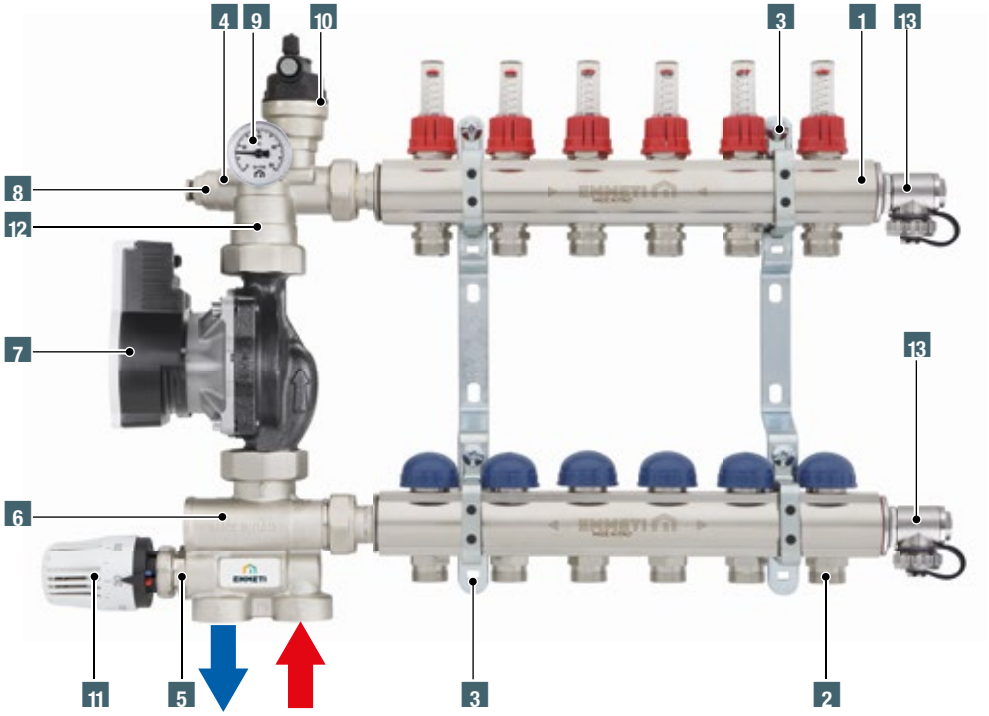
TM3-R

It is a regulation and distribution unit for low temperature heating systems. The mixing system with fixed-point regulation and thermostatic head reacts to any variation in the flow and heat emission and keeps the temperature of the fluid of the radiant panel system constant. The unit comes complete with an electronic circulator, a thermostatic head with remote sensor for fixed-point regulation and brackets for wall-mounting or for mounting inside a metal box.



Construction

1. N° 1 flow bar for underfloor system with flow meter;
2. N° 1 return bar for underfloor system prepared for the assembly of electrothermic heads;
3. N° 2 brackets for the fastening of manifolds;
4. Housing for safety thermostat probe;
5. N° 1 mixing valve with connection M30x1.5, prepared for the assembly of thermostatic head with immersion probe from 20 to 65 °C;
6. N° 1 calibration and by-pass valve;
7. N° 1 Wilo electronic circulator FOR wired RS 25/7 (three-core cable L = 1000 mm)
8. N° 1 housing for flow temperature probe;
9. N° 1 control thermometer from 0 to 80°C;
10. N° 1 1/2"automatic relief valve
11. N° 1 thermostatic head with immersion probe from 20 to 65 °C (fixed point adjustment)
12. N° 1 non-return valve (not shown)
13. N° 2 filling and unloading taps with swivel connection and safety cap.

Operation

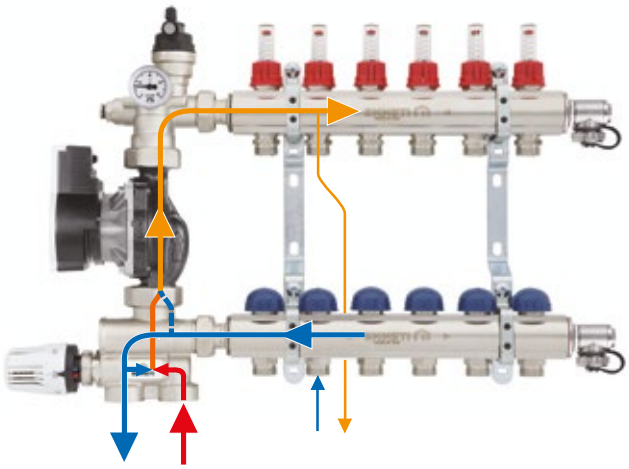
The mixing system with fixed-point regulation (via thermostatic head) reacts to any variation in the flow and heat emission and keeps the temperature of the fluid of the underfloor heating system constant.

