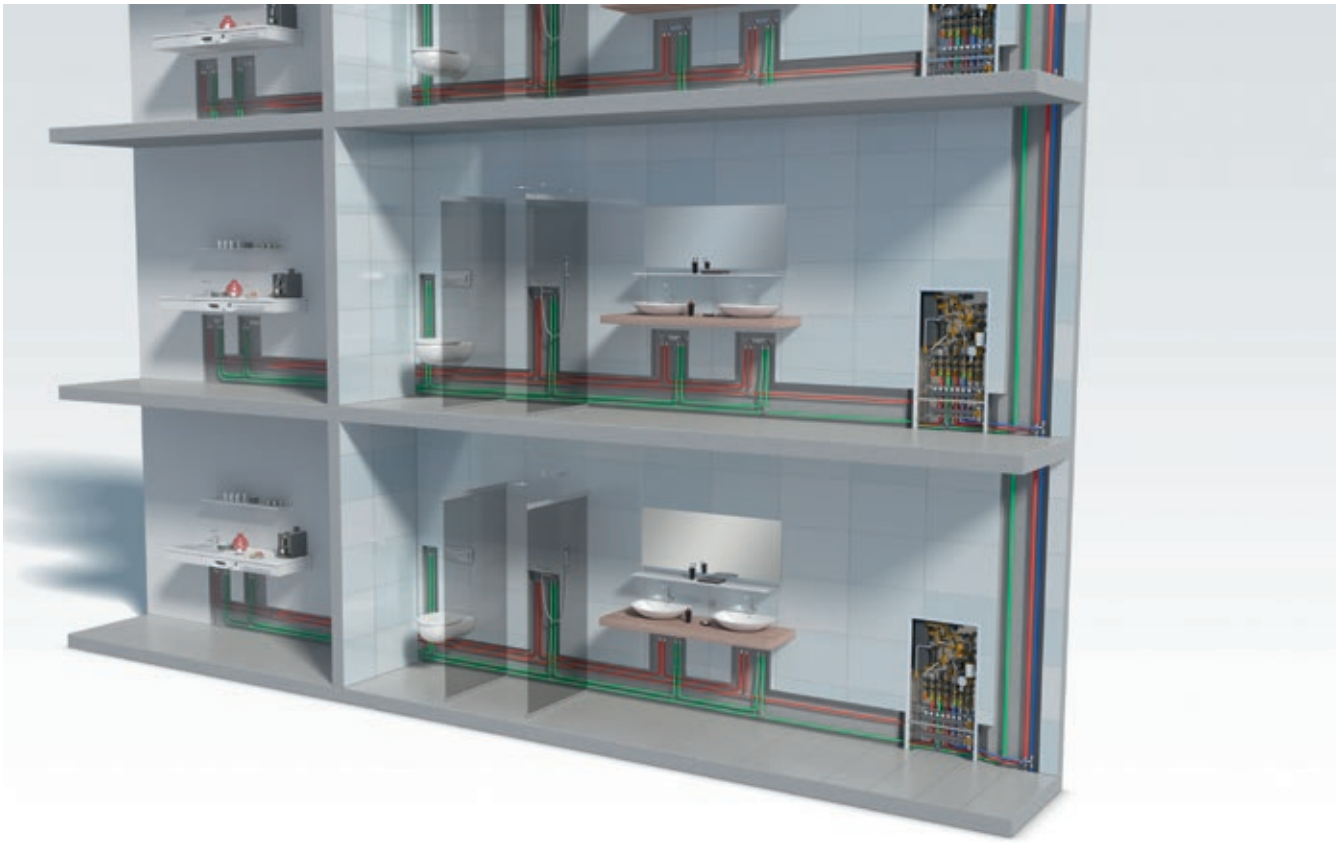
One of the key factors that influence perfect drinking water quality is the avoidance of long holding times and unfavourable temperature ranges. Decentralised heat interface units and loop installations offer maximum security, so that the risk of microbial contamination can be minimised.

The requirements for the safety and purity of drinking water are clearly defined. The planning, construction and operational implementation is often associated with problems, as is frequently revealed by the large number of findings over the action value for Legionella. Added to this is the increased demand among consumers for an unlimited supply of hot water from the drinking water system at any time, preferably without any long delays.

Two criteria are key for optimum drinking water hygiene, according to the generally acknowledged rules of the trade: Regular water exchange within the entire piping system, as well as the maintenance of the required temperatures in the cold water, hot water and circulation pipes. In order to meet these requirements, from the transfer point in the building to the point of discharge, planners, installers and operators are jointly required to ensure that planning, installation and commissioning complies with regulations and legal requirements. Although this may sound complex and highly theoretical at first, life is made easier for all those involved in the construction industry if the risk of contamination is consistently ruled out in the planning phase. Anyone who decides on a domestic hot water supply in accordance with the flow principle with decentralised heat interface units eliminates risks such as legionella growth in cooler strata of central drinking water tanks or extensive circulation pipes.

In accordance with DIN 1988-200, in decentralised fresh hot water technology, the heat for hot water production is no longer stored in the drinking water itself but in a hygienically harmless form in heating buffer storage tanks. In addition, hot water distribution and circulation pipes in the building, which may cause microbial contamination due to insufficient insulation or poor hydraulic balancing, are no longer needed. A loop-through ring installation is recommended for the hygienic distribution of hot and cold drinking water on

individual floors. This not only allows small line cross-sections and water volumes, but also enables flow through all parts of the pipe, regardless of which tapping points are used frequently, infrequently or not at all. This prevents stagnation in the single-storey distribution system during normal consumption.



In apartment buildings, a separate heat interface unit handles hygienic hot water preparation for each usage unit. An efficient heat exchanger not only ensures a high level of hot water convenience, but also low return temperatures, which in turn contribute to the energy-efficient operation of the heating system. It is also important for the operator that it should be easy to record consumption in every usage unit by means of the directly integrated water and heat meters. The heat interface units are connected directly to the heating supply line in the 2-pipe system so that there is no need for the central hot water and circulation pipes in the supply shafts. This reduces the size of the supply shafts by approx. 40%. As a result, radiated loss is avoided in the lines and in the no longer required drinking water storage tank. This not only increases energy efficiency, but also - much more importantly for hygiene - also prevents stagnation in the cold water line. Here, in contrast to the central hot water preparation system, a significantly higher water exchange takes place, as the cold water pipe covers the total requirement (hot and cold) of the connected usage units.

Buffering heat instead of storing it in the drinking water

In addition, decentralised fresh water technology can effectively counteract the risk of contamination in drinking water. The circulation or storage of heated drinking water is completely avoided in decentralised fresh water stations, if possible. Only as much drinking water is heated to tap temperature, as the user needs right now. The required energy is not stored in the form of drinking water, but rather in buffer tanks that use heating water as a medium. Thus, the concept also meets the requirements of DIN 1988-200, which stipulates: "If energy is to be stored, it should not be stored in the drinking water, but instead the technique of storing energy in the heating system, e.g. through buffer storage, is to be preferred."

Conditions for the use of heat exchangers in the drinking water sector

Conditions for use

- When heat interface units are operated in drinking water installations, care must be taken to avoid high pressure surges (for example due to fittings, booster systems, etc.). In the case of fittings with very short opening and closing times, there are always strong short-term pressures that exceed the specifications of DIN 1988-200, section 3.4.3, inadmissibly.

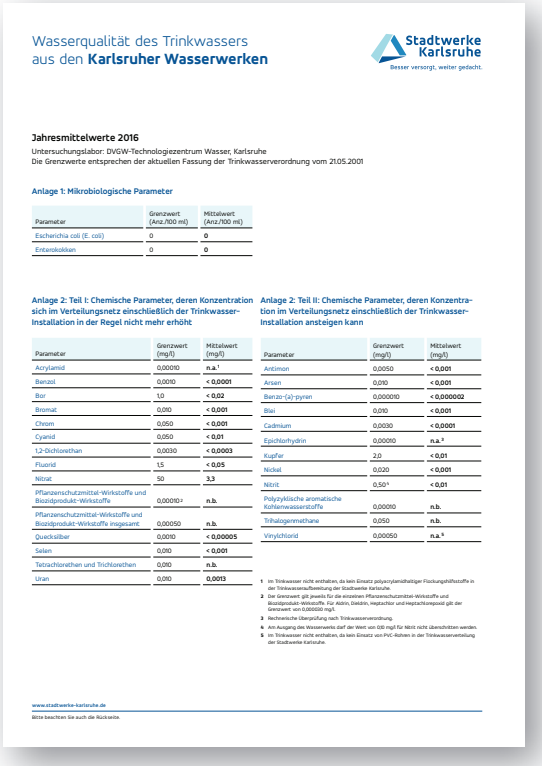
The following specifications must therefore be observed when operating the drinking water installation.

- The positive pressure surge (when closing the fitting) must not exceed 2 bar.
- Negative pressure surges (when opening the valve) must not be more than 50% lower than the flow pressure created after opening.

Damage to components such as heat exchangers (solder cracks, deformation of exchanger plates, leaks, etc.) may result in a breach of these DIN specifications. DVGW worksheet W 303 recommends the most effective and reliable measure to optimise pressure at the point of origin. The operation and maintenance of the systems must be in accordance with DIN EN 806-5.

Prior to the use of heat interface units, a water analysis of the application area is mandatory for the stainless steel plate heat exchangers. This is usually obtained from the local water utility company.

Here is an example:



Wasserqualität des Trinkwassers
aus den **Karlsruher Wasserwerken**

Stadtwerke Karlsruhe
Besser versorgt, weiter gedacht.

Jahresmittelwerte 2016

Untersuchungslabor: DVGW-Technologiezentrum Wasser, Karlsruhe
Die Grenzwerte entsprechen der aktuellen Fassung der Trinkwasserverordnung vom 21.05.2001

Anlage 1: Mikrobiologische Parameter

Parameter	Grenzwert (Anz./100 ml)	Mittelwert (Anz./100 ml)
Escherichia coli (E. coli)	0	0
Enterokokken	0	0

Anlage 2: Teil I: Chemische Parameter, deren Konzentration sich im Verteilungsnetz einschließlich der Trinkwasser-Installation in der Regel nicht mehr erhöht

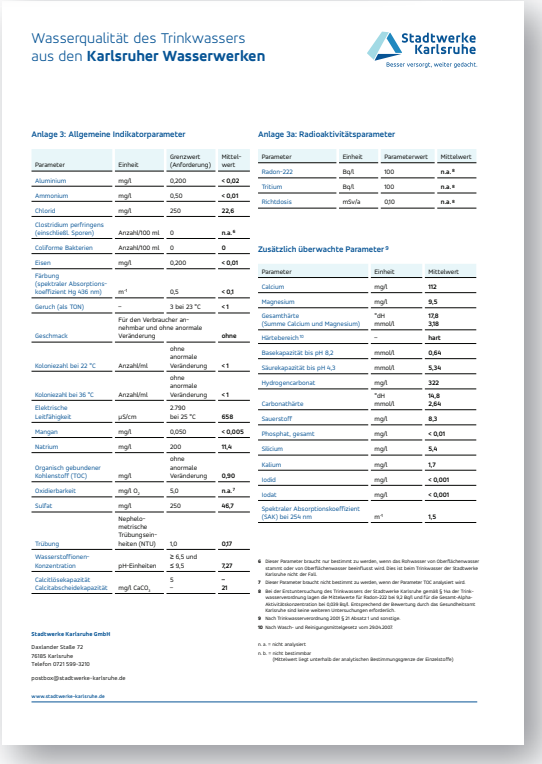
Parameter	Grenzwert (mg/l)	Mittelwert (mg/l)
Acrylamid	0,00010	n.a.[1]
Benzol	0,0010	< 0,0001
Bor	1,0	< 0,02
Bromat	0,010	< 0,001
Chrom	0,050	< 0,001
Cyanid	0,050	< 0,01
1,2-Dichlorethan	0,0030	< 0,0003
Fluorid	1,5	< 0,05
Nitrat	50	3,3
Pflanzenschutzmittel-Wirkstoffe und Biozidprodukt-Wirkstoffe	0,00010[2]	n.b.
Pflanzenschutzmittel-Wirkstoffe und Biozidprodukt-Wirkstoffe insgesamt	0,00050	n.b.
Quecksilber	0,0010	< 0,00005
Selen	0,010	< 0,001
Tetrachlorethen und Trichlorethen	0,010	n.b.
Uran	0,010	0,0013

Anlage 2: Teil II: Chemische Parameter, deren Konzentration im Verteilungsnetz einschließlich der Trinkwasser-Installation ansteigen kann

Parameter	Grenzwert (mg/l)	Mittelwert (mg/l)
Antimon	0,0050	< 0,001
Arsen	0,010	< 0,001
Benzo-(a)-pyren	0,000010	< 0,000002
Blei	0,010	< 0,001
Cadmium	0,0030	< 0,0001
Epichlorhydrin	0,00010	n.a.[3]
Kupfer	2,0	< 0,01
Nickel	0,020	< 0,001
Nitrit	0,50[4]	< 0,01
Polyzyklische aromatische Kohlenwasserstoffe	0,00010	n.b.
Trihalogenmethane	0,050	n.b.
Vinylchlorid	0,00050	n.a.[5]

1 Im Trinkwasser nicht enthalten, da kein Einsatz polyacrylamidhaltiger Flockungshilfsstoffe in der Trinkwasseraufbereitung der Stadtwerke Karlsruhe.
2 Der Grenzwert gilt jeweils für die einzelnen Pflanzenschutzmittel-Wirkstoffe und Biozidprodukt-Wirkstoffe. Für Aldrin, Dieldrin, Heptachlor und Heptachlorepoxid gilt der Grenzwert von 0,000030 mg/l.
3 Rechnerische Überprüfung nach Trinkwasserverordnung.
4 Am Ausgang des Wasserwerks darf der Wert von 0,10 mg/l für Nitrit nicht überschritten werden.
5 Im Trinkwasser nicht enthalten, da kein Einsatz von PVC-Rohren in der Trinkwasserverteilung der Stadtwerke Karlsruhe.

www.stadtwerke-karlsruhe.de
Bitte beachten Sie auch die Rückseite.



Wasserqualität des Trinkwassers
aus den **Karlsruher Wasserwerken**

Stadtwerke Karlsruhe
Besser versorgt, weiter gedacht.

Anlage 3: Allgemeine Indikatorparameter

Parameter	Einheit	Grenzwert (Anforderung)	Mittelwert
Aluminium	mg/l	0,200	< 0,02
Ammonium	mg/l	0,50	< 0,01
Chlorid	mg/l	250	22,6
Clostridium perfringens (einschließl. Sporen)	Anzahl/100 ml	0	n.a.[6]
Coliforme Bakterien	Anzahl/100 ml	0	0
Eisen	mg/l	0,200	< 0,01
Färbung (spektraler Absorptionskoeffizient Hg 436 nm)	m^{-1}	0,5	< 0,1
Geruch (als TON)	–	3 bei 23 °C	< 1
Geschmack	Für den Verbraucher annehmbar und ohne anormale Veränderung		ohne
Koloniezahl bei 22 °C	Anzahl/ml	ohne anormale Veränderung	< 1
Koloniezahl bei 36 °C	Anzahl/ml	ohne anormale Veränderung	< 1
Elektrische Leitfähigkeit	µS/cm	2.790 bei 25 °C	658
Mangan	mg/l	0,050	< 0,005
Natrium	mg/l	200	11,4
Organisch gebundener Kohlenstoff (TOC)	mg/l	ohne anormale Veränderung	0,90
Oxidierbarkeit	mg/l O_2	5,0	n.a.[7]
Sulfat	mg/l	250	46,7
Trübung	Nephelometrische Trübungseinheiten (NTU)	1,0	0,17
Wasserstoffionenkonzentration	pH-Einheiten	≥ 6,5 und ≤ 9,5	7,27
Calcitlösekapazität Calcitabscheidekapazität	mg/l $CaCO_3$	5 –	– 21

Anlage 3a: Radioaktivitätsparameter

Parameter	Einheit	Parameterwert	Mittelwert
Radon-222	Bq/l	100	n.a.[8]
Tritium	Bq/l	100	n.a.[8]
Richtdosis	mSv/a	0,10	n.a.[8]

Zusätzlich überwachte Parameter[9]

Parameter	Einheit	Mittelwert
Calcium	mg/l	112
Magnesium	mg/l	9,5
Gesamthärte (Summe Calcium und Magnesium)	°dH mmol/l	17,8 3,18
Härtebereich[10]	–	hart
Basekapazität bis pH 8,2	mmol/l	0,64
Säurekapazität bis pH 4,3	mmol/l	5,34
Hydrogencarbonat	mg/l	322
Carbonathärte	°dH mmol/l	14,8 2,64
Sauerstoff	mg/l	8,3
Phosphat, gesamt	mg/l	< 0,01
Silicium	mg/l	5,4
Kalium	mg/l	1,7
Iodid	mg/l	< 0,001
Iodat	mg/l	< 0,001
Spektraler Absorptionskoeffizient (SAK) bei 254 nm	m^{-1}	1,5

6 Dieser Parameter braucht nur bestimmt zu werden, wenn das Rohwasser von Oberflächenwasser stammt oder von Oberflächenwasser beeinflusst wird. Dies ist beim Trinkwasser der Stadtwerke Karlsruhe nicht der Fall.
7 Dieser Parameter braucht nicht bestimmt zu werden, wenn der Parameter TOC analysiert wird.
8 Bei der Erstuntersuchung des Trinkwassers der Stadtwerke Karlsruhe gemäß § 9a der Trinkwasserverordnung lagen die Mittelwerte für Radon-222 bei 9,2 Bq/l und für die Gesamt-Alpha-Aktivitätskonzentration bei 0,039 Bq/l. Entsprechend der Bewertung durch das Gesundheitsamt Karlsruhe sind keine weiteren Untersuchungen erforderlich.
9 Nach Trinkwasserverordnung 2001 § 21 Absatz 1 und sonstige.
10 Nach Wasch- und Reinigungsmittelgesetz vom 29.04.2007

n. a. = nicht analysiert
n. b. = nicht bestimmbar (Mittelwert liegt unterhalb der analytischen Bestimmungsgrenze der Einzelstoffe)

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Source: www.stadtwerke-karlsruhe.de;
Download "Information Flyer for Water Quality of Karlsruhe Drinking Water"

Specifications for plate heat exchangers

Limit values for drinking water quality

The soldered plate heat exchanger consists of embossed stainless steel plates 1.4404/1.4401 or SA240 316L/SA240 316. Thus, the corrosion pattern of stainless steel and copper or nickel solder must be considered.

The heat exchangers in the heat interface units are manufactured with copper-welded stainless steel plates as standard. Before using these heat exchangers, the building services engineer or the installation contractor must check whether the questions of corrosion protection and scale formation have been adequately taken into account in accordance with DIN 1988-200, Paragraph 12.3.2 and the current drinking water analyses.

This involves the following points:

- **Selection of the materials**
- **Consideration of corrosion-related change in drinking water quality**
- **Implementation of the installation**
- **Consideration of the expected operating conditions**

With high electrical conductivity of the drinking water of more than 500 µS/cm, corrosion can occur on copper materials, possibly damaging the copper solder in the heat exchangers.

For electrical conductivities of > 500 µS/cm, we therefore recommend the use of nickel-welded stainless steel plate heat exchangers.

The following values should be adhered to for water constituents and characteristic values (1.4404 / SA240 316L):

Water constituents + characteristic values	**Unit**	Plate heat exchanger **copper-welded**	Plate heat exchanger **Vaclnox-welded**	Plate heat exchanger **Stainless steel screw connection**
pH value		* 7-9 (under consideration of the SI index)	6 - 10	6 - 10
Saturation index SI (delta pH value)		-0.2 < 0 < +0.2	No definition	No definition
General hardness total	°dH	6 - 15	6 - 15	6 - 15
Conductivity	µS/cm	10...500	No definition	No definition
Filterable materials	mg/l	< 30	< 30	< 30
** Chlorides	mg/l	no chlorides permissible above 100 °C		
Free chlorine	mg/l	< 0.5	< 0.5	< 0.5
Hydrogen sulphide (H_2S)	mg/l	< 0.05	No definition	No definition
Ammonia (NH_3/NH_4+)	mg/l	< 2	No definition	No definition
Sulphate	mg/l	< 100	< 400	No definition
Hydrogen carbonate	mg/l	< 300	No definition	No definition
Hydrogen carbonate / sulphate	mg/l	< 1.0	No definition	No definition
Sulphide	mg/l	< 1	< 7	No definition
Nitrate	mg/l	< 100	No definition	No definition
Nitrite	mg/l	< 0.1	No definition	No definition
Iron, dissolved	mg/l	< 0.2	< 0.2	< 0.2
Manganese	mg/l	< 0.1	No definition	No definition
Free aggressive carbonic acid	mg/l	< 20	No definition	No definition

**
At 20 °C max. 800 mg/l
At 25 °C max. 600 mg/l
At 50 °C max. 200 mg/l
At 100 °C max. 0 mg/l

*
The pH value must be greater than 7.4 sein. If the pH is between 7.0 and 7.4, the TOC value must be less than 1.5 g/m³ or less than 1.5 mg/l.

The stated values are guide values that may differ under certain operating conditions. If you have any questions, please give us a call.

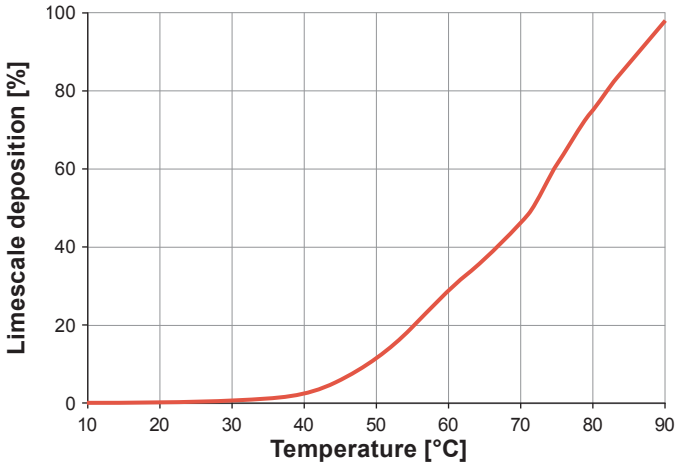
Source: Kelvion Brazed PHE GmbH

Lime precipitation in the water, depending on the temperature

Lime precipitation

Temperature [°C]	10	20	30	40	50	60	70	80	90
Limescale deposition [%]	0	0.59	1.18	2.94	11.76	29.41	47.06	76.47	100

Limescale deposition as water heats up

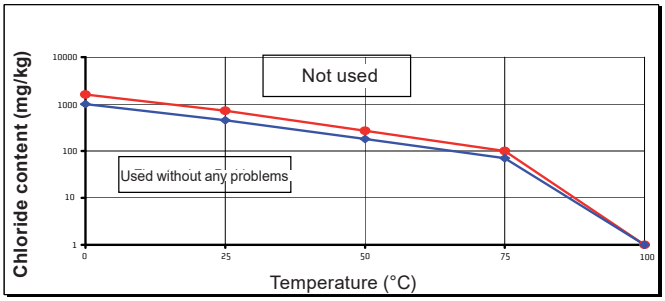


Limit values in chlorine content with stainless steel

Caution

These also apply to pipelines in the units and other stainless steel components.

The stated values are guide values that may differ under certain operating conditions.



Permissible chlorine content, depending on the temperature (1.4404 / SA240 316L).

Planning rules and regulations – Installation and operation of systems with heat interface units

Numerous regulations apply to the planning and construction of plants, as well as to operators.. A small selection of important rules and regulations and rules are summarized below.

Codes of practice for drinking water installations
This Journal of Laws makes a fundamental distinction between large-scale installations and small installations. The requirements for small installations apply to heat interface units.

Article 8 (12):
"Large-scale installation for heating drinking water" An installation with

a) Tank-based drinking water heating system or central through-flow drinking water heating system, each with a capacity of more than 400 litres or

b) a contents of more than three litres in at least one pipeline between the outlet of the drinking water heater and the outlet; the contents of a circulation line are not taken into account. Corresponding systems in single-family or two-family houses do not count as large-scale systems for drinking water heating.

There is no obligation to carry out inspections according to Article 14b if water consumption is less than 10 cubic metres per day.

DVGW Worksheet W 551, published 2004
DVGW Worksheet W 551 should also be listed here. The definition in the Codes of practice for drinking water installations is also used here. Specifications for heat interface units are not provided here under the 3-litre rule.

Small systems
Small systems are all systems with tank-based drinking water heaters or central through-flow drinking water heaters in:
- Single-family and two-family homes regardless of the capacity of the drinking water heater and pipeline
- Systems with drinking water heaters with a content less than/equal to 400 litres and a capacity less than or equal to 3 litres in each pipeline between the outlet of the drinking water heater and the tapping point.
- Any circulation line will not be considered.

Drinking water heating system requirements
Decentralised through-flow drinking water heating systems can be used without further measures if the line volume connected downstream of the drinking water heating system does not exceed 3 litres.

In order to illustrate in tabular form, what a water capacity of 3 litres in the pipelines means:

Pipeline capacity – threaded pipe according to DIN 2440

inches	3/8"	1/2"	3/4"
Nominal width [mm]	10	15	20
External diameter [mm]	17.2	21.3	26.9
Contents [l/m]	0.123	0.201	0.366
Installation length up to 3 litres [m]	24.39	14.92	8.19

Pipeline capacity – copper pipe

Nominal width [mm]	10	12	15	18
Wall thickness [mm]	0.8	1	1	1
Contents [l/m]	0.06	0.08	0.13	0.2
Installation length up to 3 litres [m]	50	37.5	23.07	15

Pipeline capacity – Uponor composite pipe

Dimensions [mm]	16 x 2	18 x 2	20 x 2.25	25 x 2,5	32 x 3
DN	12	14	15	20	25
Pipeline capacity [l/m]	0.113	0.154	0.189	0.314	0.531
Installation length up to 3 litres [m]	26.5	19.5	15.9	9.6	5.6

General technical information

Technical data for consumer and drinking water stations (all stations must be earthed).

Max. operating temperature	85 °C
Max. primary differential pressure in the heating system	2.5 bar
Operating pressure	PN 10
Including Heating circuit pump and manifold	PN6 to PN10
Minimum cold water pressure	approx. 2 bar
Connections, flat-sealing	3/4" IG or 1"

Heating system
The heating system must be planned and implemented in accordance with accepted engineering practices, as well as the DIN standards and VDI guidelines described below. If necessary, please observe the applicable and comparable country-specific regulations and standards.

The list is not necessarily exhaustive.
- DIN EN 6946 Calculation of the U-value
- DIN EN 12831 Calculation of heat load
- DIN EN 128282 Heating systems in buildings - Planning of water-based heating systems
- DIN 18380 VOB / C
- DIN 4109 Sound insulation in buildings
- TRGI Technical Rules for Gas Installation
- VDI 2035 Conditioning of heating water
- EneV Energy Saving Directive

We recommend that sludge and air separators should be fitted. The expansion vessel must be adapted and adjusted to the system.

Drinking water delivery
The drinking water installation must be planned and implemented in accordance with the German Infection Protection Ordinance, in particular Article 37 of the German Infection Protection Act, 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 directives 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
- Regulations of local water supply companies
- The applicable and comparable country-specific regulations and standards.

This results in a number of points that should be pointed out specifically in what is not necessarily an exhaustive list. For buildings with six or more floors we recommend installing a pressure reducer in the cold water intake.

Heat exchanger for hot drinking water (statutory and legal bases)
The water must be analysed to clarify whether copper-welded heat exchangers (standard version) or possibly diffusion-welded heat exchangers are used. These are necessary if, for example, conductivity is greater than 500 µS/cm or if galvanised hot water pipes are found in the property during renovations.

Avoiding water hammers
According to DIN 1988-200, section 3.4.3, the sum of water hammer and static pressure must not exceed the permissible operating pressure.
- The permissible operating pressure for heat interface units is 10 bar.

When heat interface units are operated in drinking water installations, care must be taken to avoid high water hammer (for example due to fittings, booster systems, etc.). In the case of fittings with very short opening and closing times, there are always strong short-term pressures that exceed the specifications of DIN 1988-200, section 3.4.3, inadmissibly. The following specifications must therefore be observed when operating the drinking water installation:
- The positive pressure surge (when closing the fitting) must not exceed 2 bar.
- Negative pressure surges (when opening the valve) must not be more than 50% lower than the flow pressure created after opening.

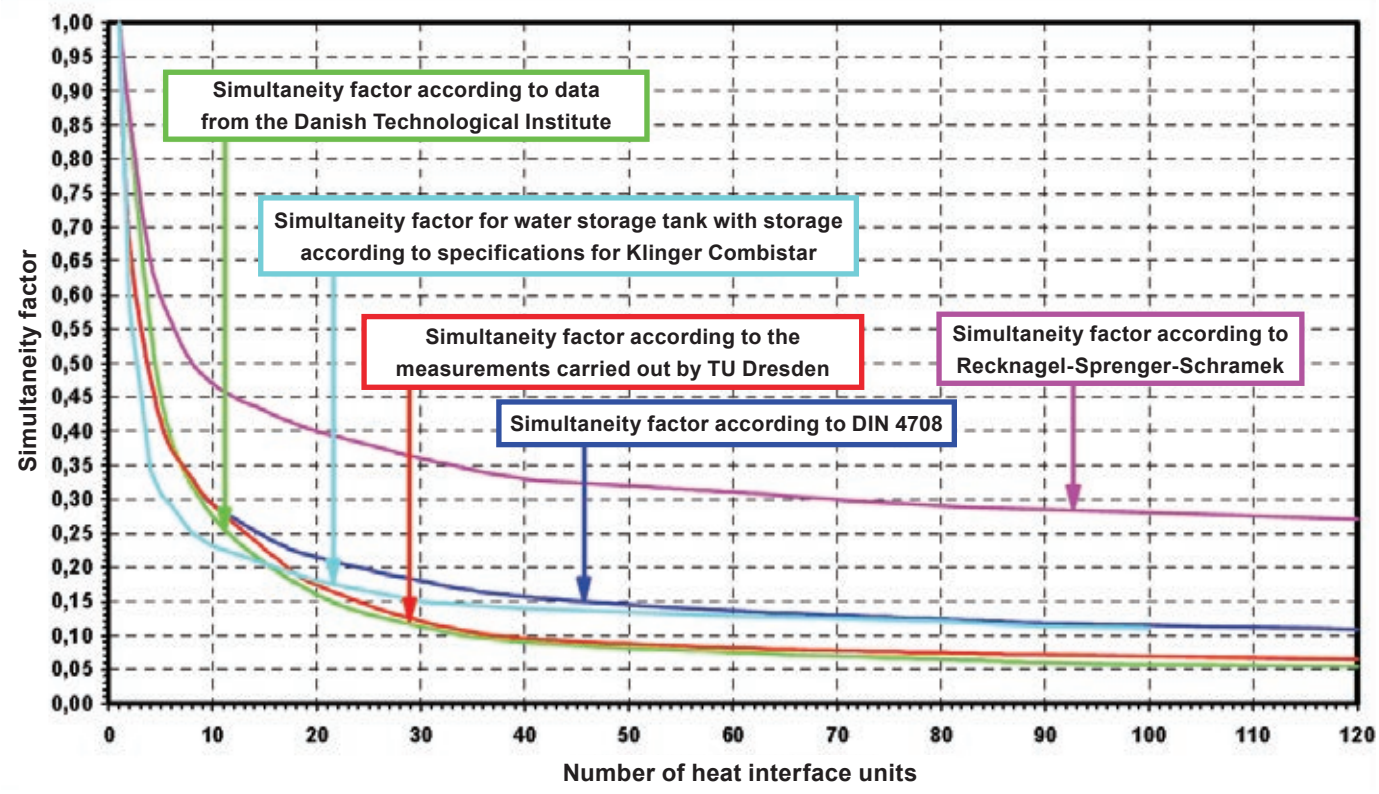
Damage to components such as heat exchangers (solder cracks, deformation of exchanger plates, leaks, etc.) may result in a breach of this DIN specification. DVGW worksheet W 303 recommends the most effective and reliable measure to optimise pressure at the point of origin. The operation and maintenance of the systems must be in accordance with DIN EN 806-5.

Calculation of systems with heat interface units

Simultaneity

Calculations involving systems with heat interface units differ from conventional calculations, because the heating system also needs to transport the energy of the domestic hot water system. As the hot water is not consumed consistently, peaks in the supply lines must be planned. These power peaks were investigated by the "Danish Technological Institute" on the basis of past simultaneities and confirmed by the Technical University in Dresden. These principles have been incorporated into AGFW Worksheet FW 520.

Simultaneity factors for heat interface units with domestic water heaters in the through-flow principle



Characteristics of the simultaneity factor according to different sources (source: TUD Report on simultaneities)

Sample calculation

The following points are always of decisive importance during calculation

- Supply temperature in the system
- Required bulk performance of the heat interface unit
- Heat exchanger size for domestic hot water supply
- Required hot water temperature (e.g. from 10°C to 45°C)
- Available differential pressure
- Available cold water pressure
- Heat output per consumer unit

Sample calculation

3 lines with 4 apartments each:

Total	12 RUs
Heat interface unit with	size 30 plate heat exchanger
Supply temperature	65 °C
Bulk performance	17 l/min
Hot water temperature	50°C

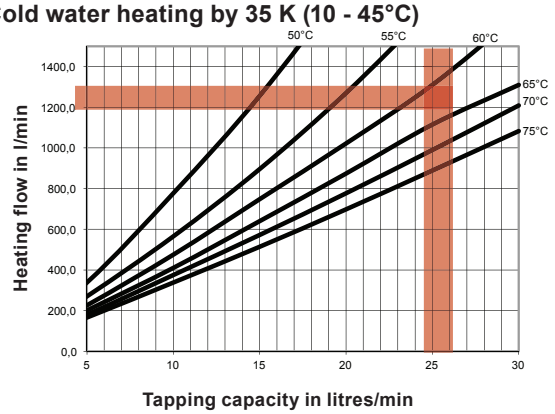
No other information required here.

1 **Selection of the station based on the hot water requirement**

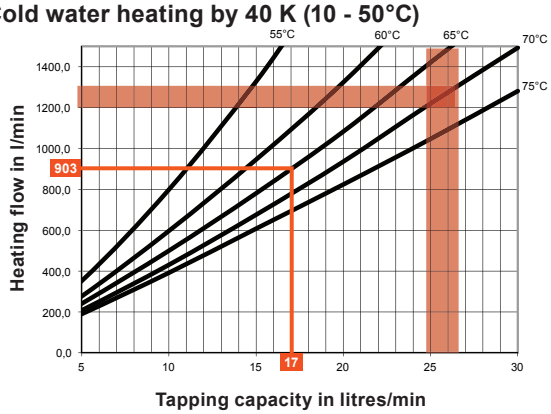
2 **Determining the heating volume flow as well as pressure loss with the help of diagrams**

Sample selection from curve

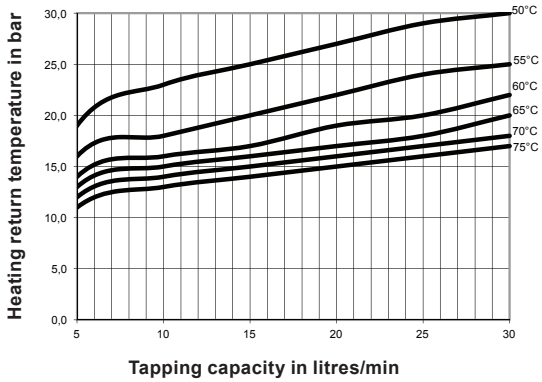
Cold water heating by 35 K (10 - 45°C)

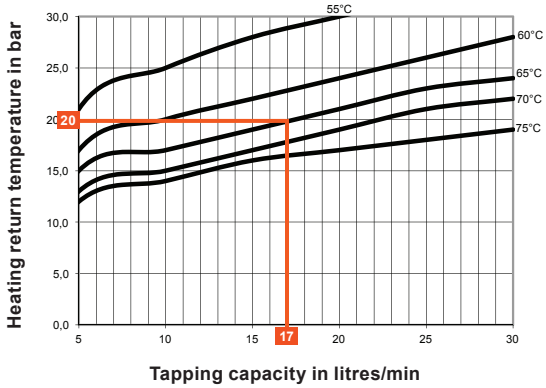


Cold water heating by 40 K (10 - 50°C)



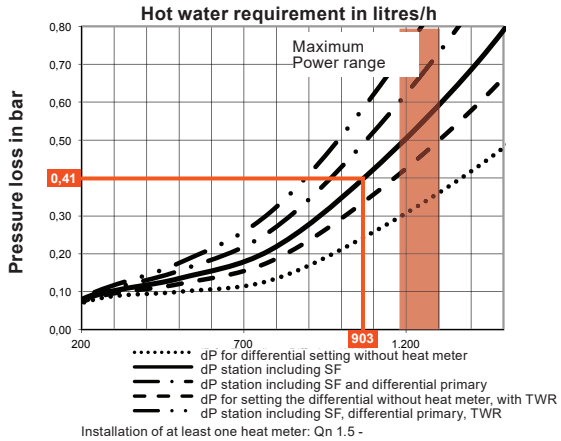
Required heating volume flow 903 l/h. Attention: This only applies to domestic hot water supply. Heating is not taken into account during tapping.





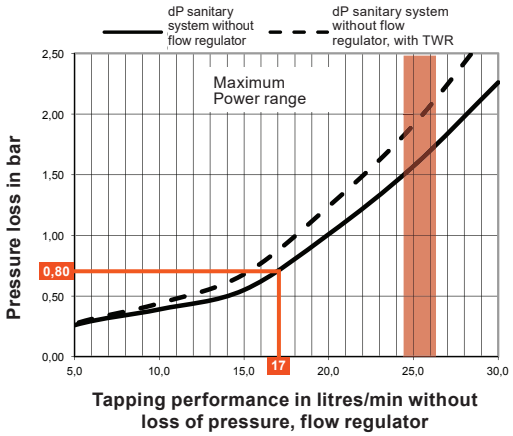
Return temperature during tapping 20 °C. This only applies to a measurement in the heat interface unit and without heating. A mixed temperature is established in normal mode.

Heating side (primary)



Installation of at least one heat meter: Qn 1.5 -
dP for additional integrated fixtures, such as TWRs, heat meters, etc.
not taken into account in the curve.

Cold water side (secondary)



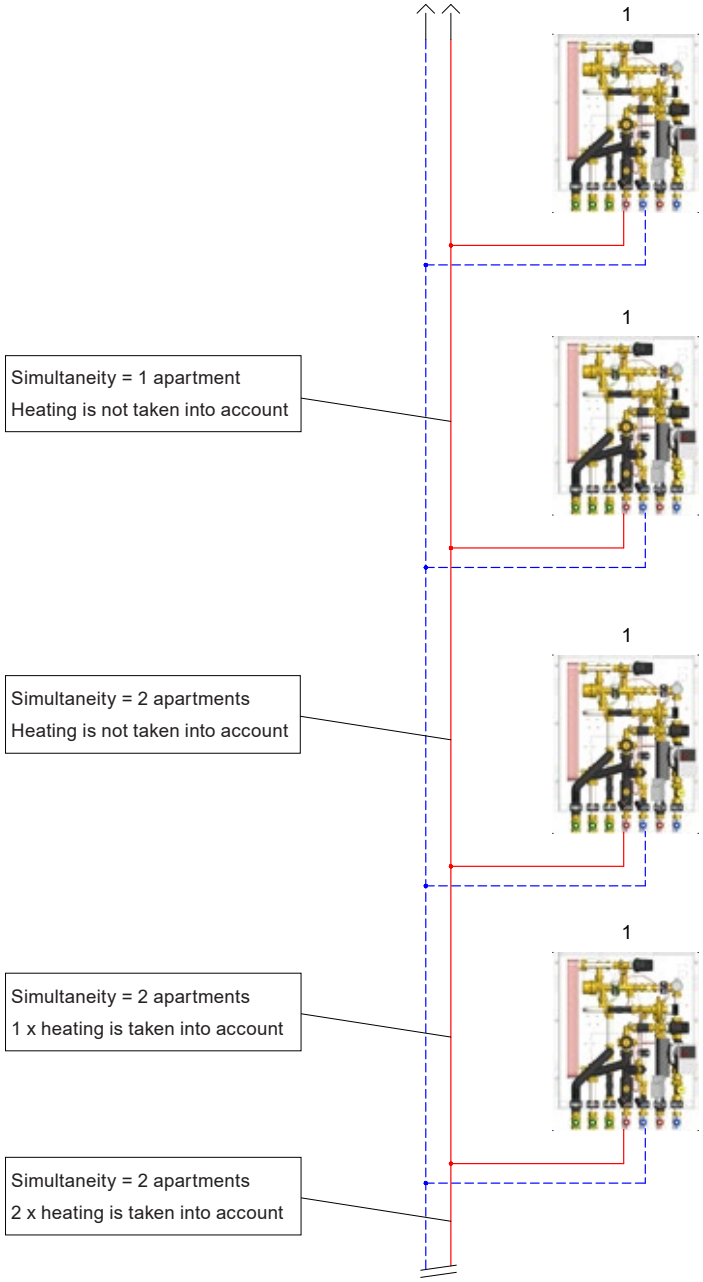
Pressure losses at drinking water flow regulators (add to diag.): 12 l/min = 068-0.88 bar;
17 l/min = 0.75-0.95 bar; 19 l/min = 1.00-1.20 bar; 22 l/min = 1.20-1.40 bar

Performance curve diagrams (see the "Performance curve diagrams" chapter)

You can also use the short selection tables on page 18 to select the devices.

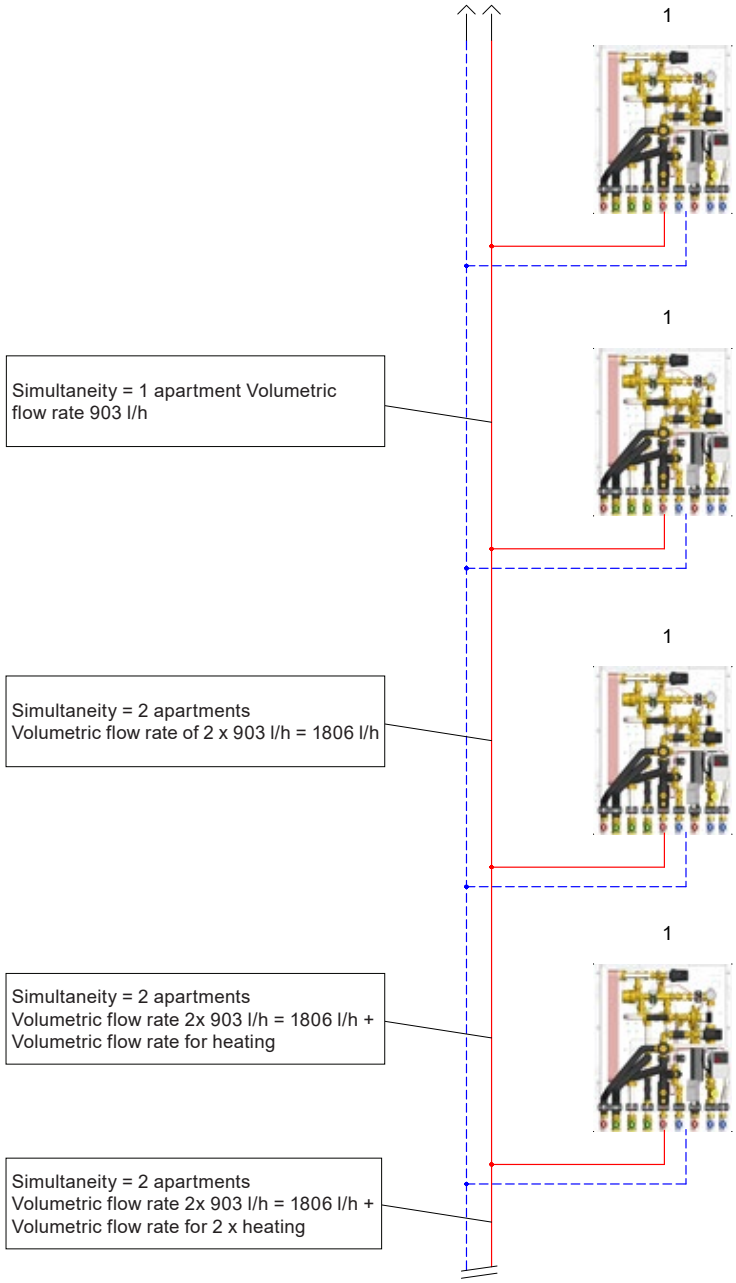
3 Line calculation taking simultaneities into account: see the sample curve from TU Dresden

Theoretical calculation on the line



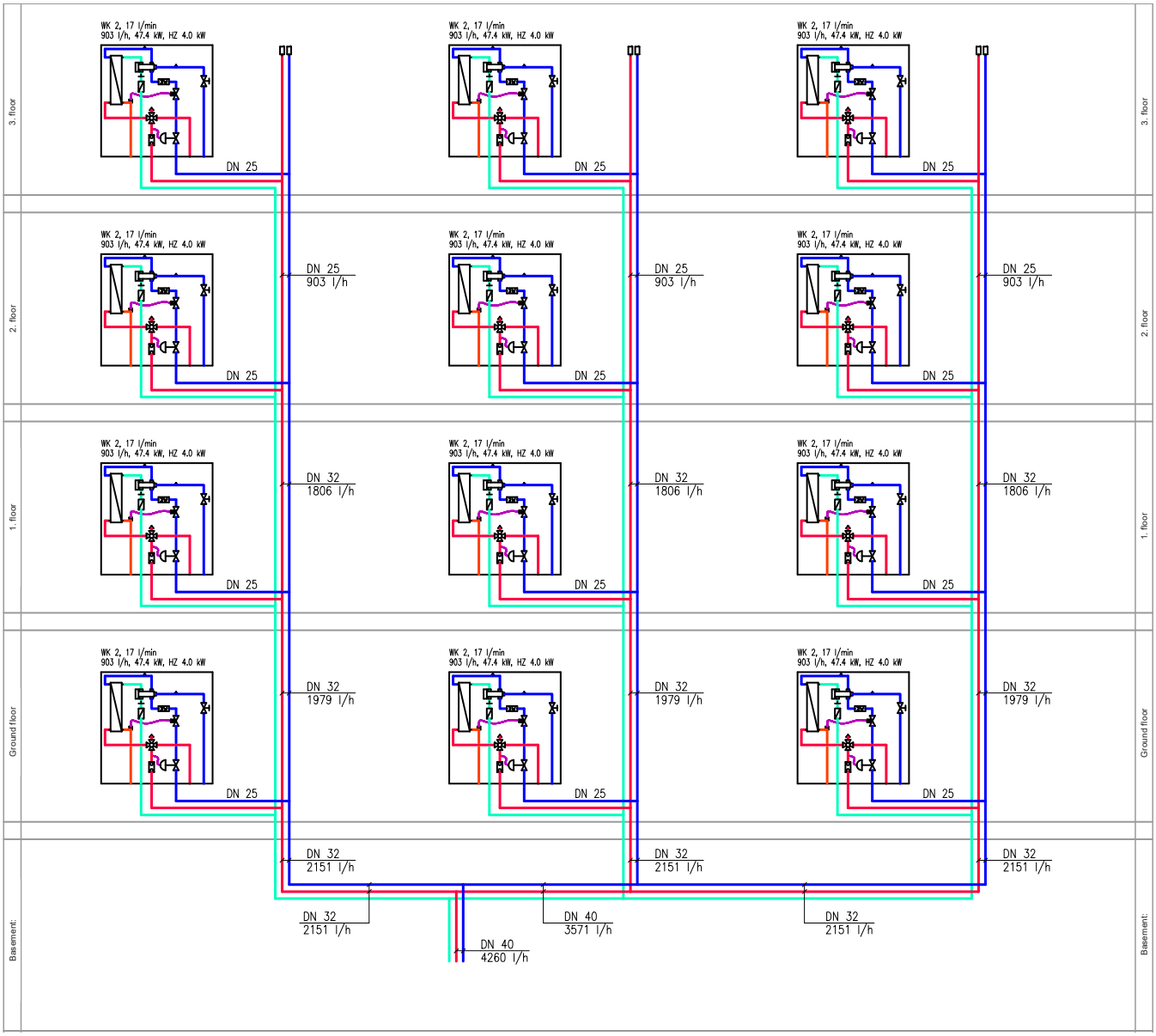
Legend
Heating supply Heating return
1. Uponor Combi Port B1000 sample set-up

In this case figures are used from the example of volumetric flow rate of 903 l/h



Legend	
Heating supply	———
Heating return	- - - -
1. Uponor Combi Port B1000 sample set-up	

Sample calculation for the piping diagram



Specification

Determination of simultaneity according to the Technical University Dresden (TUD)

- Pipeline 1: 4 stations = 2 stations for hot water preparation
- Pipeline 2: 4 stations = 2 stations for hot water preparation
- Pipeline 3: 4 stations = 2 stations for hot water preparation

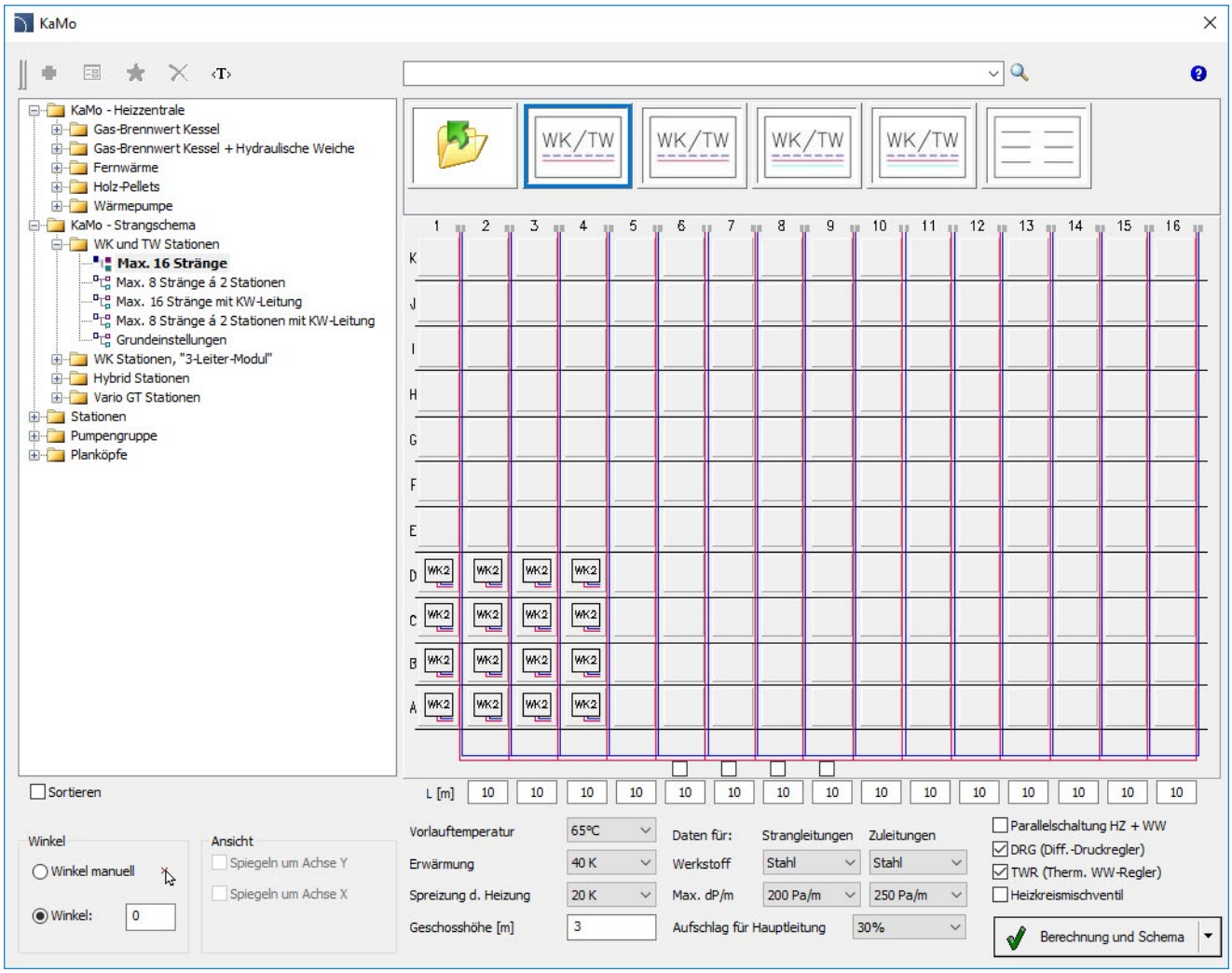
Determination of heating volumetric flow rate with continuous heating (at 5 kW and 20 k dT = 215 l/h)

- Pipeline 1: 2 simultaneous heating
- Pipeline 2: 2 simultaneous heating
- Pipeline 3: 2 simultaneous heating

Main pipeline

- Main pipeline for 12 stations = 3 x hot water preparation and 9 x heating

Calculation results in table form



Sample calculation

Exchanger type	Number of RUs	Part line	Simultaneity of hot water preparation	Simultaneity of heating	Volumetric flow rate of hot water preparation system [l/h]	Heating output [kW]	Heating volumetric flow rate [l/h]	Total volumetric flow rate [l/h]	DN	PFR·L [Pa]	V [m/s]	Sz	Zeta [Pa]	Pressure loss [Pa]
Pipeline no. 1 (RUs one above the other)														
WK 2, 17 l/min, 903 l/h, 47.4 kW, HZ 4.0 kW	1	TS A 1	1	0	903	0	0	903	25	97 · 6.0 = 582	0.43	1	93	675
WK 2, 17 l/min, 903 l/h, 47.4 kW, HZ 4.0 kW	2	TS A 2	2	0	1806	0	0	1806	32	88 · 6.0 = 528	0.5	1	123	651
WK 2, 17 l/min, 903 l/h, 47.4 kW, HZ 4.0 kW	3	TS A 3	2	1	1806	4	172	1979	32	104 · 6.0 = 624	0.54	1	147	771
WK 2, 17 l/min, 903 l/h, 47.4 kW, HZ 4.0 kW	4	TS A 4	2	2	1806	8	344	2151	32	122 · 6.0 = 732	0.59	1	174	906
Total														**3003**
Pipeline no. 2 (RUs one above the other)														
WK 2, 17 l/min, 903 l/h, 47.4 kW, HZ 4.0 kW	1	TS A 1	1	0	903	0	0	903	25	97 · 6.0 = 582	0.43	1	93	675
WK 2, 17 l/min, 903 l/h, 47.4 kW, HZ 4.0 kW	2	TS A 2	2	0	1806	0	0	1806	32	88 · 6.0 = 528	0.5	1	123	651
WK 2, 17 l/min, 903 l/h, 47.4 kW, HZ 4.0 kW	3	TS A 3	2	1	1806	4	172	1979	32	104 · 6.0 = 624	0.54	1	147	771
WK 2, 17 l/min, 903 l/h, 47.4 kW, HZ 4.0 kW	4	TS A 4	2	2	1806	8	344	2151	32	122 · 6.0 = 732	0.59	1	174	906
Total														**3003**
Pipeline no. 3 (RUs one above the other)														
WK 2, 17 l/min, 903 l/h, 47.4 kW, HZ 4.0 kW	1	TS A 1	1	0	903	0	0	903	25	97 · 6.0 = 582	0.43	1	93	675
WK 2, 17 l/min, 903 l/h, 47.4 kW, HZ 4.0 kW	2	TS A 2	2	0	1806	0	0	1806	32	88 · 6.0 = 528	0.5	1	123	651
WK 2, 17 l/min, 903 l/h, 47.4 kW, HZ 4.0 kW	3	TS A 3	2	1	1806	4	172	1979	32	104 · 6.0 = 624	0.54	1	147	771
WK 2, 17 l/min, 903 l/h, 47.4 kW, HZ 4.0 kW	4	TS A 4	2	2	1806	8	344	2151	32	122 · 6.0 = 732	0.59	1	174	906
Total														**3003**
Main pipeline – left														
Part line	4	TS Z 2	2	2	1806	8	344	2151	32	122 ·20.0 = 2440	0.59	2.5	436	2876
Total (including pipeline with max. dP)														**5879**
Main pipeline – right														
Part line	4	TS Z 4	2	2	1806	8	344	2151	32	122 ·20.0 = 2440	0.59	2.5	436	2876
Part line	8	TS Z 3	3	5	2710	20	861	3571	40	147 ·20.0 = 2940	0.72	2.5	653	3593
Total (including pipeline with max. dP)														**9472**
Supply line from the central heating														
Part line	12	TS Z 1	3	9	2710	36	1550	4260	40	205 · 6.0 = 1230	0.86	2.5	929	2159
Overall loss of pressure (pipe network)														**11631**

4 Determining the overall volumetric flow rate as well as the overall pressure loss

Overall loss of pressure	[bar]	[Pa]
Device (without meter)	0.28	28405
DRG (kvs=3.5)	0.07	6660
Flow regulator (kvs=3.5)	0.07	6660
Overall loss of pressure at station	0.42	41725
Pipeline		
Critical circuit (D-3)	0.12	11631
Pipeline with supplement (curves, etc.)	0.15	15120
Overall loss of pressure without heat meter		56846
Ultrasound dp assumption for heat meter Qn 1.5	0.57	5000
Overall loss of pressure with heat meter ultrasound	0.05	61846

Pump design	
Total volumetric flow rate [l/h]	4260
Overall loss of pressure [bar]	0.62

The pipes are then dimensioned in the usual way using the relevant tables.

