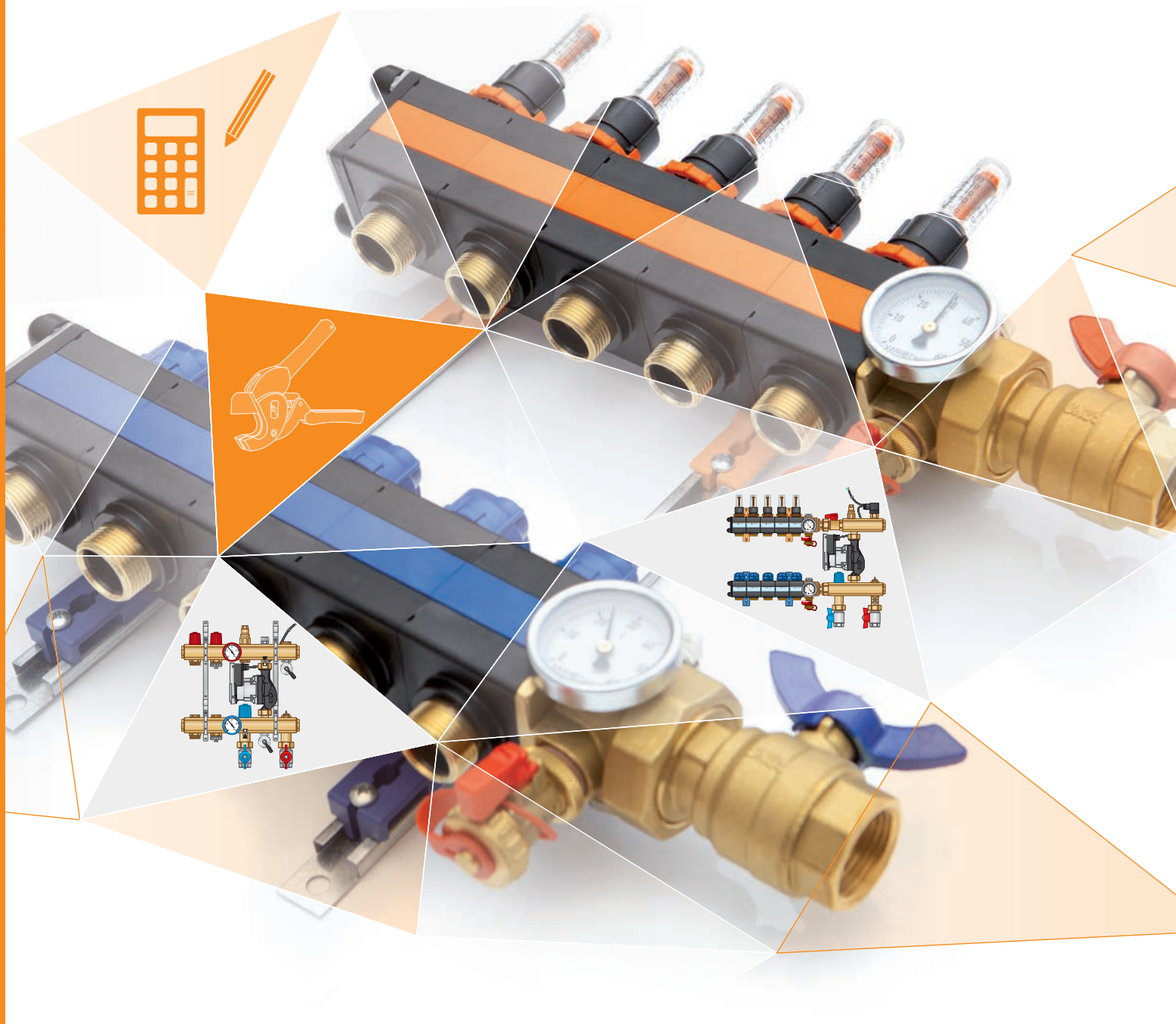
DaC

PLANNING. INSTALLATION.

DISTRIBUTION AND CONTROL



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VARIOTHERM

VMONT9 | e92917

TABLE OF CONTENTS

PDF

1 GENERAL

1.1 Safety information

- The electrical and hydraulic connection and service work on the device may only be provided by authorised specialist personnel.
- The devices are designed for use in dry, closed rooms.
- The electrical installation standards and regulations specified by the local energy supply companies should be observed, together with the locally applicable regulations and standards for heating installations.
- Faults in the connection can cause damage to the device! We bear no liability for damage caused by incorrect connection and/or inappropriate handling of the device.

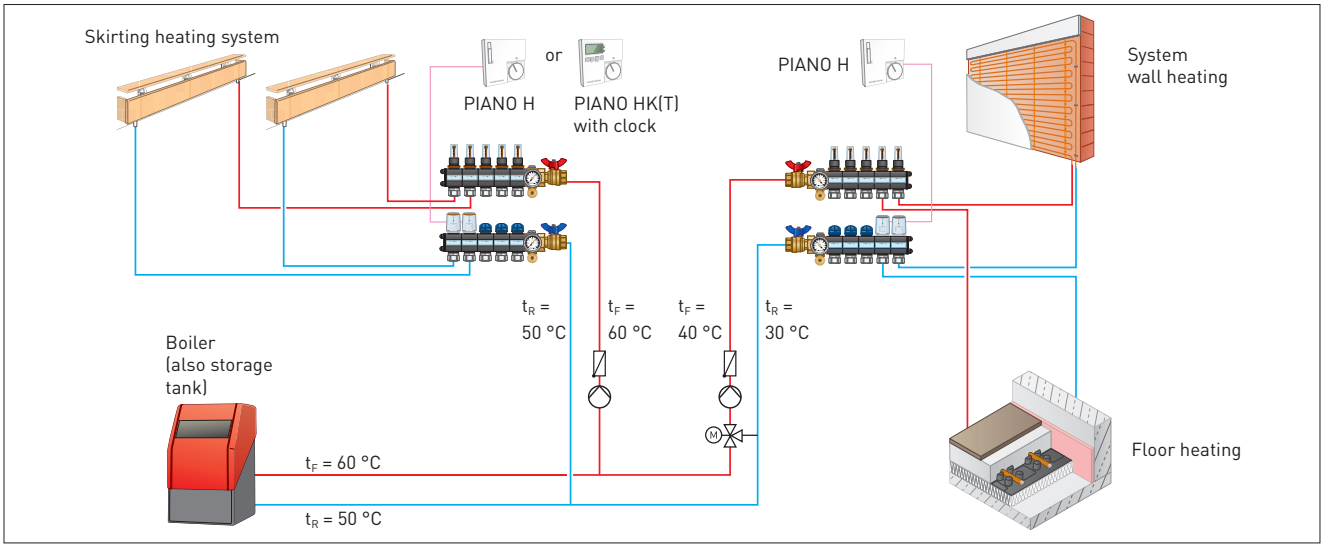
1.2 Guarantee conditions

If the system components are installed or commissioned incorrectly, all claims on the basis of the manufacturer's warranty and guarantee become void.

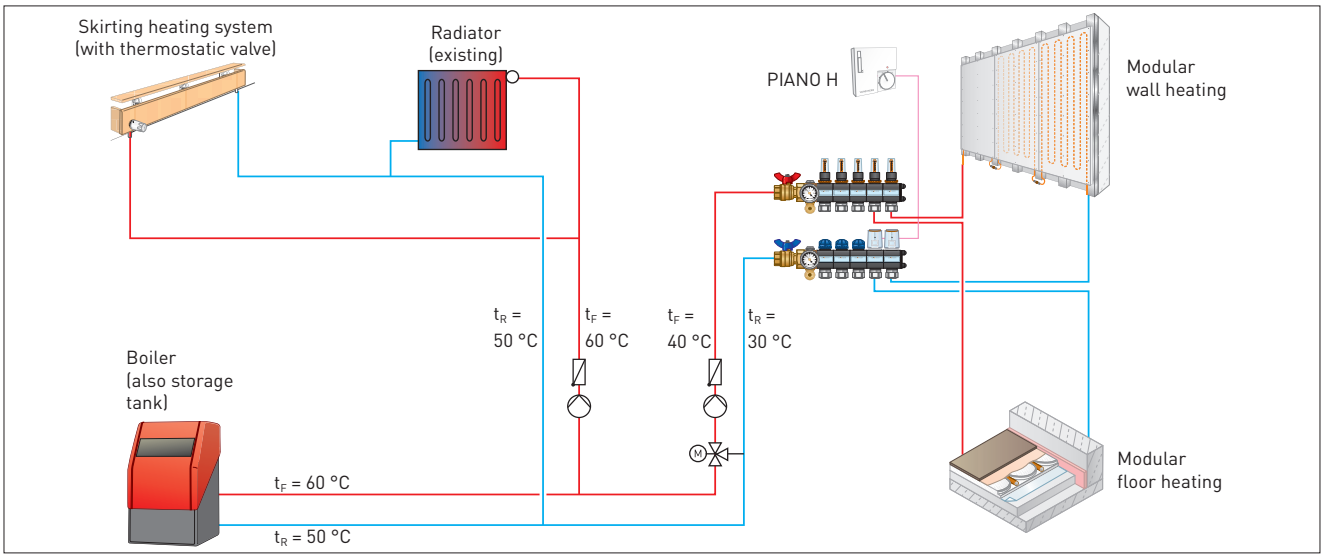
1.3 Standards

The validity of the standards specified in these installation instructions was last verified on 11 July 2017!
If necessary, amendments to standards must be checked!

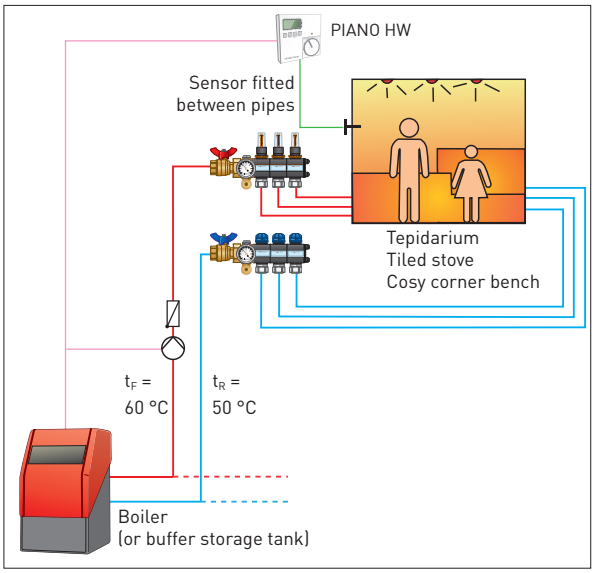
1.4 A few system diagrams (not intended to be exhaustive)



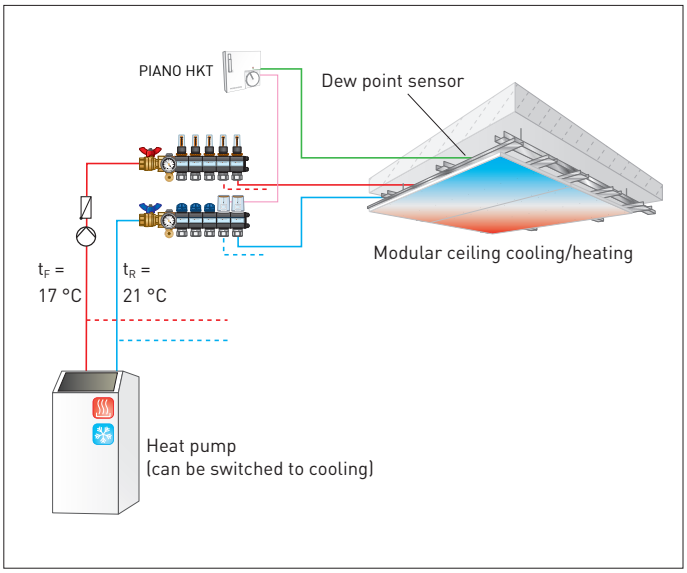
▲ System with manifold



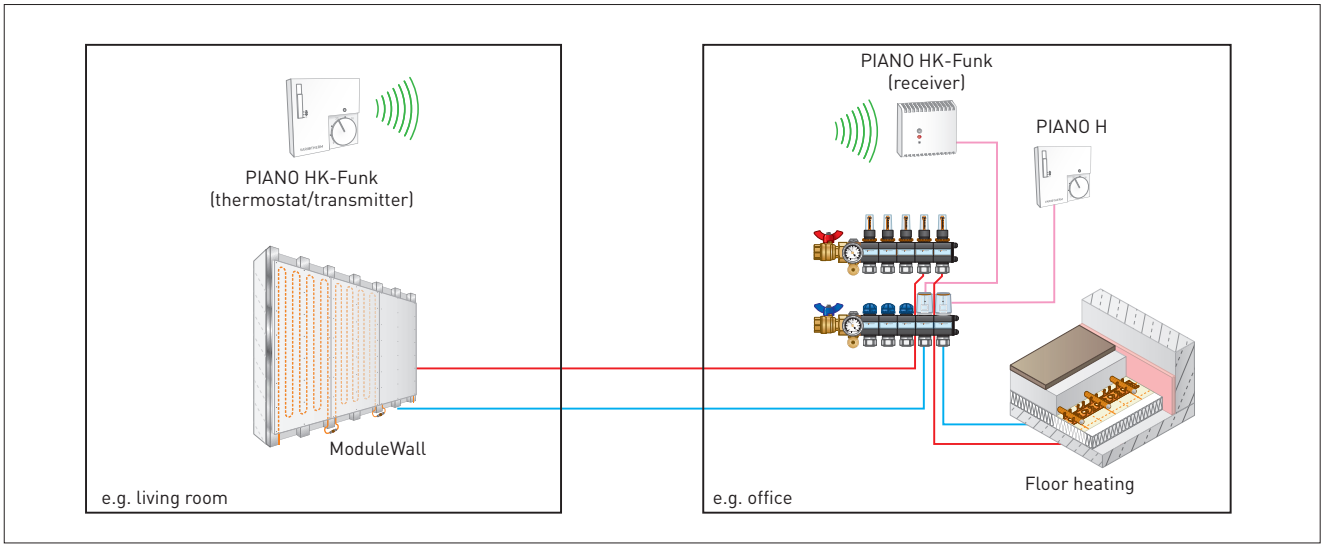
▲ System with manifold and existing 2-pipe system



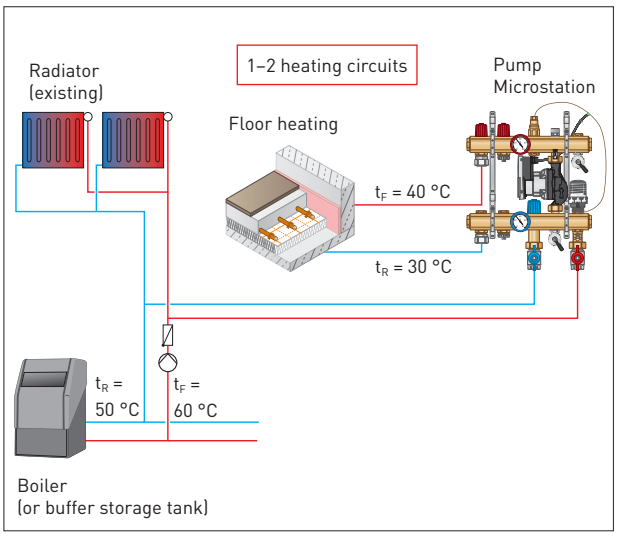
▲ Tepidarium, tiled stove or cosy corner bench system



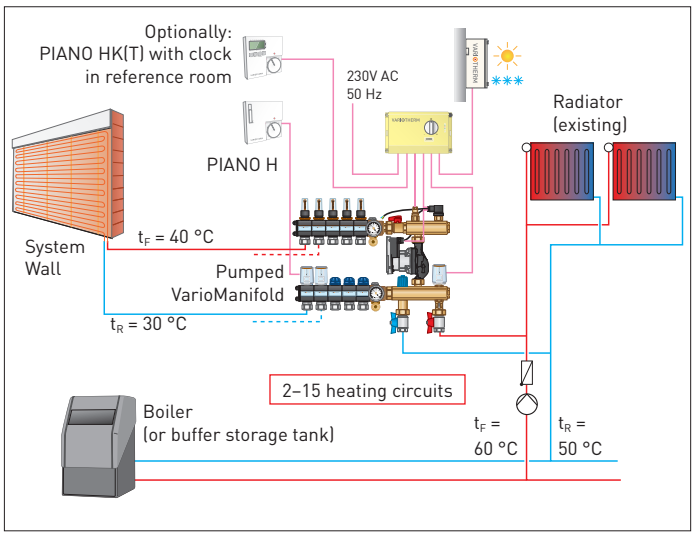
▲ Surface heating and cooling system



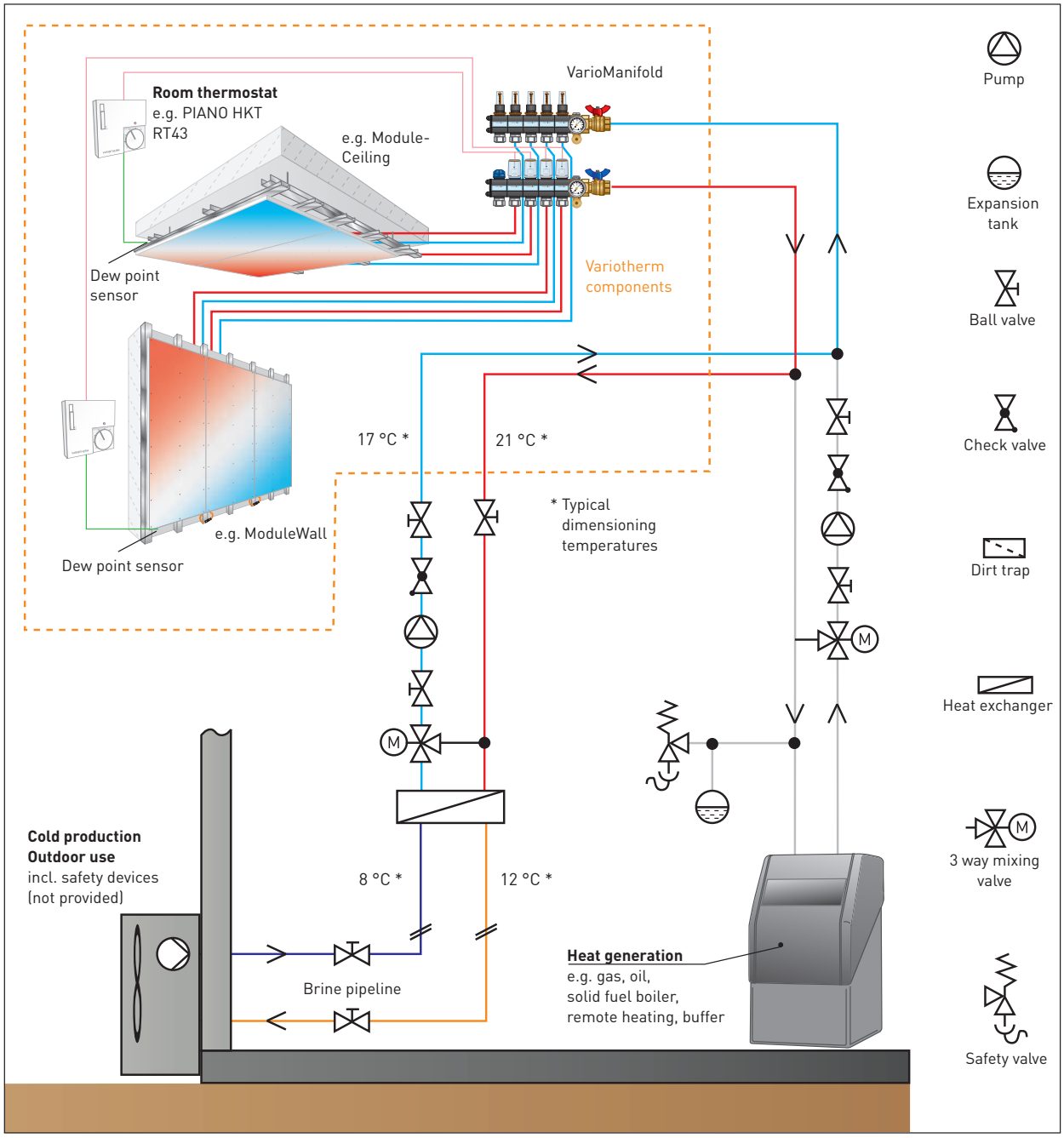
▲ Radio solution in the absence of ductwork between the room thermostat and thermoelectric actuator

