



Motorized control valves

VF 2 / VF 3

Description

VF 2 and VF 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) 335, 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) 335 or AMV(E) 435 actuators. With AMV(E) 56 actuator (with adapter **065Z0312**);
- DN 100 with AMV(E) 55/56 or AMV(E) 65x actuators;
- DN 125, 150 with AMV(E) 55/56, AMV(E) 65x or AMV(E) 85/86 actuators;
- DN 200-300 with AME 685 or AME 855 actuators.

Combinations of actuators is evident under section "Dimension".

Features & benefits

- Soft sealing design DN15-80, 200-300
- Snap mechanical connection together with AMV(E) 335, AMV(E) 435
- Dedicated 2 and 3-port valve
- Suitable for diverting applications (3-port)

Ordering

Product code numbers

Description	Diameter [mm]	Kvs values [m ³ /h]	Media temperature [°C] [Max]	Code number	VVS DK
VF 2 PN16 15/0,63 2-way seated flange	15	0.63	130	065Z0271	461004044
VF 2 PN16 15/1 2-way seated flange	15	1.00	130	065Z0272	461004054
VF 2 PN16 15/1,6 2-way seated flange	15	1.60	130	065Z0273	461004064
VF 2 PN16 15/2,5 2-way seated flange	15	2.50	130	065Z0274	461004074
VF 2 PN16 15/4 2-way seated flange	15	4.00	130	065Z0275	461004084
VF 2 PN16 20/6,3 2-way seated flange	20	6.30	130	065Z0276	461004106
VF 2 PN16 25/10 2-way seated flange	25	10.00	130	065Z0277	461004108
VF 2 PN16 32/16 2-way seated flange	32	16.00	130	065Z0278	461004110
VF 2 PN16 40/25 2-way seated flange	40	25.00	130	065Z0279	461004111
VF 2 PN16 50/40 2-way seated flange	50	40.00	130	065Z0280	461004112
VF 2 PN16 65/63 2-way seated flange	65	63.00	130	065Z0281	461004113
VF 2 PN16 80/100 2-way seated flange	80	100.00	130	065Z0282	461004114
VF 2 PN16 100/145 2-way seated flange	100	145.00	130	065B3205	461042216
VF 2 PN16 125/220 2-way seated flange	125	220.00	200	065B3230	461042217
VF 2 PN16 150/320 2-way seated flange	150	320.00	200	065B3255	461042218
VF 3 PN16 15/0,63 3-way seated flange	15	0.63	130	065Z0251	461014044
VF 3 PN16 15/1 3-way seated flange	15	1.00	130	065Z0252	461014054
VF 3 PN16 15/1,6 3-way seated flange	15	1.60	130	065Z0253	461014064
VF 3 PN16 15/2,5 3-way seated flange	15	2.50	130	065Z0254	461014074
VF 3 PN16 15/4 3-way seated flange	15	4.00	130	065Z0255	461014084
VF 3 PN16 20/6,3 3-way seated flange	20	6.30	130	065Z0256	461014106
VF 3 PN16 25/10 3-way seated flange	25	10.00	130	065Z0257	461014108
VF 3 PN16 32/16 3-way seated flange	32	16.00	130	065Z0258	461014110
VF 3 PN16 40/25 3-way seated flange	40	25.00	130	065Z0259	461014111
VF 3 PN16 50/40 3-way seated flange	50	40.00	130	065Z0260	461014112
VF 3 PN16 65/63 3-way seated flange	65	63.00	130	065Z0261	461014113
VF 3 PN16 80/100 3-way seated flange	80	100.00	130	065Z0262	461014114
VF 3 PN16 100/145 3-way seated flange	100	145.00	130	065B1685	461052216
VF 3 PN16 125/220 3-way seated flange	125	220.00	200	065B3125	461052117
VF 3 PN16 150/320 3-way seated flange	150	320.00	200	065B3150	461052118
VF3 PN16 200/630 3-way seated flange	200	630.00	130	065B4200	461052220
VF3 PN16 250/1000 3-way seated flange	250	1000.00	130	065B4250	461052222
VF3 PN16 300/1250 3-way seated flange	300	1350.00	130	065B4300	461052224
VF3 PN16 DN50/40 dp1,5 softB	50	40.00	130	065Z0085	

