



Other valves

VL 2 / VL 3

Seated valves (PN 6)

Description

VL 2 and VL 3 valves provide a quality, cost effective solution for most water and chilled applications.

The valves are designed to be combined with following actuators:

- DN 15-50 with AMV(E) 435 or AMV(E) 438 SU actuators. With AMV(E) 25 (SU/SD) or AMV(E) 35 actuators (with adapter 065Z0311).
- DN 65-80 with AMV(E) 435 actuators. With AMV(E) 56 actuator (with adapter 065Z0312).
- DN 100 with AMV(E) 55 or AMV(E) 56, AMV(E) 655, AMV(E) 658 SU/SD or AMV(E) 659 SD actuators.

Combinations with other actuators could be seen under Accessories.

Features & benefits

- Bubble tight design DN 15-80
- Snap mechanical connection together with AMV(E) 435
- Dedicated 2 and 3-port valve
- Suitable for diverting applications (3-port)

Ordering

Product code numbers

2-way valve **VL 2**

DN	k_{vs} (m ³ /h)	T_{max} (°C)	Code No.
15	0.63	120	065Z0371
	1.0		065Z0372
	1.6		065Z0373
	2.5		065Z0374
	4.0		065Z0375
20	6.3		065Z0376
25	10		065Z0377
32	16		065Z0378
40	25		065Z0379
50	40		065Z0380
65	63		065Z0381
80	100		065Z0382
100	145		065Z3426

3-way valve **VL 3**

DN	k_{vs} (m ³ /h)	T_{max} (°C)	Code No.
15	0.63	120	065Z0351
	1.0		065Z0352
	1.6		065Z0353
	2.5		065Z0354
	4.0		065Z0355
20	6.3		065Z0356
25	10		065Z0357
32	16		065Z0358
40	25		065Z0359
50	40		065Z0360
65	63		065Z0361
80	100		065Z0362
100	145		065Z3413

Example:

2-way valve; DN 15; k_{vs} 1,6; PN 6; T_{max} 120 °C; flange connection

- 1× VL 2 DN 15 valve

Code No.: **065Z0373**

Description	Diameter [mm]	Kvs values [m ³ /h]	Media temperature [°C] [Max]	Code number
VL3 PN6 DN15/0,63 flange	15	0.63	120	065Z0351
VL3 PN6 DN15/1 flange	15	1.00	120	065Z0352
VL3 PN6 DN15/1,6 flange	15	1.60	120	065Z0353
VL3 PN6 DN15/2,5 flange	15	2.50	120	065Z0354
VL3 PN6 DN15/4 flange	15	4.00	120	065Z0355
VL3 PN6 DN20/6,3 flange	20	6.30	120	065Z0356
VL3 PN6 DN25/10 flange	25	10.00	120	065Z0357
VL3 DN32/16 PN6 flange	32	16.00	120	065Z0358
VL3 PN6 DN40/25 flange	40	25.00	120	065Z0359

VL3 PN6 DN50/40 flange	50	40.00	120	065Z0360
VL3 PN6 DN65/63 flange	65	63.00	120	065Z0361
VL3 DN80/100 PN6 flange	80	100.00	120	065Z0362
VL2 PN6 DN15/0,63 flange	15	0.63	120	065Z0371
VL2 PN6 DN15/1 flange	15	1.00	120	065Z0372
VL2 PN6 DN15/1,6 flange	15	1.60	120	065Z0373
VL2 PN6 DN15/2,5 flange	15	2.50	120	065Z0374
VL2 PN6 DN15/4 flange	15	4.00	120	065Z0375
VL2 PN6 DN20/6,3 flange	20	6.30	120	065Z0376
VL2 PN6 DN25/10 flange	25	10.00	120	065Z0377
VL2 PN6 DN32/16 flange	32	16.00	120	065Z0378
VL2 PN6 DN40/25 flange	40	25.00	120	065Z0379
VL2 PN6 DN50/40 flange	50	40.00	120	065Z0380
VL2 PN6 DN65/63 flange	65	63.00	120	065Z0381
VL2 PN6 DN80/100 flange	80	100.00	120	065Z0382
VL 3 PN6 100/145 2-way seated flange	100	145.00	120	065Z3413
VL 2 PN6 100/145 2-way seated flange	100	145.00	120	065Z3426
/				C33139
VLN 315 kvs 4				C33380
VLN 320 kvs 6,3				C33381
VLN 325 kvs 10				C33382
VLN 332 kvs 16				C33383
VLN 340 kvs 25				C33384
VLN 350 kvs 40				C33385
VLN 365 kvs 63				C33386
VLN 380 kvs 100				C33387

