

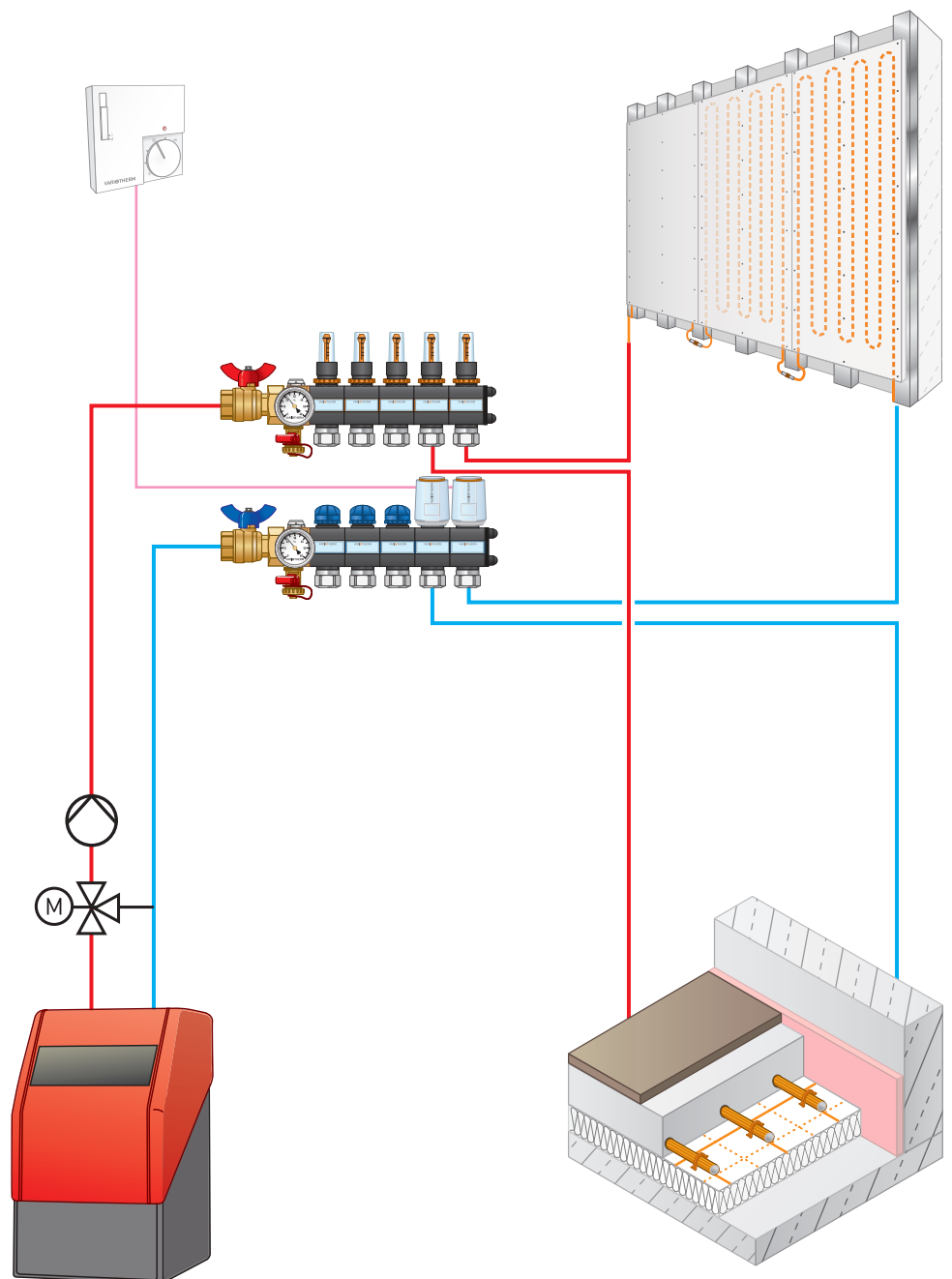


Installation



Planning

VARIOTHERM
HEATING. COOLING. COMFORT.



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1 General information

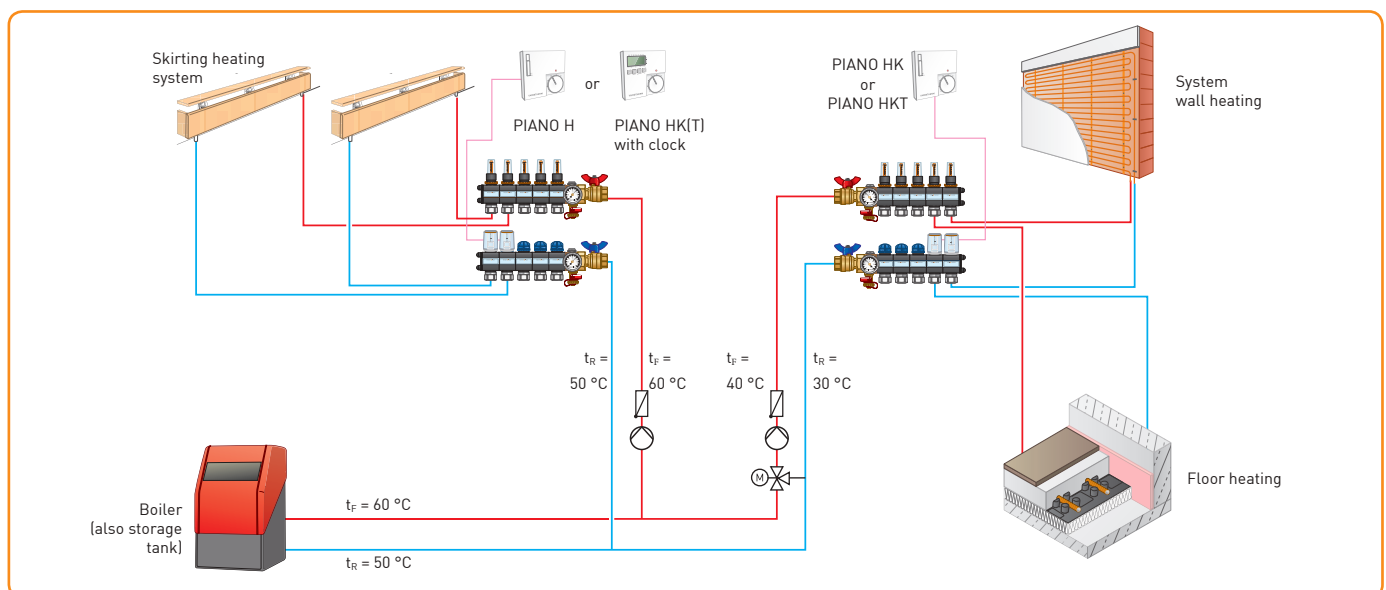
1.1 Safety information

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

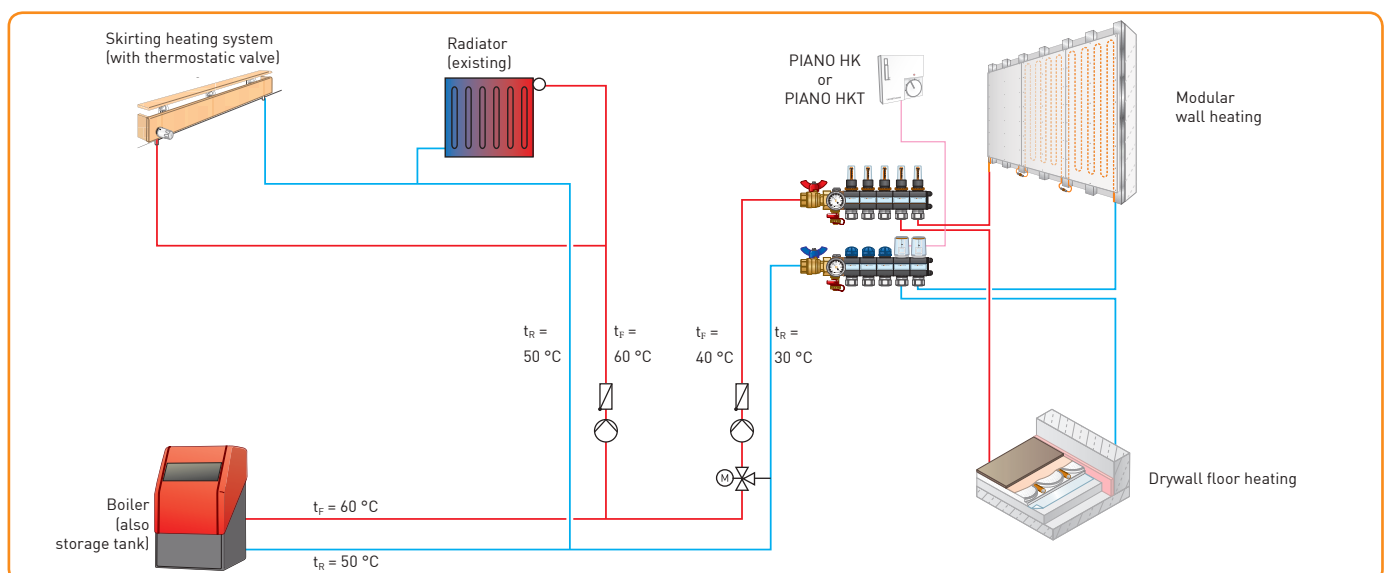
1.2 Distribution and control

Heating/cooling manifolds are installed for the distribution of water within the heating/cooling system.

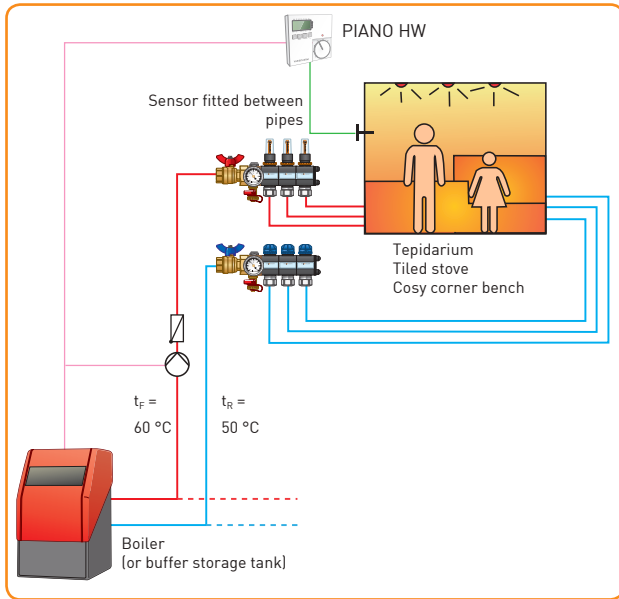
1.3 A few system diagrams (not intended to be exhaustive)



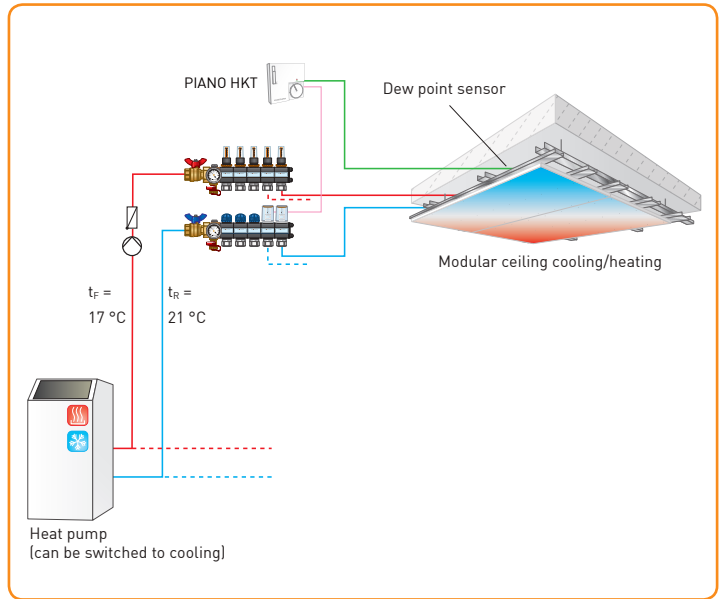
System with manifold



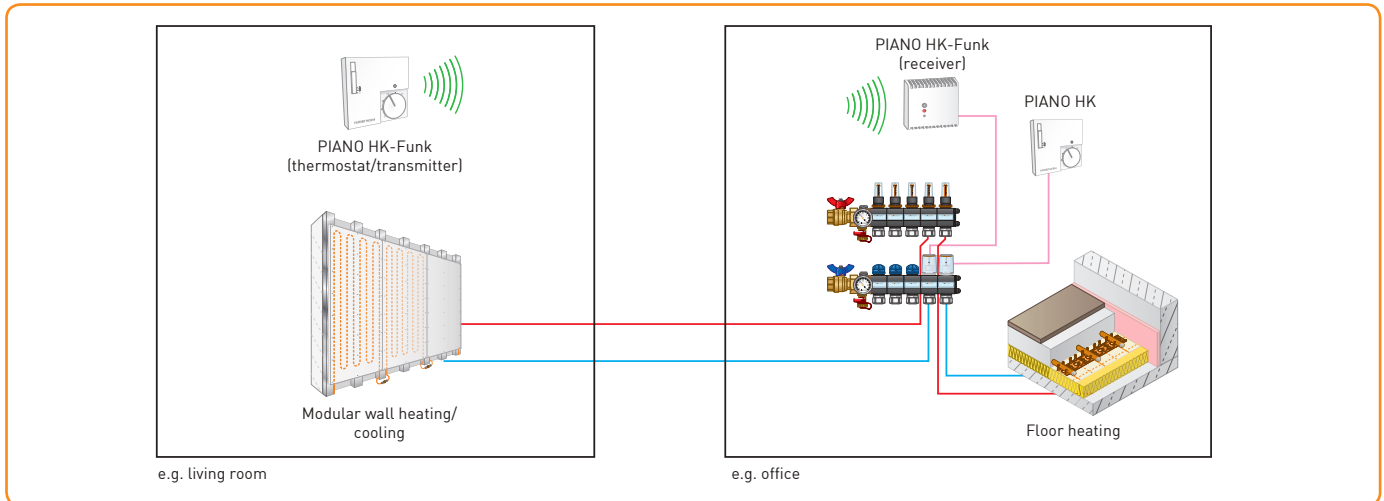
System with manifold and existing 2-pipe system



Tepidarium, tiled stove or cosy corner bench system

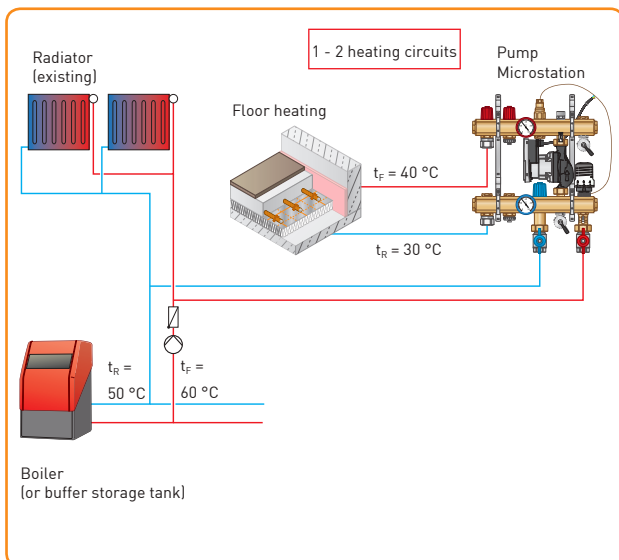


Surface heating and cooling system

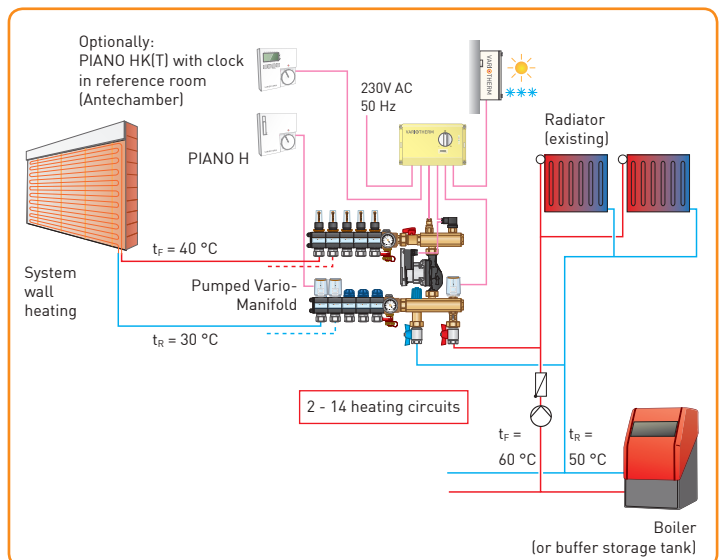


Radio solution in the absence of ductwork between the room thermostat and thermoelectric actuator

If you wish to create several surface heating circuits with low temperatures using an existing 2-pipe system, then install a microstation with a pump or a pumped manifold.

