

1. Application

The fixed value control set is used to connect underfloor heating systems to systems that require higher flow temperatures, e.g. radiators, and to lower them. The fixed value control set is installed directly in front of the heating circuit manifolds and set to a preselected fixed setpoint for the underfloor heating (e.g. 35 °C). Non-corrosive heating water in accordance with VDI 2035 or ÖNORM H 5195 or a glycol/water mixture with up to 50 % glycol can be used as the operating medium. The fixed-value control set can be used at medium temperatures between - 10 °C and + 110 °C and at operating pressures of up to 6 bar.

2. Scope of delivery

- Flow thermostatic valve and head with immersion sensor integrated in the control bar
- Return regulating valve integrated in the control bar
- Wilo-Para 15-130/4-20/SC pump
- Safety temperature limiter 55 °C, glued into the control bar
- Backflow preventer integrated in the control bar
- Plug-in thermometer
- Seals
- Thread extensions incl. washers
- Installation instructions
- Brief instructions Wilo-Para 15-130/4

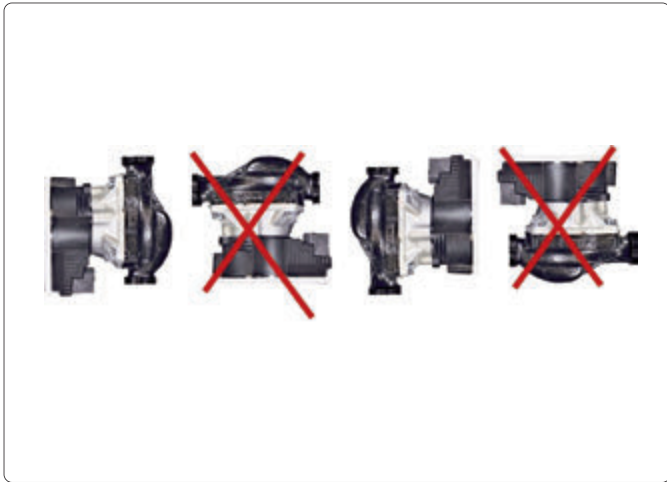
3. Function

The flow temperature setpoint for the underfloor heating is set on the thermostatic head. The temperature of the heating flow (e.g. 70 °C) is reduced to the level of underfloor heating (e.g. 35 °C) by controlled admixing of the colder return water from the underfloor heating system (hydraulic admixing circuit). Depending on the size of the manifold, the boiler temperature must be at least 10 K - 15 K higher than the desired underfloor heating flow temperature.

To prevent the flow temperature from being exceeded without authorisation (e.g. in the event of a defective thermostatic head), the fixed set point control set has a safety temperature limiter glued into the control bar. It interrupts the power supply to the circulation pump if the factory-set maximum temperature of 55 °C is exceeded. The circulation pump starts automatically as soon as the temperature falls below the maximum temperature again.

4. Assembly

- Fit the assembly with circulation pump and control bar directly to the union fittings of the heating circuit manifold with a flat seal:
- Remove the 3/4" end plugs from the manifold bar;
 - Screw the upper control bar of the fixed value control set (with immersion sensor) to the return heating circuit manifold bar;
 - Screw the lower control bar (with thermometer) to the flow heating circuit manifold bar;
 - Mount the assembly in the manifold cabinet using the fixing clamps supplied with the manifolds. Attention! The threaded extensions including the washers are fitted to the two upper fixing points of the clamps before the fixing clamps are fitted. This raises the assembly and prevents contact between the pump housing and the cabinet wall.
 - Screw the flow thermostatic valve incl. 3/4" union fitting into the return manifold bar.
 - Screw the return flow regulating valve incl. 3/4" union fitting into the flow manifold bar.
 - Wire the circulation pump electrically according to the manufacturer's specifications. Please note that the safety temperature limiter glued into the control bar must be integrated into the circuit as a 1-pole NC contact.



The total pressure loss of the underfloor heating can be found in the design data. If this data is not known, the default setting "2" should be used as an approximation.

Note: Depending on the system configuration, it may be necessary to provide additional components, e.g. a hydraulic separator or a non-return valve, between the fixed value control set and the high-temperature primary circuit. These can prevent the circulation pumps from influencing each other adversely and the associated incorrect flow or flow noise. The boiler manufacturer's technical documentation must be observed.