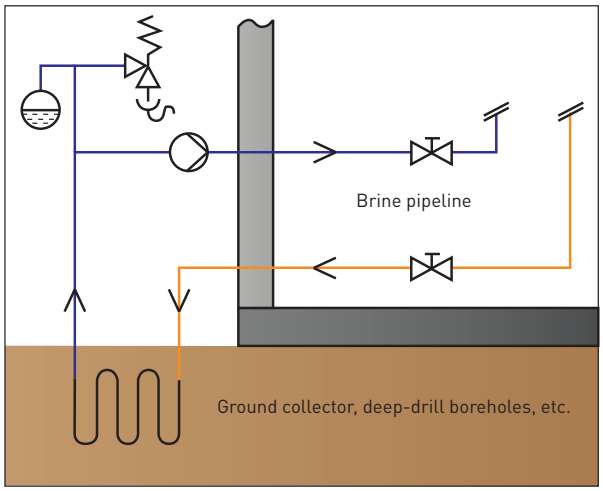


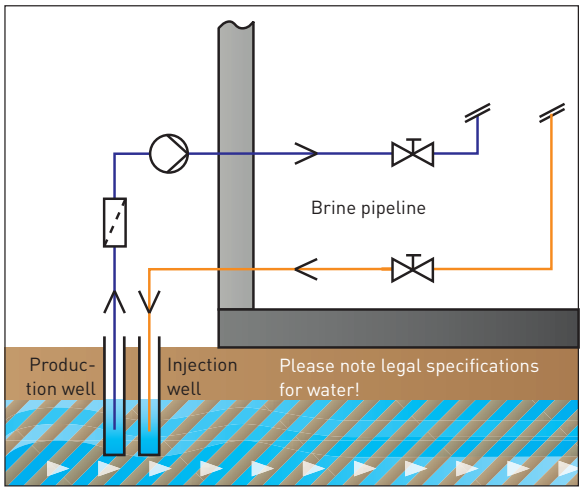
▲ Pump Microstation and fixed-value regulator



▲ Pumped VarioManifold (weather-guided)





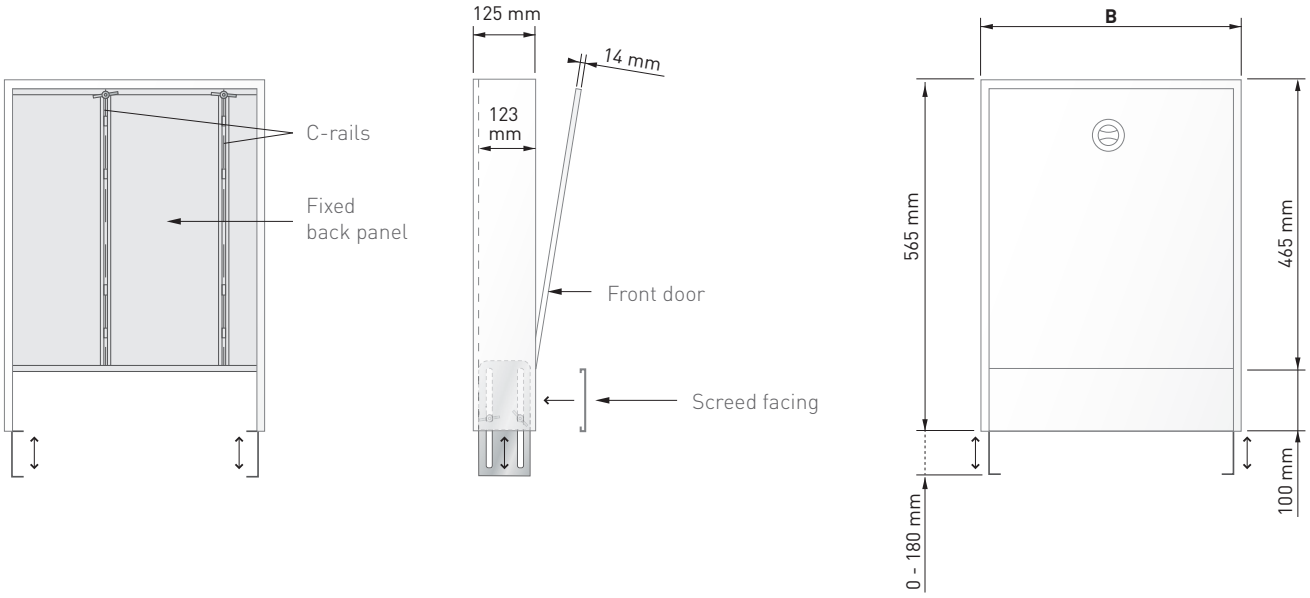


▲ Examples for cold water production (not provided and not intended to be exhaustive):

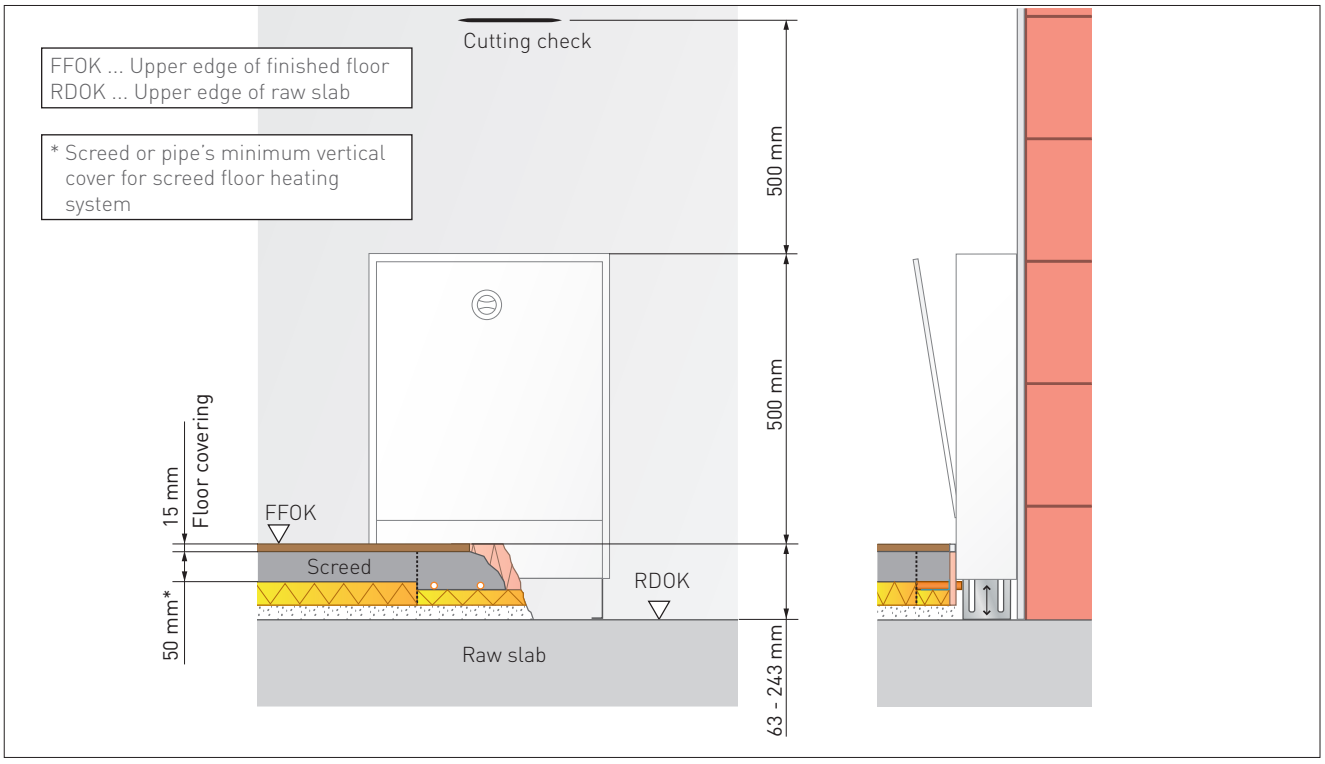
2 MANIFOLD CABINETS

2.1 Manifold cabinet on-wall

The manifold cabinet is placed on the wall and screwed tight. For the bracket installation, see section 2.5.

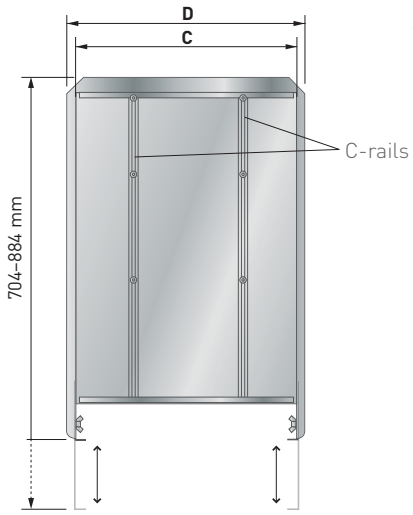


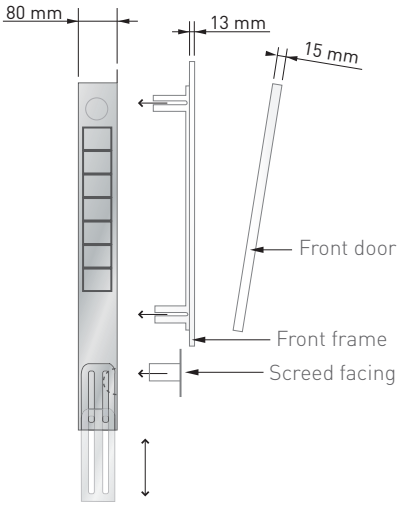
Manifold cabinet types	VSA1	VSA2	VSA3	VSA4
Dimension B (mm)	**452**	**652**	**952**	**1252**
VarioManifold circuits	2–3	1, 4–7	8–13	14–17
Pumped VarioManifold circuits	–	2–6	7–12	13–15
Pump Microstation circuits	1–2	–	–	–

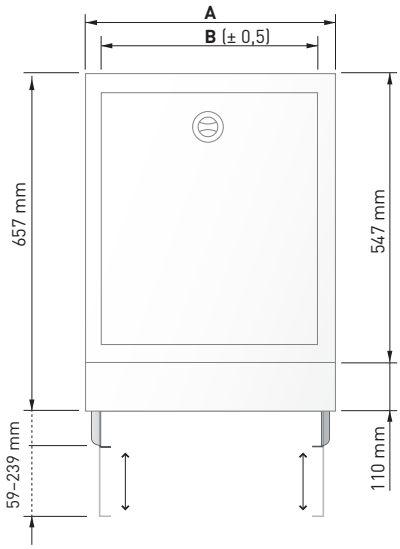


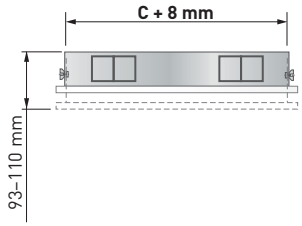
▲ Example for on-wall installation

2.2 Manifold cabinet UF in-wall









Manifold cabinet types	VSU1	VSU2	VSU3	VSU4
Dimension A (mm)	**459**	**598**	**898**	**1198**
Dimension B (mm)	**387**	**526**	**826**	**1126**
Dimension C (mm)	**395**	**534**	**834**	**1134**
Dimension D (mm)	**435**	**574**	**874**	**1174**
VarioManifold circuits	1–4	5–7	8–13	14–17
Pumped VarioManifold circuits	–	2–4	5–10	11–15
Pump Microstation circuits	1–2	–	–	–

Montage

1. Remove the front frame and the base cover from the cabinet.
2. Place the cabinet in the recess in the wall, straighten it using the adjustable feet and fix it to the unfinished floor.
3. Mount the bracket set to the rear side of the manifold.
4. Snap the VarioManifold into the C-rails and affix with the screws.
5. Connect the connection pipes. To do so, pre-cut opening plates on the right and left can be broken open.
6. Fix the wall cabinet in the wall with quick setting cement. Screw it to the supporting structure in the drywall.
7. Lay out the heating/cooling distribution circuits. Feed the flow and return to the heating surfaces.

In-wall mounted front frame:

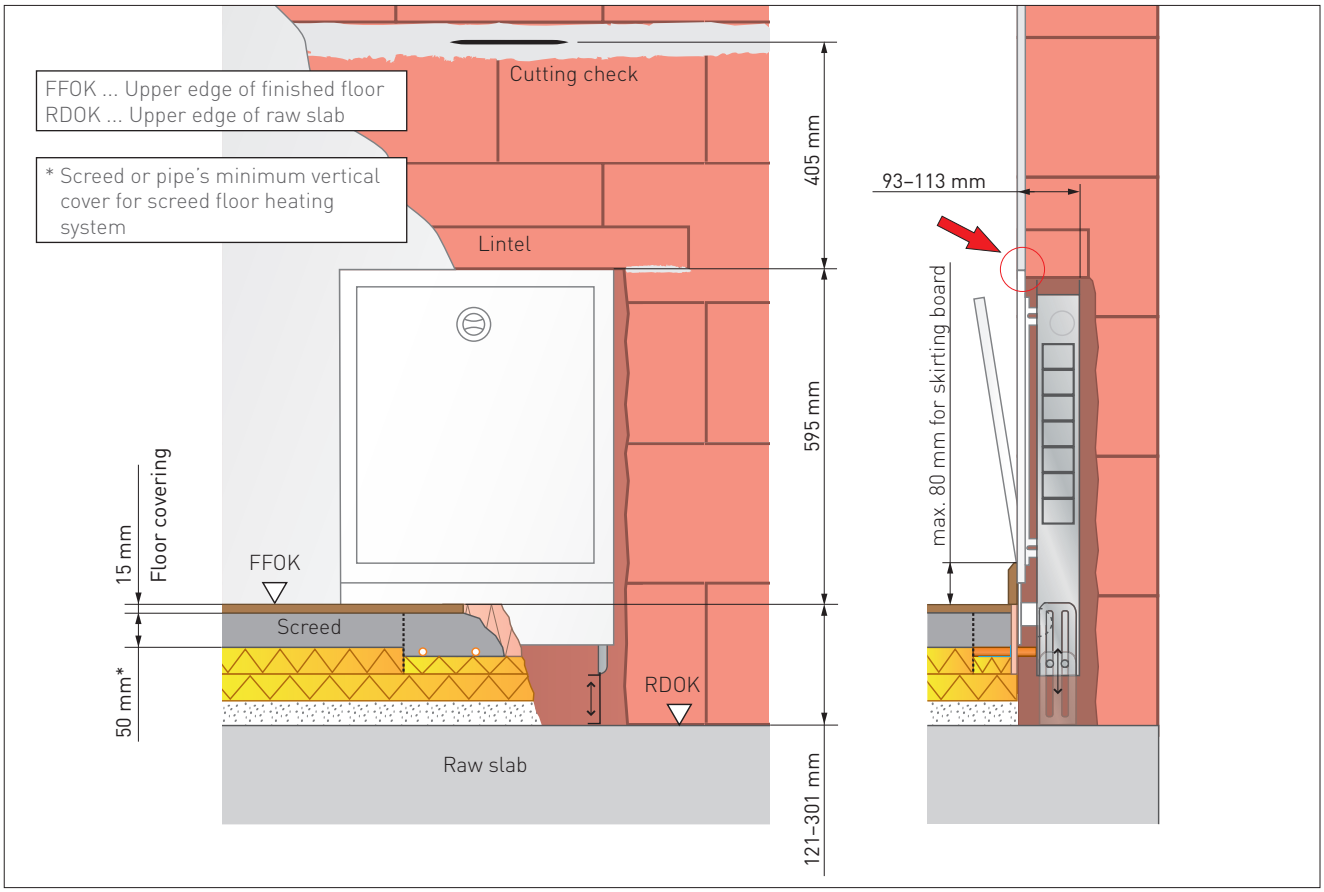
8a. Attach the screed facing (this will not be plastered over later) – this covers the area between the front frame and the finished floor level. Cover all visible parts well (e.g. with painter's tape) – protect the opening from dirt with card or plastic film.