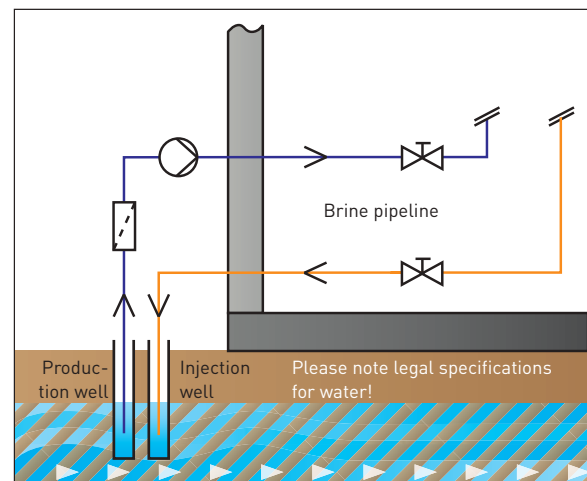
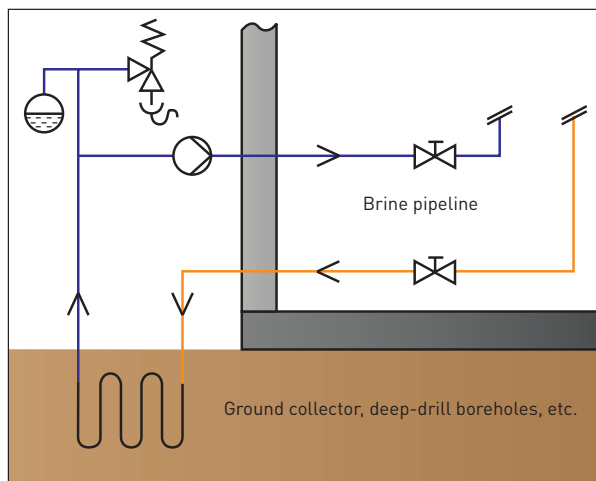
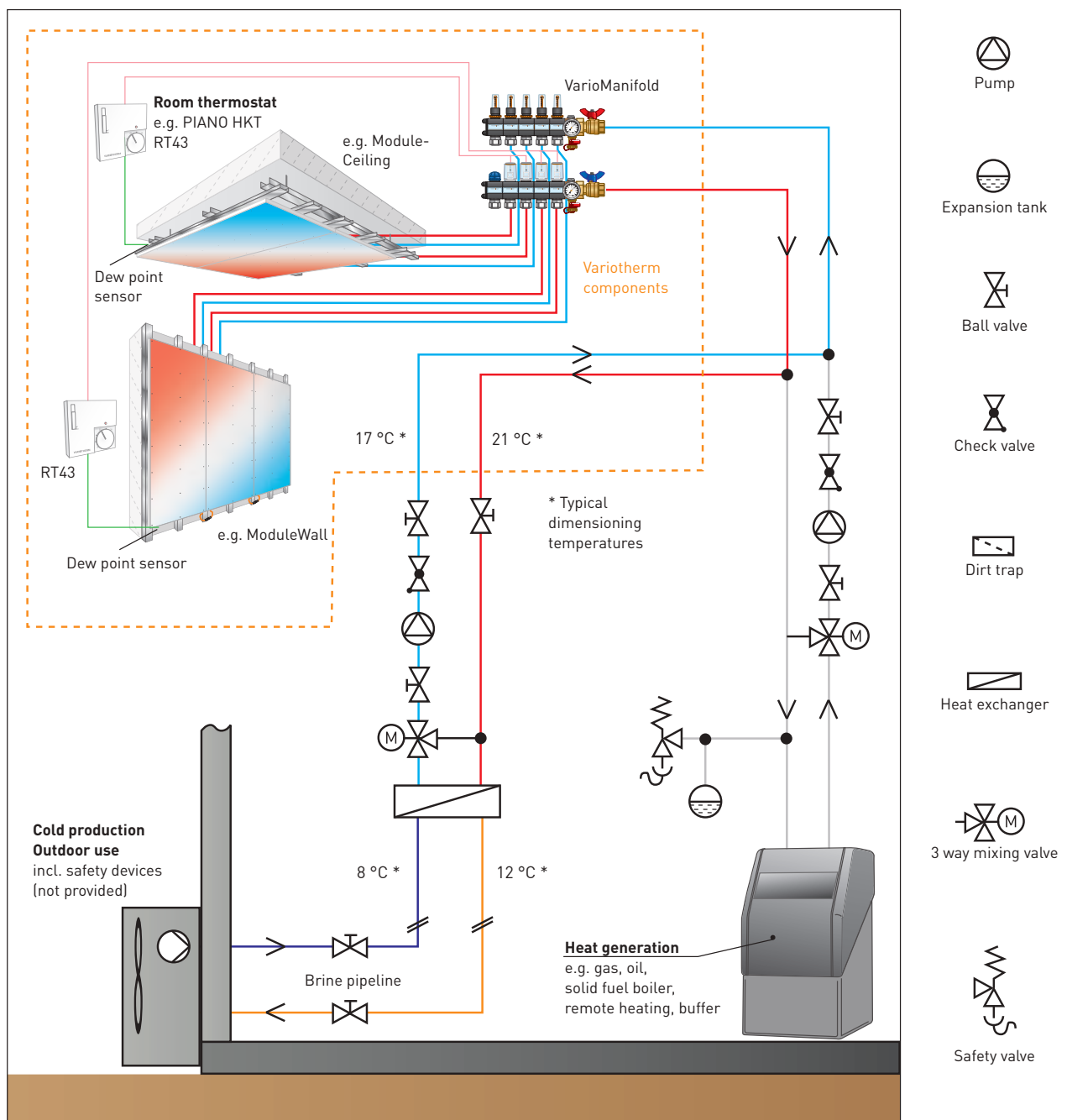


Pump Microstation and fixed-value regulator



Weather-guided pumped manifold

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

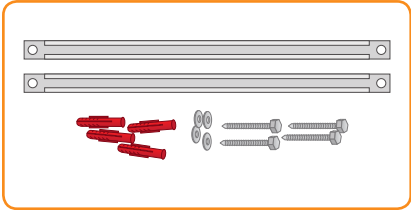


2 Manifold cabinets

If you intend to use manifold cabinets, these are mounted before the manifolds are installed.

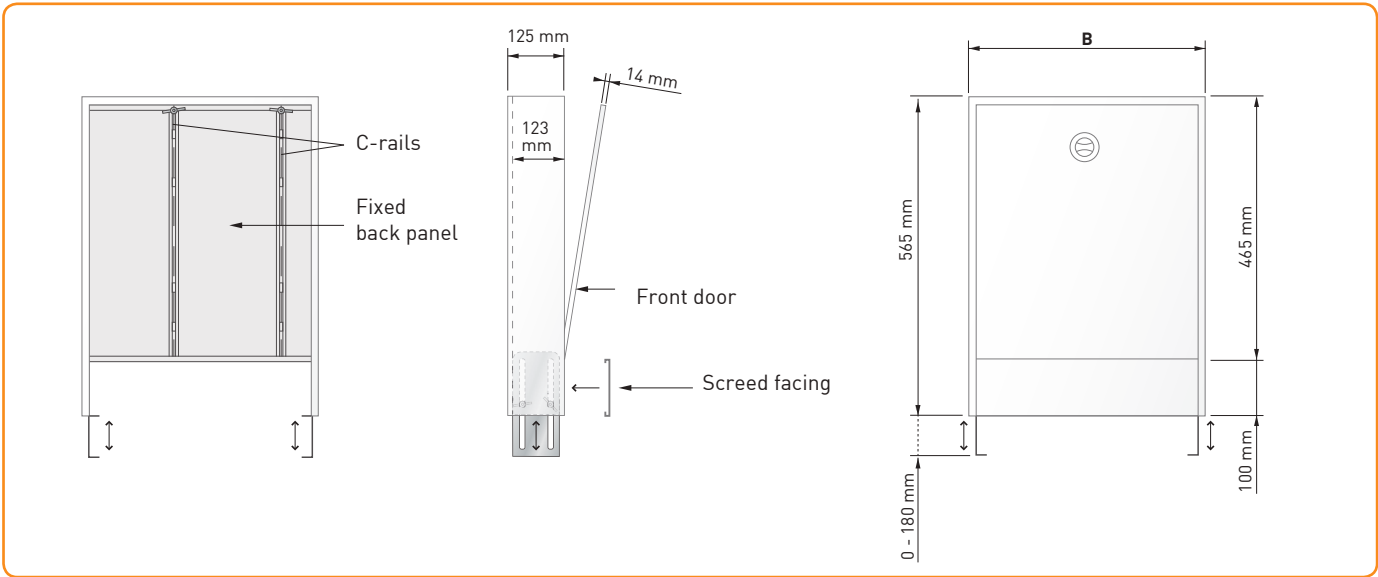
2.1 Fixing bars (wall mounting without manifold cabinet):

The fixing bars are mounted to the wall at a suitable distance depending on the manifold size using the screws (4x) provided. The VarioManifold, Pumped VarioManifold or Pump Microstation can then be attached to them.

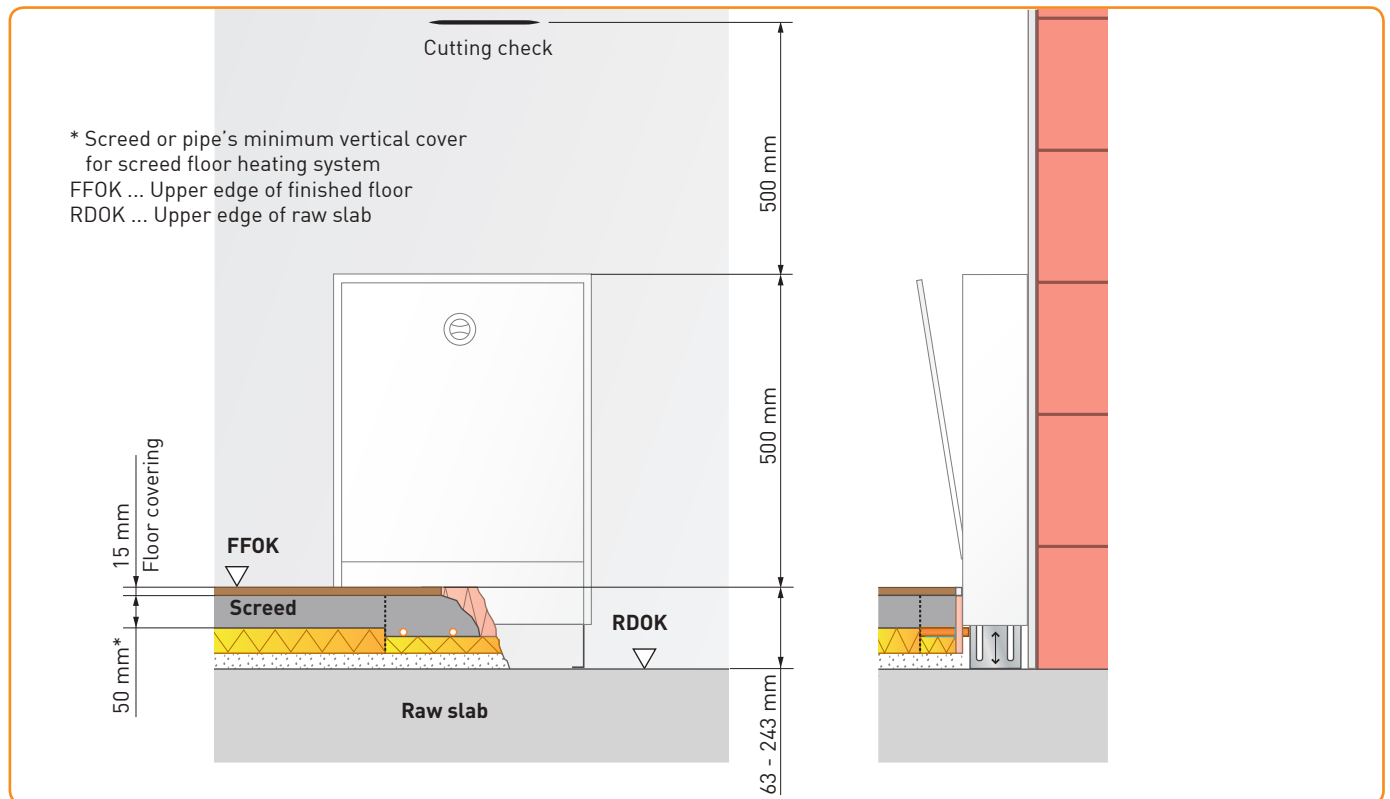


2.2 Manifold cabinet on-wall

The manifold cabinet is placed on the wall and screwed tight. For the bracket installation, see section 2.4.

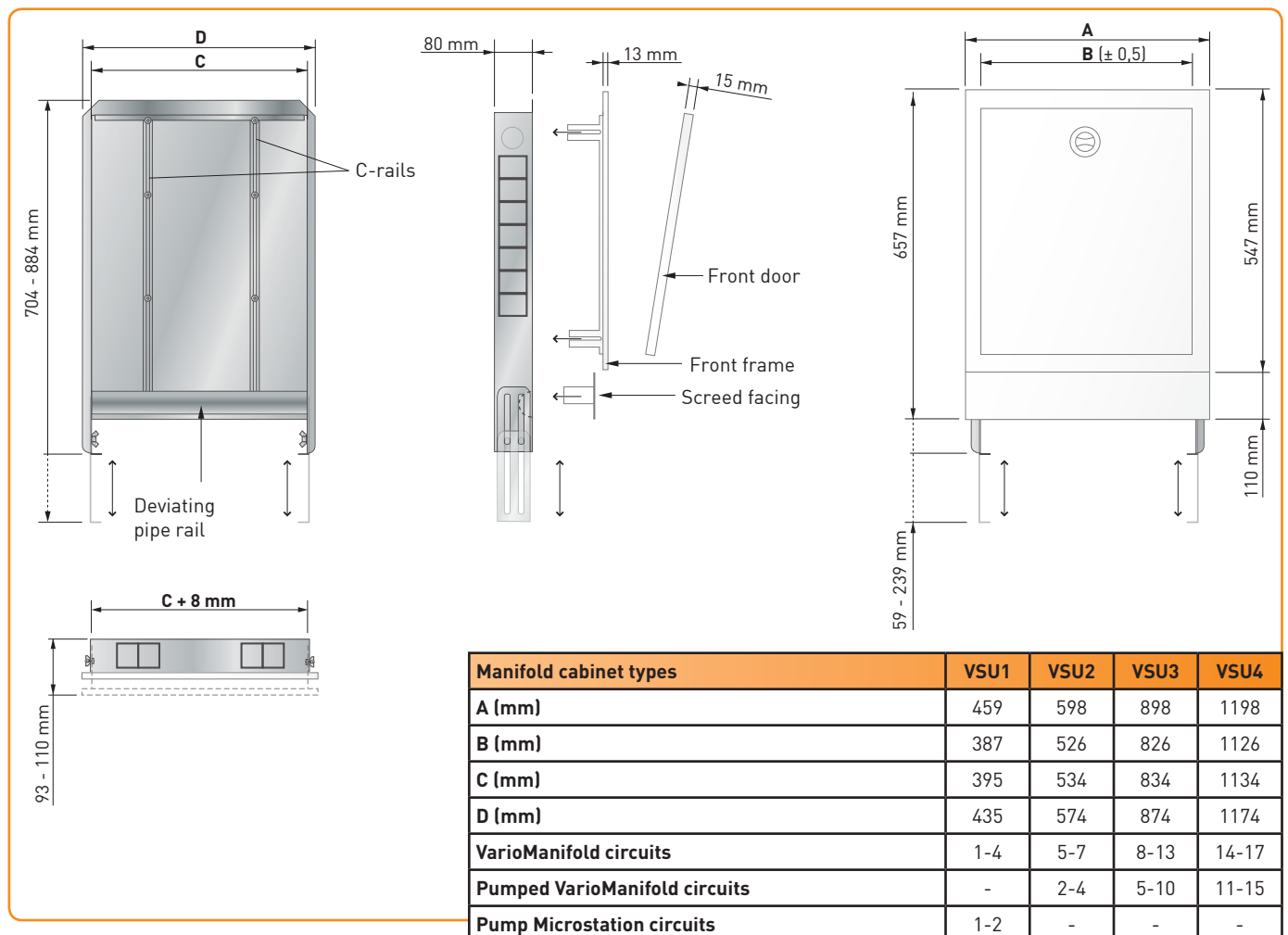


Manifold cabinet types	VSA1	VSA2	VSA3	VSA4
B (mm)	430	630	930	1230
VarioManifold circuits	2-3	1,4-7	8-13	14-17
Pumped VarioManifold circuits	-	2-6	7-12	13-15
Pump Microstation circuits	1-2	-	-	-