If the set flow temperature of the underfloor heating is not reached at the design flow temperature of the primary circuit (e.g. 70 °C), the return flow limiter must be opened in small steps until the desired set value is reached.

The flow temperature of the primary circuit must be approx. 10 to 15 K above the desired underfloor heating temperature.

The desired flow temperature of the underfloor heating must be set on the thermostatic head and observed over a certain period of time on the thermometer of the fixed value control set. This may take some time during initial commissioning, as the entire water volume of the still cold heating circuits must be heated up by adding water from the primary circuit. The return temperature of the underfloor heating should therefore be at least 20 to 25 °C for proper adjustment.

For certain systems (e.g. thermal heating with hot water storage tank), it may be necessary to provide additional installations. If the flow of heating medium in the primary circuit is interrupted, e.g. due to night shut-off or domestic hot water heating, it is possible that the pump of the fixed value control set may press into the return flow of the radiators or that noises may occur at the heat generator.

For this reason, a non-return valve, hydraulic separator or similar should also be provided in these systems. The manufacturer's documentation and hydraulic diagrams of the boiler manufacturer must always be observed.

Attention: The electrical installation of the circulation pump may only be carried out by a qualified electrician. The applicable VDE safety regulations must be observed.

- Filling and venting of the fixed value control set via the integrated filling and draining tap in the flow bar of the heating circuit manifold. A backflow preventer integrated in the control manifold prevents an incorrect flow in the direction of the return heating circuit manifold. To bleed the circulation pump, please refer to the enclosed operating instructions.

5. Optional equipment

The use of heating circuit manifolds with flow indicators (art. no. 030011-2 - 030011-12) is recommended. With their visual display, these make it easier to set the calculated heating circuit flow rates. In addition, actuators (art. no. 070001) with a strip terminal including pump logic (art. no. 070012 or 070012-1) should be used. The strip terminal with pump logic switches off the pump when the last actuator closes, thus preventing unnecessary power consumption by the pump.

6. Commissioning

First, all underfloor heating circuits must be hydraulically balanced in accordance with the design, i.e. the planned flow rate at the respective flow valve must be adjusted. The return flow limiter (see diagram on page 3) is adjusted according to the pipe network calculation of the primary circuit (radiator circuit). For proper function, the total pressure loss of the primary circuit (radiator circuit) must correspond to that of the secondary circuit (underfloor heating manifold).

7. Adjustment of the fixed value control set

- Fill, bleed and pressurise the system.
- Carry out hydraulic balancing of the underfloor heating circuits (see also the description of the heating circuit manifolds). All valves of the heating circuit manifolds (flow and return) must be set to the characteristic values specified in the planning.
- Increase the primary circuit temperature to the design temperature (e.g. 70 °C).
- Unscrew the sealing cap on the return flow limiter (spanner size 19) and use a 5 mm hexagon spanner to close the spindle by turning it clockwise as far as it will go (smallest setting value "0").
- Use the hexagon spanner to set the spindle to the calculated value in turns (see below) by turning it anti-clockwise (e.g. open by 2 turns).
- Check the flow temperature at the manifold and the flow rates of the underfloor heating circuits. The return temperature of the underfloor heating should be at least 20 - 25 °C.
- If the flow temperature at the manifold is too low, open the regulating cone of the return flow limiter further by turning it anti-clockwise. Ensure that the heating circuits continue to receive a sufficient quantity of water.
- Finally, the sealing cap on the return flow limiter can be screwed back on.

8. Technical data

Circulation pump Wilo-Para 15-130/4-20/SC

- Energy efficiency index: ≤ 0,20
- Operating voltage: AC 230 V 50 Hz
- Climate Protection Directive: ErP 2015 ready
- Power consumption: P1 (W) min. = 3 W, max. = 20 W
- Length: 130 mm
- Protection class: IP 40
- Media temperature