Accessories code numbers

Adapter

DN	Actuators	max. Δp (bar)	Code No.
15-50	AMV(E) 25, 35	4.0	065Z0311
65-80	AMV(E) 56	2.5	065Z0312

Stem heater

DN	Actuators	Power supply	Code No.	
		(V/VA)	Stem Heater	Adapter
15-80	AMV(E) 435	24/40	065Z0315	/
15-50	AMV(E) 438 SU			enclosed
15-50	AMV(E) 25/35			065Z0311
65-80	AMV(E) 56			065Z0312
100	AMV(E) 55, 56, 65x	24/15	065Z7020	/

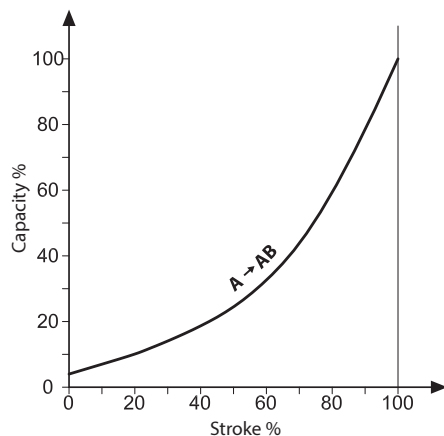
Spare parts code numbers

Type	DN	Code No.
Stuffing box	15	065Z0321
	20	065Z0322
	25	065Z0323
	32	065Z0324
	40/50	065Z0325
	65/80	065Z0327
	100	065B1360

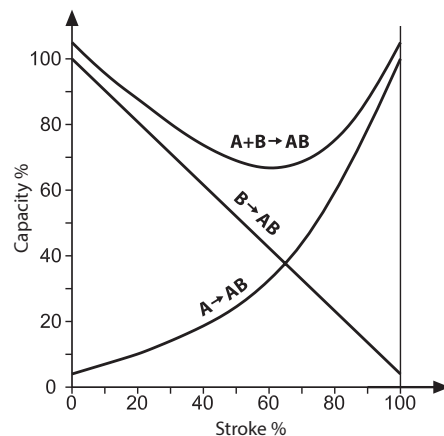
Functions

Valve characteristics

Valve characteristics log (2-way)



Valve characteristics log/lin (3-way)



Product details

General data

Technical data

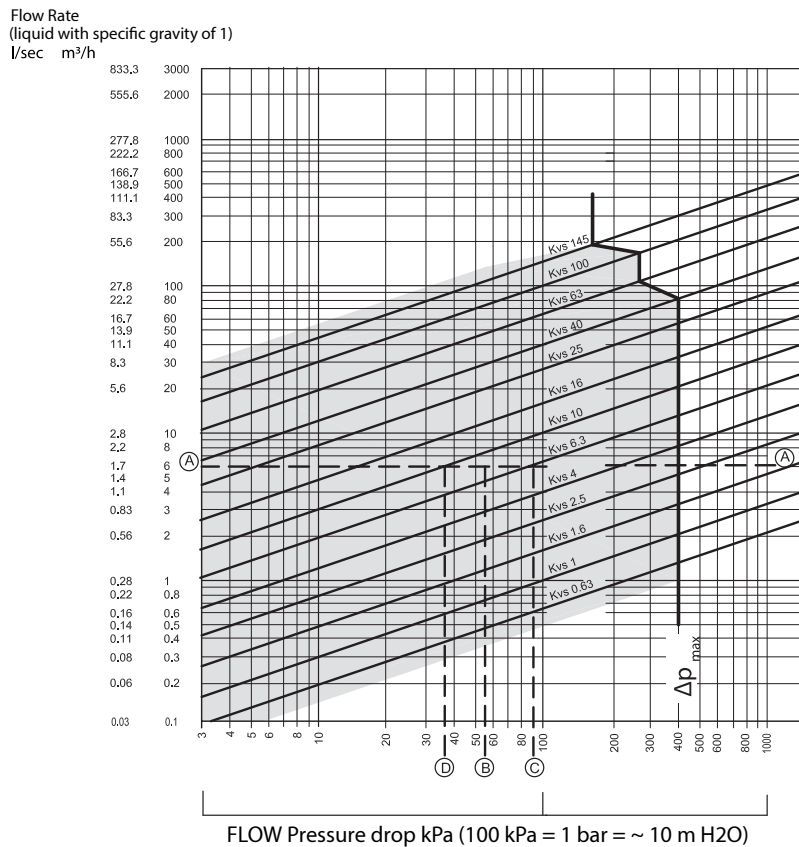
Nominal diameter	DN	15					20	25	32	40	50	65	80	100
k _{VS} value	m ³ /h	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	40	63	100	145
Stroke	mm	10							15			20		30
Control range		30:1	50:1				100:1							
Control characteristic		LOG: port A-AB; LIN: port B-AB												
Cavitation factor z		≥ 0.4												
Leakage		A - AB bubble tight design												0.05 % of k _{VS}
		B - AB ≤ 1.0 % of k _{VS}												
Nominal pressure	PN	6												
Max. closing pressure ¹⁾ (mixing)	bar	4										2.5		1.0 ²⁾
Max. closing pressure ¹⁾ (diverting)		1										0.6		0.3 ²⁾
Medium		Circulation water / glycolic water up to 50 %												
Medium pH		Min. 7, Max. 10												
Medium temperature	°C	2(-10 ³) ... 120												
Connections		Flange PN 6 acc. to EN 1092-2												