Example for on-wall installation

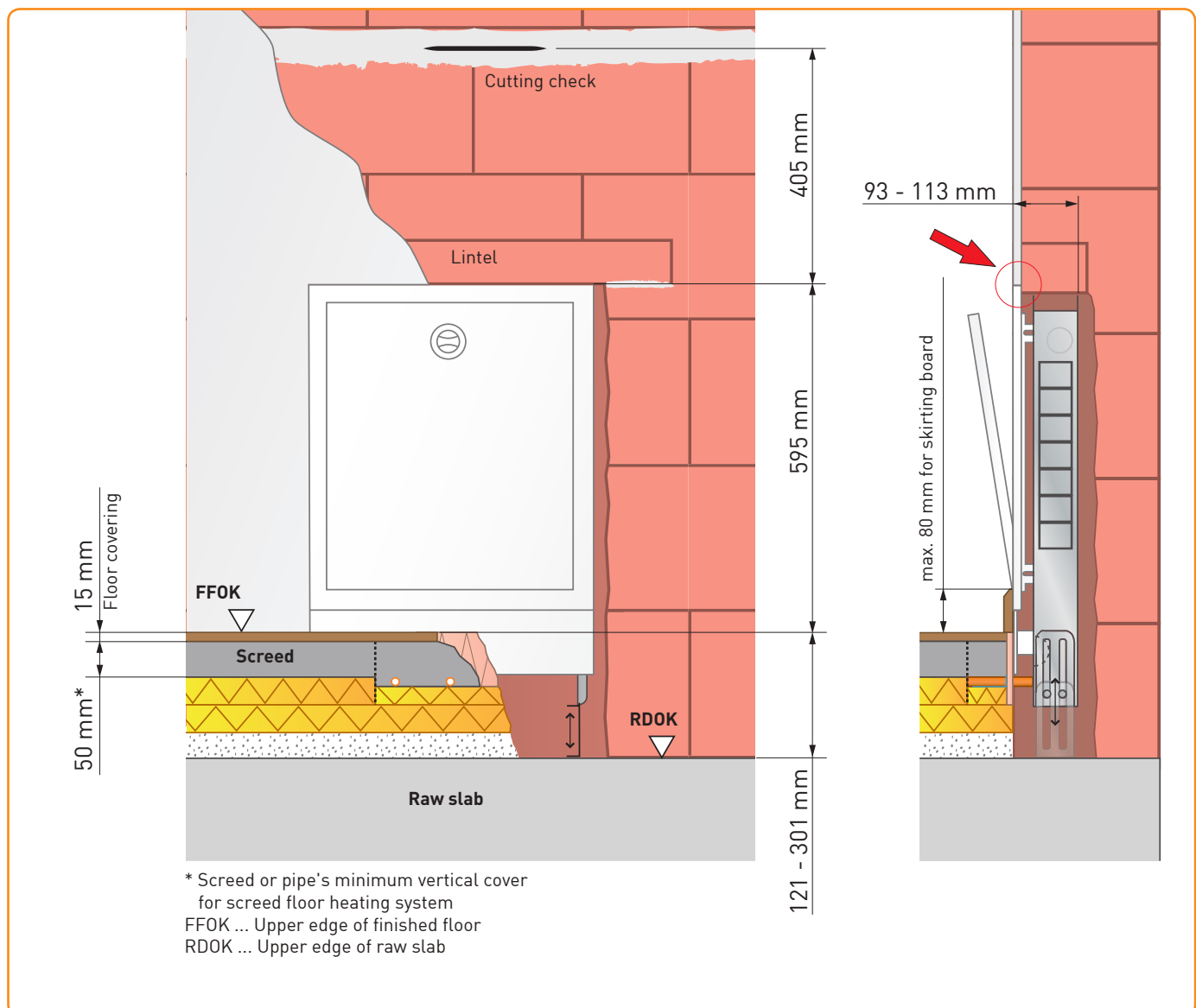
2.3 Manifold cabinet UF in-wall



- 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 (see chapter 2.4).
- 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 behind the deviating pipe bend into the floor and towards the heating surfaces.

In-wall mounted front frame:

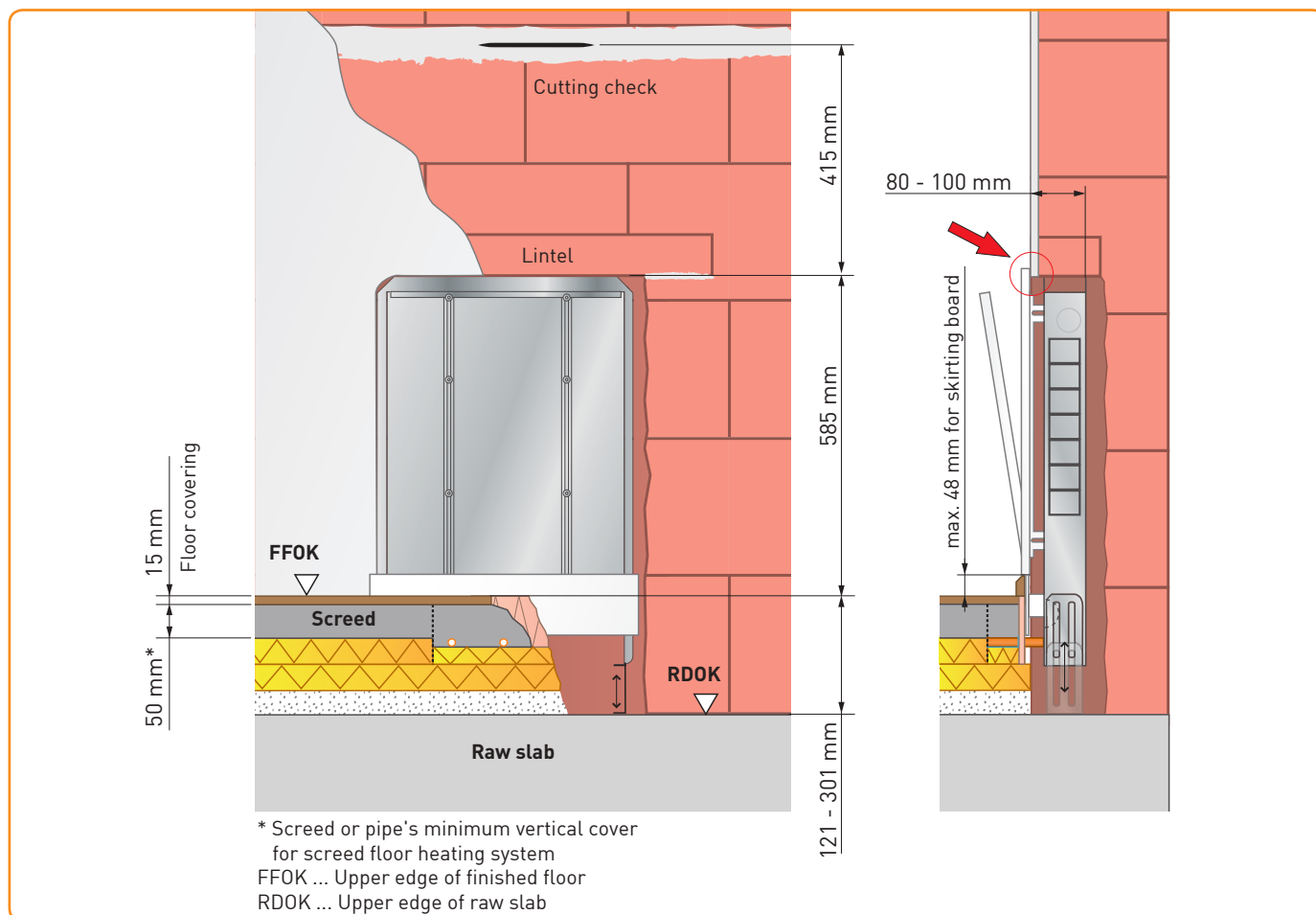
- 8a Attach the screed facing (this will not be plastered over later) - this covers the area between the front frame and the finished floor level. Cover all visible parts well (e.g. with painter's tape) - protect the opening from dirt with card or plastic film.
- 9a After completing the wall, remove the protective coverings or adhesive tapes and attach the doors.



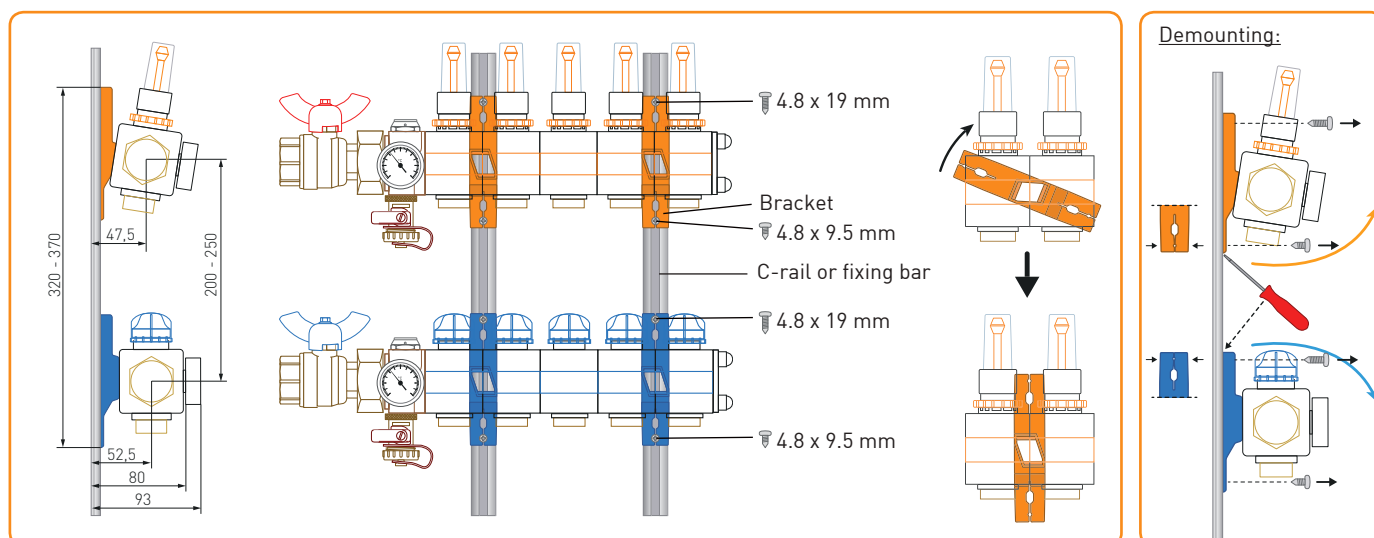
Example for in-wall mounted front frame

Wall-mounted front frame:

- 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 wall-mounted front frame

2.4 Bracket set and dimensions

3 VarioManifold 5.0

Manifold module with outlet facing upwards

200 - 250 mm

Flow

Return

Installation length

1 Locking ball valve, supply (1" female thread)

2 Locking ball valve, return (1" female thread)

3 Manual air vent

4 Thermometer

5 Feed & drain cock

6 Flow indicator

7 Flow segment with flow indicator

8 Return segment with stop valve

9 Thermoelectric actuator

10 Name labels blue

11 End plates (isolated)

12 Variotherm 3/4" Eurocone clamping screw fitting (for Variotherm pipes $\varnothing 11.6$, $\varnothing 16$ and $\varnothing 20$ mm)

13 Insulating grommet (optional)

Technical data:

Max. test pressure: 10 bar (only with water)	Max. operating overload pressure: 6 bar
Operating temperatures: -20 °C bis +90 °C (anti-freeze filling)	
Installation depth of manifold: 93 mm or 80 mm with removed thermometers	

230 V AC 50 Hz

Electrical distribution box (in close proximity to the heating/cooling distribution manifold)

for example 1,5 mm²

e.g. room thermostat PIANO H

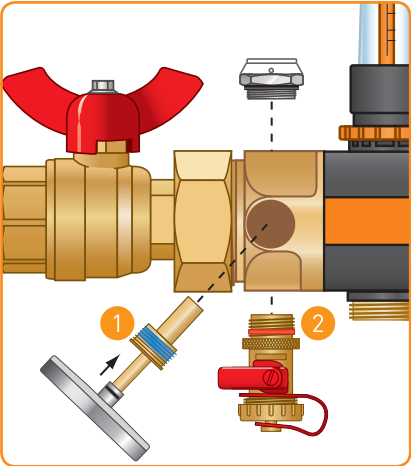
Elbow fitting 6/4" 90° (optional):

installation length +15 mm

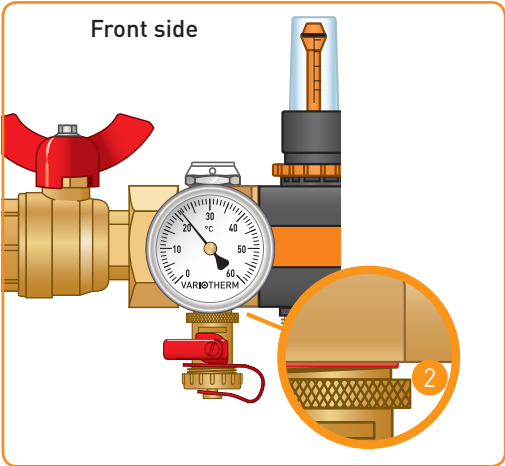
Manifold	Inst. length	Manifold	Inst. length
1 circuit (1-beam)	345 mm	10 circuits	645 mm
2 circuits	245 mm	11 circuits	695 mm
3 circuits	295 mm	12 circuits	745 mm
4 circuits	345 mm	13 circuits	795 mm
5 circuits	395 mm	14 circuits	845 mm
6 circuits	445 mm	15 circuits	895 mm
7 circuits	495 mm	16 circuits	945 mm
8 circuits	545 mm	17 circuits	995 mm
9 circuits	595 mm		

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

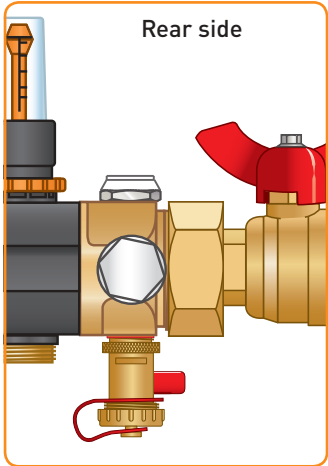
3.1 Assembly thermometer



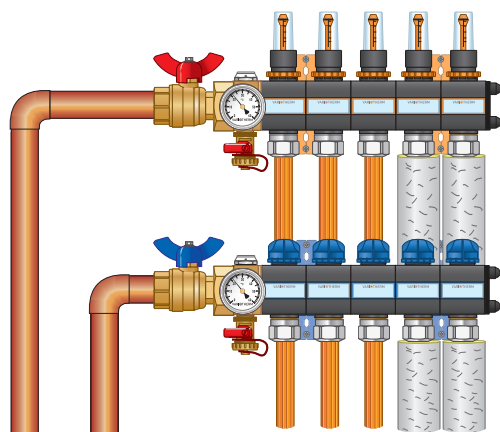
Screw the immersion sleeve 1 into the connection block and tighten with 15 Nm. Then insert the thermometer.



Do not completely tighten the feed cock 2. The seal remains just visible.



