

ESBE GUIDE

SELECT THE MOST SUITABLE MIXING VALVE

In the following pages you will be able to find the valve best matching your system and application requirements.

HOW TO SELECT A ROTARY MIXING VALVE

ESBE 3-way mixing valves are usually connected as a mixing valve, but it may also be used as a change-over valve or diverting valve.

If high return temperature is required (mostly solid fuel installations) a 4-way mixing valve is recommended. In all other applications/installations a 3-way valve is preferred.

In systems with two heat sources or storage tanks, the VRB-valve helps to prioritize the cheapest energy source and keeps a good temperature stratification in the storage tank.

FIELDS OF APPLICATION

- 1) Control of (fluid) water based systems for heating and cooling: radiator heating, floor heating and other surface heating and cooling systems.
- 2) Change-over or diverting valve (only 3-way valves).

Make sure that the nominal pressure, the differential pressure as well as the leak rate are within acceptable values. This information is stated for each valve.

SELECTION OF MIXING VALVE SIZE

Each size of mixing valve has a Kvs-value (capacity in m³/h at a pressure drop of 1 bar) stated. It is the Kvs-value as well as the system the valve serves that decides which valve to choose. You find suitable Kvs-values in the graphs at page 32-33.

For a radiator system $\Delta t = 20^{\circ}\text{C}$ is usually chosen and for under floor heating $\Delta t = 5^{\circ}\text{C}$.

Suitable pressure drop should be in the range 3–15 kPa. As a rule of thumb, the lowest Kvs-value is chosen, if there are two alternatives within the pressure drop range.

MATERIAL/MEDIA

Valve series VRG, VRB and 5MG are made of a special brass alloy (DZR) and therefore also suitable for domestic water installations.

ESBE's other series of mixing valves may only be used in closed systems where the water is not oxygenated.

A maximum of 50% glycol for freezing protection and oxygen absorbing compounds are allowed as additives. As both the viscosity and the thermal conduction are affected when glycol is added to the system water, this fact has to be considered when dimensioning the valve. A good rule is to choose one size higher Kv-value when 30 - 50 % glycol is added. A lower concentration of glycol does not affect the valve performance.



VALVES, RE. PED 97/23/EC

Pressure Equipment in conformity with PED 97/23/EC, article 3.3 (sound engineering practice). According to the directive the equipment shall not carry any CE-mark.



DISPOSAL OF VALVES

The products must not be disposed of together with domestic waste, but should be treated as metal scrap. Local and currently valid legislation must be observed.

DISPOSAL OF ACTUATORS AND REGULATORS

The device must not be disposed of together with domestic waste. This applies in particular to the printed circuit card. Legislation may demand special handling of certain components, or it may be desirable from an ecological point of view. Local and currently valid legislation must be observed.

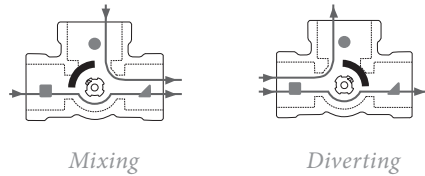
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OPERATION 3-WAY VALVES

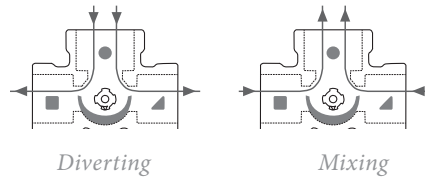
VRG130, 330

The required system temperature is obtained by adding a suitable proportion of return water to the boiler flow.



VRG230

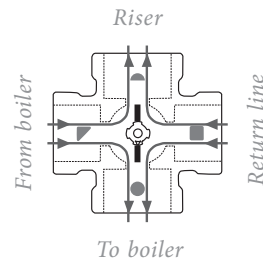
Valves with special design of the inner parts, suitable for applications which requires mid-port changeover operation. Can be placed in both diverting and mixing positions.