¹⁾ Maximum permissible differential pressure across the valve referred for the whole actuating range of motorised valve (a function of actuator's performance)

²⁾ for actuator AMV(E) 55

³⁾ At temperatures from -10 up to +2 °C use stem heater

Sizing



Example

Design data:

Flow rate: 6 m³/h

System pressure drop: 55 kPa

Locate the horizontal line representing a flow rate of 6 m³/h (line A-A). The valve authority is given by the equation:

$$\text{Valve authority, } a = \frac{\Delta p_1}{\Delta p_1 + \Delta p_2}$$

Where:

Δp_1 = pressure drop across the fully open valve

Δp_2 = pressure drop across the rest of the circuit with a full open valve

The ideal valve would give a pressure drop equal to the system pressure drop (i.e. an authority of 0,5):

if: $\Delta p_1 = \Delta p_2$

$$a = \frac{\Delta p_1}{2 \times \Delta p_2} = 0.5$$

In this example an authority of 0,5 would be given by a valve having a pressure drop of 55 kPa at that flow rate (point B).

The intersection of line A-A with a vertical line drawn from B lies between two diagonal lines; this means that no ideally-sized valve is available.

The intersection of line A-A with the diagonal lines gives the pressure drops stated by real, rather than ideal, valves. In this case, a valve with k_{vs} 6,3 would give a pressure drop of 90,7 kPa (point C):

$$\text{Hence valve authority} = \frac{90.7}{90.7 + 55} = 0.62$$

The second largest valve, with k_{vs} 10, would give a pressure drop of 36 kPa (point D):

$$\text{Hence valve authority} = \frac{36}{36 + 55} = 0.395$$

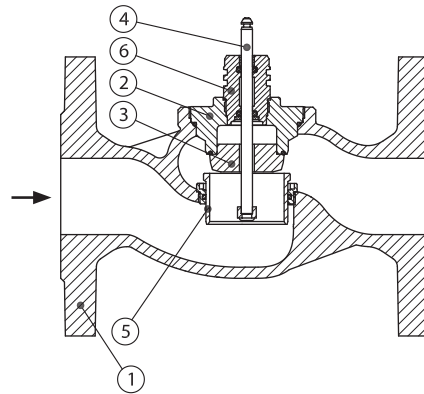
Generally, for a 3 port application, the smaller valve would be selected (resulting in a valve authority higher than 0,5 and therefore improved control). However, this will increase the total pressure and should be checked by the system designer for compatibility with available pump heads, etc. The ideal authority is 0,5 with a preferred range of between 0,4 and 0,7.