3.2 Possible variations

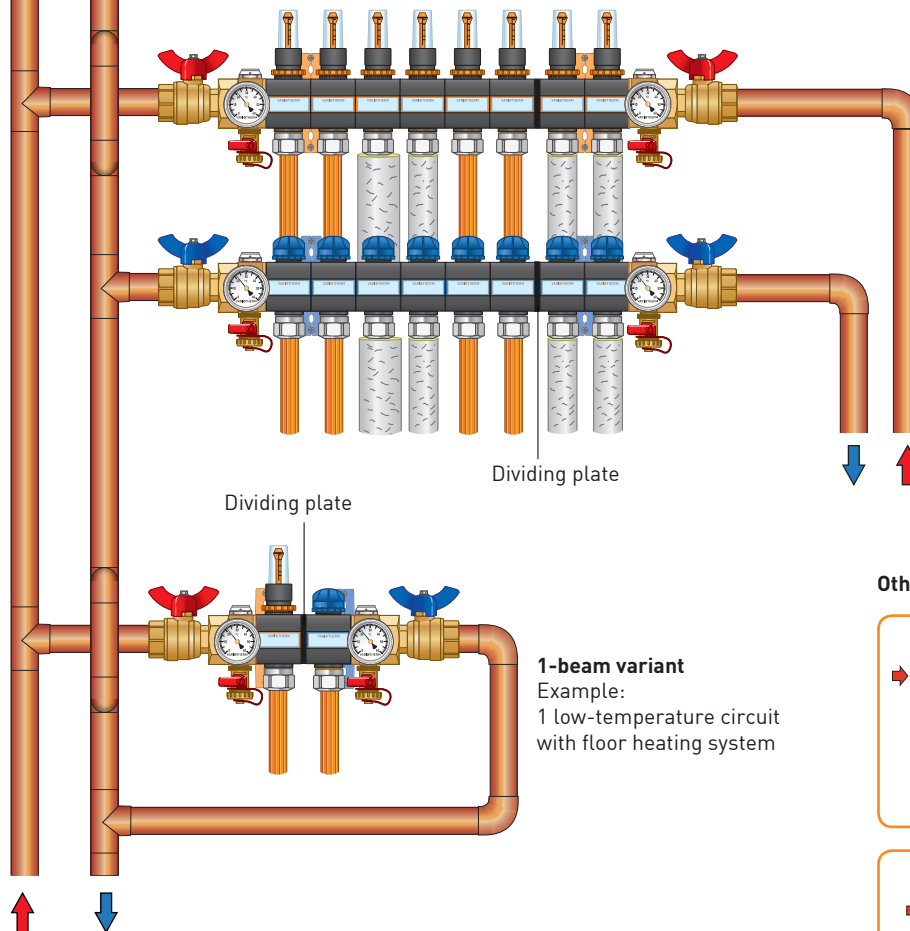


Basic Version

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

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



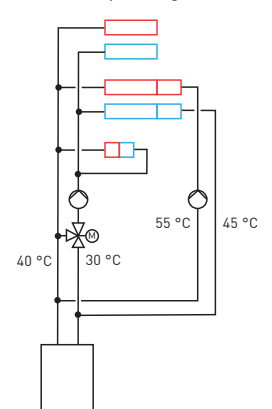
Dividing plate

Dividing plate

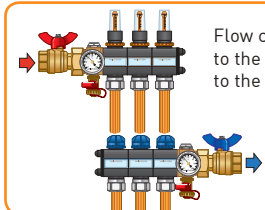
1-beam variant

Example:
1 low-temperature circuit
with floor heating system

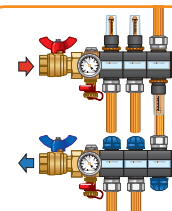
Example diagram:



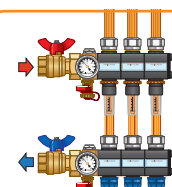
Other variants:



Flow connected
to the left, return
to the right



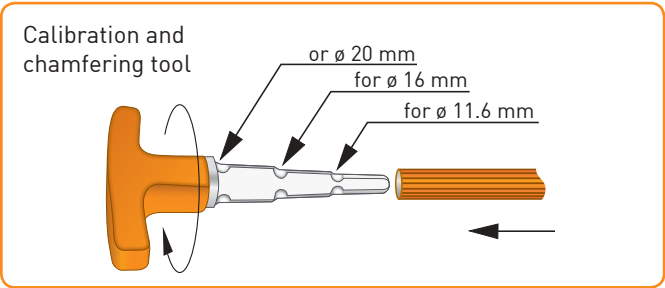
One circuit
facing upwards



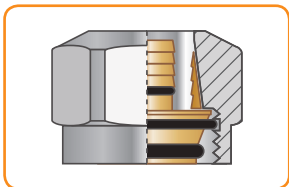
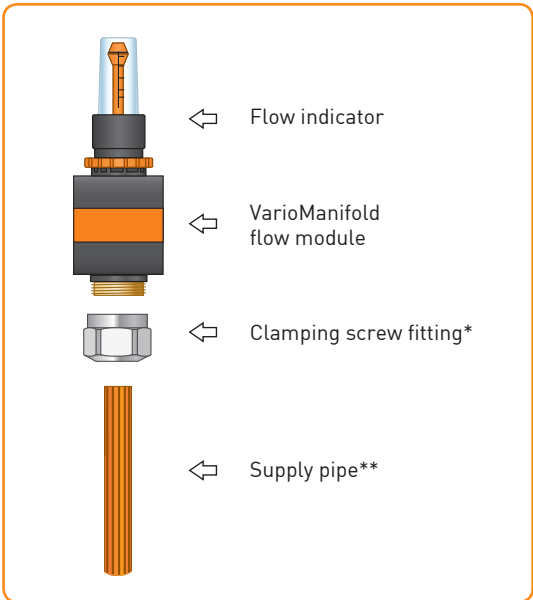
All circuits
facing upwards

Dimensioning example for supply pipe to heating distribution manifold $\Delta t (t_F - t_R) = 10 \text{ K}$		
Heating circuits	Heat output	Dimensions for copper/multi-layer supply pipes
≤ 6	$\leq 7.5 \text{ kW}$	for example Cu22x1.0 / 26x3
7 - 11	7.5 - 14 kW	for example Cu28x1.0 / 32x3
12 - 17	14 - 20 kW	for example Cu35x1.2 / 40x4
Dimensioning example for supply pipe to cooling distribution manifold $\Delta t (t_F - t_R) = 4 \text{ K}$		
Cooling circuits	Cooling performance	Dimensions for copper/multi-layer supply pipes
≤ 6	$\leq 3.5 \text{ kW}$	for example Cu22x1.0 / 26x3
7 - 11	3.5 - 6.5 kW	for example Cu28x1.0 / 32x3
12 - 17	6.5 - 9.5 kW	for example Cu35x1.2 / 40x4

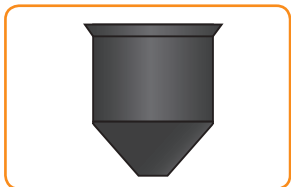
3.3 Connecting the Variotherm pipes



- 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.
- 3 Tighten the clamping screw fitting for one more turn with an open-end wrench. The tightening torque is 35 Nm.



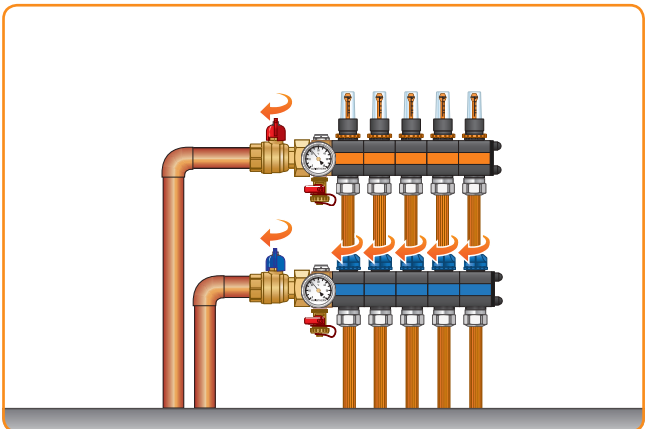
Clamping screw fitting*
3/4"EURO



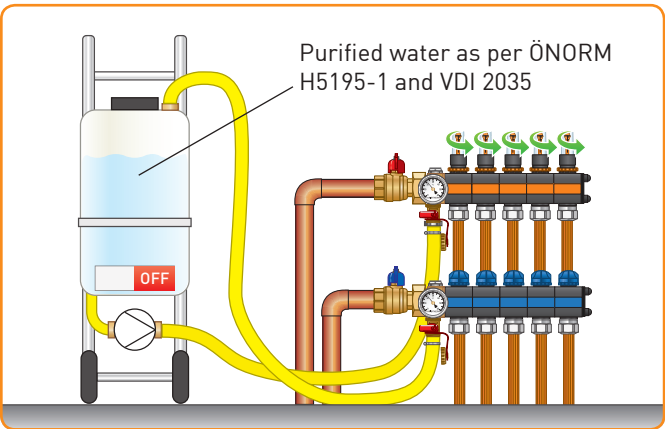
Insulating grommet,
Protection against condensa-
tion at the clamping screw fit-
ting in case of cooling.

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

3.4 Filling/flushing/deaerating the system

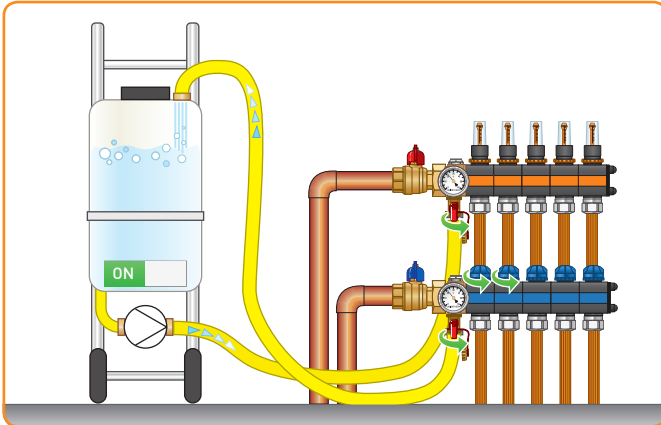


- 1 Main locking ball valves and all return modules are closed. ↻



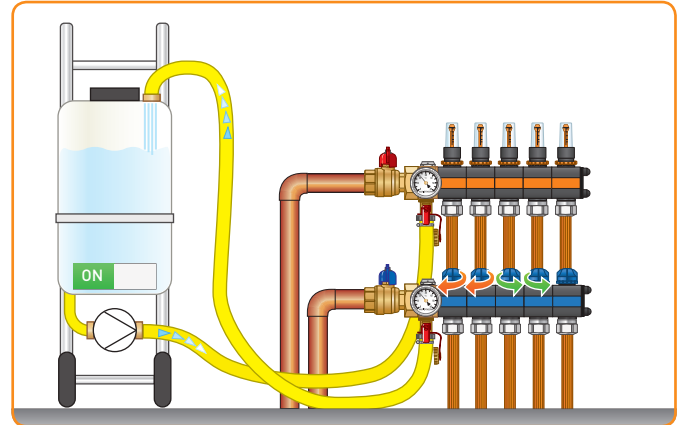
2. All flow valves are opened. ↻
3. Then connect the filling and flushing station to both feed & drain cocks on the supply and return pipes.

Attention: Flushing only in flow direction!



4 Switch on the flushing and filling station. Then turn on the feed & drain cocks; the supply pipe is pressurised and the return segments of the first two heating/cooling circuits are opened.

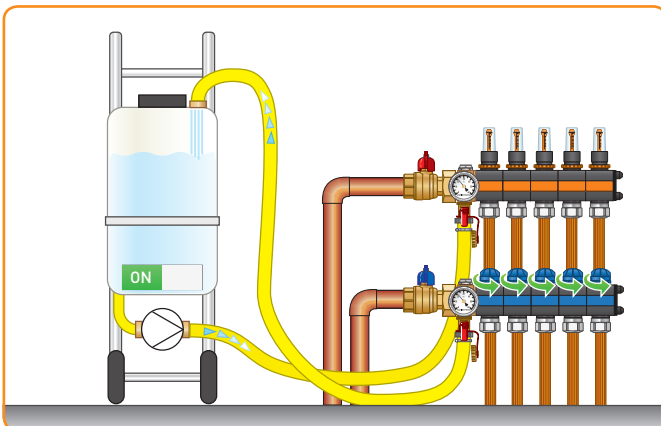
➡ This thoroughly flushes water through the supply line into the two heating/cooling circuits.



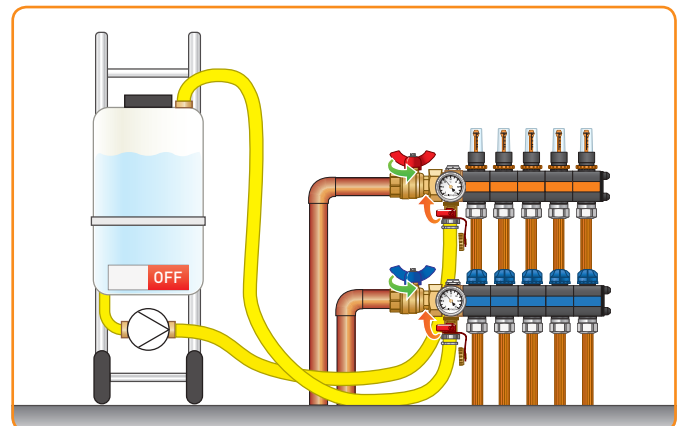
5 Once the water comes out with no air bubbles, the opened return modules are to be closed. ↶

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.

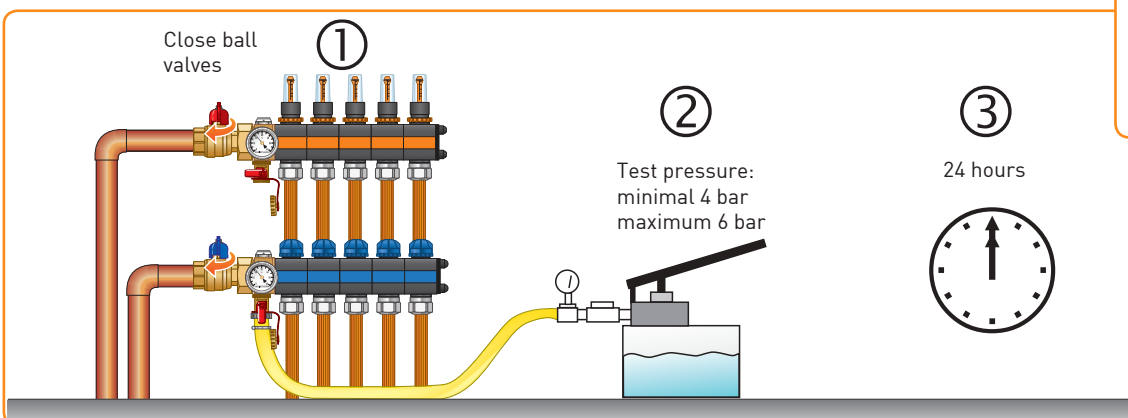


7 Finally, this „flushing procedure“ is repeated upon opening of all flow and return modules. ➡



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

3.5 Pressure test



4) Then retighten screws and reduce pressure to 2 - 3 bar.

Maintain this pressure until completion of the object in order to identify any possible damage.

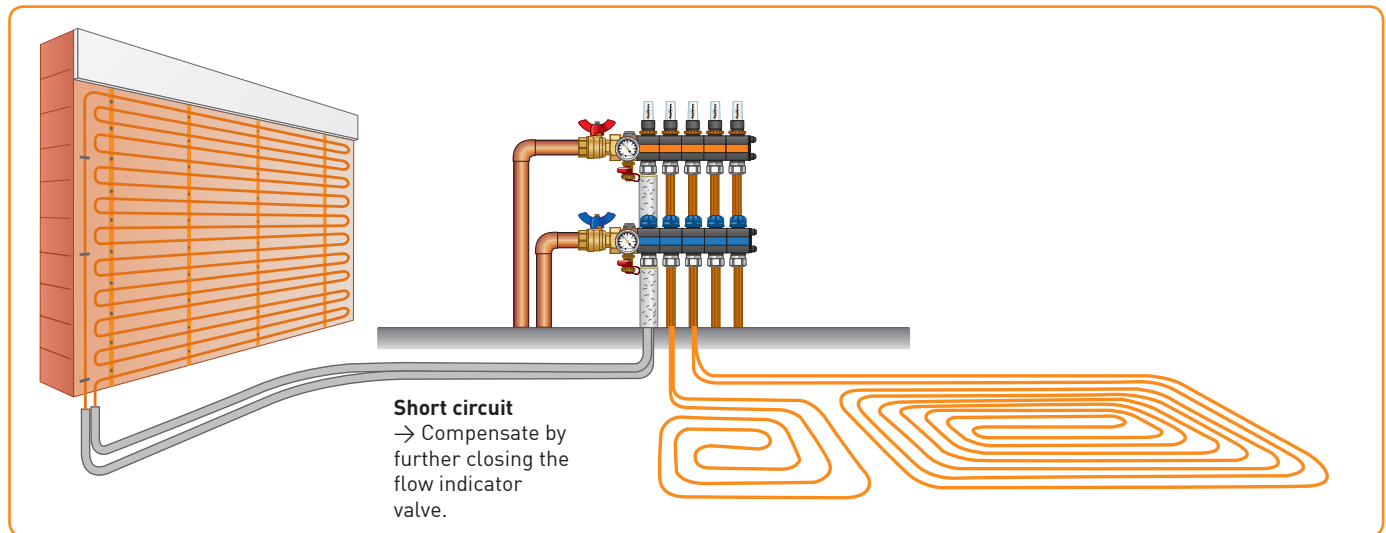
Caution: Concrete (screed/industrial floor heating systems) heats up during the binding process, increasing the pressure in the heating system. Always use an expansion tank and a safety valve!