9a. After completing the wall, remove the protective coverings or adhesive tapes and attach the doors.

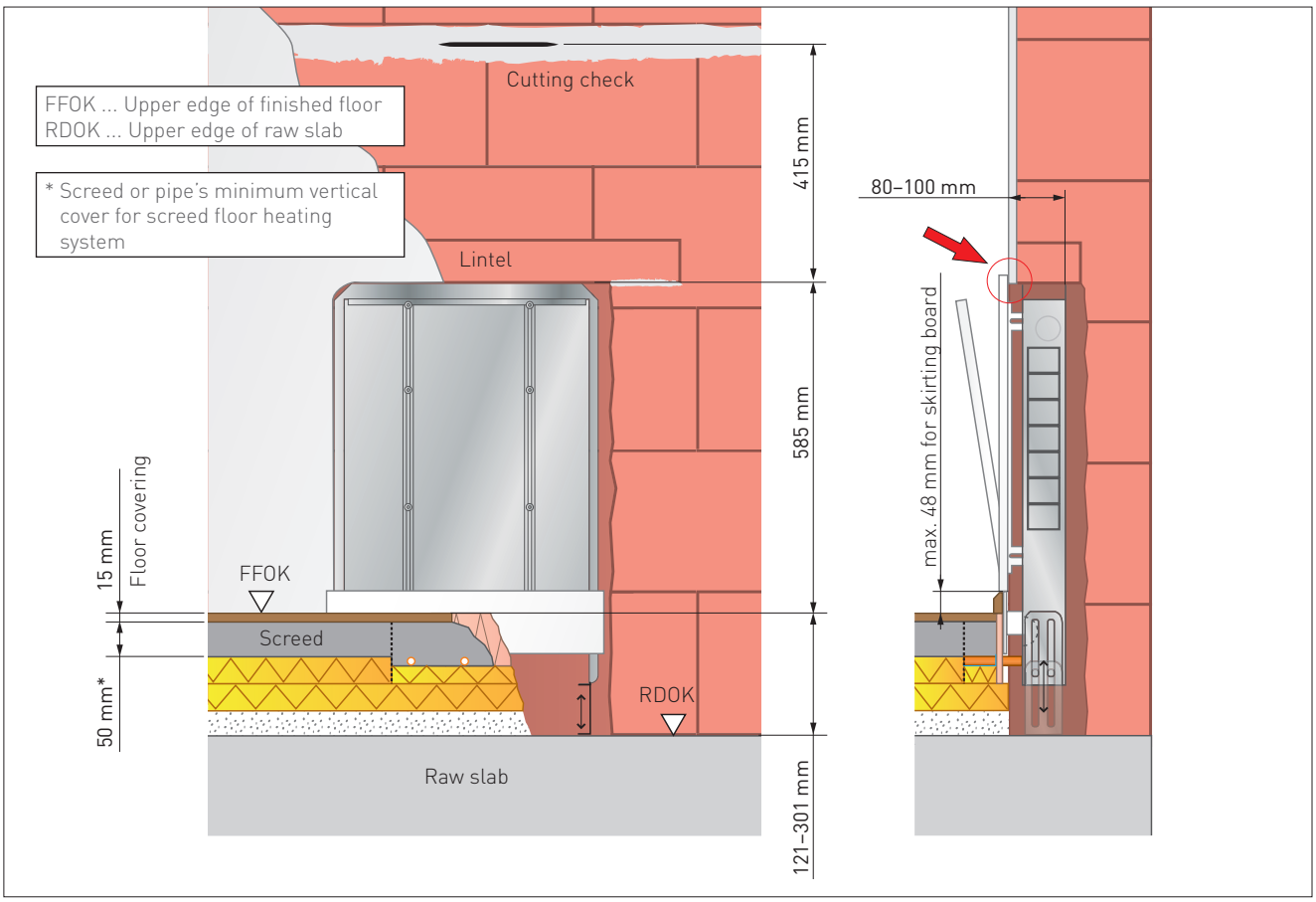
Frontrahmen in Aufputzmontage:

8b. Attach the screed facing (this will not be plastered over later) - this covers the area between the front frame and the finished floor level. Align the front box edge to the finished plaster edge or finished wall edge. Cover all visible parts well (e.g. with painter's tape) - protect the opening from dirt with card or plastic film.

9b. After completing the wall, remove the protective coverings or adhesive tapes and attach the front frames and doors.



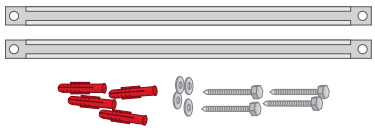
▲ Example for in-wall mounted front frame



▲ Example for wall-mounted front frame

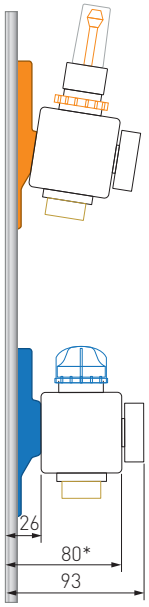
2.3 Wall mounting without manifold cabinet

The fixing bars are mounted to the wall at a suitable distance depending on the manifold size using the screws provided. The VarioManifold, Pumped VarioManifold or Pump Microstation can then be attached to them.



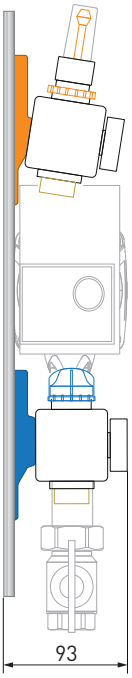
2.4 Installation depths of the manifolds

VarioManifold 5.0

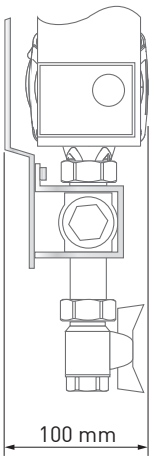


* without thermometer

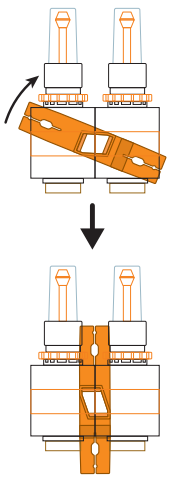
Pumped VarioManifold 5.0

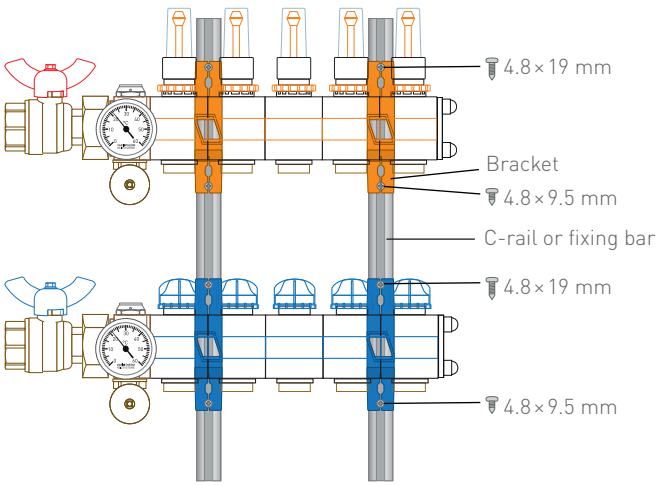


Pump Microstation

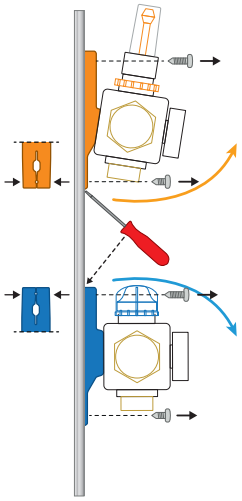


2.5 Installation on C-rails/fixing bars





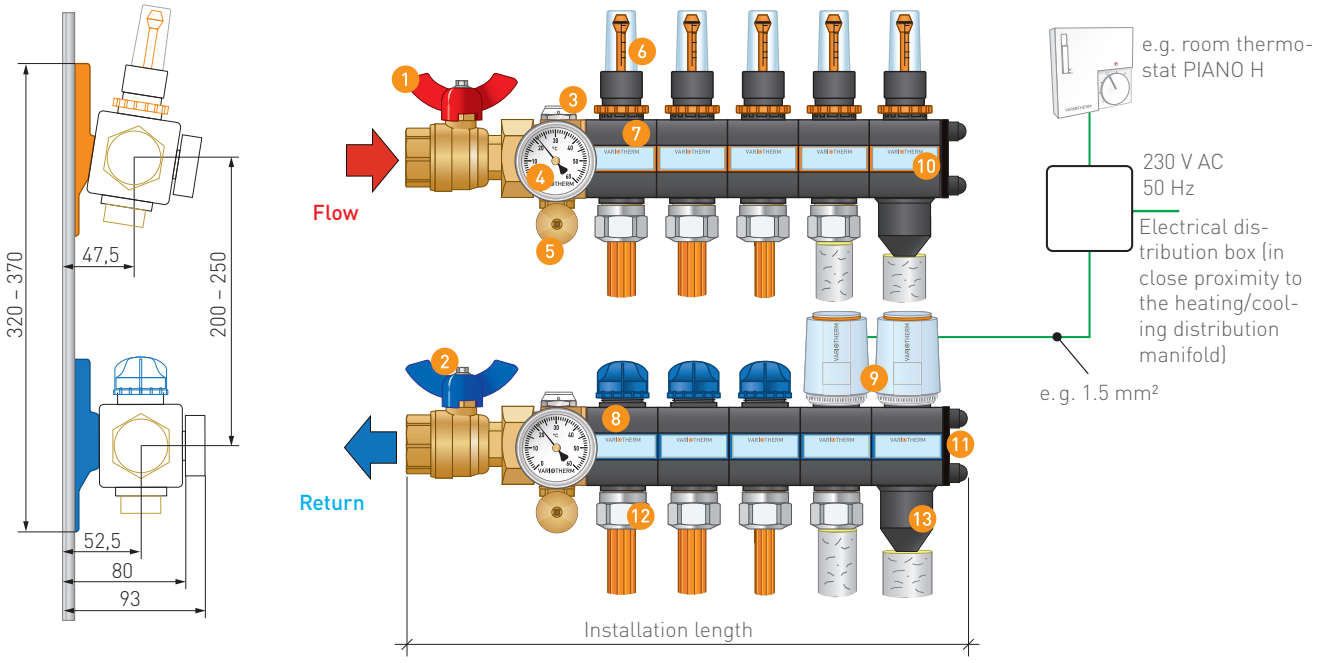
Demounting:



3 VARIOMANIFOLD 5.0

3.1 Description

The VarioManifold 5.0 is made of plastic modules which are fitted together according to the number of heating/cooling circuits required.



Manifold circuits	Installation length	Fitting manifold	Remaining space VSU/VSA
1 circuit*	345 mm	VSU1/VSA2	50/305 mm
2 circuits	245 mm	VSU1/VSA1	150/205 mm
3 circuits	295 mm	VSU1/VSA1	100/155 mm
4 circuits	345 mm	VSU1/VSA2	50/305 mm
5 circuits	395 mm	VSU2/VSA2	139/255 mm
6 circuits	445 mm	VSU2/VSA2	89/205 mm
7 circuits	495 mm	VSU2/VSA2	39/155 mm
8 circuits	545 mm	VSU3/VSA3	289/405 mm
9 circuits	595 mm	VSU3/VSA3	239/355 mm
10 circuits	645 mm	VSU3/VSA3	189/305 mm
11 circuits	695 mm	VSU3/VSA3	139/255 mm
12 circuits	745 mm	VSU3/VSA3	89/205 mm
13 circuits	795 mm	VSU3/VSA3	39/155 mm
14 circuits	845 mm	VSU4/VSA4	289/405 mm
15 circuits	895 mm	VSU4/VSA4	239/355 mm
16 circuits	945 mm	VSU4/VSA4	189/305 mm
17 circuits	995 mm	VSU4/VSA4	139/255 mm

* 1-block variant

1. Flow locking ball valve (1" female thread)
2. Return locking ball valve (1" female thread)
3. Manual air vent
4. Thermometer
5. Fill & drain cock 1/2", twistable
6. Flow indicator, viewing glass can be unscrewed under pressure
7. Flow segment with flow indicator which can be pre-set (10–160 l/h)
8. Return segment with shut-off valve
9. Thermoelectric actuator (for individual room regulation)
10. Identification labels
11. End panel (insulated)
12. Variotherm clamping screw fitting 3/4" Eurocone (For Varioterm pipes ø11.6, ø16 and ø20 mm)
13. Insulating grommet (optional for cooling)

Technical data

Max. test pressure: 10 bar (only with water)

Max. operating overload pressure: 6 bar

Operating temperatures:
–20 to +90 °C (anti-freeze filling)

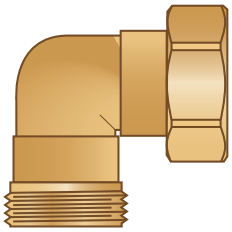
Installation depth of manifold:
93 mm or 80 mm with removed thermometers

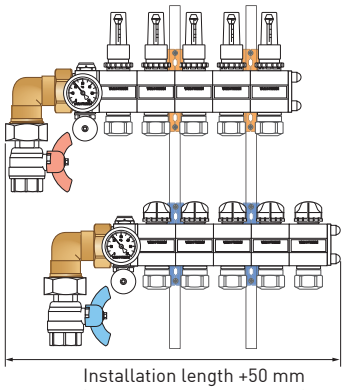
Advantages

- Plastic manifold with internal air chambers for heat insulation
- Flexible to convert to thermostat operation
- Pre-set flow indicator in the flow (10–160 l/h) according to ÖN/DIN EN 1264/4, viewing glass can be cleaned
- Optimised for **low temperature** surface heating/cooling
- Detachable locking ball valves on the flow and return pipes
- Ventilation and flushing option via the twistable fill & drain cock
- Modular structure
- Completely oxygen-tight
- Identification labels
- All parts self-sealing, manifolds pressure-tested
- Adjustable spacing between the flow and return pipes

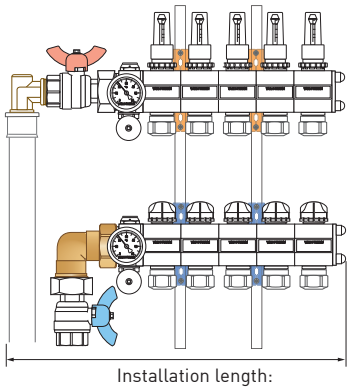
3.2 Elbow fitting 6/4" 90°

To fit the vertical supply lines to the VarioManifold. Remaining space in the manifold box can be used for additional installation length, see table Section 3.1.



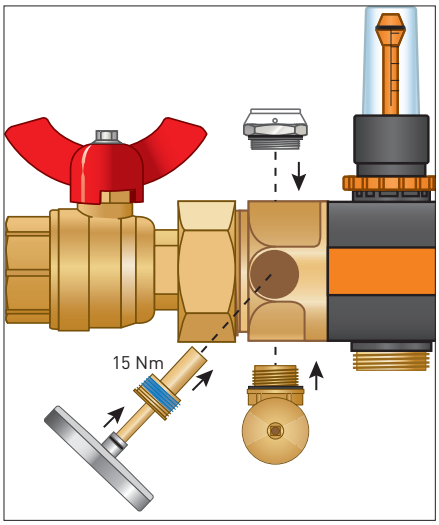


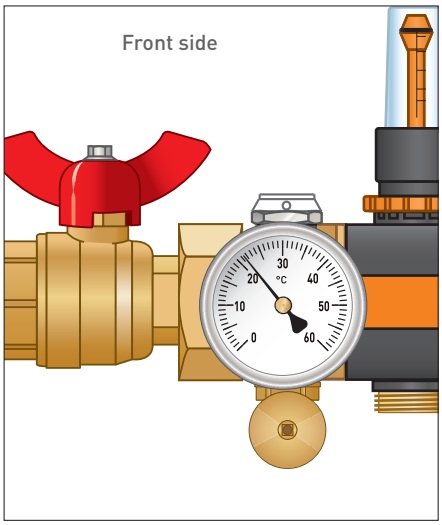
Installation length +50 mm
(displaced by one segment)

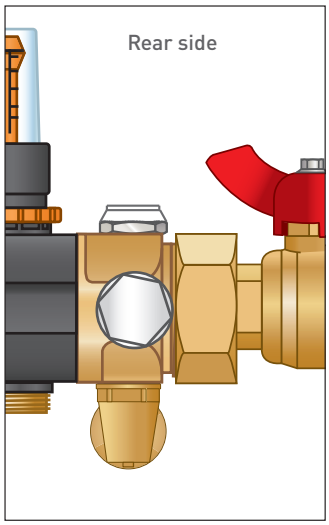


Installation length:
approx. +65 mm

3.3 Completion of the connecting block





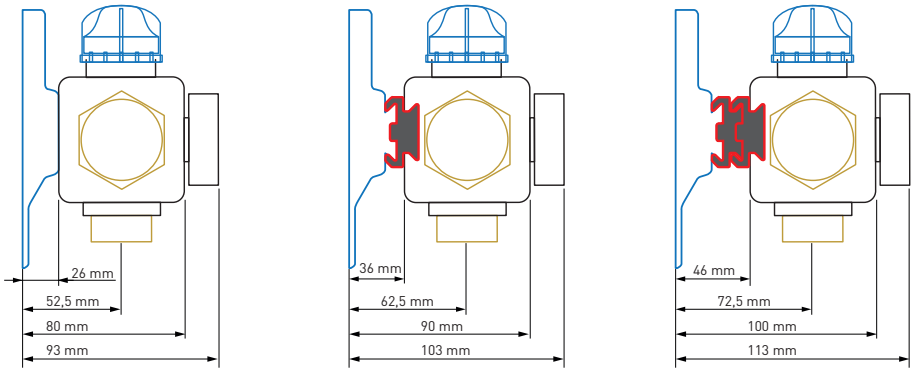


3.4 Dimensioning examples for supply pipe

Dimensioning example for supply pipe to heating distribution manifold Δt (t_F – t_R) = 10 K		
Heating circuit	Heat load	Dimensions for multi-layer supply pipes / copper
⩽ 6	⩽ 7.5 kW	for example 26x3 / Cu22x1.0
7–11	7.5–14 kW	for example 32x3 / Cu28x1.0
12–17	14–20 kW	for example 40x4 / Cu35x1.2
Dimensioning example for supply pipe to cooling distribution manifold Δt (t_F – t_R) = 4 K		
Cooling circuit	Cooling load	Dimensions for multi-layer supply pipes / copper
⩽ 6	⩽ 3.5 kW	for example 26x3 / Cu22x1.0
7–11	3.5–6.5 kW	for example 32x3 / Cu28x1.0
12–17	6.5–9.5 kW	for example 40x4 / Cu35x1.2