5 Determination of the system pump group and buffer storage tank in connection with boilers and district heating

(for other heat sources we will be happy to advise you)

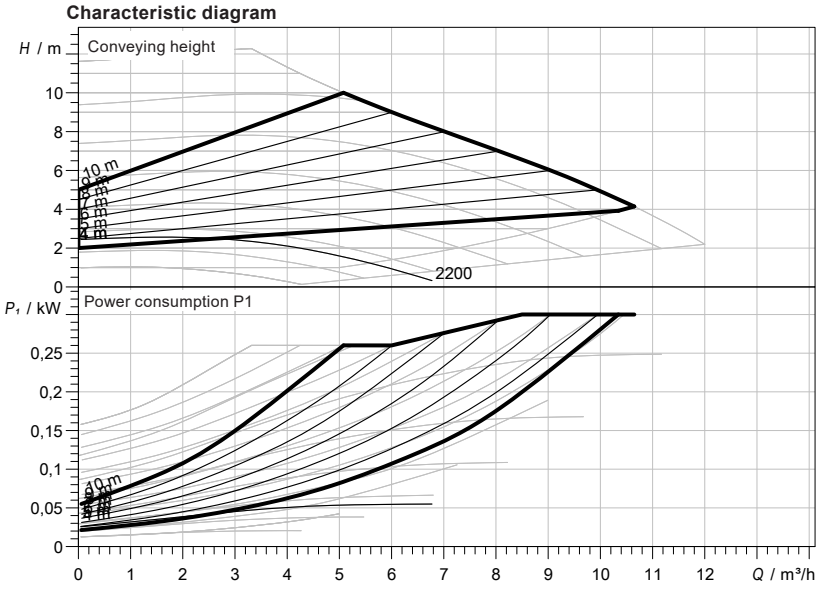
3 kW/RU with 30K supply return differential – dp max 400

V [l/h]	Buffer volume [l]	Pump group				dp max 400
	Boiler / district heating	Unregulated	Thermally regulated	Valve dp [mbar]	Mixing valve	Valve dp [mbar]
2000	500	SPG 32-UM	SPG 32-TM	59	SPG 32-M4	250
3000	750	SPG 32-UM	SPG 32-TM	134	SPG 32-M6	222
4000	750	SPG 32-UM	SPG 32-TM	238	SPG 32-M6	403
5000	1000	SPG 32-UM	SPG 32-TM	372	SPG 32-M10	250
6000	1000	SPG 32-UM	SPG 50-TM12	230	SPG 32-M10	360
7000	1500	SPG 32-UM	SPG 50-TM12	314	SPG 50-M16	191
8000	1500	SPG 32-UM	SPG 50-TM16	250	SPG 50-M16	250
9000	1500	SPG 50-UM	SPG 50-TM16	316	SPG 50-M16	316
10000	1500	SPG 50-UM	SPG 50-TM16	391	SPG 50-M16	391
11000	2000	SPG 50-UM	2 x SPG 32-TM12	2 x 194	SPG 50-M25	194
12000	2000	SPG 50-UM	2 x SPG 32-TM12	2 x 230	SPG 50-M25	230
13000	2250	SPG 50-UM	2 x SPG 32-TM12	2 x 270	SPG 50-M25	270
14000	2250	SPG 50-UM	2 x SPG 32-TM12	2 x 314	SPG 50-M25	314
15000	3000	SPG 50-UM	2 x SPG 32-TM12	2 x 360	SPG 50-M25	360
16000	3000	2 x SPG 32-UM	2 x SPG 50-TM16	2 x 250	2 x SPG 50-M16	2 x 250
17000	3000	2 x SPG 50-UM	2 x SPG 50-TM16	2 x 282	2 x SPG 50-M16	2 x 282
18000	3000	2 x SPG 50-UM	2 x SPG 50-TM16	2 x 316	2 x SPG 50-M16	2 x 316
19000	3000	2 x SPG 50-UM	2 x SPG 50-TM16	2 x 253	2 x SPG 50-M16	2 x 353
20000	3000	2 x SPG 50-UM	2 x SPG 50-TM16	2 x 391	2 x SPG 50-M16	2 x 391

5 kW/RU

V [l/h]	Buffer volume [l]	Pump group			
	Boiler / district heating	Unregulated	Thermally regulated	Valve dp [mbar]	Mixing valve
2000	500	SPG 32-UM	SPG 32-TM	59	SPG 32-M4
3000	750	SPG 32-UM	SPG 32-TM	134	SPG 32-M6
4000	750	SPG 32-UM	SPG 32-TM	238	SPG 32-M6
5000	1000	SPG 32-UM	SPG 32-TM	372	SPG 32-M10
6000	1000	SPG 32-UM	SPG 50-TM12	230	SPG 32-M10
7000	1000	SPG 32-UM	SPG 50-TM12	314	SPG 50-M16
8000	1500	SPG 32-UM	SPG 50-TM16	250	SPG 50-M16
9000	1500	SPG 50-UM	SPG 50-TM16	316	SPG 50-M16
10000	1500	SPG 50-UM	SPG 50-TM16	391	SPG 50-M16
11000	1500	SPG 50-UM	2 x SPG 32-TM12	2 x 194	SPG 50-M25
12000	2000	SPG 50-UM	2 x SPG 32-TM12	2 x 230	SPG 50-M25
13000	2000	SPG 50-UM	2 x SPG 32-TM12	2 x 270	SPG 50-M25
14000	2000	SPG 50-UM	2 x SPG 32-TM12	2 x 314	SPG 50-M25
15000	2000	SPG 50-UM	2 x SPG 32-TM12	2 x 360	SPG 50-M25
16000	2250	2 x SPG 32-UM	2 x SPG 50-TM16	2 x 250	2 x SPG 50-M16
17000	2250	2 x SPG 50-UM	2 x SPG 50-TM16	2 x 282	2 x SPG 50-M16
18000	3000	2 x SPG 50-UM	2 x SPG 50-TM16	2 x 316	2 x SPG 50-M16
19000	3000	2 x SPG 50-UM	2 x SPG 50-TM16	2 x 253	2 x SPG 50-M16
20000	3000	2 x SPG 50-UM	2 x SPG 50-TM16	2 x 391	2 x SPG 50-M16

Pump performance curve for the installed Wilo Stratos 25/1-12



Source: Technical data sheet for Wilo Stratos 25 1-12

If other pumps are used, please take into account the previously calculated volume flow, including pressure losses.

Important: Calculations are always carried out from the ends of the lines to the central heating system. New parallel usage begins again at each node.

The quickest way to perform simple calculations is with KaMo CAD software. See the example on page 17

This program can be downloaded free of charge from the homepage of KaMo (www.kamo.de) together with instructions, a list of compatible software programs and a video tutorial.

Output data for consumer and drinking water stations

Values for various temperatures

Requirement:
Representation of the consumer and drinking water characteristic curves as discrete curves PWC 10 °C
Cold water temperature is assumed to be a fixed value.

Recording of through-flow volumes, tapping performance for hot drinking water and pressure losses, including differential pressure regulator and dirt collector

Output data for consumer and drinking water stations, 14 plates (GBS-240H-14)

Flow temp. [°C]	Temp. PWH [°C]		Through-flow rate PWH (tapping rate) [l/min]	
50			**11**	**12**
	45	**Vol HZ prim [l/h]**	1163	
		Return temp. [°C]	30	
		dp [bar]	0.73	
		Output [KW]	27.1	
		Flow regulator dp [bar]	0.75	
55			**11**	**12**
	45	**Vol HZ prim [l/h]**	759	847
		Return temp. [°C]	25	25
		dp [bar]	0.34	0.42
		Output [KW]	26.5	29.6
		Flow regulator dp [bar]	0.75	0.8
	50	**Vol HZ prim [l/h]**	1163	
		Return temp. [°C]	34	
		dp [bar]	0.73	
		Output [KW]	28.4	
		Flow regulator dp [bar]	0.75	
60			**10**	**12**
	45	**Vol HZ prim [l/h]**	538	665
		Return temp. [°C]	21	22
		dp [bar]	0.2	0.26
		Output [KW]	24.4	29.4
		Flow regulator dp [bar]	0.75	0.8
	50	**Vol HZ prim [l/h]**	725	917
		Return temp. [°C]	27	28
		dp [bar]	0.32	0.49
		Output [KW]	27.8	34.1
		Flow regulator dp [bar]	0.75	0.8

Flow temp. [°C]	Temp. PWH [°C]		Through-flow rate PWH (tapping rate) [l/min]	
65			**10**	**12**
	45	**Vol HZ prim [l/h]**	452	556
		Return temp. [°C]	19	20
		dp [bar]	0.18	0.21
		Output [KW]	24.2	29.1
		Flow regulator dp [bar]	0.75	0.8
	50	**Vol HZ prim [l/h]**	574	715
		Return temp. [°C]	23	24
		dp [bar]	0.23	0.33
		Output [KW]	28.0	34.1
		Flow regulator dp [bar]	0.75	0.8
70			**10**	**12**
	45	**Vol HZ prim [l/h]**	394	481
		Return temp. [°C]	17	18
		dp [bar]	0.15	0.19
		Output [KW]	24.3	29.1
		Flow regulator dp [bar]	0.75	0.8
	50	**Vol HZ prim [l/h]**	487	599
		Return temp. [°C]	21	22
		dp [bar]	0.19	0.22
		Output [KW]	27.8	33.4
		Flow regulator dp [bar]	0.75	0.8
75			**10**	**12**
	45	**Vol HZ prim [l/h]**	354	431
		Return temp. [°C]	16	17
		dp [bar]	0.15	0.18
		Output [KW]	24.3	29.1
		Flow regulator dp [bar]	0.75	0.8
	50	**Vol HZ prim [l/h]**	424	519
		Return temp. [°C]	19	20
		dp [bar]	0.18	0.2
		Output [KW]	27.7	33.2
		Flow regulator dp [bar]	0.75	0.8

Requirement:
Representation of the consumer and drinking water characteristic curves as discrete curves PWC 10 °C
Cold water temperature is assumed to be a fixed value.

Recording of through-flow volumes, tapping performance for hot drinking water and pressure losses, including differential pressure regulator and dirt collector

Output data for consumer and drinking water stations, 20 plates (GBS-240H-20)

Flow temp. [°C]	Temp. PWH [°C]		Through-flow rate PWH (tapping rate) [l/min]	
50			**12.5**	
	45	**Vol HZ prim [l/h]**	1163	
		Return temp. [°C]	28	
		dp [bar]	0.63	
		Output [KW]	29.8	
		Flow regulator dp [bar]	0.75	
55			**12**	**15**
	45	**Vol HZ prim [l/h]**	768	1004
		Return temp. [°C]	22	24
		dp [bar]	0.26	0.44
		Output [KW]	29.5	36.2
		Flow regulator dp [bar]	0.75	0.9
	50	**Vol HZ prim [l/h]**	1163	
		Return temp. [°C]	30	
		dp [bar]	0.63	
		Output [KW]	33.8	
		Flow regulator dp [bar]	0.75	
60			**12**	**15**
	45	**Vol HZ prim [l/h]**	608	783
		Return temp. [°C]	19	20
		dp [bar]	0.19	0.27
		Output [KW]	29.0	36.4
		Flow regulator dp [bar]	0.75	0.9
	50	**Vol HZ prim [l/h]**	804	1059
		Return temp. [°C]	24	26
		dp [bar]	0.29	0.46
		Output [KW]	33.7	41.9
		Flow regulator dp [bar]	0.75	0.9

Flow temp. [°C]	Temp. PWH [°C]		Through-flow rate PWH (tapping rate) [l/min]	
65			**12**	**15**
	45	**Vol HZ prim [l/h]**	523	673
		Return temp. [°C]	17	18
		dp [bar]	0.17	0.21
		Output [KW]	29.2	36.8
		Flow regulator dp [bar]	0.75	0.9
	50	**Vol HZ prim [l/h]**	656	849
		Return temp. [°C]	21	23
		dp [bar]	0.21	0.3
		Output [KW]	33.6	41.5
		Flow regulator dp [bar]	0.75	0.9
70			**12**	**15**
	45	**Vol HZ prim [l/h]**	463	590
		Return temp. [°C]	16	17
		dp [bar]	0.16	0.19
		Output [KW]	29.1	36.4
		Flow regulator dp [bar]	0.75	0.9
	50	**Vol HZ prim [l/h]**	561	720
		Return temp. [°C]	19	20
		dp [bar]	0.21	0.24
		Output [KW]	33.3	41.9
		Flow regulator dp [bar]	0.75	0.9
75			**12**	**15**
	45	**Vol HZ prim [l/h]**	416	528
		Return temp. [°C]	14	15
		dp [bar]	0.15	0.17
		Output [KW]	29.5	36.8
		Flow regulator dp [bar]	0.75	0.9
	50	**Vol HZ prim [l/h]**	494	631
		Return temp. [°C]	17	18
		dp [bar]	0.17	0.2
		Output [KW]	33.3	41.8
		Flow regulator dp [bar]	0.75	0.9

Requirement:
Representation of the Consumer and drinking water characteristic curves as discrete curves PWC 10 °C
Cold water temperature is assumed to be a fixed value.

Recording of through-flow volumes, tapping performance for hot drinking water and pressure losses, including differential pressure regulator and dirt collector

Output data for consumer and drinking water stations, 30 plates (GBS-240H-30)

Flow temp. [°C]	Temp. PWH [°C]		Through-flow rate PWH (tapping rate) [l/min]	
50			**14**	
	45	**Vol HZ prim [l/h]**	1163	
		Return temp. [°C]	24	
		dp [bar]	0.58	
		Output [KW]	35.2	
		Flow regulator dp [bar]	0.80	
55			**15**	**17**
	45	**Vol HZ prim [l/h]**	903	1048
		Return temp. [°C]	20	21
		dp [bar]	0.34	0.48
		Output [KW]	36.8	41.4
		Flow regulator dp [bar]	0.90	1
	50	**Vol HZ prim [l/h]**		
		Return temp. [°C]		
		dp [bar]		
		Output [KW]		
		Flow regulator dp [bar]		
60			**15**	**17**
	45	**Vol HZ prim [l/h]**	739	848
		Return temp. [°C]	17	18
		dp [bar]	0.24	0.3
		Output [KW]	37.0	41.4
		Flow regulator dp [bar]	0.90	1
	50	**Vol HZ prim [l/h]**	941	1090
		Return temp. [°C]	22	23
		dp [bar]	0.38	0.5
		Output [KW]	41.6	46.9
		Flow regulator dp [bar]	0.90	1

Flow temp. [°C]	Temp. PWH [°C]		Through-flow rate PWH (tapping rate) [l/min]	
65			**15**	**17**
	45	**Vol HZ prim [l/h]**	643	738
		Return temp. [°C]	16	16
		dp [bar]	0.2	0.24
		Output [KW]	36.6	42.1
		Flow regulator dp [bar]		
	50	**Vol HZ prim [l/h]**	784	903
		Return temp. [°C]	19	20
		dp [bar]	0.27	0.34
		Output [KW]	41.9	47.3
		Flow regulator dp [bar]	0.90	1
70			**15**	**17**
	45	**Vol HZ prim [l/h]**	572	653
		Return temp. [°C]	15	15
		dp [bar]	0.18	0.2
		Output [KW]	36.6	41.8
		Flow regulator dp [bar]	0.90	1
	50	**Vol HZ prim [l/h]**	678	781
		Return temp. [°C]	17	18
		dp [bar]	0.21	0.26
		Output [KW]	41.8	47.2
		Flow regulator dp [bar]	0.90	1
75			**15**	**17**
	45	**Vol HZ prim [l/h]**	515	588
		Return temp. [°C]	14	14
		dp [bar]	0.17	0.18
		Output [KW]	36.5	41.7
	50	**Vol HZ prim [l/h]**	605	691
		Return temp. [°C]	15	16
		dp [bar]	0.19	0.21
		Output [KW]	42.2	47.4
		Flow regulator dp [bar]	0.90	1

Requirement:
Representation of the Consumer and drinking water characteristic curves as discrete curves PWC 10 °C
Cold water temperature is assumed to be a fixed value.

Recording of through-flow volumes, tapping performance for hot drinking water and pressure losses, including differential pressure regulator and dirt collector

Output data for consumer and drinking water stations, 40 plates (GBS-240H-40)

Flow temp. [°C]	Temp. PWH [°C]		Through-flow rate PWH (tapping rate) [l/min]	
50			**15**	**19**
	45	**Vol HZ prim [l/h]**	1163	
		Return temp. [°C]	23	
		dp [bar]	0.5	
		Output [KW]	36.5	
		Flow regulator dp [bar]	0.90	
55			**17**	**19**
	45	**Vol HZ prim [l/h]**	994	1127
		Return temp. [°C]	19	19
		dp [bar]	0.39	0.49
		Output [KW]	41.6	47.2
		Flow regulator dp [bar]	1.00	1.2
	50	**Vol HZ prim [l/h]**		
		Return temp. [°C]		
		dp [bar]		
		Output [KW]		
		Flow regulator dp [bar]		
60			**17**	**19**
	45	**Vol HZ prim [l/h]**	920	1035
		Return temp. [°C]	17	21
		dp [bar]	0.33	0.4
		Output [KW]	46.0	46.9
		Flow regulator dp [bar]	1.00	1.2
	50	**Vol HZ prim [l/h]**	815	1163
		Return temp. [°C]	16	22
		dp [bar]	0.25	0.5
		Output [KW]	41.7	51.4
		Flow regulator dp [bar]	1.00	1.2

Flow temp. [°C]	Temp. PWH [°C]		Through-flow rate PWH (tapping rate) [l/min]	
65			**17**	**19**
	45	**Vol HZ prim [l/h]**	711	800
		Return temp. [°C]	14	15
		dp [bar]	0.2	0.25
		Output [KW]	42.2	46.5
		Flow regulator dp [bar]	1.00	1.2
	50	**Vol HZ prim [l/h]**	886	1002
		Return temp. [°C]	18	19
		dp [bar]	0.3	0.39
		Output [KW]	48.4	53.6
		Flow regulator dp [bar]	1.00	1.2
70			**17**	**19**
	45	**Vol HZ prim [l/h]**	629	708
		Return temp. [°C]	13	14
		dp [bar]	0.18	0.2
		Output [KW]	41.7	46.1
		Flow regulator dp [bar]	1.00	1.2
	50	**Vol HZ prim [l/h]**	755	854
		Return temp. [°C]	16	16
		dp [bar]	0.22	0.27
		Output [KW]	47.4	53.6
		Flow regulator dp [bar]	1.00	1.2
75			**17**	**19**
	45	**Vol HZ prim [l/h]**	573	643
		Return temp. [°C]	13	13
		dp [bar]	0.16	0.19
		Output [KW]	41.3	46.4
		Flow regulator dp [bar]	1.00	1.2
	50	**Vol HZ prim [l/h]**	671	754
		Return temp. [°C]	14	15
		dp [bar]	0.19	0.22
		Output [KW]	47.6	52.6
		Flow regulator dp [bar]	1.00	1.2

Requirement:
Representation of the Consumer and drinking water characteristic curves as discrete curves PWC 10 °C
Cold water temperature is assumed to be a fixed value.

Recording of through-flow volumes, tapping performance for hot drinking water and pressure losses, including differential pressure regulator and dirt collector

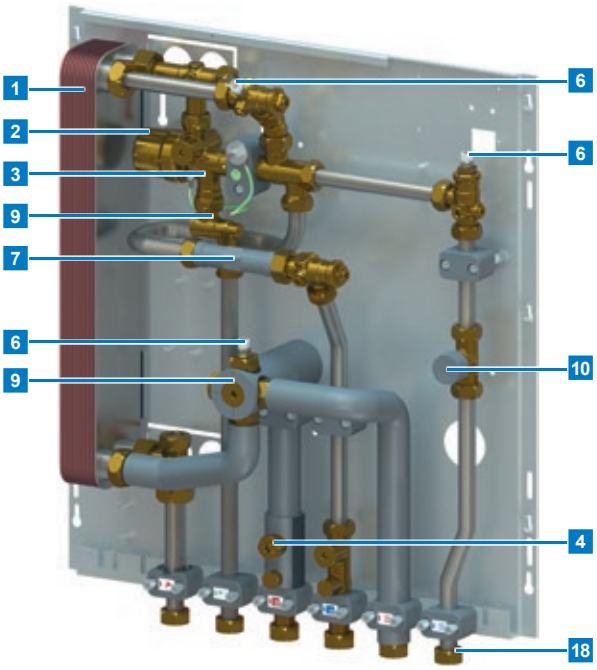
Output data for heat interface units 40 litres

Flow temp. [°C]	Temp. PWH [°C]		Through-flow rate PWH (tapping rate) [l/min]	
48			**19**	**22**
	45	**Vol HZ prim [l/h]**	1480	
		Return temp. [°C]	20	
		dp [bar]	0.96	
		Output [KW]	48.2	
		Flow regulator dp [bar]	1.50	
50			**19**	**22**
	45	**Vol HZ prim [l/h]**	1230	
		Return temp. [°C]	17	
		dp [bar]	0.72	
		Output [KW]	47.2	
		Flow regulator dp [bar]	1.50	
	50	**Vol HZ prim [l/h]**		
		Return temp. [°C]		
		dp [bar]		
		Output [KW]		
		Flow regulator dp [bar]		
52			**19**	**22**
	45	**Vol HZ prim [l/h]**	1100	1310
		Return temp. [°C]	16	16
		dp [bar]	0.61	0.76
		Output [KW]	46.1	54.8
		Flow regulator dp [bar]	1.50	1.9
	50	**Vol HZ prim [l/h]**	1600	
		Return temp. [°C]	25	
		dp [bar]	1.08	
		Output [KW]	50.2	
		Flow regulator dp [bar]	1.50	

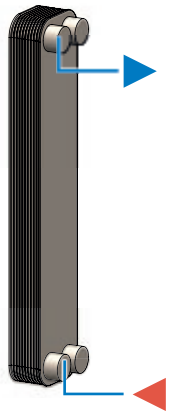
Flow temp. [°C]	Temp. PWH [°C]		Through-flow rate PWH (tapping rate) [l/min]	
55			**19**	**22**
	45	**Vol HZ prim [l/h]**	1000	1180
		Return temp. [°C]	14	15
		dp [bar]	0.52	0.67
		Output [KW]	47.7	54.9
		Flow regulator dp [bar]	1.50	1.9
	50	**Vol HZ prim [l/h]**	1270	1570
		Return temp. [°C]	19	20
		dp [bar]	0.76	1.05
		Output [KW]	53.2	63.9
		Flow regulator dp [bar]	1.50	1.9
60			**19**	**22**
	45	**Vol HZ prim [l/h]**	840	990
		Return temp. [°C]	12	13
		dp [bar]	0.42	0.52
		Output [KW]	46.9	54.1
		Flow regulator dp [bar]	1.50	1.9
	50	**Vol HZ prim [l/h]**	1050	1200
		Return temp. [°C]	16	16
		dp [bar]	0.53	0.67
		Output [KW]	53.7	61.4
		Flow regulator dp [bar]	1.50	1.9
65			**19**	**22**
	45	**Vol HZ prim [l/h]**	780	860
		Return temp. [°C]	12	13
		dp [bar]	0.4	0.43
		Output [KW]	48.1	52.0
		Flow regulator dp [bar]	1.50	1.9
	50	**Vol HZ prim [l/h]**	890	1040
		Return temp. [°C]	13	14
		dp [bar]	0.44	0.53
		Output [KW]	53.8	61.7
		Flow regulator dp [bar]	1.50	1.9

Modules of the heat interface unit

Description of the parts in the base station



1 Stainless steel plate heat exchanger



The stainless steel plate exchanger is responsible for the exchange of energy between the heating and the domestic hot water supply system. This is available for hot water preparation in three different versions in the seal of the stainless steel plates.

Versions:
- Copper solder
- VacInox
- Screwed version

The specific use depends on the quality of the drinking water. See also "Specifications for plate heat exchanger" page 9. Due to its long thermal length it guarantees high cooling levels for the heating water during hot water preparation. This ensures the effective utilisation of the existing energy in the heating system and reduces the amount of water required for the preparation of hot water. Stainless steel plate heat exchangers are used with different numbers of plates. 14, 20, 30 and 40 plates are commonly used.

There is no need to insulate the stainless steel plate exchanger. Exceptions are transfers from heating system to heating system or in service water circulation mode.

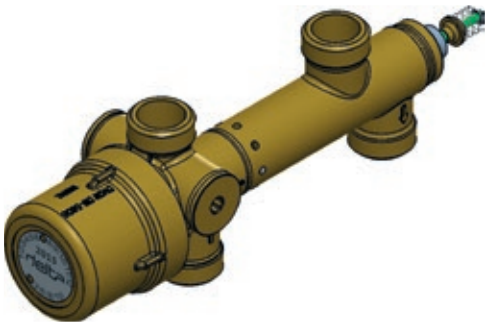
Calcification during hot water preparation in standard operation can be avoided by:

- Connection to the heat exchanger: cold below, hot above. After termination of the tapping process and thus the energy supply, this causes rapid mixing of the heat exchanger in the mean temperature. Physics plays a part here as cold water drops to the bottom. The use of the proportional volume control valve ensures very fast control.
- System temperatures are kept as low as possible, equal to 65 °C, so as to avoid the range where lime precipitation from the water is strongest and fastest.
- A thermosiphon is always installed in supply line to the heat exchanger.

Water capacity of the most common heat exchangers

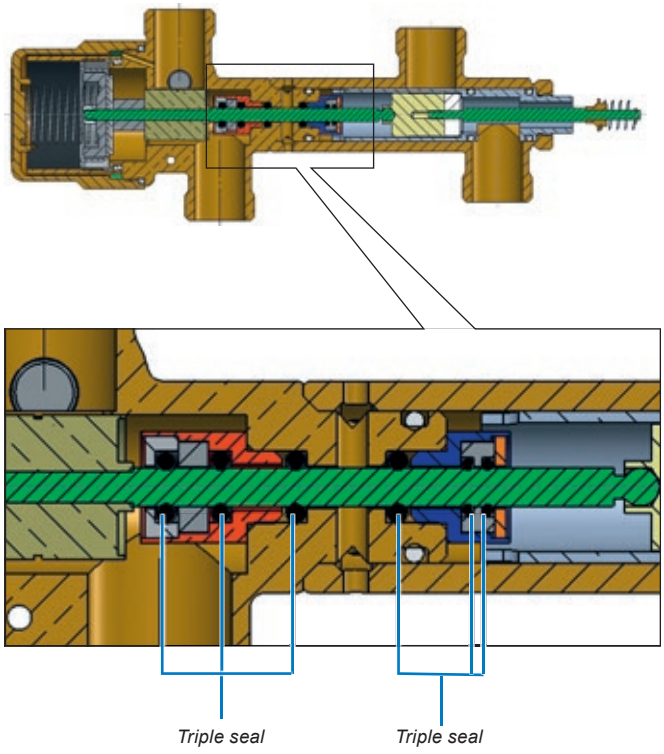
Plate exchangers	Primary side (heater)	Secondary side (drinking water)
GBS 240H-14 (14 plates)	0.42 litres	0.49 litres
GBS 240H-20 (20 plates)	0.63 litres	0.70 litres
GBS 240H-30 (30 plates)	0.98 litres	1.05 litres
GBS 240H-40 (40 plates)	1.33 litres	1.40 litres

2 Proportional volume control valve



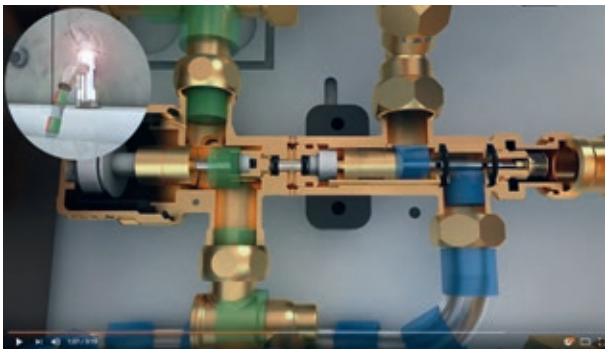
The proportional volume control valve is a central element of domestic hot water supply in our heat interface units. It is responsible for the rapid switching of the heating system to domestic hot water supply. As standard, the proportional volume control valve ensures the proportionality of the through-flow rates of hot water and drinking water. Most units have a priority circuit for domestic hot water instead of home heating. The heating water cannot enter the drinking water system via the proportional volume control valve or vice versa.

The system interior has a coated drinking water side and a patented triple seal on the moving parts in the sanitary and heating area.



Operating mode

a Hydronic heating

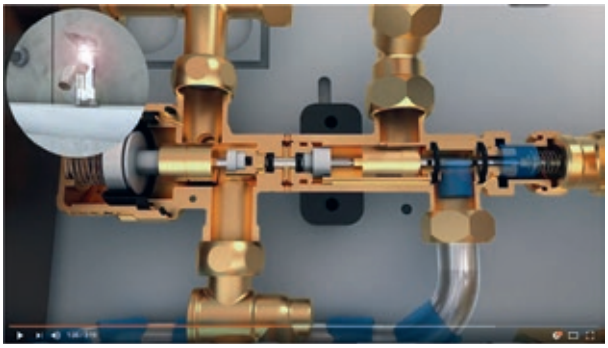


Uponor Combi and Aqua Port product animation – available on YouTube

The starting signal is the opening of the hot water tap. The cold water pressure pushes the PM regulator to the left on the roller diaphragm and thus initiates hot water dispensing. The route to the heat exchanger for the heating system is opened in response to hot water requirements. Home heating is deactivated while the hot water tap is in use. The proportionality on the heating side is assured by means of a cover.

b Heating mode

The hot water tap is closed, the spring pushes the proportional volume control valve to the right again back to its starting position. The energy supply to the heat exchanger is stopped and released for home heating.



Uponor Combi and Aqua Port product animation – available on YouTube

The proportional volume control valve has DVGW approval and WRAS approval.

DVGW CERT

DVGW-Baumusterprüfzertifikat

DVGW type examination certificate

DW-5806BR8312

Anwendungsbereich *field of application*	Produkte der Wasserversorgung *products of water supply*
Zertifikatinhaber *owner of certificate*	Delta Systemtechnik GmbH Heineckes Feld 9, D-29227 Celle
Vertreiber *distributor*	Delta Systemtechnik GmbH Heineckes Feld 9, D-29227 Celle
Produktart *product category*	Elektrische Bauteile: Temperaturregler (5806)
Produktbezeichnung *product description*	Proportionalmengenregler
Modell *model*	PM-Regler
Prüfberichte *test reports*	Kontrollprüfung Labor: KT 066/12 vom 17.12.2012 (TZW) Mechanikprüfung: KT 018/10 vom 02.07.2010 (TZW) Baumusterprüfung: S 033/04 vom 17.07.2006 (TZW) KTW-Prüfung: KA 480/10 vom 08.03.2011 (TZW) Mikrobiologische Prüfung: MO 350A/07 vom 11.10.2007 (TZW) KTW-Prüfung: KA 0212/12 vom 17.10.2012 (TZW)
Prüfgrundlagen *test basis*	DVGW VP 201 (01.11.2004) UBA METALLE (01.12.2012) BGA KTW (12.12.1985) UBA KTW (07.10.2008) DVGW W 270 (01.11.2007)
Ablaufdatum / AZ *date of expiry / file no.*	17.07.2015 / 12-0363-WNV

DAkkS

WRAS APPROVED PRODUCT

This certifies that

DELTA SYSTEMTECHNIK GMBH

has had the undermentioned product examined, tested and found, when correctly installed, to comply with the requirements of the United Kingdom Water Supply (Water Fittings) Regulations and Scottish Water Byelaws.

1020206 & 1020129 PROPORTIONAL FLOW CONTROLLERS

The certificate by itself is not evidence of a valid WRAS Approval. Confirmation of the current status of an approval must be obtained from the WRAS Directory (www.wras.co.uk/directory)

The product so mentioned will be valid until the end of:

October 2020

1010311

Certificate No.

Secretary

Chairman, Product Assessment Group

3 Cold water throttle valves

The cold water throttle valve is located in the screw connection between the cold water connection of the proportional volume control valve and the cold water dirt collector. It is secured by means of a retaining ring. The retaining ring can only be changed using special pliers.

The cold water throttle valve limits the cold water flow to the heat exchanger. The throttle valve prevents the amount of cold water and thus the hot water supply from exceeding the calculated volume so the heating side cannot raise the cold water to the desired temperature.

Different sizes are available. These are marked in colour.

Hot drinking water preparation system flow regulator insert

Surcharge for hot drinking water preparation system flow regulator insert, colour black	6 l/min
Surcharge for hot drinking water preparation system flow regulator insert, colour white	8 l/min
Surcharge for hot drinking water preparation system flow regulator insert, colour orange	9 l/min
Surcharge for hot drinking water preparation system flow regulator insert, colour blue	10 l/min
Surcharge for hot drinking water preparation system flow regulator insert, colour red	12 l/min
Surcharge for hot drinking water preparation system flow regulator insert, colour green	15 l/min
Surcharge for hot drinking water preparation system flow regulator insert, colour brown	17 l/min
Surcharge for hot drinking water preparation system flow regulator insert, colour black	19 l/min
Surcharge for hot drinking water preparation system flow regulator insert, colour purple	22 l/min

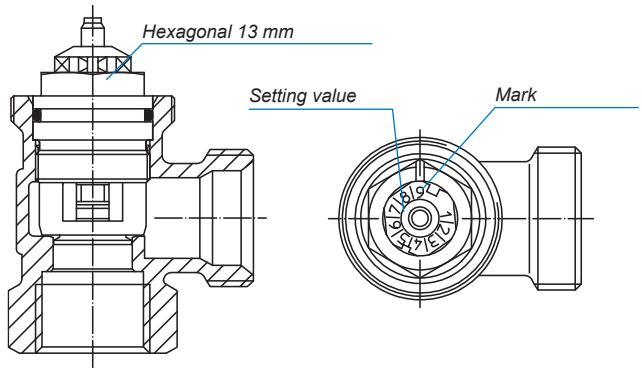
10 Zone valve in the residential heating circuit return

The zone valve has several functions in the heat interface unit.

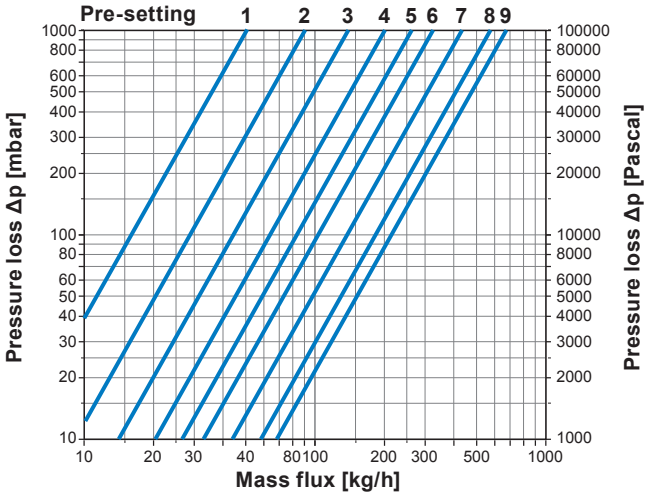
- In conjunction with a 2-point actuator and an apartment heating system, the consumer unit can be operated in accordance with the requirements of the EnEV. The valve is used to open and close the residential heating circuit without interrupting the domestic hot water supply. The threaded connection to the actuator is 20 x 1.5.
- In control circuits for radiant heating systems, the valve is intended work in conjunction with a thermal switch to close the supply circuit in the event of overheating. The heating circuit pump should not be deactivated. The threaded connection to the actuator is 20 x 1.5.
- The zone valve allows the domestic heating system to be hydraulically adjusted by the domestic hot water supply within the heat interface unit. The zone valve has 9 Kvs pre-heating settings, which are easy to set. The amount of heating water can also be read via the heat meter, if such a meter is installed.
- The default setting on the factory side is always **7**.

Setting values

Pre-setting	1	2	3	4	5	6	7	8	9
Kv value with 2 KP deviation	0.05	0.09	0.14	0.20	0.26	0.32	**0,43**	0.57	0.67



Nominal widths with 2K P deviation

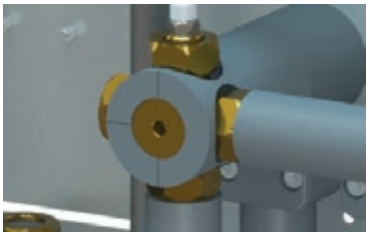


Other valve inserts can also be screwed into the zone valve, for example an insert with Kvs 2.8 for large volumes of water and an insert with pressure relief for systems with very high preliminary pressure. There is no longer a regulating option available for either variant.

5 Dirt collector

Every heat interface unit has a standard dirt collector or different optional dirt traps. The most frequently used variants are listed here.

Dirt collector in the heating flow from the supply



This dirt collector protects the heat interface unit from dirt particles from the heating supply network. The mesh size is 0.5 mm.

Dirt collector in the cold water supply in front of the proportional volume control valve

This dirt collector protects the heat interface unit, in particular the proportional volume control valve, from dirt particles from the cold water pipeline in the heating supply network. The mesh size is 0.5 mm.

Dirt collector in the apartment's heating return

In heat interface units with radiators in the residential heating circuit, we also recommend using the dirt collector option when renovating existing systems. This protects the heat interface units from dirt from old system parts. The mesh size is 0.5 mm. This dirt collector is already installed in systems with a control circuit for radiant heating.

6 Heat meter line with sensor pocket in the supply

As a rule, heat interface units have always allowed energy metering for heating and domestic hot water supply. The following heat meters (heat meter) are recommended: through-flow class QN 1.5; installation length 110 mm; DN20 AG.

In the hot water mode of the heat interface unit, volume flows of up to 1,100 l/h can occur on the primary side. To avoid high pressure losses via the heat meter, this QN should be 1.5 m³/h. A QN = 0.6 m³/h leads to disruptions in the domestic hot water supply. The sampling rate of the meter should not be > 4 seconds, as otherwise a large part of the energy flow will not be detected.

The plastic fittings are not approved for continuous operation and must be removed after commissioning. Stainless steel fittings are available for continuous operation.

4 Sensor pocket

A M10 x 1 sensor pocket is already installed in the heat interface units for a submersible supply thermostat. The return thermostat of the heat meter should already be integrated in the meter housing.

Description of the parts as an option for the base station

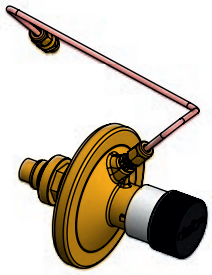
12 Thermostatic lead module (TTV)

The function of the TTV is to avoid stagnation in the heating network. During transitional periods and in summer in particular, there are periods in which no hot water is dispensed. Without a TTV, the pipes in the supply line would cool down. When hot water is dispensed, flow takes place throughout the entire recooled pipe system until the necessary energy for hot water dispensing is available. The TTV operates as a return temperature limiter, i.e. the valve opens after the temperature drops below the set temperature and closes when the set temperature is reached.

A TTV should be installed on every device, if possible, so that there is sufficient movement in the system. The setting of the TTV also significantly determines the return temperature in the system. The temperature setting should be approx. 5 K below the supply temperature. In general, the factory setting is 45 °C. The differential pressure should not exceed 2.3 bar.

When completely open and with a differential pressure of 0.8 bar, the rate of flow through the fitting is 0.3 l/min. However, since the TTV is constantly opening for brief periods before immediately closing again, the flow of water is even lower in practice.

15 Differential pressure regulator



The differential pressure regulator ensures the hydraulic balancing of the regulatory range of the upstream system . Here, the higher differential pressure of the supply pump is adjusted to the needs of the device. In practice, control valves, such as the proportional volume control valve or the radiator valves, must be protected against excessive differential pressure and the fitting must not be allowed to overflow. At the same time, adjustment takes place within the complete heating system, as each consumer unit is only assigned the calculated differential pressure. Undersupply or oversupply of the central heating pump is avoided in well-calculated systems.

The differential pressure regulator works proportionally, independently and without auxiliary energy. It is installed in the return.

The differential pressure regulators are infinitely adjustable from the outside and can be read off.

There are two installation options for the heat interface units. These can also be combined. These are at the device input and/or in front of the residential heating circuit.

Adjustment range in front of the unit input:	100-400 mbar
Factory setting:	200 mbar

Adjustment range in front of the heating circuit:	50-300 mbar
Factory setting:	100 mbar

13 Thermostatic hot water temperature limiter (TWB)

The thermostatic hot water temperature limiter is used in systems with system flow temperatures greater than 65 °C. The function of the thermostatic hot water temperature limiter is to maintain the outlet temperature at below 60 °C when hot water is dispensed for lengthy periods. Brief temperature changes are compensated by the fast response time - approximately 2-3 seconds faster than conventional valves. However, if dispensing begins again immediately, the thermostatic hot water temperature limiter is unable to reduce the energy already contained in the heat exchanger.

The sensor element made from stainless steel 1.4404 sits in the hot water outlet of the heat exchanger and the control head operates in the heating system return from the supplier side. This means that no unnecessary energy is ever supplied to the heat exchanger.

Setting range

Scale value	1	2	3	4	5	6	7	8
Hot water temp. 35 - 70 °C	35	40	45	50	55	60	65	70

8 Hot and cold water meter lines with and without apartment outlet

Several meter lines are available for heat interface units to enable hot water and cold water to be metered. Their function is to calculate the amounts of water consumed by each unit according to legal and local regulations.

Meter adapters Qn 1.5 with 110 mm x DN20 AG and QN 2.5 130 mm x DN25 AG. It is also possible to measure the amount of cold water made available only for domestic hot water preparation.
Here is an example:

The plastic fittings are not approved for continuous operation and must be removed after commissioning. Stainless steel fittings are available for continuous operation.

Mixing circuits for radiant heating

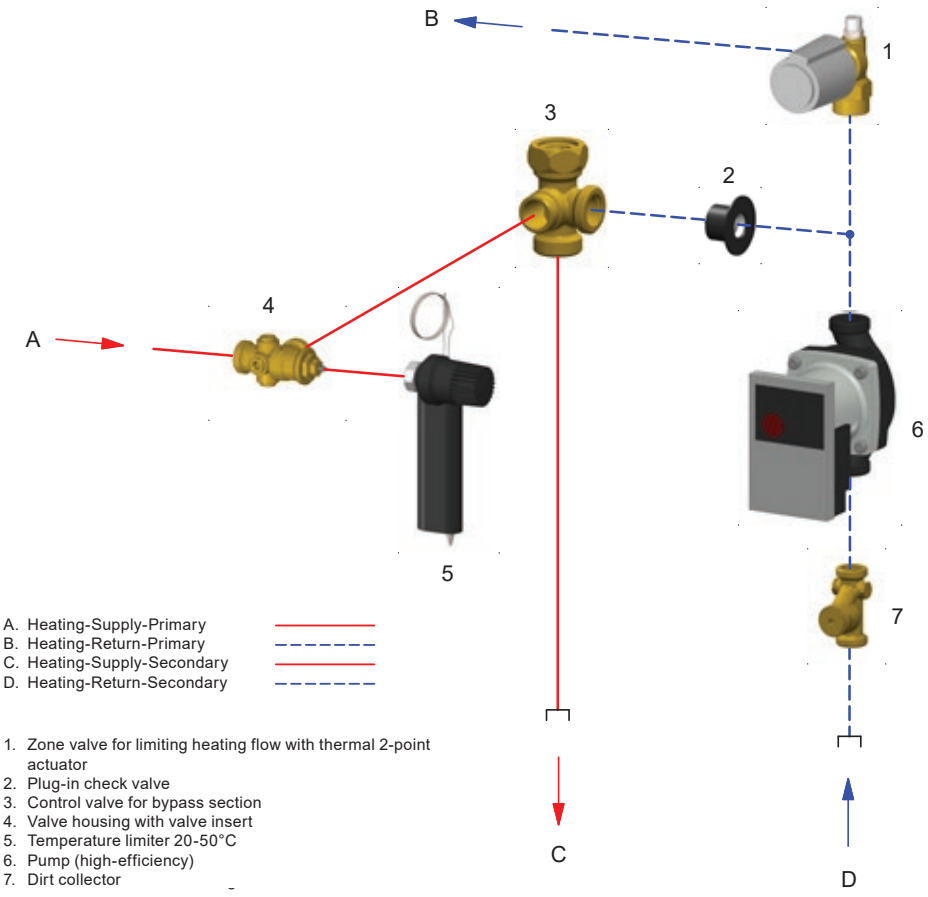
As higher temperatures are usually required for domestic hot water preparation than for radiant heating, we need mixing circuits to reduce the temperatures.

The mixing circuits can be controlled either thermostatically or in connection with a corresponding control system - also via a supply temperature sensor and with a 3-point actuator.

All mixing circuits have a high-efficiency pump (Wilo Yonos Para 15 / 1-6) in a constant-volume heating circuit. Since the mixing circuit is designed as an injection circuit, this has a bypass line with a check valve and a regulating throttle valve for adjusting unfavourable hydraulic conditions. The variable-volume part of the injection circuit must always have higher pressure loss than the constant-volume part.

The regulating throttle valve is fully open on delivery. A dirt collector is always installed to protect the unit. The mesh size of the sieve insert is 0.5 mm.

The heating circuit emergency shutdown already provided protects the radiant heating from excessive temperatures. A 2-point actuator (NC) on the zone valve and a switching thermostat, preferably in the flow of the radiant heating system, control the heating circuit when the setpoint temperature is exceeded. The heating circuit pump continues to run to allow the radiant heating system to cool down quickly.



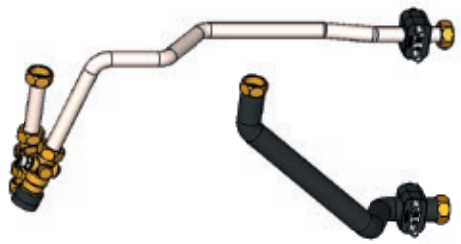
A. Heating-Supply-Primary
B. Heating-Return-Primary
C. Heating-Supply-Secondary
D. Heating-Return-Secondary

1. Zone valve for limiting heating flow with thermal 2-point actuator
2. Plug-in check valve
3. Control valve for bypass section
4. Valve housing with valve insert
5. Temperature limiter 20-50°C
6. Pump (high-efficiency)
7. Dirt collector

Output data of the injection circuit

Power	approx. 15 kW
Variable volumetric flow	420 l/h
Constant volumetric flow rate	1290 l/h
Residual conveying height	approx. 0,3 bar

High temperature heating circuit in conjunction with mixing circuit for radiant heating

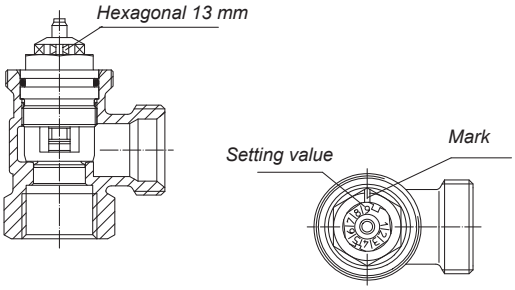


If heat interface units are used with mixing circuits, there is frequently also a need for additional heating of the residential unit with radiators, for example for towel rails or for ancillary spaces. A second high-temperature circuit can be installed in the heat interface units for this purpose. This already has a zone valve for the hydraulically adjustment of the domestic heating circuit for the domestic hot water supply within the heat interface unit. The zone valve has 9 Kvs pre-heating settings, which are easy to set. The amount of heating water can also be read via the heat meter, if such a meter is installed.

Setting values

Pre-setting	1	2	3	4	5	6	7	8	9
Kv value with 2 KP deviation	0.05	0.09	0.14	0.20	0.26	0.32	**0,43**	0.57	0.67

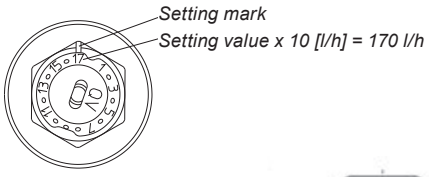
The default setting on the factory side is always **7**.

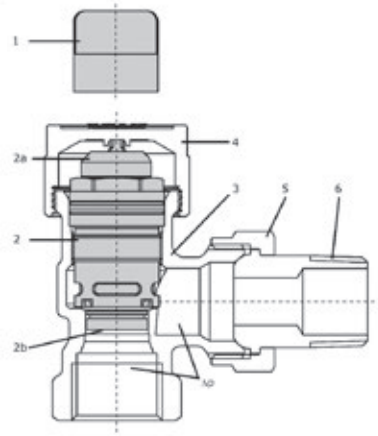


A 2-point actuator can be set up for separate control. The connection thread for the actuator is M 30 x 1.5. As an alternative to valve insert AV 9, a volumetric flow limiter can also be installed. This makes the hydraulic adjustment of the water volume an easy matter.