Design

(Design variations are possible)

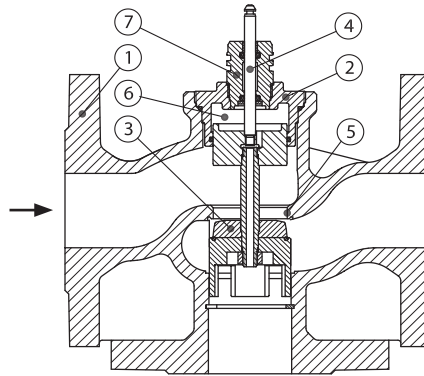
VL 2 DN 15-80

1. Valve body
2. Valve insert
3. Valve cone
4. Valve stem
5. Moving valve seat (pressure relieved)
6. Stuffing box



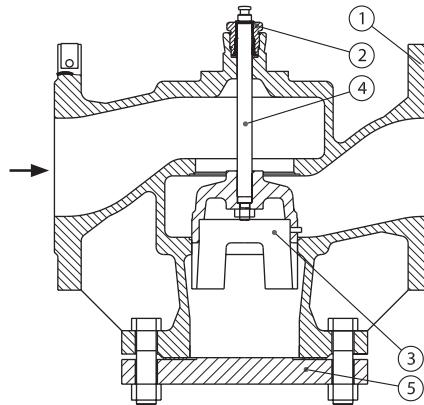
VL 3 DN 15-80

1. Valve body
2. Valve insert
3. Valve cone
4. Valve stem
5. Valve seat
6. Pressure relieve chamber
7. Stuffing box



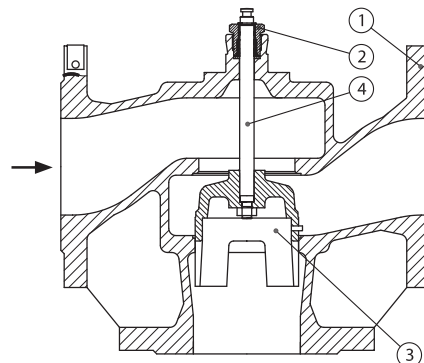
VL 2 DN 100

1. Valve body
2. Valve insert
3. Valve cone
4. Valve stem
5. Blind flange



VL 3 DN 100

1. Valve body
2. Valve insert
3. Valve cone
4. Valve stem





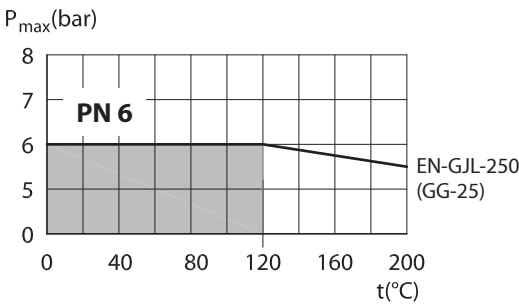
Materials

Valve body	Grey cast iron EN-GJL-250 (GG-25)
Valve stem	Stainless steel
Valve cone	Brass ¹⁾
Stuffing box sealing	EPDM

¹⁾ At DN 100 red bronze CuSn5Zn5Pb5 (Rg 5)

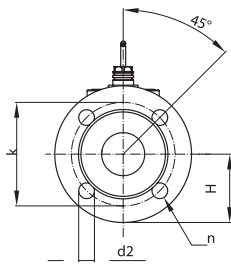
Pressure and temperature data

Pressure temperature diagram

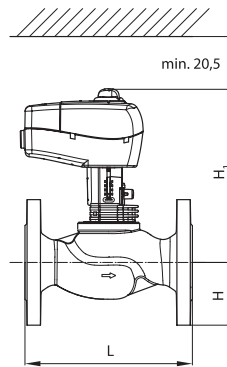


Maximum allowed operating pressure as a function of medium temperature (flanges according to EN 1092-2).

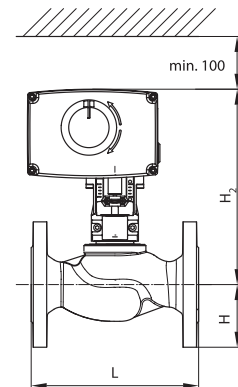
Dimensions



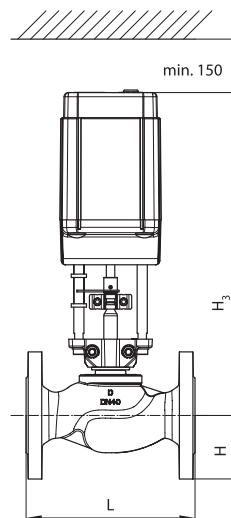
VL 2 (DN 15-80)



AMV(E) 435 + VL 2 (DN 15-80)



