

Three-way reversing valve



Thermostatic 3-way control valves

For heating and cooling systems

*Engineering
GREAT Solutions*

Three-way reversing valve

Three-way reversing valve for the distribution of mass flow in heating and cooling systems.



Key features

- > **Valve body in gunmetal**
corrosion-resistant and safe
- > **Stainless spindle with double O-ring seal**
- > **For all IMI Heimeier thermostatic heads and actuators**
- > **Outer O-ring can be replaced while under pressure**

Technical description

Three-way reversing valve for the distribution of mass flow in heating and cooling systems, made of gunmetal, with protection cap.

Stainless spindle has double O-ring seal. Outer O-ring can be replaced without

draining the system.

Models: flat sealing. Connection with threaded or soldering nipples.

Maximum allowable working pressure 10 bar.

Low-pressure steam 110°C (230°F)/

0.5 bar.

Allowable differential pressure

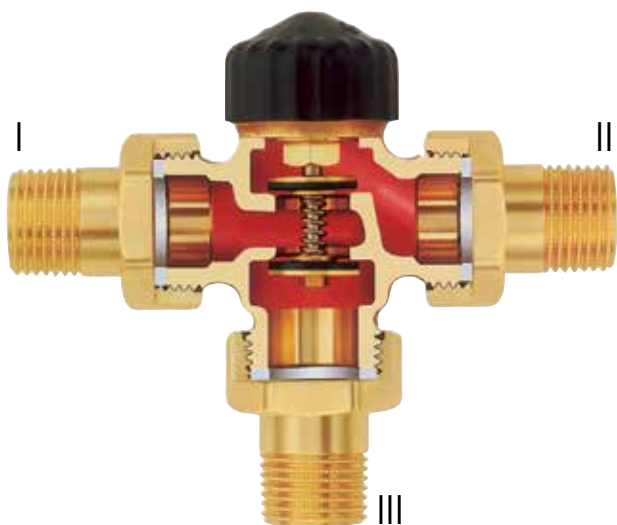
DN 15 = 1.20 bar

DN 20 = 0.75 bar

DN 25 = 0.50 bar

Construction

Three-way reversing valve



Function

The EMO T thermal actuator is used for two-step control with auxiliary power.

In the model **normally open (NO)**, the straight passage I-II of the three-way reversing valve is open without, and the angled exit I-III is closed without current.

In the model **normally closed (NC)**, the straight passage I-II of the three-way reversing valve is closed without, and the angled exit I-III is open without current.

Thermostatic heads are used for proportional control without auxiliary power. They also operate in intermediate positions. When the temperature rises, the straight passage I-II is closed and the angled exit I-III is opened.

The TA-Slider 160, EMOLON, and/or EMO 3 / EMO 3/230 motorized actuators are used for proportional and/or three-step control with auxiliary power. The effective direction is determined by the controller or the connection.

Application

Distributing function

– Switching between heat consuming apparatuses such as the heating circuit and heater for potable water or between various heat generating devices such as boilers, heat pumps, or solar energy systems.

– Output control of heat exchangers via flow rate control, e.g. for air heaters, coolers or other heat exchangers. Volume flow remains steady in the primary circuit.

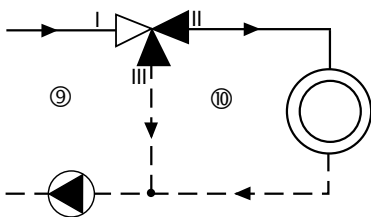
Mixing function

– Mixing control through installation in the return pipe (external mixing point). Approximately equal volume flow in the secondary circuit.

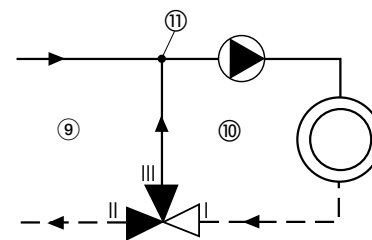
Principle

Pay attention to the flow direction, see function.