OPERATION 4-WAY VALVES

VRG140

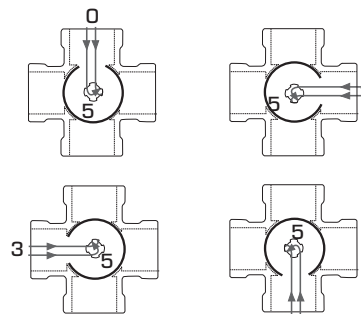
The valves have a double mixing function, i.e. a proportion of the hot water supplied from the boiler is mixed with the return water. This results in a higher return water temperature, reducing the risk of corrosion and assuring a longer life for the boiler.



OPERATION 5-WAY VALVES

5MG

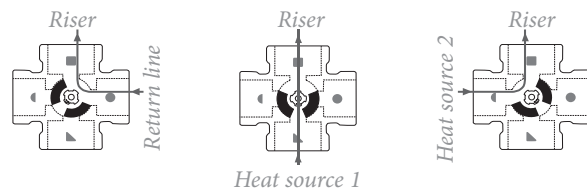
Mixing valve with 4 inlets for use in systems with three heat sources or three layers in a storage tank.



OPERATION BIVALENT VALVES

VRB140

Mixing valve with 3 inlets for use in systems with two heat sources or two layer storage tank.



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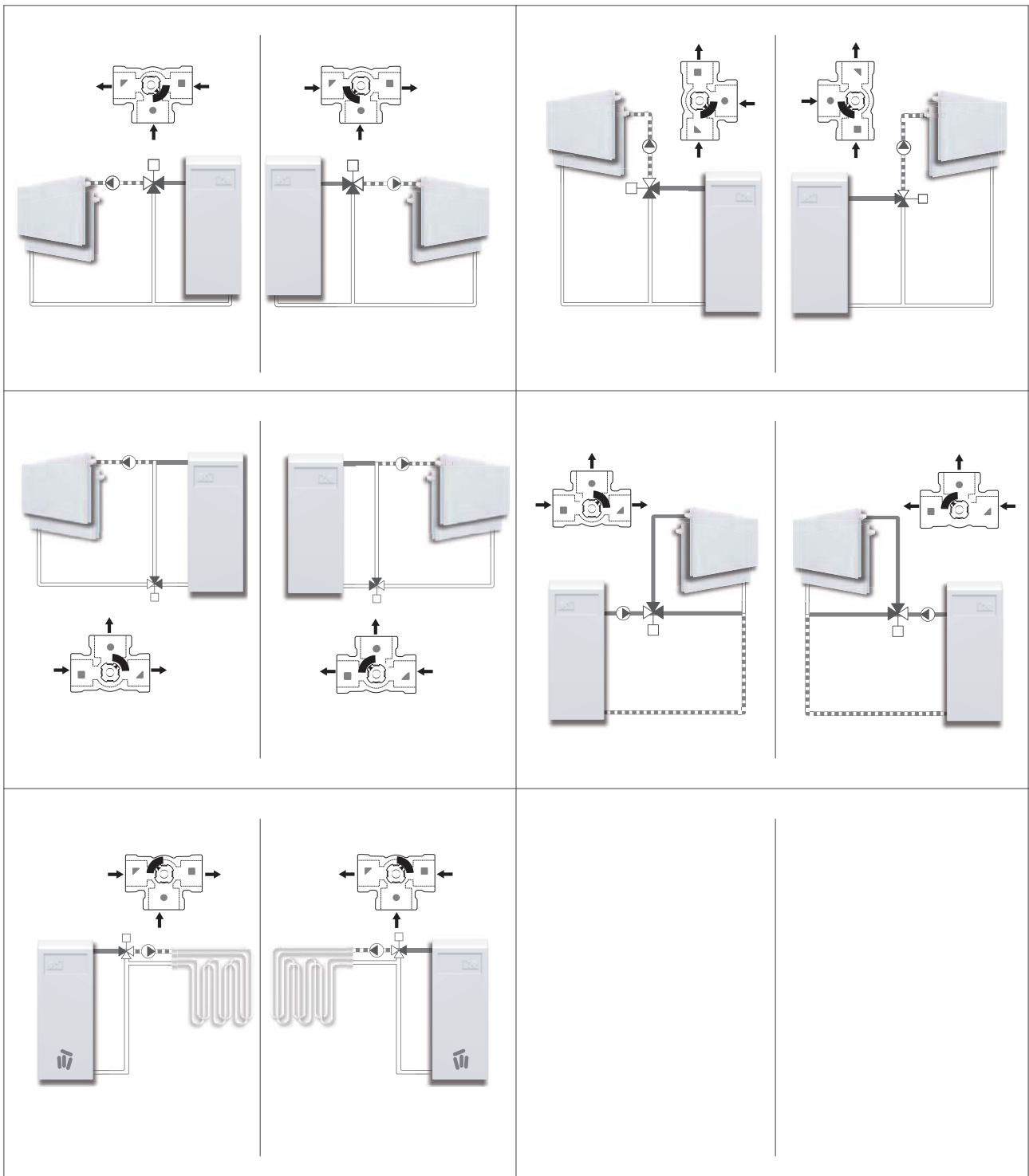
SELECT THE MOST SUITABLE MIXING VALVE