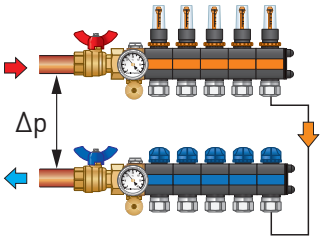
3.5 Spacer for bracket set

To increase the distance between the wall and the return block.
One time use: +10 mm
Two time use: +20 mm

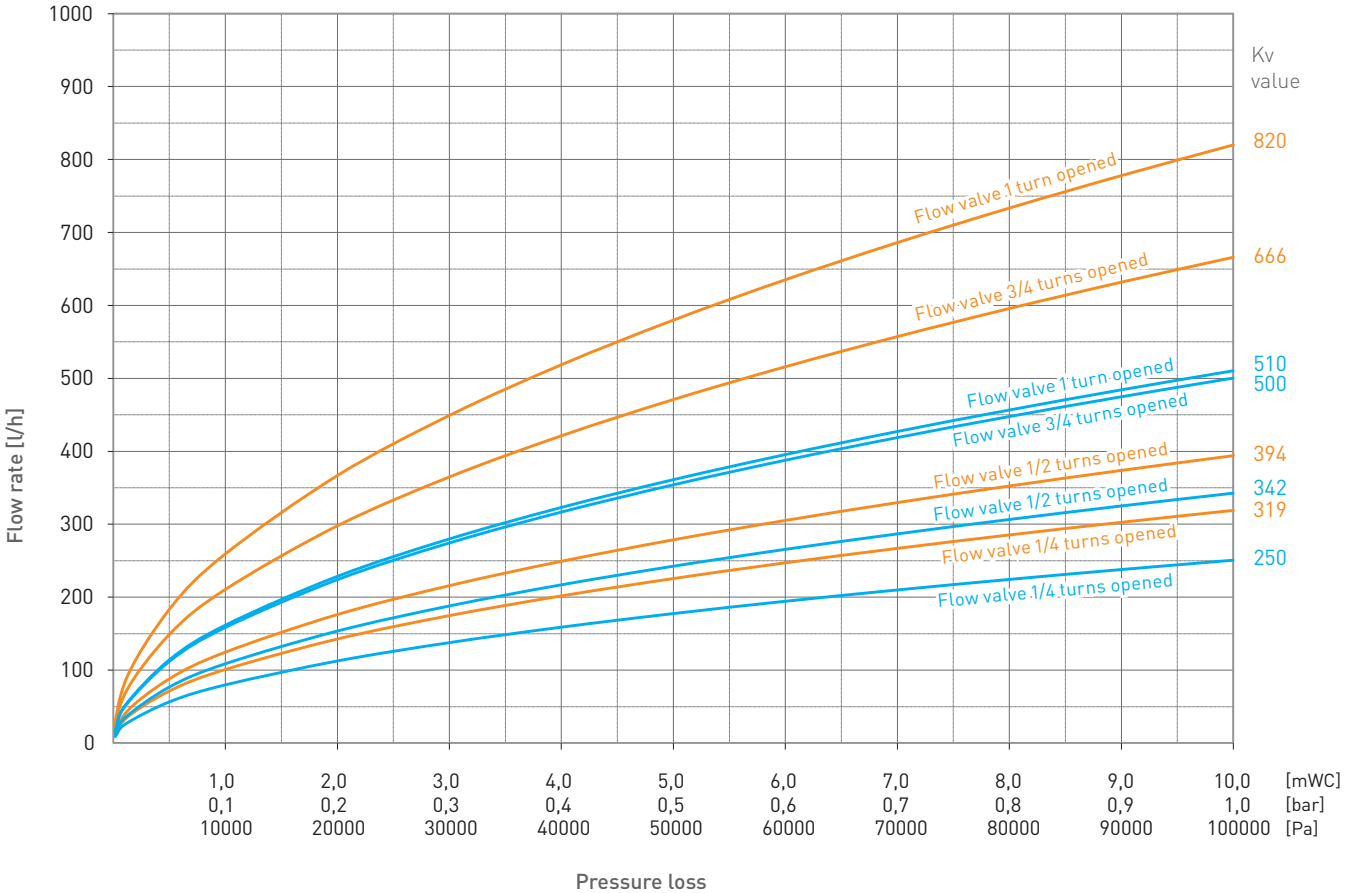


3.6 Flow characteristic curve

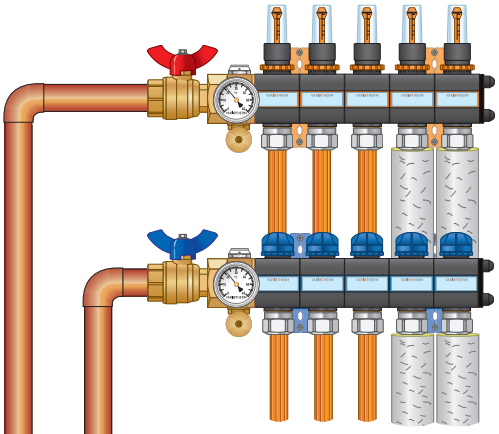
To ascertain the pressure loss of the heating/cooling distribution manifold for the respective heating/cooling circuits (without pressure loss of pipes).



Max. opened return valve
- with clamping screw fitting for VarioProFile pipe 11.6x1.5
- with clamping screw fitting for VarioProFile pipe 16x2

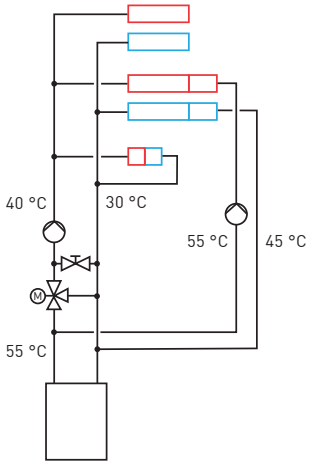


3.7 Possible variations

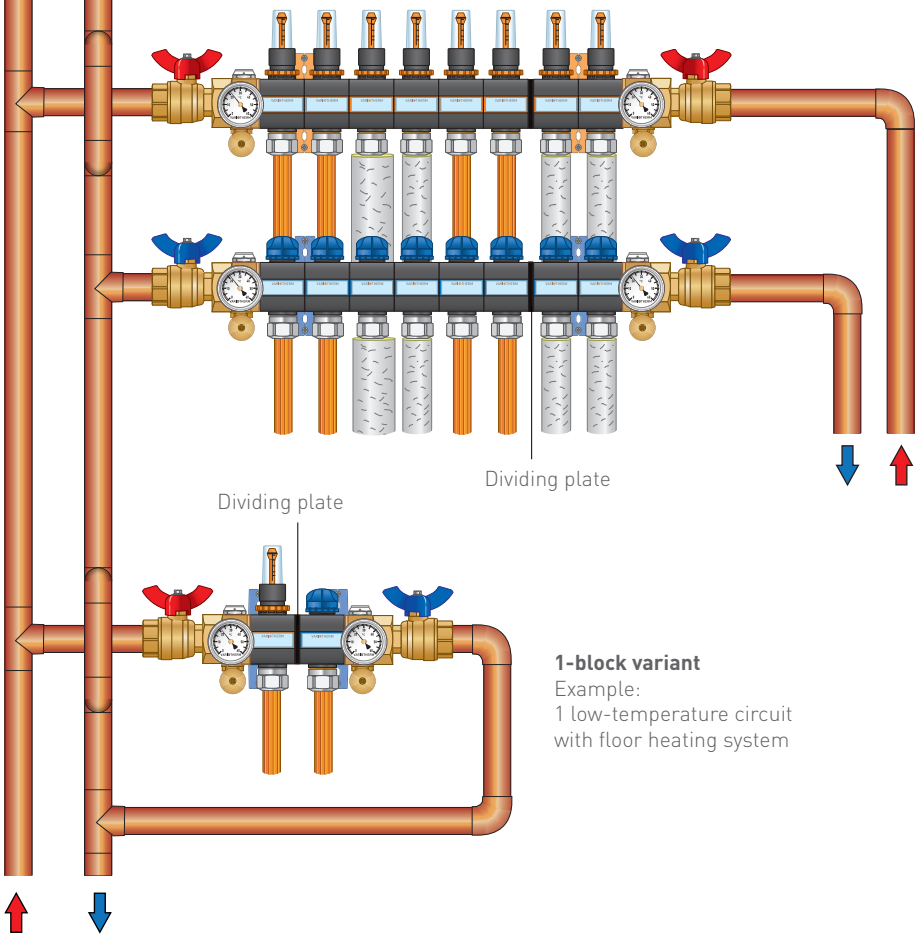


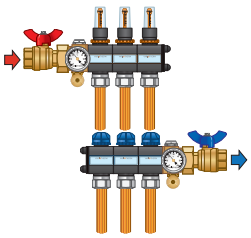
Basic Version
Example:
5 low-temperature circuits with
floor heating system and
wall heating system

Example diagram:



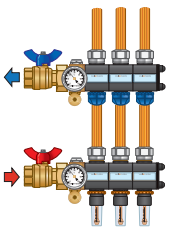
Combination – two different temperature circuits
Example: 6 low-temperature circuits with wall and floor heating,
2 high-temperature circuits for trench heating and cosy corner bench





Flow connected to the left,
return to the right

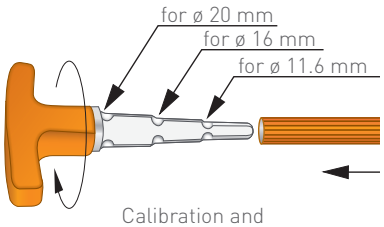
1-block variant
Example:
1 low-temperature circuit
with floor heating system



All circuits facing upwards

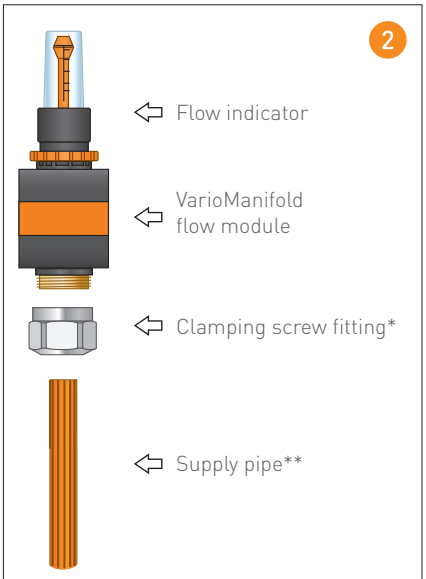
3.8 Connecting the Variotherm pipes

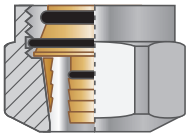
Straight, level cut
with pipe cutting pliers



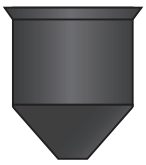
Calibration and
chamfering tool

1. The supply pipe is cut off straight across and then calibrated.
2. Push the pipe into the clamping screw fitting up to the stop, and in this position tighten the union nut hand-tight.
   Tighten the clamping screw fitting for one more turn with an open-end wrench (AF30). The tightening torque is 35 Nm.





Clamping screw fitting* 3/4"EURO, especially developed for Variotherm pipes, nickel plated, single-piece, with metal clamping ring and galvanic isolation, tested according to EN 21003

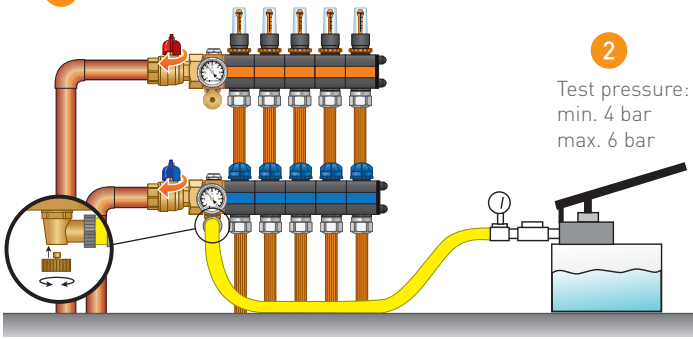


Insulating grommet, protection against condensation at the clamping screw fitting in case of cooling.

** Supply pipe	* Clamping screw fitting
Variomodular pipe 20x2 Laser	3/4"EUROx20 (Z1500)
VarioProFile pipe 16x2 Laser	3/4"EUROx16 (Z1400)
VarioProFile pipe 11.6x1.5 Laser	3/4"EUROx11.6 (Z1300)
Pre-insulated Variomodular pipe 16x2 Laser	3/4"EUROx16 (Z1400)

3.9 Pressure test

1. Close ball valves, open feed & drain cock

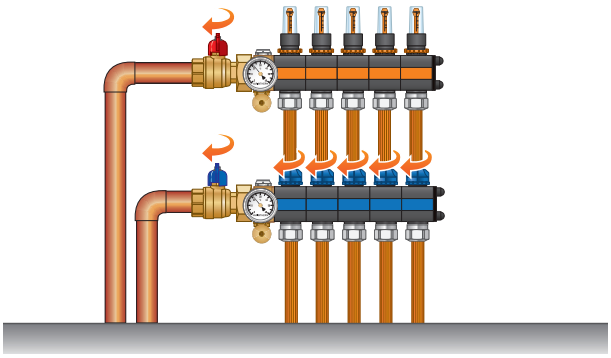


2. Test pressure:
   min. 4 bar
   max. 6 bar

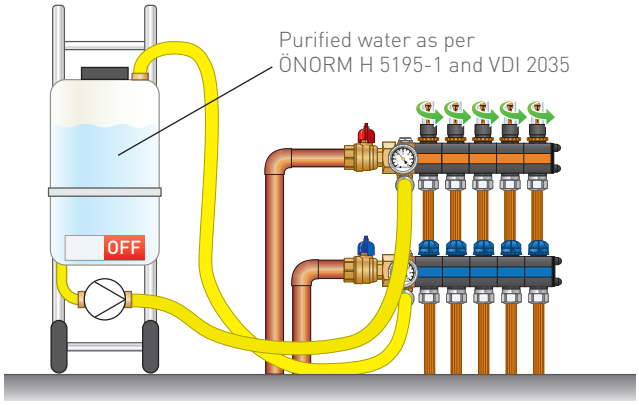
3. 24 h

4. Then tighten the screwed fittings and reduce pressure to 2–3 bar. Maintain this pressure until completion of the object in order to identify any possible damage.

3.10 Filling/flushing/deaerating the system

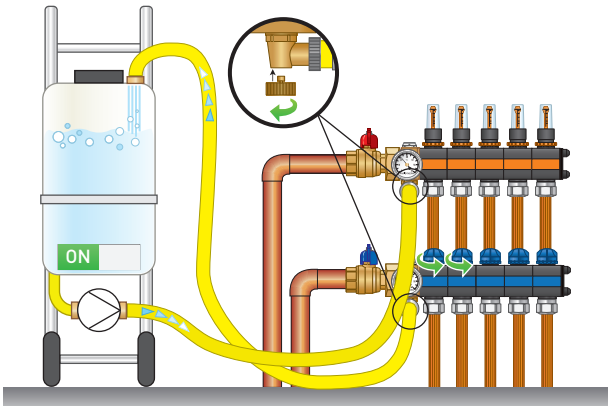


1. Main locking ball valves and all return modules are closed.

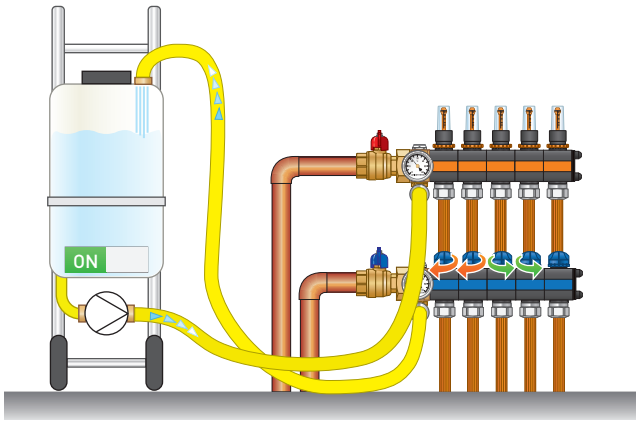


2. All flow valves are opened.

3. Then connect the filling and flushing station to both feed & drain cocks on the supply and return pipes.



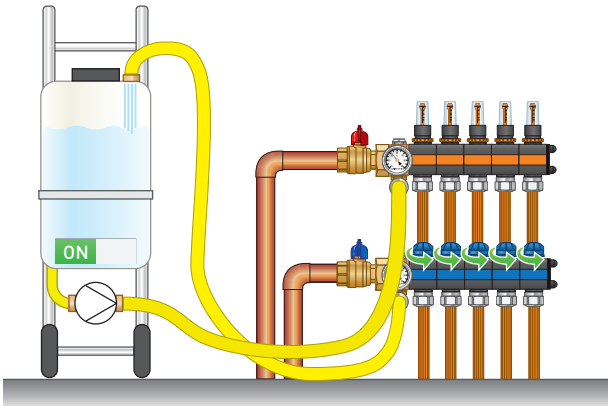
4. Switch on the flushing and filling station. Then open the fill & drain cock, the flow pipe is pressurised and the return segments of the first two heating/cooling circuits will open.
This thoroughly flushes water through the flow into the heating/cooling circuits.