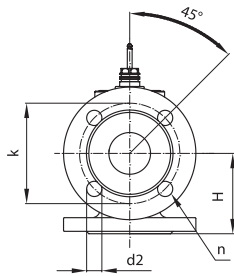
AMV(E) 438 SU + VL 2 (DN 15-50)
AMV(E) 25 (SU/SD),35 +
VL 2 (DN 15-50) +
adapter **065Z0311**



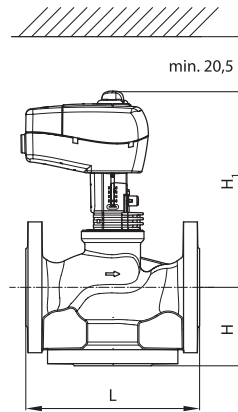
AMV(E) 56 + VL 2 (DN 65-80) + adapter **065Z0312**

Type	DN	L	H	H ₁	H ₂	H ₃	k	d ₂	n	Weight (kg)
		mm								
VL 2	15	130	40	191	216	-	55	11	4	1.48
	20	150	45	194	218	-	65	11	4	2.07
	25	160	50	197	222	-	75	14	4	2.59
	32	180	60	202	226	-	90	14	4	3.82
	40	200	65	213	237	-	100	14	4	5.28
	50	230	70	218	242	-	110	14	4	6.74
	65	290	88	254	-	428	130	14	4	13.90
	80	310	95	258	-	432	150	19	4	17.22

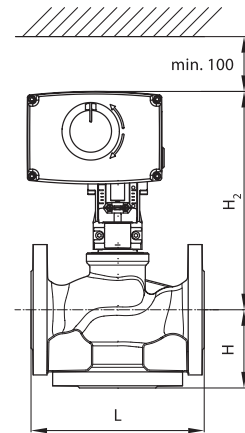
Note: If stem heater is used dimension H₁ is increased for 28 mm and H₂ for 32 mm.



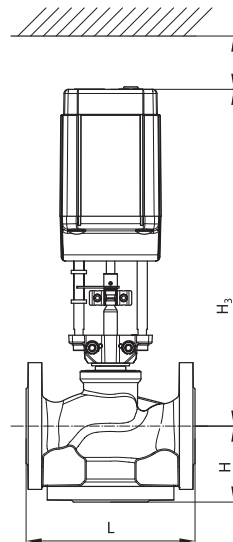
VL 3 (DN 15-80)



AMV(E) 435 + VL 3 (DN 15-80)

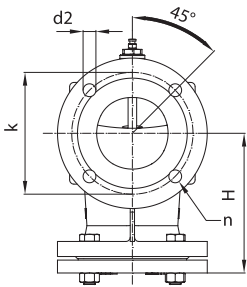


AMV(E) 438 SU + VL 3 (DN 15-50)
 AMV(E) 25 (SU/SD),35 + VL 3 (DN 15-50)
 +
 adapter **065Z0311**

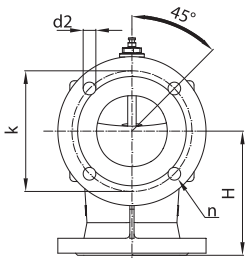
AMV(E) 56 + VL 3 (DN 65, 80) + adapter **065Z0312**

Type	DN	L	H	H ₁	H ₂	H ₃	k	d ₂	n	Weight (kg)
		mm								
VL 3	15	130	63	191	216	-	55	11	4	1.93
	20	150	70	194	218	-	65	11	4	2.68
	25	160	75	197	222	-	75	11	4	3.59
	32	180	80	202	226	-	90	14	4	5.17
	40	200	90	230	255	-	100	14	4	7.08
	50	230	100	243	267	-	110	14	4	10.11
	65	290	120	254	-	428	130	14	4	16.15
	80	310	155	270	-	432	150	19	4	22.36

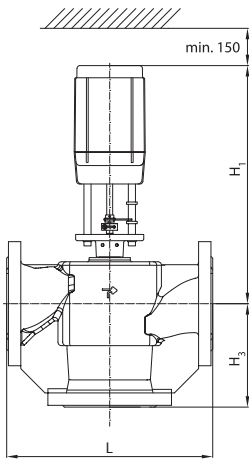
Note: If stem heater is used dimension H₁ is increased for 28 mm and H₂ for 32 mm.