Pressure test pump

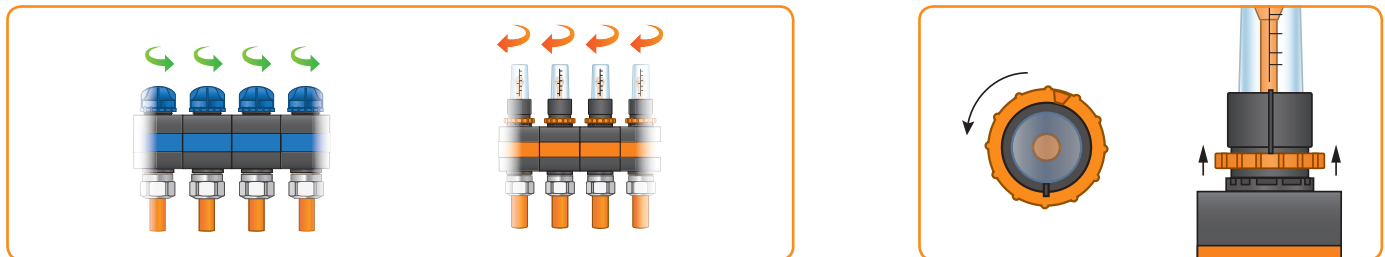
3.6 Hydronic balancing

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.



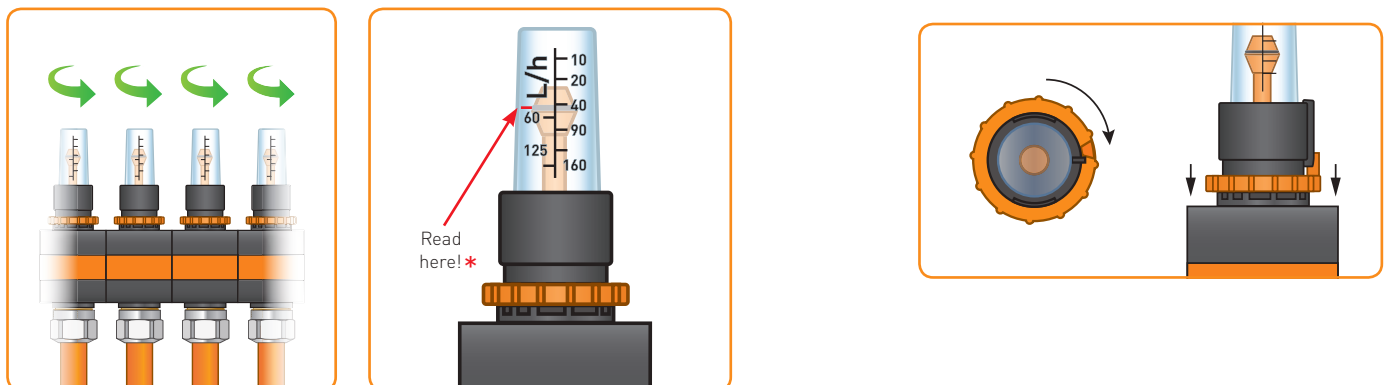
Hydronic balancing is performed by means of the flow rate valve in the flow (orange segment).

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. Then press the affixing ring down.



* Values may differ due to no purified water or polluted heating water (corrosion).

3.7 Hydronic balancing handover protocol

- ☐ Hydronic balancing has been carried out according to the values of the heat requirement calculation
- ☐ Hydronic balancing has been carried out with individual adjustments

Heating/cooling distribution manifolds

[illegible]

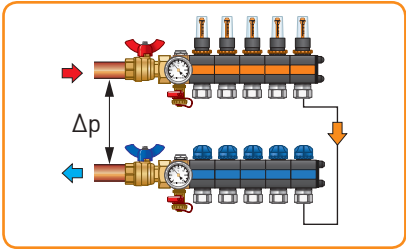
Carried out by:

Place, date, signature (installer):

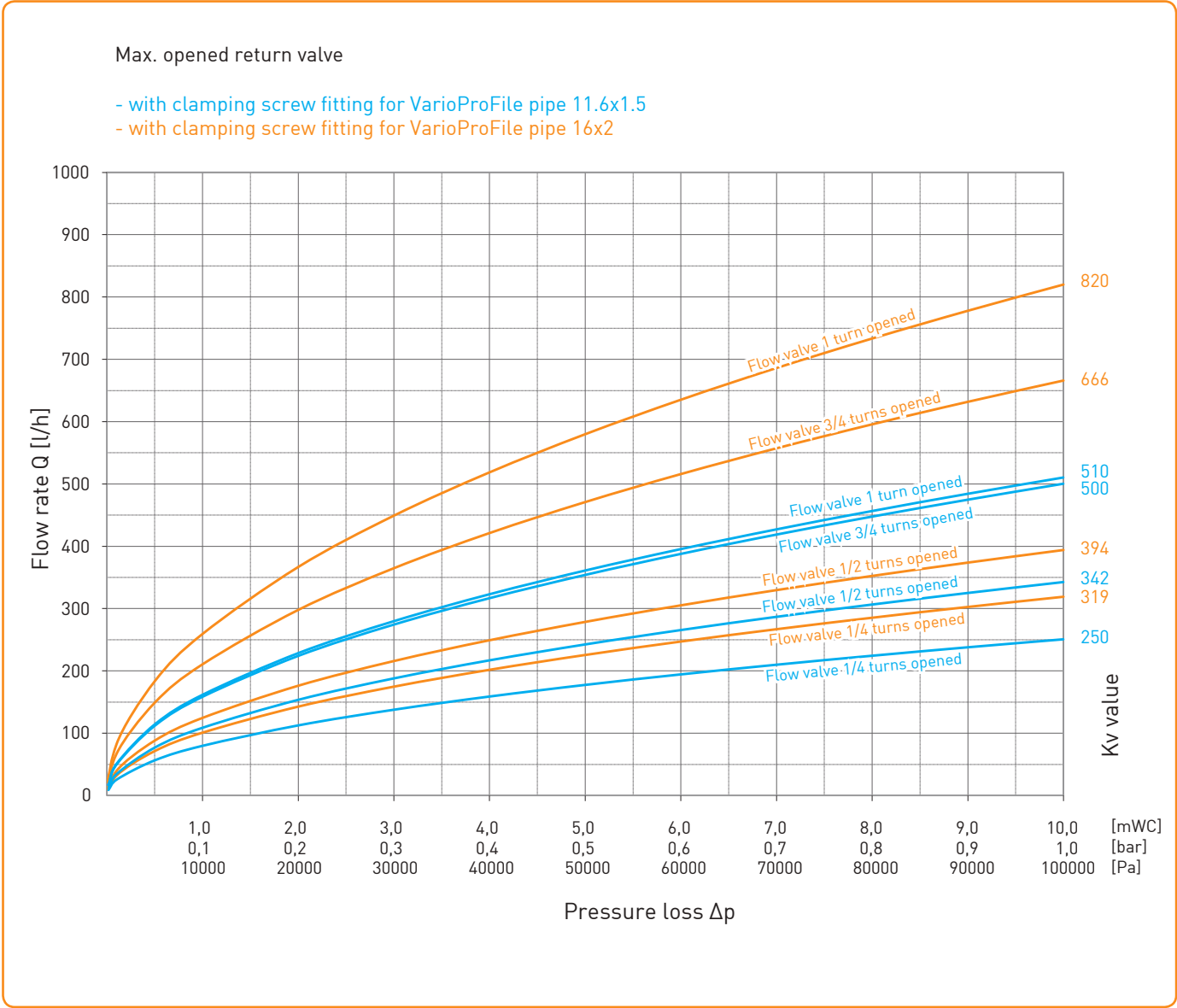
Construction project:

Place, date, signature (installer):

3.8 Flow characteristic curve



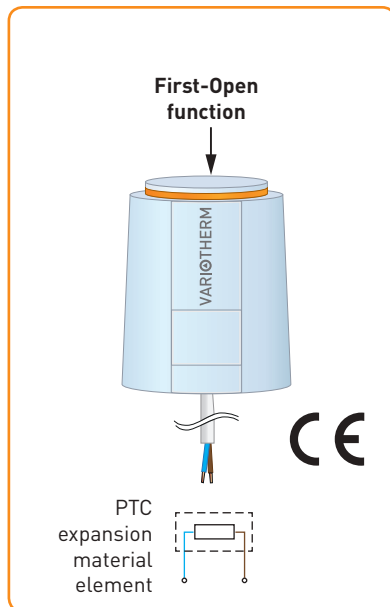
To ascertain the pressure loss of the heating/cooling distribution manifold for the respective heating/cooling circuits (without pressure loss of pipes).



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.

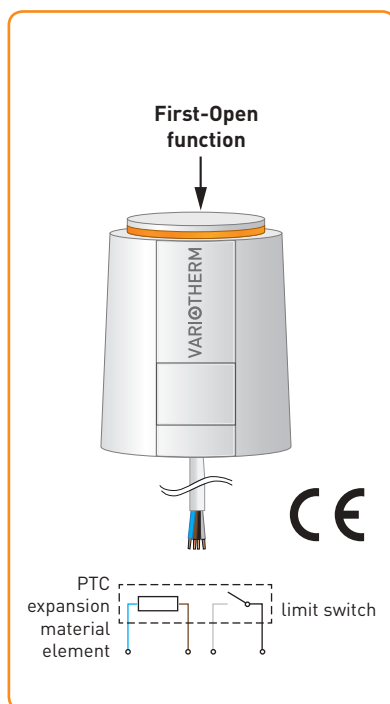
4.1 Thermoelectric actuator



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	
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
CE conformity as per	EN 60730	
Housing/housing colour:	Polyamide/light blue	
Weight	100 g with 1 m connection cable	
Connection line	2 x 0,75 mm² PVC grey / 1 m	
Overvoltage resistance as per EN 60730-1	min. 2.5 kV	min. 2.5 kV

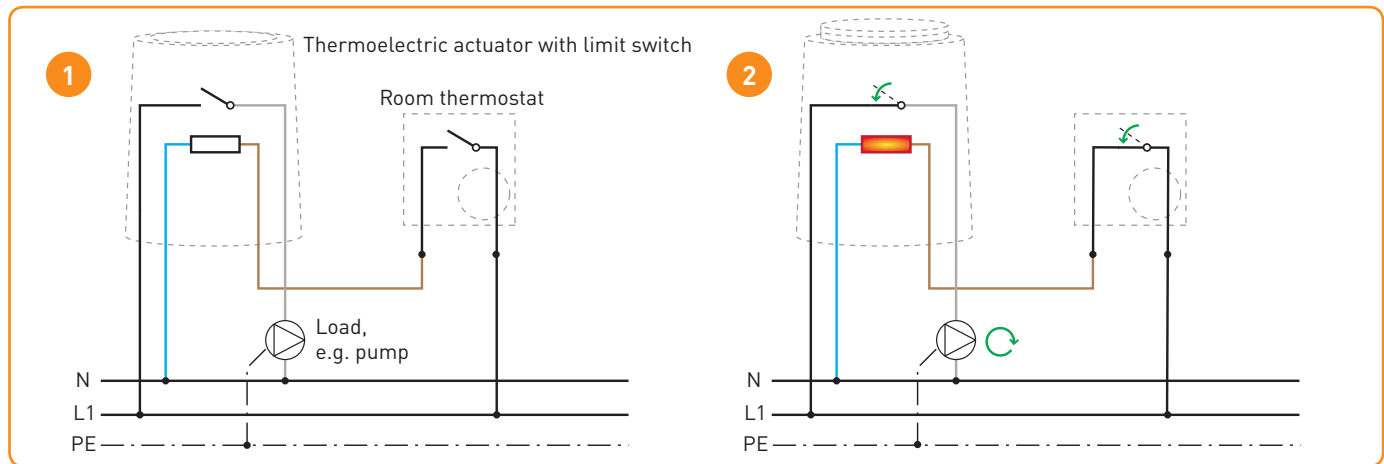
4.2 Thermoelectric actuator with limit switch

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	
Closing and opening times	approx. 3 min.	
Adjustment travel	4 mm	
Adjustment force	100 N ±5 %	
Limit switch - switching current	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 with 1 m connection cable	
Connection line	4 x 0,75 mm² PVC grey / 1 m	
Overvoltage resistance as per EN 60730-1	min. 2.5 kV	1 kV

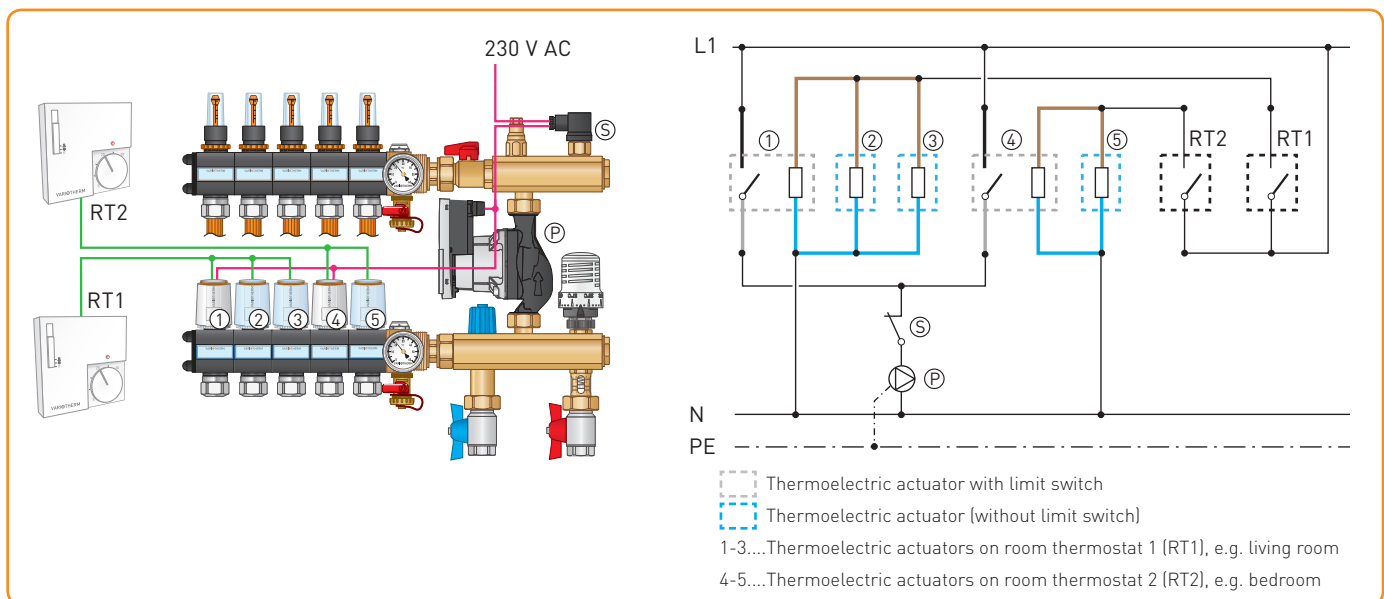
***First-Open function:** The Thermoelectric actuator is switched to open when power off by default so that the installer can immediately start the system with installed thermoelectric actuators. If the thermoelectric actuator is energised for → 6 minutes, it will be switched to closed when power off.



Cabling diagram - basic wiring

Functionality description::

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

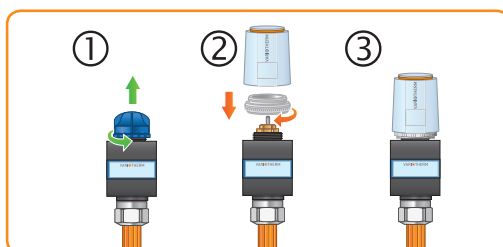


Wiring of limit switches for several thermoelectric actuators on a pumped manifold (example)

Functionality description:

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.