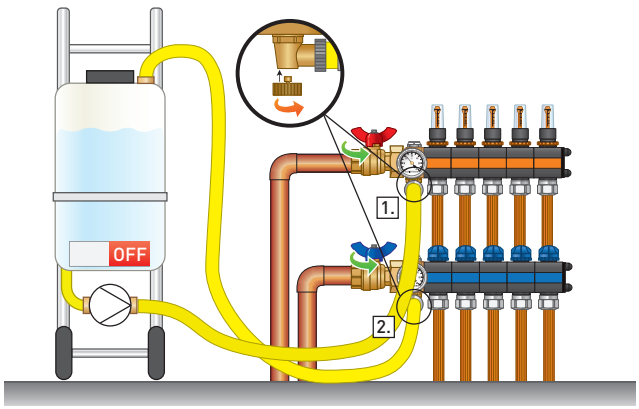
5. Once the water comes out with no air bubbles, the opened return modules are to be closed.

6. Immediately afterwards, the next two return modules are to be opened.

The same procedure is followed for the other circuits in sequential order, until the entire system is filled.



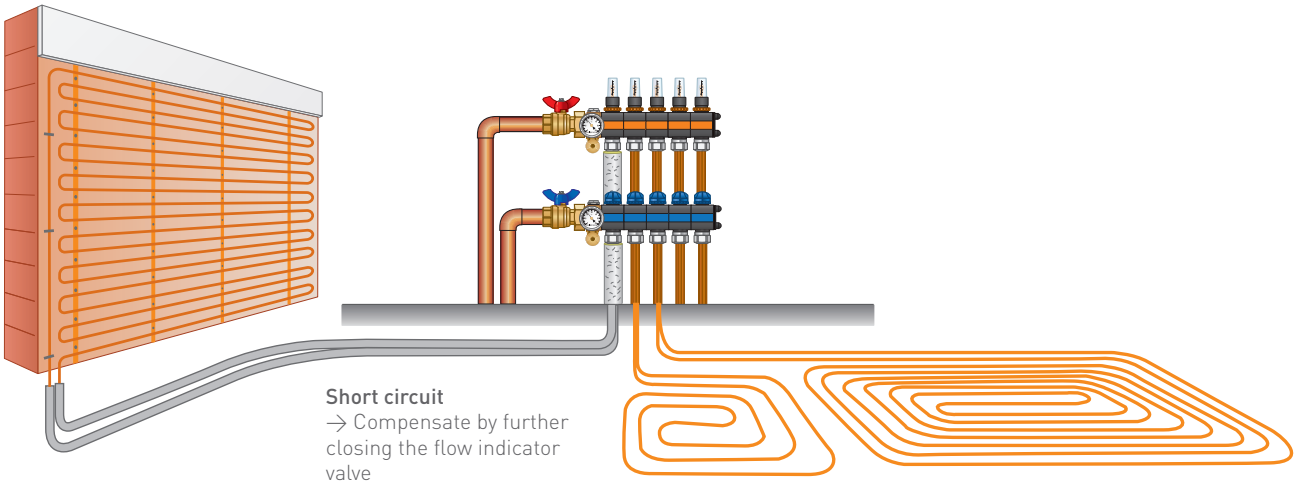
7. Finally, this "flushing procedure" is repeated upon opening of all flow and return modules.



8. First turn off the fill & drain cock on the return pipe, then immediately turn off the fill & drain cock on the flow pipe. Turn off the flushing and filling station.
Open the main locking ball valves.

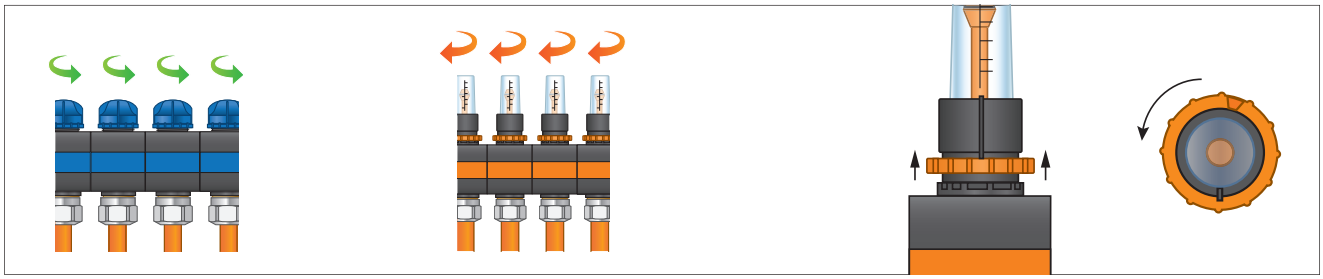
3.11 Hydronic balancing

The length of the Variotherm pipe (heating surface + supply pipes), possible connection parts (e.g. press-fit couplings) and the distribution manifold determine the pressure loss in the individual heating/cooling circuits. For hydronic balancing, the relevant circulation pump must be running. A water flow rate is assigned to each heating/cooling circuit.

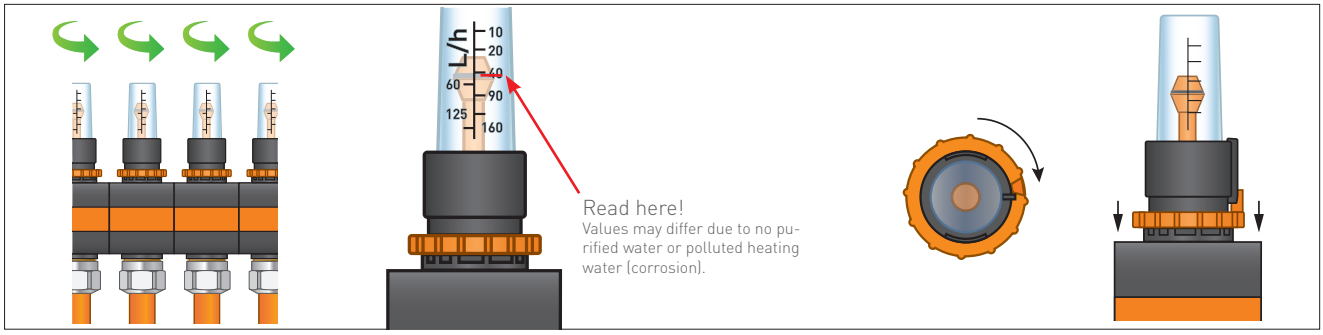


Hydronic balancing is performed by means of the flow rate valve in the flow (orange segment).

1. Fully open all return valves. Close all flow valves. Pull up the affixing ring and turn it anticlockwise until it stops. Then press down the affixing ring.



2. Slowly open the flow indicators in sequential order until the display has reached the required flow rate. Because the flow rates of the individual heating/cooling circuits affect one another, it may be necessary to make corrections to the values in a second flow. Pull up the affixing ring and turn it clockwise until it stops. The press the affixing ring down.

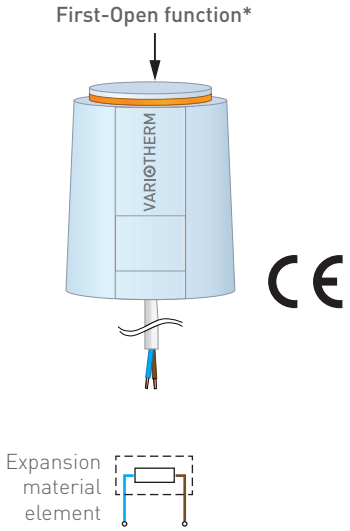


4 THERMOELECTRIC ACTUATORS

The Thermoelectric actuator of the heating/cooling distribution manifold opens or closes the circuit depending on the requirements of the room thermostat.

4.1 Thermoelectric actuator

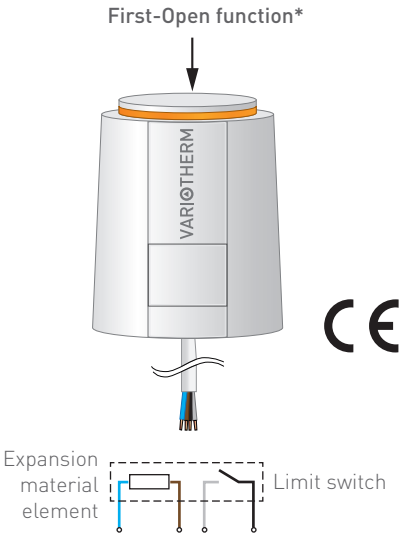
Technical data		
Type (voltage)	**230 V AC 50/60 Hz**	**24 V AC/DC 0–60 Hz**
Activation current	< 550 mA (max. 100 ms)	< 300 mA (max. 2 min.)
Operating current	4.3 mA	42 mA
Operating power	1 W	
Design	Closed when power off (NC)	
Closing and opening times	approx. 3.5 min.	
Adjustment travel	4 mm	
Adjustment force	100 N ± 5 %	
Media temperature	0–100 °C	
Storage temperature	–25 ... +60 °C	
Ambient temperature	0 ... +60 °C	
Protection degree/protection class	IP 54 / II	IP 54 / III
CE conformity as per	EN 60730	
Housing/housing colour	Polyamide / light blue	
Weight	100 g	
Connection line	2×0.75 mm² PVC grey / 1 m	
Overvoltage resistance as per EN 60730-1	min. 2,5 kV	min. 2,5 kV



4.2 Thermoelectric actuator with limit switch

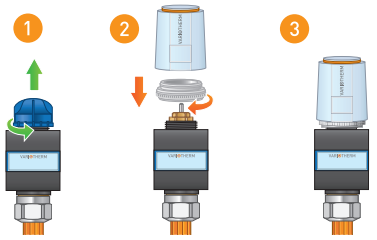
This variant of the thermoelectric actuator is also fitted with an internal switch (open when power off), which closes as soon as voltage is applied to the actuator.

Technical data		
Type (voltage)	230 V AC 50/60 Hz	24 V AC/DC 0–60 Hz
Activation current	< 550 mA (max. 100 ms)	< 300 mA (max. 2 min.)
Operating current	4,3 mA	42 mA
Operating power	1 W	
Design	Closed when power off (NC)	
Closing and opening times	ca. 3 min.	
Adjustment travel	4 mm	
Adjustment force	100 N ± 5 %	
Endschalter Schaltstrom	230 V AC: 5 A ohmic load, 1 A inductive load	24 V DC: 3 A ohmic load, 1 A inductive load
Switching point	approx. 2 mm	
Media temperature	0–100 °C	
Storage temperature	–25 ... +60 °C	
Ambient temperature	0 ... +60 °C	
Protection degree/protection class	IP 54 / II	IP 54 / III
CE conformity as per	EN 60730	
Housing/housing colour	Polyamide / light grey	
Weight	150 g	
Connection line	4×0.75 mm² PVC grey / 1 m	
Overvoltage resistance as per EN 60730-1	mind. 2,5 kV	1 kV



***First-Open function:** The Thermoelectric actuator is switched to open when power off by default so that the installer can immediately start the system with installed thermoelectric actuators. If the thermoelectric actuator is energised for > 6 minutes, it will be switched to closed when power off.

4.3 Installing the thermoelectric actuators

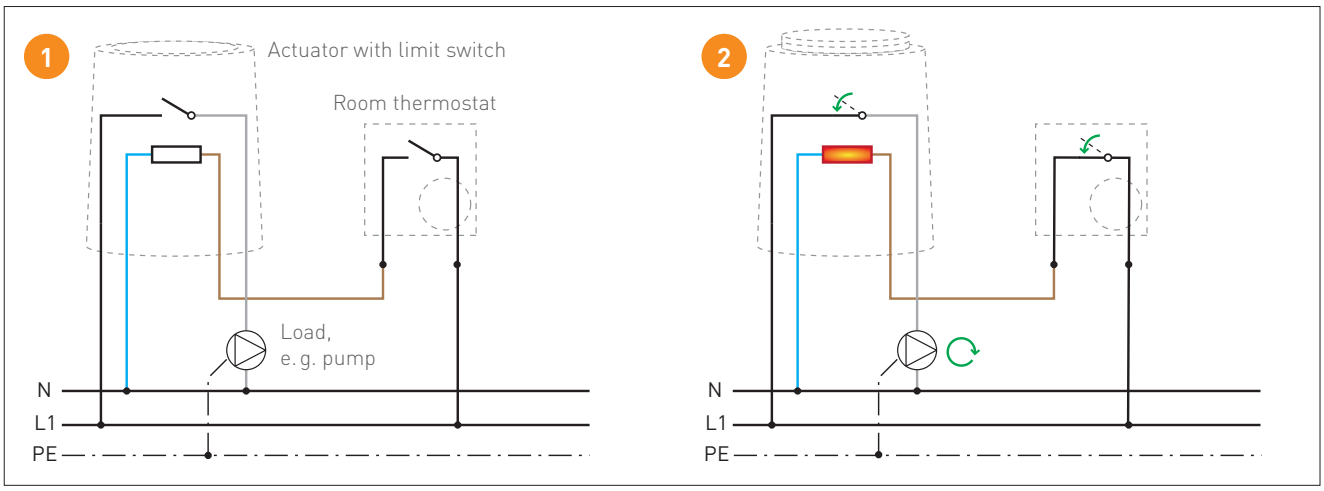


It is not necessary to drain the system!

1. Remove the valve's protective cap
2. Screw on the grey adapter ring
3. Click thermoelectric actuator into place

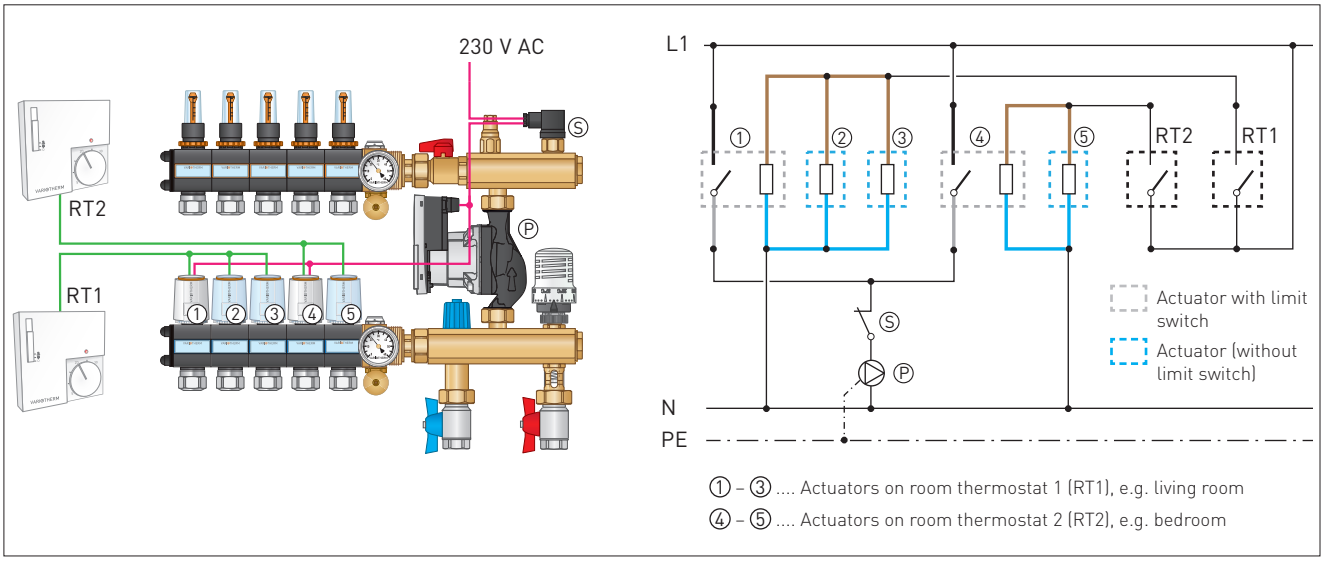
4.4 Functionality description with limit switch

1. No heating/cooling requirement:
   Room thermostat relay output open → limit switch open, as the actuator is powered off → pumpe off
2. Heating/cooling requirement present:
   Relay output of the room thermostat closed → limit switch closed, as voltage is applied to the actuator → pump running



▲ Cabling diagram - basic wiring

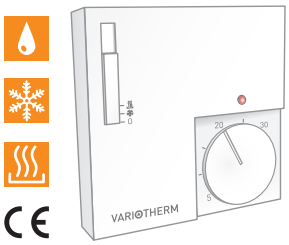
The pump runs if voltage is applied to at least one thermoelectric actuator with a limit switch.
The pump is off when all thermoelectric actuators with a limit switch are closed.



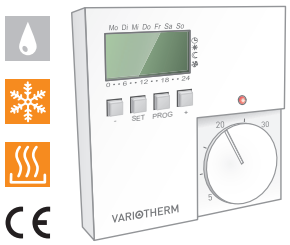
▲ Wiring of limit switches for several thermoelectric actuators on a pumped manifold (example)

5 CONTROLLERS

Central heating systems are to be equipped with state-of-the-art automatic devices for room-specific temperature control. Also see operating manual for installation instructions.