AQ dynamic zone valve

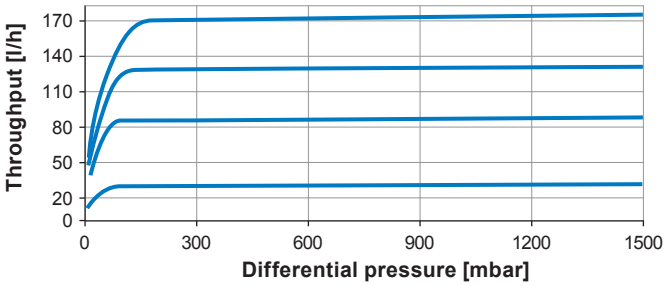
- This is adjusted by means of the pre-setting key on the hand wheel. This prevents the manipulation of the preset value by unauthorised persons.
- The valve is infinitely adjustable. It is possible to correct the setting value while the system is running.





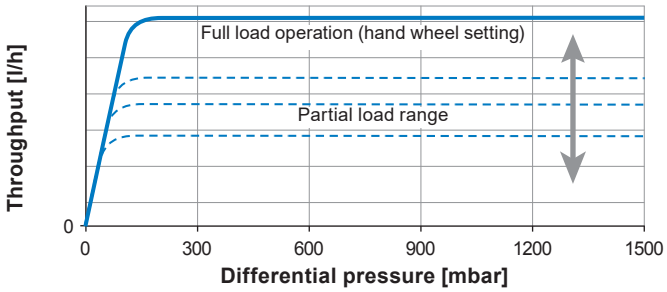
1 *Pre-setting key*
2 *QA valve insert*
2a *Hand wheel*
2b *Filter screen*
3 *Housing*
4 *Protective cap*
5 *Union nut*
6 *Outlet*
Δp Differential pressure

Valve characteristic curves at various hand wheel presets in full load operation



The hand wheel setting adjusts the maximum required flow (full load operation) of the valve. It cannot be exceeded. A thermostat or actuator mounted on the valve can be used to control the flow in partial load operation up to this max. flow.

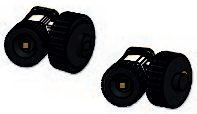
Valve characteristic curves in partial load operation



14 Return temperature limiter (RTB) for the heating circuit

A low return temperature in the system is vital in order to operate systems cost efficiently. If hydraulic adjustment of the domestic heating system cannot be guaranteed, the use of a return temperature limiter is recommended here. This is available for single-pipe systems or for two-pipe systems. The fitting is installed in the return of the residential heating circuit. The setting values are printed on the hand wheel. The valve has a Kvs value of 1.55. The factory-side setting is 37.5 °C.

5 Fill and drain valves



Commissioning and service work on systems very often require the heating water to be drained and refilled. These fittings are also used to flush a system. The fittings are usually installed in the supply and return to the supply line. A DN20 hose connection can be used as a common connection. The cap closure can be used as a hand wheel. After the system has been commissioned, screw the cap closure tightly onto the outlet.

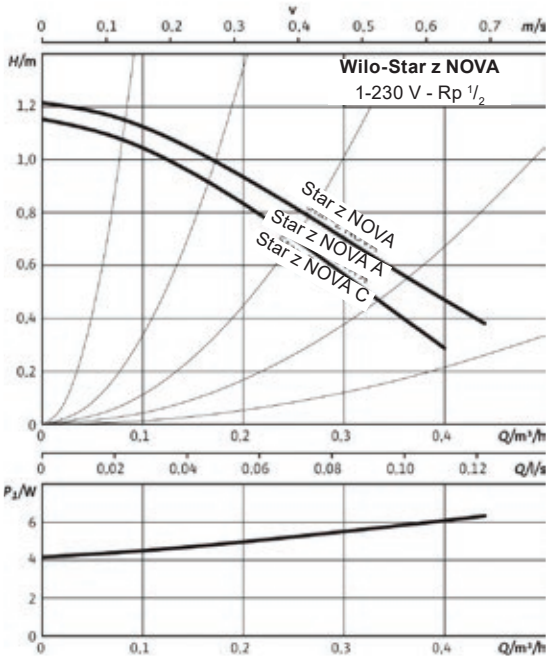
20 Service water circulation (BWZ)

Service water circulation systems are available for residential units with a pipe volume greater than 3 litres. It makes little sense to use of a service water circulation system in installation situations with smaller lines. During planning it is necessary to consider whether the prudent placement of the heat interface unit would render a service water heat interface unit unnecessary. **The Uponor Aqua Port Compact unit is available as an alternative. This can handle a low heating flow temperature in hot water** (see also pages 46-48, 105/106).

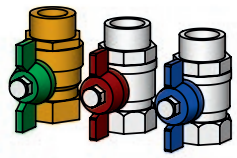
For standard service water circulation, a TTV is already included in the delivery to maintain the temperature of the hot water network, so this does not have to be ordered separately. The stainless steel plate heat exchanger is always insulated to avoid losses due to stagnation. Attention, there is a higher risk of calcification with the stainless steel plate heat exchanger. The Wilo Star Z Nova circulation pump including check valve provides the necessary circulation. The legally required timeout for the service water circulation system is ensured by a timer.

For service water circulation according to DVGW Code of Practice 551, the heating water flow temperatures must be approx. 70 ° C in order to ensure that service water circulation at 60/55 °C is properly compliant. The system return temperatures set themselves to a much higher value than in normal mode.

Wilo-Star-Z NOVA characteristic curves

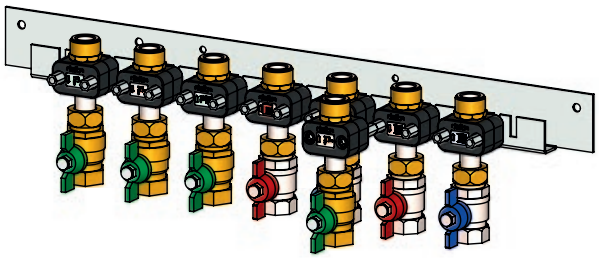


17 Isolating ball valves



Isolating ball valves are only intended for commissioning and decommissioning the heat interface units. They have no regulating function. They should have a full bore and no internal reduction. Isolating ball valves must be operated at least once a year.

On-wall mounted rails with isolating ball valves



On-wall-mounted rails are an assembly variant for pre-installation of the connection pipes without the need for a heat interface unit. This option protects the potential heat interface unit from contamination, damage or theft. The isolating ball valves are already installed. Before the heat interface unit is fitted, the pipeline should be flushed. The dimensions and designs of the individual heat interface unit variants must be observed. On-wall-mounted rails can be used for on-wall mounting with both on-wall-mounted housings and flush-mounted housings.

On-wall mounted housings

On-wall-mounted housings are available in different versions, heights and widths. Here, the on-wall-mounted housings must be assigned to the respective heat interface unit types.
The on-wall-mounted housings form an aesthetically pleasing and stable terminal on the wall. Many variants offer unimpeded access to the heat interface units, e.g. for reading the meters.

All on-wall-mounted housings have a venting system to prevent unnecessary build-up of heat and condensation. The lower connector can be covered with a panel. Please allow approx. 3 cm clearance above and to the sides for the removal of the on-wall mounted housings.

Mounting plate at special height
(W: 555, H: 1026) Suitable for on-wall-mounted housing ADH 3. Accommodates a heat interface unit as well as other accessories such as pump groups and floor heating circuit manifolds (up to 7 heating circuits).

Type	**Dimensions** in mm W x H x D	**Description**
ADH 1	480 x 800 x 150	one-piece
ADH 2 S	480 x 800 x 160	two-piece with frame and door
ADH 2 SL	480 x 900 x 160	
ADH 2 SLX	480 x 1250 x 160	
ADH 2 B	600 x 800 x 160	
ADH 3	600 x 1200 x 240	
ADH 3 (new)	775 x 1180 x 260	

In-wall mounted housings

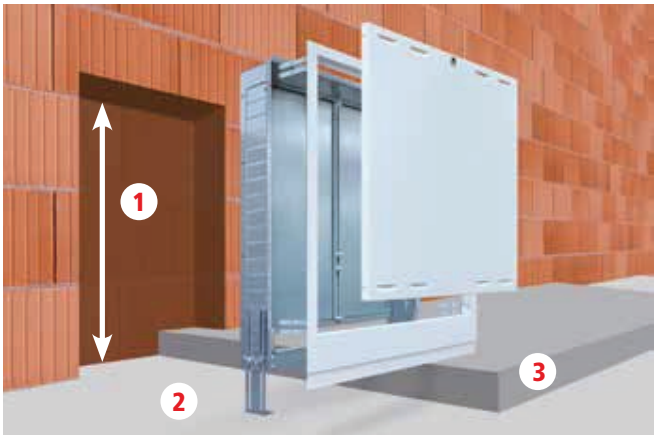
In-wall mounted housings are a different versions, heights and widths. The right size depends on the content and design of the heat interface unit. Note the dimensional drawings of the respective heat interface units for the different sizes. All in-wall-mounted housings have a venting system to prevent unnecessary build-up of heat and condensation. The wall finishing frame with door can be pulled forwards and thus may change the installation depth in the wall. The in-wall-mounted boxes are available in wall-mounted or free-standing designs.

Wall-mounted version

Type	**Dimensions** in mm W x H x D	**Recess dimensions W x H**
UP 49-85-15	490 x 850 x 150-200	530 x 870
UP 61-85-15	610 x 850 x 150-200	650 x 870
UP 81-85-15	810 x 850 x 150-200	850 x 870

Version on feet with height-adjustable feet/screed impact strip.

Type	Dimensions in mm W x H x D	Recess dimensions W x H
UP 49-85-15 ST	490 x 920-1020 x 150-200	530 x Table A
UP 61-85-15 ST	610 x 920-1020 x 150-200	650 x Table A
UP 61-120-15 ST	610 x 1220-1380 x 150-200	650 x Table B
UP 81-120-15 ST	810 x 1220-1380 x 150-200	850 x Table B



Underfloor set-up 3	Recess height (1) (Table A)	Recess height (1) (Table B)
180 mm	1030 mm	1400 mm
160 mm	1010 mm	1380 mm
140 mm	990 mm	1360 mm
120 mm	970 mm	1340 mm
100 mm	950 mm	1320 mm

Heating manifold

Heating manifolds are available in different versions and with different outlets. For standard radiant heating systems these manifolds are made from high quality stainless steel (1.4307).

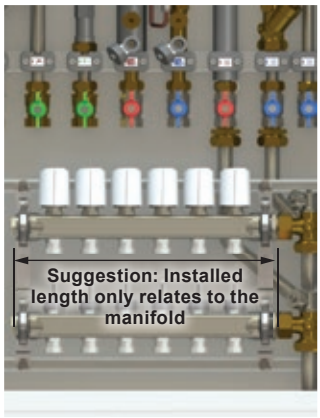
Properties of stainless steel distribution units

INOX underfloor heating manifold made from stainless steel for consumer and drinking water stations..
Underfloor heating manifold DN32 for underfloor heating systems completely connected to the station with piping.
2 SFE taps and thermometer strips in the supply and return lines, ready for connection with special distribution unit brackets and sound insulation insert in accordance with DIN 4109.
Outlets secondary to 3/4'' AG (Euro-Konus).

SUP Integrated flow meter 0 - 5 l/min
Return Integrated control valve and manual control caps, convertible for use with actuators. Valve presettable according to characteristic curve diagram.

Installed length of underfloor heating manifold (installed length information only relates to the manifold)

Type (heating circuits)	Installed length [mm]
Heating circuits 2	161
Heating circuits 3	211
Heating circuits 4	261
Heating circuits 5	311
Heating circuits 6	361
Heating circuits 7	411
Heating circuits 8	461
Heating circuits 9	511
Heating circuits 10	561
Heating circuits 11	611
Heating circuits 12	661

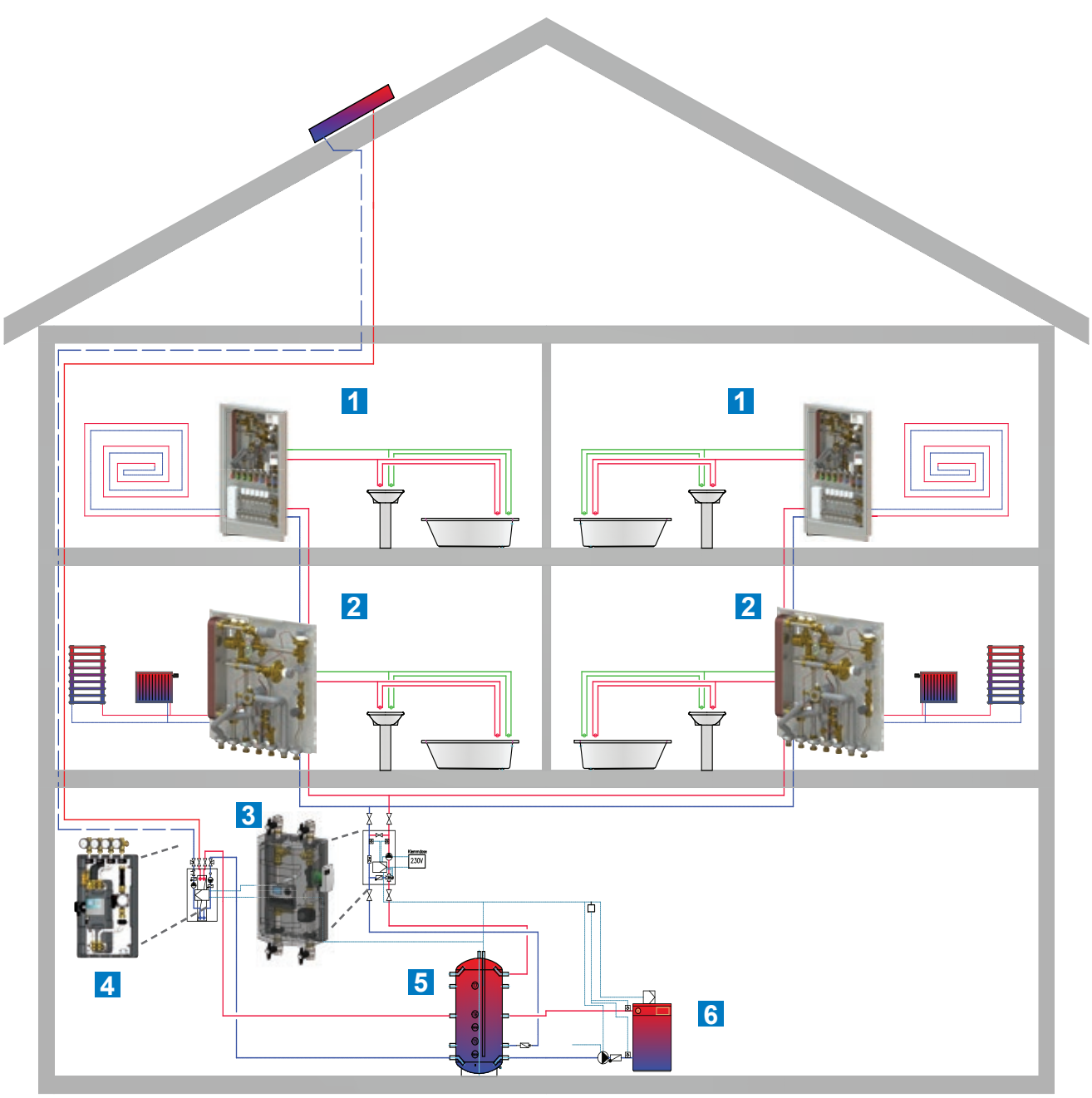


- 2 to 12 heating circuits are possible. **Caution!** In-wall-mounted housings with width 610 mm should only be used with up to 7 heating circuits; with 8 or more heating circuits use in-wall-mounted housing with a width of 810 mm. In on-wall-mounted panels with a large base plate (700 mm), up to 10 heating circuits can be used.
- All fittings directly connected to the manifold are nickel plated to avoid contact corrosion.
- Stable austenitic material structure with little ferrite and magnetism, permanently corrosion-resistant.
- Valve cones in the return beam are conical in shape. As a result, small volumes of water can be precisely and easily set on the return valve.
- Greater safety thanks to an integrated waste water deflector as a third safety feature on the valve spindle.
- Large viewing window with scale on the flow meter in the progress bar.
- **Caution!** Do not use this to set the water volume.

Uponor Combi Port B1000 system integration

Heat interface unit, wide version

Heat interface units are generally part of a system specially tailored to them. This is the standard system layout. It does not matter whether the system is viewed vertically (multi family homes) or horizontally (local heat distribution networks).



1 Heat interface units (wide version) for underfloor heating and fresh hot water
- Heating distribution circuit integrated in the station ready for installation
- Pump modules with injection circuit for radiant heating systems

2 Heat interface units (wide version) for radiator heating and fresh hot water

3 System pump group

4 Solar station

5 Buffer storage tank

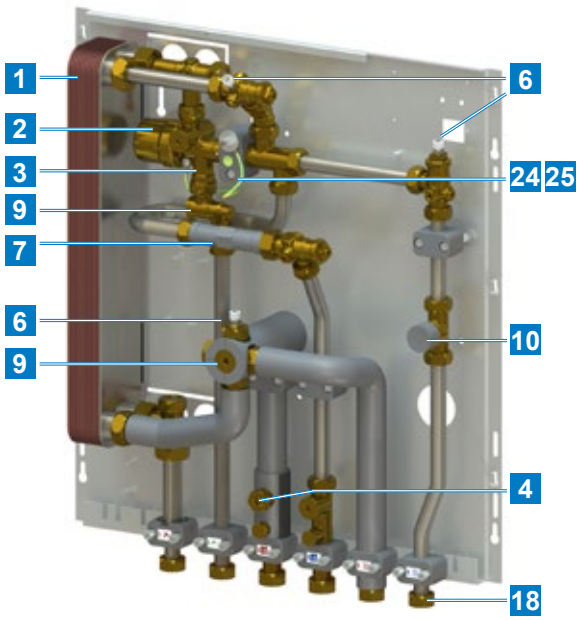
6 Heater (boiler)

Module overview

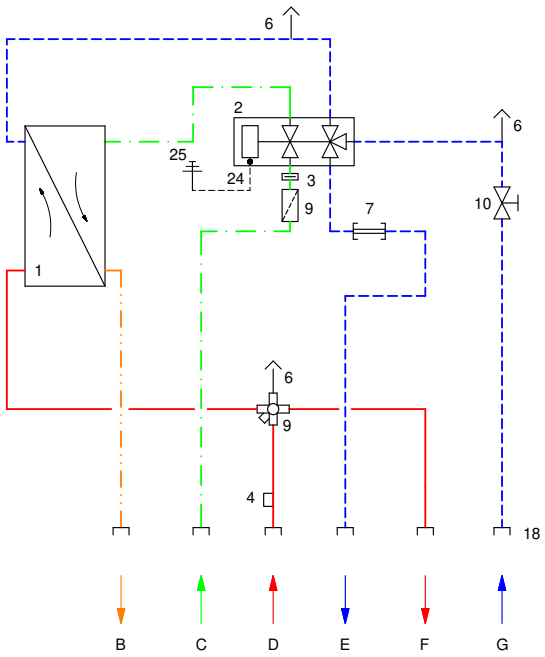
There are numerous module variants for the wide version of the heat interface units. Here is the selection

Modules	yes / no • –
Exchanger	
Stainless steel soldered exchanger	•
Screw-mounted exchanger, including water hammer arrestor	•
Functional modules	
Wider base plate	•
Water hammer arrestor mounted	
• in the proportional volume control valve	•
• in the hot water line	–
Valve inserts	
• for screwing into the multifunctional valve	•
• (pressure relief) for screwing into the multifunctional valve	•
• (adjustable) for screwing into the multifunctional valve	•
• for screwing into the multifunctional valve with volume flow limiter	–
• Dynamic volume flow valve with scale	–
Differential pressure regulator	
• Primary heating input	•
• Secondary heating circuit	•
• in second heating circuit	•
• Set in pipeline	•
Thermostatic lead module	•
• TTV	•
• TTV for risers	•
Thermostatic hot water temperature limiter	
• TWB 15-50 °C	•
• TWB 35-70 °C	•
• T-Mix/TWB combination for high tapping volumes 28-30 l/min	•
Return temperature limiter (RTB)	
• for single-pipe systems	•
• for two-pipe systems	•
• in second heating circuit	•
Adapter for hot water meter	•
Adapter for cold water meter for domestic hot water preparation	•
Cold water residential unit outlet without meter adapter	•
Cold water residential unit outlet with 1 meter adapter	•
Cold water residential unit outlet with 2 meter adapters	•
Cold water pipeline with pressure reducer	•
Cold water pipeline pressure reducer, cold water residential unit outlet	•
Cold water pipeline with a meter adapter, pressure reducer, cold water residential unit outlet	•
Cold water pipeline with a meter adapter and pressure reducer	•
Dirt collector in the Return-Secondary	•
Drainage set for Heating-Supply-Primary/Heating-Return-Primary	•
Circulation pump set	•
Safety valve set for installation in the hot water pipeline	•
Connection of a second heating circuit for drinking water module (Uponor Aqua Port Compact)	•
Mixer circuit:	
• Thermal drive or 3-point actuator	•
• second heating circuit	•
Safety temperature monitor	•
Manifold connection set ?	•
Underfloor heating manifold with flow meter	•
On-wall mounting rail	•
In-wall-mounted housing with frame and door	•
Sheet steel frame, door designed as a radio receiver	•
In-wall mounting rail	•
Connection, e.g. for in-wall-mounted rail	•
On-wall-mounted cladding	•
Cover panel for on-wall mounted cladding	•
Mounting plate for manifold set-up and on-wall mounting	•
Straight isolating ball valves	•
Angled isolating ball valves	•
Control	
Thermal actuator 230 V	•
Thermal actuator 24 V	•
Control based on weather conditions and room temperature	•
3-point actuator	•
Actuator with 0-10 V control input and 24 V voltage supply	•
Uponor BASE Flexiboard	•
Distributor socket for M-BUS systems	•
Wiring with thermostatic injection circuit	•
Wiring with weather-based injection circuit (3-points)	•
Wiring with weather-based injection circuit (3-points) including Uponor Smatrix regulation	•
Installation of heat or drinking water meters provided	•
Wiring with M-BUS for meter	•
Wiring of electrical components within the station to a distributor box	•

Base station



Hydraulic plan



Technical data

Materials

Fittings	*Drinking water, hygienically suitable materials according to DVGW, UBA, WRAS*
Sanitary	*CW617N; heating: CW617N, CW614N*
Seals	*according to DVGW KTW D1/D2, W270 and WRAS requirements*
Thermal insulation	*EPP*
Heat exchanger	*Plates: 1.4404; solder: Copper, nickel or screw-mounted exchanger (VacInox)*
Pipeline	*1.4401*

Sanitary

Max. operating pressure	*PN 10*
Min. preliminary pressure	*2,0 bar*

Heating

Max. operating pressure	*PN 10*
Max. operating temperature	*85 °C*
Max. pr. Differential pressure	*2,5 bar*

Electrical

Current connection	*230 V/50 Hz during use: Mixed circuit, service water circulation, zone valve with room thermostat, otherwise functional without a current connection*
Dimensions	*W x H x D = 555 mm x 600 mm x 150 mm*
Weight	*14 plates = 13.2 kg / 20 plates = 13.9 kg 30 plates = 15.3 kg / 40 plates = 16.8 kg*

Legend

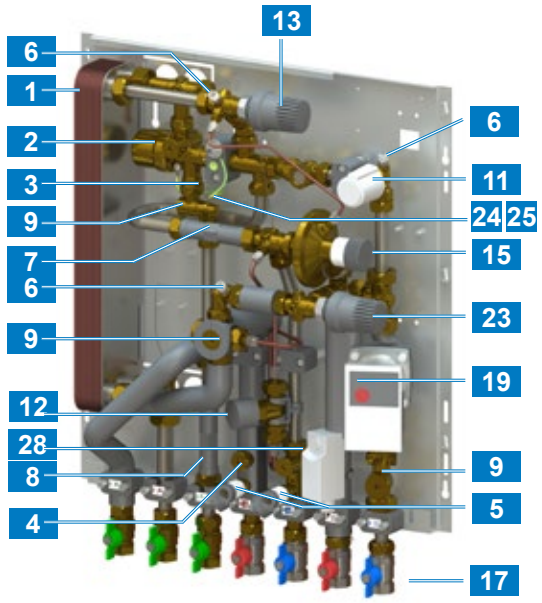
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

- **1** *Plate heat exchangers*
- **2** *Proportional quantity control valve (PM valve)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **9** *Dirt collector*
- **10** *Zone valve for limiting heating flow -for apartments*
- **18** *Union nut*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*

Base stations are platforms that are usually supplemented by additional module units.

The station is available in the following versions	
GBS 240H-14 (14 plates)	12 l/min. approx. 35 kW
GBS 240H-20 (20 plates)	15 l/min. approx. 42 kW
GBS 240H-30 (30 plates)	17 l/min. approx. 48 kW
GBS 240H-40 (40 plates)	19 l/min. approx. 55 kW

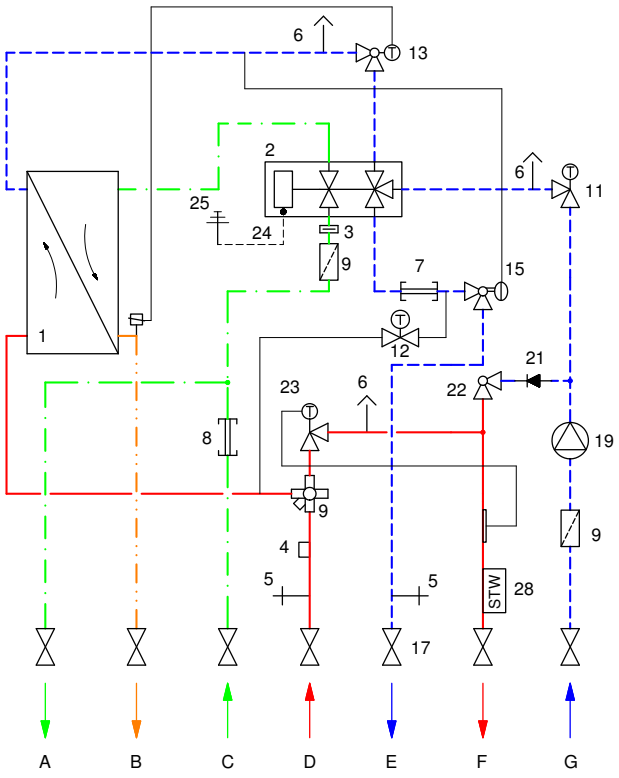
Sample set-up



Note

The basic units are supplemented here by modules and assembled to form an individual heat interface unit for the planned application requirements.

Hydraulic plan



Legend

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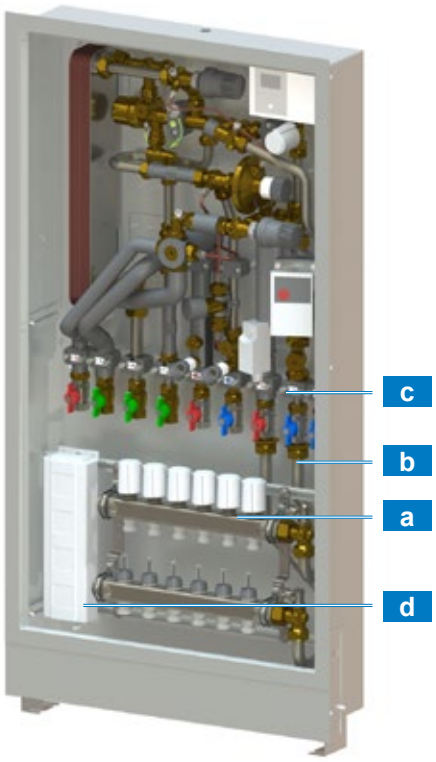
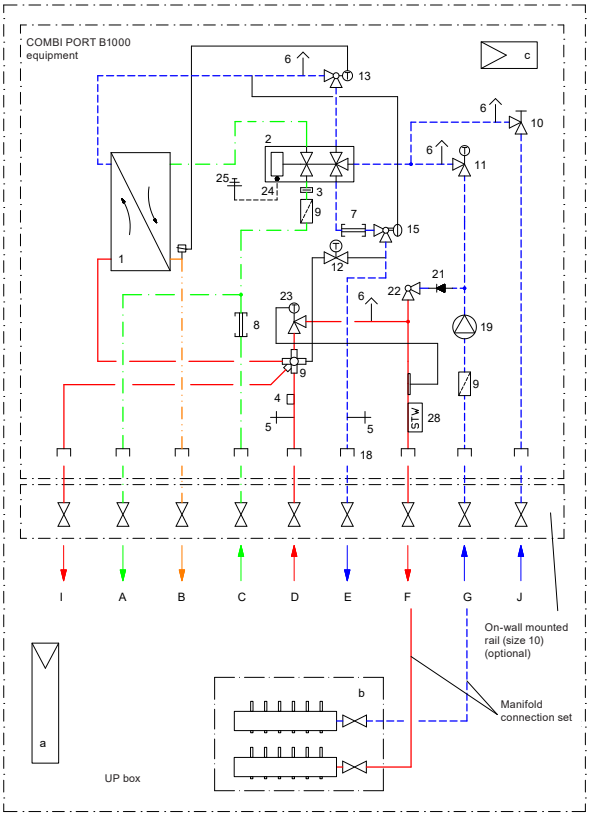
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **9** *Dirt collector*
- **11** *Zone valve for limiting heating flow- Residential unit with thermal 2-point actuator*
- **12** *(TTV) Thermostatic lead module*
- **13** *(TWB) Thermostatic hot water temperature limiter*
- **15** *Differential pressure regulator primarily in the station input*
- **17** *Isolating ball valve*
- **19** *Pump*
- **21** *Check valve*
- **22** *Control valve for bypass section*
- **23** *Thermostatic underfloor heating regulation 20-50°C*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*
- **28** *Safety temperature monitor*

Sample set-up for in-wall mounting

Sample set-up including manifold



Hydraulic plan including manifold



Special parts

- **a** *Underfloor heating manifold*
- **b** *Manifold connection set*
- **c** *On-wall mounted rail*
- **d** *Uponor BASE Flexiboard*

Legend

- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*
- **I** *Heating-Supply add-on HC*
- **J** *Heating-Return add-on HC*

- **1** *Plate heat exchangers*
- **2** *Proportional quantity control valve (PM valve)*
- **3** *Coldwater orifice plate (in screw connection)*
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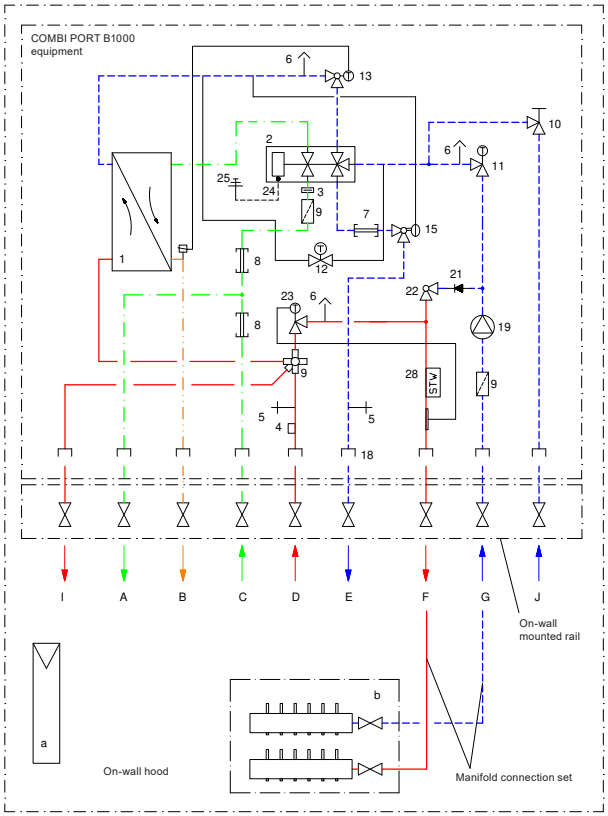
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*
- **28** *Safety temperature monitor*

Sample set-up for on-wall mounting (ADH3)

Sample set-up including manifold

Hydraulic plan including manifold



Special parts

- **a** *Uponor BASE Flexiboard*
- **b** *Underfloor heating manifold*
- **c** *On-wall mounted rail*
- **d** *Manifold connection set*

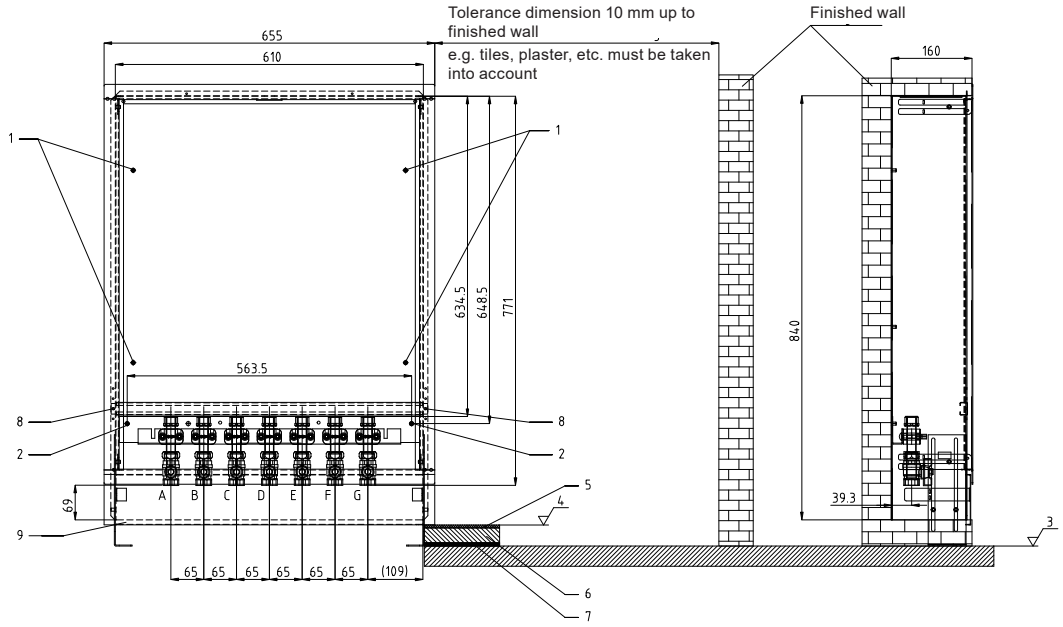
Legend

- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*
- **I** *Heating Supply add-on HC*
- **J** *Heating Return add-on HC*

- **1** *Plate heat exchangers*
- **2** *Proportional quantity control valve (PM valve)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **9** *Dirt collector*
- **10** *Zone valve for limiting heating flow -for apartments*
- **11** *Zone valve for limiting heating flow- Residential unit with thermal 2-point actuator*
- **12** *(TTV) Thermostatic lead module*
- **13** *(TWB) Thermostatic hot water temperature limiter*
- **15** *Differential pressure regulator primarily in the station input*
- **18** *Union nut*
- **19** *Pump*
- **21** *Check valve*
- **22** *Control valve for bypass section*
- **23** *Thermostatic underfloor heating regulation 20-50°C*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*
- **28** *Safety temperature monitor*

Dimensional drawings

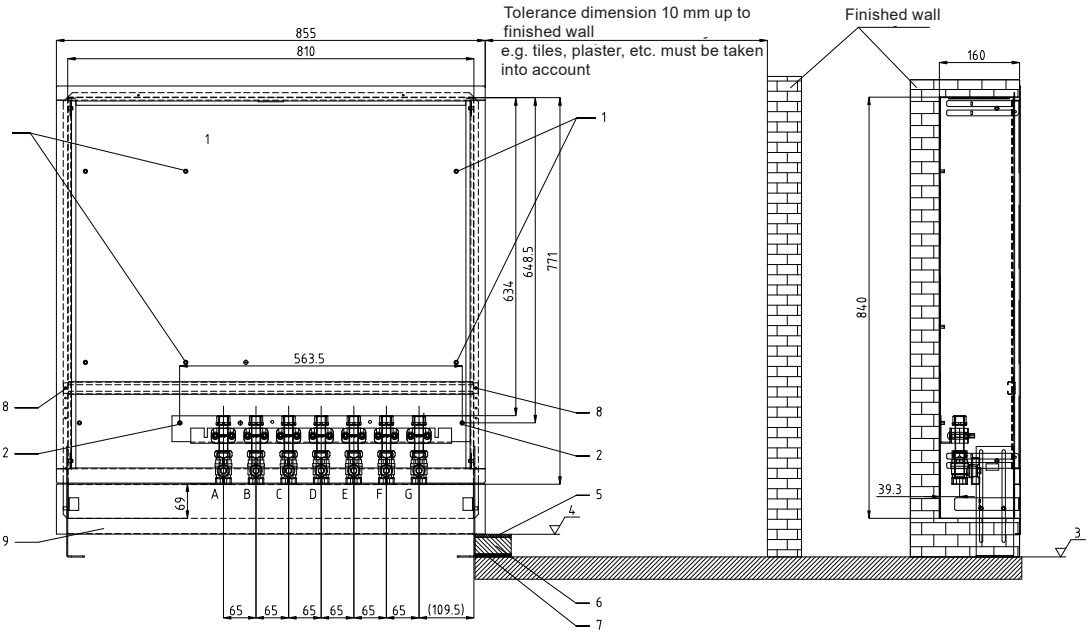
Dimensions for base plate, heat interface unit wide version in UP housing (610 cm)



- **A** *Flow regulator in residential units (optional)*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

- **1** *Mounting bolts for base plate*
- **2** *Mounting bolts for connection rail (3rd from top)*
- **3** *Top edge of the bare concrete floor*
- **4** *Top edge of the floor*
- **5** *Covering*
- **6** *Screed*
- **7** *Insulating layer*
- **8** *Connection point for the cross supports*
- **9** *Screed impact plate*

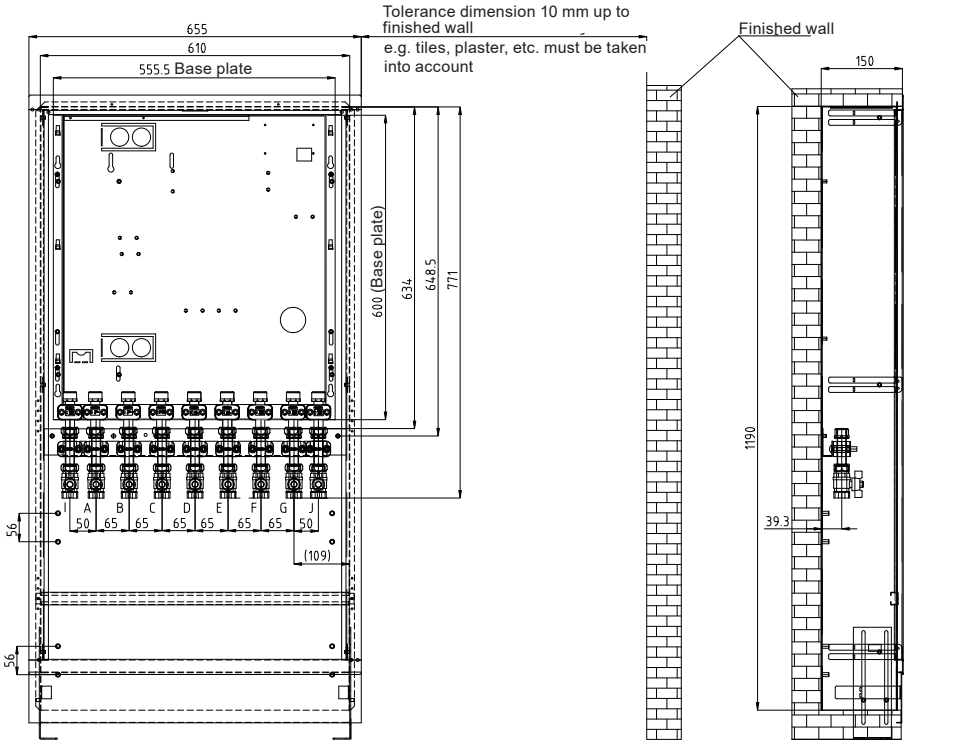
Dimensions for base plate, heat interface unit wide version in UP housing (810 cm)



- **A** *Flow regulator in residential units (optional)*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

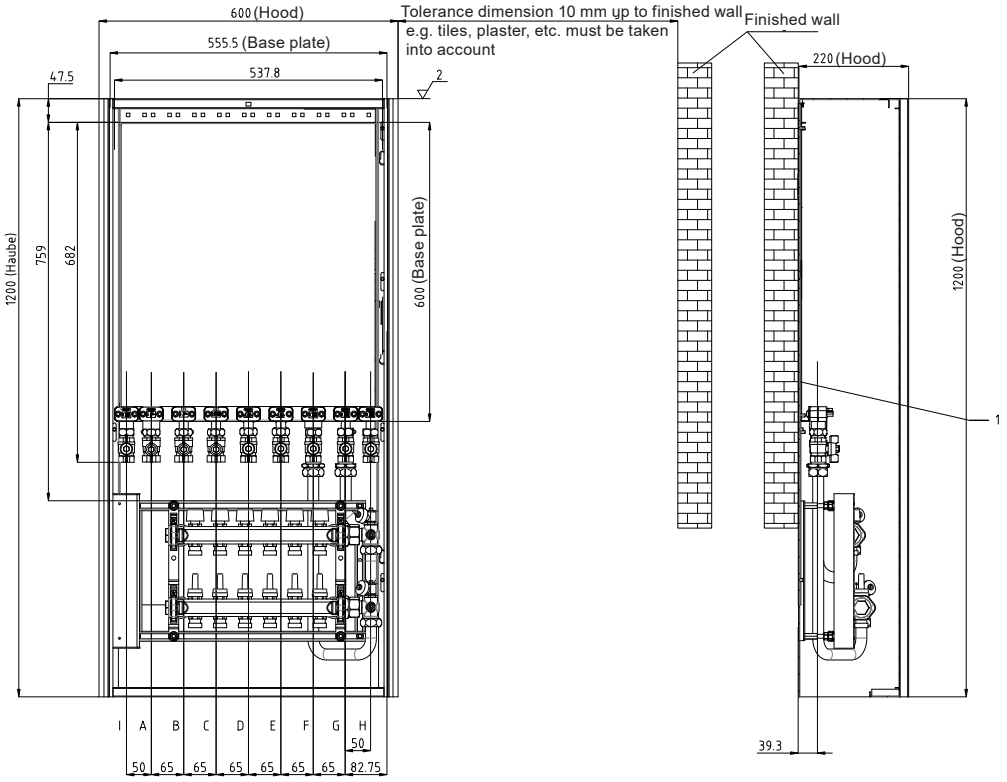
- **1** *Mounting bolts for base plate*
- **2** *Mounting bolts for connection rail (3rd from top)*
- **3** *Top edge of the bare concrete floor*
- **4** *Top edge of the floor*
- **5** *Covering*
- **6** *Screed*
- **7** *Insulating layer*
- **8** *Connection point for the cross supports*
- **9** *Screed impact plate*

Dimensions for heat interface unit wide version in UP housing including manifold



- **A** *Flow regulator in residential units (optional)*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*
- **I** *Heating Supply add-on HC*
- **J** *Heating Return add-on HC*

Dimensions for heat interface unit wide version in on-wall housing including manifold



- **A** *Flow regulator in residential units (optional)*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*
- **H** *Heating-Return stat. heating circuit*
- **I** *Heating-Supply-stat. heating circuit*

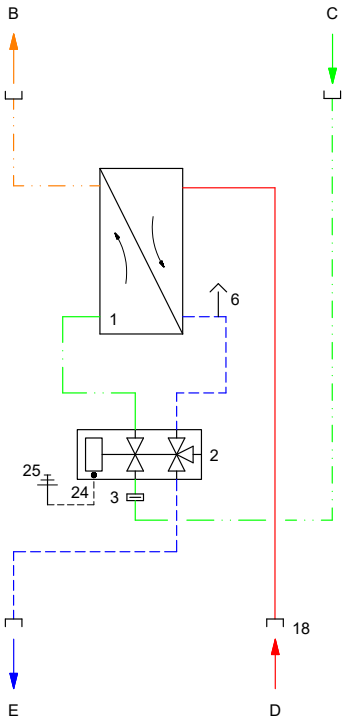
- **1** *Base plate*
- **2** *Top edge of hood*

Uponor Aqua Port Compact

The alternative to service water circulation (BWZ)

Base station

Hydraulic plan



The Uponor Aqua Port Compact under-table unit can be used as an alternative to a traditional service water circulation system with the familiar disadvantages of water hygiene and the necessary high temperatures on the circulation side. An outlet for the unit is installed on the heat interface units and the Uponor Aqua Port Compact is supplied with energy from this. The energy continues to be measured in the heat interface unit.

Caution
A bathroom radiator can be connected as an option. In this case, a dynamic radiator valve should be included in order to prevent the return temperature from rising and ensuring hydraulic balance.

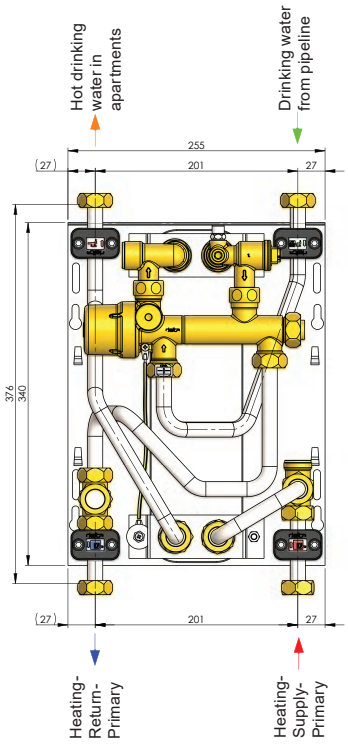
This system is used just to keep heating water is kept at the set temperature until fresh warm water is prepared in the consumer unit. The flow temperature can also be between 55 and 60 °C, depending on the planned hot water outlet temperature. Starting from this heat exchanger, the 3-litre rule according to DVGW W 551 also applies here. To keep the heating supply line warm as far as the Uponor Aqua Port Compact under-table unit, a TTV is installed in the Uponor Aqua Port Compact under-table unit.
Plate exchanger GKE-228H-24

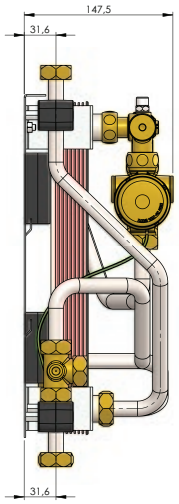
Legend

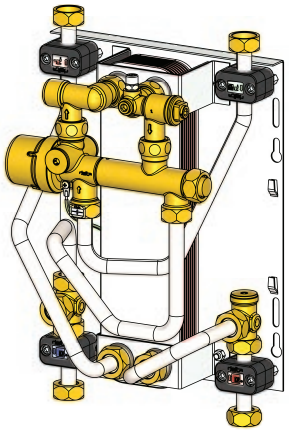
- B *Hot drinking water in apartments*
- C *Drinking water from pipeline*
- D *Heating-Supply-Primary*
- E *Heating-Return-Primary*
- 1 *Plate heat exchangers*
- 2 *Proportional quantity control valve (PM valve)*
- 3 *Coldwater orifice plate (in screw connection)*
- 6 *Venting*
- 18 *Union nut*
- 24 *Equipotential bonding connection*
- 25 *Earthing on site*

Dimensional drawings

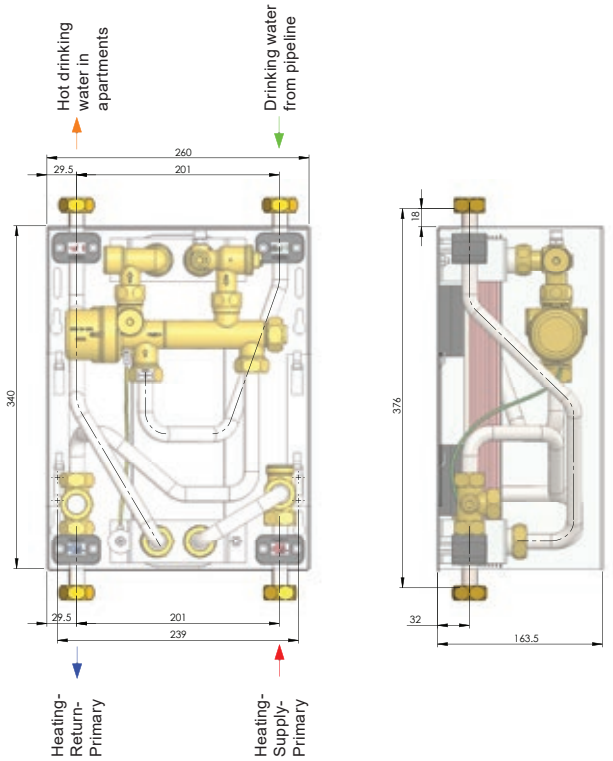
Base station Uponor Aqua Port Compact

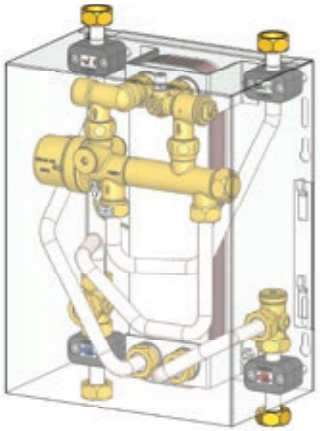






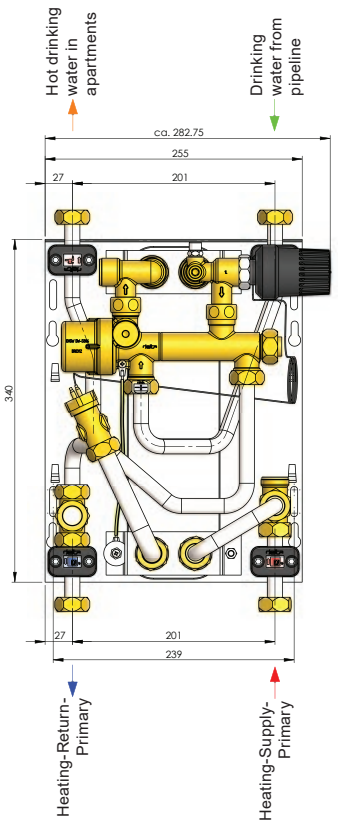
Sample set-up for compact unit with on-wall hood

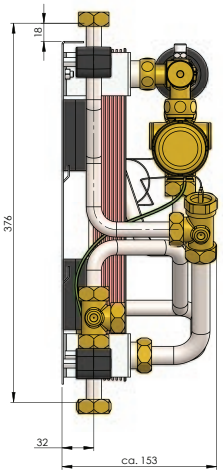


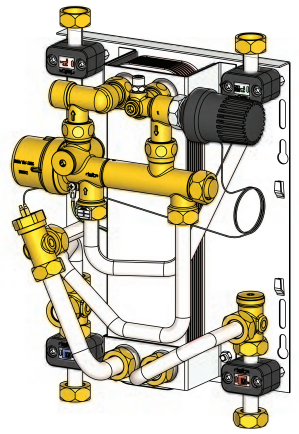


Dimensional drawings

Sample set-up for compact unit with thermostatic hot water temperature limiter







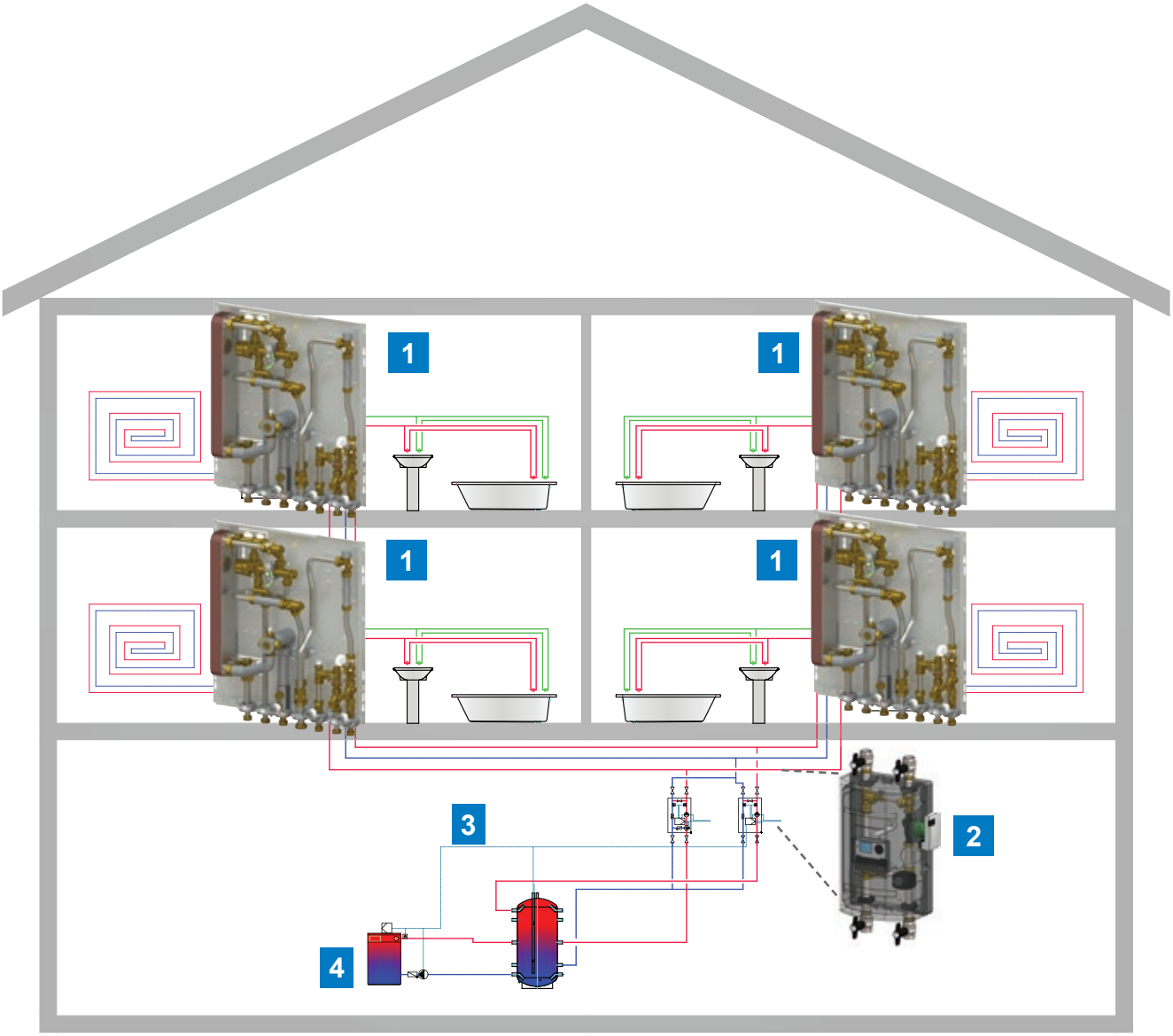
Note:
The thermostatic hot water temperature limiter module cannot be used with the on-wall hood!