Mixing operation with use of adjustable by-pass

Using the mixing system, the temperature of the supply water of the underfloor heating system (low temperature mixed water) is regulated at a fixed point, by means of the application on the mixing valve of a thermostatic head with a remote temperature sensor.

The temperature sensor with capillary tubing 8 inserted in the valve box detects the temperature of the fluid downstream of the circulator, keeping it at the value set on the knob of the head (from 20 to 65 °C).

By acting on the calibration and by-pass valve 6, it is possible to adjust the by-pass flow of the underfloor heating system, thus ensuring that the ΔT of the original design is reached.



Use

The TM3-R mixing units can operate with zero head, connected to an open manifold (hydraulic separator) or to a storage tank (puffer). The Wilo Para RS 25/7 electronic circulator keeps the differential pressure at the ends of the circuits of the underfloor heating system constant, with respect to the variation of the required pressure (opening/closing of one or more circuits).

Warning

In accordance with UNI EN 1264-4, there must be a safety device (thermostat) that blocks the supply of the low temperature zone over certain limits. This function is integrated in the accessories of the Electrical box with safety thermostat and 6T base unit.

Technical data

Operating conditions and performance data
Max temperature on primary circuit: 90 °C
Maximum operating pressure: 6 bar
Δp max on primary circuit: 1 bar
Temperature interval on secondary circuit: 20÷65 °C
Thermal power exchangeable with ΔT=7°C and Δp=0.25 bar on the secondary circuit:
- 10 kW with by-pass in position 0 (by-pass completely closed)
- 12.5 kW with by-pass in position 5 (fully open by-pass)

Mixing kit materials
Brass UNI EN 12168 CW614N
Brass UNI EN 12165 CW617N
O-ring seals EPDM 70 Sh

Materials of manifolds
Manifolds obtained from drawn bar in brass UNI EN 12168 CW617
Manifold seals in EPDM 70 Sh

Manifolds
Size: 1"
End thread: G 1" female
Takeoffs: 24x19 male, centre distance 50 mm

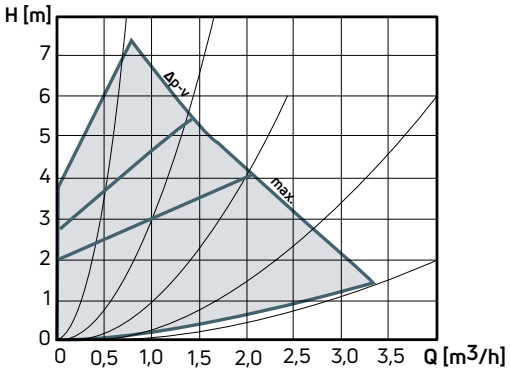
Regulation group
Connections to primary: G 1" female, centre distance 50 mm
Connections to secondary: G 1" male, O-Ring seal, centre distance 210 mm

Wilo Para RS 25/7 electronic circulator
Thread UNI EN ISO 228-1 (G 1"1/2)
Centre distance: 130 mm
Variable speed of rotation: 2580÷4700 rpm
Maximum head: 7 m
Maximum capacity: 3.5 m^3/h
Usable fluids:
- cooling and heating water
- water and glycol: max 1:1

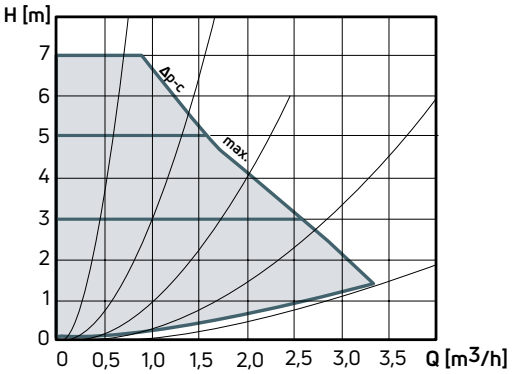
Power supply: 1~230V +10% / -15%, 50/60Hz
Protection class: IPX 4D
Insulation class: F
Absorbed power from 1-230 V: 8.2÷50 W
Current absorbed from 1-230 V: 0.07 ÷0.44 A
EEI ≤ 0.2