- Recommended
- Secondary alternative
- Not applicable

Note: The illustrations always shows the mid position of the valve.

APPLICATION EXAMPLES ARE VALID FOR

- VRG130
- VRG140
- VRG230
- VRG330
- VRB140
- 5MG
- 3F
- 4F

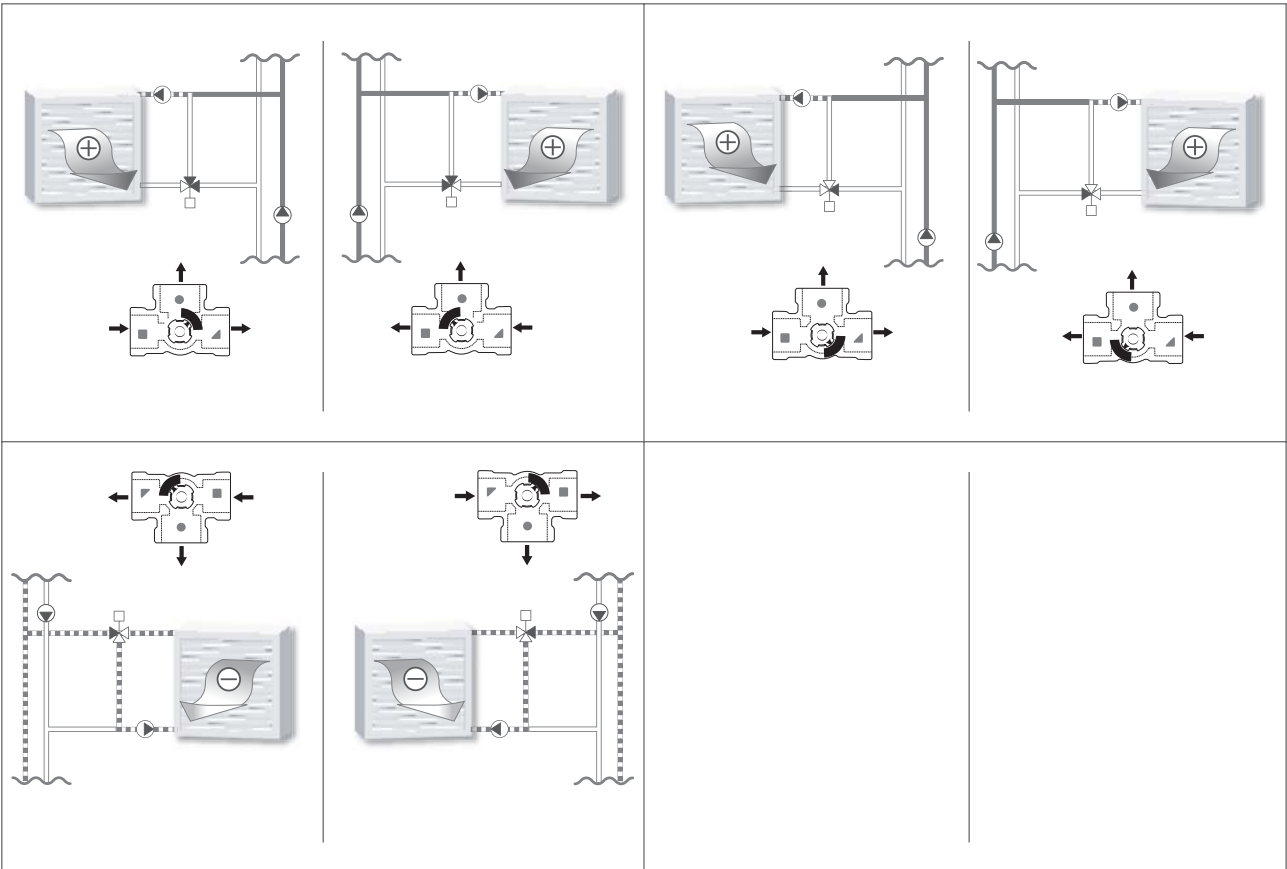


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SELECT THE MOST SUITABLE MIXING VALVE