Uponor Combi Port B1000 3P system integration

3-pipe expansion

The 3-pipe expansion system is used to integrate low-temperature heating systems directly via the heat interface unit. The second supply line allows central, weather-based regulation of the room temperature. This heating circuit is metered and billed separately. There is no pump module/control component in the station, and the associated cabling is also unnecessary.

The high temperature heating circuit is only used for hot water preparation. The module can be partially extended here. The basis is a storage concept with two different supply temperatures and a common return.



1 Heat interface unit with 3-pipe expansion for underfloor heating and fresh hot water

2 Pump group

3 Buffer storage tank

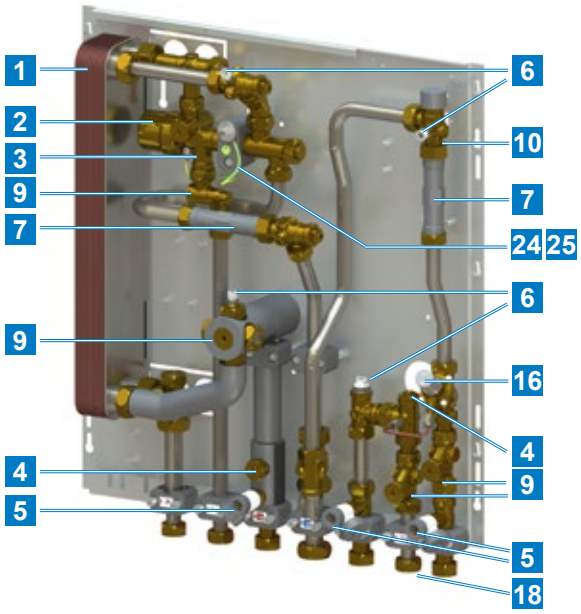
4 Heater (boiler)

Module overview

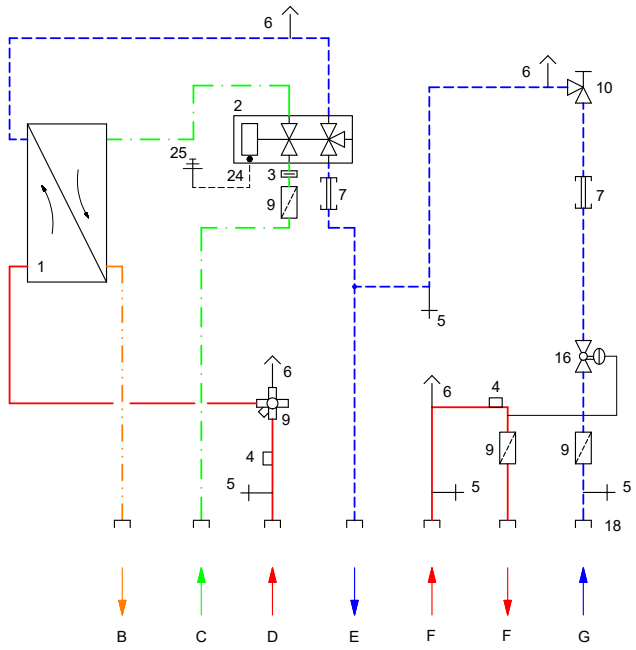
There are numerous module variants for the heat interface units with a 3-pipe expansion. Here is the selection

Modules	yes / no ● –
Exchanger	
Stainless steel soldered exchanger	●
Screw-mounted exchanger with water hammer arrestor	●
Functional modules	
Wider base plate	–
Water hammer arrestor, mounted:	
• in the proportional volume control valve	●
• in the hot water line	–
Valve inserts	
• for screwing into the multifunctional valve	●
• (pressure relief) for screwing into the multifunctional valve	●
• (adjustable) for screwing into the multifunctional valve	●
• for screwing into the multifunctional valve with volume flow limiter	●
• Dynamic volume flow valve with scale	–
Differential pressure regulator	
• Primary heating input	●
• Secondary heating circuit	●
• in second heating circuit	–
• Set in pipeline	–
Thermostatic lead module	
• TTV	●
• TTV for risers	●
Thermostatic hot water temperature limiter	
• TWB 15-50 °C	●
• TWB 35-70 °C	●
• T-Mix/TWB combination for high tapping volumes 28-30 l/min	–
Return temperature limiter (RTB)	
• for single-pipe systems	–
• for two-pipe systems	–
• in second heating circuit	–
Adapter for hot water meter	●
Adapter for cold water meter for domestic hot water preparation	●
Cold water residential unit outlet without meter adapter	●
Cold water residential unit outlet with 1 meter adapter	●
Cold water residential unit outlet with 2 meter adapters	●
Cold water pipeline with pressure reducer	●
Cold water pipeline pressure reducer, cold water residential unit outlet	●
Cold water pipeline with a meter adapter, pressure reducer, cold water residential unit outlet	●
Cold water pipeline with a meter adapter and pressure reducer	●
Dirt collector in the Return-Secondary.	●
Drainage set for Heating-Supply-Primary/Heating-Return-Primary	●
Circulation pump set	●
Safety valve set for installation in the hot water pipeline	●
Connection of a second heating circuit for drinking water module (Uponor Aqua Port Compact)	–
Mixer circuit:	
• Thermal drive or 3-point actuator	–
• second heating circuit	–
Safety temperature monitor	–
Manifold connection set	●
Underfloor heating manifold with flow meter	●
On-wall mounting rail	●
In-wall-mounted housing with frame and door	●
Sheet steel frame, door designed as a radio receiver	●
In-wall mounting rail	●
Connection, e.g. for in-wall-mounted rail	●
On-wall-mounted cladding	●
Cover panel for on-wall mounted cladding	●
Mounting plate for manifold set-up and on-wall mounting	●
Straight isolating ball valves	●
Angled isolating ball valves	●
Control	
Thermal actuator 230 V	●
Thermal actuator 24 V	●
Control based on weather conditions and room temperature	–
3-point actuator	–
Actuator with 0-10 V control input and 24 V voltage supply	●
Uponor Smatrix control	●
Distributor socket for M-BUS systems	●
Wiring with thermostatic injection circuit	–
Wiring with weather-based injection circuit (3-points)	–
Wiring with weather-based injection circuit (3-points) including Uponor Smatrix regulation	–
Installation of heat or drinking water meters provided	●
Wiring with M-BUS for meter	●
Wiring of electrical components within the station to a distributor box	●

Base station



Hydraulic plan



Technical data

Materials

Fittings	*Drinking water, hygienically suitable materials according to DVGW, UBA, WRAS*
Sanitary	*CW617N; heating: CW617N, CW614N*
Seals	*according to DVGW KTW D1/D2, W270 and WRAS requirements*
Thermal insulation	*EPP*
Heat exchanger	*Plates: 1.4404; solder: Copper, nickel or screw-mounted exchanger (VacInox)*
Pipeline	*1.4401*

Sanitary

Max. operating pressure	*PN 10*
Min. preliminary pressure	*2,0 bar*

Heating

Max. operating pressure	*PN 10*
Max. operating temperature	*85 °C*
Max. pri. Differential pressure	*2,5 bar*

Electrical

Current connection	*230 V/50 Hz during use: Mixed circuit, service water circulation, zone valve with room thermostat, otherwise functional without a current connection*
Dimensions	*W x H x D = 555 mm x 600 mm x 150 mm*
Weight	*14 plates = 13.2 kg / 20 plates = 13.9 kg 30 plates = 15.3 kg / 40 plates = 16.8 kg*

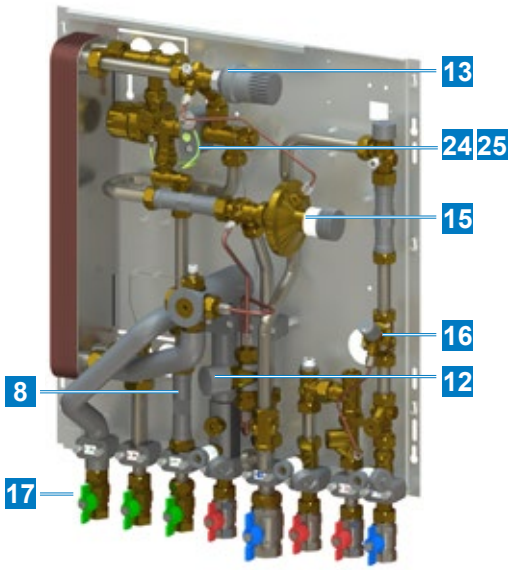
Legend

- B *Hot drinking water in apartments*
- C *Drinking water from pipeline*
- D *Heating-Supply-Primary*
- E *Heating-Return-Primary*
- F *Heating-Supply-Secondary*
- G *Heating-Return-Secondary*

- 1 *Plate heat exchangers*
- 2 *Proportional quantity control valve (PM valve)*
- 3 *Coldwater orifice plate (in screw connection)*
- 4 *Sensor pocket heat meter M10x1, submersible*
- 5 *Draining*
- 6 *Venting*
- 7 *Heat meter adaptor*
- 9 *Dirt collector*
- 10 *Zone valve for limiting heating flow -for apartments*
- 16 *Differential pressure control, secondary heating circuit*
- 18 *Union nut*
- 24 *Equipotential bonding connection*
- 25 *Earthing on site*

The station is available in the following versions	
GBS 240H-14 (14 plates)	12 l/min. approx. 35 kW
GBS 240H-20 (20 plates)	15 l/min. approx. 42 kW
GBS 240H-30 (30 plates)	17 l/min. approx. 48 kW
GBS 240H-40 (40 plates)	19 l/min. approx. 55 kW

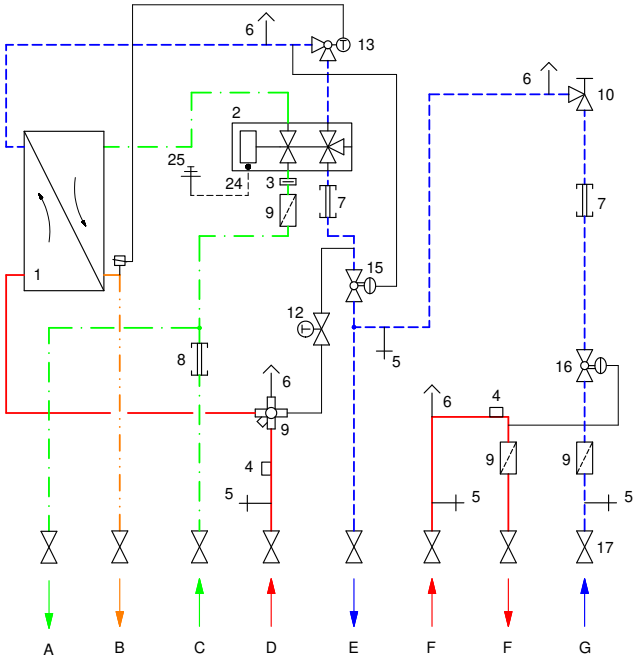
Sample set-up



Note

The basic units are supplemented here by modules and assembled to form an individual heat interface unit for the planned application requirements.

Hydraulic plan



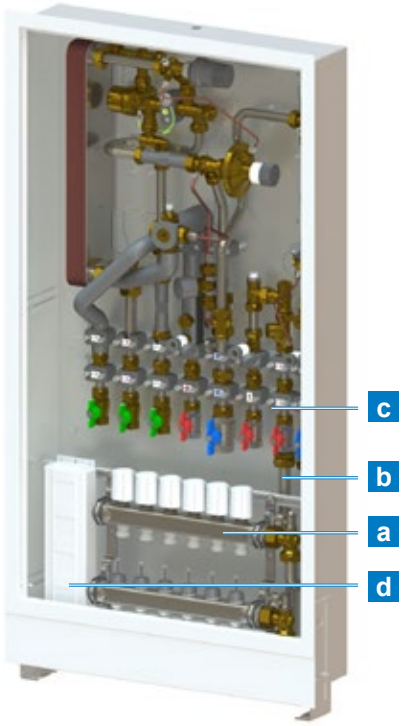
Legend

- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

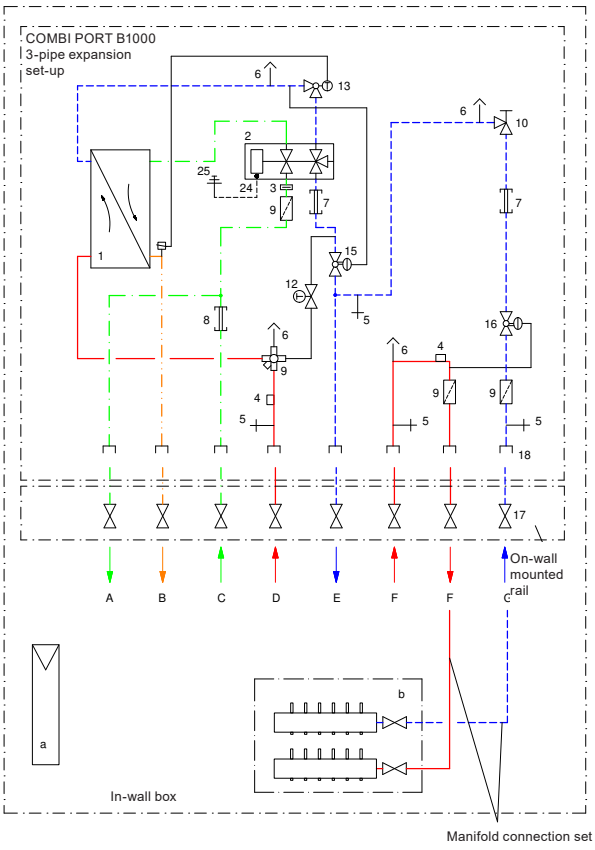
- **1** *Plate heat exchangers*
- **2** *Proportional quantity control valve (PM valve)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **9** *Dirt collector*
- **10** *Zone valve for limiting heating flow -for apartments*
- **12** *(TTV) Thermostatic lead module*
- **13** *(TWB) Thermostatic hot water temperature limiter*
- **15** *Differential pressure regulator primarily in the station input*
- **16** *Differential pressure control, secondary heating circuit*
- **17** *Isolating ball valve*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*

Sample set-up for in-wall mounting

Sample set-up including manifold



Hydraulic plan



Special parts

- **a** *Underfloor heating manifold*
- **b** *Manifold connection set*
- **c** *On-wall mounted rail*
- **d** *Uponor BASE Flexiboard*

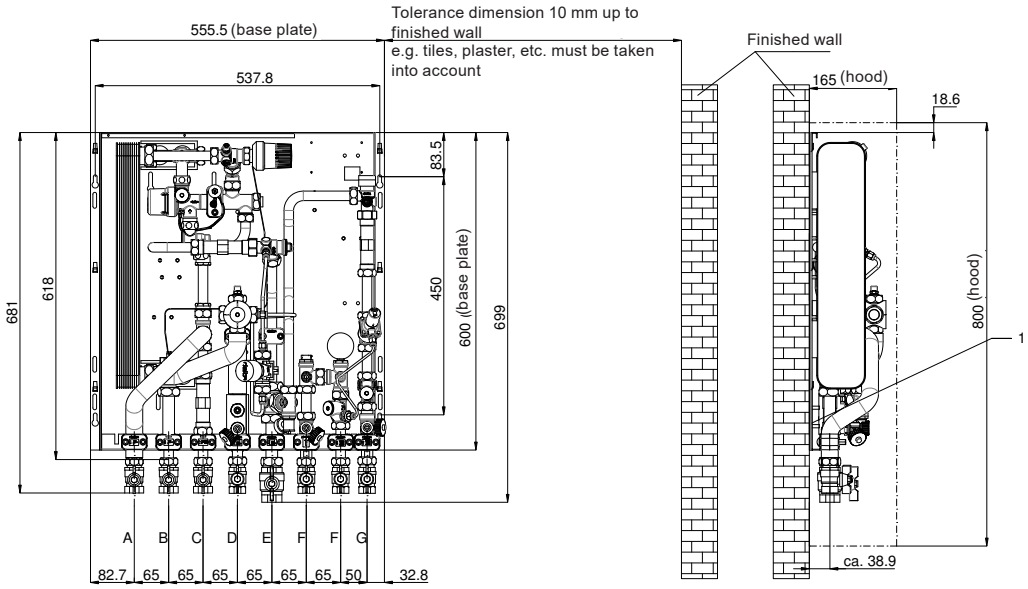
Legend

- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

- **1** *Plate heat exchangers*
- **2** *Proportional quantity control valve (PM valve)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **9** *Dirt collector*
- **10** *Zone valve for limiting heating flow -for apartments*
- **12** *(TTV) Thermostatic lead module*
- **13** *(TWB) Thermostatic hot water temperature limiter*
- **15** *Differential pressure regulator primarily in the station input*
- **16** *Differential pressure control, secondary heating circuit*
- **17** *Isolating ball valve*
- **18** *Union nut*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*

Dimensional drawings

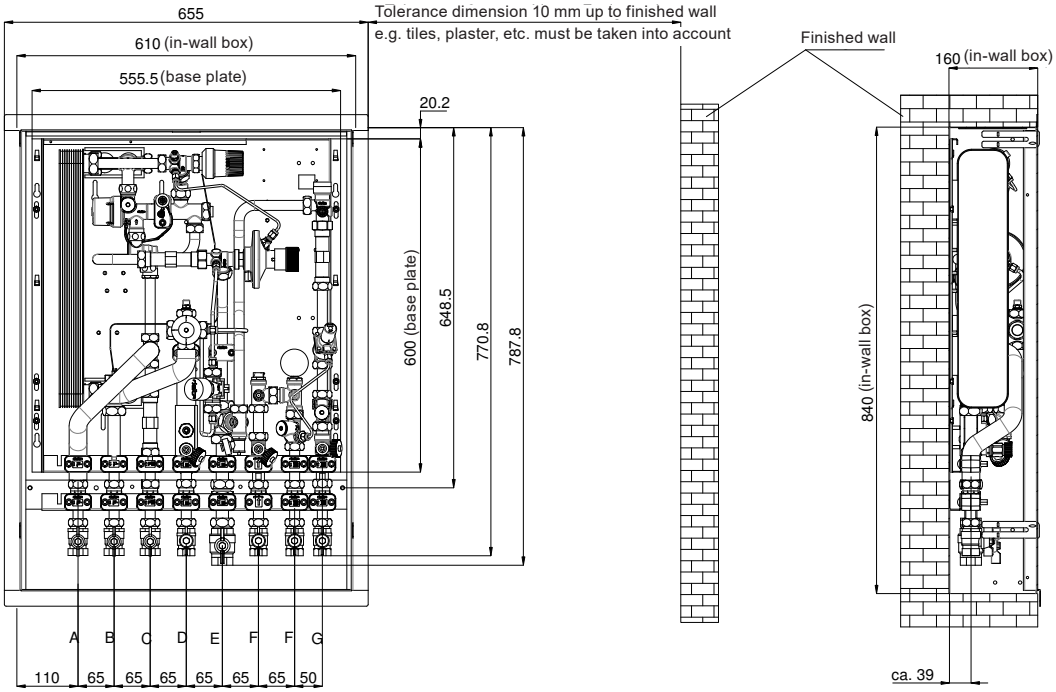
Dimensions for base plate, heat interface unit with 3-pipe expansion



A *Drinking water in apartments*
B *Hot drinking water in apartments*
C *Drinking water from pipeline*
D *Heating-Supply-Primary*
E *Heating-Return-Primary*
F *Heating-Supply-Secondary*
G *Heating-Return-Secondary*

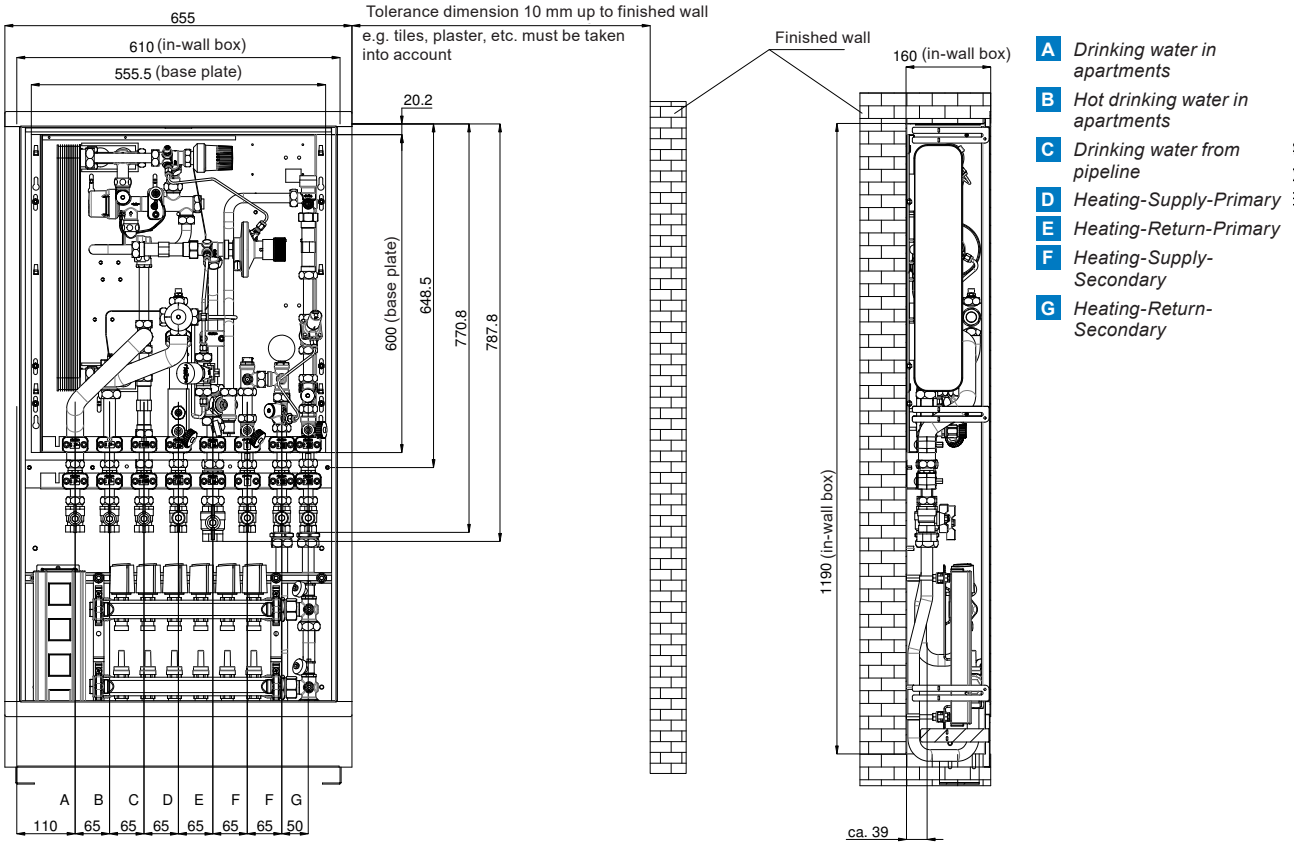
1 *Base plate*

Dimensions for heat interface unit with 3-pipe expansion in in-wall housing



A *Drinking water in apartments*
B *Hot drinking water in apartments*
C *Drinking water from pipeline*
D *Heating-Supply-Primary*
E *Heating-Return-Primary*
F *Heating-Supply-Secondary*
G *Heating-Return-Secondary*

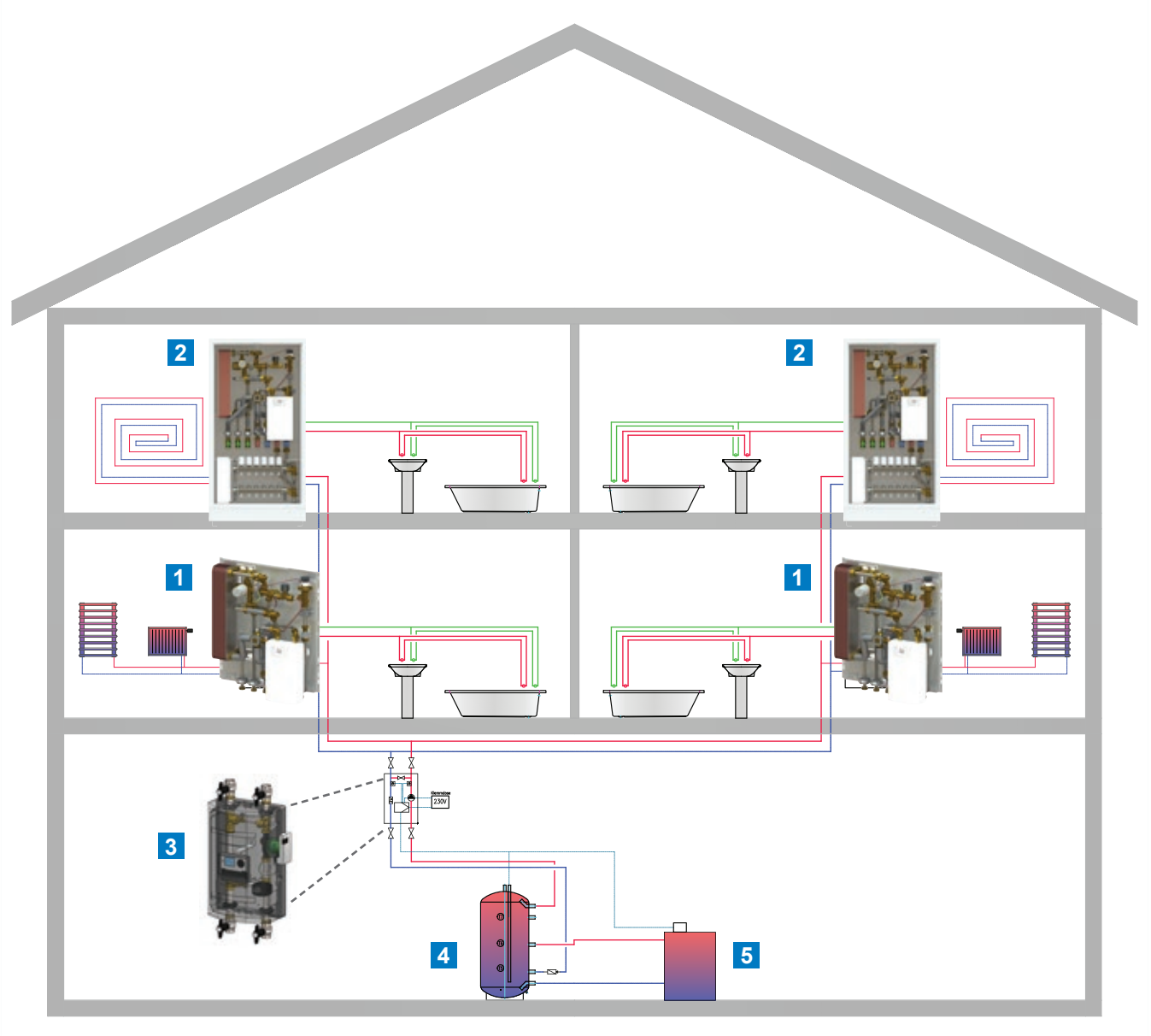
Dimension with 3-pipe module for in-wall housing including manifold



System integration with Uponor Combi Port B1000-HY and Aqua Port B1000-HY

Hybrid heat interface unit

The hybrid heat interface unit also enables a comfortable hot water temperature to be achieved even at low heating supply temperatures. This unit variant is ideal for systems with heat pumps that cannot achieve temperatures above 55 °C in a cost-efficient way. However other alternative sources of heat can also be used (e.g. for solar thermal transition periods).



1 Hybrid heat interface unit for fresh hot water and radiator heating

2 Hybrid heat interface unit including underfloor heating manifold for fresh hot water and underfloor heating

3 Pump group

4 Buffer storage tank

5 Heater (boiler)

Module overview, Uponor Combi Port B1000-HY

There are numerous module variants for hybrid heat interface units. Here is the selection

Modules	yes / no ● –
Exchanger	
Stainless steel soldered exchanger	●
Screw-mounted exchanger, including water hammer arrestor	●
Functional modules	
Wider base plate	●
Remote control for electrical through flow heaters	●
Water hammer arrestor (included in basic version)	
• in the proportional volume control valve	–
• in the hot water line	–
Valve inserts	
• for screwing into the multifunctional valve	●
• (pressure relief) for screwing into the multifunctional valve	●
• (adjustable) for screwing into the multifunctional valve	●
• for screwing into the multifunctional valve with volume flow limiter	–
• Dynamic volume flow valve with scale	–
Differential pressure regulator	
• Primary heating input	●
• Secondary heating circuit	–
• in second heating circuit	–
• Set in pipeline	●
Thermostatic lead module	
• TTV	–
• TTV for risers	–
Thermostatic hot water temperature limiter	
• TWB 15-50 °C	–
• TWB 35-70 °C	–
• T-Mix/TWB combination for high tapping volumes 28-30 l/min	–
Return temperature limiter (RTB)	●
• for single-pipe systems	●
• for two-pipe systems	–
• in second heating circuit	–
Adapter for hot water meter	–
Adapter for cold water meter for domestic hot water preparation	●
Cold water residential unit outlet without meter adapter	–
Cold water residential unit outlet with 1 meter adapter	●
Cold water residential unit outlet with 2 meter adapters	●
Cold water pipeline with pressure reducer	–
Cold water pipeline pressure reducer, cold water residential unit outlet	–
Cold water pipeline with a meter adapter, pressure reducer, cold water residential unit outlet	–
Cold water pipeline with a meter adapter and pressure reducer	–
Dirt collector in the Return-Secondary.	●
Drainage set for Heating-Supply-Primary/Heating-Return-Primary	–
Circulation pump set	●
Safety valve set for installation in the hot water pipeline	–
Connection of a second heating circuit for drinking water module (Uponor Aqua Port Compact)	–
Mixer circuit:	
• Thermal drive or 3-point actuator	–
• second heating circuit	–
Safety temperature monitor	–
Manifold connection set	–
Underfloor heating manifold with flow meter	●
On-wall mounting rail	●
In-wall-mounted housing with frame and door	●
Sheet steel frame, door designed as a radio receiver	●
In-wall mounting rail	●
Connection, e.g. for in-wall-mounted rail	●
On-wall-mounted cladding	●
Cover panel for on-wall mounted cladding	–
Mounting plate for manifold set-up and on-wall mounting	●
Straight isolating ball valves	●
Angled isolating ball valves	●
Control	
Thermal actuator 230 V	●
Thermal actuator 24 V	●
Control based on weather conditions and room temperature	–
3-point actuator	–
Actuator with 0-10 V control input and 24 V voltage supply	●
Uponor Smatrix control	●
Distributor socket for M-BUS systems	●
Wiring with thermostatic injection circuit	–
Wiring with weather-based injection circuit (3-points)	–
Wiring with weather-based injection circuit (3-points) including Uponor Smatrix regulation	–
Installation of heat or drinking water meters provided	●
Wiring with M-BUS for meter	–
Wiring of electrical components within the station to a distributor box	–

Function description

The hybrid heat interface unit also enables a comfortable hot water temperature of 45-60 °C to be achieved even at low heating supply temperatures of 35-40 °C. This unit variant is ideal for systems with heat pumps that cannot achieve temperatures above 55 °C in a cost-efficient way. However other alternative sources of heat can also be used (e.g. for solar thermal transition periods).

The pre-heating of cold water involves a powerful stainless steel plate heat exchanger. Due to the high volumetric flow rate and the small spread of approx. 3-5 K means that the cold water is heated to approx. 37 °C. Post-heating to a higher hot water temperature required for a shower or bath (about 40-60 °C) uses the integrated, electric through flow water heater (400 V). The drinking water preheated in the heat exchanger to 40 °C requires a very low electrical charge of 3-5 kW to increase the temperature to 45 °C.

One unit version is available with heating support and one simply as a domestic hot water heater. Please note the connected electrical load of the electric through flow water heater. DIN 18015-1 must be observed here.

The simultaneity is as follows for the electrical connection in residential construction:

Basis for measuring main lines in residential buildings without electric heating, nominal voltage 230/400 V.

	without electric hot water	with electric hot water	Required electric hot water	Requirement per RU without electric hot water	Simul-taneity
RU	P_{tot} in kVA	P_{tot} in kVA	P in kVA	P in kVA	in %
5	40	74	34	8.0	14.8
10	55	108	53	5.5	10.8
20	71	135	64	3.6	6.8
24	75	140	65	3.1	5.8
30	83	150	67	2.8	5.0
40	90	160	70	2.3	4.0
50	95	170	75	1.9	3.4
60	100	180	80	1.7	3.0
70	104	186	82	1.5	2.7
80	106	190	84	1.3	2.4
90	107	198	91	1.2	2.2
100	108	200	92	1.1	2.0

kVA = kilo Volt x Ampere

P = Power

P_{tot} = Total power

RU = Residential units

el. hot water = Electric hot water supply (based on 21 kW hydraulic through flow heaters)

Technical data

Materials

Fittings	*Drinking water, hygienically suitable materials according to DVGW, UBA, WRAS*
	Sanitary: CW617N; Heating: CW617N, CW614N
Seals	*according to DVGW KTW D1/D2, W270 and WRAS requirements*
Thermal insulation	*EPP*
Heat exchanger	*Plates: 1.4404; solder: Copper, nickel or screw-mounted exchanger*
Pipeline	*1.4401*

Sanitary

Max. operating pressure	*PN 10*
Min. preliminary pressure	*3,0 bar*

Heating

Max. operating pressure	*PN 10*
Max. operating temperature	*60 °C*
Max. pr. Differential pressure	*2,5 bar*

Electrical

Current connection	*230 V/50 Hz during use: Mixed circuit, service water circulation, zone valve with room thermostat, otherwise functional without a current connection*

WS-Hybrid mechanical

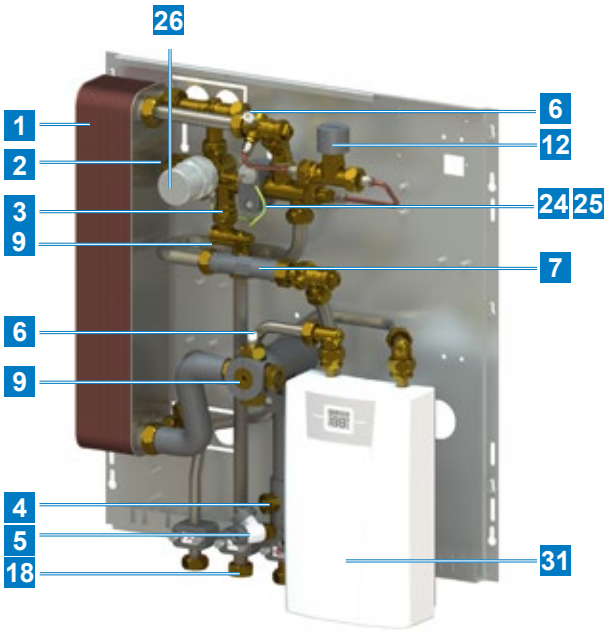
Power	*11 kW (16A) / 13.5 kW (19.5 A)*
Electrical connection	*3/PE 380..415 V AC*
Wire cross section, at least.	*1.5 mm2 (11 kW) / 2.5 mm2 (13.5 kW)*
Power	*18 kW (26 A) / 21 kW (30 A)*
Electrical connection	*3/PE 380..415 V AC*
Wire cross section, at least.	*4 mm2*
Power	*6.0..9.6 kW (27.3..40 A)*
Electrical connection	*1/N/PE 220..240 V AC*
Wire cross section, at least.	*3 x 4 mm2 / 3 x 6 mm2*

Dimensions

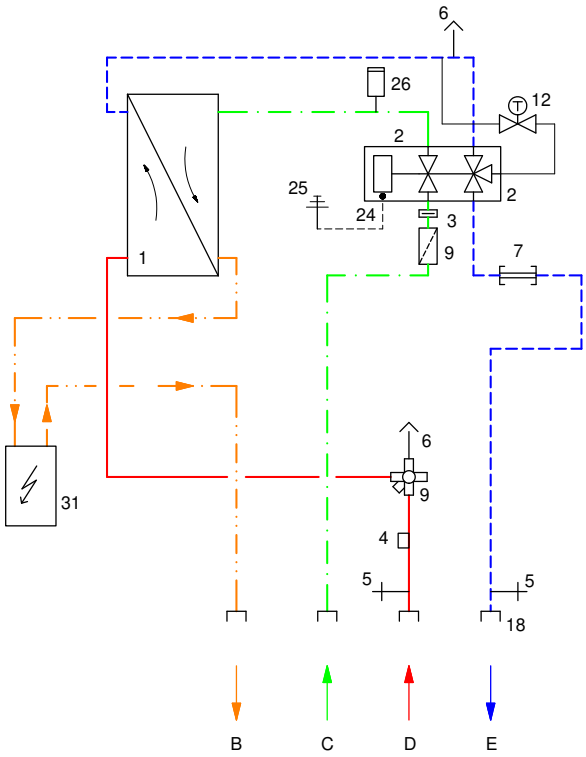
W x H x D	*555 x 600 x 180 mm*
Weight	*13.2 kg W-Hybrid-HKTS*
	11.7 kg W-Hybrid-TS

Base station

Drinking water hybrid



Hydraulic plan



Output data for domestic hot water preparation							
	Pre-heating						
Supply primary °C	38						
Return primary °C	20						
Heating volumetric flow rate in l/h	831	Electric post-heating					
Output in kW	17.4	4.8	6.9	8.8	10.5	12.6	17.4
Hot drinking water preparation system l/min. approx.	10	10	10	10	10	10	10
Hot drinking water preparation system temp. °C	35	42	45	48	50	53	60
Flow regulator temperature °C	10	35	35	35	35	35	35
Mixing temperature at tapping point and volume to be dispensed							
Hot drinking water tapping, total l/min	-	11.5	12.5	13.5	14.2	15.3	17.8
Mixed hot drinking water temperature °C	-	38	38	38	38	38	38
Total power in kW	-	22.2	24.3	26.2	27.9	30	34.8

Output data in heating mode		
Valve insert	AV (Standard)	AZ
Supply primary	38°C	38°C
Return primary	28°C	28°C
Power	450 l/h	650 l/h
Hot drinking water preparation system	5.3 kW	7.6 kW

The station is available in the following versions	
GBS 240H-30 (30 plates)	400 V / 11-13 kW or 18-21 kW

Legend

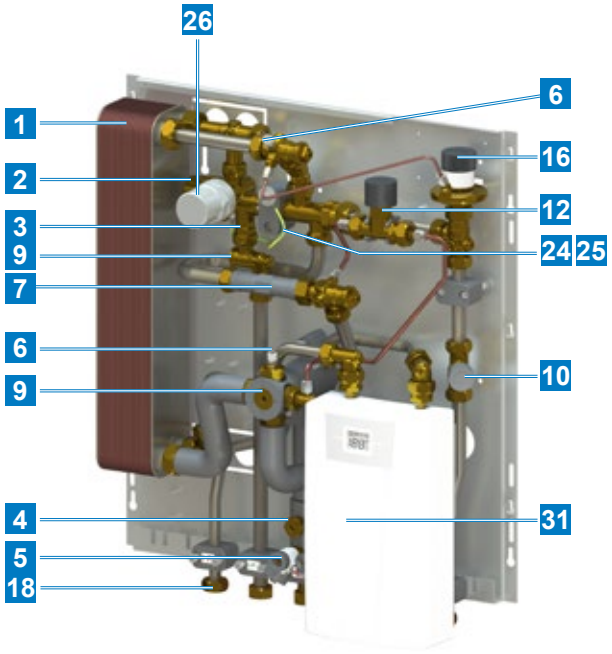
- B *Hot drinking water in apartments*
- C *Drinking water from pipeline*
- D *Heating-Supply-Primary*
- E *Heating-Return-Primary*
- 1 *Plate heat exchangers*
- 2 *Proportional volume control (PV control)*
- 3 *Coldwater orifice plate (in screw connection)*
- 4 *Sensor pocket heat meter M10x1, submersible*
- 5 *Draining*
- 6 *Venting*
- 7 *Heat meter adaptor*
- 9 *Dirt collector*
- 12 *(TTV) Thermostatic lead module*
- 18 *Union nut*
- 24 *Equipotential bonding connection*
- 25 *Earthing on site*
- 26 *water hammer arrestor*
- 31 *Through flow heater*

Note

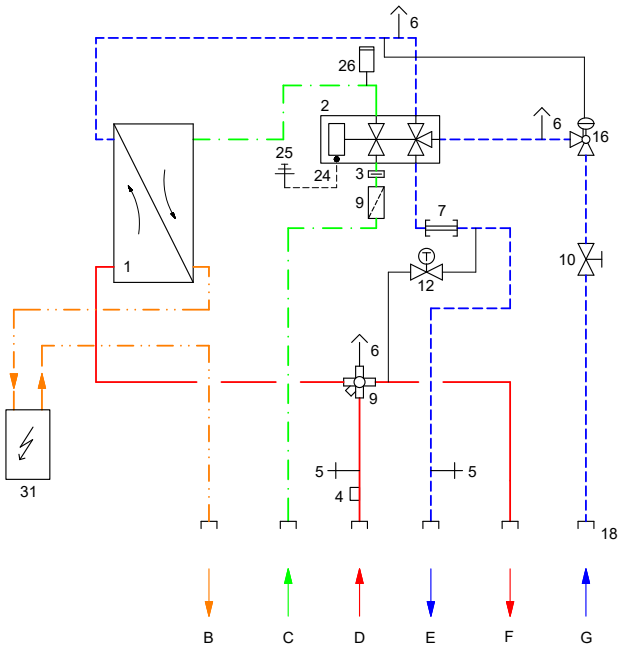
When installing in an in-wall-mounted cabinet, the installation depth must be at least 180 mm (in-wall cabinet with adjustable frame) and the ADH2/B is not to be used for on-wall mounting with cladding. There is a separate on-wall cladding for this purpose.

Base station

Hybrid heat interface unit



Hydraulic plan



Output data for domestic hot water preparation							
	Pre-heating						
Supply primary °C	38						
Return primary °C	20						
Heating volumetric flow rate in l/h	831	Electric post-heating					
Output in kW	17.4	4.8	6.9	8.8	10.5	12.6	17.4
Hot drinking water preparation system l/min. approx.	10	10	10	10	10	10	10
Hot drinking water preparation system temp. °C	35	42	45	48	50	53	60
Flow regulator temperature °C	10	35	35	35	35	35	35
Mixing temperature at tapping point and volume to be dispensed							
Hot drinking water tapping, total l/min	-	11.5	12.5	13.5	14.2	15.3	17.8
Mixed hot drinking water temperature °C	-	38	38	38	38	38	38
Total power in kW	-	22.2	24.3	26.2	27.9	30	34.8

Valve insert	AV (Standard)	AZ
Supply primary	38°C	38°C
Return primary	28°C	28°C
Power	450 l/h	650 l/h
Hot drinking water preparation system	5.3 kW	7.6 kW

The station is available in the following versions	
GBS 240H-30 (30 plates)	400 V kW 11-13 or kW 18-21

Legend

- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

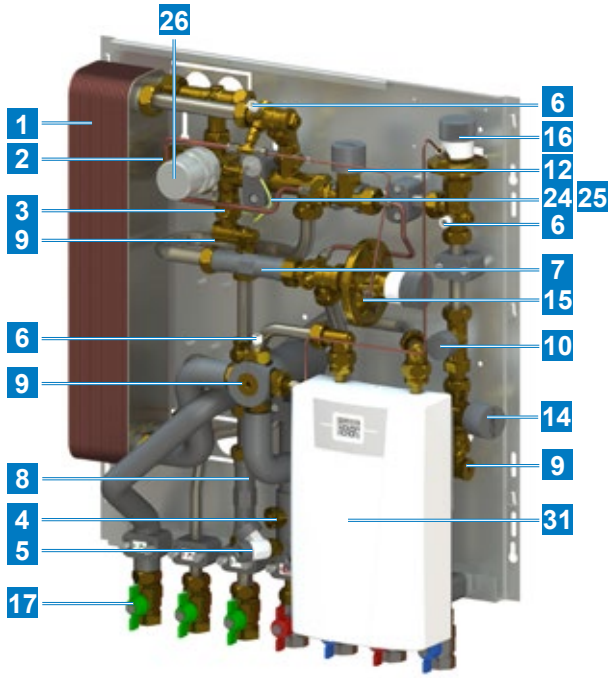
- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **9** *Dirt collector*
- **10** *Zone valve for limiting heating flow -for apartments*
- **12** *(TTV) Thermostatic lead module*
- **16** *Differential pressure control, secondary heating circuit*
- **18** *Union nut*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*
- **26** *water hammer arrestor*
- **31** *Through flow heater*

Note

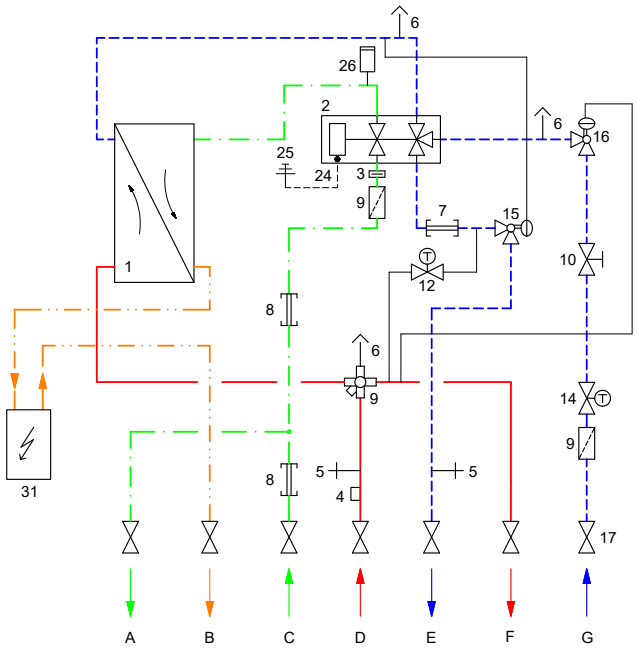
When installing in an in-wall-mounted cabinet, the installation depth must be at least 180 mm (in-wall cabinet with adjustable frame) and the ADH2/B is not to be used for on-wall mounting with cladding. There is a separate on-wall cladding for this purpose.

Sample set-up

Hybrid heat interface unit



Hydraulic plan



Output data for domestic hot water preparation

	Pre-heating						
Supply primary °C	38						
Return primary °C	20						
Heating volumetric flow rate in l/h	831	Electric post-heating					
Output in kW	17.4	4.8	6.9	8.8	10.5	12.6	17.4
Hot drinking water preparation system l/min. approx.	10	10	10	10	10	10	10
Hot drinking water preparation system temp. °C	35	42	45	48	50	53	60
Flow regulator temperature °C	10	35	35	35	35	35	35
Mixing temperature at tapping point and volume to be dispensed							
Hot drinking water tapping, total l/min	-	11.5	12.5	13.5	14.2	15.3	17.8
Mixed hot drinking water temperature °C	-	38	38	38	38	38	38
Total power in kW	-	22.2	24.3	26.2	27.9	30	34.8

Valve insert	AV (Standard)	AZ
Supply primary	38°C	38°C
Return primary	28°C	28°C
Power	450 l/h	650 l/h
Hot drinking water preparation system	5.3 kW	7.6 kW

The station is available in the following versions

GBS 240H-30 (30 plates)	400 V kW 11-13 or kW 18-21

Legend

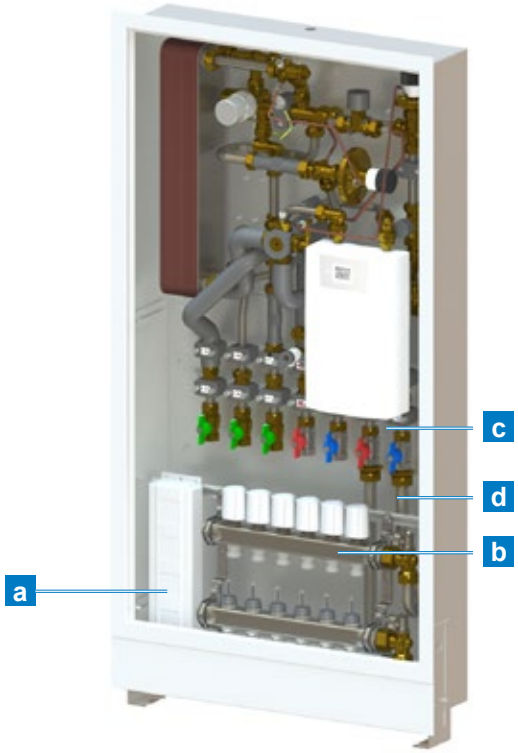
- A *Drinking water in apartments*
- B *Hot drinking water in apartments*
- C *Drinking water from pipeline*
- D *Heating-Supply-Primary*
- E *Heating-Return-Primary*
- F *Heating-Supply-Secondary*
- G *Heating-Return-Secondary*

- 1 *Plate heat exchangers*
- 2 *Proportional quantity control valve (PM valve)*
- 3 *Coldwater orifice plate (in screw connection)*
- 4 *Sensor pocket heat meter M10x1, submersible*
- 5 *Draining*
- 6 *Venting*
- 7 *Heat meter adaptor*
- 8 *Adaptor*
- 9 *Dirt collector*
- 10 *Zone valve for limiting heating flow -for apartments*
- 12 *(TTV) Thermostatic lead module*
- 14 *Return temperature limiter (RTB)*
- 15 *Differential pressure regulator primarily in the station input*
- 16 *Differential pressure control, secondary heating circuit*
- 17 *Isolating ball valve*
- 24 *Equipotential bonding connection*
- 25 *Earthing on site*
- 26 *water hammer arrestor*
- 31 *Through flow heater*

Note

When installing in an in-wall-mounted cabinet, the installation depth must be at least 180 mm (in-wall cabinet with adjustable frame) and the ADH2/B is not to be used for on-wall mounting with cladding. There is a separate on-wall cladding for this purpose.

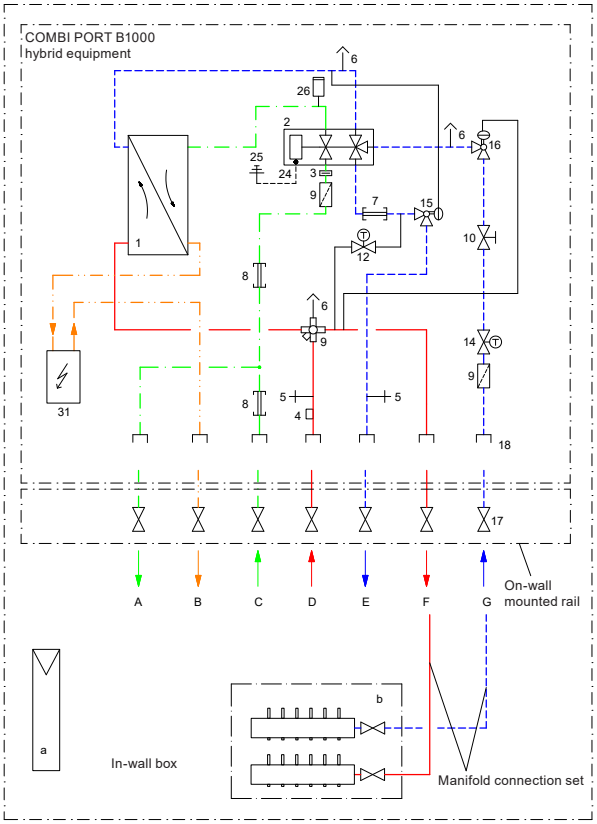
Sample set-up including manifold



Note

The basic units are supplemented here by modules and assembled to form an individual heat interface unit for the planned application requirements.