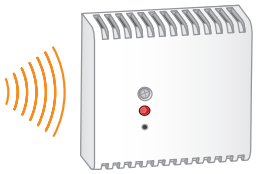


Room thermostat	PIANO H	PIANO HK	PIANO HKT
Operating mode:	Room temperature: Heating	Room temperature: Heating, Cooling	Room temperature: Heating, Cooling
Operating voltage:	230 V AC, 50 Hz	230 V AC, 50 Hz	230 V AC, 50 Hz
Relay output:	floating input[1] (NO contact), 10 A, 230 V AC	floating input[1] (NO contact), 10 A, 230 V AC	floating input[1] (NO contact), 5 A, 230 V AC
Temperature range:	+5 ... +30 °C	+5 ... +30 °C	+5 ... +30 °C
Switching difference:	±0.2 K	±0.2 K	±0.2 K
Protection degree:	IP 30	IP 30	IP 30
Features:	KTY semiconductor sensor Screw connections On/off switch	KTY semiconductor sensor Screw connections Off/heating/cooling switch	KTY semiconductor sensor Screw connections Off/heating/cooling switch **Dew point sensor with 5 m cable** (extendible to max. 20 m with 2x1.5 mm²)
Status display:	LED red	LED red	LED red/orange
Protection class:	II	II	II
Size (H × W × D):	81 × 81 × 16 (25) mm	81 × 81 × 16 (25) mm	81 × 81 × 16 (36) mm
Attachment:	to in-wall box	to in-wall box	to in-wall box
Colour:	RAL 9010 Pure white	RAL 9010 Pure white	RAL 9010 Pure white



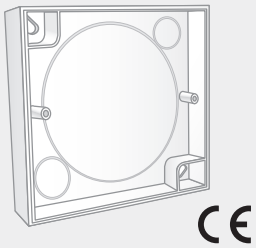
Room thermostat	PIANO HK(T) with clock	PIANO HW with clock	PIANO HF with heating surface sensor
Operating mode:	Room temperature: Heating, Cooling	Surface temperature: Heating	Room/Surface temperature: Heating
Operating voltage:	230 V AC, 50 Hz	230 V AC, 50 Hz	230 V AC, 50 Hz
Relay output:	floating input[1] (NO contact), 5 A, 230 V AC	non floating input (NO contact), 16 A, 230 V AC	non floating input (NO contact), 10 A, 230 V AC
Temperature range:	+5 ... +30 °C	+10 ... +50 °C	Room: +5 ... +30 °C (control dial) Surface: +5 ... +55 °C (internal pot.)
Switching difference:	±0.1 ... ±1.3 K settable	±0.1 ... ±1.3 K settable	±0.2 K
Protection degree:	IP 30	IP 30	IP 30
Features:	KTY semiconductor sensor Screw connections Digital clock with weekly program 32 switching points (heating) and 32 switching points (cooling) **Optionally: operation with dew point sensor (RT422)**	KTY semiconductor sensor Screw connections Digital clock with weekly program **Heating surface sensor with 4 m cable** (extendible to max. 25 m with 2x0.75 mm²)	KTY semiconductor sensor Screw connections On/off switch Individual settings for room and surface temperature **Heating surface sensor with 4 m cable** (extendible to max. 25 m with 2x0.75 mm²)
Status display:	LED red	LED red	LED red/orange
Protection class:	II	II	II
Size (H × W × D):	81 × 81 × 16 (36) mm	81 × 81 × 16 (36) mm	81 × 81 × 16 (25) mm
Attachment:	to in-wall box	to in-wall box	to in-wall box
Colour:	RAL 9010 Pure white	RAL 9010 Pure white	RAL 9010 Pure white

[1] The required safety distances (EN 60730-1) are to fulfill externally!



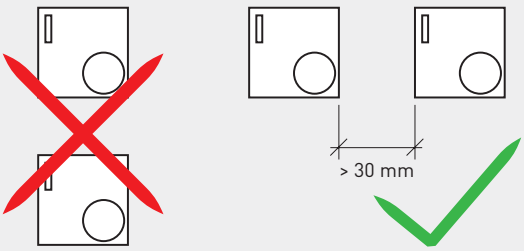
Radio thermostat	PIANO HK-Funk
Operating mode:	Heating, Cooling
Operating voltage:	3 V Battery (durability approx. 2 years)
Output:	Radio transmitter, Radio signal 433.92 MHz
Temperature range:	+5 ... +30 °C
Switching difference:	±0.2 K
Protection degree:	IP 20
Features:	KTY semiconductor sensor Screw connections Off/heating/cooling switch
Status display:	none
Protection class:	III (extra-low voltage, DIN EN 60730-1)
Size (H×W×D):	81×81×16 mm
Attachment:	surface mounting
Colour:	RAL 9010 Pure white

Radio receiver	PIANO HK-Funk
Operating voltage:	230 V AC, 50 Hz
Relay output:	non floating input (NO contact), 230 V AC, max. 16 A (cosφ = 1), max. 4 A (cosφ = 0.6)
Receiving frequenzy:	433.92 MHz
Status display:	LED red
Protection class:	II
Protection degree:	IP 30
Size (H×W×D):	71×71×31 mm
Attachment:	surface mounting or in-wall box (outside of the manifold box!)

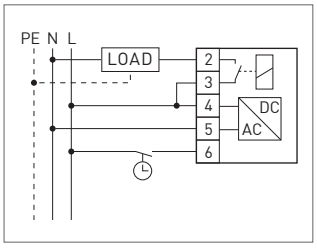


Surface mounting frame for installation without existing in-wall box, compatible with following room thermostates:
PIANO H, PIANO HK, PIANO HF

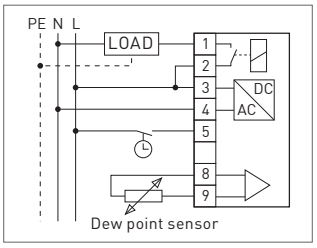
Size (H×W×D): 81×81×18 mm
Attachment: surface mounting
Colour: RAL 9010 Pure white



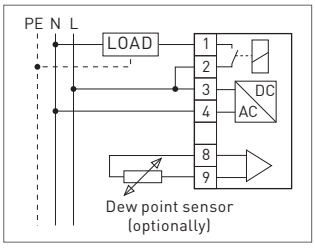
Connection diagrams



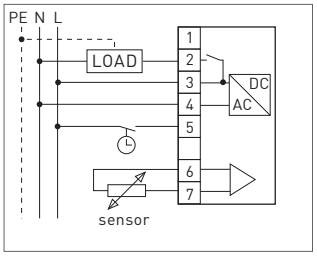
PIANO H / PIANO HK



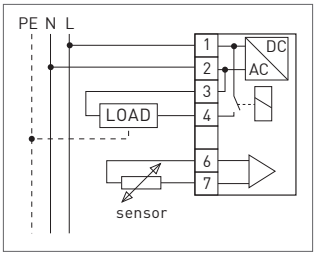
PIANO HKT



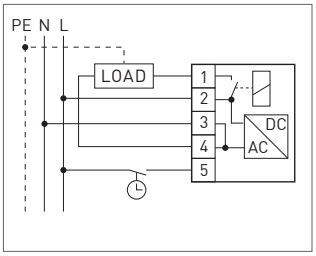
PIANO HK(T) with clock



PIANO HF



PIANO HW with clock

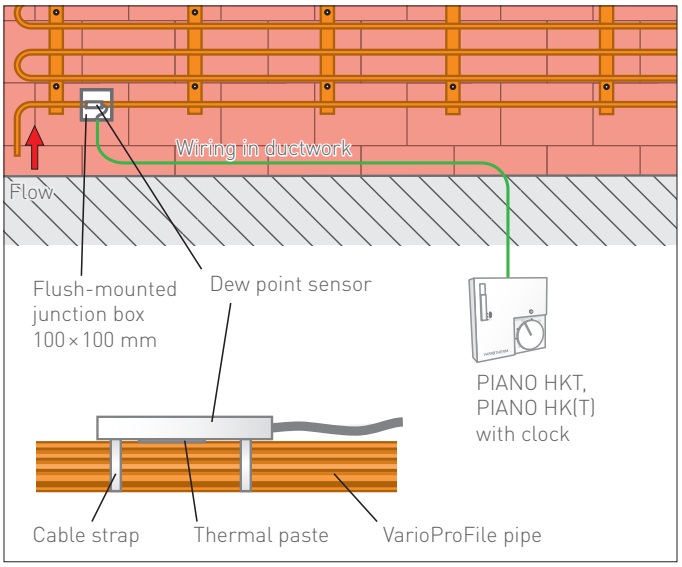


PIANO HK-Funk (receiver)

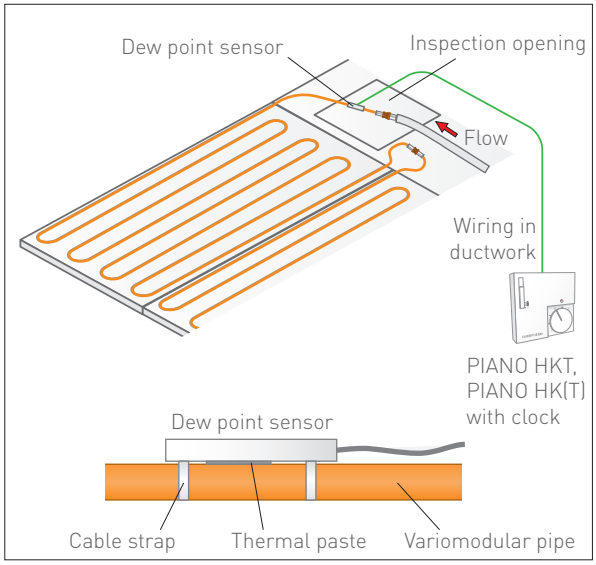
5.1 Fitting dew point sensor

With PIANO HKT and PIANO HK(T) with clock, the associated dew point sensor (available separately for PIANO HK[T]) is connected. Use: SystemWall cooling, EasyFlexWall cooling, ModuleWall/ModuleCeiling cooling.
The dew point sensor should be fitted at the position on the pipe that is expected to dew first. Generally this is the case at the flow entry.

The dew point sensor is fitted to the pipe using cable ties. Make sure that there is good thermal contact between the pipe and the sensor (use heat transfer paste). The supply pipes should be sufficiently secured.

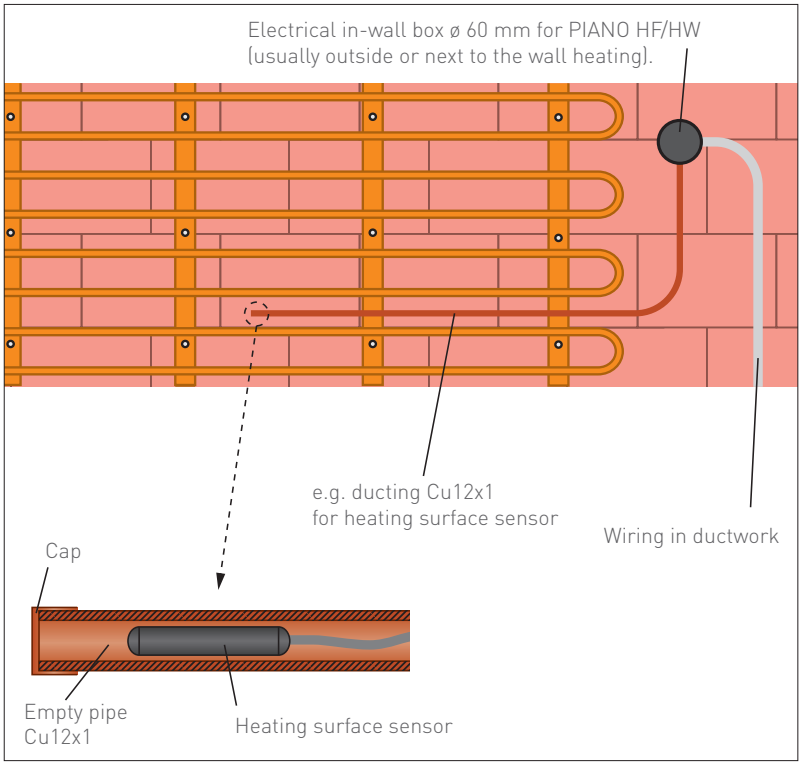


▲ Example System wall cooling



▲ Example Modular ceiling cooling

5.2 Fitting heating surface sensor



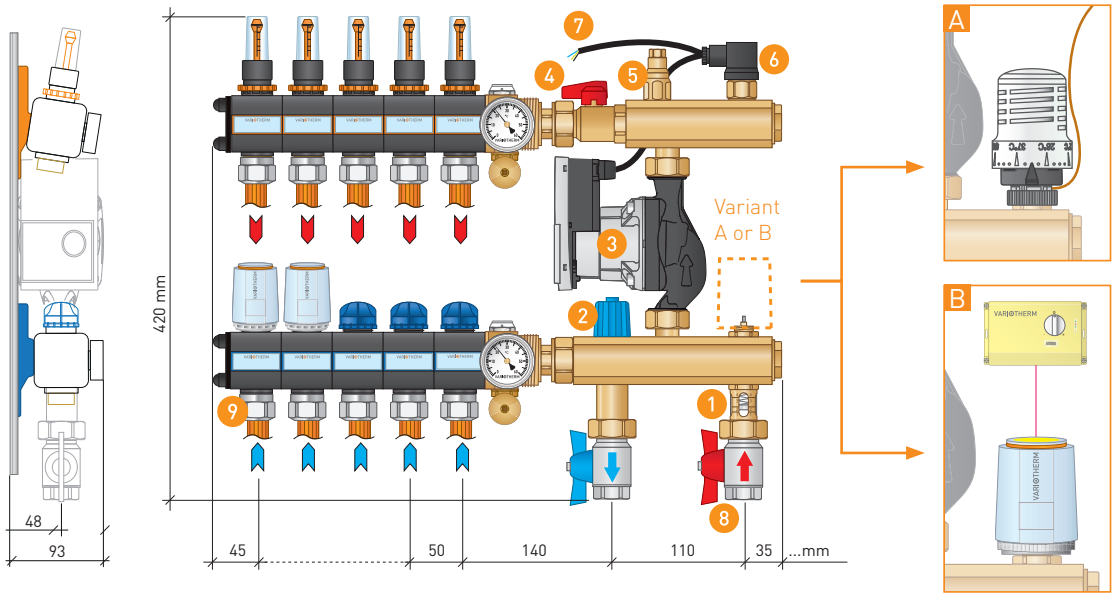
▲ Example EasyFlex wall heating

With PIANO HF and PIANO HW with clock, the supplied heating surface sensor is connected. Use: EasyFlex wall heating (e.g. centrally heated tile stoves).
Before plastering, the ducting (e.g. Cu12 pipe) for the heating surface sensor is clamped in a suitable reference position between the Variotherm pipes.

6 PUMPED VARIOMANIFOLD 5.0

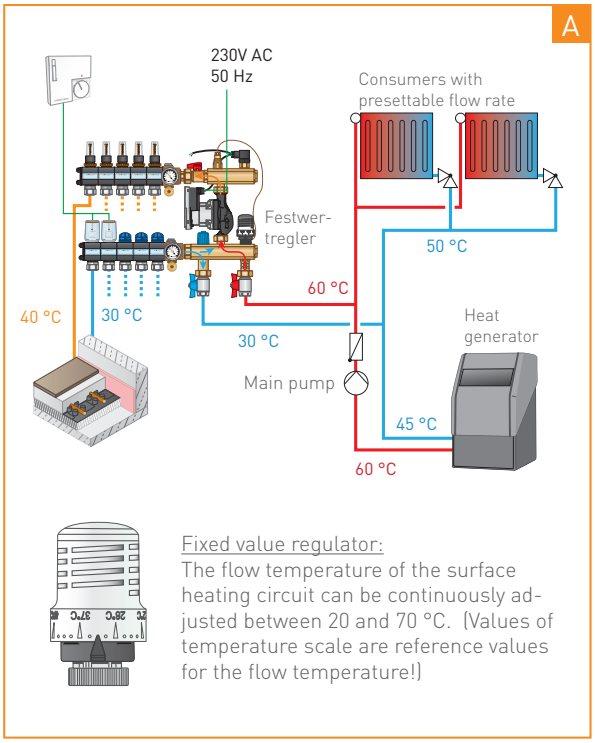
6.1 Description

- For installing surface heating systems (2–15 heating circuits) in high-temperature heating systems (2-pipe system) with existing circulation pump.
- The flow temperature of the boiler circuit must be at least 10 K higher than the set flow temperature of the surface heating circuit.
- Observe the required pipe diameter (capacity) to the Pumped Manifold. Primary pressure required!



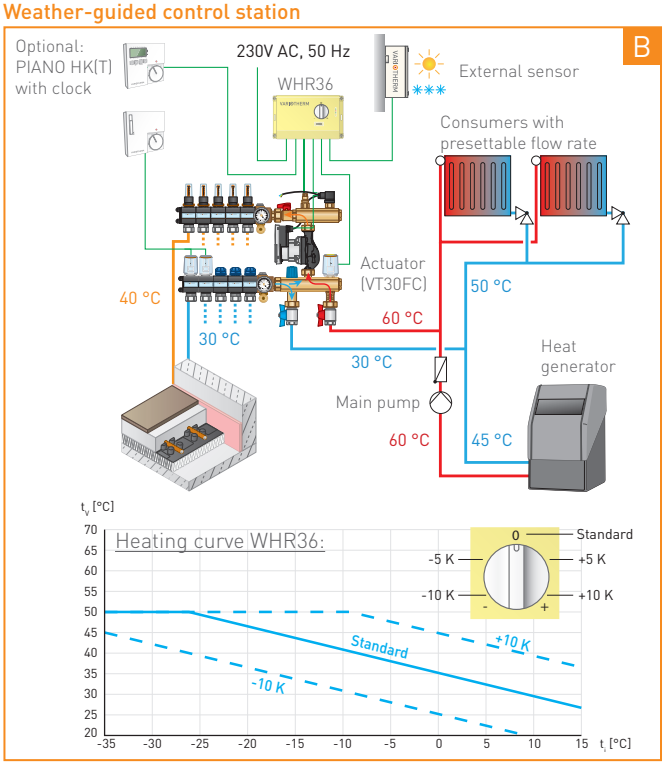
1 Flow indicator 2 Regulating valve 3 Pump PVS (WILO Yonos Para 15/6) 4 Flushing ball valve (close when flushing)
5 Immersion sleeve for remote sensor (Fixed value control station A) or for flow temperature sensor (weather-guided control station B); contains heat transfer paste (Safety data sheet: www.variotherm.com) 6 Temperature limiter (Factory setting 60 °C)
7 230V AC, 50 Hz (provided connection cable: 3×0.5 mm² [max. 3 A], please note the electrical protection!)
8 Locking ball valve (3/4" female thread) 9 Variotherm clamping screw fittings 3/4" Eurocone

Fixed value control station



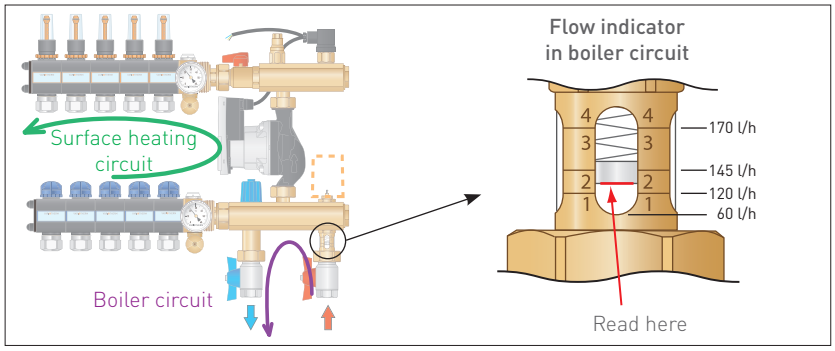
Fixed value regulator:
The flow temperature of the surface heating circuit can be continuously adjusted between 20 and 70 °C. (Values of temperature scale are reference values for the flow temperature!)