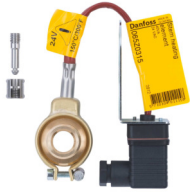
Example:

2-way valve; DN 15; k_{vs} 1.6; PN 16; T_{max} 130 °C; flange connection;

- 1× VF 2 DN 15 valve

Code No.: **065Z0273**

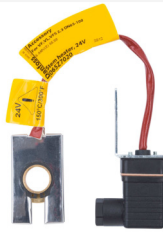
Accessories code numbers



065Z0315

Stem heater for AMV(E) 335/435, AME 435 QM, NovoCon M

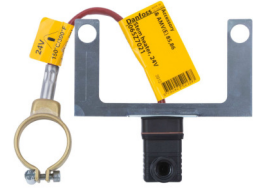
Stem heater for AMV(E) 335/435, AME 435 QM, NovoCon M



065Z7022

Stem heater AMV55/56

Stem heater AMV55/56



065Z7021

STEAM HEATER

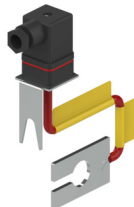
STEAM HEATER



065Z0312

AdapAMx55/56/y23-VRB/G,VF/L2009dn65-80

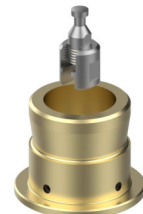
AdapAMx55/56/y23-VRB/G,VF/L2009dn65-80



065Z7020

STEM HEATER

STEM HEATER



065Z0311

AdapAMx15/16/25/35-VRB/G,VF/L2009dn15-50

AdapAMx15/16/25/35-VRB/G,VF/L2009dn15-50

Spare parts code numbers



065Z0327

Valve stuff.box VRB,VRG,VF,VL DN65,80g0

Valve stuff.box VRB,VRG,VF,VL DN65,80g0



065Z0324

Valve stuff.box VRB,VRG,VF,VL DN32 g200

Valve stuff.box VRB,VRG,VF,VL DN32 g200



065Z0323

Valve stuff.box VRB,VRG,VF,VL DN25 g200

Valve stuff.box VRB,VRG,VF,VL DN25 g200



065Z0321

Valve stuff.box VRB,VRG,VF,VL DN15 g200

Valve stuff.box VRB,VRG,VF,VL DN15 g200



065B0007

ACC.STUFFING BOX FOR VF DN 125 - DN 150

ACC.STUFFING BOX FOR VF DN 125 - DN 150



065Z0325

Valve stuff.box VRB,VRG,VF,VL DN40,50g0

Valve stuff.box VRB,VRG,VF,VL DN40,50g0



065B3530

Stuffing box VFM DN150-250

Stuffing box VFM DN150-250



065Z0322

Valve stuff.box VRB,VRG,VF,VL DN20 g200

Valve stuff.box VRB,VRG,VF,VL DN20 g200



065B1360

ACC.STUFFING BOX FOR VF/L DN 65-DN100

ACC.STUFFING BOX FOR VF/L DN 65-DN100

Product details

General data

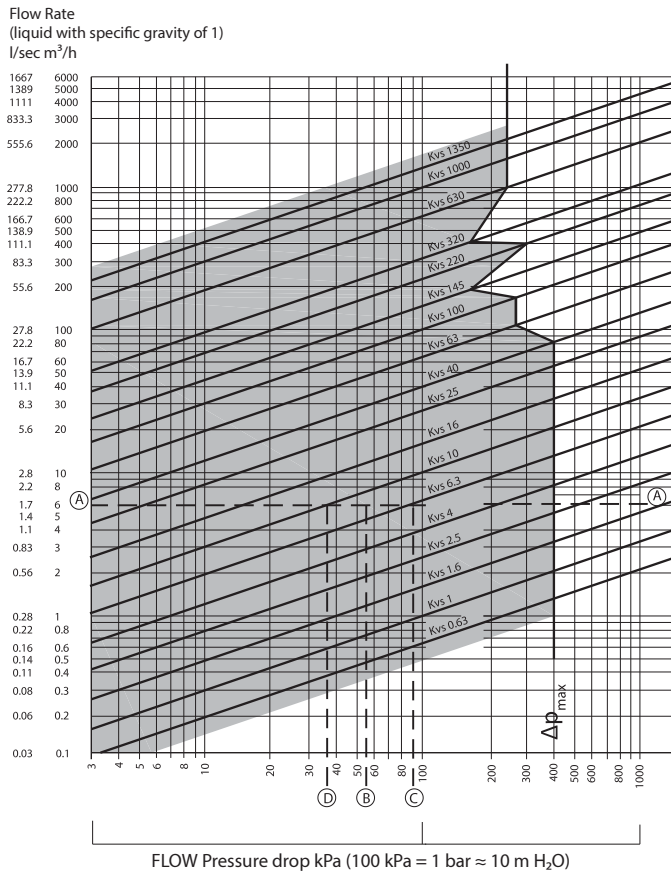
Technical data

Nominal diameter	DN	15					20	25	32	40	50	65	80	100	125	150	200	250	300																	
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	220	320	630	1000	1350																	
Stroke	mm	10					15					20					30					40					57					73				
Control range		30:1					50:1					100:1					>50:1																			
Control characteristic		LOG: port A-AB; LIN: port B-AB																																		
Cavitation factor z		≥ 0.4															≥ 0.45																			
Leakage	A-AB	$\leq 0.03\%$ of k_{VS}										$\leq 0.05\%$ of k_{VS}					$\leq 0.01\%$ of k_{VS}																			