Hydraulic plan



Special parts

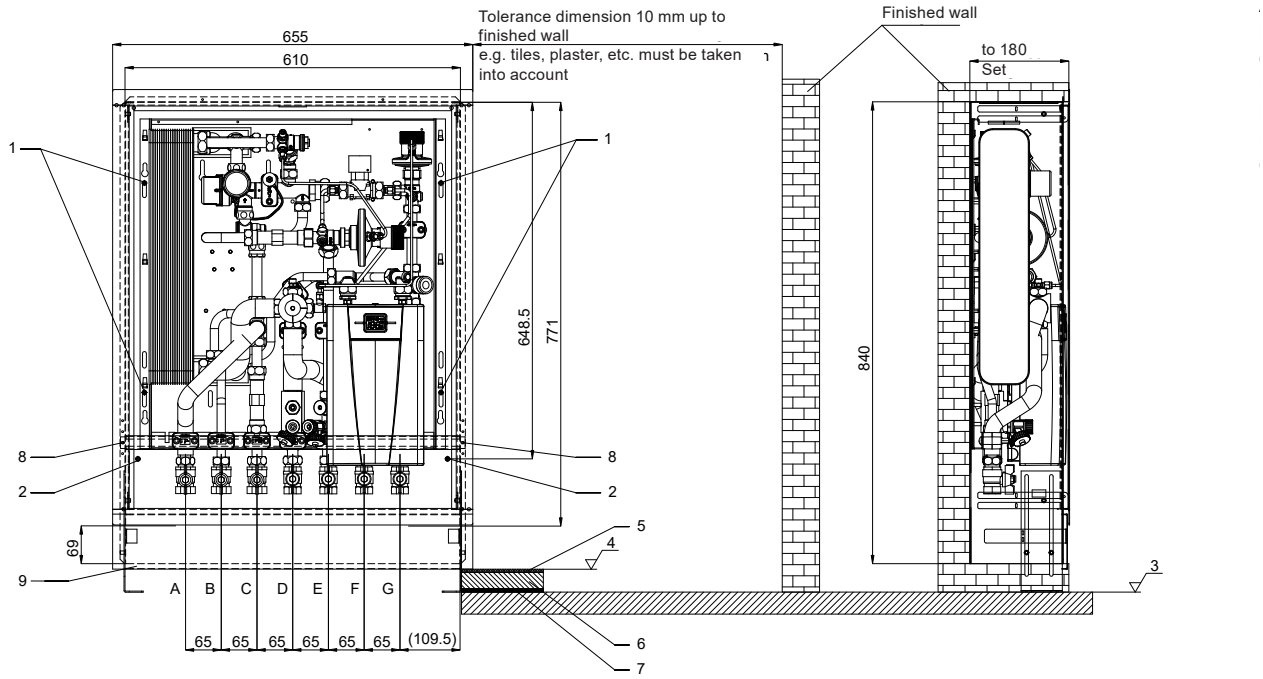
- **a** *Uponor BASE Flexiboard*
- **b** *Underfloor heating manifold*
- **c** *On-wall mounted rail*
- **d** *Manifold connection set*

Legend

- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*
- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **9** *Dirt collector*
- **10** *Zone valve for limiting heating flow -for apartments*
- **12** *(TTV) Thermostatic lead module*
- **14** *(RTB) Return temperature limiter*
- **15** *Differential pressure regulator primarily in the station input*
- **16** *Differential pressure control, secondary heating circuit*
- **17** *Isolating ball valve*
- **18** *Union nut*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*
- **26** *water hammer arrestor*
- **31** *Through flow heater*

Dimensional drawings

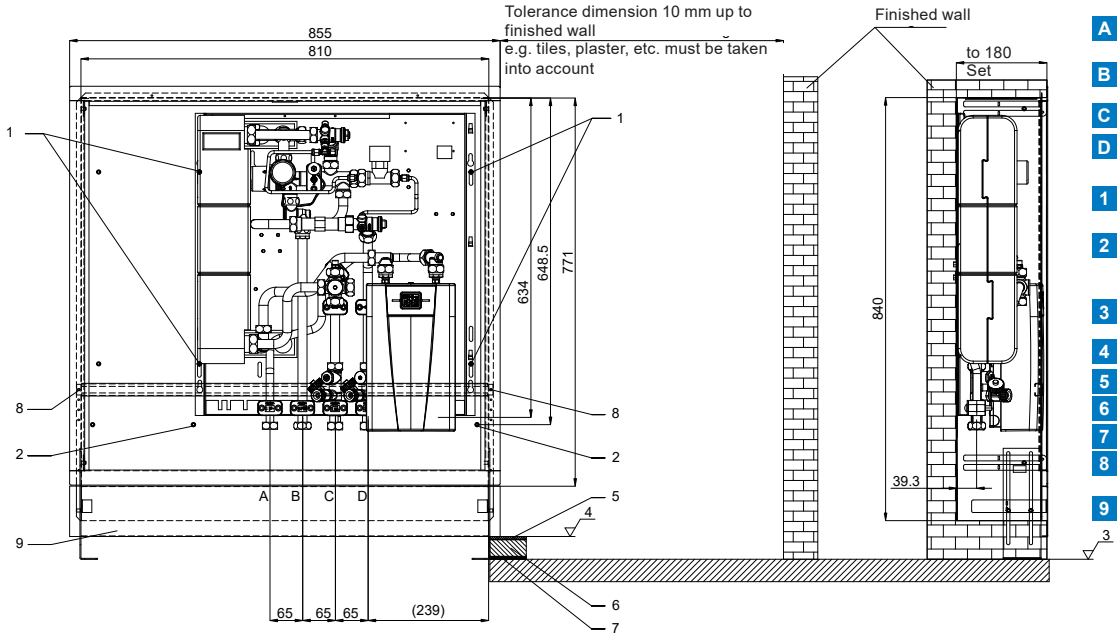
Hybrid dimensioning in in-wall housing



A *Drinking water in apartments*
B *Hot drinking water in apartments*
C *Drinking water from pipeline*
D *Heating-Supply-Primary*
E *Heating-Return-Primary*
F *Heating-Supply-Secondary*
G *Heating-Return-Secondary*
1 *Mounting bolts for base plate*
2 *Mounting bolts for connection rail (3rd from top)*
3 *Top edge of the bare concrete floor*
4 *Top edge of the floor*
5 *Covering*
6 *Screed*
7 *Insulating layer*
8 *Connection point for the cross supports*
9 *Screed impact plate*

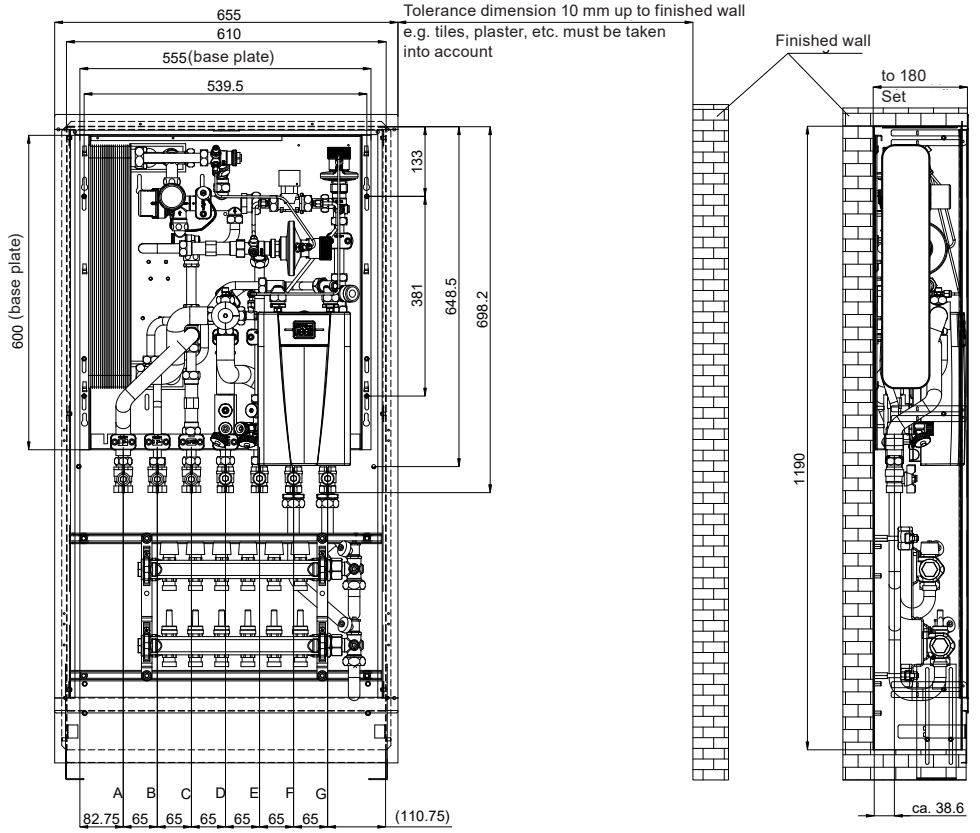
Caution The in-wall-mounted boxes have a depth of 180 mm for this unit.
For underfloor heating, the unit has an available water volume of max. 900 l/h.

Dimensional drawing of a hybrid drinking water station in the in-wall housing (cabinet height 810 cm)



- **A** *Hot drinking water in apartments*
- **B** *Drinking water from pipeline*
- **C** *Heating-Supply-Primary*
- **D** *Heating-Return-Primary*
- **1** *Mounting bolts for base plate*
- **2** *Mounting bolts for connection rail (3rd from top)*
- **3** *Top edge of the bare concrete floor*
- **4** *Top edge of the floor*
- **5** *Covering*
- **6** *Screed*
- **7** *Insulating layer*
- **8** *Connection point for cross supports*
- **9** *Screed impact plate*

Dimensional drawing of hybrid heat interface unit with manifold

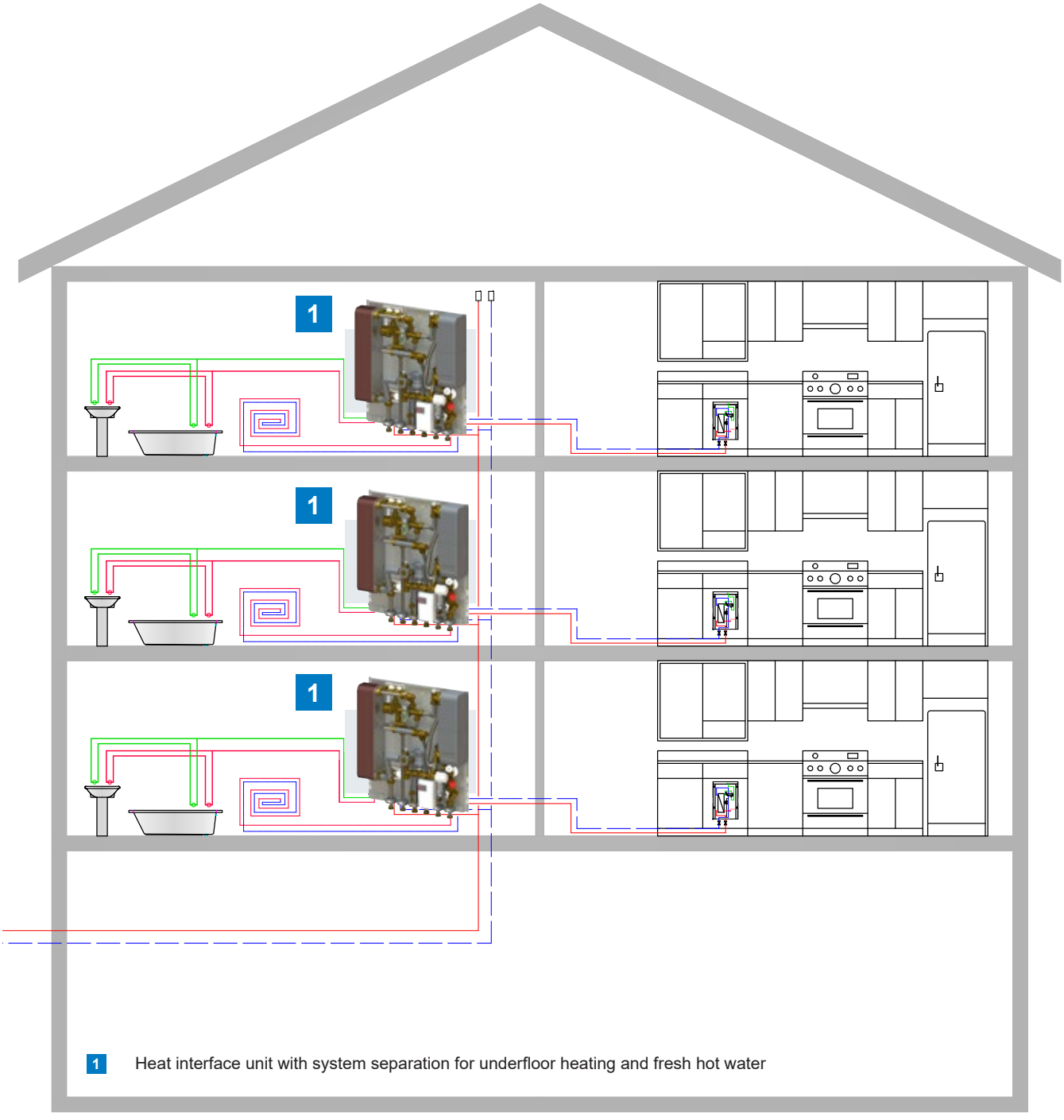


- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

Uponor Combi Port B1000-X system integration

Heat interface unit with system separation

The heat interface units with system separation are available in a wide variety of designs. The area of application of these heat interface units is local heat distribution. Systems for energy contracting with clear legal delimitation of the heating systems also use this system separation. The secondary safety technology is already included in the scope of delivery or can be connected on site for the requirements of a larger diaphragm expansion vessel. The heating side can be controlled thermostatically or with a weather-based regulator.
The output of the heat exchanger for system separation largely depends on the temperatures/outputs available and desired. If in doubt, please request an appropriate heat exchanger design for this. As is already know, domestic hot water preparation is covered by a through flow system.



1 Heat interface unit with system separation for underfloor heating and fresh hot water

Module overview

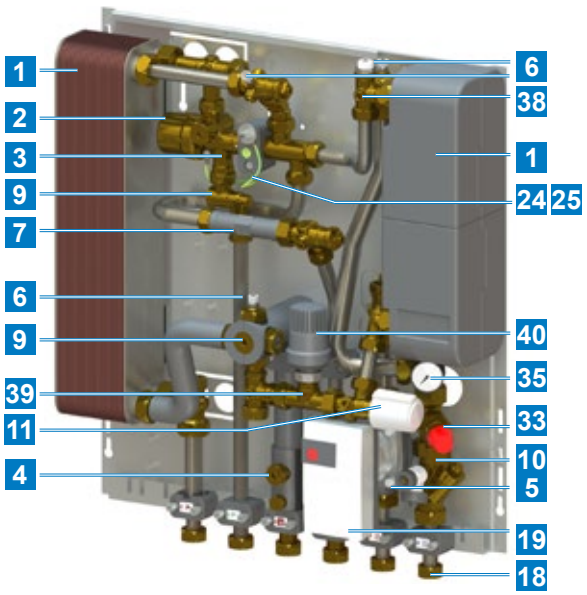
There are numerous module variants for the heat interface units with system separation. Here is the selection

Modules	yes / no ● –
Exchanger	
Stainless steel soldered exchanger	●
Screw-mounted exchanger, including water hammer arrestor	●
Functional modules	
System separation, expansion vessel (doubled base plate)	●
Water hammer arrestor mounted	
• in the proportional volume control valve	●
• in the hot water line	–
Valve inserts	
• for screwing into the multifunctional valve	–
• (pressure relief) for screwing into the multifunctional valve	●
• (adjustable) for screwing into the multifunctional valve	●
• for screwing into the multifunctional valve with volume flow limiter	●
• Dynamic volume flow valve with scale	–
Differential pressure regulator	
• Primary heating input	●
• Secondary heating circuit	–
• in second heating circuit	–
• Set in pipeline	●
Thermostatic lead module	
• TTV	●
• TTV for risers	–
Thermostatic hot water temperature limiter	
• TWB 15-50 °C	●
• TWB 35-70 °C	●
• T-Mix/TWB combination for high tapping volumes 28-30 l/min	–
Return temperature limiter (RTB)	
• for single-pipe systems	–
• for two-pipe systems	–
• in second heating circuit	–
Adapter for hot water meter	●
Adapter for cold water meter for domestic hot water preparation	●
Cold water residential unit outlet without meter adapter	●
Cold water residential unit outlet with 1 meter adapter	●
Cold water residential unit outlet with 2 meter adapters	●
Cold water pipeline with pressure reducer	–
Cold water pipeline pressure reducer, cold water residential unit outlet	–
Cold water pipeline with a meter adapter, pressure reducer, cold water residential unit outlet	●
Cold water pipeline with a meter adapter and pressure reducer	–
Adapter for hot water meter for in the hot water outlet	–
Dirt collector in the Return-Secondary.	–
Drainage set for Heating-Supply-Primary/Heating-Return-Primary	●
Adapter for Primary Return shut-off	●
Circulation pump set	●
Safety valve set for installation in the hot water pipeline	●
Connection of a second heating circuit for drinking water module (Uponor Aqua Port Compact)	–
Connection for second heating circuit	–
Mixer circuit: (System separation module)	
• Thermal drive or 3-point actuator	●
Safety temperature monitor	●
Manifold connection set	–
Underfloor heating manifold with flow meter	●
On-wall mounting rail *	●
In-wall-mounted housing with frame and door *	●
Sheet steel frame, door designed as a radio receiver *	–
In-wall mounting rail *	–
Connection, e.g. for in-wall-mounted rail *	–
On-wall-mounted cladding	●
Cover panel for on-wall mounted cladding	–
Mounting plate for manifold set-up and on-wall mounting	–
Straight isolating ball valves	●
Angled isolating ball valves	–

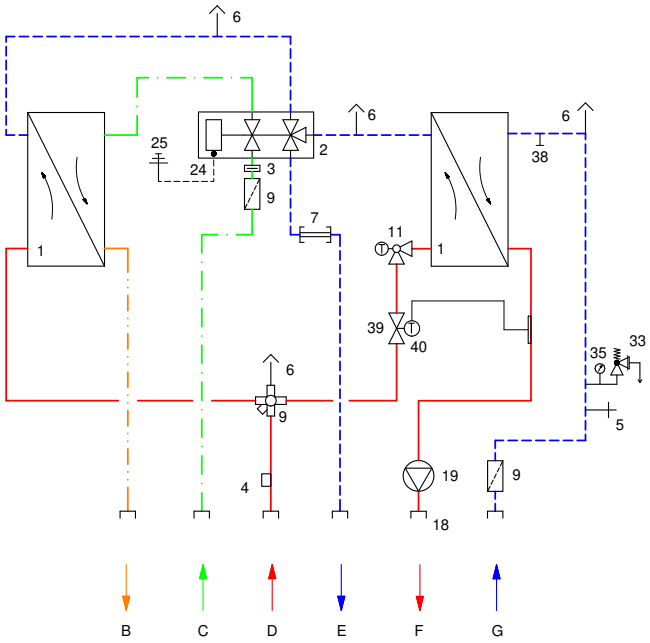
* Not possible in conjunction with system separation MAG (doubled base plate)

Control	
Thermal actuator 230 V	●
Thermal actuator 24 V	●
Control based on weather conditions and room temperature	●
3-point actuator	●
Actuator with 0-10 V control input and 24 V voltage supply	●
Uponor Smatrix control	●
Distributor socket for M-BUS systems	–
Wiring with thermostatic injection circuit	–
Wiring with weather-based injection circuit (3-points)	–
Wiring with weather-based injection circuit (3-points) including Uponor Smatrix regulation	–
Installation of heat or drinking water meters provided	●
Wiring with M-BUS for meter	●
Wiring of electrical components within the station to a distributor box	–

Base station



Hydraulic plan



The station is available in the following versions	
GBS-240H-14 (14 plates)	12 l/min. approx. 35 kW
GBS-240H-20 (20 plates)	15 l/min. approx. 42 kW
GBS-240H-30 (30 plates)	17 l/min. approx. 48 kW
GBS-240H-40 (40 plates)	19 l/min. approx. 55 kW

Heating side
GBS-220-16
GBS-220-22

Weather-regulated
Fixed value for floor 20-50 °C
Fixed value for radiators 35-70 °C

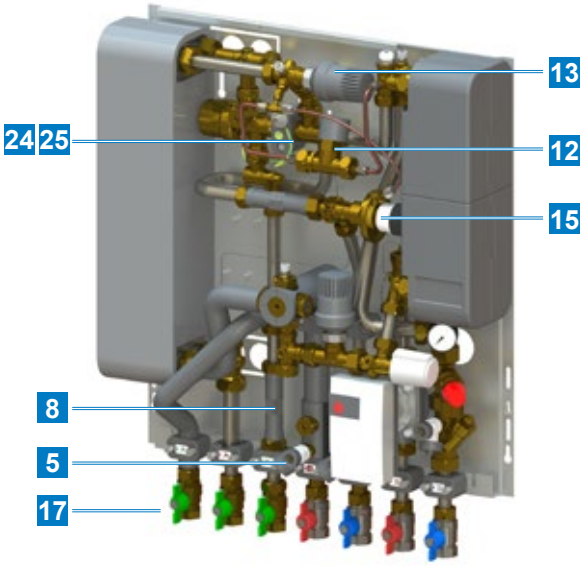
Primary Supply	Primary Return	Sec. Supply	Sec. Return	Heating output
70°C	45°C	58°C	38°C	10 kW
65°C	38°C	45°C	35°C	10 kW
65°C	46°C	58°C	38°C	8.1 kW

Legend

- B *Hot drinking water in apartments*
- C *Drinking water from pipeline*
- D *Heating-Supply-Primary*
- E *Heating-Return-Primary*
- F *Heating-Supply-Secondary*
- G *Heating-Return-Secondary*

- 1 *Plate heat exchangers*
- 2 *Proportional volume control (PV control)*
- 3 *Coldwater orifice plate (in screw connection)*
- 4 *Sensor pocket heat meter M10x1, submersible*
- 5 *Draining*
- 6 *Venting*
- 7 *Heat meter adaptor*
- 9 *Dirt collector*
- 11 *Zone valve for limiting heating flow- Residential unit with thermal 2-point actuator*
- 18 *Union nut*
- 19 *Pump*
- 24 *Equipotential bonding connection*
- 25 *Earthing on site*
- 33 *Safety valve*
- 35 *Manometer*
- 38 *(MAG) connection Diaphragm expansion vessel*
- 39 *Straight valve*
- 40 *Thermostatic regulator*

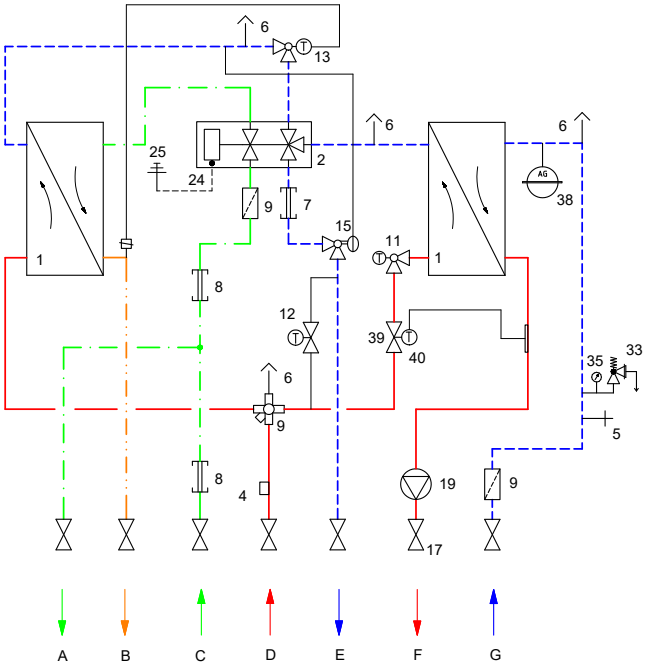
Sample set-up



Note

The basic units are supplemented here by modules and assembled to form an individual heat interface unit for the planned application requirements.

Hydraulic plan



Technical data

Materials

Fittings	*Drinking water, hygienically suitable materials according to DVGW, UBA, WRAS*
Sanitary	*CW617N; heating: CW617N, CW614N*
Seals	*according to DVGW KTW D1/D2, W270 and WRAS requirements*
Thermal insulation	*EPP*
Heat exchanger	*Plates: 1.4404; solder: Copper, nickel or screw-mounted exchanger*
Pipeline	*1.4401*

Sanitary

Max. operating pressure	*PN 10*
Min. preliminary pressure	*2,0 bar*

Heating

Max. operating pressure	*PN 10*
Max. operating temperature	*85 °C*
Max. primary differential pressure	*2,5 bar*

Electrical

Current connection	*230 V/50 Hz during use: Mixed circuit, service water circulation, zone valve with room thermostat, otherwise functional without a current connection*

Dimensions

Width x Height x Depth	*555 mm x 600 mm x 160 mm (standard set-up)* *555 mm x 600 mm x 270 mm (doubled base plate)*
Weight	*approx. 25 kg*

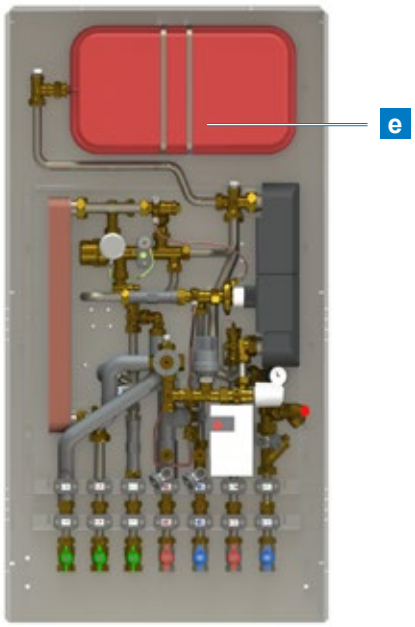
Legend

- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

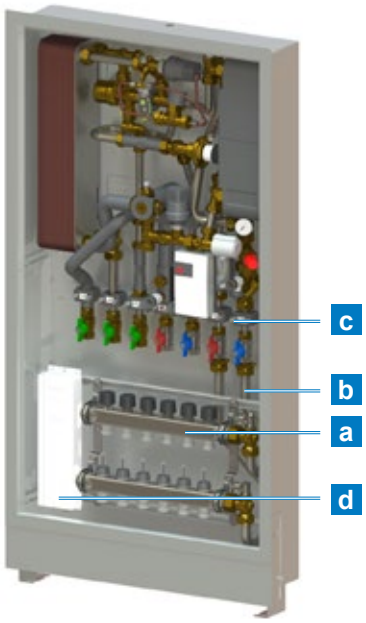
- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **9** *Dirt collector*
- **11** *Zone valve for limiting heating flow- Residential unit with thermal 2-point actuator*
- **12** *(TTV) Thermostatic lead module*
- **13** *(TWB) Thermostatic hot water temperature limiter*
- **15** *Differential pressure regulator primarily in the station input*
- **17** *Isolating ball valve*
- **19** *Pump*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*
- **33** *Safety valve*
- **35** *Manometer*
- **38** *Diaphragm expansion vessel (MAG) connection*
- **39** *Straight valve*
- **40** *Thermostatic regulator*

Sample set-up including manifold

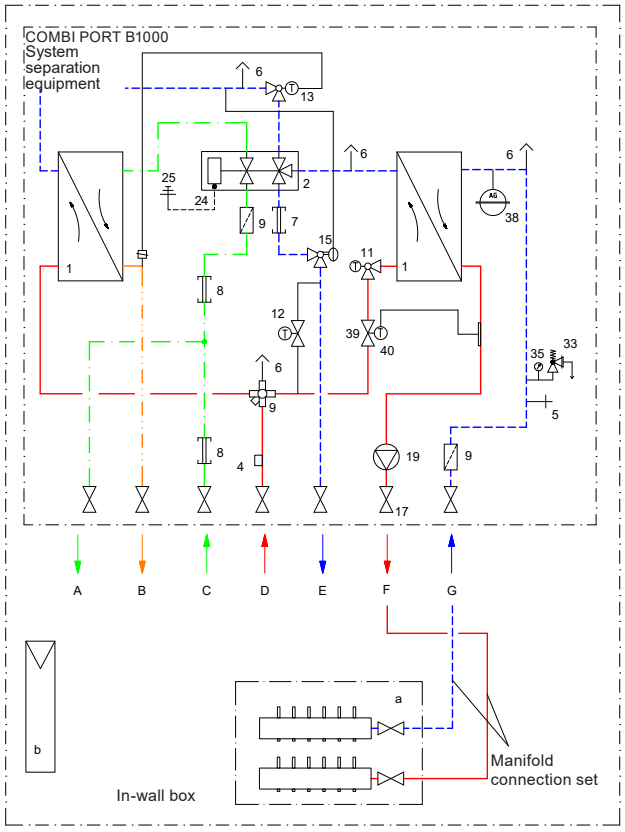
Sample set-up including MAG (diaphragm expansion vessel)



Sample set-up including manifold



Hydraulic plan



Special parts

- **a** *Underfloor heating manifold*
- **b** *Manifold connection set*
- **c** *On-wall mounting rail*
- **d** *Uponor BASE Flexiboard*
- **e** *On-wall mounting of expansion vessel with on-wall housing ADH-D. Also available as an in-wall version on request.*

Legend

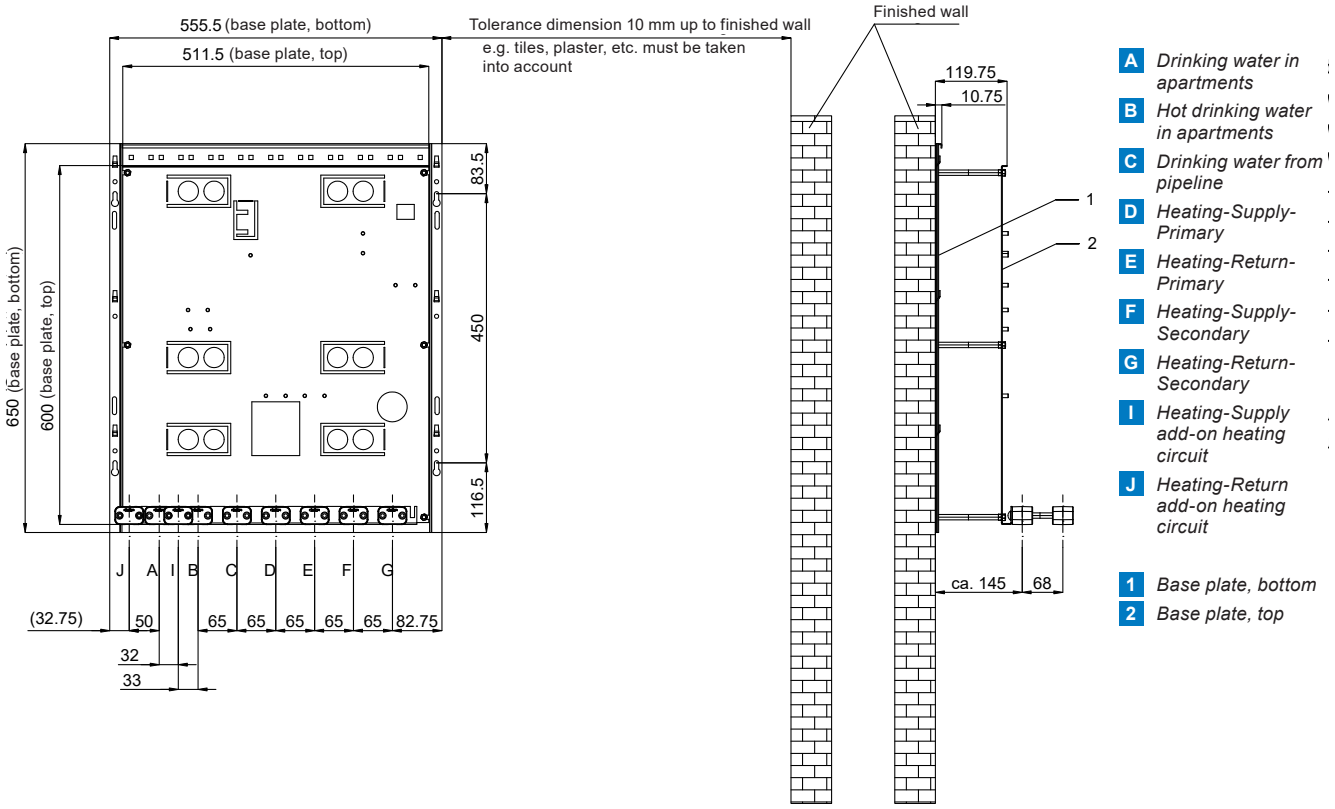
- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **9** *Dirt collector*
- **11** *Zone valve for limiting heating flow- Residential unit with thermal 2-point actuator*
- **12** *(TTV) Thermostatic lead module*
- **13** *(TWB) Thermostatic hot water temperature limiter*
- **15** *Differential pressure regulator primarily in the station input*
- **17** *Isolating ball valve*
- **19** *Pump*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*
- **33** *Safety valve*
- **35** *Manometer*
- **38** *Diaphragm expansion vessel (MAG) connection*
- **39** *Straight valve*
- **40** *Thermostatic regulator*

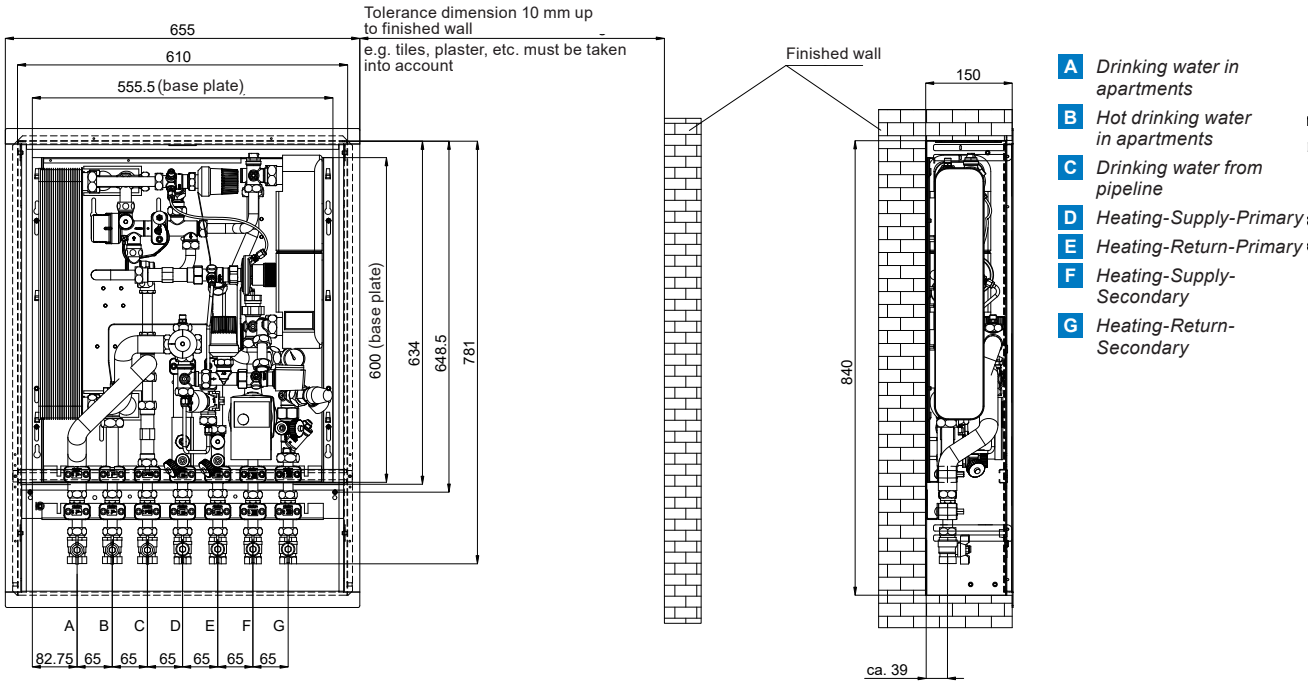
Info Safety temperature monitor is supplied - mounted on site!

Dimensional drawings

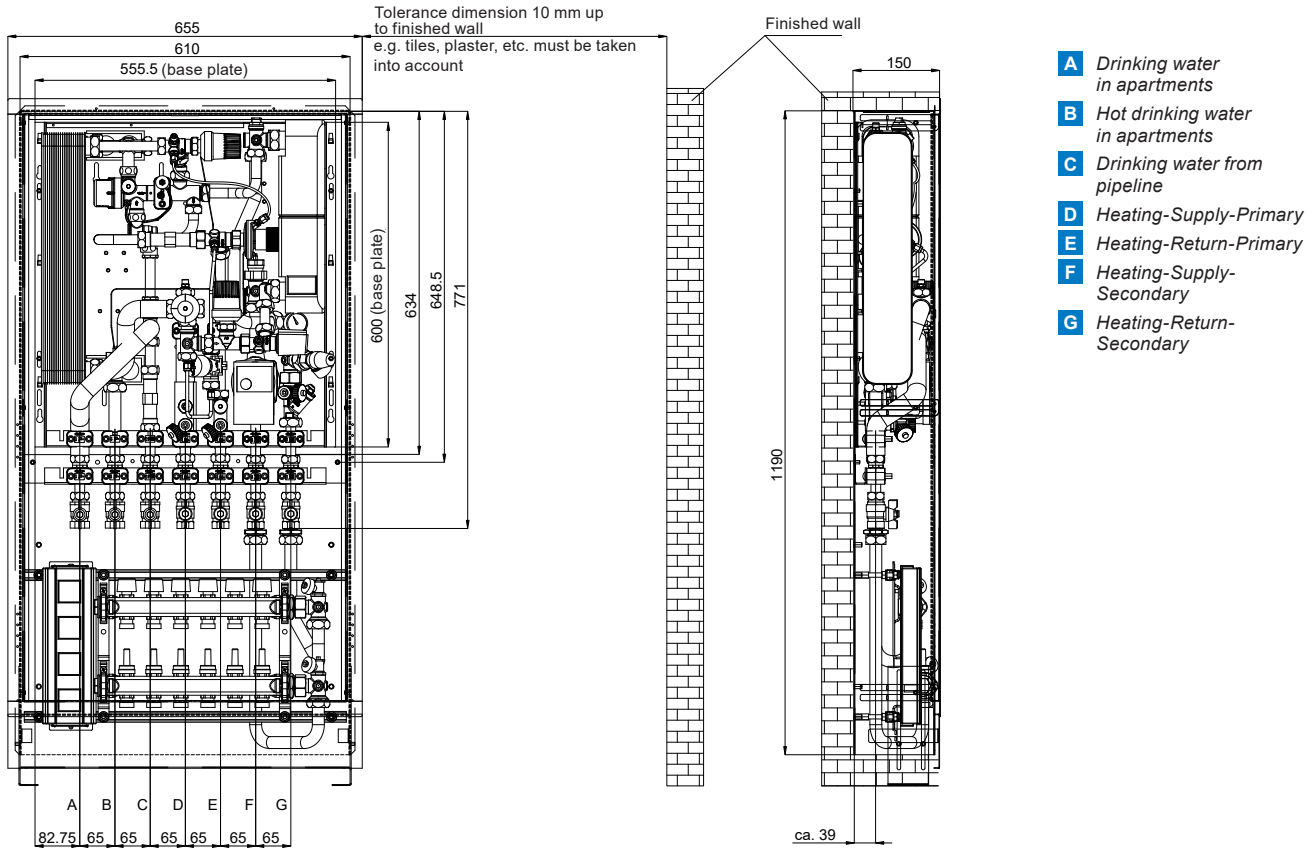
Dimensioning of base plate (doubled for expansion vessel)



Dimensioning in in-wall housing



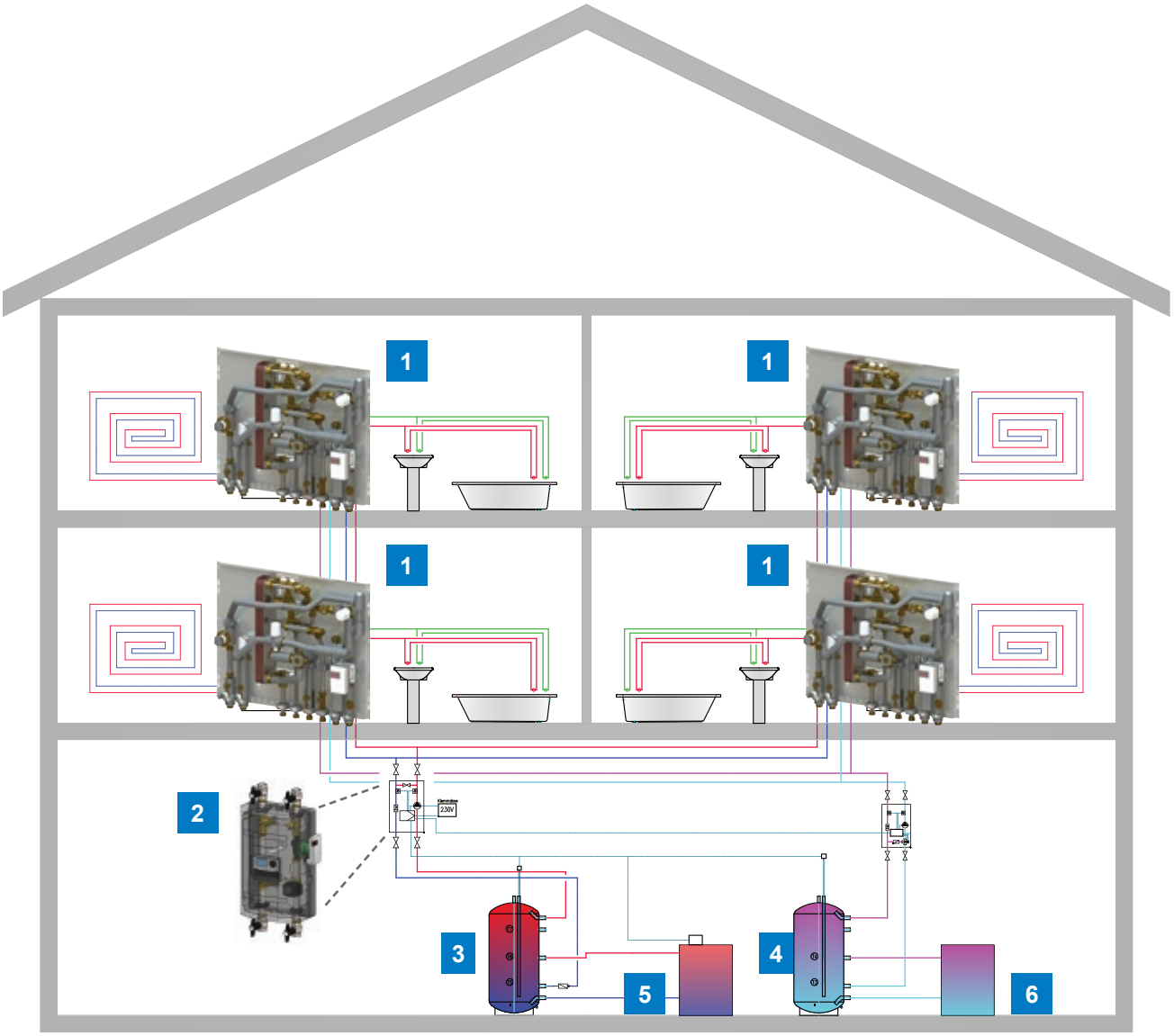
Dimensioning in in-wall housing including manifold



Uponor Combi Port B1000-HC system integration

Heat interface unit with heating/cooling module

Enables individual temperature control for each residential unit and thus meets the highest comfort requirements. Heating/cooling is switched by means of a weather-based regulator.



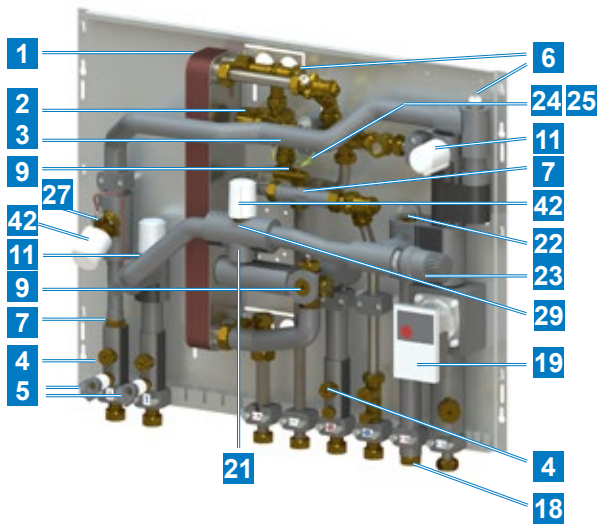
1 Heat interface unit heating/cooling module for underfloor heating/cooling and fresh hot water
2 Pump group
3 Heating buffer storage tank
4 Cold buffer storage tank
5 Heater (boiler)
6 Cold generator (evaporator)

Module overview

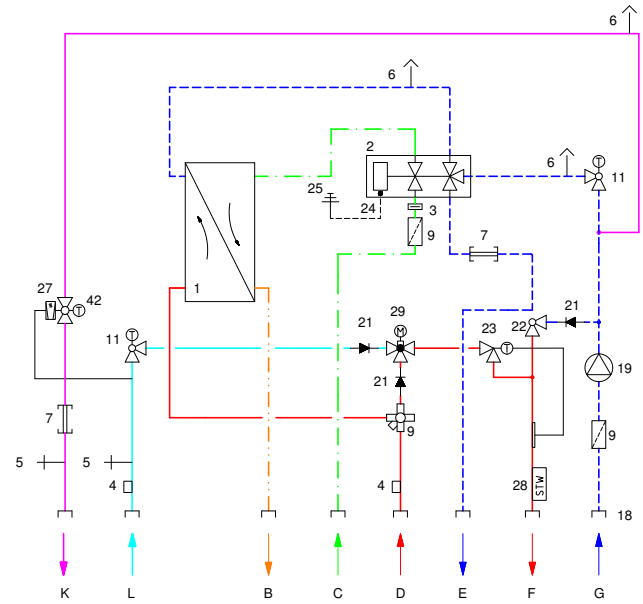
There are numerous module variants for the heat interface units with heating/cooling modules. Here is the selection

Modules	yes / no ● –
Exchanger	
Stainless steel soldered exchanger	●
Screw-mounted exchanger, including water hammer arrestor	●
Functional modules	
Wider base plate	●
Water hammer arrestor mounted	
• in the proportional volume control valve	–
• in the hot water line	–
Valve inserts	
• for screwing into the multifunctional valve	●
• (pressure relief) for screwing into the multifunctional valve	●
• (adjustable) for screwing into the multifunctional valve	●
• for screwing into the multifunctional valve with volume flow limiter	●
• Dynamic volume flow valve with scale	●
Differential pressure regulator	
• Primary heating input	●
• Secondary heating circuit	●
• in second heating circuit	–
• Set in pipeline	–
Thermostatic lead module	●
• TTV	–
• TTV for risers	●
Thermostatic hot water temperature limiter	
• TWB 15-50 °C	●
• TWB 35-70 °C	●
• T-Mix/TWB combination for high tapping volumes 28-30 l/min	–
Return temperature limiter (RTB)	
• for single-pipe systems	–
• for two-pipe systems	–
• in second heating circuit	–
Adapter for hot water meter	–
Adapter for cold water meter for domestic hot water preparation	–
Cold water residential unit outlet without meter adapter	●
Cold water residential unit outlet with 1 meter adapter	●
Cold water residential unit outlet with 2 meter adapters	●
Cold water pipeline with pressure reducer	–
Cold water pipeline pressure reducer, cold water residential unit outlet	●
Cold water pipeline with a meter adapter, pressure reducer, cold water residential unit outlet	●
Cold water pipeline with a meter adapter and pressure reducer	●
Dirt collector in the Return-Secondary	–
Drainage set for Heating-Supply-Primary/ Heating-Return-Primary	●
Circulation pump set	●
Safety valve set for installation in the hot water pipeline	●
Connection of a second heating circuit for drinking water module (Uponor Aqua Port Compact)	●
On-wall cladding for special installations (under-table unit)	–
Mixer circuit:	
• Thermal drive or 3-point actuator	●
• second heating circuit	–
Safety temperature monitor	●
Manifold connection set	●
Underfloor heating manifold with flow meter	●
On-wall mounting rail	●
In-wall-mounted housing with frame and door	●
Sheet steel frame, door designed as a radio receiver	●
In-wall mounting rail	●
Connection, e.g. for in-wall-mounted rail	●
On-wall-mounted cladding	●
Cover panel for on-wall mounted cladding	●
Mounting plate for manifold set-up and on-wall mounting	●
Straight isolating ball valves	●
Angled isolating ball valves	●
Control	
Thermal actuator 230 V	●
Thermal actuator 24 V	●
Control based on weather conditions and room temperature	●
3-point actuator	●
Actuator with 0-10 V control input and 24 V voltage supply	●
Uponor Smatrix control	●
Distributor socket for M-BUS systems	●
Wiring with thermostatic injection circuit	–
Wiring with weather-based injection circuit (3-points)	●
Wiring with weather-based injection circuit (3-points) including Uponor Smatrix regulation	●
Installation of heat or drinking water meters provided	●
Wiring with M-BUS for meter	●
Wiring of electrical components within the station to a distributor box	●

Base station



Hydraulic plan



Technical data

Materials

Fittings	*Drinking water, hygienically suitable materials according to DVGW, UBA, WRAS*
Sanitary	*CW617N; heating: CW617N, CW614N*
Seals	*according to DVGW KTW D1/D2, W270 and WRAS requirements*
Thermal insulation	*EPP*
Heat exchanger	*Plates: 1.4404; solder: Copper, nickel (VacInox) or screw-mounted exchanger*
Pipeline	*1.4401*

Sanitary

Max. operating pressure	*PN 10*
Min. preliminary pressure	*2,0 bar*

Heating

Max. operating pressure	*PN 10*
Max. operating temperature	*85 °C*
Max. primary differential pressure	*2,5 bar*

Electrical

Current connection	*230 V/50 Hz during use: Mixed circuit, service water circulation, zone valve with room thermostat, otherwise functional without a current connection*

Dimensions

Width x Height x Depth	*755.5 mm x 600 mm x 150 mm*

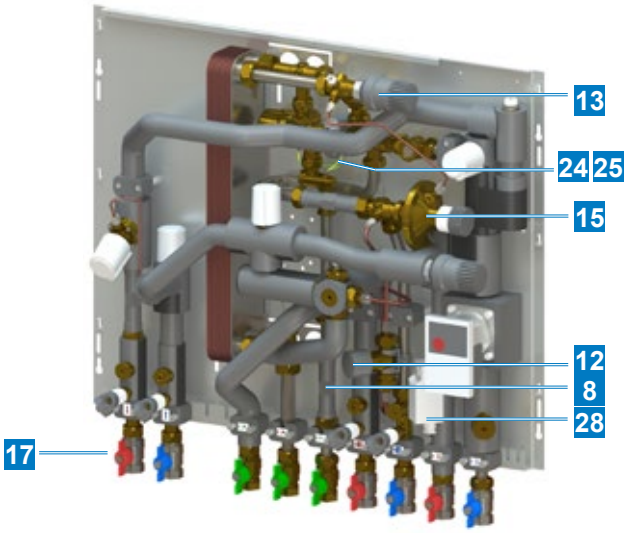
Legend

- B *Hot drinking water in apartments*
- C *Drinking water from pipeline*
- D *Heating-Supply-Primary*
- E *Heating-Return-Primary*
- F *Heating-Supply-Secondary*
- G *Heating-Return-Secondary*
- K *Heating/Cooling-Return*
- L *Heating/Cooling-Supply*

- 1 *Plate heat exchangers*
- 2 *Proportional volume control (PV control)*
- 3 *Coldwater orifice plate (in screw connection)*
- 4 *Sensor pocket heat meter M10x1, submersible*
- 5 *Draining*
- 6 *Venting*
- 7 *Heat meter adaptor*
- 9 *Dirt collector*
- 11 *Zone valve for limiting heating flow- Residential unit with thermal 2-point actuator*
- 18 *Union nut*
- 19 *Pump*
- 21 *Check valve*
- 22 *Control valve for bypass section*
- 23 *Thermostatic underfloor heating regulation 20-50°C*
- 24 *Equipotential bonding connection*
- 25 *Earthing on site*
- 27 *Dynamic volume flow control combination valve*
- 28 *Safety temperature monitor (STW)*
- 29 *3-way switching valve*
- 42 *2-point actuator*

The station is available in the following versions	
GBS-240H-14 (14 plates)	12 l/min. approx. 35 kW
GBS-240H-20 (20 plates)	15 l/min. approx. 42 kW
GBS-240H-30 (30 plates)	17 l/min. approx. 48 kW
GBS-240H-40 (40 plates)	19 l/min. approx. 55 kW

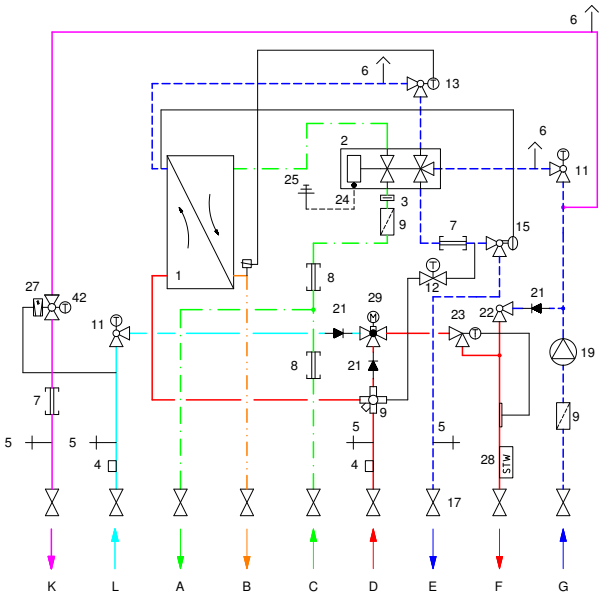
Sample set-up



Note

The basic units are supplemented here by modules and assembled to form an individual heat interface unit for the planned application requirements.