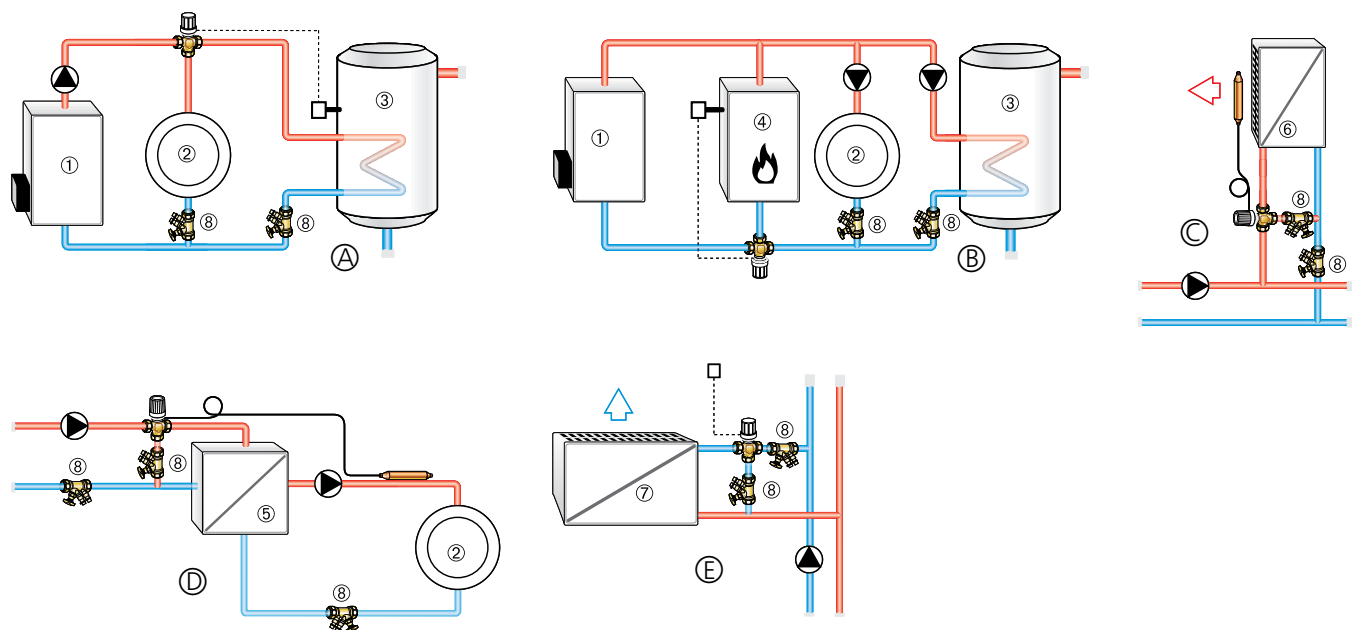
Distributing function



Mixing function



Sample application



- 1. Oil/gas boiler
- 2. Heating circuit
- 3. Hot water storage
- 4. Boiler for solid fuels
- 5. Heat exchanger
- 6. Air heater
- 7. Fan-coil device
- 8. STAD balancing valve
- 9. Primary circuit
- 10. Secondary circuit

- A. Switching between heat consumers such as heating circuits and hot water storages with e. g. EMO T.
- B. Switching between heat generating devices such as an oil/ gas boiler or boilers for solid fuels with e. g. EMO T.
- C. Flow rate control for constant blow-out temperature with air heaters with thermostatic head K with contact sensor.
- D. Switching with fixed-command control of the flow temperature to a secondary circuit of the heat exchanger, such as heaters for potable water, industrial pools, and swimming pool water with thermostatic head K with contact sensor.
- E. Control of the water circuit from fan-coil devices (air conditioners / forced air convectors) with e. g. EMO T.

Note

The composition of the heat transfer medium should be one which avoids damage or the accumulation of stones in hot water heating systems, in accordance with VDI guide line 2035.

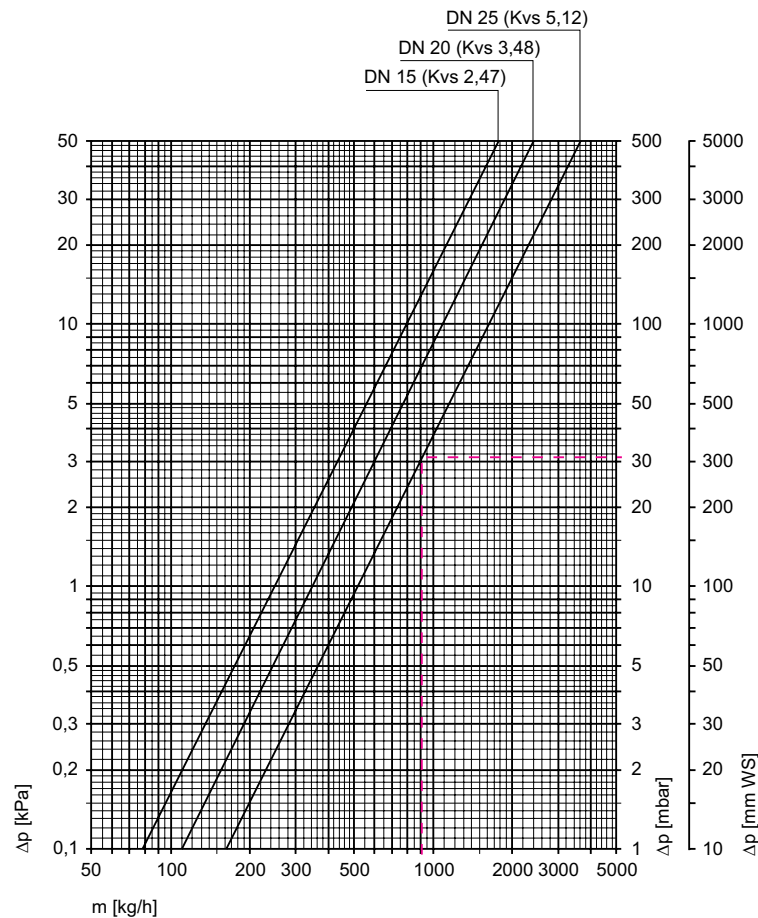
For industrial and long-distance energy systems, see applicable codes VdTÜV and 1466/AGFW FW 510.