	B-AB	$\leq 1.0\%$ of k_{VS}																																		
Nominal pressure	PN	16																																		
Max. closing pressure ¹⁾		for VF 2 (up to DN 150) and for VF 3 (in mixing applications)																																		
AMV(E) 335/435	(400 N)	bar	4										2.5		-																					
AMV(E) 25 (SU/SD)/438 SU	(450 N)												-																							
AMV(E) 35	(600 N)												-																							
AMV(E) 25	(1000 N)												-																							
AMV(E) 55/65x	(2000 N)		-	1.5	1.0	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-																
AMV(E) 56	(1500 N)		-	2.5	1.0	0.5	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-																
AMV(E) 85/86	(5000 N)		-	-	3.0	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-																
AME 685	(5000 N)		-	-	-	-	1.5	1.2	0.8	-	-	-	-	-	-	-	-	-	-	-																
AME 855	(15000N)	-	-	-	-	5.0	4.0	2.5	-	-	-	-	-	-	-	-	-	-	-																	
Max. closing pressure ¹⁾		for VF 3 (diverting applications)																																		
AMV(E) 335/435	(400 N)	bar	1										0.6		-																					
AMV(E) 25 (SU/SD)/438 SU	(450 N)												-																							
AMV(E) 35	(600 N)												-																							
AMV(E) 25	(1000 N)												-																							
AMV(E) 55/65x	(2000 N)		-	0.3	0.6	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-																
AMV(E) 56	(1500 N)		0.6	0.3	0.5	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-																
AMV(E) 85/86	(5000 N)		-	-	0.6	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-																
AME 685	(5000 N)		-	-	-	-	1.2	1.0	0.5	-	-	-	-	-	-	-	-	-	-	-																
AME 855	(15000N)	-	-	-	-	4.0	3.5	2.0	-	-	-	-	-	-	-	-	-	-	-																	
Medium		Circulation water/glycolic water up to 50 %																																		
Medium pH		Min. 7, Max. 10																																		
Medium temperature ²⁾	°C	2 (-10) ... 130										2 (-10) ... 200					2 (-10) ... 130																			
Connections		Flange PN 16 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) 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:

Δp₁ = pressure drop across the fully open valve

Δp₂ = 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: Δp₁ = Δp₂

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

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):