Hydraulic plan

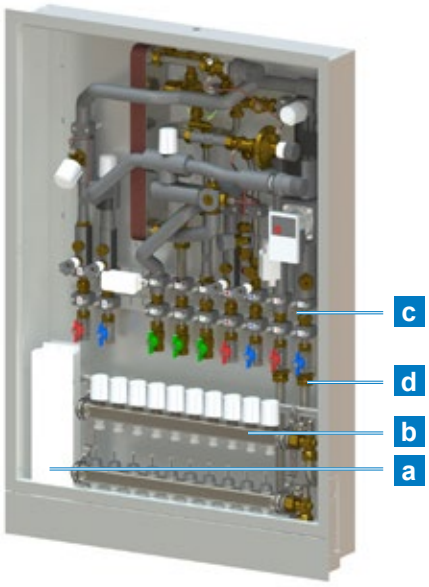


Legend

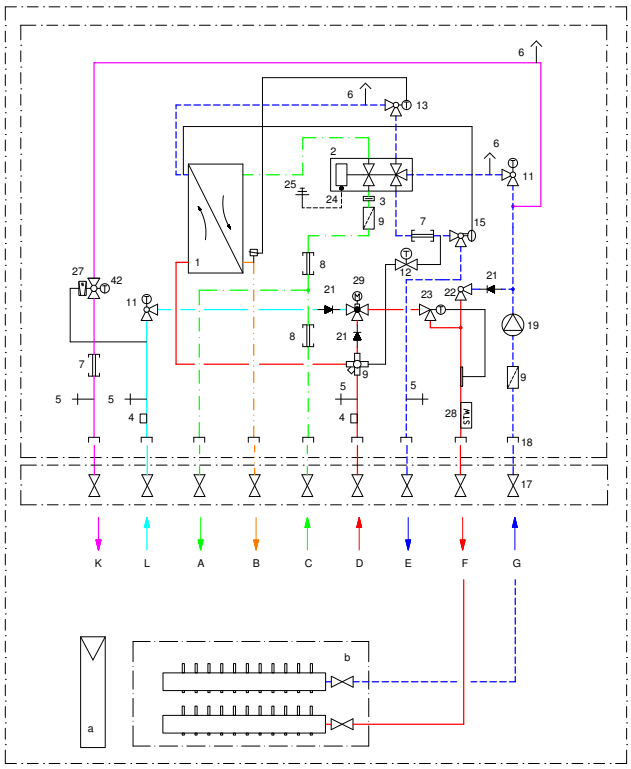
- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*
- **K** *Heating/Cooling-Return*
- **L** *Heating/Cooling-Supply*

- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **9** *Dirt collector*
- **11** *Zone valve for limiting heating flow- Residential unit with thermal 2-point actuator*
- **12** *(TTV) Thermostatic lead module*
- **13** *(TWB) Thermostatic hot water temperature limiter*
- **15** *Differential pressure regulator primarily in the station input*
- **17** *Isolating ball valve*
- **19** *Pump*
- **21** *Check valve*
- **22** *Control valve for bypass section*
- **23** *Thermostatic underfloor heating regulation 20-50°C*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*
- **27** *Dynamic volume flow control combination valve*
- **28** *Safety temperature monitor (STW)*
- **29** *3-way switching valve*
- **42** *2-point actuator*

Sample set-up including manifold



Hydraulic plan



Special parts

- **a** *Uponor BASE Flexiboard*
- **b** *Underfloor heating manifold*
- **c** *On-wall mounting unit*
- **d** *Manifold connection set*

Legend

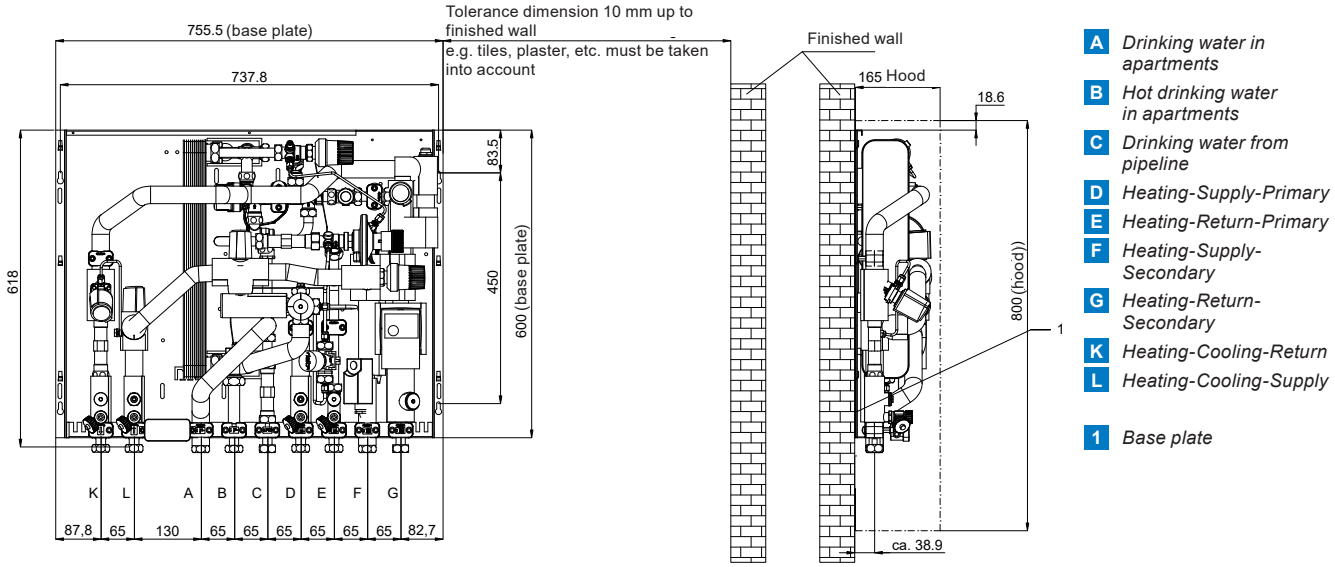
- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*
- **K** *Heating/Cooling-Return*
- **L** *Heating/Cooling-Supply*

- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **9** *Dirt collector*
- **11** *Zone valve for limiting heating flow- Residential unit with thermal 2-point actuator*
- **12** *(TTV) Thermostatic lead module*

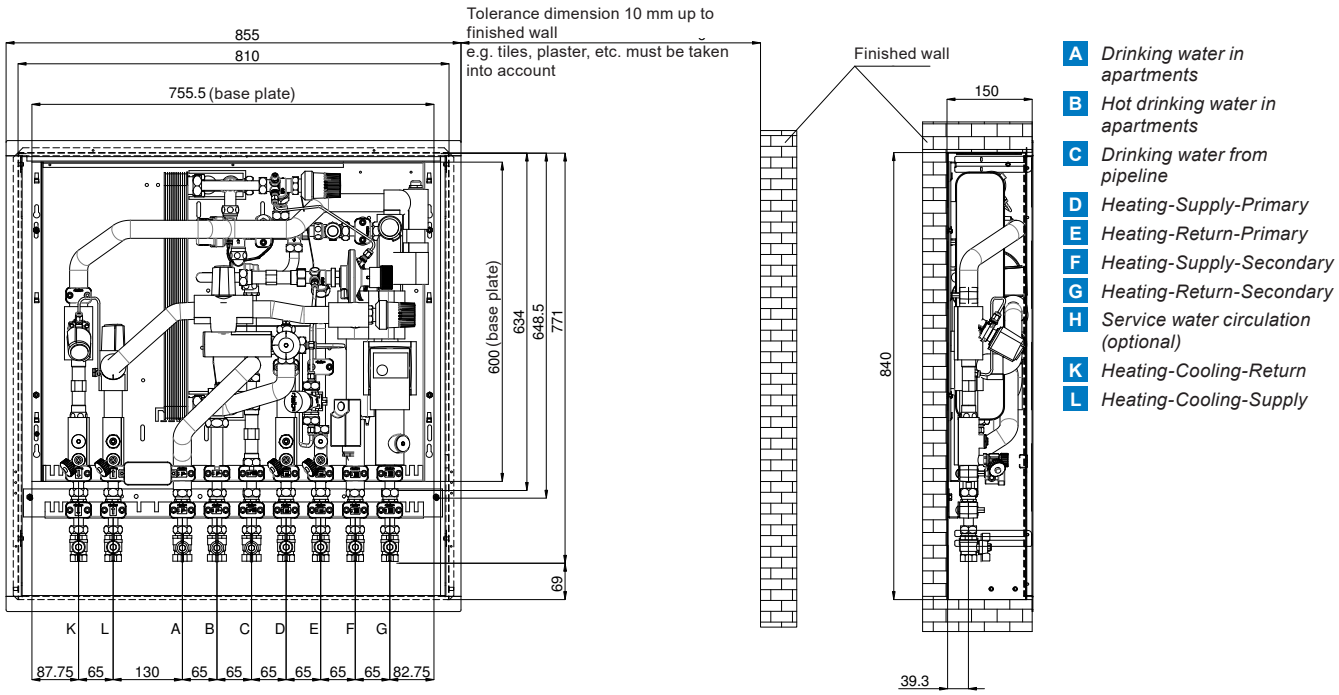
- **13** *(TWB) Thermostatic hot water temperature limiter*
- **15** *Differential pressure regulator primarily in the station input*
- **17** *Isolating ball valve*
- **18** *Union nut*
- **19** *Pump*
- **21** *Check valve*
- **22** *Control valve for bypass section*
- **23** *Thermostatic underfloor heating regulation 20-50°C*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*
- **27** *Dynamic volume flow control combination valve*
- **28** *Safety temperature monitor (STW)*
- **29** *3-way switching valve*
- **42** *2-point actuator*

Dimensional drawings

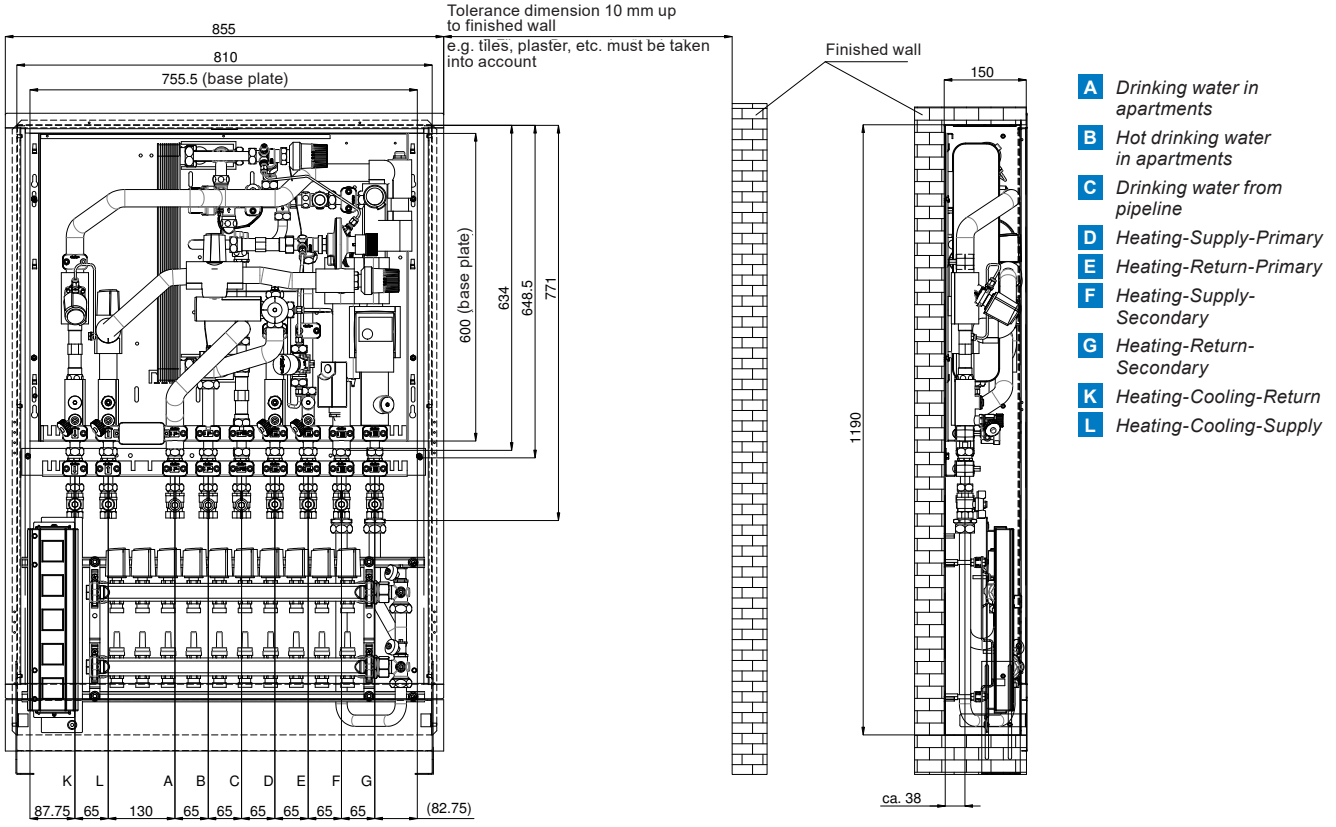
Dimensioning of base plate



Dimensioning of in-wall housing



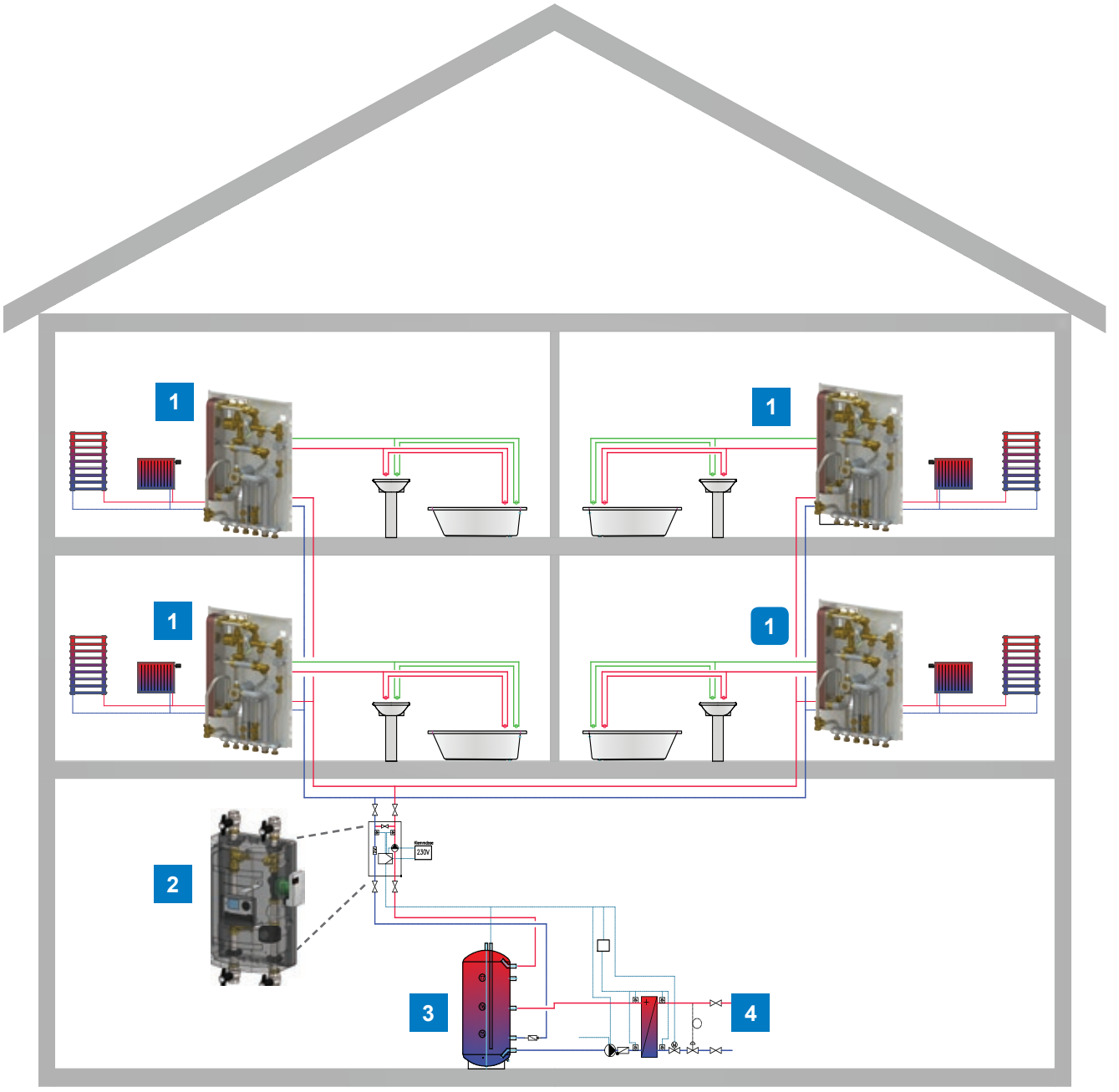
Dimensioning in in-wall housing including manifold



Uponor Combi Port S1000 system integration

Heat interface unit, narrow version

The station offers an individual and building-specific component selection. This modular approach to construction ensures the greatest possible technical flexibility right up to on-site completion.



1 Narrow heat interface units (for use in confined spaces)
Supplying the residential units with radiator heating and fresh water

2 Pump group

3 Buffer storage tank

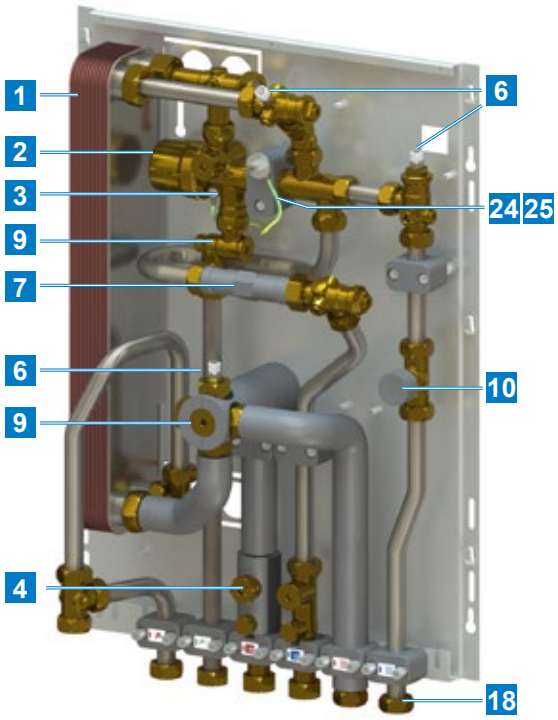
4 Heat transfer station (local heating/district heating)

Module overview

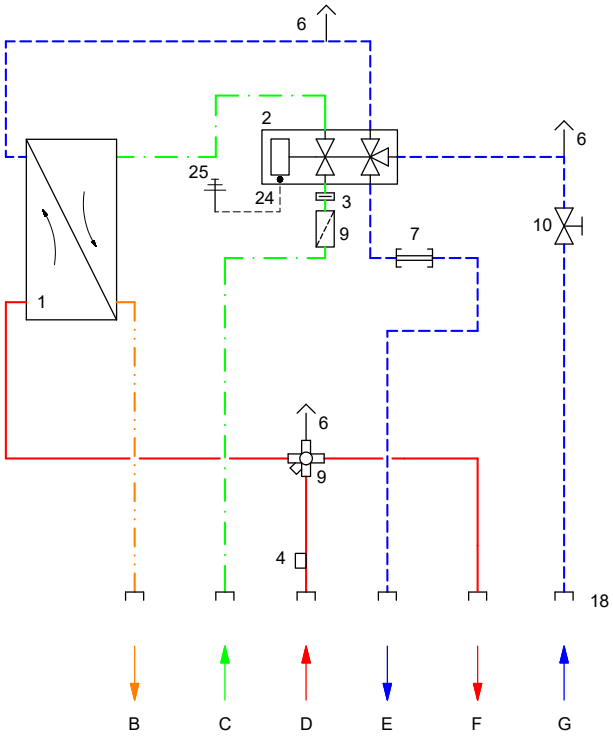
There are numerous module variants for the narrow version of the heat interface units. Here is the selection

Modules	yes / no ● –
Exchanger	
Stainless steel soldered exchanger	●
Screw-mounted exchanger, including water hammer arrestor	●
Functional modules	
Wider base plate	–
Water hammer arrestor mounted	
• in the proportional volume control valve	●
• in the hot water line	●
Valve inserts	
• for screwing into the multifunctional valve	●
• (pressure relief) for screwing into the multifunctional valve	●
• (adjustable) for screwing into the multifunctional valve	●
• for screwing into the multifunctional valve with volume flow limiter	–
• Dynamic volume flow valve with scale	–
Differential pressure regulator	
• Primary heating input	●
• Secondary heating circuit	●
• in second heating circuit	–
• Set in pipeline	●
Thermostatic lead module	●
• TTV	●
• TTV for risers	
Thermostatic hot water temperature limiter	
• TWB 15-50 °C	●
• TWB 35-70 °C	●
• T-Mix/TWB combination for high tapping volumes 28-30 l/min	–
Return temperature limiter (RTB)	
• for single-pipe systems	●
• for two-pipe systems	●
• in second heating circuit	–
Adapter for hot water meter	–
Adapter for cold water meter for domestic hot water preparation	●
Cold water residential unit outlet without meter adapter	●
Cold water residential unit outlet with 1 meter adapter	●
Cold water residential unit outlet with 2 meter adapters	●
Cold water pipeline with pressure reducer	●
Cold water pipeline pressure reducer, cold water residential unit outlet	●
Cold water pipeline with a meter adapter, pressure reducer, cold water residential unit outlet	●
Cold water pipeline with a meter adapter and pressure reducer	●
Dirt collector in the Return-Secondary	●
Drainage set for Heating-Supply-Primary/ Heating-Return-Primary	●
Circulation pump set	●
Safety valve set for installation in the hot water pipeline	●
Connection of a second heating circuit for drinking water module (Uponor Aqua Port Compact)	–
Mixer circuit:	
• Thermal drive or 3-point actuator	–
• second heating circuit	–
Safety temperature monitor	–
Manifold connection set	–
Underfloor heating manifold with flow meter	–
On-wall mounting rail	–
In-wall-mounted housing with frame and door	●
Sheet steel frame, door designed as a radio receiver	●
In-wall mounting rail	●
Connection, e.g. for in-wall-mounted rail	●
On-wall-mounted cladding	●
Cover panel for on-wall mounted cladding	●
Mounting plate for manifold set-up and on-wall mounting	–
Straight isolating ball valves	●
Angled isolating ball valves	●
Control	
Thermal actuator 230 V	●
Thermal actuator 24 V	●
Control based on weather conditions and room temperature	–
3-point actuator	–
Actuator with 0-10 V control input and 24 V voltage supply	–
Uponor Smatrix control	–
Distributor socket for M-BUS systems	●
Wiring with thermostatic injection circuit	–
Wiring with weather-based injection circuit (3-points)	–
Wiring with weather-based injection circuit (3-points) including Uponor Smatrix regulation	–
Installation of heat or drinking water meters provided	●
Wiring with M-BUS for meter	●
Wiring of electrical components within the station to a distributor box	–

Base station



Hydraulic plan



Technical data

Materials

Fittings	*Drinking water, hygienically suitable materials according to DVGW, UBA, WRAS*
Sanitary	*CW617N; heating: CW617N, CW614N*
Seals	*according to DVGW KTW D1/D2, W270 and WRAS requirements*
Thermal insulation	*EPP*
Heat exchanger	*Plates: 1.4404; solder: Copper*
Pipeline	*1.4401*

Sanitary

Max. operating pressure	*PN 10*
Min. preliminary pressure	*2,0 bar*

Heating

Max. operating pressure	*PN 10*
Max. operating temperature	*85 °C*
Max. pr. Differential pressure	*2,5 bar*

Electrical

Current connection	*230 V/50 Hz during use: Mixed circuit, service water circulation, zone valve with room thermostat, otherwise functional without a current connection*

Dimensions

Width x Height x Depth	*435 mm x 600 mm x 150 mm*

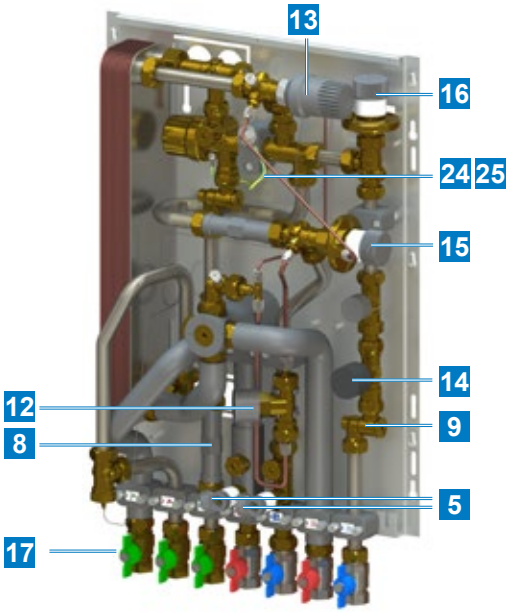
Legend

- B *Hot drinking water in apartments*
- C *Drinking water from pipeline*
- D *Heating-Supply-Primary*
- E *Heating-Return-Primary*
- F *Heating-Supply-Secondary*
- G *Heating-Return-Secondary*

- 1 *Plate heat exchangers*
- 2 *Proportional volume control (PV control)*
- 3 *Coldwater orifice plate (in screw connection)*
- 4 *Sensor pocket heat meter M10x1, submersible*
- 6 *Venting*
- 7 *Heat meter adaptor*
- 9 *Dirt collector*
- 10 *Zone valve for limiting heating flow -for apartments*
- 18 *Union nut*
- 24 *Equipotential bonding connection*
- 25 *Earthing on site*

The station is available in the following versions	
GBS-240H-14 (14 plates)	12 l/min. approx. 35 kW
GBS-240H-20 (20 plates)	15 l/min. approx. 42 kW
GBS-240H-30 (30 plates)	17 l/min. approx. 48 kW

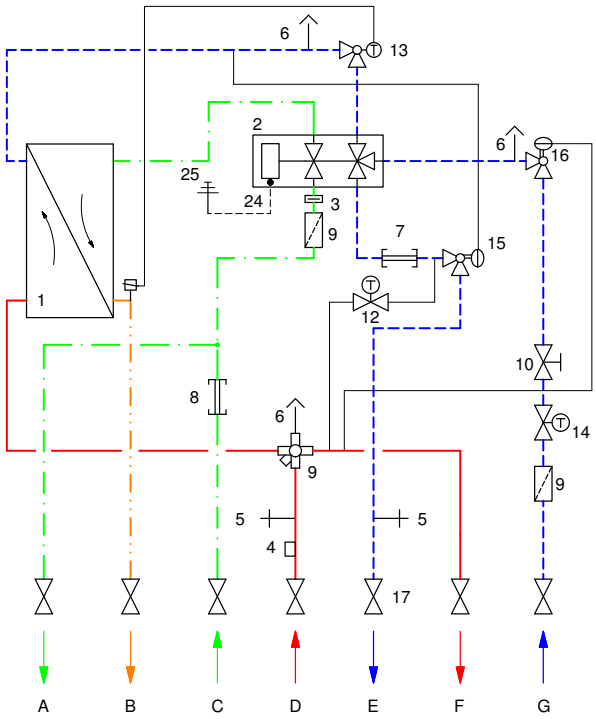
Sample set-up



Note

The basic units are supplemented here by modules and assembled to form an individual heat interface unit for the planned application requirements.

Hydraulic plan



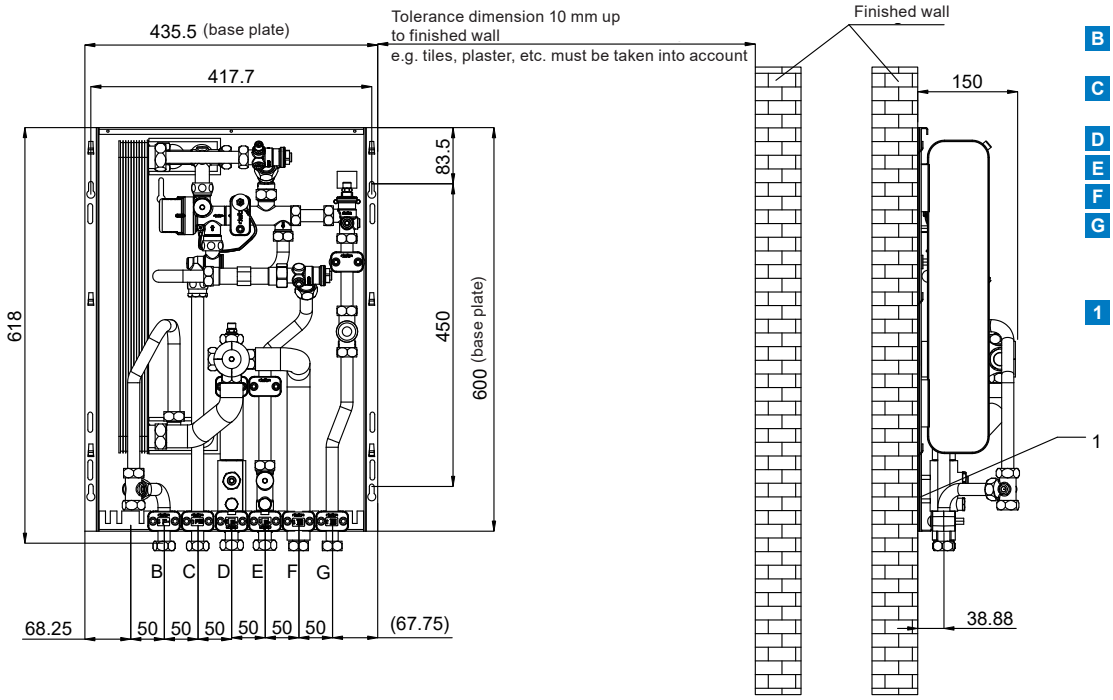
Legend

- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **3** *Coldwater orifice plate |(in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **9** *Dirt collector*
- **10** *Zone valve for limiting heating flow -for apartments*
- **12** *(TTV) Thermostatic lead module*
- **13** *(TWB) Thermostatic hot water temperature limiter*
- **14** *Return temperature limiter (RTB)*
- **15** *Differential pressure regulator primarily in the station input*
- **16** *Differential pressure control, secondary heating circuit*
- **17** *Isolating ball valve*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*

Dimensional drawings

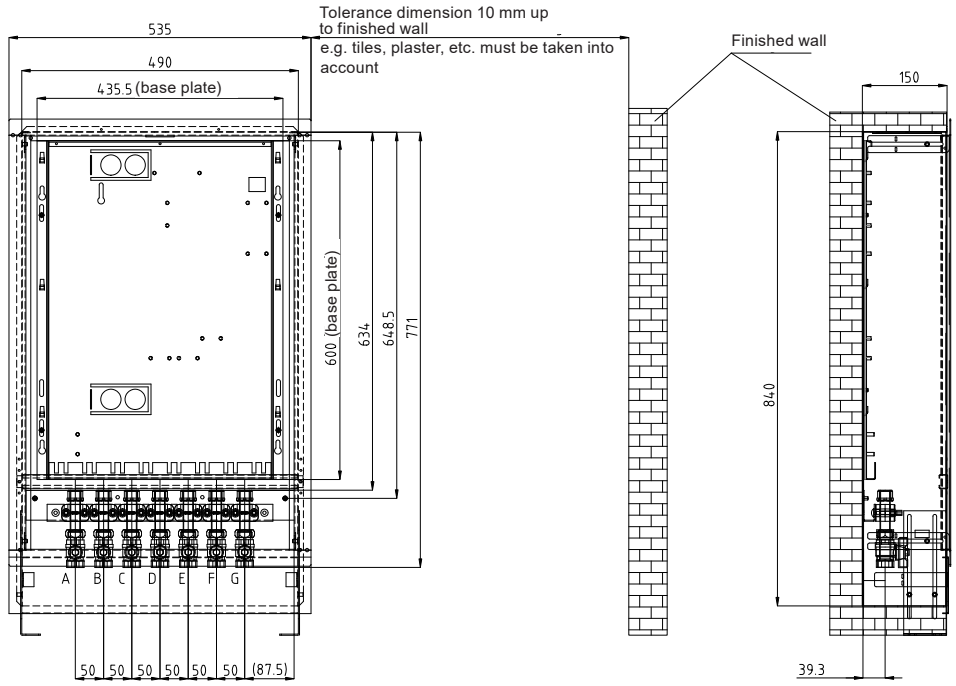
Dimensioning of base plate



B *Hot drinking water in apartments*
C *Drinking water from pipeline*
D *Heating-Supply-Primary*
E *Heating-Return-Primary*
F *Heating-Supply-Secondary*
G *Heating-Return-Secondary*

1 *Base plate*

Dimensioning of in-wall housing

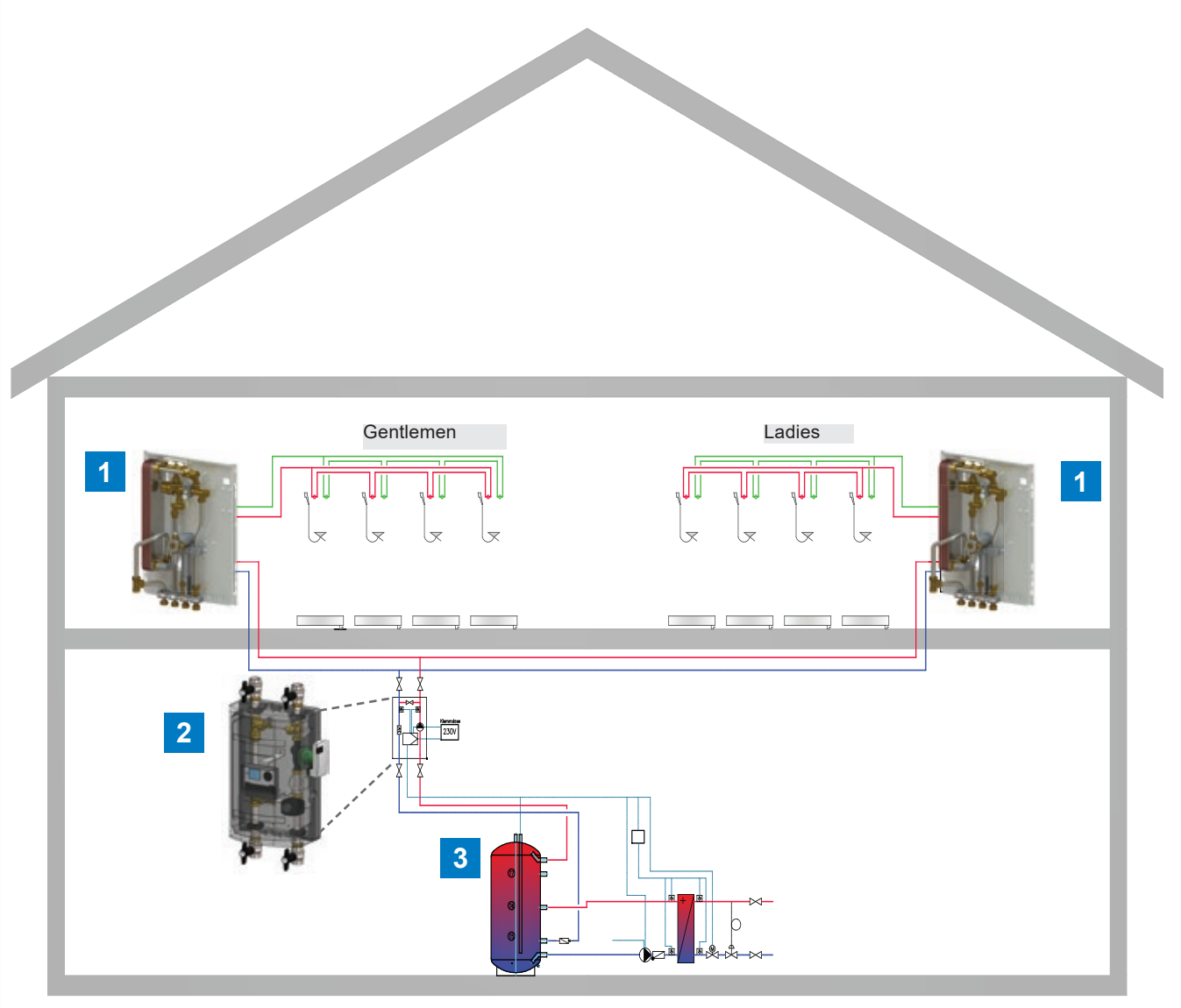


A *Drinking water in apartments*
B *Hot drinking water in apartments*
C *Drinking water from pipeline*
D *Heating-Supply-Primary*
E *Heating-Return-Primary*
F *Heating-Supply-Secondary*
G *Heating-Return-Secondary*

Uponor Aqua Port S1000 system integration

Drinking water station

The drinking water station is a through flow/domestic hot water system (without heating function) suitable for use in homes or for the decentralized hot water delivery in sports halls, hospitals, retirement homes and nursing homes, kindergartens, hotels, etc. Operators and owners can achieve hygienic safety as well as low supply temperatures and high energy savings without a prescribed drinking water testing requirement. Heating and domestic hot water temperatures may be operated with different primary supply temperatures, which is also very beneficial for the operation of heat pumps, for example.



1 Drinking water station (supplies residential units with fresh hot water)

2 Pump group

3 Buffer storage tank

4 Heat transfer station (local heating/district heating)

Module overview

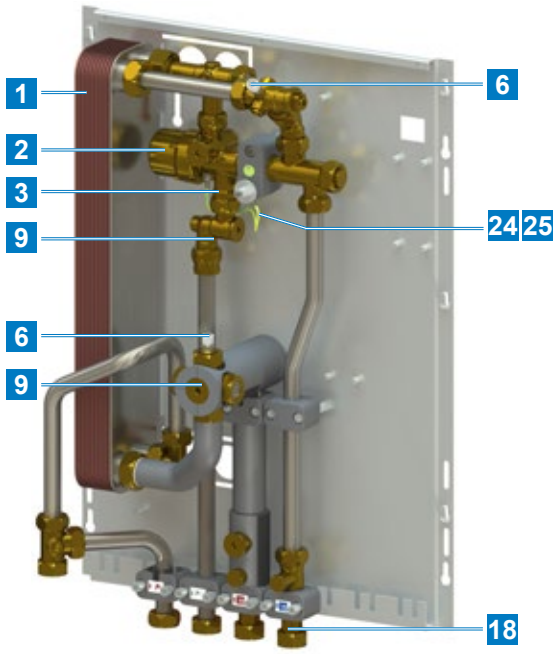
There are numerous module variants for drinking water stations. Here is the selection:

Modules	yes / no ● –
Exchanger	
Stainless steel soldered exchanger	●
Screw-mounted exchanger, including water hammer arrestor	●
Functional modules	
Wider base plate	–
Water hammer arrestor, mounted	
• in the proportional volume control valve	●
• in the hot water line	●
Valve inserts	
• for screwing into the multifunctional valve	●
• (pressure relief) for screwing into the multifunctional valve	●
• (adjustable) for screwing into the multifunctional valve	●
• for screwing into the multifunctional valve with volume flow limiter	–
• Dynamic volume flow valve with scale	–
Differential pressure regulator	
• Primary heating input	●
• Secondary heating circuit	–
• in second heating circuit	–
• Set in pipeline	–
Thermostatic lead module	●
• TTV	●
• TTV for risers	●
Thermostatic hot water temperature limiter	
• TWB 15-50 °C	●
• TWB 35-70 °C	●
• T-Mix/TWB combination for high tapping volumes 28-30 l/min	–
Return temperature limiter (RTB)	
• for single-pipe systems	–
• for two-pipe systems	–
• in second heating circuit	–
Special adapter for hot water meter	–
Adapter for cold water meter for domestic hot water preparation	●
Cold water residential unit outlet without meter adapter	●
Cold water residential unit outlet with 1 meter adapter	●
Cold water residential unit outlet with 2 meter adapters	●
Cold water pipeline with pressure reducer	●
Cold water pipeline pressure reducer, cold water residential unit outlet	●
Cold water pipeline with a meter adapter, pressure reducer, cold water residential unit outlet	●
Cold water pipeline with a meter adapter and pressure reducer	●
Dirt collector in the Return Line Secondary	–
Drainage set for Heating-Supply-Primary/ Heating-Return-Primary	●
Circulation pump set	●
Safety valve set for installation in the hot water pipeline	●
Connection of a second heating circuit for drinking water module (Uponor Aqua Port Compact)	–
Mixer circuit:	
• Thermal drive or 3-point actuator	–
• second heating circuit	–
Safety temperature monitor	–
Manifold connection set	–
Underfloor heating manifold with flow meter	–
On-wall mounting rail	●
In-wall-mounted housing with frame and door	●
Sheet steel frame, door designed as a radio receiver	●
In-wall mounting rail	–
Connection, e.g. for in-wall-mounted rail	–
On-wall-mounted cladding	●
Cover panel for on-wall mounted cladding	●
Mounting plate for manifold set-up and on-wall mounting	–
Straight isolating ball valves	●
Angled isolating ball valves	●

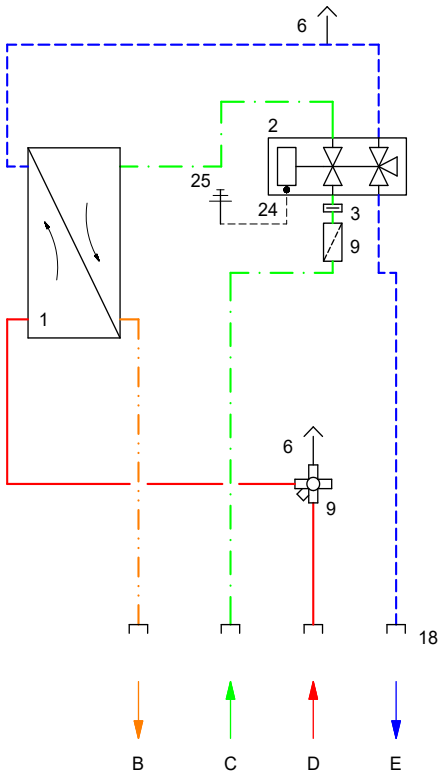
Control	
Thermal actuator 230 V	–
Thermal actuator 24 V	–
Control based on weather conditions and room temperature	-
3-point actuator	–
Actuator with 0-10 V control input and 24 V voltage supply	–
Uponor Smatrix control	–
Distributor socket for M-BUS systems	–
Wiring with thermostatic injection circuit	–
Wiring with weather-based injection circuit (3-points)	–
Wiring with weather-based injection circuit (3-points) including Uponor Smatrix regulation	–
Installation of heat or drinking water meters provided	●
Wiring with M-BUS for meter	–
Wiring of electrical components within the station to a distributor box	–

Base station

Narrow version



Hydraulic plan



Technical data

Materials

Fittings	*Drinking water, hygienically suitable materials according to DVGW, UBA, WRAS*
Sanitary	*CW617N; heating: CW617N, CW614N*
Seals	*according to DVGW KTW D1/D2, W270 and WRAS requirements*
Thermal insulation	*EPP*
Heat exchanger	*Plates: 1.4404; solder: Copper, nickel or screw-mounted exchanger*
Pipeline	*1.4401*

Sanitary

Max. operating pressure	*PN 10*
Min. preliminary pressure	*2,0 bar*

Heating

Max. operating pressure	*PN 10*
Max. primary differential pressure	*2,5 bar*
Max. operating temperature	*85 °C*

Dimensions

Width x Height x Depth	*435 x 600 x 150 mm*

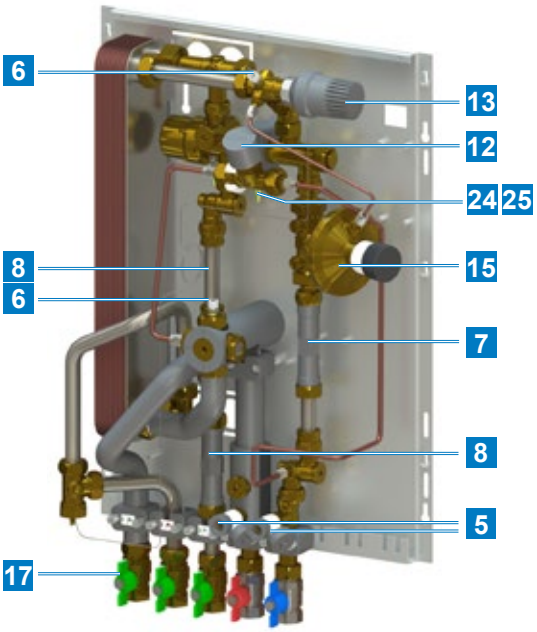
Legend

- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*

- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **3** *Coldwater orifice plate (in screw connection)*
- **6** *Venting*
- **9** *Dirt collector*
- **18** *Union nut*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*

The station is available in the following versions	
GBS-240H-14 (14 plates)	12 l/min. approx. 35 kW
GBS-240H-20 (20 plates)	15 l/min. approx. 42 kW
GBS-240H-30 (30 plates)	17 l/min. approx. 48 kW
GBS-240H-40 (40 plates)	19 l/min. approx. 55 kW

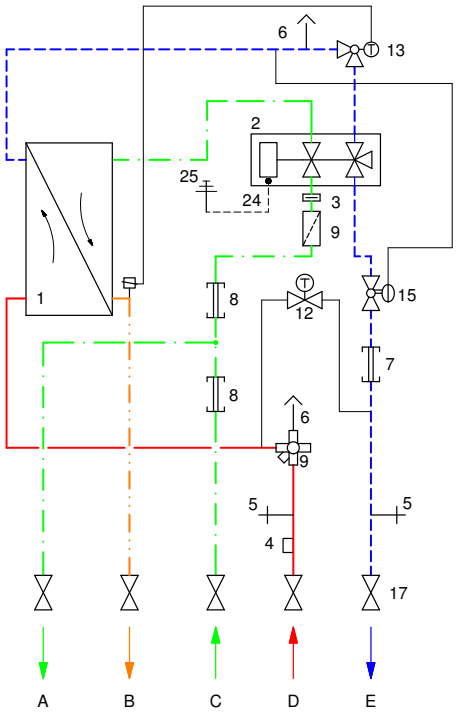
Sample set-up



Note

The basic units are supplemented here by modules and assembled to form an individual heat interface unit for the planned application requirements.

Hydraulic plan



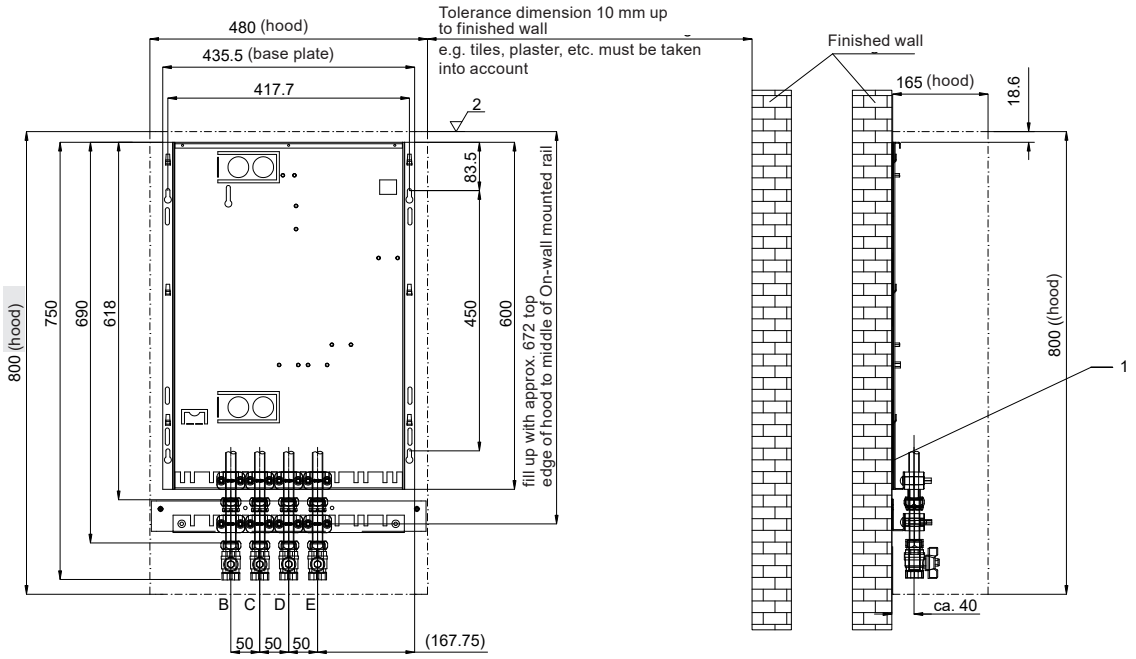
Legend

- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*

- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **9** *Dirt collector*
- **12** *(TTV) Thermostatic lead module*
- **13** *(TWB) Thermostatic hot water temperature limiter*
- **15** *Differential pressure regulator primarily in the station input*
- **17** *Isolating ball valve*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*

Dimensional drawings

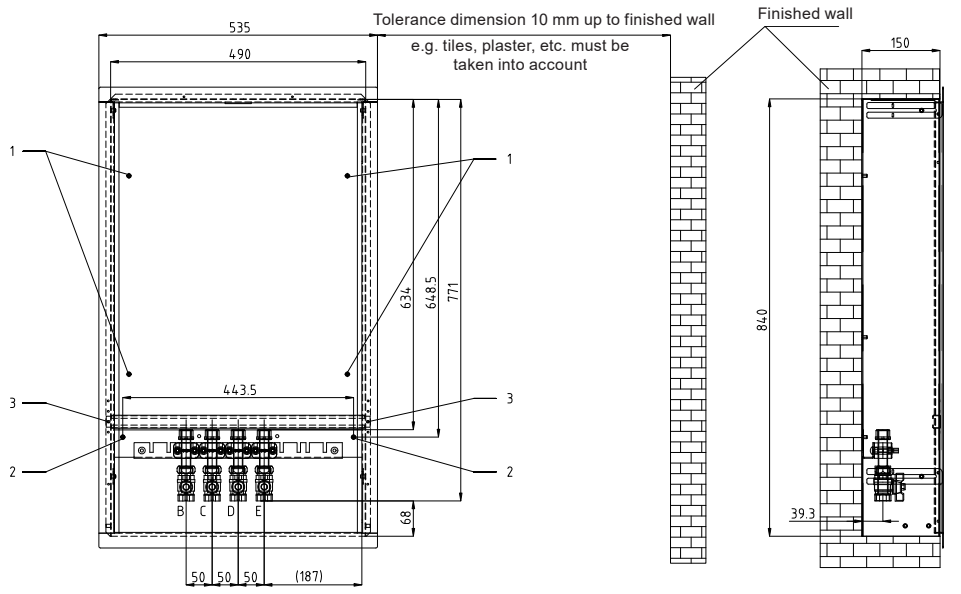
Dimensioning of base plate



B *Drinking water in apartments*
C *Drinking water from pipeline*
D *Heating-Supply-Primary*
E *Heating-Return-Primary*

1 *Base plate*
2 *Top edge of hood*

Dimensioning of in-wall housing



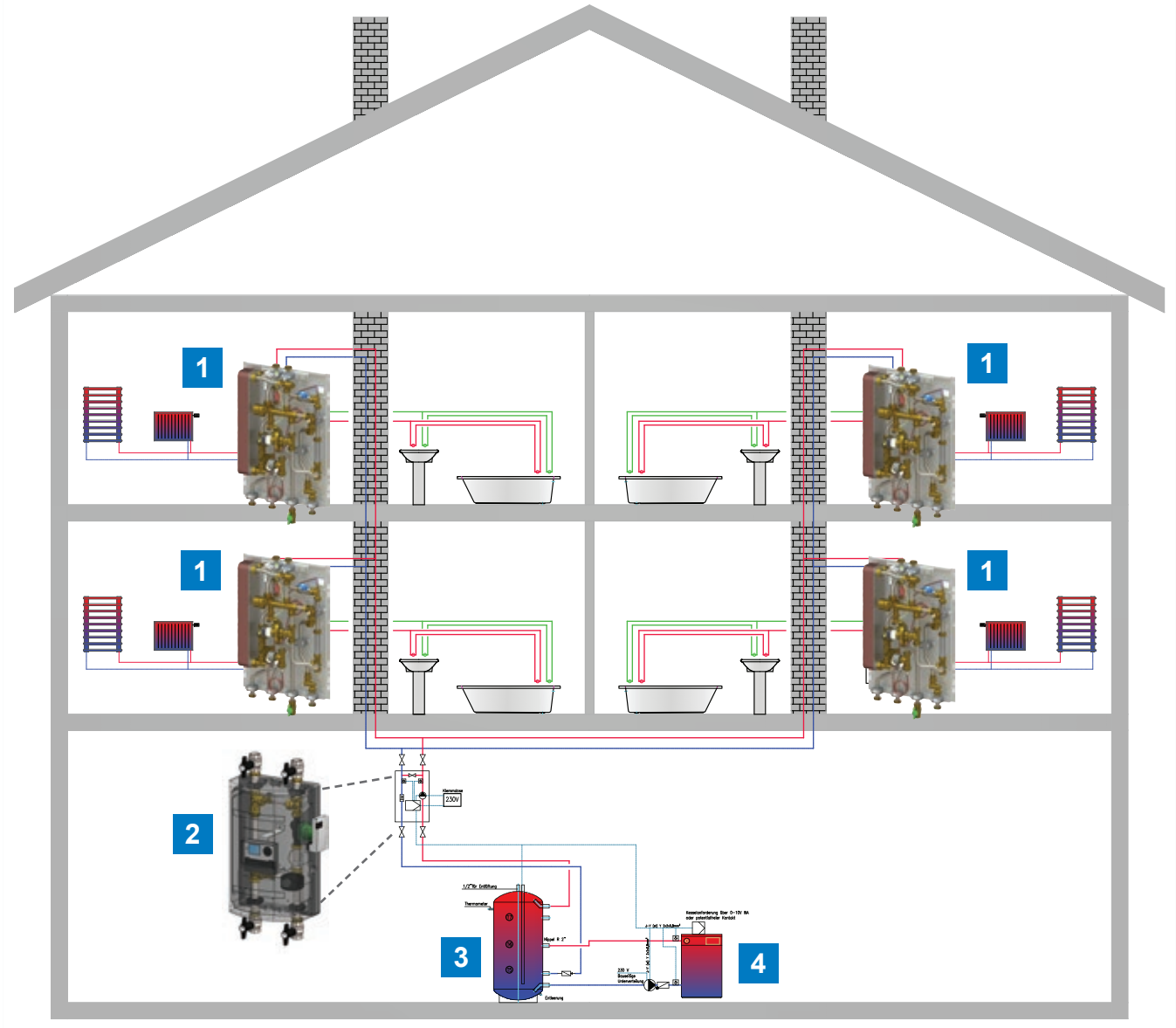
B *Hot drinking water in apartments*
C *Drinking water from pipeline*
D *Heating-Supply-Primary*
E *Heating-Return-Primary*

1 *Mounting bolts for base plate*
2 *Mounting bolts for connection rail (3rd from top)*
3 *Top edge of the bare concrete floor*
4 *Top edge of the floor*
5 *Covering*
6 *Screed*
7 *Insulating layer*
8 *Connection point for cross supports*
9 *Screed impact plate*

Uponor Combi Port T1000 system integration

Replacement water heating station

This station is designed for quick and easy replacement of gas water heaters with domestic hot water systems. In this case, the disused chimney can be used as a supply shaft. The station is connected to the heating pipeline via the upper primary connections. The sequence of the residential unit connections below corresponds to the connection diagram of the old gas-fuelled water heaters, so that the station can be installed quickly without much dirt and without crossing pipelines. The station is clad by an on-wall-mounted cabinet that also covers the lower connections.