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

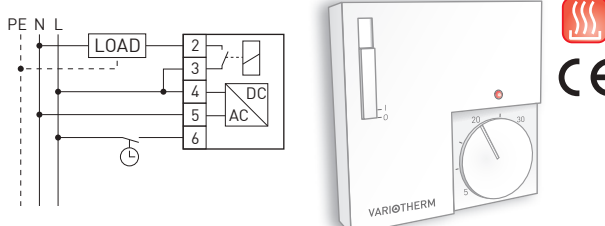
5 Controllers

5.1 Type overview

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.

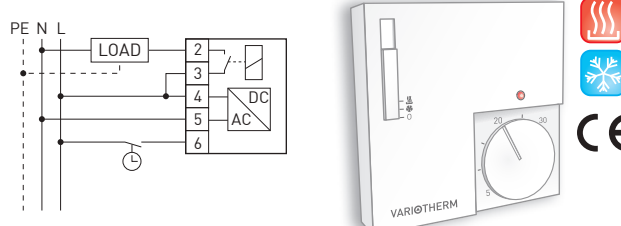
PIANO H electronic room thermostat

for heating mode. Item number: RT40

	
Operating voltage:	230 V AC, 50 Hz
Relay output:	floating input ¹⁾ (NO contact), 10 A, 230 V AC
Temperature range:	+5 ... +30 °C
Switching difference:	±0.2 K
Protection degree:	IP 30
Features:	KTY semiconductor sensor Screw connections On/off switch Switching status display
Weight:	85 g
Protection class:	II
Size (h x w x d):	81 x 81 x 16 [25] mm
Attachment:	to in-wall box
Colour:	RAL 9010 Pure white

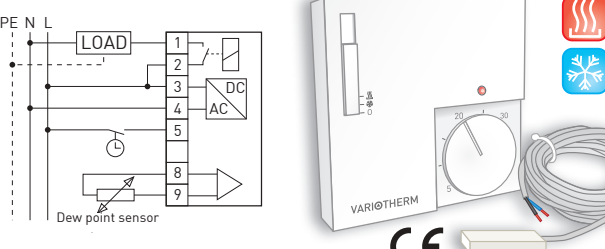
PIANO HK electronic room thermostat

for heating/cooling mode. Item number: RT41

	
Operating voltage:	230 V AC, 50 Hz
Relay output:	floating input ¹⁾ (NO contact), 10 A, 230 V AC
Temperature range:	+5 ... +30 °C
Switching difference:	±0.2 K
Protection degree:	IP 30
Features:	KTY semiconductor sensor Screw connections Off/heating/cooling switch Switching status display
Weight:	95 g
Protection class:	II
Size (h x w x d):	81 x 81 x 16 [25] mm
Attachment:	to in-wall box
Colour:	RAL 9010 Pure white

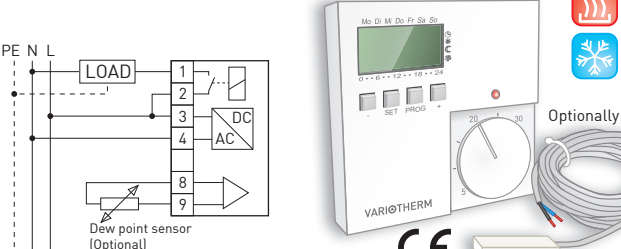
PIANO HKT electronic room thermostat

for heating/cooling operation. Item number: RT42

	
Operating voltage:	230 V AC, 50 Hz
Relay output:	floating input ¹⁾ (NO contact), 5 A, 230 V AC
Temperature range:	+5 ... +30 °C
Switching difference:	±0.2 K
Protection degree:	IP 30
Sensor cable:	5 m (extendible to max. 20 m with 2x1.5 mm ²)
Features:	incl. dew point sensor KTY semiconductor sensor Screw connections Off/heating/cooling switch Switching status display LED red/orange
Weight:	210 g
Protection class:	II
Size (h x w x d):	81 x 81 x 16 [36] mm
Attachment:	to in-wall box
Colour:	RAL 9010 Pure white

PIANO HK(T) electronic room thermostat with clock

for heating/cooling mode. Item number: RT43

	
Operating voltage:	230 V AC, 50 Hz
Relay output:	floating input ¹⁾ (NO contact), 5 A, 230 V AC
Temperature range:	+5 ... +30 °C
Temperature switching difference:	settable
Protection degree:	IP 30
Features:	KTY semiconductor sensor Screw connections Switching status display Digital clock with weekly program 32 switching points (heating) and 32 switching points (cooling) (Optionally: operation with dew point sensor, item number: RT421)
Weight:	190 g
Protection class:	II
Size (h x w x d):	81 x 81 x 16 [36] mm
Attachment:	to in-wall box
Colour:	RAL 9010 Pure white

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

PIANO HF electronic room thermostat
with heating surface sensor

for heating mode. Item number: RT44

Operating voltage:	230 V AC, 50 Hz
Relay output:	non floating input (NO contact), 10 A, 230 V AC
Temperature range room:	+5 ... +30 °C
Temperature range surface:	+5 ... +55 °C
Switching difference:	±0.2 K
Protection degree:	IP 30
Sensor cable:	Length: 4 m (extendible to max. 25 m with 2x0.75 mm²)
Features:	KTY semiconductor sensor (room & surface) Screw connections On/off switch Switching status display Individual settings for room and surface temperature
Weight:	210 g
Protection class:	II
Size (h x w x d):	81 x 81 x 16 (25) mm
Attachment:	to in-wall box
Colour:	RAL 9010 Pure white

PIANO HW electronic surface thermostat with clock

for heating mode. Item number: RT60

Operating voltage:	230 V AC, 50 Hz
Relay output:	non floating input (NO contact), 16 A, 230 V AC
Temperature range surface:	+10 ... +50 °C
Temp. switching difference:	settable
Protection degree:	IP 30
Sensor cable:	Length: 4 m (extendible to max. 25 m with 2x0.75 mm²)
Features:	KTY semiconductor sensor Screw connections Switching status display Digital clock with weekly programme
Weight:	280 g
Protection class:	II
Size (h x w x d):	81 x 81 x 16 (36) mm
Attachment:	to in-wall box
Colour:	RAL 9010 Pure white

Surface mounting frame for room thermostat

Item number: RT491

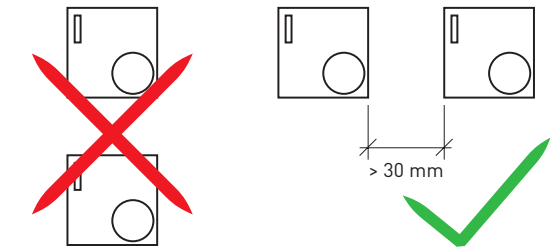
Application:	for installation without existing in-wall box, compatible with following room thermostats: <ul style="list-style-type: none"> PIANO H PIANO HK PIANO HF
Weight:	35 g
Size (h x w x d):	81 x 81 x 18 mm
Attachment:	surface mounting
Colour:	RAL 9010 Pure white

PIANO HK-Funk electronic room thermostat

for heating/cooling mode. Item number: RT47

Radio receiver connection diagram:	
Radio thermostat (transmitter):	
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
Weight:	70 g
Protection class:	III (extra-low voltage, DIN EN 60730-1)
Size (h x w x d):	81 x 81 x 16 mm
Attachment:	surface mounting
Colour:	RAL 9010 Pure white
Radio receiver:	
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 frequency:	433,92 MHz
Features:	Switching status display
Weight:	90 g
Protection class:	II
Protection degree:	IP 30
Size (h x w x d):	71 x 71 x 31 mm
Attachment:	surface mounting or in-wall box (outside of the manifold box)

Arrangement of multiple room thermostats:

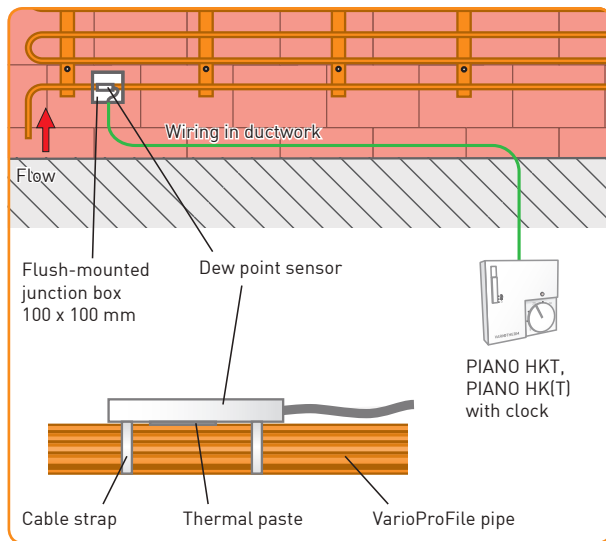


5.2 Fitting dew point sensor

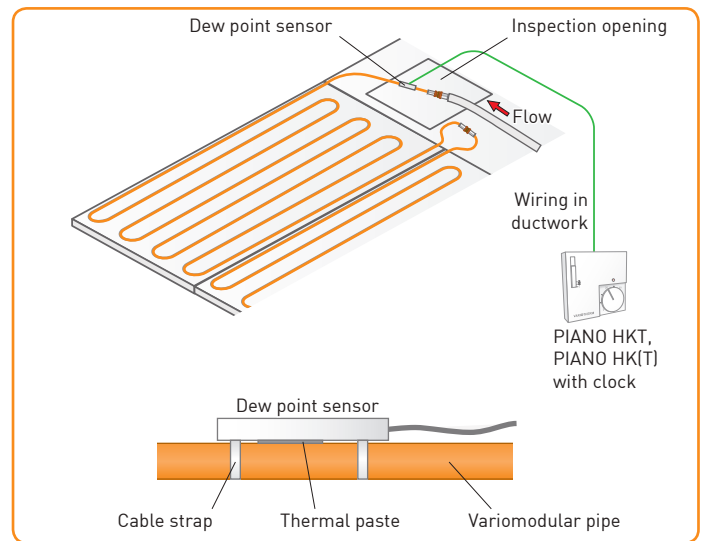
With *PIANO HKT* and *PIANO HK(T)* with clock, the associated dew point sensor (available separately for *PIANO HK(T)*) is connected. Use: SystemWall cooling, EasyFlexWall cooling, ModuleWall/ModuleCeiling cooling.

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.

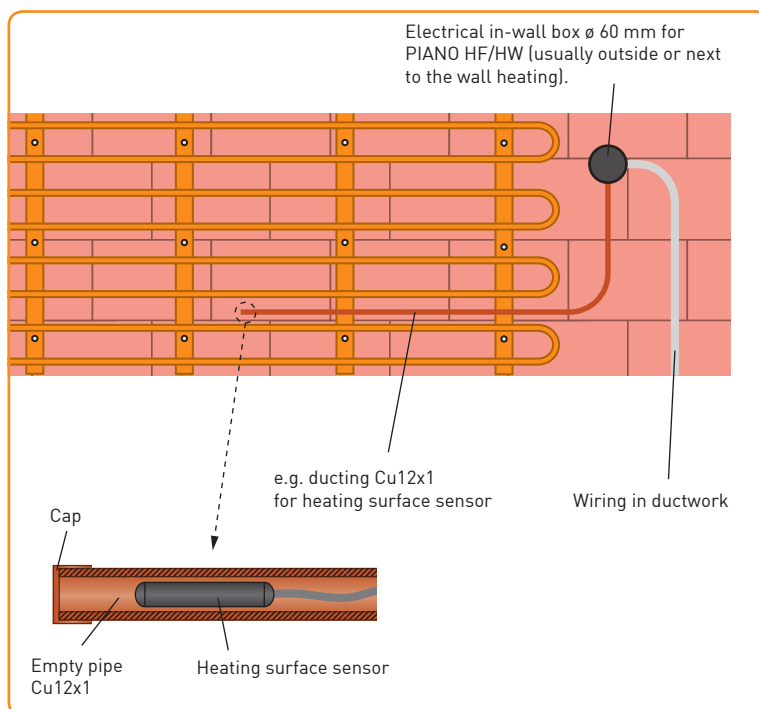


Example System wall cooling



Example Modular ceiling cooling

5.3 Fitting heating surface sensor



Example EasyFlex wall heating

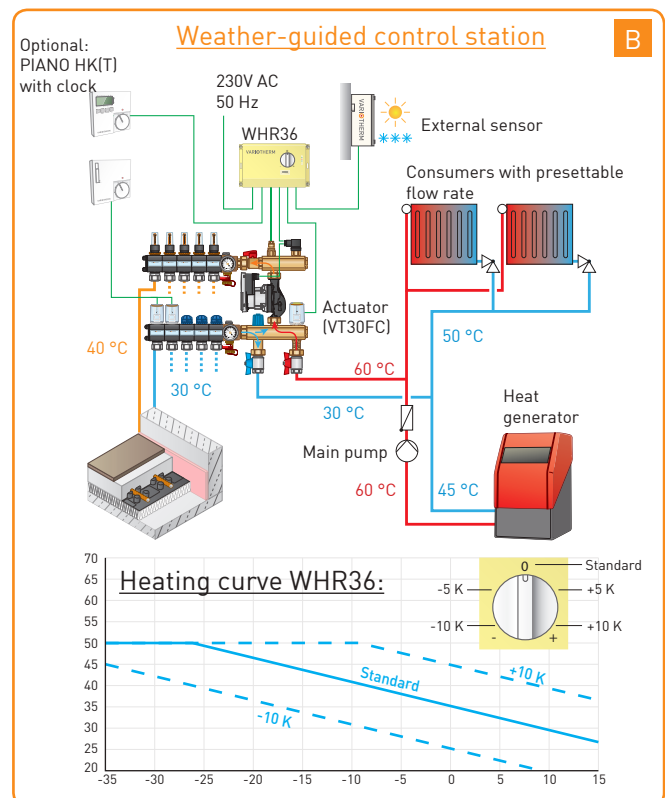
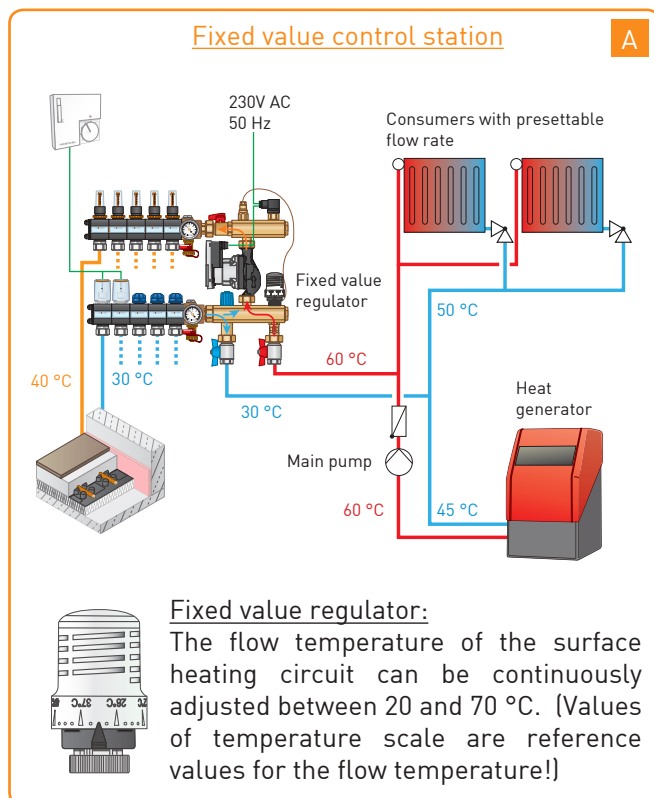
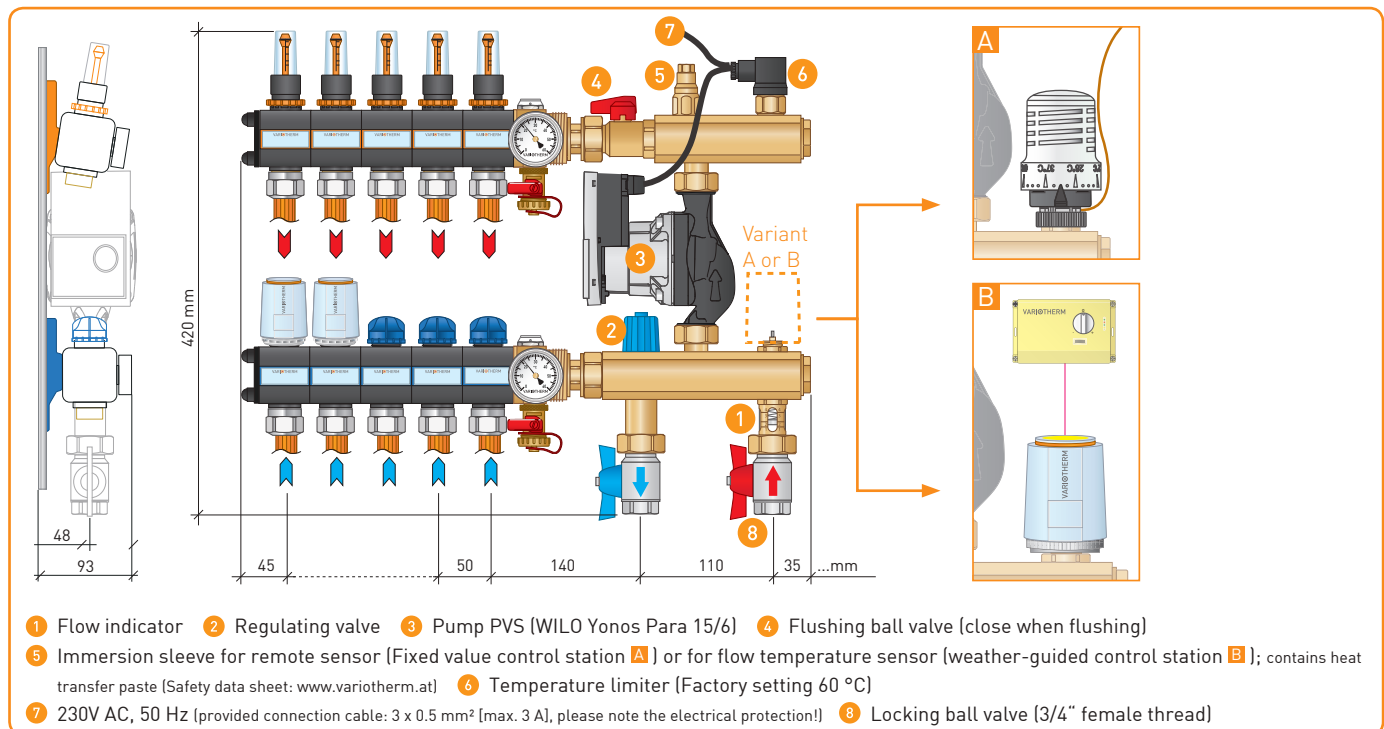
With *PIANO HF* and *PIANO HW* with clock, the supplied heating surface sensor is connected. Use: EasyFlex wall heating (e.g. centrally heated tile stoves).