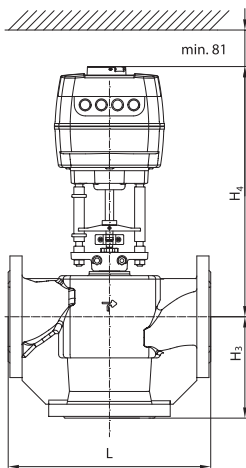
VL 2 (DN 100)



VL 3 (DN 100)



AMV(E) 55, 56 +
VL 2, VL 3 (DN 100)

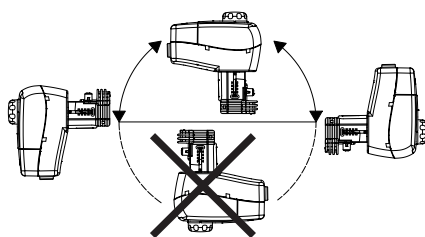


AMV(E) 65x +
VL 2, VL 3 (DN 100)

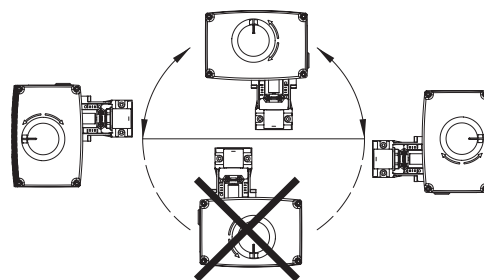
Type	DN	L	H	H ₁	H ₂	H ₃	k	d ₂	n	Weight (kg)
		mm								
VL 2	100	350	196	406	317	450	170	18	4	39.0
VL 3			175							34.0