1. Replacement water heating station for fresh hot water and radiator heating
2. Pump group
3. Buffer storage tank
4. Heater (boiler)

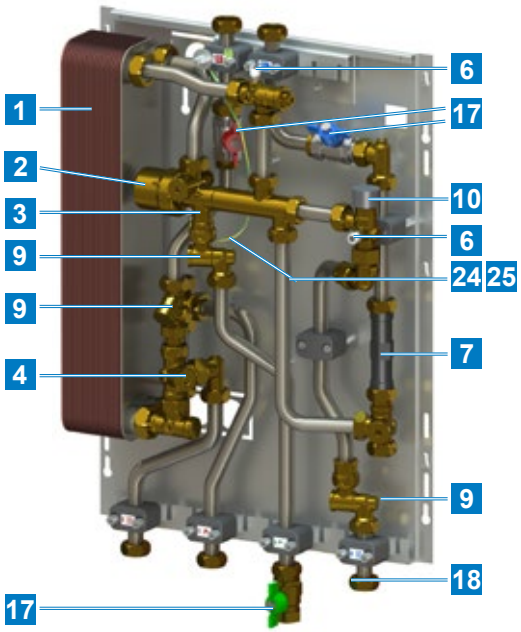
Module overview

There are numerous module variants for the replacement water heating station. Here is the selection

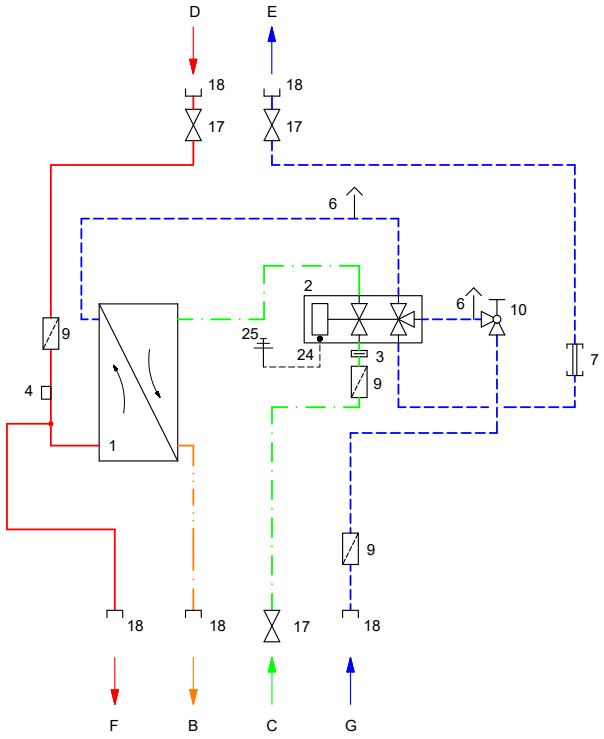
Modules	yes / no ● –
Exchanger	
Stainless steel soldered exchanger	●
Screw-mounted exchanger	●
Functional modules	
Wider base plate	–
Water hammer arrestor, mounted	
• in the proportional volume control valve	–
• in the hot water line	●
Valve inserts:	
• for screwing into the multifunctional valve	●
• (pressure relief) for screwing into the multifunctional valve	●
• (adjustable) for screwing into the multifunctional valve	●
• for screwing into the multifunctional valve	–
• with volumetric flow limiter	–
• Dynamic volume flow valve with scale	–
Differential pressure regulator:	
• Primary heating input	●
• Secondary heating circuit	–
• in second heating circuit	–
• Set in pipeline	●
TTV	●
TTV for risers	●
TWB	
• TWB 20-50 °C	●
• TWB 35-70 °C	●
• T-Mix/TWB combination	–
RTB	●
• for single-pipe systems	●
• for two-pipe systems	–
• in second heating circuit	–
Adapter for hot water meter	–
Adapter for cold water meter for domestic hot water preparation	●
Cold water residential unit outlet without meter adapter *	–
Cold water residential unit outlet with 1 meter adapter *	–
Cold water residential unit outlet with 2 meter adapters*	–
Cold water pipeline with pressure reducer	●
Cold water pipeline pressure reducer, cold water residential unit outlet	–
Cold water pipeline with a meter adapter, pressure reducer, cold water residential unit outlet	–
Cold water pipeline with a meter adapter and pressure reducer	●
Dirt collector in the Return-Secondary	–
Heating-Supply-Primary/Heating-Return-Primary drainage set	●
Circulation pump set	–
Safety valve	–
Connection of a second heating circuit for drinking water module (Uponor Aqua Port Compact)	–
Mixer circuit:	
• Thermal drive or 3-point	–
• second heating circuit	–
Safety temperature monitor	–
Manifold connection set	–
Underfloor heating manifold with flow meter	–
On-wall mounting rail	–
In-wall mounting	–
Sheet steel frame, door designed as a radio receiver	–
In-wall mounting rail	–
Connection, e.g. for in-wall-mounted rail	–
On-wall-mounted cladding	●
Cover panel for on-wall mounted cladding	●
Mounting plate for manifold set-up and on-wall mounting	–
Straight isolating ball valves	●
Angled isolating ball valves	–
Control	
Thermal actuator 230 V	●
Thermal actuator 24 V	●
Control based on weather conditions and room temperature	–
3-point actuator	–
Actuator with 0-10 V control input and 24 V voltage supply	–
Uponor Smatrix control	–
Distributor socket for M-BUS systems	–
Wiring with thermal injection circuit	–
Wiring with weather-based injection circuit (3-points)	–
Wiring with weather-based injection circuit (3-points) including Uponor Smatrix regulation	–
Installation of heat or drinking water meters provided	●
Wiring with M-BUS for meter	–
Wiring of electrical components within the station to a distributor box	–

* (optional, from above or below)

Base station



Hydraulic plan



Technical data

Materials

Fittings	*Drinking water, hygienically suitable materials according to DVGW, UBA, WRAS*
Sanitary	*CW617N; heating: CW617N, CW614N*
Seals	*according to DVGW KTW D1/D2, W270 and WRAS requirements*
Heat exchanger	*Plates: 1.4404; solder: Copper, nickel or screw-mounted exchanger*
Pipeline	*1.4401*

Sanitary

Max. operating pressure	*PN 10*
Min. preliminary pressure	*2,0 bar*

Heating

Max. operating pressure	*PN 10*
Max. operating temperature	*85 °C*
Max. primary differential pressure	*2,5 bar*

Electrical

Current connection	*230 V/50 Hz during use:* *Zone valve with room thermostat, otherwise functional without a current connection*

Dimensions

Width x Height x Depth	*435 mm x 600 mm x 150 mm*
Weight	*12.7 kg - 14 plates/13.2 kg - 20 plates* *13.9 kg - 30 plates/15.3 kg - 40 plates*

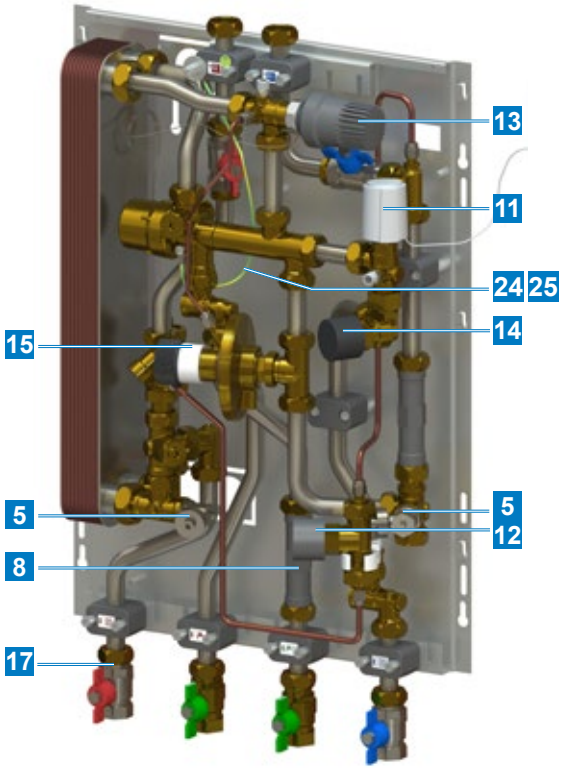
Legend

- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **9** *Dirt collector*
- **10** *Zone valve for limiting heating flow -for apartments*
- **17** *Isolating ball valve*
- **18** *Union nut*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*

The station is available in the following versions	
GBS-240H-14 (14 plates)	12 l/min. approx. 35 kW
GBS-240H-20 (20 plates)	15 l/min. approx. 42 kW
GBS-240H-30 (30 plates)	17 l/min. approx. 48 kW

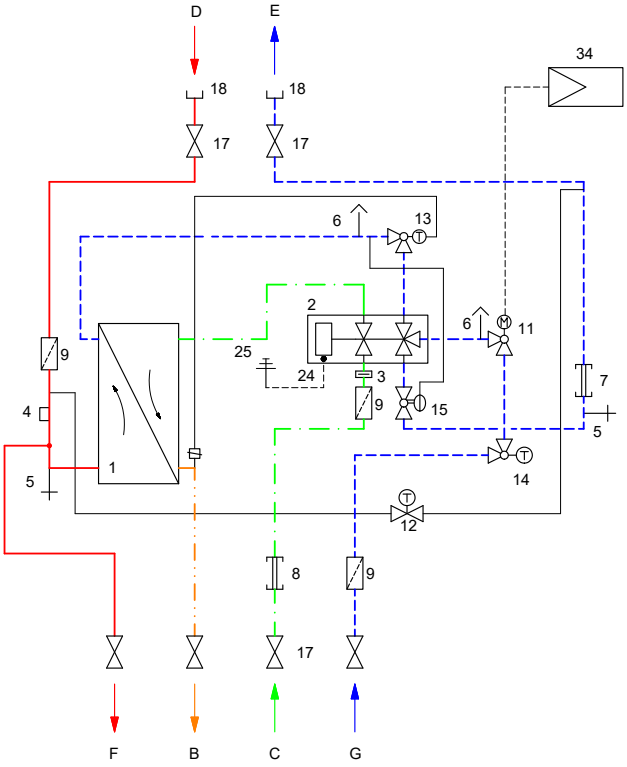
Sample set-up



Note

The basic units are supplemented here by modules and assembled to form an individual heat interface unit for the planned application requirements.

Hydraulic plan



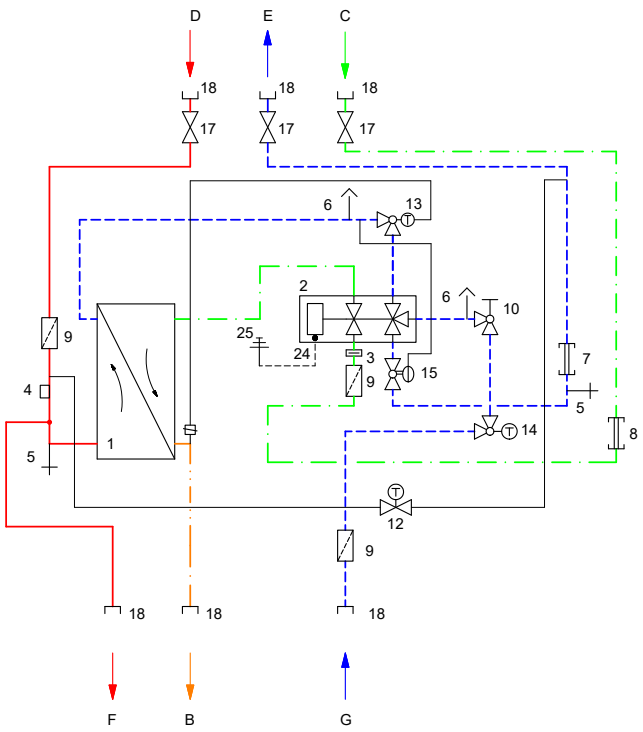
Legend

- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

- **1** *Plate heat exchangers*
- **2** *Proportional volume control valve (proportional volume control valve)*
- **3** *Coldwater flow regulator (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **9** *Dirt collector*
- **11** *Zone valve for limiting heating flow- Residential unit with thermal 2-point actuator*
- **12** *(TTV) Thermostatic lead module*
- **13** *(TWB) Thermostatic hot water temperature limiter*
- **14** *Return temperature limiter (RTB)*
- **15** *Differential pressure regulator primarily in the station input*
- **17** *Isolating ball valve*
- **18** *Union nut*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*
- **34** *Control*

Sample set-up for cold water, above

Hydraulic plan



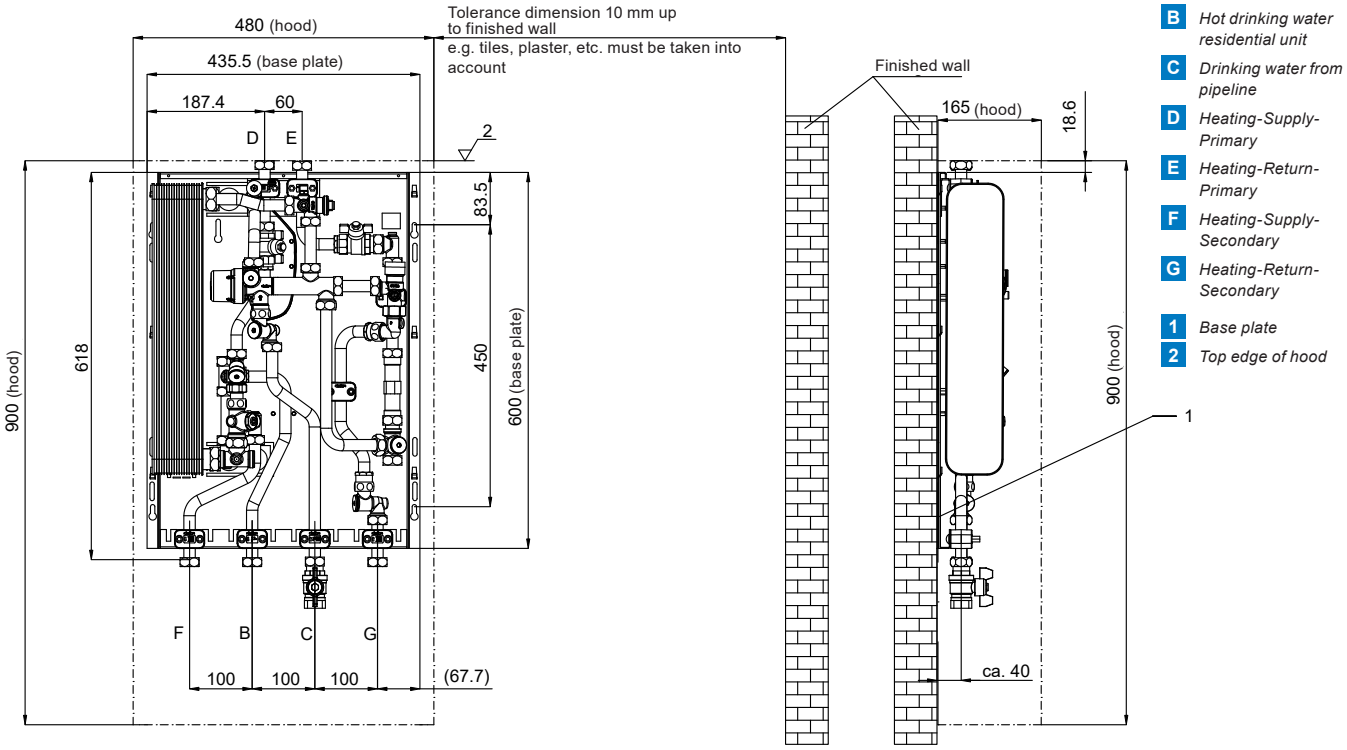
Legend

- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

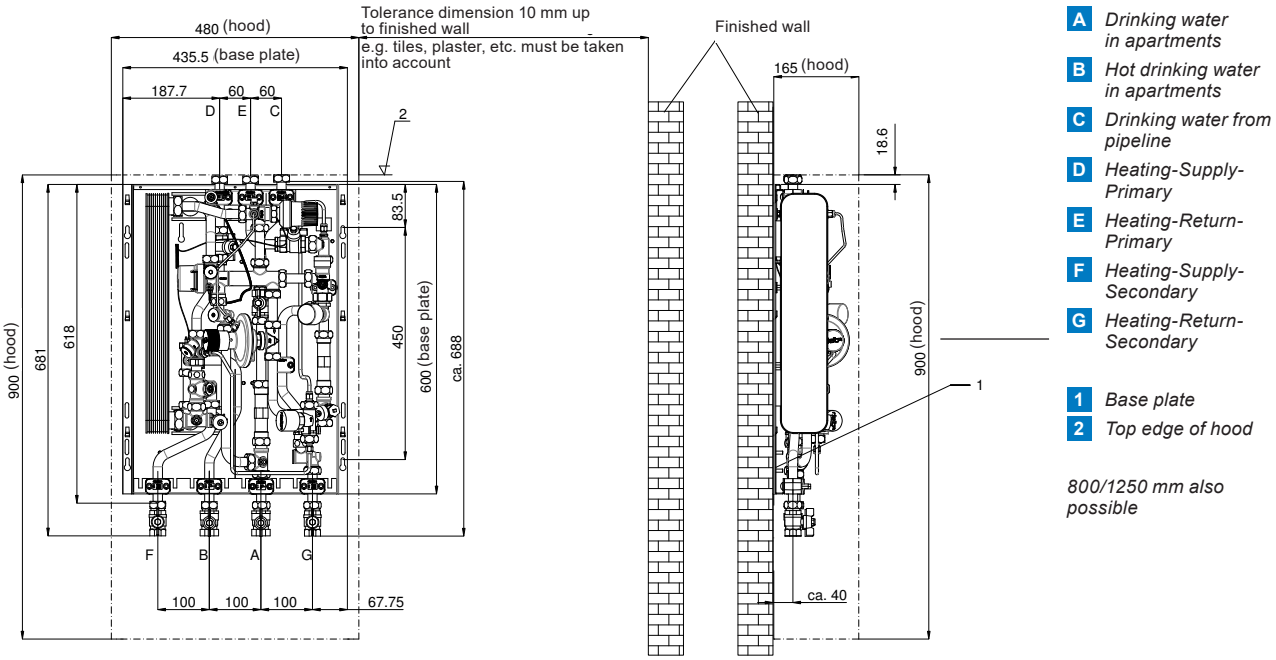
- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **5** *Draining*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **9** *Dirt collector*
- **10** *Zone valve for limiting heating flow -for apartments*
- **12** *(TTV) Thermostatic lead module*
- **13** *(TWB) Thermostatic hot water temperature limiter*
- **14** *Return temperature limiter (RTB)*
- **15** *Differential pressure regulator primarily in the station input*
- **17** *Isolating ball valve*
- **18** *Union nut*
- **24** *Equipotential bonding connection*
- **25** *Earthing on site*

Dimensional drawings

Dimensioning of base plate



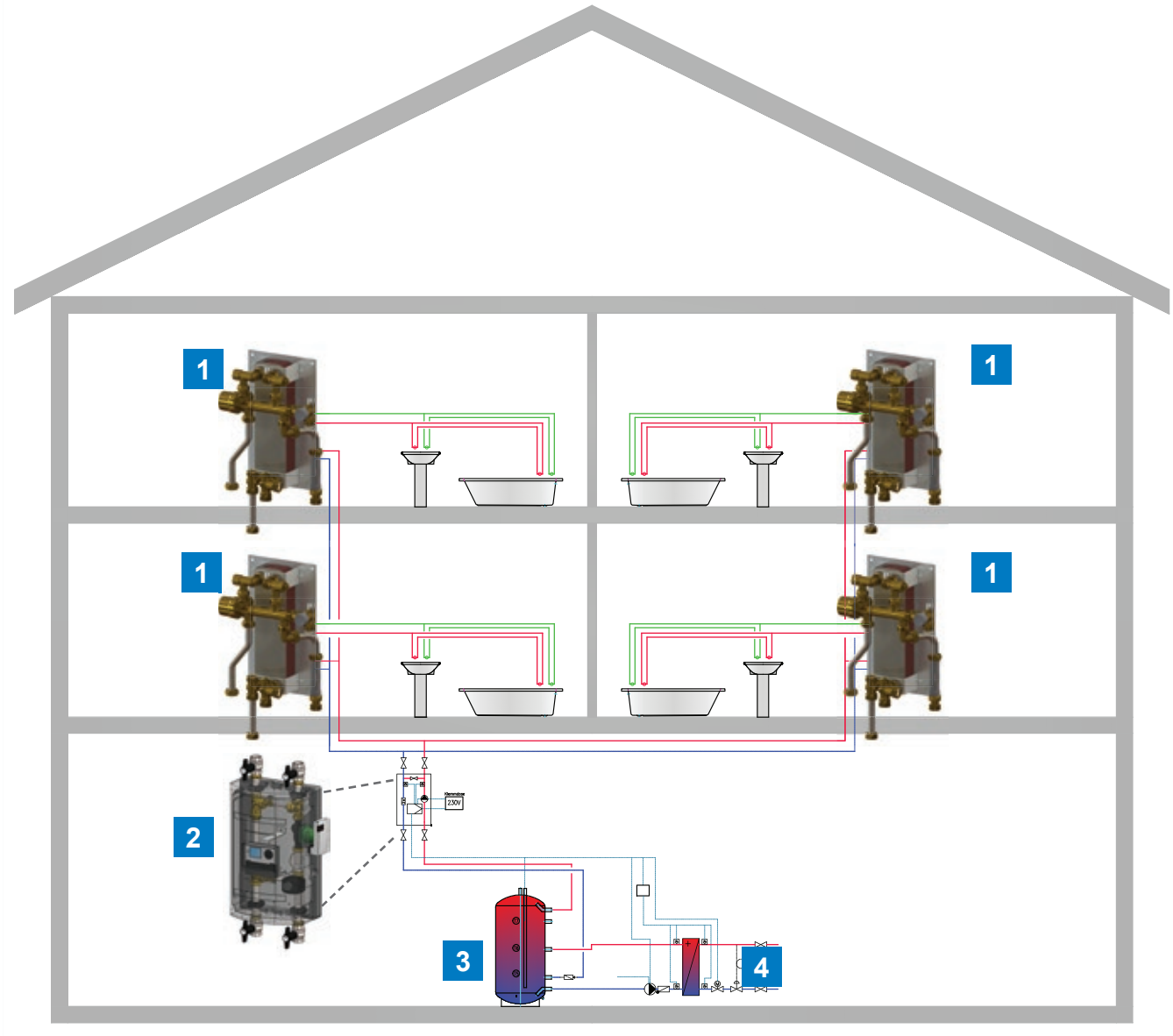
Dimensioning for base plate for cold water, above



Uponor Combi Port M90 system integration

Heat interface unit M90

Heat interface units are generally part of a system specially tailored to them. This is the standard system layout. It does not matter whether the system is viewed vertically (multi family homes) or horizontally (local heat distribution networks).



1 Drinking water station (supplies residential units with fresh hot water)

2 Pump group

3 Buffer storage tank

4 Heat transfer station (local heating/district heating)

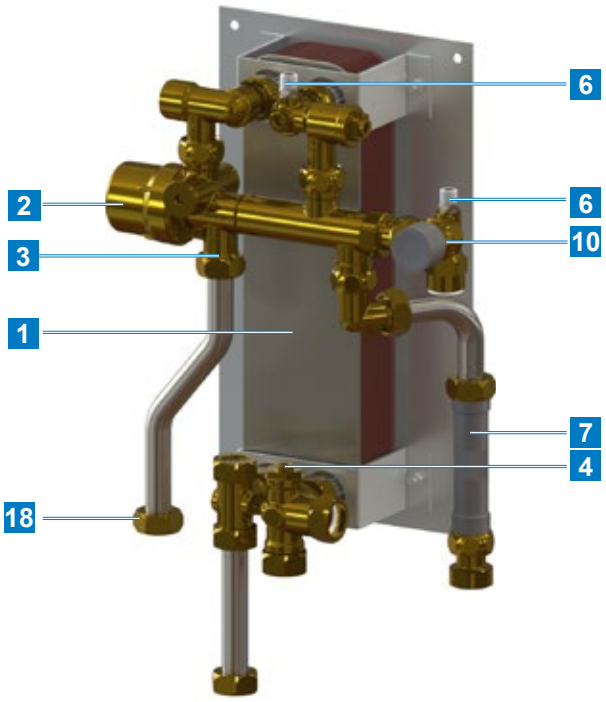
Module overview

There are numerous module variants for heat interface unit M90. Here is the selection

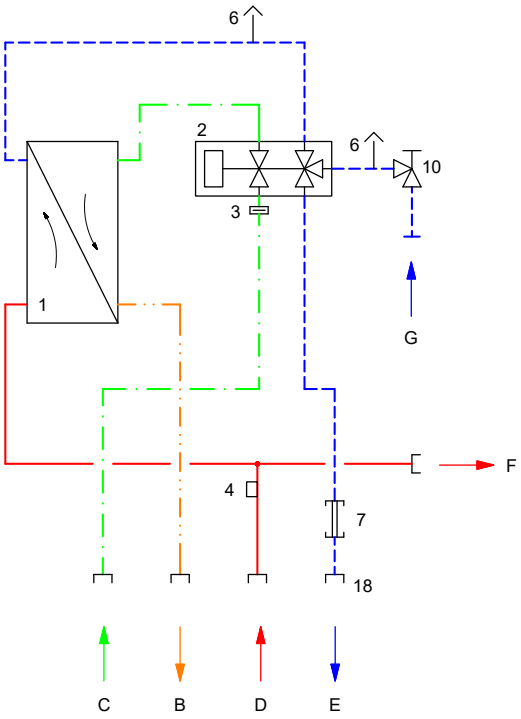
Modules	yes / no ● –
Exchanger	
Stainless steel soldered exchanger	–
Screw-mounted exchanger	–
Functional modules	
Wider base plate	–
Water hammer arrestor, mounted	
• in the proportional volume control valve	–
• in the hot water line	–
Valve inserts:	
• for screwing into the multifunctional valve	●
• (pressure relief) for screwing into the multifunctional valve	●
• (adjustable) for screwing into the multifunctional valve	●
• for screwing into the multifunctional valve	–
• with volumetric flow limiter	–
• Dynamic volume flow valve with scale	–
Differential pressure regulator:	
• Primary heating input	–
• Secondary heating circuit	–
• in second heating circuit	–
• Set in pipeline	●
TTV	●
TTV for risers	●
TWB	
• TWB 20-50 °C	●
• TWB 35-70 °C	●
• T-Mix/TWB combination	●
RTB	
• for single-pipe systems	–
• for two-pipe systems	–
• in second heating circuit	–
Adapter for hot water meter	–
Adapter for cold water meter for domestic hot water preparation	●
Cold water residential unit outlet without meter adapter	–
Cold water residential unit outlet with 1 meter adapter	–
Cold water residential unit outlet with 2 meter adapters	–
Cold water pipeline with pressure reducer	●
Cold water pipeline pressure reducer, cold water residential unit outlet	–
Cold water pipeline with a meter adapter, pressure reducer, cold water residential unit outlet	–
Cold water pipeline with a meter adapter and pressure reducer	●
Dirt collector in the Return-Secondary.	–
Draining set	–
Circulation pump set	–
Safety valve	–
Connection of a second heating circuit for drinking water module (Uponor Aqua Port Compact)	●
Mixer circuit:	
• Thermal drive or 3-point	–
• second heating circuit	–
Safety temperature monitor	–
Manifold connection set	–
Underfloor heating manifold with flow meter	–
On-wall mounting rail	–
In-wall mounting	–
Sheet steel frame, door designed as a radio receiver	–
In-wall mounting rail	–
Connection, e.g. for in-wall-mounted rail	–
On-wall-mounted cladding	–
Cover panel for on-wall mounted cladding	–
Mounting plate for manifold set-up and on-wall mounting	–
Straight isolating ball valves	●
Angled isolating ball valves	–

Control	
Thermal actuator 230 V	●
Thermal actuator 24 V	●
Control based on weather conditions and room temperature	–
3-point actuator	–
Actuator with 0-10 V control input and 24 V voltage supply	–
Uponor Smatrix control	–
Distributor socket for M-BUS systems	–
Wiring with thermal injection circuit	–
Wiring with weather-based injection circuit (3-points)	–
Wiring with weather-based injection circuit (3-points) including Uponor Smatrix regulation	–
Installation of heat or drinking water meters provided	●
Wiring with M-BUS for meter	–
Wiring of electrical components within the station to a distributor box	–

Base station



Hydraulic plan



Technical data

Materials

Fittings	*Drinking water, hygienically suitable materials according to DVGW, UBA, WRAS*
Sanitary	*CW617N; heating: CW617N, CW614N*
Seals	*according to DVGW KTW D1/D2, W270 and WRAS requirements*
Thermal insulation	*EPP*
Heat exchanger	*Plates: 1.4404; solder: Copper, nickel or screw-mounted exchanger*
Pipeline	*1.4401*

Sanitary

Max. operating pressure	*PN 10*
Min. preliminary pressure	*2,0 bar*

Heating

Max. operating pressure	*PN 10*
Max. operating temperature	*85 °C*
Max. primary differential pressure	*2,5 bar*

Electrical

Current connection	*230 V/50 Hz during use: Mixed circuit, service water circulation, zone valve with room thermostat, otherwise functional without a current connection*

Dimensions

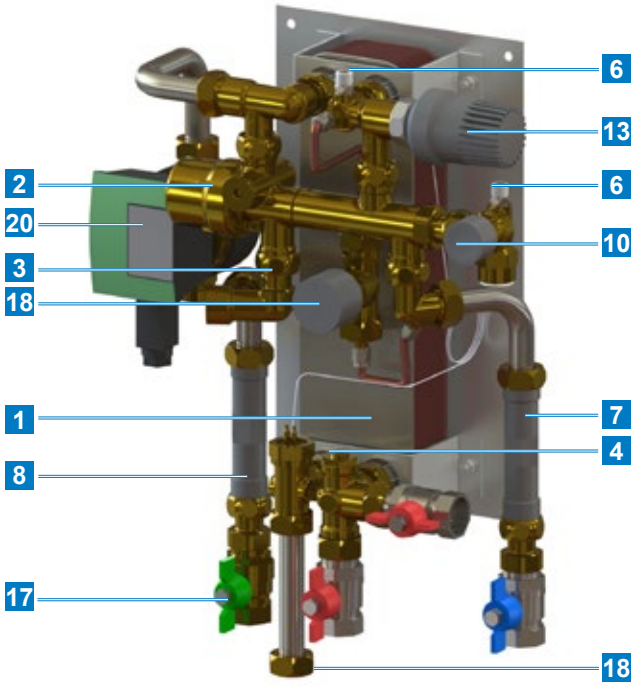
Width x Height x Depth	*275 mm x 440 mm x 170 mm (base station)*
	400 mm x 440 mm x 170 mm (equipment)

Legend

- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*
- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **10** *Zone valve for limiting heating flow -for apartments*
- **18** *Union nut*

The station is available in the following version	
GBS-220H-16 (16 plates)	12 l/min. approx. 35 kW

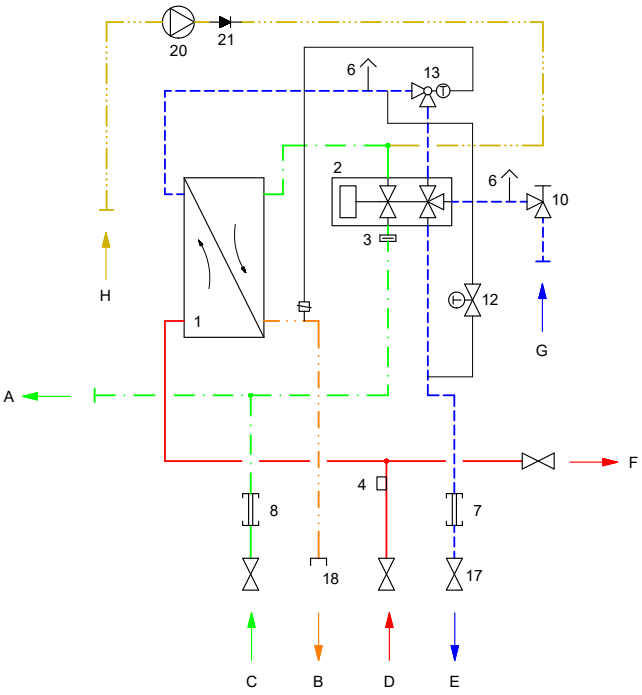
Sample set-up



Note

The basic units are supplemented here by modules and assembled to form an individual heat interface unit for the planned application requirements.

Hydraulic plan



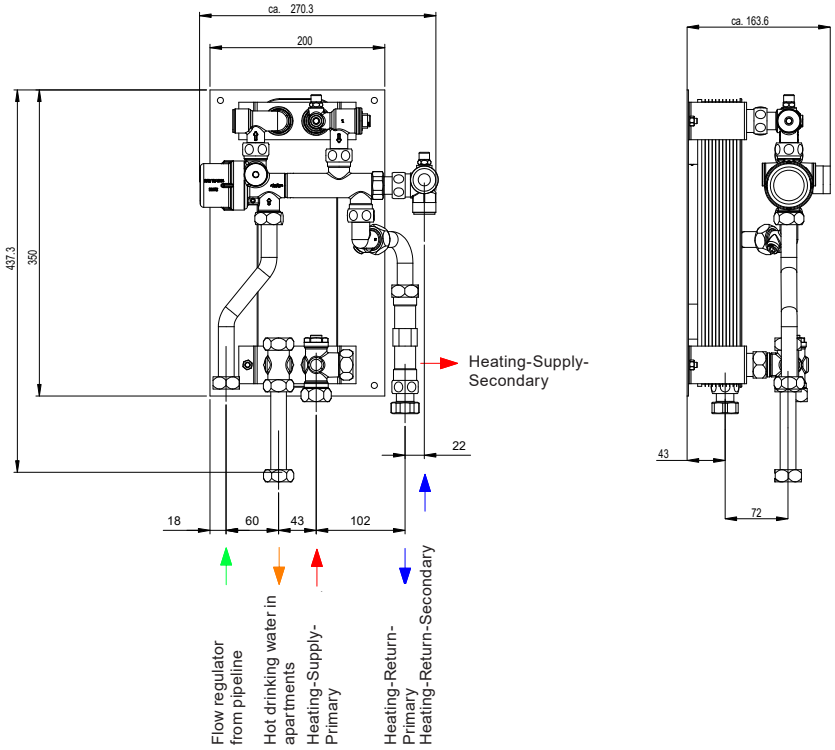
Legend

- **A** *Drinking water in apartments*
- **B** *Hot drinking water in apartments*
- **C** *Drinking water from pipeline*
- **D** *Heating-Supply-Primary*
- **E** *Heating-Return-Primary*
- **F** *Heating-Supply-Secondary*
- **G** *Heating-Return-Secondary*

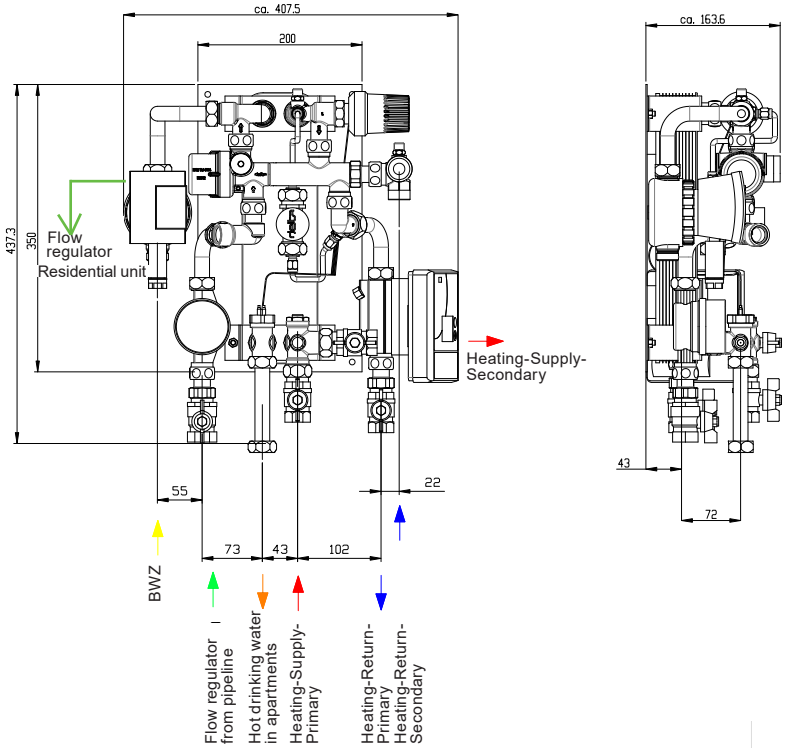
- **1** *Plate heat exchangers*
- **2** *Proportional volume control (PV control)*
- **3** *Coldwater orifice plate (in screw connection)*
- **4** *Sensor pocket heat meter M10x1, submersible*
- **6** *Venting*
- **7** *Heat meter adaptor*
- **8** *Adaptor*
- **10** *Zone valve for limiting heating flow -for apartments*
- **12** *(TTV) Thermostatic lead module (optional)*
- **13** *(TWB) Thermostatic hot water temperature limiter (optional)*
- **17** *Isolating ball valve (optional)*
- **18** *Union nut*
- **24** *Equipotential bonding connection*
- **20** *Circulation pump (optional)*
- **21** *Check valve*

Dimensional drawings

Dimensioning of base plate



Dimensioning of sample set-up



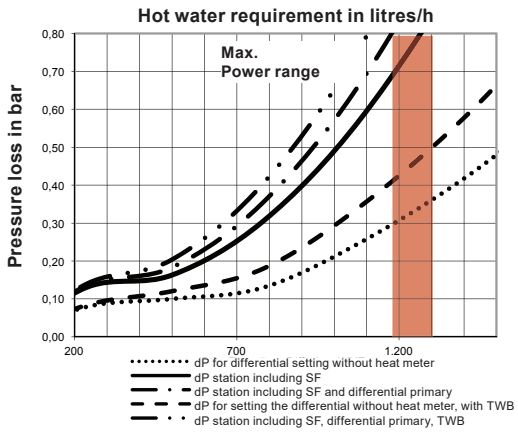
Performance curve diagrams

For consumer and drinking water stations with 14 plates (12 l/min.)

Uponor Combi Port B1000/Combi Port S1000 / Combi Port B1000-X / Combi Port B1000-HC / Combi Port T1000 / Aqua Port B1000/Aqua Port S1000

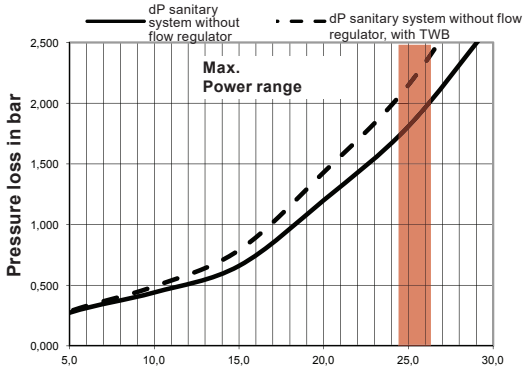
Pressure losses

Heating side (primary)



Installation of at least one heat meter: Qn 1.5 - dP for additional integrated fixtures, such as TWRs, heat meters, etc. not taken into account in the curve.

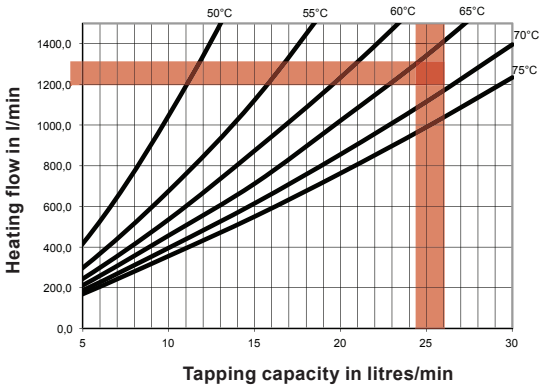
Cold water side (secondary)

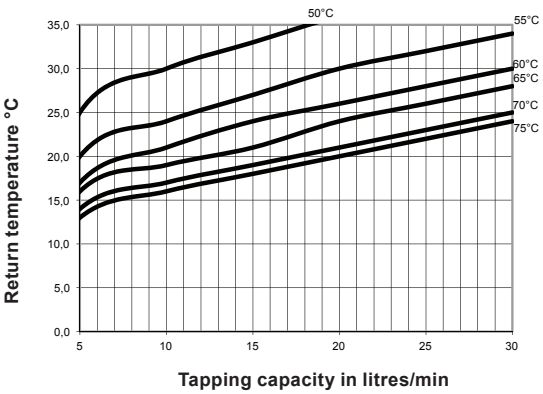


Pressure losses at drinking water flow regulators (add to diag.):
12 l/min = 0.68 - 0.88 bar
15 l/min = 0.70 - 0.90 bar
17 l/min = 0.75 - 0.95 bar

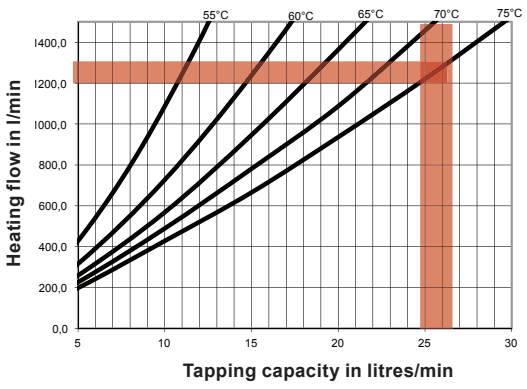
Performance curves and return temperatures

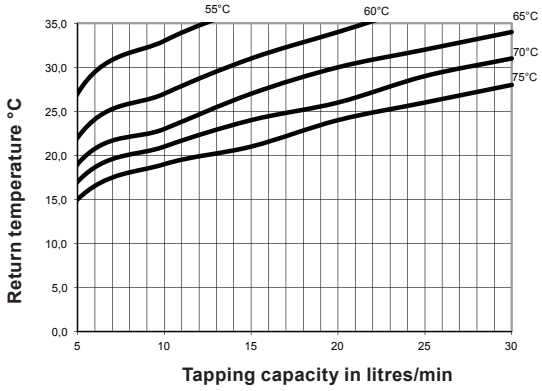
Cold water heating by 35 K (10 - 45°C)





Cold water heating by 40 K (10 - 50°C)



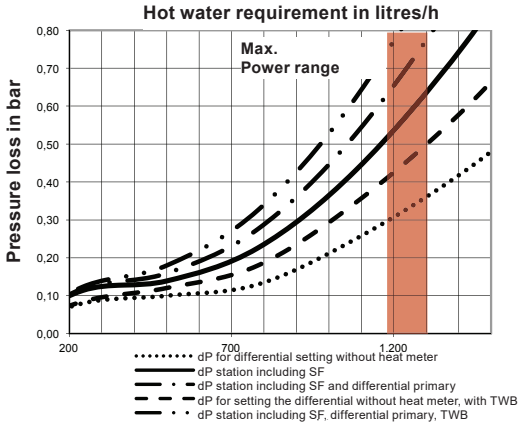


For consumer and drinking water stations with 20 plates (15 l/min.)

Uponor Combi Port B1000/Combi Port S1000 / Combi Port B1000-X / Combi Port B1000-HC / Combi Port T1000 / Aqua Port B1000/Aqua Port S1000

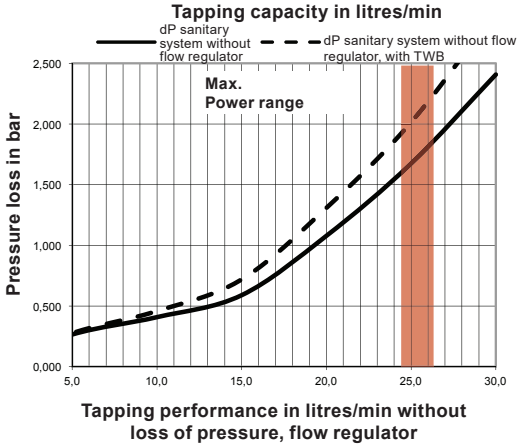
Pressure losses

Heating side (primary)



Installation of at least one heat meter: Qn 1.5 -
dP for additional integrated fixtures, such as TWRs, heat meters, etc. not taken into account in the curve.

Cold water side (secondary)

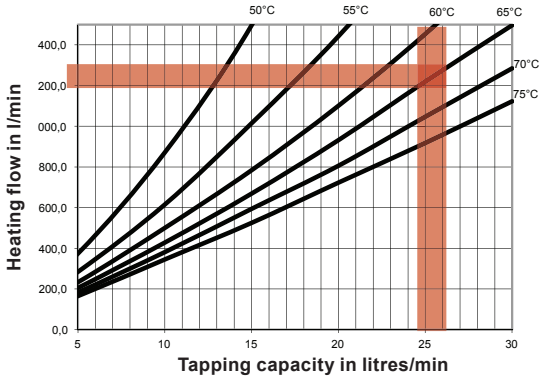


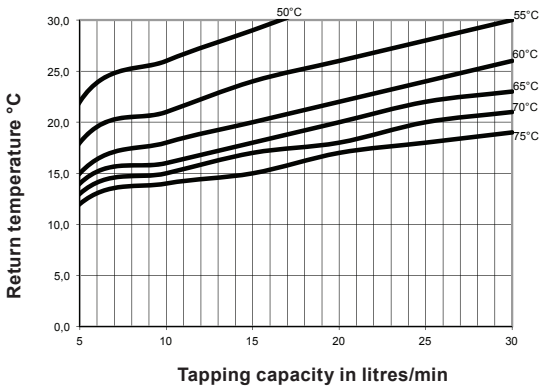
Tapping performance in litres/min without loss of pressure, flow regulator

Pressure losses at drinking water flow regulators (add to diag.):
15 l/min = 0.70 - 0.90 bar
17 l/min = 0.75 - 0.95 bar
19 l/min = 1.00 - 1.20 bar

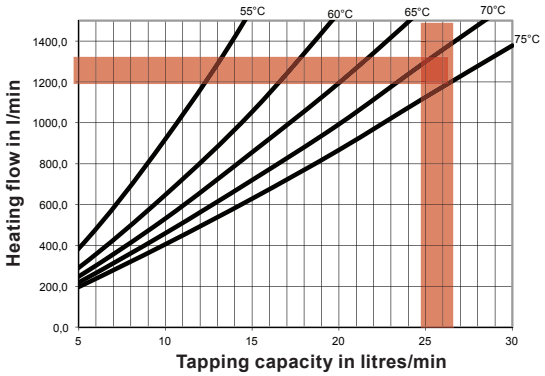
Performance curves and return temperatures

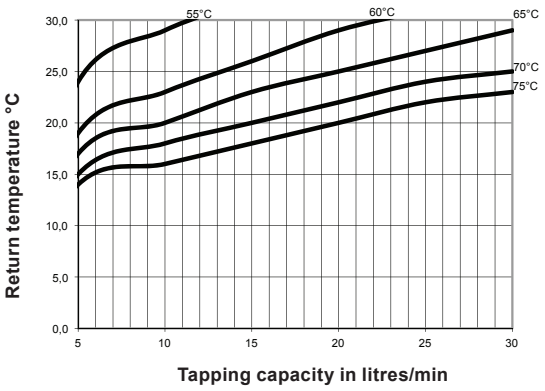
Cold water heating by 35 K (10 - 45°C)





Cold water heating by 40 K (10 - 50°C)



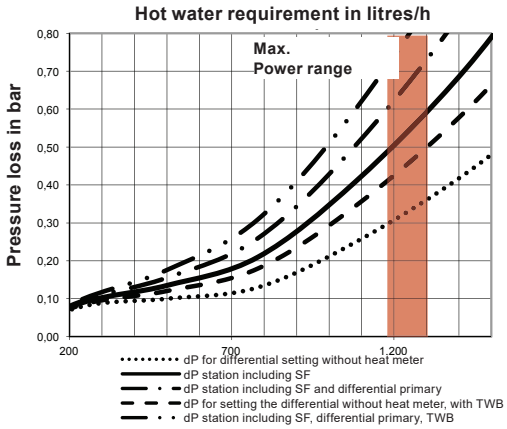


For consumer and drinking water stations with 30 plates (17 l/min.)

Uponor Combi Port B1000/Combi Port S1000 / Combi Port B1000-X / Combi Port B1000-HC / Combi Port T1000 / Aqua Port B1000/Aqua Port S1000

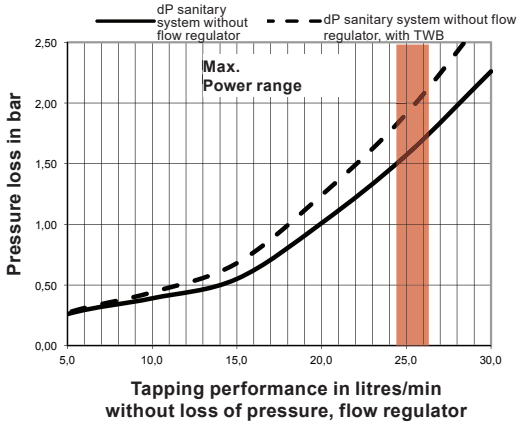
Pressure losses

Heating side (primary)



Installation of at least one heat meter: Qn 1.5 - dP for additional integrated fixtures, such as TWRs, heat meters, etc. not taken into account in the curve.