Before plastering, the ducting (e.g. Cu12 pipe) for the heating surface sensor is clamped in a suitable reference position between the Variotherm pipes.

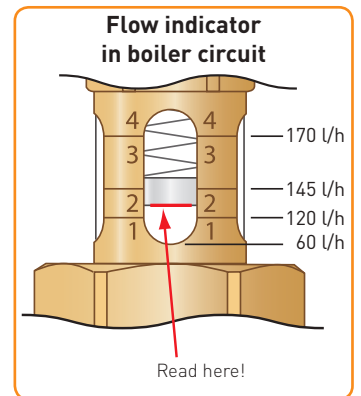
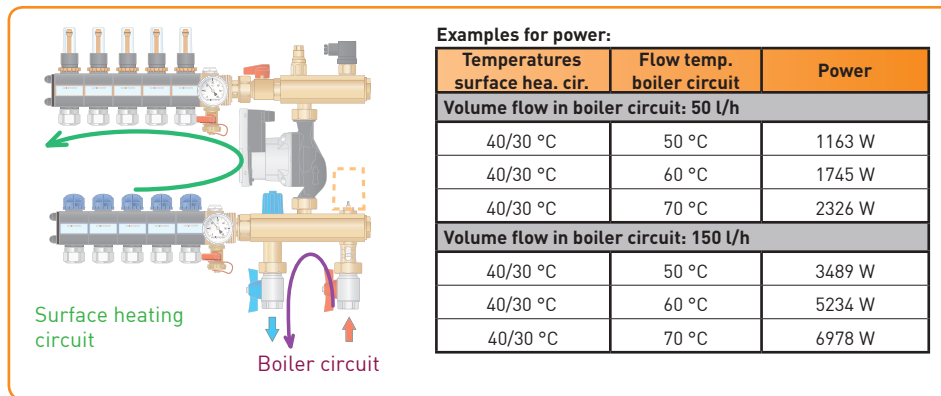
6 Pumped VarioManifold 5.0

6.1 Description

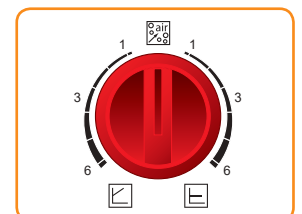
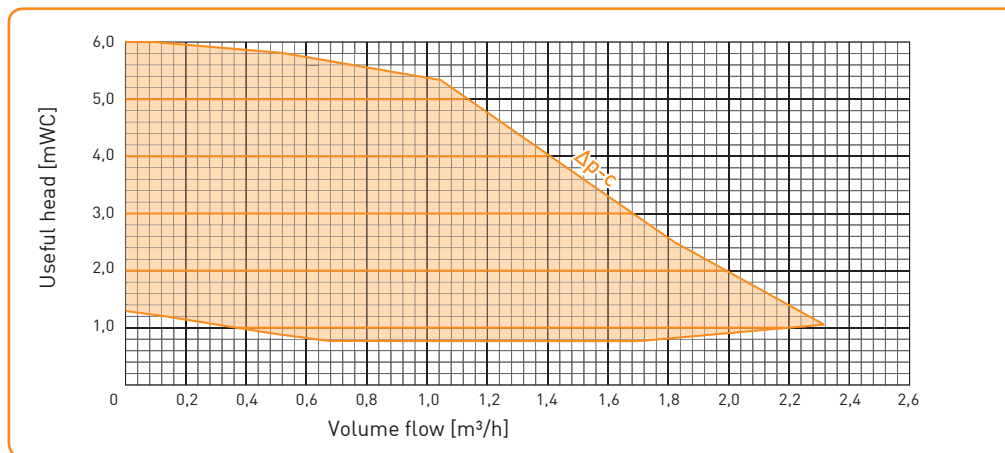
- For installing surface heating systems (2 – 15 heating circuits) in high-temperature heating systems (2-pipe system) with existing circulation pump.
- The flow temperature of the boiler circuit must be at least 10 K higher than the set flow temperature of the surface heating circuit.
- Observe the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



6.2 Weather-guided control station for surface heating for systems featuring a main pump



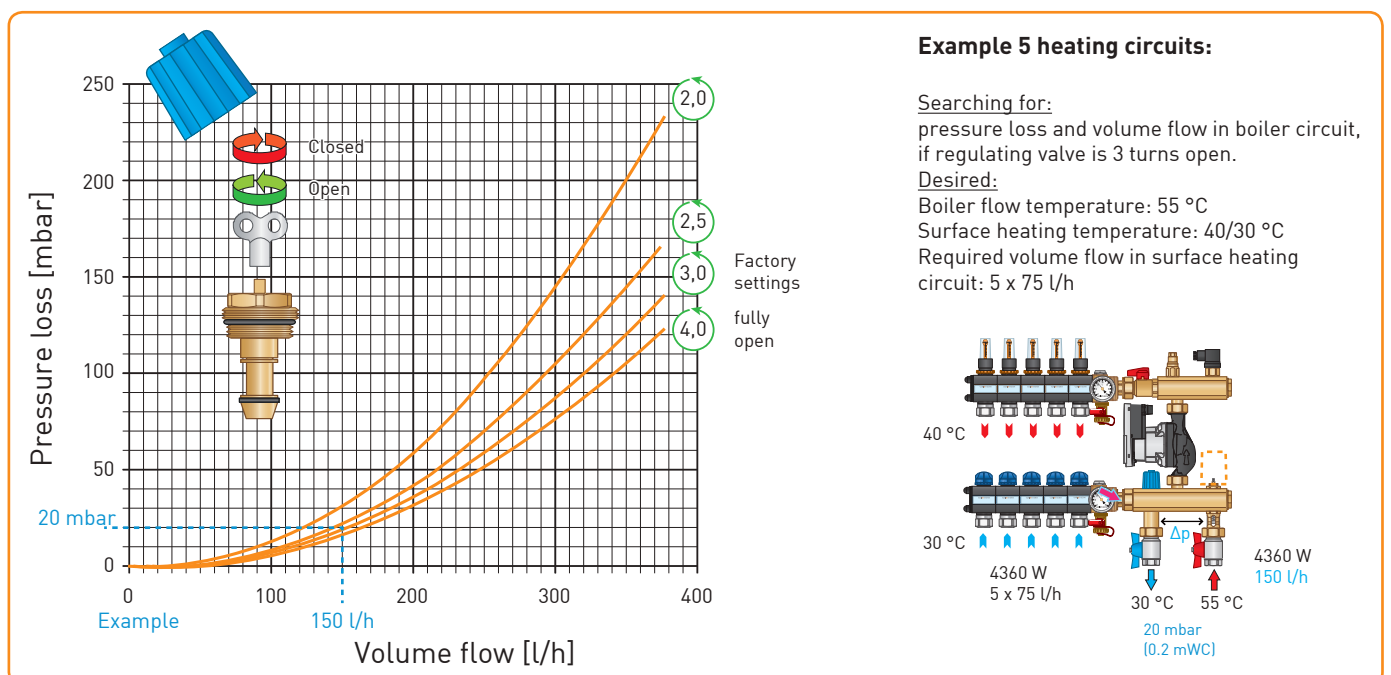
6.3 Pump PVS (WILO Yonos PARA 15/6)



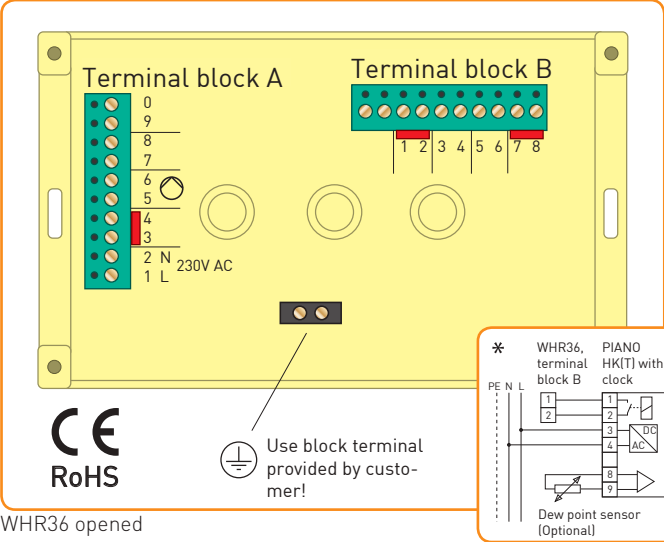
- ☒ Constant differential pressure ($\Delta p-c$), for surface heating
- ☒ Venting function
- ☒ Variable differential pressure ($\Delta p-v$)

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 (↗)



6.5 WHR36 – weather-guided controller



WHR36 opened

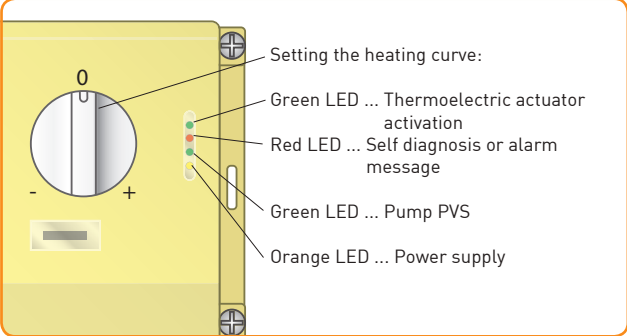
Electrical connection:

Terminal block A, 230V AC	
1	Power supply phase
2	Power supply neutral conductor
3-4	Bridge
5-6	PVS pump incl. safety thermostat Schaltstrom Relais max. 0,8 A
7-8	Thermoelectric actuator (only item no. VT30FC permissible)
9-0	Boiler demand, with contact 5-6 switched (potential-free, 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 x 0.75 mm², max. 50 m)
5-6	Flow sensor ¹⁾ (cable for example 2 x 0.75 mm², max. 50 m)
7-8	Bridge, or switching contact for pump & actuator On/Off

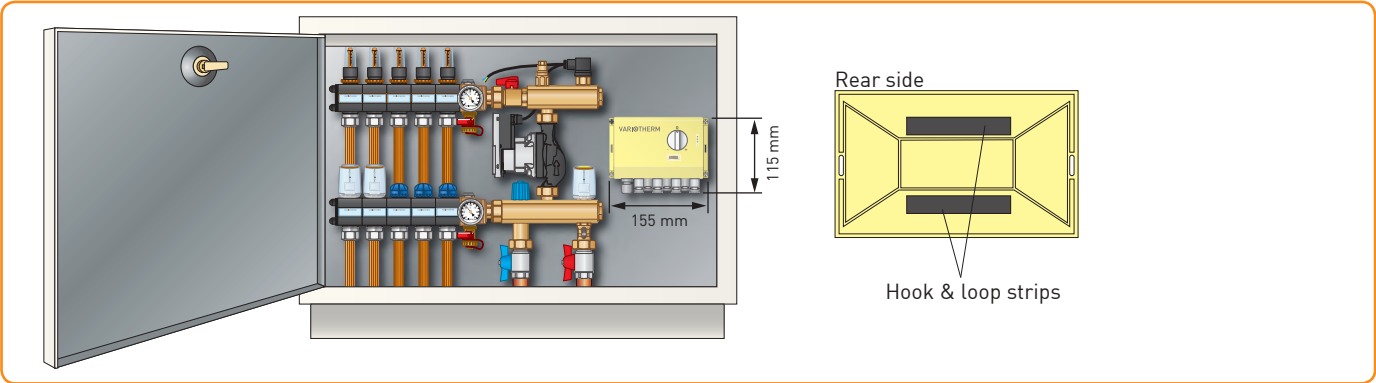
¹⁾ Use original sensor!

Control lamps:

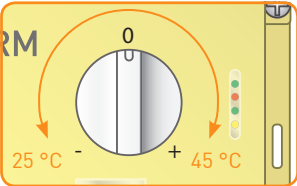


Self-diagnosis is performed when starting for the first time. The red LED flashes for about 5 seconds and goes out. After about 5 minutes the controller begins to adjust the flow temperature to the heating curve. If the red LED is continuously illuminated an alarm is present. In this case the wiring 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:

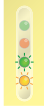


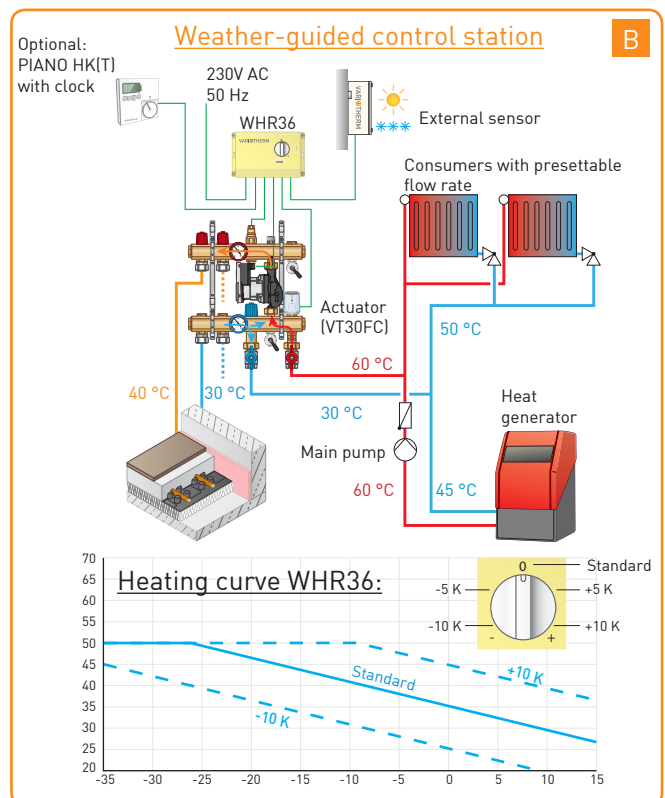
During the heating-up process the outdoor sensor is disconnected (terminal strip B, 3-4). The controller works as a fixed value regulator from 25 °C (knob turned fully counter-clockwise to -) to 45 °C (knob turned fully clockwise to +). The temperature is adjusted manually every day.