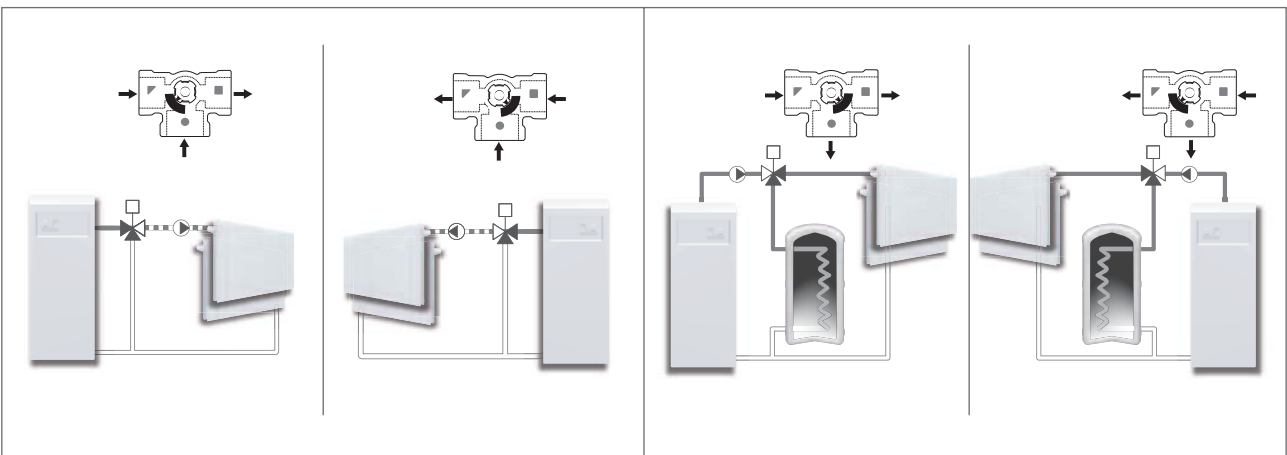
APPLICATION EXAMPLES ARE VALID FOR

- VRG130
 VRG140
 VRG230
 VRG330
 VRB140
 5MG
 3F
 4F



APPLICATION EXAMPLES ARE VALID FOR

- VRG130
 VRG140
 VRG230