Note: If stem heater is used dimension H remains the same

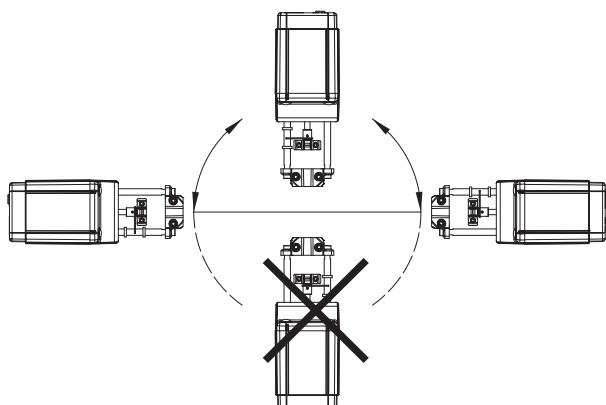
Installation



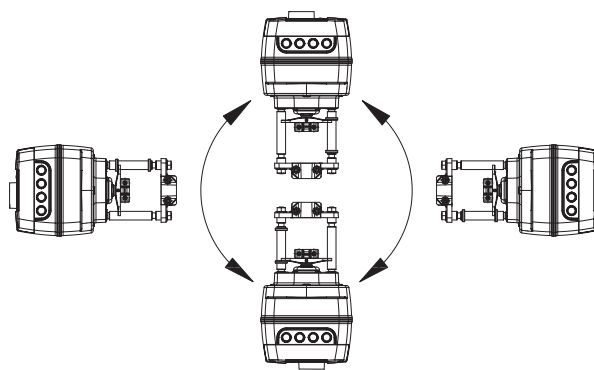
AMV(E) 435



AMV(E) 25(SU/SD)/35/438 SU



AMV(E) 55/56



AMV(E) 65x

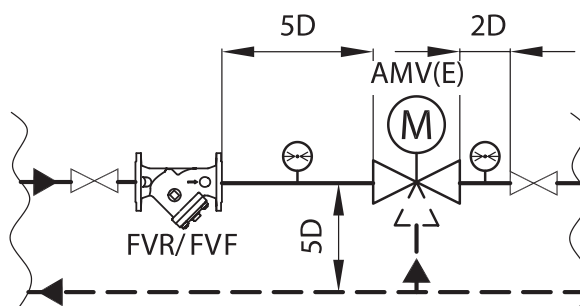
Valve mounting

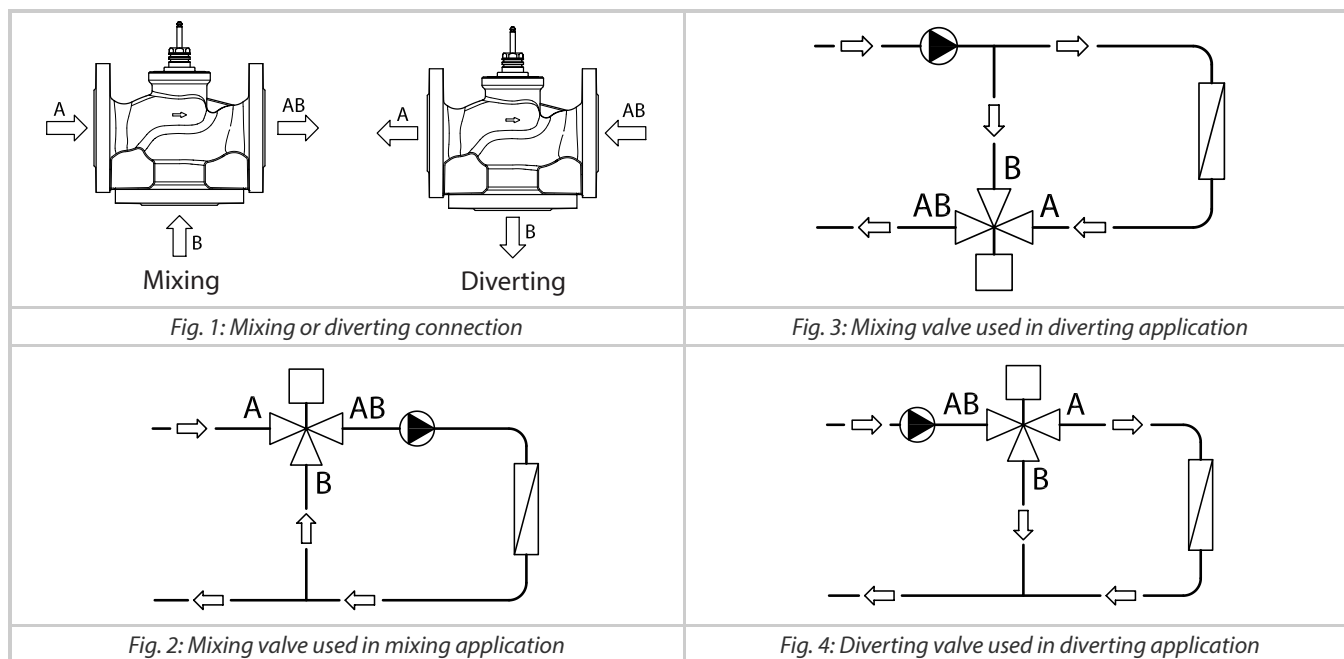
Before valve mounting the pipes have to be cleaned and free from abrasion. Valve must be mounted according to flow direction as indicated on valve body. Mechanical loads of the valve body caused by the pipes are not allowed. Valve should be free of vibrations as well.

Installation of the valve with the actuator is allowed in horizontal position or upwards. Installation downwards is not allowed.

Always install the valve with the arrow on the body in the same direction as the flow. In order to avoid turbulence, which will affect the measuring accuracy, it is recommended to have a straight length of pipe up and down stream from the valve as shown (D - diameter of pipe).

Note: Install a strainer upstream of the valve (e.g. Danfoss FVR/FVF)





Mixing or diverting connection

3-way valve can be used either as mixing or diverting valve (fig.1).

If 3-way valve is installed as mixing valve meaning that A and B ports are inlet ports, and AB port is outlet port it can be installed in mixing (fig.2) or diverting application (fig.3). 3-way valve can be also installed as diverting valve in diverting application (fig.4) meaning that AB port is inlet and A and B ports are outlets.

Note: Maximal closing pressure for mixing and diverting installation are not the same. Please refer to values stated in Technical data section.

Certificates, declarations and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Issuer	Approval topic
EAC Declaration	EAC KZ 7100841.13.12.02339	EAC - Eurasian Customs Union	MD
UA Declaration	Danfoss UA 10.01.23 Heat Control Valves	Danfoss	
Manufacturer's Declaration	Danfoss MD BF11032024-en01.01	Danfoss	Pressure, PED, EU RoHS
Export Control Declaration	Butterfly, other valves, Manual balancing valves, one pipe solution valves and hot water balancing valves	Danfoss	
EU Declaration	EU Declaration of conformity 260619EN2801	Danfoss	Packaging, PPWR



EU Declaration	<u>Packaging EU Declaration of Conformity 260707EN0801</u>	Danfoss	Packaging, PPWR
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