Weather-guided control station

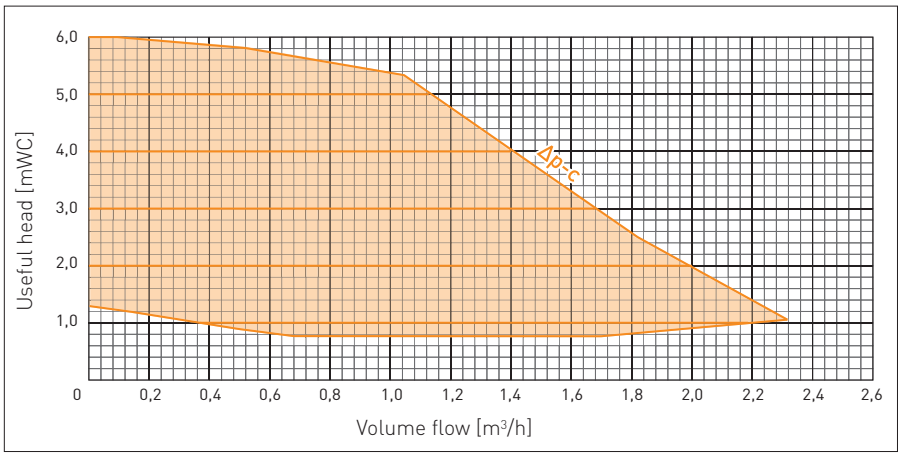


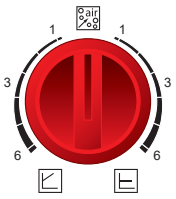
6.2 Examples for power and volume flow

Temperatures surface circuit	Flow temp. boiler circuit	Power
Volume flow in boiler circuit: 50 l/h		
40/30 °C	50 °C	1163 W
40/30 °C	60 °C	1745 W
40/30 °C	70 °C	2326 W
Volume flow in boiler circuit: 150 l/h		
40/30 °C	50 °C	3489 W
40/30 °C	60 °C	5234 W
40/30 °C	70 °C	6978 W



6.3 Pump PVS (WILO Yonos Para 15/6)





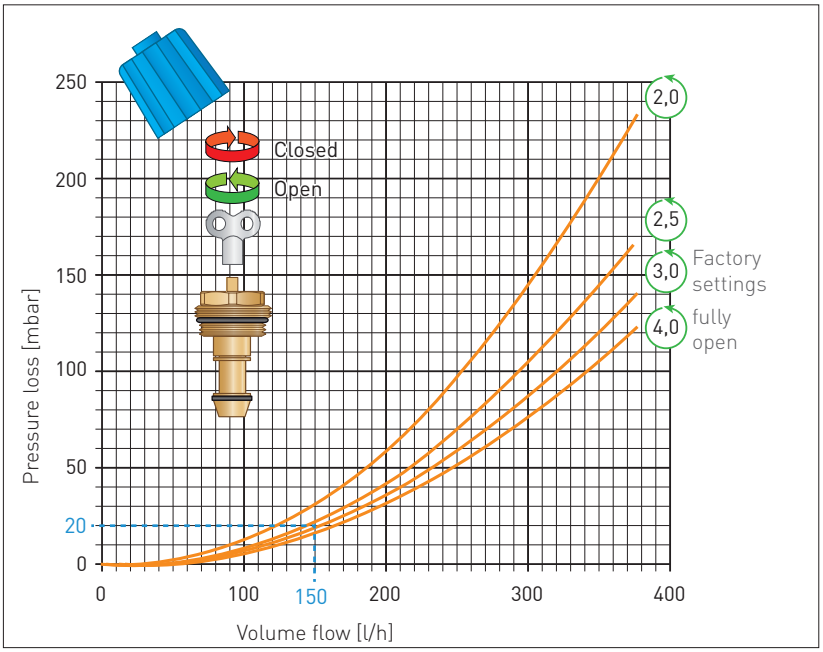
Constant differential pressure (Δp-c), for surface heating

Venting function (for rotor chamber of the pump)

Variable differential pressure (Δp-v)

6.4 Regulating valve – Pressure loss in the boiler circuit

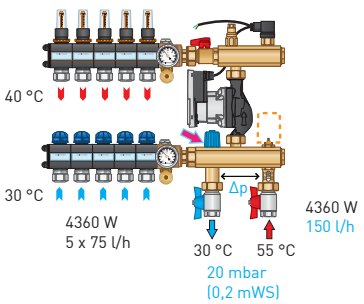
The flow rate in the boiler circuit is adjusted using the regulating valve when the fixed-value regulator or actuator is fully opened (↘).



Example 5 heating circuits:

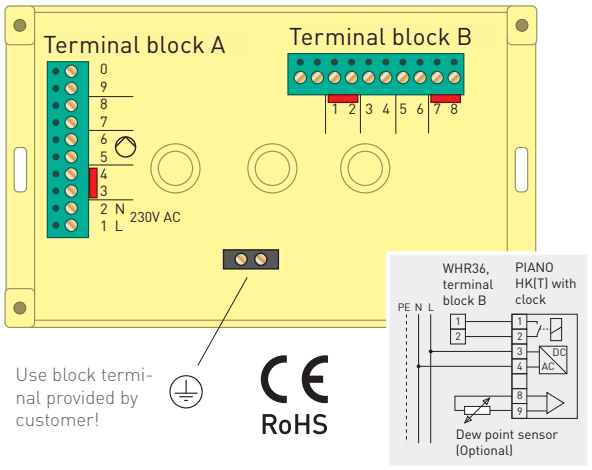
Searching for:
pressure loss and volume flow in boiler circuit, if regulating valve is 3 turns open.

Desired:
Boiler flow temperature: 55 °C
Surface heating temperature: 40/30 °C
Required volume flow in surface heating circuit: 5×75 l/h



6.5 WHR36 – weather-guided controller

Electrical connection



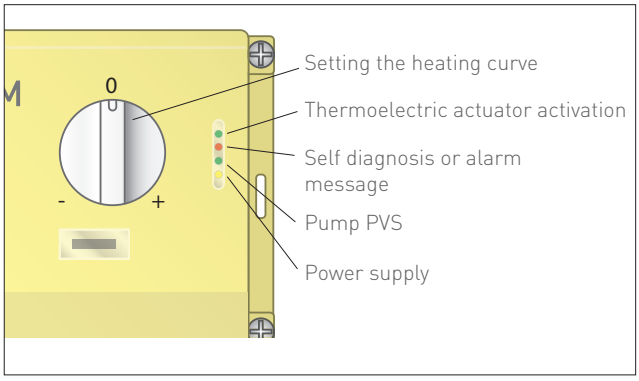
▲ Connection diagram

Terminal block A, 230V AC	
1	Power supply phase
2	Power supply neutral conductor
3-4	Bridge
5-6	PVS pump incl. safety thermostat, relay switching current max. 0.8 A
7-8	Thermoelectric actuator (only item no. VT30FC permissible)
9-0	Boiler demand, with contact 5-6 switched (floating input, max. 0.8 A)

Terminal block B, safety-low voltage	
1-2	Bridge, or optionally: Room thermostat with clock (part no. RT43) (see connection diagram*)
3-4	External sensor[1] (cable for example 2×0.75 mm², max. 50 m)
5-6	Flow sensor[1] (cable for example 2×0.75 mm², max. 50 m)
7-8	Bridge, or switching contact for pump & actuator On/Off

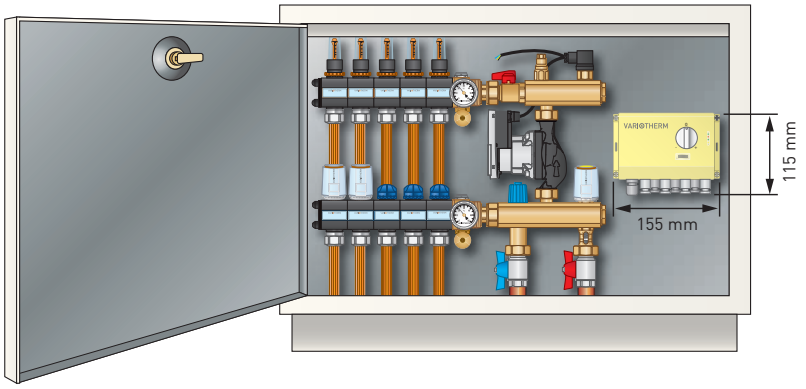
[1] Use original sensor!

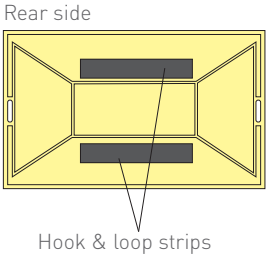
Commissioning



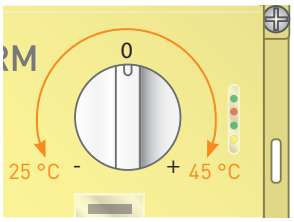
Self-diagnosis is performed when starting for the first time. The red LED flashes for about 5 seconds and goes out. After about 5 minutes the controller begins to adjust the flow temperature to the heating curve. If the red LED is continuously illuminated an alarm is present. In this case the wiring must be checked. An alarm occurs if the flow temperature in the surface heating circuits exceeds 55 °C. The controller returns to normal operation when the flow temperature cools to below 52 °C.

Attachment





Dry heating



During the heating-up process the outdoor sensor is disconnected (terminal strip B, 3-4). The controller works as a fixed value regulator from 25 °C (knob turned fully counter-clockwise to -) to 45 °C (knob turned fully clockwise to +). The temperature is adjusted manually every day.

Sensor resistance values

Flow temperature sensor (NTC resistor)					
+15 °C	+20 °C	+25 °C	+30 °C	+35 °C	+40 °C
18.0 kΩ	14.0 kΩ	10.0 kΩ	7.5 kΩ	5.5 kΩ	4.1 kΩ

Outdoor sensor (NTC resistor)					
-20 °C	-10 °C	0 °C	+10 °C	+20 °C	+25 °C
8.23 kΩ	4.90 kΩ	3.00 kΩ	1.90 kΩ	1.25 kΩ	1.00 kΩ

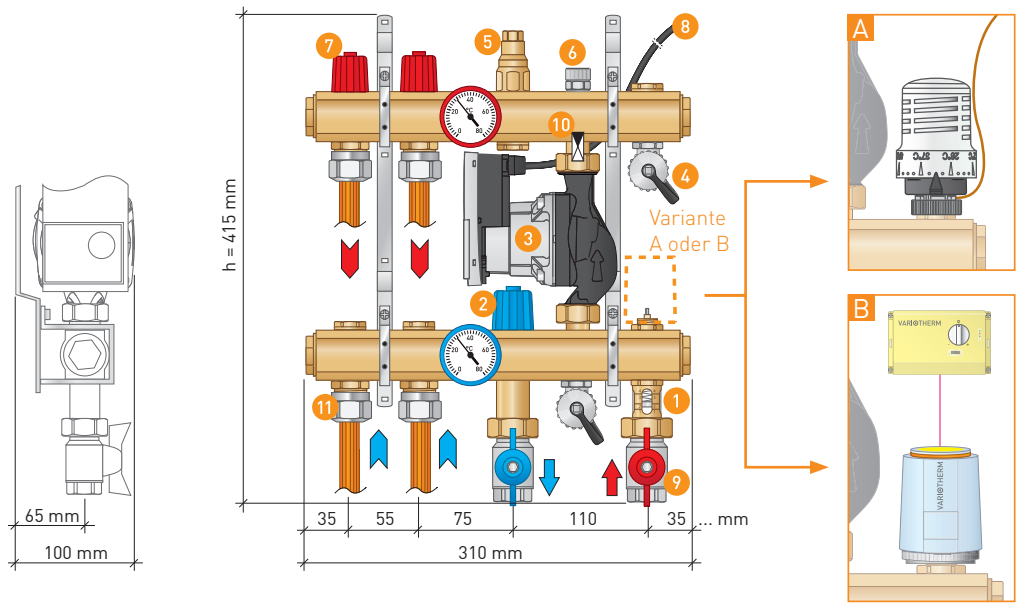
6.6 Troubleshooting

Fault	Troubleshooting
• Surface heating circuit temperature too low	• Main pump must be available and running • Fixed value control station: Switch on the pump PVS • Weather-guided control station: - Switch on the controller WHR36, orange LED (power on) and green LED (pump on) should glow - Check the heating curve setting • Adjust the surface heating circuit flow • Check and regulate the flow in the boiler circuit (regulating valve) • Regulate the existing heating system (e.g. radiators) • Switch main pump to a higher setting level • Check if the flow/return in the boiler circuit has been reversed • Air in system, flush again if necessary • Fully open the flushing ball valve • Consider the time for baking out, moisture in surface heating system (wet plaster, screed ...)
• Surface heating circuit temperature too high	Fixed-value control station: • Fixed value regulator is not screwed all the way to the end stop Weather-guided control station: • Actuator adapter is not screwed all the way to the end stop • Check the heating curve setting

7 PUMP MICROSTATION

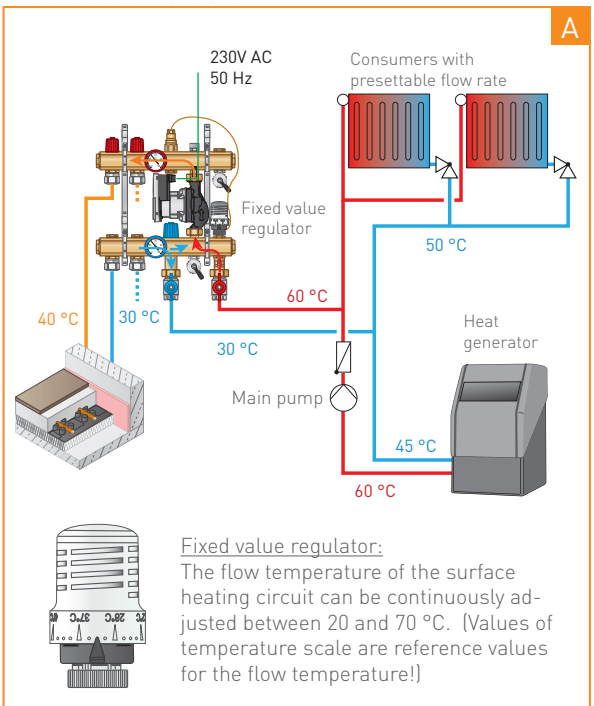
7.1 Description

- For installing surface heating systems (1–2 heating circuits) in high-temperature heating systems (2-pipe system) with existing circulation pump.
- The flow temperature of the boiler circuit must be at least 10 K higher than the set flow temperature of the surface heating circuit.
- Observe the required pipe diameter (capacity) to the Pump Microstation. Primary pressure required!



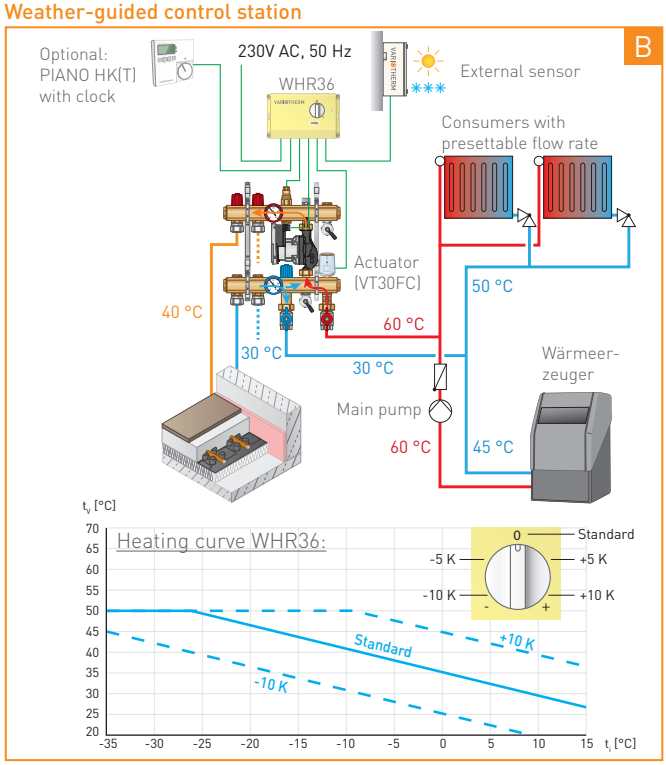
1 Flow indicator 2 Regulating valve 3 Pump PMS (WILO Yonos Para 15/6) 4 Feed & drain cock
5 Immersion sleeve for remote sensor (Fixed value control station A) or for flow temperature sensor (weather-guided control station B); contains heat transfer paste (Safety data sheet: www.variotherm.com) 6 Manual air-vent 7 Flow valve, adjustable via protection cap
8 230V AC, 50 Hz (provided connection cable: 3 x 0.5 mm² [max. 3 A], please note the electrical protection!)
9 Locking ball valve (3/4" female thread) 10 Check valve 11 Variotherm clamping screw fitting 3/4" Eurocone

Fixed value control station



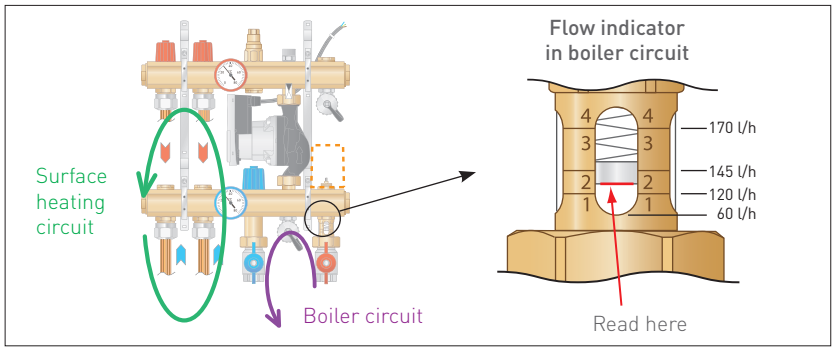
Fixed value regulator:
The flow temperature of the surface heating circuit can be continuously adjusted between 20 and 70 °C. (Values of temperature scale are reference values for the flow temperature!)