 VRG330
 VRB140
 5MG
 3F
 4F

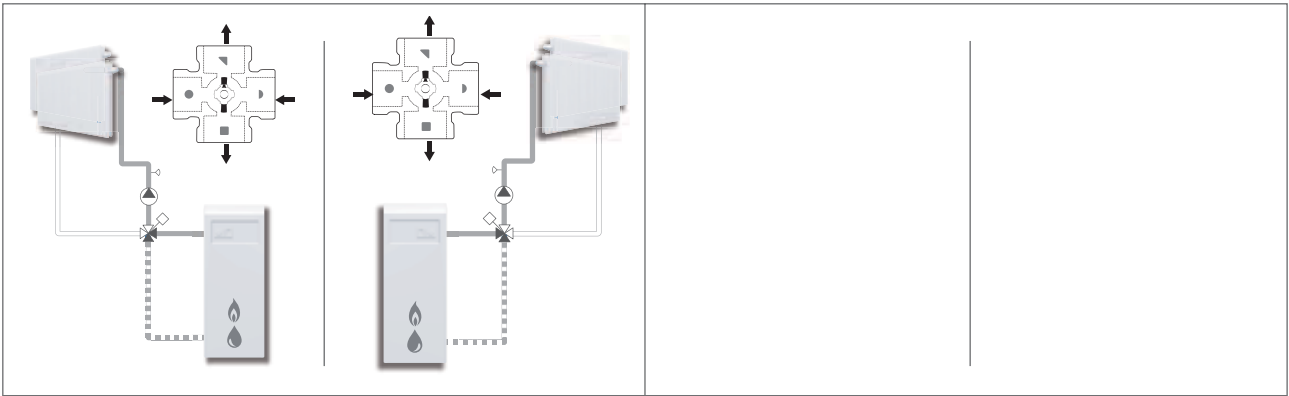


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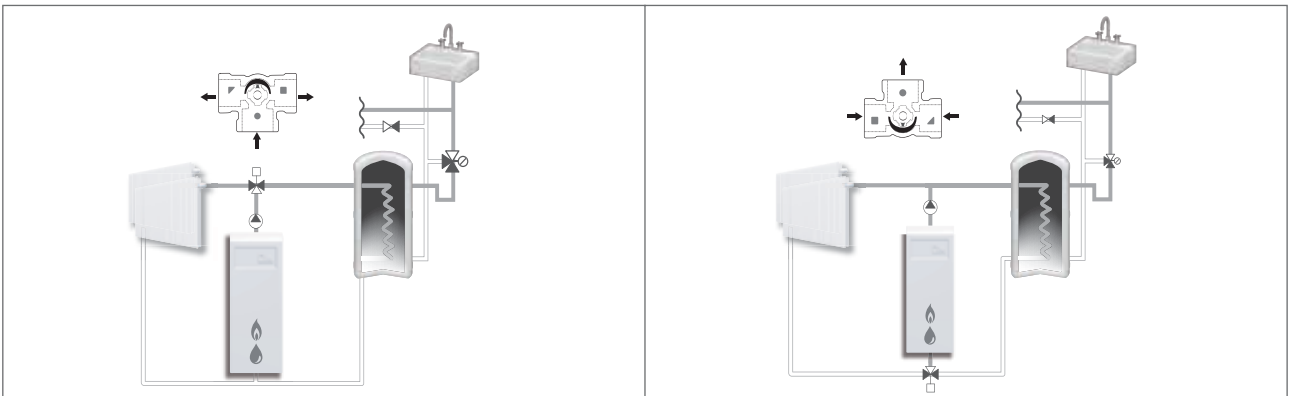
APPLICATION EXAMPLES ARE VALID FOR