Wilo Para 25/7 circulator hydraulic performance diagrams

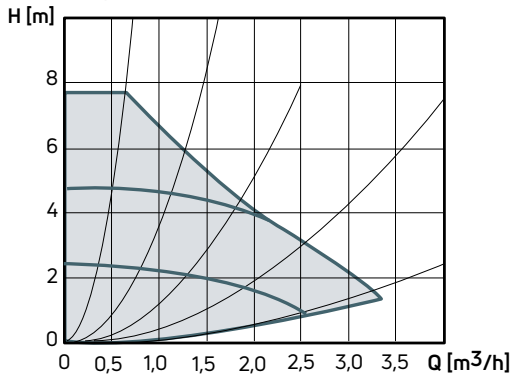
Δp-v Variable



Δp-c Constant

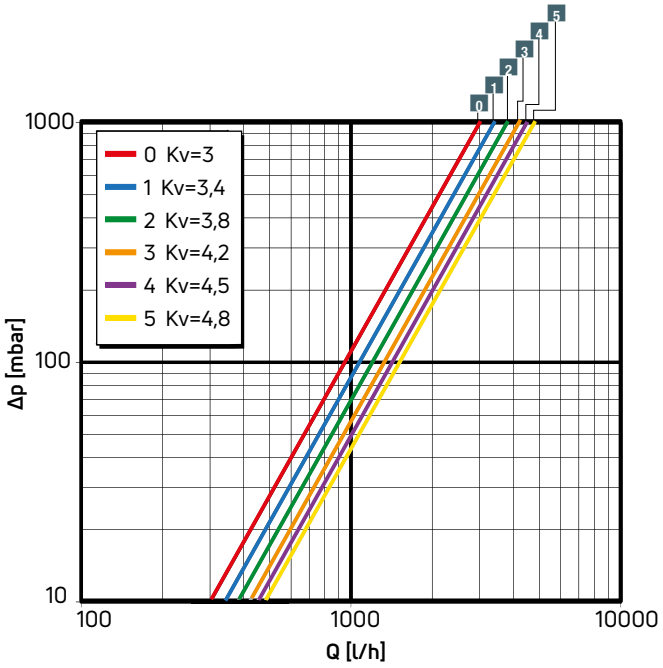


Constant speed



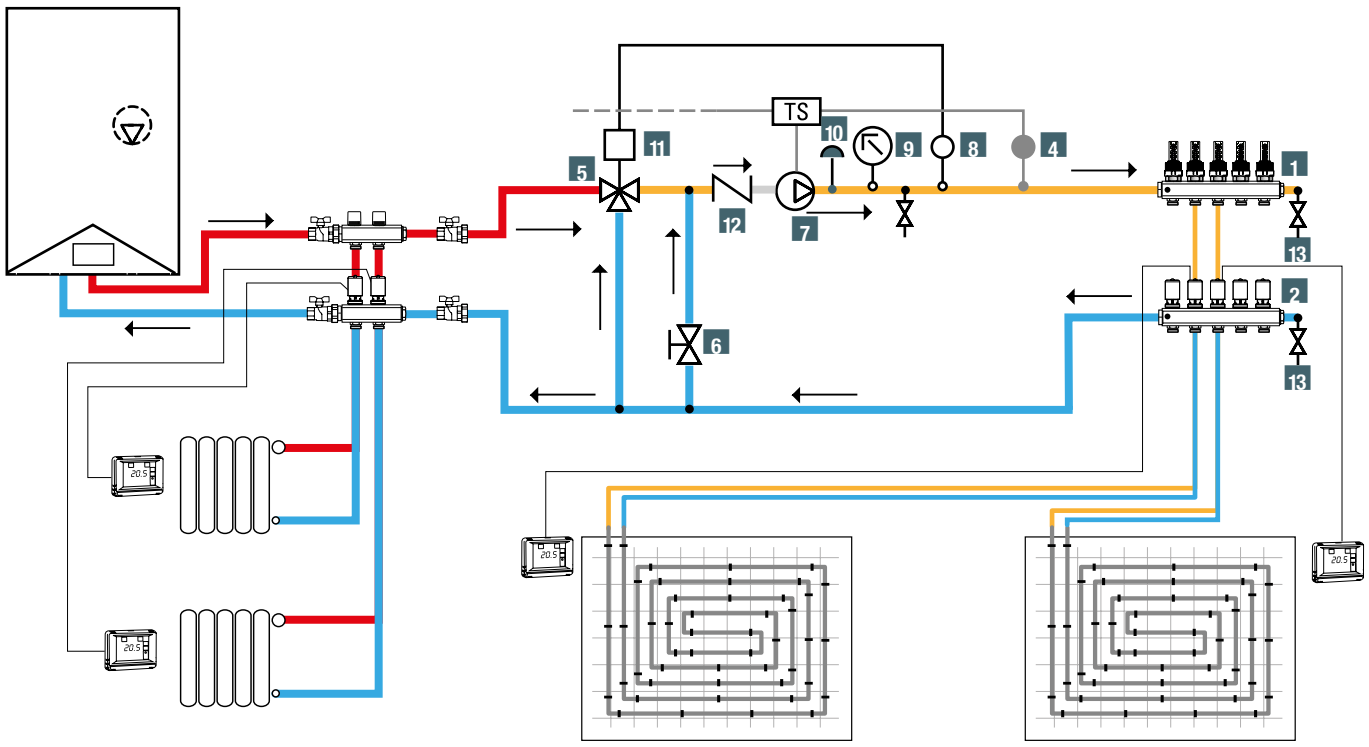
Adjustment diagram

Pressure drops of mixing unit



0 ... 5 Position of calibration and by-pass valve
Performance detected at -2K

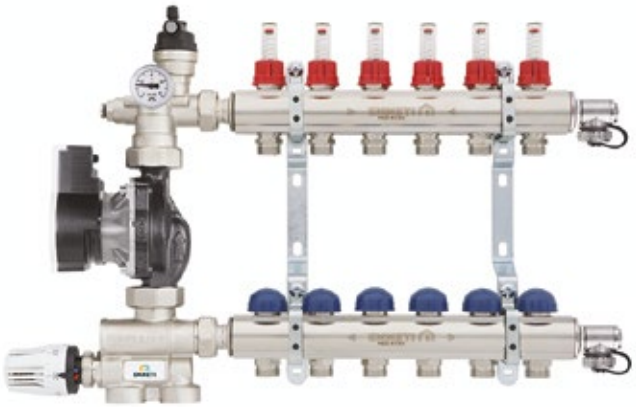
Hydraulic diagram



Description of components: see introduction photos

The Range