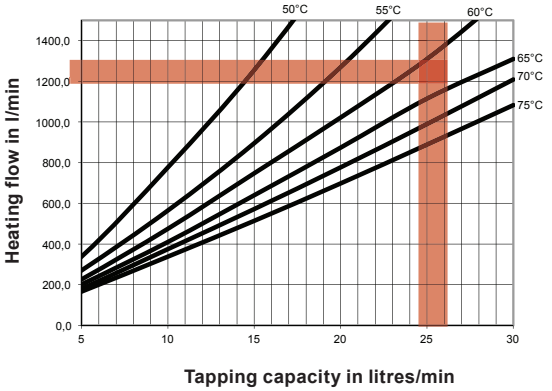
Cold water side (secondary)

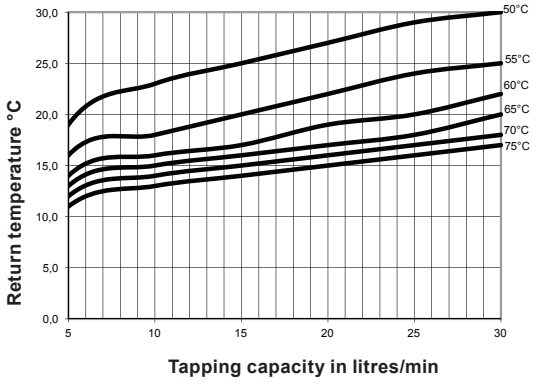


Pressure losses at drinking water flow regulators (add to diag.):
12 l/min = 0.68 - 0.88 bar
17 l/min = 0.75 - 0.95 bar
19 l/min = 1.00 - 1.20 bar
22 l/min = 1.20 - 1.40 bar

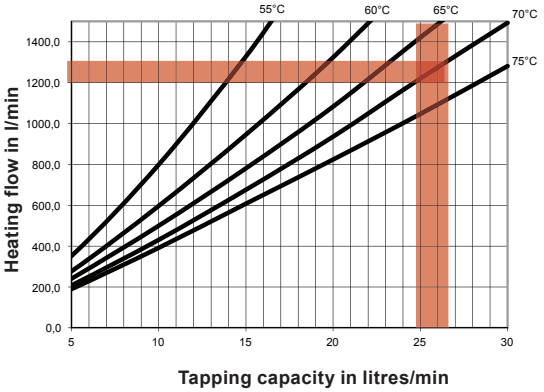
Performance curves and return temperatures

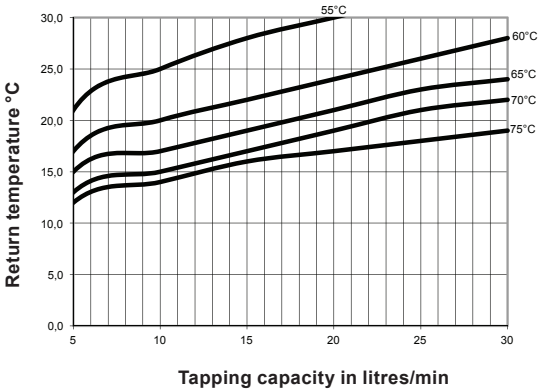
Cold water heating by 35 K (10 - 45°C)





Cold water heating by 40 K (10 - 50°C)



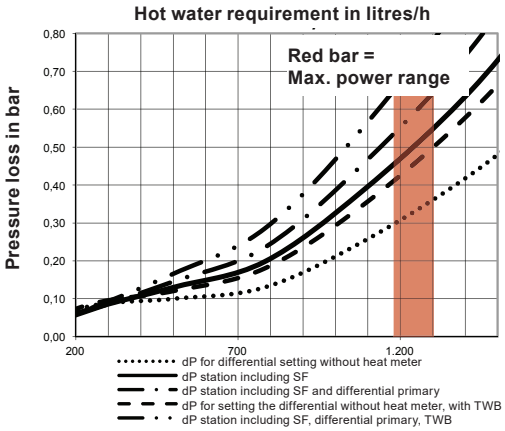


For consumer and drinking water stations with 40 plates (19 l/min.)

Uponor Combi Port B1000/Combi Port S1000 / Combi Port B1000-X / Combi Port B1000-HC / Combi Port T1000 / Aqua Port B1000/Aqua Port S1000

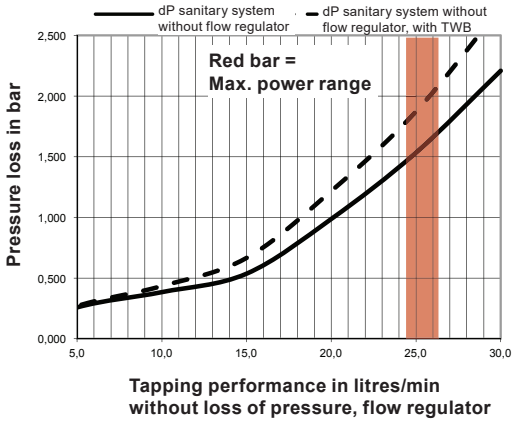
Pressure losses

Heating side (primary)



Installation of at least one heat meter: Qn 1.5 - dP for additional integrated fixtures, such as TWB, heat meters, etc. not taken into account in the curve.

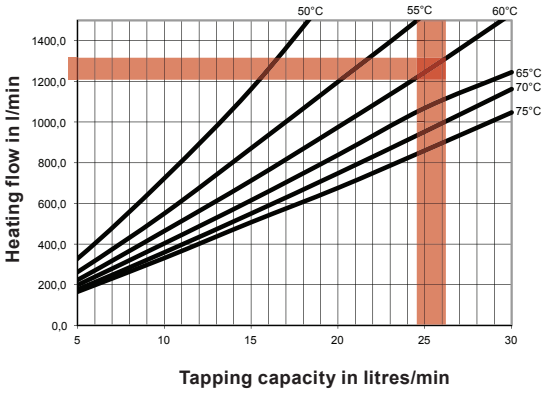
Cold water side (secondary)

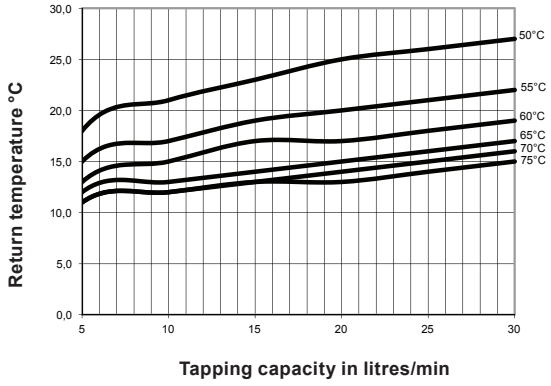


Pressure losses at drinking water flow regulators (add to diag.):
19 l/min = 1.00 - 1.20 bar
22 l/min = 1.20 - 1.40 bar

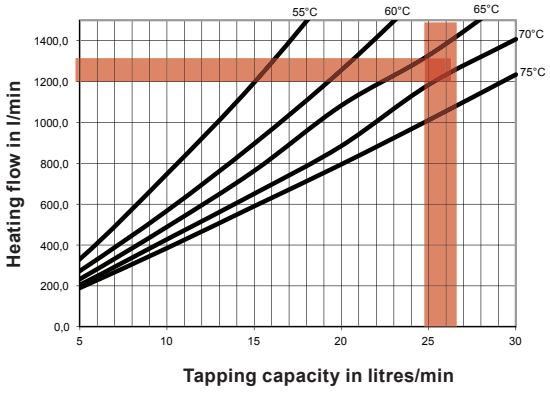
Performance curves and return temperatures

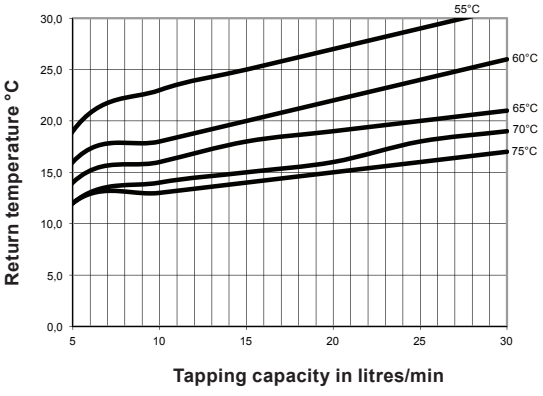
Cold water heating by 35 K (10 - 45°C)





Cold water heating by 40 K (10 - 50°C)





Hybrid output data

Output data for domestic hot water preparation

	Unit	Pre-heating						
Supply primary	°C	38						
Return primary	°C	20						
Heating volumetric flow rate	l/h	831						
			Electric post-heating					
Power	kW	17.4	4.8	6.9	8.8	10.5	12.6	17.4
Hot drinking water preparation system appox.	l/min	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Hot drinking water preparation system temperature	°C	35	42	45	48	50	53	60
Flow regulator temperature	°C	10	35	35	35	35	35	35

Mixing temperature at tapping point and volume to be dispensed

	Unit							
Hot drinking water tapping, total	l/min	-	11.5	12.5	13.5	14.2	15.3	17.8
Mixed hot drinking water temperature	°C	-	38	38	38	38	38	38
Total power	kW	-	22.2	24.3	26.2	27.9	30	34.8

Output data in heating mode

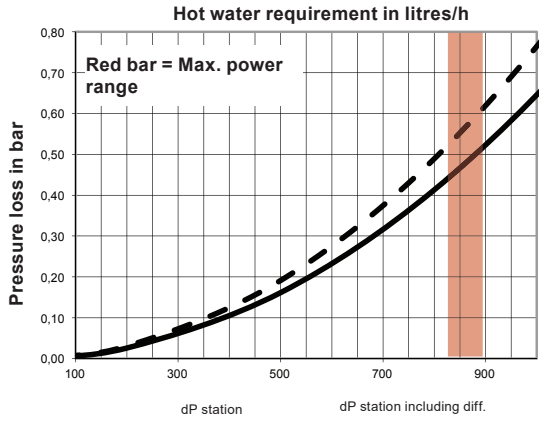
Valve insert	Unit	AV (Standard)	AZ
Supply primary	°C	38	38
Return primary	°C	28	28
Power	l/h	450	650
Hot drinking water preparation system	kW	5.3	7.6

Under-table unit with 24 plates

Uponor Aqua Port Compact (GSB 228-24)

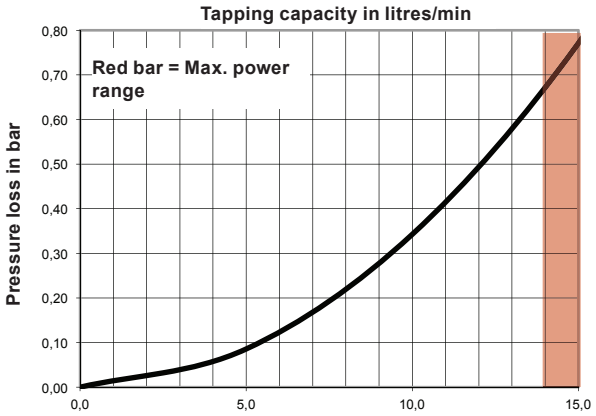
Pressure losses

Heating side (primary)



Pressure losses including KGH. Additional pressure losses, e.g. heat meter with Qn 1.5 of approx. 0.05 bar and other internal/external fixtures must be included.

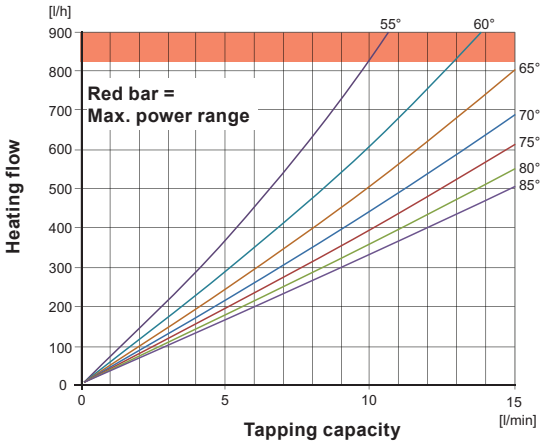
Cold water side (secondary)

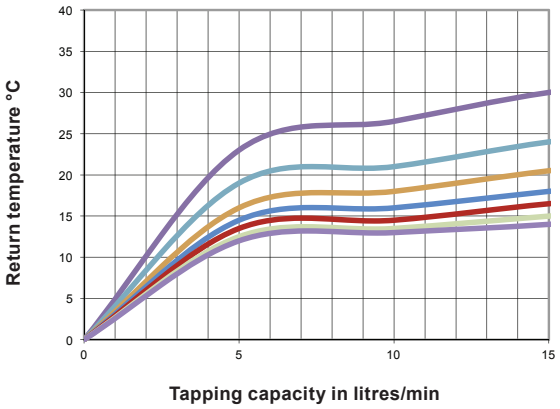


Pressure losses at drinking water flow regulators (add to diag.):
- 10 l/min = 0.65 - 0.85 bar
- 12 l/min = 0.68 - 0.88 bar
- 15 l/min = 0.70 - 0.90 bar
- 17 l/min = 0.75 - 0.95 bar

Performance curves and return temperatures

Cold water heating by 40 K (10 - 50°C)



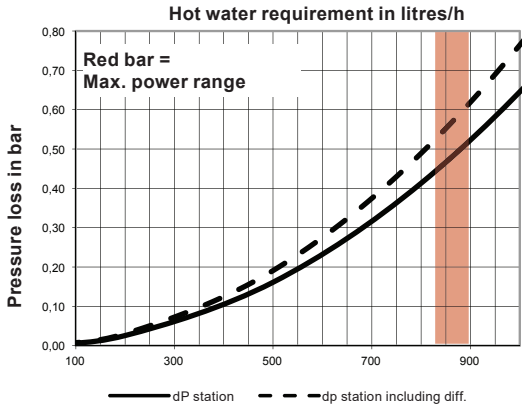


Under-table unit with 24 plates

Uponor Aqua Port Compact (GSB 228-24)

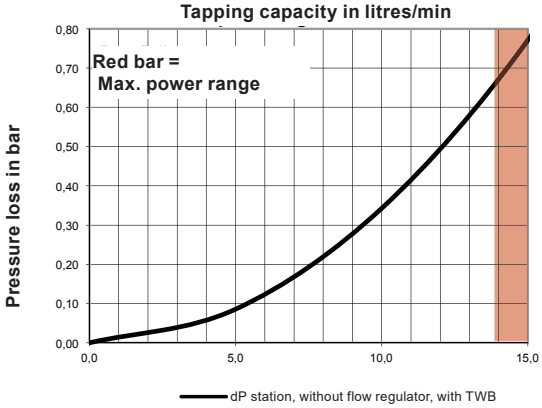
Pressure losses

Heating side (primary)



Pressure losses including KGH. Additional pressure losses, e.g. heat meter with Qn 1.5 of approx. 0.05 bar and other internal/external fixtures must be included.

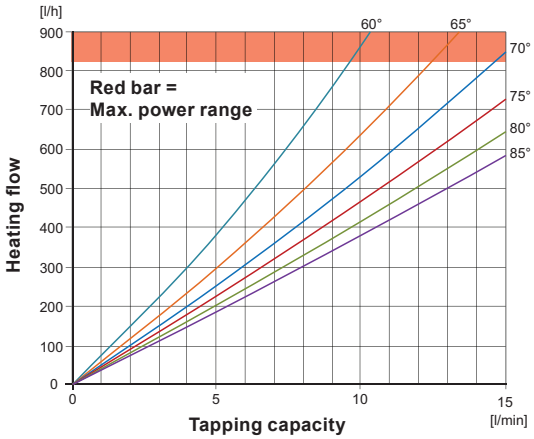
Cold water side (secondary)

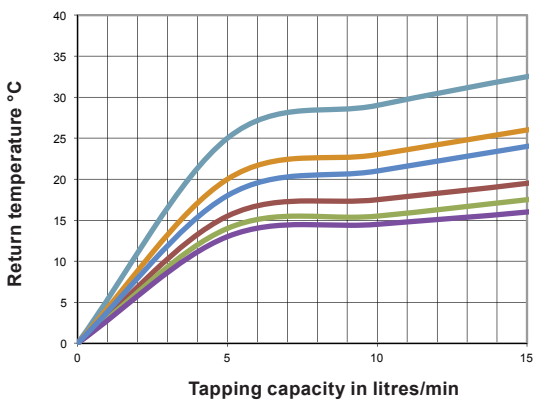


Pressure losses at drinking water flow regulators (add to diag.):
- 10 l/min = 0.65 - 0.85 bar
- 12 l/min = 0.68 - 0.88 bar
- 15 l/min = 0.70 - 0.90 bar
- 17 l/min = 0.75 - 0.95 bar

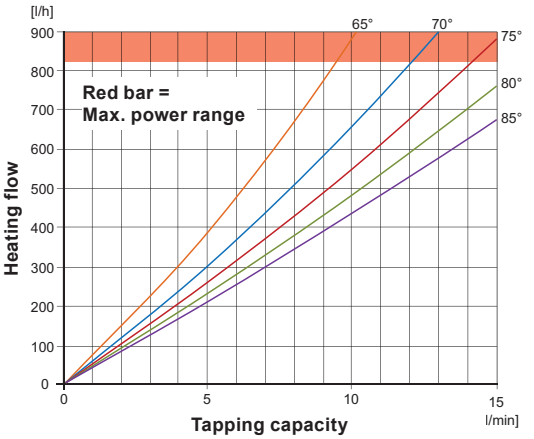
Performance curves and return temperatures

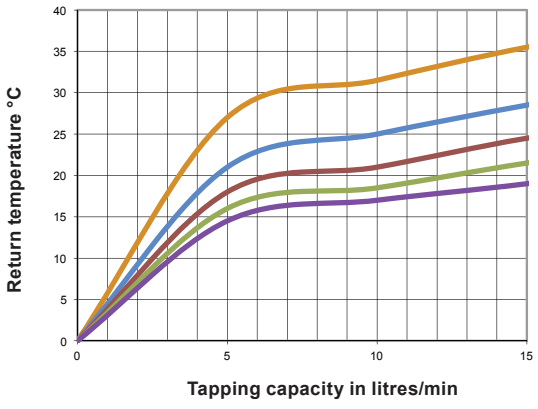
Cold water heating by 45 K (10 - 55°C)





Cold water heating by 50 K (10 - 60°C)



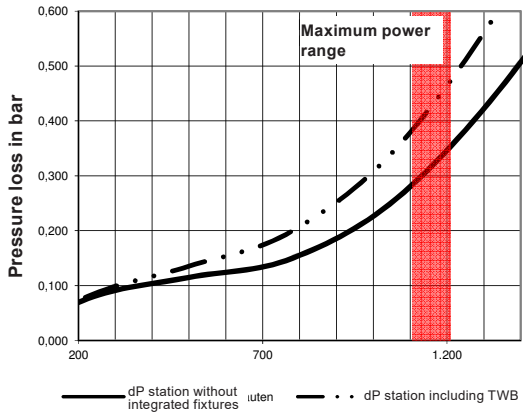


WS-M90

Exchanger GBS-220H-16

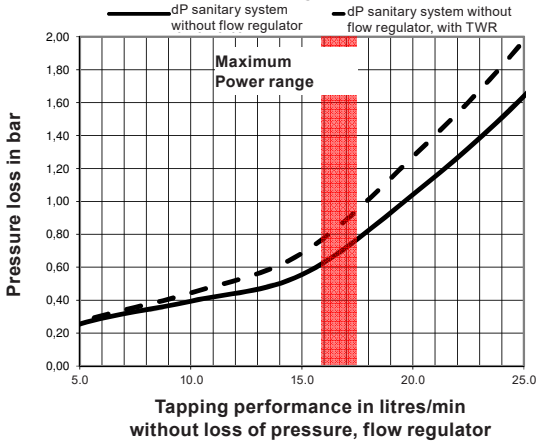
Pressure losses

Heating side (primary)



Installation of at least one heat meter:
Qn 1.5 - dP for additional integrated fixtures, such as heat meters, etc. not taken into account in the curve.

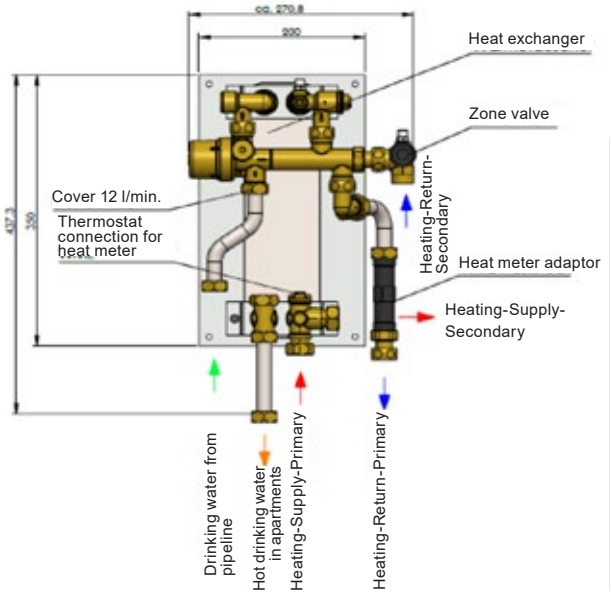
Cold water side (secondary)



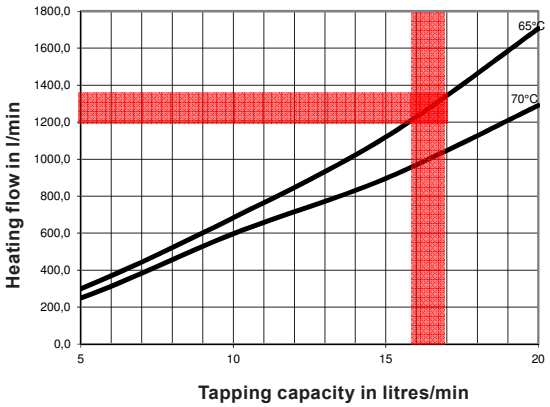
Pressure losses at drinking water flow regulators (add to diag.):
- 12 l/min = 0.68 - 0.88 bar
- 15 l/min = 0.70 - 0.90 bar
- 17 l/min = 0.75 - 0.95 bar

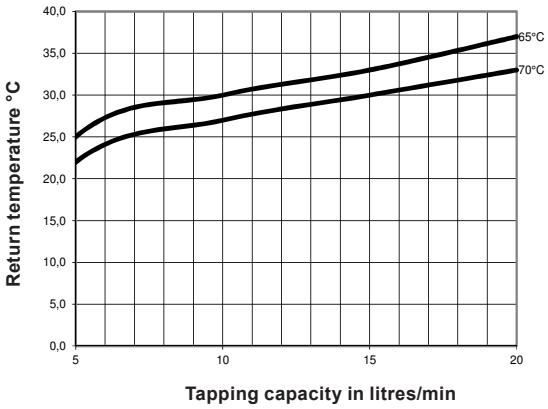
Performance curves and return temperatures

Technical data:
max. p - SA PN 10
max. p - HZ PN 10
max. T - HZ 90°C
max. dp - HZ 1 bar



Cold water heating by 40 K (10 - 50°C)





FAQ

Frequently asked questions about the use of heat interface units

Use of safety valves in units with flow systems?

According to DIN EN 806-2: "All closed drinking water heaters must be fitted with at least one diaphragm safety valve (carrying the TÜV mark) **(exception: flow heaters with a nominal volume > 3 l)**." Thus, normally no safety valves are required in the heat interface units. However, if the nominal volume is exceeded, exemptions are excluded. The provisions of this DIN EN 806-2 then apply. Corresponding safety valves can be ordered separately.

Change to the installation position of the stations?

The stations have been designed for vertical mounting to minimise or prevent problems with air and dirt in the station, and the mechanical and electromechanical components. These functions are no longer available when the installation position is changed. In addition, when mounted in a conventional way, the plate heat exchanger cools down quickly. Connectors on the plate heat exchanger have been designed with the warm side up and the cold side down. After the tapping process, this leads to extremely rapid mixing of the temperatures within the heat exchanger. (Difference in density). This reduces lime precipitation. If the drinking water station is mounted horizontally, any planned pumps in the mixing circuit or a service water circulation system would be installed in the wrong position, which could damage the pump.

Insulation for heat interface units?

The ITG (Institute for Technical Building Equipment) in Dresden offers the following statement on this subject: **"Requirements of the Energy Saving Ordinance in relation to the insulation of decentralised heat interface units"**.
Heating systems with heat interface units are subject to the requirements of the Energy Saving Ordinance - EnEV2014 [16], insofar as the buildings fall within the scope of the said ordinance. Article 14 EnEV is decisive with regard to thermal insulation, formulating requirements with regard to the thermal insulation of pipelines and fittings.

The following is an extract from EnEV 2014:

Requirements of EnEV 2014 (extract)

§ 14

Distribution equipment and hot water systems
(5) When installing and replacing heat distribution and hot water pipes as well as fittings in buildings for the first time, their heat output according to Annex 5 must be limited.

Annex 5 (relating to Article 10 (2), Article 14 (5) and Article 15 (4), requirements relating to the thermal insulation of pipelines and fittings

Table 1
Thermal insulation of heat distribution and hot water pipes, cooling and cold water pipes and fittings.

Line	Pipeline/fitting type	Minimum thickness of the insulation layer, based on a thermal conductivity of 0.035 W/(m·K)
1	Internal diameter up to 22 mm	20 mm
2	Internal diameter between 22 mm and 35 mm	30 mm
3	Internal diameter between 35 mm and 100 mm	equal internal diameter
4	Internal diameter over 100 mm	100 mm
5	Lines and fittings according to lines 1 to 4 in wall and ceiling openings, in the intersecting areas of pipelines, at pipeline junctions and in central pipeline network manifolds.	1/2 of the requirements of lines 1 to 4
6	Heat distribution pipes according to lines 1 to 4 laid after 31 January 2002 in components between heated rooms belonging to different users.	1/2 of the requirements of lines 1 to 4
7	Pipelines according to line 6 in floor construction	6 mm
8	Cooling and cold water pipes as well as fittings for air conditioning systems and refrigeration systems.	6 mm

Paragraph (2)

Table 1 does not apply in the cases described in Article 14 (5) insofar as heat distribution lines according to lines 1 to 4 are located in heated rooms or in components between heated rooms belonging to a user and their heat output may be influenced by exposed shut-off devices. In the cases described in Article 14 (5), the table does not apply to hot water pipes with a capacity of up to 3 litres that are neither included in the circulation circuit nor equipped with electrical heat tracing (stub lines) and that are located in heated rooms.

Insulation for heat interface units

According to EnEV, the heat radiated from of heat distribution and hot water pipes, as well as fittings in buildings, must be limited. On the other hand, the EnEV does not make any explicit demands in relation to the thermal insulation of pipelines and other components within a heat generator or heat transfer station. Although not a requirement of the EnEV, this includes any component that is physically located within the housing of the heat interface unit; while the components installed as part of the heat interface unit module are understood to be located in the station.

In order to avoid the unnecessary expenditure of energy and in the interests of drinking water hygiene, the lines inside the station should nevertheless be protected to a technically meaningful extent against external heat loss and heat transfer within the station.

Requirements in relation to the thermal insulation of primary pipelines and fittings are not affected by the special properties of heat interface units. Pipelines and fittings on the primary side are to be protected against heat loss according to Annex 5 EnEV (see, inter alia, Article 10 (2) and Article 14 (5) EnEV). Appendix 5, EnEV is also applicable to pipelines downstream of the heat interface unit on the secondary side. However, in accordance with Annex 5, paragraph 2 EnEV, the obligation to limit thermal protection pursuant to Annex 5 Table 1 for pipelines located in heated rooms or in components between heated rooms belonging to a user and [their] heat output may be influenced by exposed shut-off devices. This usually applies to the heating connection lines on the secondary side between the station and the heat transfer system, provided these are clearly laid within a single unit.

For certain, hard to insulate areas of pipe, including intersections and wall/ceiling openings, the insulation thickness may be reduced to half the respective requirement for continuous piping areas (Annex 5, Table 1, Line 5 EnEV).

Heat load at heat interface unit (trapped heat)

The heat interface unit was designed so that the waste heat load is minimised by prioritising drinking water hygiene. In order to avoid uncontrolled and hygienically critical temperatures over a prolonged period of time in the plate heat exchanger, the plate heat exchanger has not been insulated. As a consequence the exchanger cools down within seconds, so that drinking water hygiene is assured.

There is no build-up of trapped heat inside the mounted box, as ventilation slots are integrated in the in-wall-mounted housing. The waste heat load thus benefits the room and can be dissipated via the controlled living space ventilation system and used in heat recovery. An output of approx. 60 W should be assumed as the dissipated load for this purpose. This depends on the station type and the system conditions. For more precise information, you are also welcome to contact us.

Product-technical properties of the heat interface units are characterised by the fact that the heating and hot water pipes on the mounting base plate are thermally independent. In addition, water does not flow though the heat exchanger at times when hot water is not required on the primary side thus minimising radiated loss.

Equipotential bonding on heat interface units?

The heat interface units must be earthed according to VDE 0100 (see operating and installation instructions). VDE 0100 states: "The connections between all conducting bodies (housings) of electrical equipment must have a grounded protective conductor." There is a connection for the grounded protective conductor on the heat interface units.

Weather-based regulation required according to EnEV? (Central heating)

In the new EnEV 2014 Article 14 (1) requires that, when installed in a building, central heating systems must be fitted with central automatic devices for reducing and switching off the heat supply and for turning electrical drives on and off, depending on the **outdoor temperature**, or some **other appropriate reference variable** and **time**.
In these formulations the EnEV does not call for an outdoor temperature-based regulation as a fundamental requirement, but rather for the regulation of the supply of heat to the building. This supply of heat or regulation of output can be achieved by changing the flow temperature in the boiler or by adjusting the hot water flow rate at a constant boiler temperature.
In our system, the output of the central heating circuit pump is controlled by the Combi-Control system control, depending on the temperature difference between supply and return. The setpoint temperature difference between supply and return is specified as a fixed value for the regulator. There are now two possible states while the heating system is in operation:
The supply temperature is constant, the return temperature from the building becomes lower (for example due to a lower outdoor temperature or higher demand for heat). This increases the "delta T" between the constant supply and the colder return. The Combi-Control system regulator then increases the output (heat supply) from the pump until the setpoint temperature difference between supply and return is restored.
The supply temperature is constant, the return temperature rises (for example due to incident sunlight through the window). The temperature difference between supply and return is less than the setpoint, so the heating circuit pump reduces the power until the setpoint temperature difference between flow and return is restored.
As an option, the buffer volume and the line flow temperature can be individually adjusted, depending on the outdoor temperature, via the Combi-Control system regulator (e.g. -10 °C = Supply 65 °C and +10 °C = Supply 55 °C).
This simple control method of the heating circuit pump meets the requirements of the EnEV regarding the "automatic device ... for another appropriate reference variable". The return temperature from the network is the "other appropriate reference variable" as it is largely defined by the outdoor temperature. It is also the better controlled variable, as internal heat sources in the building (fireplaces, ovens, etc.) and external heat (incident sunlight) influence the return temperature.
The **"time"** component of the EnEV requirement is achieved by increasing the setpoint spread of the control by 5 K for example for a given period (for example between 10.00 pm and 5.00 am), resulting in a reduction in the output from the heating circuit pump, which has a similar impact on the network to a lowering of the temperature at night. Thus, 100% of the EnEV specifications are met by system control.

The following applies to the operation of heat interface units:

1. There are no regulations with regard to the EnEV for heat interface units that are used in heating networks with delta T controls. In the case of radiator heating systems, the subsequent regulation of the network temperature is not necessary and room thermostats could be used here for comfort. This is not mandatory under EnEV 2014 Article 14 (2), as existing thermostatic valves fall under the definition "automatic devices for temperature control in specific rooms".
2. Heating networks with delta T controls can safely use heat interface units with underfloor heating connection in which the system temperature is reduced via an internal mixing circuit, provided an STL (safety temperature limiter) function and pump logic (shutdown when the control valves are closed) are available. The thermostatic control is to be defined as an "automatic device for temperature control in specific rooms" in the sense of the EnEV 2014 Article 14(2). The EnEV does not require a weather-based variant in the residential units.

Sound and thermal insulation for the heat interface units?

All heat interface units mounted on the base plate have sound and thermal insulation. This avoids the transfer of heat to the base plate. The heat interface units are mechanical systems with no auxiliary power (electrical connections), so only the sound of the flow can affect the system.

In line with the DIN standard, this is calculated at 100 Pa/m and must be observed on site. These values may change when water is dispensed. One exception is the use of pump modules for radiant heating systems. A heating circuit pump is installed here for the constant-volume circuit.
Wilo Yonos Para high-efficiency pumps, which are equipped with ErP ready, are used as standard. This pump has an output of 22 watts and a noise level of 30 dB.

Thermostatic fittings for shower and bath?

Our heat interface unit is to be treated as a small system, comparable to a single-family home. Due to the small amounts of water in the pipelines, fluctuations or changes in pressure may occur in the event of rapid load changes (e.g. when a second tap is opened briefly then closed again). These cause the temperature to fluctuate by up to 4-5 K. In order to avoid this when showering, we recommend using thermostatic fittings.

Which heat meters (heat meter) are to be installed?

Through-flow class QN 1.5, installation length 110 mm, DN20 AG
In the hot water mode of the heat interface unit, volume flows of up to 1,100 l/h can occur on the primary side. To avoid high pressure losses via the heat meter, this QN should be 1.5 m³/h. A QN = 0.6 m³/h leads to disruptions in the domestic hot water supply.

Stations with greater bulk performance and DN25 connections require up to 1.8 m³/h. Hence a heat meter with QN = 2.5 m³ / h, overall length 130 mm and DN25 AG should be used. The sampling rate of the meter should not be > 4 seconds, as otherwise a large part of the energy flow will not be detected. Thus, heat meters with a high sampling rate and fast full measurements must be planned; we recommend using ultrasonic meters. 85 % of all hot water dispensing processes are short in nature < 15 seconds.

Sensor pocket

M10 x 1 sensor pockets are already installed in the heat interface units for a submersible supply thermostat. The return thermostat of the heat meter should already be integrated in the meter housing.

Is it possible to measure the consumption of a residential unit?

Energy consumption in a residential unit can be recorded with a heat meter for the amount of energy used in heating and domestic hot water preparation. A meter adapter (110 mm installation length and DN20 AG) is already installed in the base station. A M10 x 1 sensor pocket is also installed for a submersible supply thermostat. The amount of cold water can also be measured in the heat interface unit via optional meter lines.
Occasionally, planners and customers have asked whether the supplements impact on heat recording in heat interface units. In particular, the requirement of the Heating Costs Ordinance in Article 9 (1) that heat consumption for hot water and heating should be recorded with separate heat meters, caused some confusion here. We made some inquiries when assessing the Heating Costs Ordinance Article 9 (2). In the unanimous opinion of all the experts, the supplements to paragraph 2 have no impact on the recording of heat quantities in decentralised domestic hot water preparation.

With effect from 1 January 2009, paragraph 2 states: "Effective from 31 December 2013, the amount of heat allocated to the **central hot water supply system** must be measured using a heat meter". The definition for the **"central hot water supply system"** is also found in paragraph 1, so it is clear that this provision only applies to central hot water supply systems.
Heat interface units are decentralised through flow water heaters. Their definition and differentiation from central hot water supply systems derive from DVGW, worksheet 551, paragraph 4.2.1.

Service water circulation?

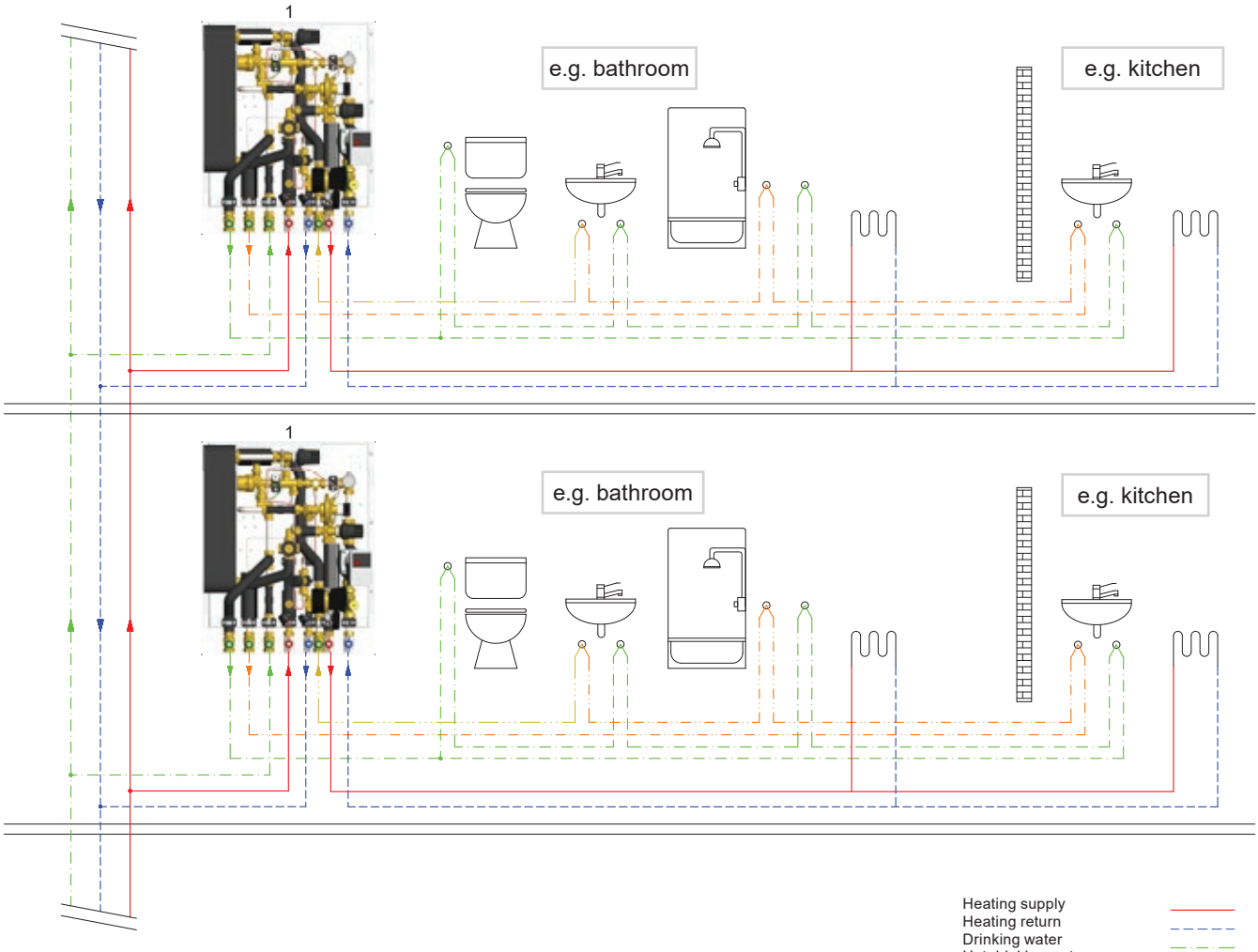
The recognised technical rules of Worksheet W551 must be complied with when planning circulation in a heat interface unit. Hence, the circulation temperature must be set to 60-55 °C.

Why is it necessary to plan circulation?

If the line lengths contain more than 3 litres of water or comfort level VDI 6003 cannot be satisfied. A kitchen sink is frequently the most distant tapping point. **For this application, we recommend a compact drinking water station.** In this case, the station can bring 6 litres of water per minute from 10 °C to 50 °C and with a primary supply heater to 55 °C.
For other applications, such as, for example, guest bathrooms, main bathrooms, nursing homes or hotels, 9 litres of water per minute can be brought from 10 °C to 45 °C with a primary supply temperature of 60 °C.
This means we can attain hygiene and economic efficiency for all systems with one drinking water station. The energy distribution losses can be reduced by 50% (without the use of a service water circulation system)!

Sample system with circulation

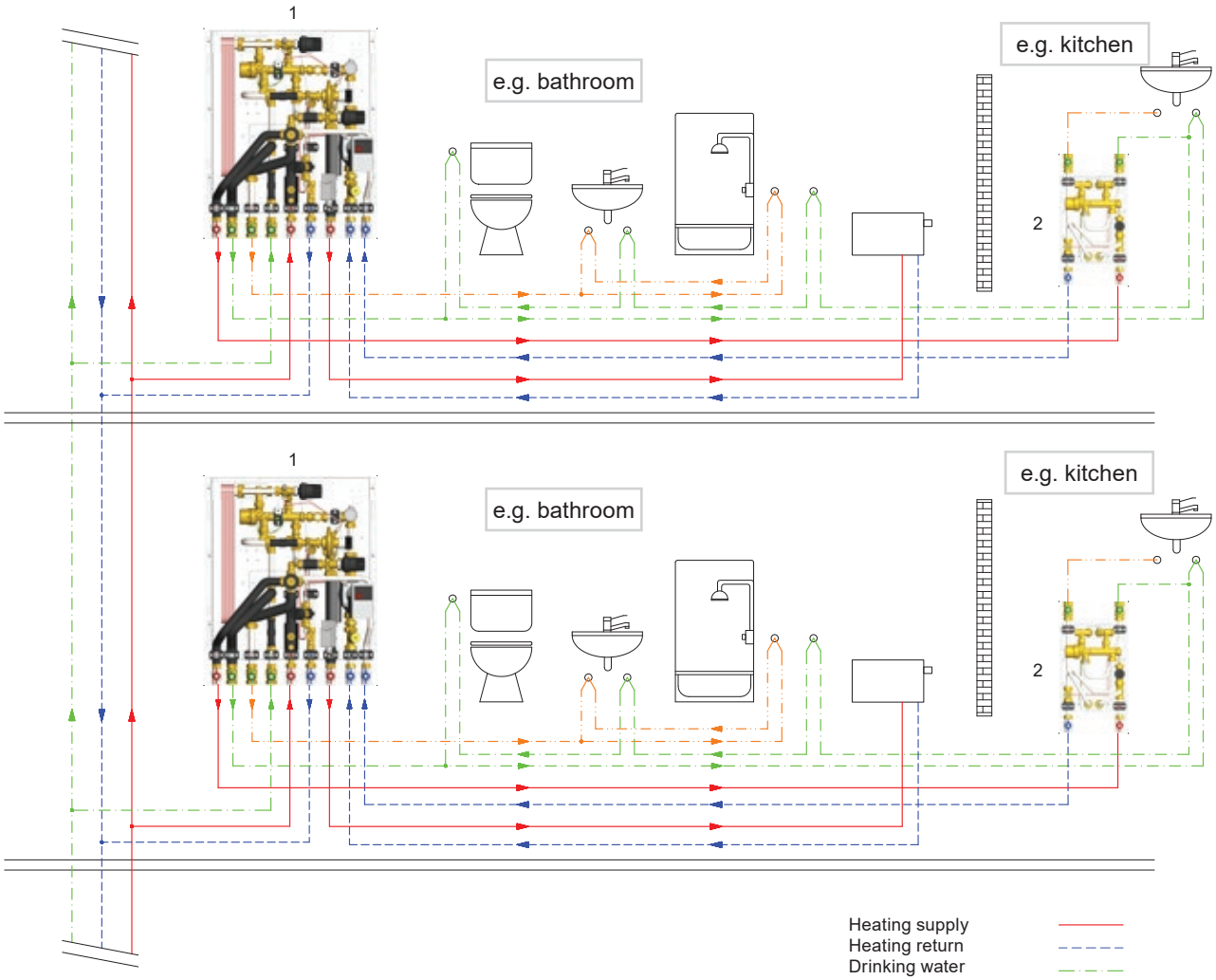
- Permanent circulation min. 55 °C
- Hot water content over 3 l
- Mandatory sampling
- Higher supply temperatures
- Risk of heat build-up in the fittings!



1. Uponor Combi Port B1000 sample set-up with service water circulation system

Sample system with under-table unit

- No hot drinking water circulation system
- Low hot water volume < 3 l
- No mandatory sampling
- Optimum drinking water hygiene
- Lower system temperatures
- Smaller main heat interface unit
- TTV in satellite station
- Comparable installation effort for pipework
- Cost neutral



1. Uponor Combi Port B1000 sample set-up
2. Under-table unit

High-efficiency pumps also used in service water circulation systems?

This issue is defined in Regulation (EC) No 641/2009 of 22 July 2009. From January 2013, the energy efficiency index limit (EEI) for glandless circulators installed outside the heat generator (external pumps) is set at 0.27. The previously stated energy efficiency classes no longer exist, pumps are then usually better than the minimum requirements of today's current class A. Hence, the energy efficiency classes are replaced with an EEI mark on the pump. As of August 2015, the EEI limit will be lowered again to 0.23 and will then apply to glandless circulation pumps installed in newly installed heating and air conditioning systems (integrated pumps), for example.

In a final implementation step, the requirements from 2020 also apply to the replacement of integrated pumps in existing heat generators. All glandless circulation pumps in heat generation and air conditioning systems are affected by the specifications. This does not apply to service water circulation pumps!

Flat-seal connections

Flat-seal connections are now an indispensable part of heating technology. Our group alone sells 30,000 to 40,000 systems per year with numerous flat-seal connections. Fast installation and ease of service are a great advantage with this type of connection. The most commonly used fittings on the market have flat seals and can be replaced at any time. Flat-seal connections are particularly good for district heating systems. Meters also have flat seals because of the flexible way they are mounted. In tests at TÜV Nord these connections have withstood a pressure of up to 25 bar without any problems. Expansion seal in pressure tests with air (10 bar); a drop in pressure may occur in this case.

Source: Haas; Data sheet 19.2 Page 1-6; OHA-Press DVGW, VP401, (HTB), KTW and BAM tested

HAAS

19.4

OHA-Press® DVGW, VP401 (HTG), KTW und BAM geprüft

HAAS

Lieferform

Montagehinweise

Hinweise zur Lagerung

DIN-DVGW-Baumusterprüfzertifikat

DIN-DVGW type examination certificate

NG-5123BN0398

Anwendungsbereich *field of application*	Produkte der Gasversorgung *products of gas supply*
Vertreiber *distributor*	Otto Haas KG Gießener Straße 5, D-90427 Nürnberg
Produktart *product category*	Schmier-/Dicht-/Betriebsmittel: Flachdichtungswerkstoff auf Basis synthetischer Fasern (5123)
Produktbezeichnung *product description*	Flachdichtungswerkstoff auf Basis synthetischer Fasern
Modell *model*	OHA-Press
Prüfberichte *test reports*	Baumusterprüfung: 02/094/5123/3 vom 22.05.2002 (EBI) Kontrollprüfung Labor: 07/136/5123/06 vom 05.09.2007 (EBI)
Prüfgrundlagen *basis of type examination*	DIN 3535-6 (01.12.1999)
Ablaufdatum / AZ *date of expiry / file no.*	22.05.2012 / 67-6555-GNV

DAT-ZE-009/96-02

TZW Karlsruhe
Prüfstelle Wasser

TZW

PRÜFZEUGNIS (V)

über die Untersuchung von Gummiproben "OHA-PRESS" gemäß KTW-Empfehlungen 1.3.13 des Bundesgesundheitsamtes

Hersteller	Otto Haas, Nürnberg,
Art der Proben	Flachdichtungsqualität
Bezeichnung der Proben	"OHA-PRESS"
Art der Prüfkörper	Probeplatten
Eingang der Proben	26.08.2002 und 13.09.2002
Probennummer	Auftraggeber
TZW-Az.	KA 326/08

Untersuchungsergebnisse

1. Rezeptur: wurde vorgelegt, überprüft und bestätigt
2. Migrationstest: O´V-Verhaltnis 1:50 cm²/cm³

Kaltwasser 23°C	1. – 3. Tag	4. – 6. Tag	7. – 9. Tag	Richtwert für 3. Extraktion
Klarheit, Färbung, Geruch, Geschmack, Schaumbildung	GS 4 Cumin	nnb	nnb	nicht nennenswert beeinflusst
C-Abgabe [mg C/m²/d]	15	10	10	≤ 125
O_2 -Zehrung [mg O_2/m²/d]	65	50	40	≤ 150
Aromatische Amine [mg/m²/d]	0,033	0,010	0,013	≤ 0,25
Phenole [mg/m²/d]	0,10	0,09	0,01	

Heißwasser 60°C	1. Extr.	6. Extr.	7. Extr.	Richtwert für 7. Extr.
Klarheit, Färbung, Geruch, Geschmack, Schaumbildung	GS 5 faulig	GS 3 faulig	GS 2 faulig	≤ 4
C-Abgabe [mg C/m²/d]	90	80	70	≤ 125
Aromatische Amine [mg/m²/d]	0,36	0,22	0,21	≤ 0,25
Phenole [mg/m²/d]	0,60	0,80	0,57	

Die untersuchten Proben "OHA-PRESS" entsprechen den Anforderungen der KTW-Empfehlungen des Bundesgesundheitsamtes (Bgesundhtn. Jg. 86, S. 1486.) im Bereich Dichtungen D2

Anmerkung:
Dieses Prüfzeugnis basiert sich auf die Erstprüfung (TZW-Az.: KA 328A/02.) vom 16.01.2003 und wurde im Kaltund Heißwasserbereich (95°C) verlängert. Dieses Zeugnis basiert auf einer Umschreibung.
Die Gültigkeit dieses Prüfzeugnisses richtet sich nach andernorts festgelegten Bestimmungen. Sie endet jedoch spätestens am 15.09.2013.

Karlsruhe, den 03.12.2008

Dr.-Ing. Krüger
Leiter der Prüfstelle

Die Veröffentlichung des Prüfzeugnisses – vollständig oder in Auszügen – ist ohne ausdrückliche Genehmigung von seiten der Prüfstelle nicht gestattet.

Das Technologiezentrum Wasser ist eine Einrichtung des DVGW | Deutsche Vereinigung des Gas- und Wasserfaches e.V.

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B-2/2 NG-5123BN0398

Typ *type*	Technische Daten *technical data*	Bemerkungen *remarks*
OHA-Press	Normbezeichnung: DIN 3535-FA	

How long will a proportional volume control valve last?

The proportional volume control valve is a fitting used in heating and drinking water systems.

Due to these operating conditions, its service life is largely dependent on the quality of the heating and drinking water system. The fitting is DVGW-certified. Here at least 180,000 load cycles are required and must be provided without any functional restrictions.

Losses via the thermostatic lead module (TTV)

The TTV is a thermostatic fitting. Opening and closing and their frequency are thus influenced by the ambient temperature. The fitting is connected to a 6 mm copper capillary tube The valve always closes during operation and only opens for a few seconds when the temperature of the pipeline is sufficient. The rate of flow through this TTV is approx. 5-7 l/h.

Tests have measured the following quantities when the valve is fully open.

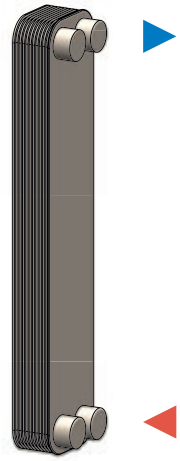
TTV version with size 6 copper line

dp [bar]	Throughput [l/min]
0.5	0.1
0.7	0.2
0.8	0.3
1	0.35
1.2	0.4
1.3	0.45
1.4	0.5
1.6	0.6

Calcification of heat exchangers

Heat exchangers tend to calcify quickly when exposed to constantly high temperatures. (See the lime precipitation curve). The system of our heat interface units is rarely affected by this for the following reasons:

- Connection to the heat exchanger, hot at the bottom and cold at the top.
- After termination of the tapping process and thus the energy supply, this causes rapid mixing of the heat exchanger in the mean temperature. Physics plays a part here as cold water drops to the bottom. The use of the proportional volume control valve ensures very fast control.
- System temperatures are kept as low as possible, < 65 °C, so as to avoid the range where lime precipitation from the water is strongest and fastest.
- A thermosiphon is always installed in supply line to the heat exchanger.

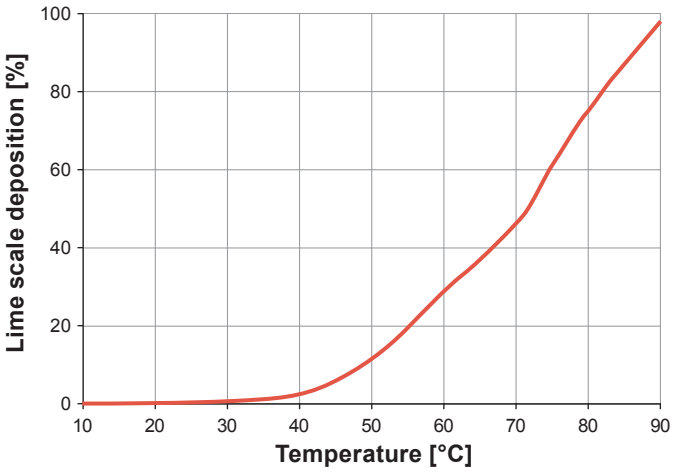


Lime precipitation in the water, depending on the temperature

Lime precipitation

Temperature [°C]	10	20	30	40	50	60	70	80	90
Limescale deposition [%]	0	0.59	1.18	2.94	11.76	29.41	47.06	76.47	100

Lime scale deposition as water heats up



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1094902 02_2019
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