- VRG130
 VRG140
 VRG230
 VRG330
 VRB140
 5MG
 3F
 4F



APPLICATION EXAMPLES ARE VALID FOR

- VRG130
 VRG140
 VRG230
 VRG330
 VRB140
 5MG
 3F
 4F



APPLICATION EXAMPLES ARE VALID FOR

- VRG130
 VRG140
 VRG230
 VRG330
 VRB140
 5MG
 3F
 4F

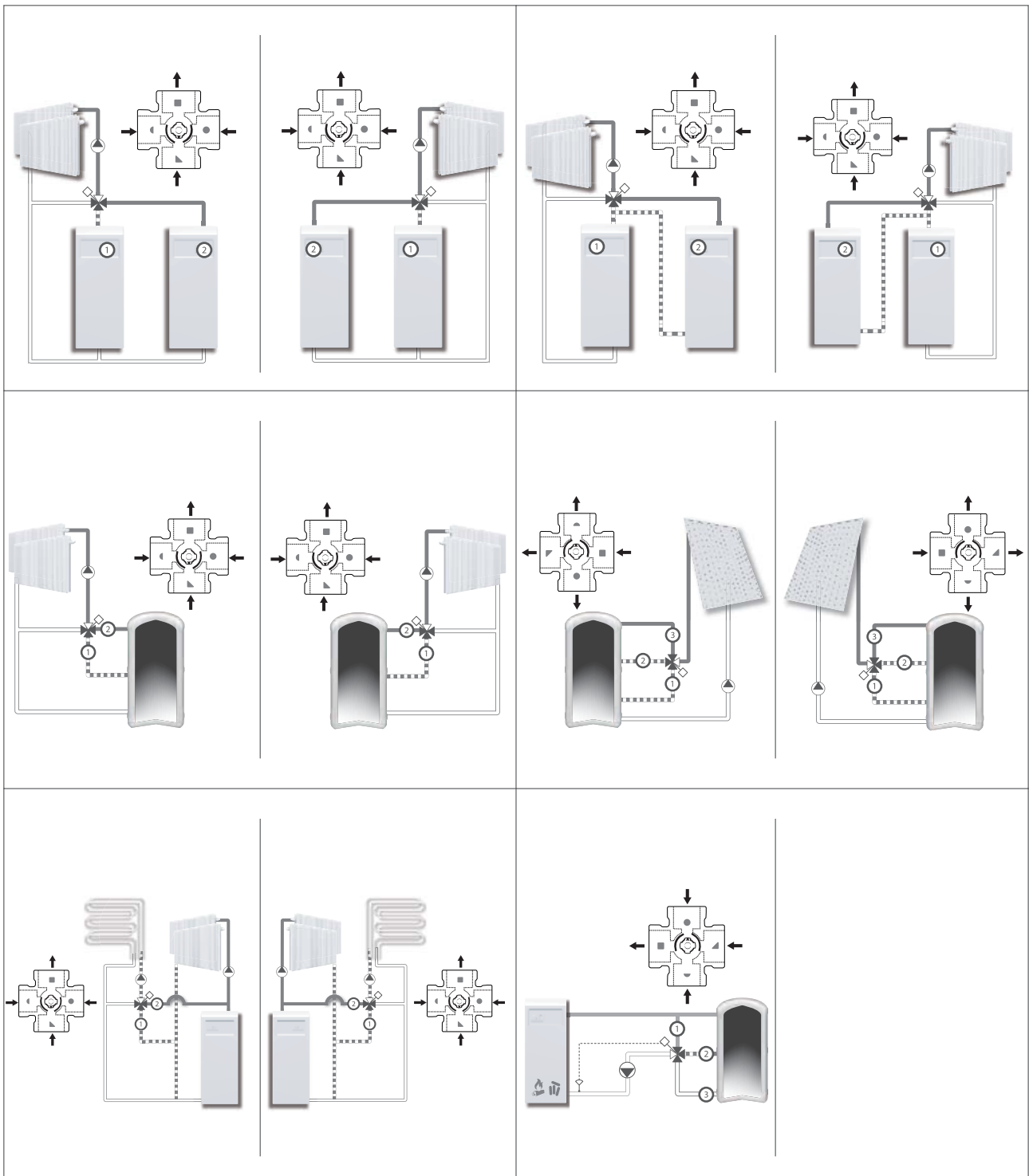


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SELECT THE MOST SUITABLE MIXING VALVE

APPLICATION EXAMPLES ARE VALID FOR

- VRG130 ○ VRG140 ○ VRG230 ○ VRG330 ● VRB140 ○ 5MG ○ 3F ○ 4F



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SELECT VALVE SIZE, SERIES VRG AND VRB

