Reduce the circulating pump's flow rate

Circulating pumps for heating often pump too much water, so they consume electrical energy unnecessarily. If you set the volume flow correctly, you'll not only save electricity but also avoid annoying whistling noises.

Action

At an outside temperature of 0 °C, the difference between the heating group's flow and return temperatures should be higher than 5 K. If the difference is less, the volume flow (flow rate) is too high and it can be reduced.

Requirement

The heating system must be equipped with multi-level or speed-controlled pumps. Two thermometers are also needed: one in the flow and one in the return.

If you can reduce the volume flow from level 3 to level 1, you will save around CHF 250 per year.[1]

What to do

1. Determine the difference between the flow and return temperatures

- Measure the difference between the flow and return temperatures.
- Compare the values to the recommended values (see the graph, overleaf).
- If the temperature difference is currently less than the recommended value, the volume flow is too high and it can be reduced.

2. Reduce the flow rate

Reduce the volume flow (see overleaf).

- Pumps with a step switch: 1 level less
- Speed-controlled pumps: reduce the volume flow by approx. 20 per cent

3. Check the temperature differences again

After half an hour, repeat steps 1 and 2 until the temperature difference corresponds to the recommendations.

4. Document the new settings

- Note down the new values in the logbook.
- If there are complaints that it is too cold in the rooms, go back one step and increase the volume flow again.

Costs – effort

Your own labour for one central heating unit with multiple pump groups (including follow-up inspection): approx. 4 hours

Please note!

- Ideally, the optimisation should be carried out when the outside temperature is about 0 °C, because the differences are more clearly visible at this temperature.
- Accurate thermometers are required to determine (small) temperature differences – so check whether the two thermometers are measuring correctly. If there are any discrepancies, calibrate the thermometers or replace them.
- Heating systems respond relatively slowly to changes, so they cannot be adjusted for optimal operation in a matter of minutes or hours.

Setting the volume flow

A: Pumps with multiple speed levels

With a step switch, the operating mode is set permanently (uncontrolled pump). The higher the speed level, the more water is pumped.

- Reduce the volume flow by selecting a lower speed level on the switch.

1 Applies to a pump with power consumption of 400 watts at the first level and 800 watts at the third level.

Ergänzende Erklärungen

B: Speed-controlled pumps with various setting options

On newer pumps, the volume flow can be adjusted with the help of various functions (e.g. automatic, via proportional pressure curve, or via constant pressure control). These pumps are usually delivered with the "automatic" factory setting. With this setting, the pump adjusts automatically in the specified delivery range. This process requires some time – so let the pump run for at least one week before you check the pump setting and select a different operating mode, if necessary.

Setting for two-pipe heating systems

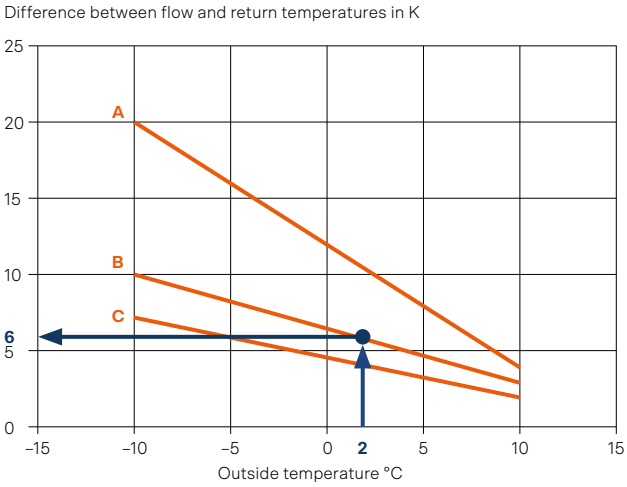
- "Automatic" mode: this mode adapts the pump's delivery rate to the actual heat demand in the system.
- Proportional pressure control mode: the delivery head increases in proportion to the volume flow. This is suitable for systems with high pressure losses in the distributor pipes (two-pipe heating systems with thermostat valves, primary circuits, cooling systems). Not suitable for underfloor heating.

Settings for underfloor and one-pipe heating systems

- "Automatic" mode: this mode adapts the pump's delivery rate to the actual heat demand in the system.
- Constant pressure control mode: the flow rate is adjusted to the current heat demand and the delivery head is always kept constant. Select the lowest curve at which the pump still provides the required delivery pressure.

Temperature difference as an indicator

The optimal difference between flow and return temperatures depends on the type of heat delivery system (underfloor heating, low-temperature radiator, high-temperature radiator) and on the outside temperature. The graph shows guidance values for the optimal temperature difference for the systems just mentioned.



A: Radiators with a flow temperature > 60 °C
B: Low-temperature radiators < 50 °C
C: Underfloor heating

Example: With an outside temperature of 2 °C, the optimal difference between the flow and return temperatures for a heating system with low-temperature radiators is 6 K.

Improved efficiency for the heat generator

As well as cutting the costs of electricity for the circulating pump, an optimal temperature difference boosts the efficiency of heat pumps and condensing boilers.

Additional information

- Dimensioning aid for circulating pumps
- Circulating pumps in heating systems, suissetec
- Use underfloor heating the right way, suissetec

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