Sensor resistance values:

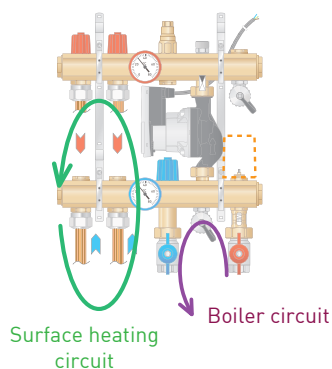
Flow temperature sensor (NTC resistor)						Outdoor sensor (NTC resistor)					
+15 °C	+20 °C	+25 °C	+30 °C	+35 °C	+40 °C	-20 °C	-10 °C	0 °C	+10 °C	+20 °C	+25 °C
18.00 kΩ	14.00 kΩ	10.00 kΩ	7.50 kΩ	5.50 kΩ	4.10 kΩ	8.23 kΩ	4.90 kΩ	3.00 kΩ	1.90 kΩ	1.25 kΩ	1.00 kΩ

6.6 Troubleshooting

Fault	Troubleshooting
<ul style="list-style-type: none"> • Surface heating circuit temperature too low 	<ul style="list-style-type: none"> • Main pump must be available and running • Fixed value control station: Switch on the pump PVS • Weather-guided control station: <ul style="list-style-type: none"> - Switch on the controller WHR36, orange LED (power on) & 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,...)
<ul style="list-style-type: none"> • Surface heating circuit temperature too high 	<p><u>Fixed-value control station:</u></p> <ul style="list-style-type: none"> • Fixed value regulator is not screwed all the way to the end stop <p><u>Weather-guided control station:</u></p> <ul style="list-style-type: none"> • Actuator adapter is not screwed all the way to the end stop • Check the heating curve setting

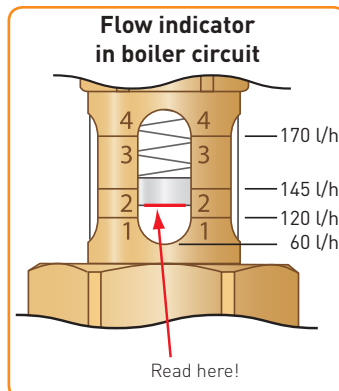


7.2 Weather-guided control station for surface heating for systems featuring a main pump

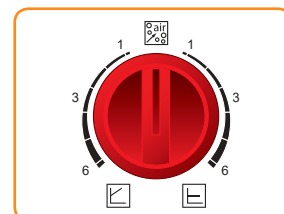
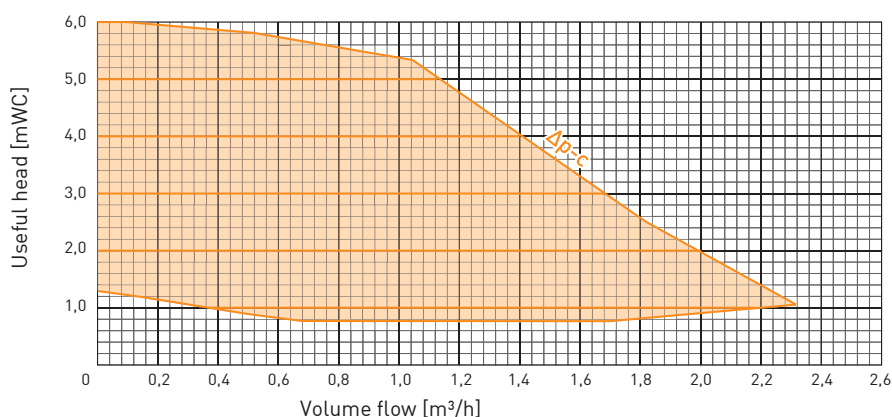


Examples for power:

Temperatures surface hea. cir.	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)



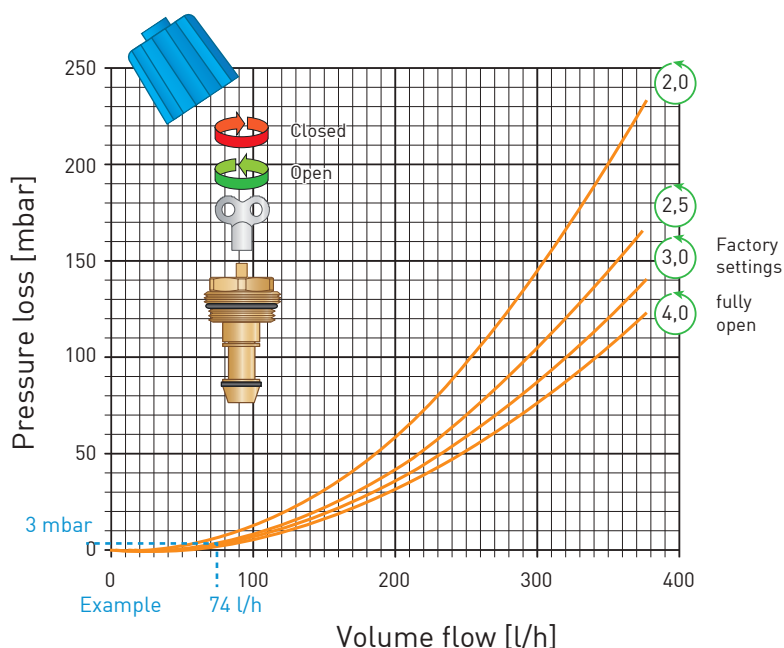
☐ Constant differential pressure ($\Delta p-c$), for surface heating

☒ Venting function

☐ Variable differential pressure ($\Delta p-v$)

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 (🔴)

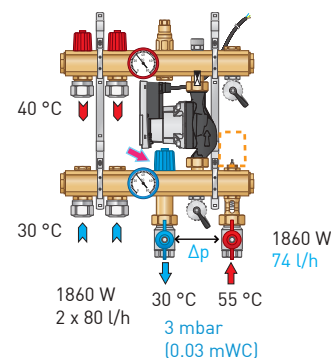


Example 2 heating circuits:

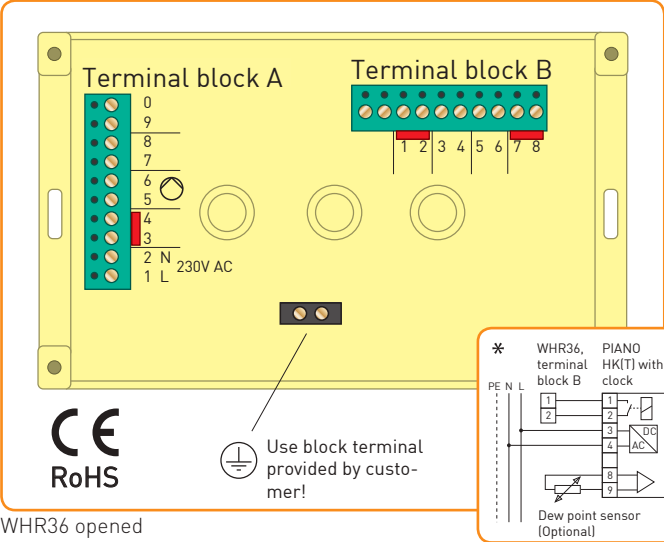
Searching for:
pressure loss and volume flow in boiler circuit,
if regulating valve is 3 turns open.

Desired:

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



7.5 WHR36 – weather-guided controller



WHR36 opened

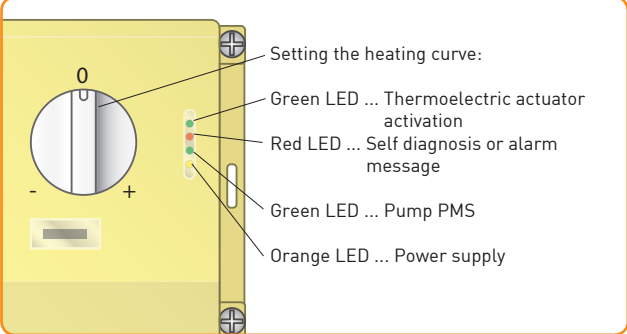
Electrical connection:

Terminal block A, 230V AC	
1	Power supply phase
2	Power supply neutral conductor
3-4	Bridge
5-6	PMS pump incl. safety thermostat Schaltstrom Relais max. 0,8 A
7-8	Thermoelectric actuator (only item no. VT30FC permissible)
9-0	Boiler demand, with contact 5-6 switched (potential-free, 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 x 0.75 mm², max. 50 m)
5-6	Flow sensor ¹⁾ (cable for example 2 x 0.75 mm², max. 50 m)
7-8	Bridge, or switching contact for pump & actuator On/Off

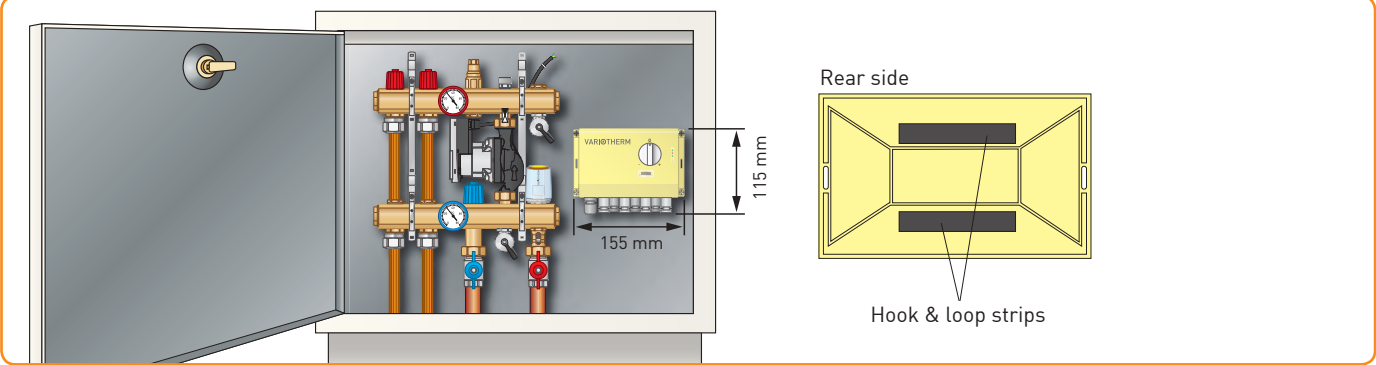
¹⁾ Use original sensor!

Control lamps:

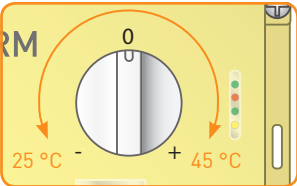


Self-diagnosis is performed when starting for the first time. The red LED flashes for about 5 seconds and goes out. After about 5 minutes the controller begins to adjust the flow temperature to the heating curve. If the red LED is continuously illuminated an alarm is present. In this case the wiring 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:

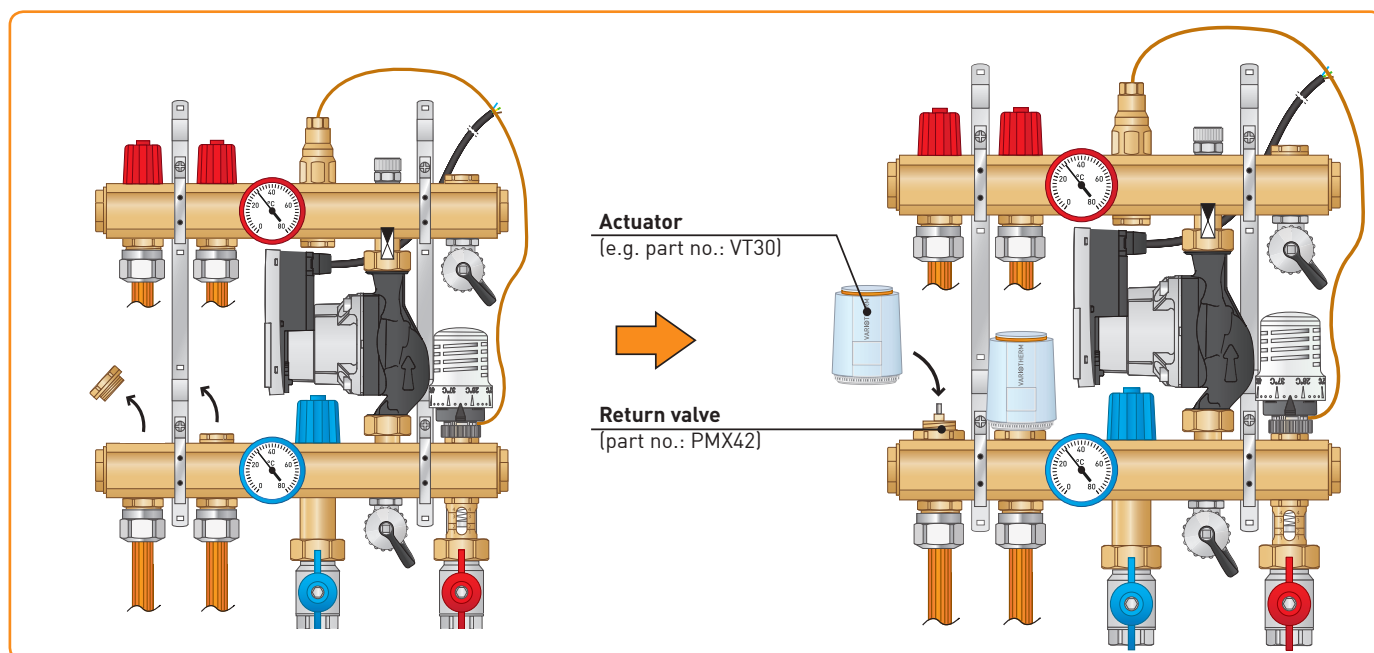


During the heating-up process the outdoor sensor is disconnected (terminal strip B, 3-4). The controller works as a fixed value regulator from 25 °C (knob turned fully counter-clockwise to -) to 45 °C (knob turned fully clockwise to +). The temperature is adjusted manually every day.

Sensor resistance values:

Flow temperature sensor (NTC resistor)						Outdoor sensor (NTC resistor)					
+15 °C	+20 °C	+25 °C	+30 °C	+35 °C	+40 °C	-20 °C	-10 °C	0 °C	+10 °C	+20 °C	+25 °C
18.00 kΩ	14.00 kΩ	10.00 kΩ	7.50 kΩ	5.50 kΩ	4.10 kΩ	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

Fault	Troubleshooting
<ul style="list-style-type: none"> • Surface heating circuit temperature too low 	<ul style="list-style-type: none"> • Main pump must be available and running • Fixed value control station: Switch on the pump PMS • Weather-guided control station: <ul style="list-style-type: none"> - Switch on the controller WHR36, orange LED (power on) & 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,...)
<ul style="list-style-type: none"> • Surface heating circuit temperature too high 	<p><u>Fixed-value control station:</u></p> <ul style="list-style-type: none"> • Fixed value regulator is not screwed all the way to the end stop <p><u>Weather-guided control station:</u></p> <ul style="list-style-type: none"> • Actuator adapter is not screwed all the way to the end stop • Check the heating curve setting

8 Return temperature limiter (for one surface heating circuit)

8.1 RTL valve

Feed cock 3/4"
for flushing the
surface heating
circuit

**Mounting
strap**

**Locking
ball valve**

flow indicator
adjustable between
0.5 - 2.5 l/min with locking

Feed cock 3/4"
for flushing the
surface heating
circuit

**Return temperature
limiter with expand-
ing element sensor**
20 - 40 °C settable,
swivel-mounted

Consumer
with presettable
flow rate

Heat generator
for example gas,
oil, solid fuel boiler,
remote heating and
buffer

↑ **Boiler flow** 3/4" Eurocone, max. 60 °C
↓ **Boiler return:** 3/4" Eurocone
↗ **Surface heating flow:** 3/4" Eurocone
↘ **Surface heating return:** 3/4" Eurocone
⊙ **Heating pump:** Caution: observe required pump
performance!

*The scale of 2-4 gives the following target temperatures (guideline):

2	2,5	3	3,5	4
20 °C	25 °C	30 °C	35 °C	40 °C

2 Setting the
return temperature*

1 Screw on
the expanding
element sensor

Lid dimensions
W x H = 340 x 235 mm

Dimensions mounting box:
W x h x d =
300 x 200 x 60 mm

8.2 RTLT valve (with thermostatic valve)

Dimensions mounting box:
W x h x d = 300 x 200 x 60 mm

thermostatic valve

Fork piece

Lid dimensions
W x h = 340 x 235 mm

Lid of RTLT valve with opening
for thermostatic valve

Turn valve body upwards

Attach fork piece and thermostatic valve

Close mounting box

VARIOTHERM

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