Thermostatic head Startec 4

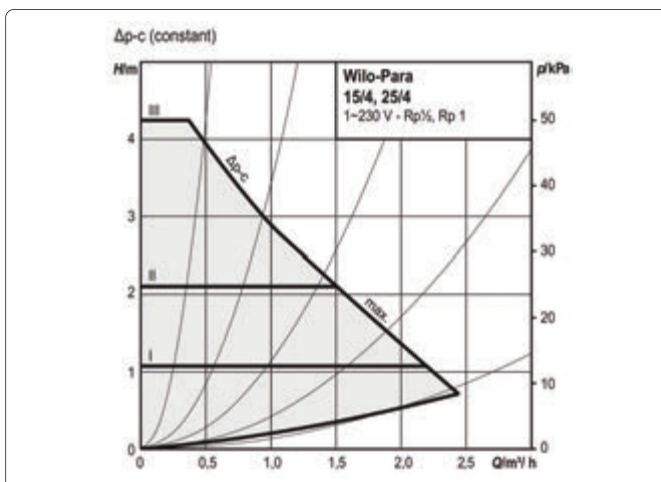
- Liquid sensor as immersion sensor with 2 m capillary tube
- Memo number 20 - 30 - 40 - 50
- Setpoint range 20 °C - 50 °C
- Connection thread M 30 x 1.5
- Integrated thermostatic valve (constant volume flow = 2.56 m³/h)

Return regulating valve DN20

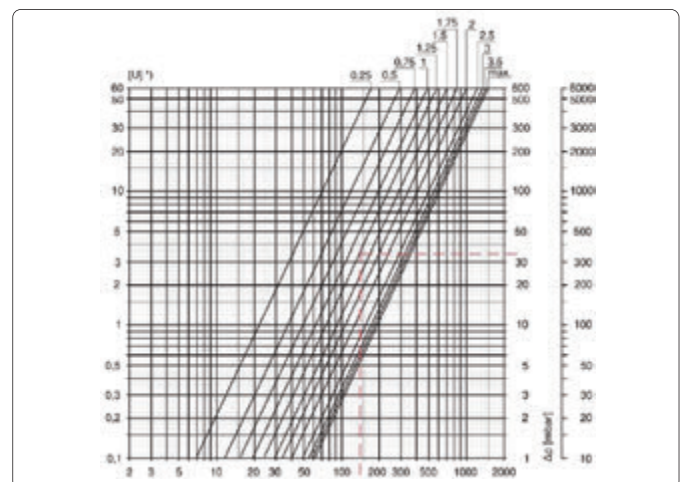
- Regulating valve insert (constant volume flow = 1.93 m³/h)
 - Presettable
 - ζ-value (open) 93.2
 - Permissible operating temperature 120 °C
 - Permissible operating pressure 10 bar
- | Setting turns | Constant volume flow value |
|---------------|----------------------------|
| 0.25 | 0.22 |
| 0.5 | 0.37 |
| 1 | 0.62 |
| 1.5 | 0.92 |
| 2 | 1.27 |
| 2.5 | 1.55 |
| 3 | 1.72 |
| 3.5 | 1.85 |

· Calculation example:

Differential pressure to be throttled $\Delta p = 34 \text{ mbar}$
 Heat flow $Q = 2440 \text{ W}$
 Temperature spread $\Delta T = 15 \text{ K (70/55 °C)}$
 Solution
 Mass flow $\dot{m} = Q / (c \cdot \Delta T)$
 $= 2440 / (1.163 \cdot 15 \text{ K})$
 $= 140 \text{ kg/h}$
 Setting turns (from diagram) $= 1.25$



Wilo-Para characteristic curves, constant differential pressure



9. Troubleshooting

The desired flow temperature in the underfloor heating circuits is not reached!

Possible cause:

- Flow temperature in primary circuit too low

Possible remedy:

- Raise to at least 10 - 15 K above the desired underfloor heating temperature

Possible cause:

- Return temperature in secondary circuit too low (min. 20 °C)

Possible remedy:

- Return flow limiter not adjusted (preset, see diagram on page 3)

Possible cause:

- No hydraulic balancing of the underfloor heating circuits

Possible remedy:

- Carry out balancing according to planning documents

Possible cause:

- Actuators are closed

Possible remedy:

- Check heat requirement from room thermostat

Possible cause:

- Circulation pump fault

Possible remedy:

- Follow the enclosed operating instructions

Noises or reheating in the boiler or radiators!

Possible causes:

- Particularly in the case of boilers with hot water storage tanks, the pump of the fixed-value control set may press into the return flow of the radiators or cause noises in the boiler at the changeover valve or the boiler pump.

Possible remedies:

- Additional installation of non-return valves or a hydraulic separator in the primary circuit. In any case, the manufacturer's documentation and hydraulic diagrams of the boiler manufacturer must be observed.