Heat transfer media containing mineral oils or lubricants containing mineral oil can have seriously negative effects on the source apparatus and usually lead to the disintegration of EPDM seals.

When using nitrite-free frost and corrosion resistance solutions with an ethylene glycol base, pay close attention to the details outlined in the manufacturers' documentation, particularly details concerning concentration and specific additives.

Technical data

Diagram – Three-way reversing valve with actuator



Three-way reversing valve with Thermostatic head K⁻¹

Three-way reversing valve with immersion/sensor	Kv-value P-band [K]				Kvs
	2,0	4,0	6,0	8,0	
DN 15	0,60	1,20	1,71	2,10	2,47
DN 20	0,70	1,50	2,39	3,10	3,48
DN 25	1,08	2,28	3,48	4,62	5,12

*) The Kv values correspond to the flow in the direction of passage I-II at the given system deviations. The kvs-values corresponds to the flow in the direction I-II with a completely opened valve and in the direction I-III with a closed valve.

Sample calculation

Goal: Pressure loss Δp_v

Given: Three-way reversing valve DN 25 with thermal actuator

Heat flow $Q = 21000 \text{ W}$

Temperature adjustment $\Delta t = 20 \text{ K (70/50}^\circ\text{C)}$

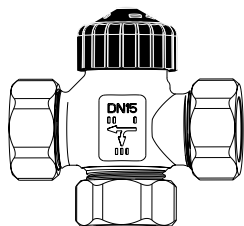
Solution: Mass flow $m = Q / (c \cdot \Delta t) = 21000 / (1,163 \cdot 20) = 903 \text{ kg/h}$

Pressure loss from diagram $\Delta p_v = 31 \text{ mbar}$

$$Cv = \frac{Kv}{0,86}$$

$$Kv = Cv \cdot 0,86$$

Articles

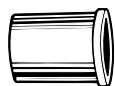
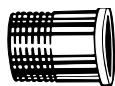


Three-way reversing valve

Flat sealing

DN	EAN	Article No
15	4024052222711	4160-02.000
20	4024052223114	4160-03.000
25	4024052223510	4160-04.000

Accessories – Flat sealing

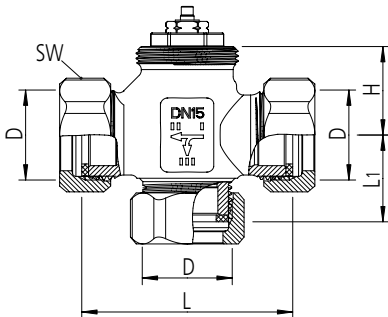


Connecting nipple for flat sealing
three-way reversing valves

DN valve		EAN	Article No
Threaded nipple			
15 (1/2")	R1/2	4024052222810	4160-02.010
20 (3/4")	R3/4	4024052223213	4160-03.010
25 (1")	R1	4024052223619	4160-04.010
Soldered nipple			
Ø Pipe			
20 (3/4")	22	4024052225217	4160-22.039
25 (1")	28	4024052225415	4160-28.039

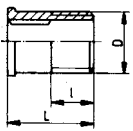
Dimensions

flat sealing

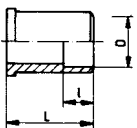


DN	D	L	L1	H	SW
15	G3/4	62	25,5	26,0	30
20	G1	71	35,5	31,0	37
25	G1 1/4	84	42,0	33,5	47

SW = Spanner opening



D	L	I
Threaded nipple		
R1/2	27,5	13,2
R3/4	30,5	14,5
R1	33	16,8



D	L	I
Soldering nipple		
22	23	17
28	27	20