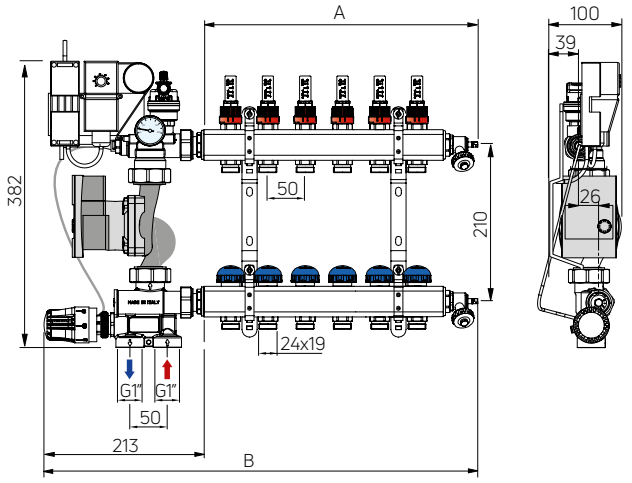
Pre-assembled low temperature regulation and distribution unit (from 2 to 12 ways), with manifolds equipped with flow meters (4 l/min), complete with a thermostatic head with immersion probe.



TM3-R thermostatic with and without Wilo Para RS 25/7 electronic circulator



Dimensions



Model	A mm	B mm
2 ways	160	373
3 ways	210	423
4 ways	260	473
5 ways	310	523
6 ways	360	573
7 ways	410	623
8 ways	460	673
9 ways	510	723
10 ways	560	773
11 ways	610	823
12 ways	660	873