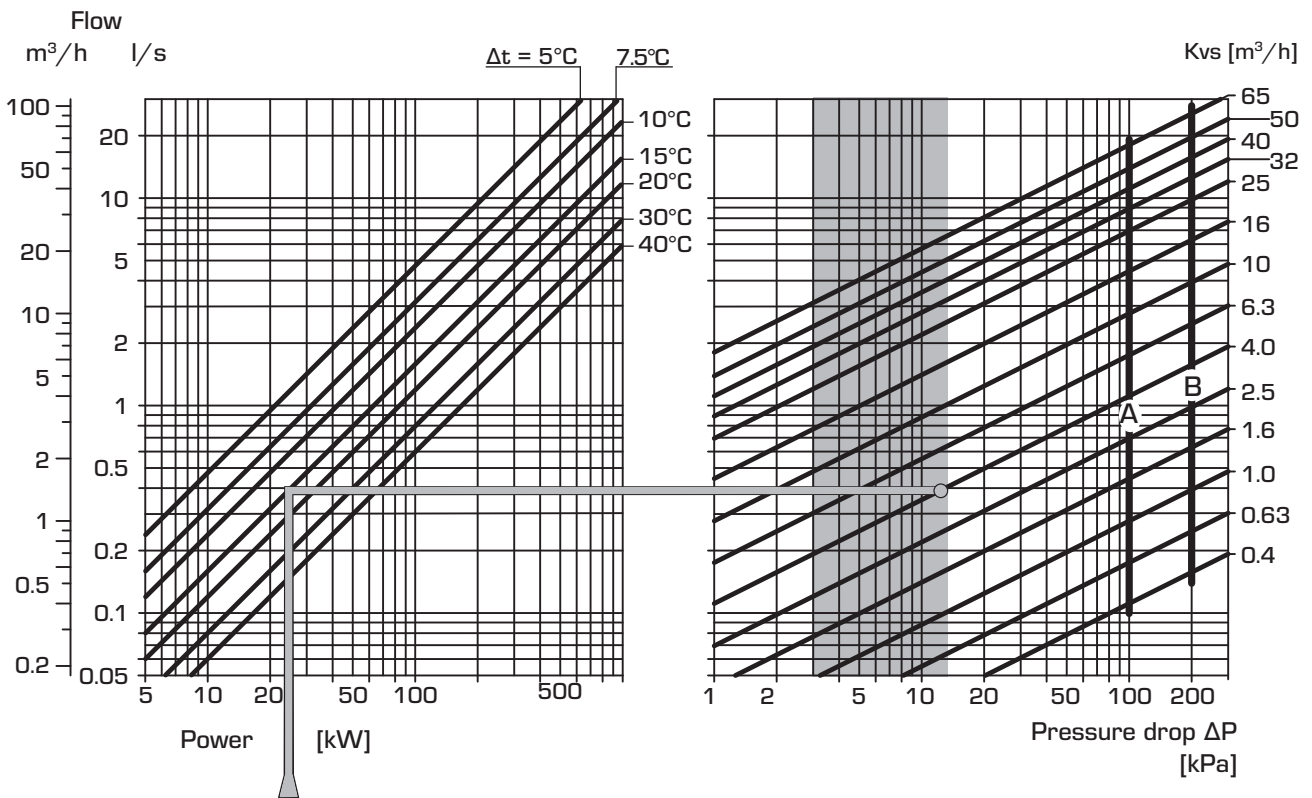
HEATING SYSTEMS (RADIATOR OR UNDERFLOOR HEATING SYSTEMS)

Start with the heat demand in kW (e.g. 25 kW) and move vertically to the chosen Δt (e.g. 15°C).

Move horizontally to the shaded field (pressure drop of 3-15 kPa) and select the smaller Kvs-value (e.g. 4.0). A mixing valve with suitable Kvs-value will be found in respective product description.

OTHER APPLICATIONS

Make sure maximum ΔP is not exceeded (see lines A and B in the graph below).



- A — max ΔP Mixing
- B — max ΔP Diverting

100 kPa = 1 bar \approx 10 mWC

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SELECT VALVE SIZE, SERIES MG, F, T/TM AND H/HG