Weather-guided control station

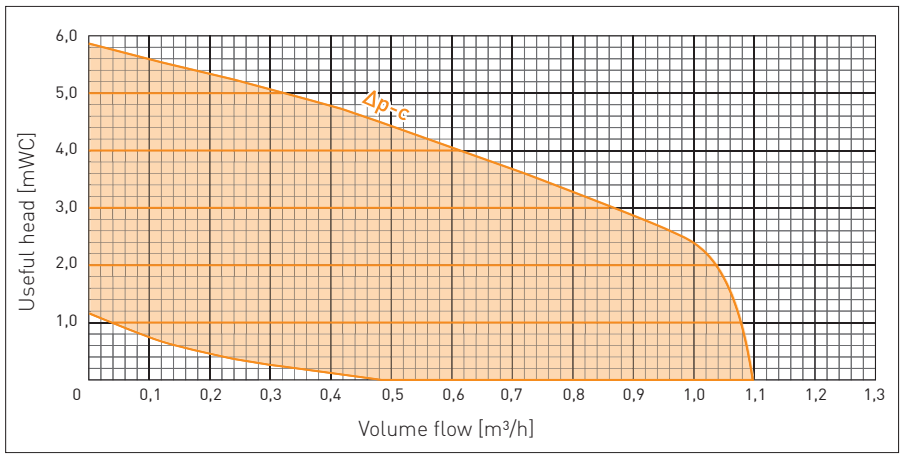


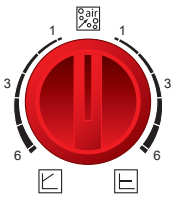
7.2 Examples for power and volume flow

Temperatures surface circuit	Flow temp. boiler circuit	Power
Volume flow in boiler circuit: 50 l/h		
40/30 °C	50 °C	1163 W
40/30 °C	60 °C	1745 W
40/30 °C	70 °C	2326 W
Volume flow in boiler circuit: 100 l/h		
40/30 °C	50 °C	2326 W
40/30 °C	60 °C	3489 W
40/30 °C	70 °C	5234 W



7.3 Pump PMS (WILO Yonos Para 15/6)





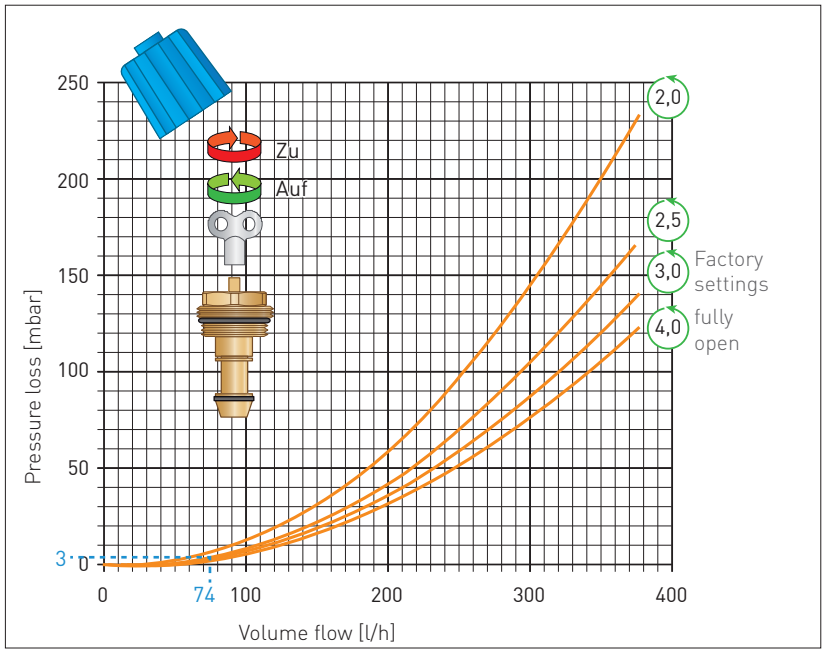
Constant differential pressure (Δp-c), for surface heating

Venting function (for rotor chamber of the pump)

Variable differential pressure (Δp-v)

7.4 Regulating valve – Pressure loss in the boiler circuit

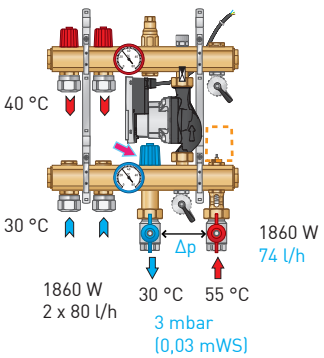
The flow rate in the boiler circuit is adjusted using the regulating valve when the fixed-value regulator or actuator is fully opened (↘).



Example 2 heating circuits:

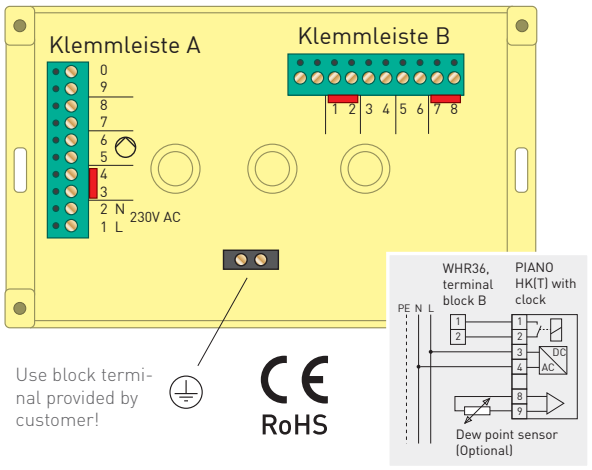
Searching for:
pressure loss and volume flow in boiler circuit, if regulating valve is 3 turns open.

Desired:
Boiler flow temperature: 55 °C
Surface heating temperature: 40/30 °C
Required volume flow in surface heating circuit: 2×80 l/h



7.5 WHR36 – weather-guided controller

Electrical connection



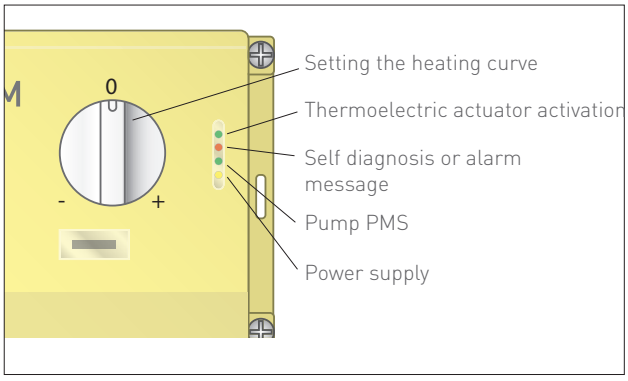
▲ Connection diagram

Terminal block A, 230V AC	
1	Power supply phase
2	Power supply neutral conductor
3-4	Bridge
5-6	PMS pump incl. safety thermostat, relay switching current max. 0.8 A
7-8	Thermoelectric actuator (only item no. VT30FC permissible)
9-0	Boiler demand, with contact 5-6 switched (floating input, max. 0.8 A)

Terminal block B, safety-low voltage	
1-2	Bridge, or optionally: Room thermostat with clock (part no. RT43) (see connection diagram*)
3-4	External sensor[1] (cable for example 2×0.75 mm², max. 50 m)
5-6	Flow sensor[1] (cable for example 2×0.75 mm², max. 50 m)
7-8	Bridge, or switching contact for pump & actuator On/Off

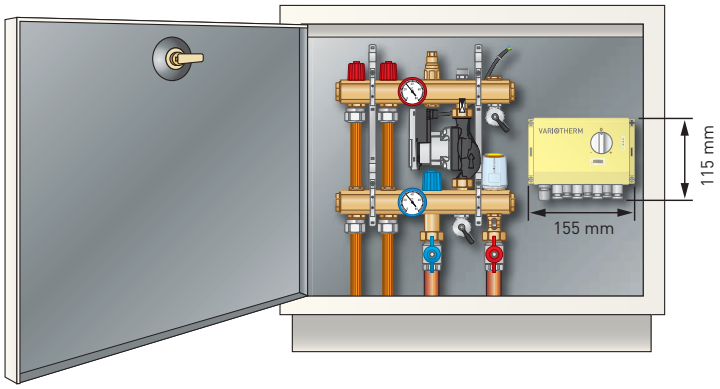
[1] Use original sensor!

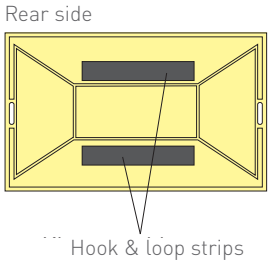
Commissioning



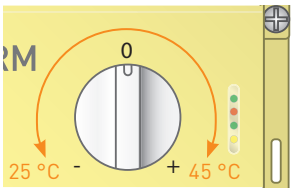
Self-diagnosis is performed when starting for the first time. The red LED flashes for about 5 seconds and goes out. After about 5 minutes the controller begins to adjust the flow temperature to the heating curve. If the red LED is continuously illuminated an alarm is present. In this case the wiring must be checked. An alarm occurs if the flow temperature in the surface heating circuits exceeds 55 °C. The controller returns to normal operation when the flow temperature cools to below 52 °C.

Attachment





Dry heating



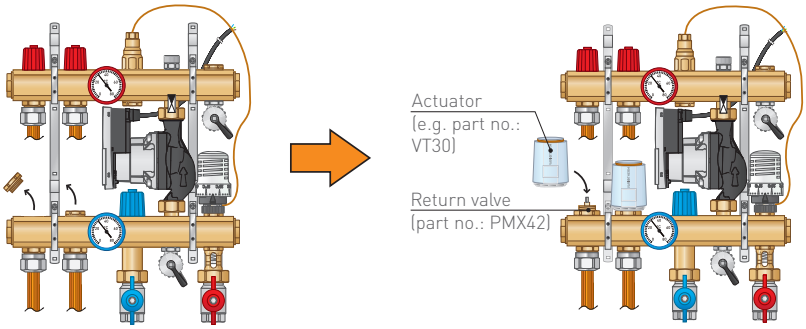
During the heating-up process the outdoor sensor is disconnected (terminal strip B, 3-4). The controller works as a fixed value regulator from 25 °C (knob turned fully counter-clockwise to -) to 45 °C (knob turned fully clockwise to +). The temperature is adjusted manually every day.

Sensor resistance values

Flow temperature sensor (NTC resistor)					
+15 °C	+20 °C	+25 °C	+30 °C	+35 °C	+40 °C
18.0 kΩ	14.0 kΩ	10.0 kΩ	7.5 kΩ	5.5 kΩ	4.1 kΩ

Outdoor sensor (NTC resistor)					
-20 °C	-10 °C	0 °C	+10 °C	+20 °C	+25 °C
8.23 kΩ	4.90 kΩ	3.00 kΩ	1.90 kΩ	1.25 kΩ	1.00 kΩ

7.6 Modification for operation with thermoelectric actuator



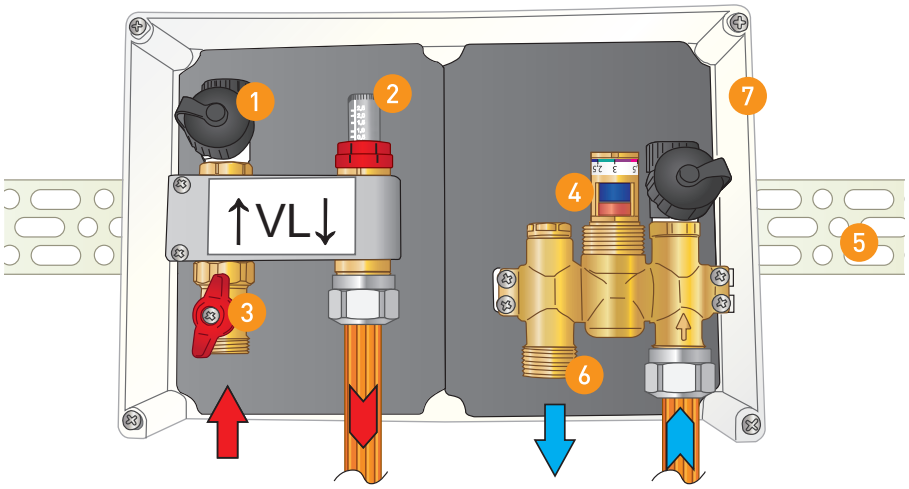
First remove the blind cap and fit the return valve. Then the actuator can be clipped onto the fitted adapter ring.

7.7 Troubleshooting

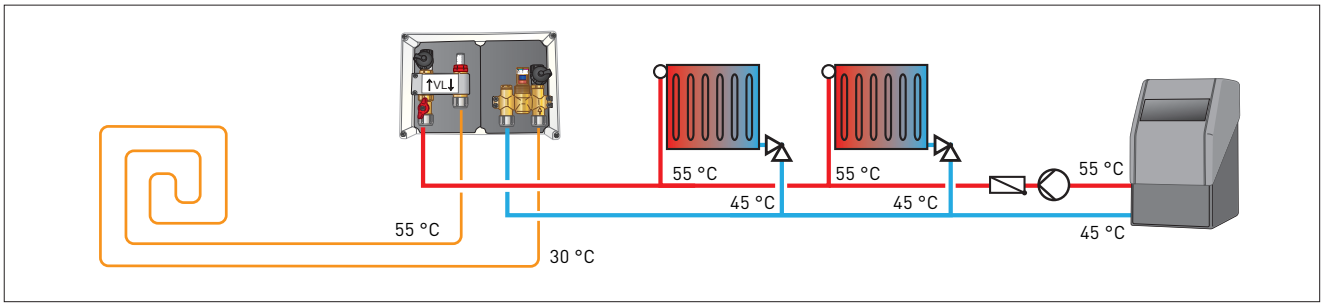
Fehler	Fehlerbehebung
• Surface heating circuit temperature too low	• Main pump must be available and running • Fixed value control station: Switch on the pump PMS • Weather-guided control station: - Switch on the controller WHR36, orange LED (power on) and green LED (pump on) should glow - Check the heating curve setting • Adjust the surface heating circuit flow • Check and regulate the flow in the boiler circuit (regulating valve) • Regulate the existing heating system (e.g. radiators) • Switch main pump to a higher setting level • Check if the flow/return in the boiler circuit has been reversed • Air in system, flush again if necessary • Consider the time for baking out, moisture in surface heating system (wet plaster, screed ...)
• Surface heating circuit temperature too high	Fixed-value control station: • Fixed value regulator is not screwed all the way to the end stop Weather-guided control station: • Actuator adapter is not screwed all the way to the end stop • Check the heating curve setting

8 RETURN TEMPERATURE LIMITER

- For installation of a small low-temperature surface heating circuit in high-temperature heating systems (2-pipe system) with existing circulation pump.
- Maximum pipe length of surface heating circuit: approx. 90 m with ø16 mm-pipe or 60 m with ø11.6 mm-pipe.
- Maximum flow temperature of boiler circuit: 60 °C



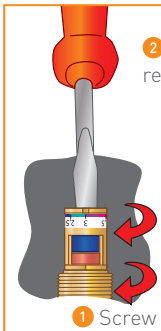
1. Fill & drain cock 3/4"
2. Flow indicator 0.5–2.5 l/min adjustable with locking device
3. Locking ball valve
4. Return temperature limiter with expanding element sensor (20–40 °C, adjustable, swivel-mounted)
5. Fastening clip
6. 3/4" Eurocone connections (4×)
7. Mounting box, dimensions (W × H × D): 300 × 200 × 60 mm



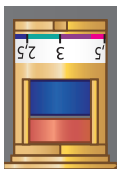
Lid dimensions
W × H = 340 × 235 mm

Lid dimensions
W × H = 340 × 235 mm
Lid of RTLT valve with opening for thermostatic valve

RTL valve (without thermostatic valve):



2 Setting the return temperature

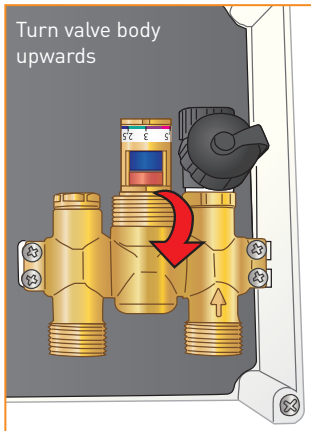


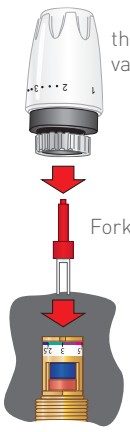
1 Screw on the expanding element sensor

Guideline:

2.0	20 °C
2.5	25 °C
3.0	30 °C
3.5	35 °C
4.0	40 °C

RTLT valve (with thermostatic valve):





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