Accessories

Straight Progress valve kit with union and butterfly handle



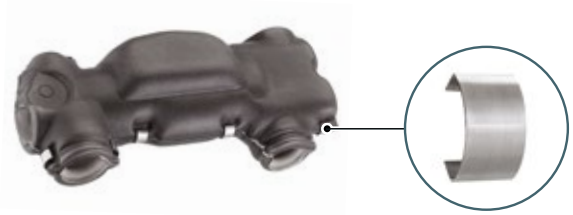
Safety thermostat kit for mixing units



Electrothermic head



Insulating shell for TM3-R



Electrical box with safety thermostat



Base unit 6T



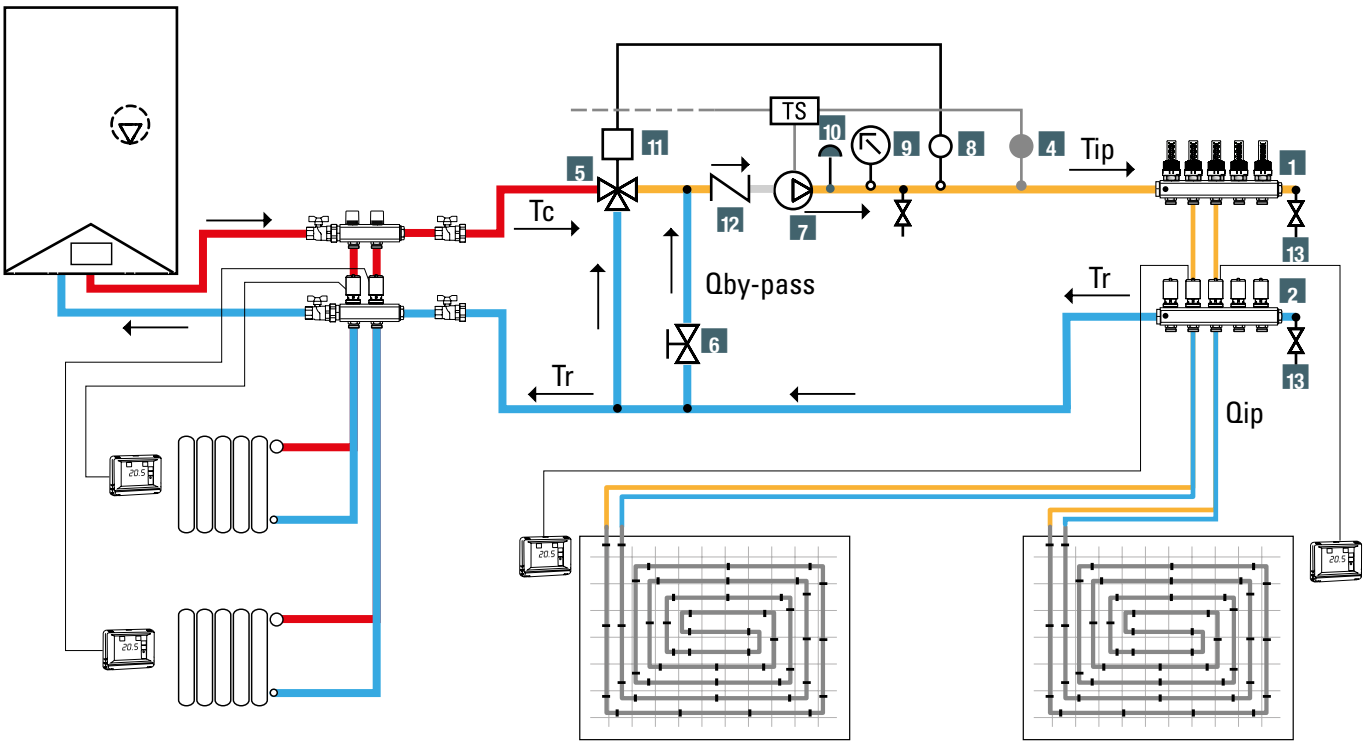
Examples of dimensioning

Fixed point control

Design information:
P = power to be supplied to the underfloor system = 6000 W
Tip = flow temperature of the underfloor system = 40 °C
Tc = temperature of water from boiler = 70 °C
ΔTip = temperature differences of the underfloor system project = 5°C
Tr = return temperature of underfloor system = Tip - ΔTip = 40 – 5 = 35 °C
Qip = underfloor system flow rate = (P[W] x 0.86) / (ΔTip) = (6000 x 0.86) / 5 = 1032 ℓ/h
Δp valv = pressure drop regulating valve

From the diagram of the pressure drops of the mixing unit, at the flow rate of 1032 ℓ/h there are 6 different curves corresponding to the different settings of the by-pass (ref. gintroductory photo): the smaller the opening of the by-pass, the smaller the reaction times of the mixing valve to temperature variations and the faster the required flow temperature is reached. conversely, opening of the by-pass reduces the losses, increasing the flow rate to the system and at the same time reducing the flow temperature fluctuations due to the opening-closing of the various areas in which the heating system is divided.

Setting the bypass to position 1 at the flow rate of 1032 ℓ/h corresponds to a pressure loss Δp valv = 90 mbar (0.09 bar).
Assumption Δp pav = floor system pressure drop = 0.25 bar adjust the power of the Wilo Para RS 25/7 circulator in order to guarantee a flow rate of 1032 ℓ/h (1.03 m³/h) and a head H = Δp valv + Δp pav = 0,09 + 0,25 = 0,34 bar (≅ 3,4 m CA).



Description of components: see introduction photos