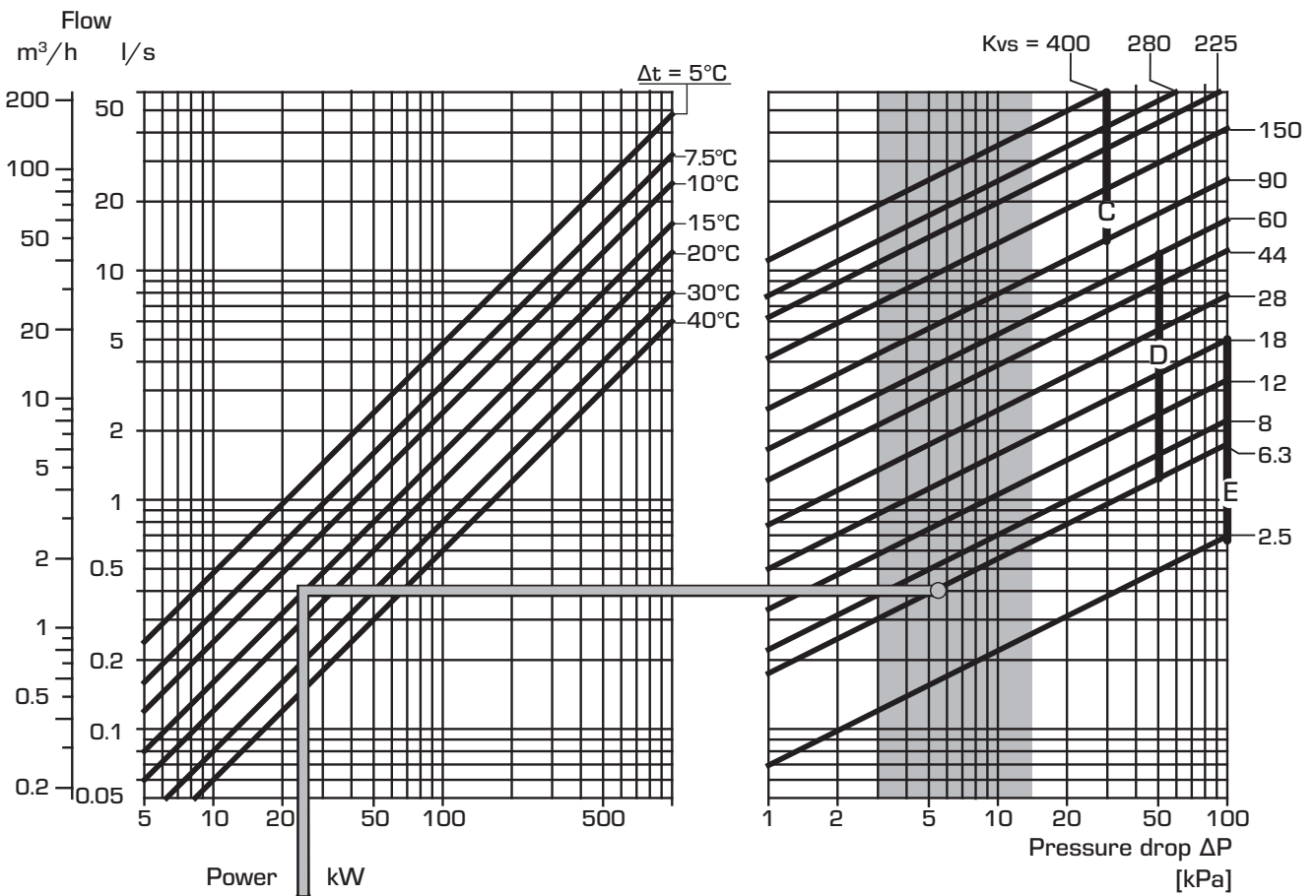
HEATING SYSTEMS (RADIATOR OR UNDERFLOOR HEATING SYSTEMS)

Start with the heat demand in kW (ex. 25 kW) and move vertically to the chosen Δt (ex. 15°C).

Move horizontally to the shaded field (pressure drop of 3-15 kPa) and select the smaller Kvs-value (e.g. 4.0). A mixing valve with suitable Kvs-value will be found in respective product description.

OTHER APPLICATIONS

Make sure maximum ΔP is not exceeded.



- C — max ΔP Series F, DN 65 – 150
 - D — max ΔP Series F, DN 20 – 50, T/TM, H/HG
 - E — max ΔP Series MG
- 100 kPa = 1 bar \approx 10 mWC