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

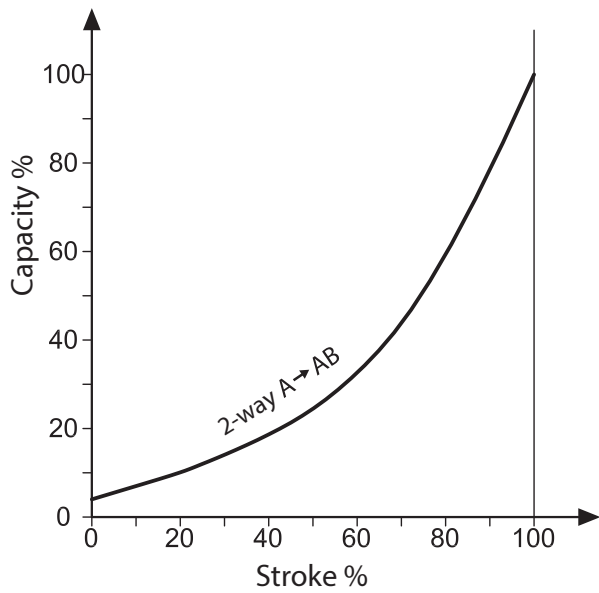
The second largest valve, with k_{vs} 10, would give a pressure drop of 36 kPa (point D):

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

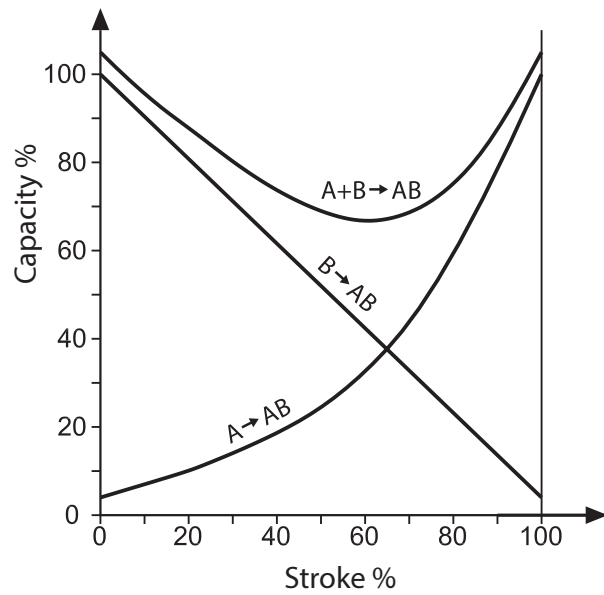
Generally, for a 3 port application, the smaller valve would be selected (resulting in a valve authority higher than 0.5 and therefore improved control). However, this will increase the total pressure and should be checked by the system designer for compatibility with available pump heads, etc. The ideal authority is 0.5 with a preferred range of between 0.4 and 0.7 .

Valve characteristics

Valve characteristics log (2-way)



Valve characteristics log/lin (3-way)

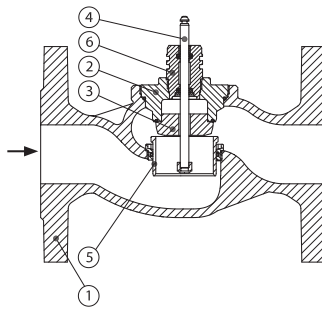


Design

(Design variations are possible)

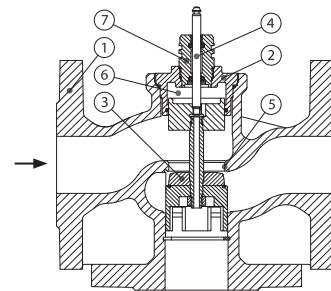
VF 2 DN 15-80

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



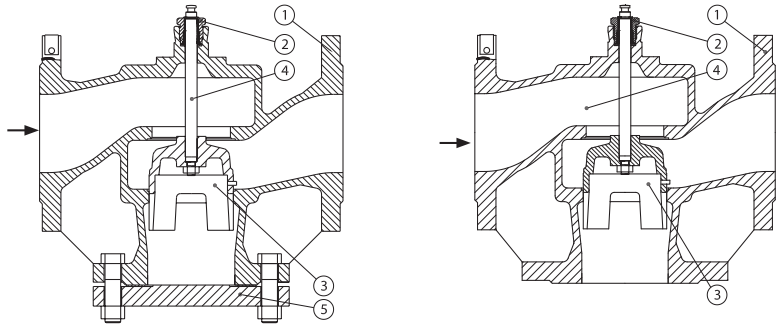
VF 3 DN 15-80

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



VF 2 DN 100

- 1. Valve body
- 2. Stuffing box
- 3. Valve cone
- 4. Valve stem
- 5. Blind flange



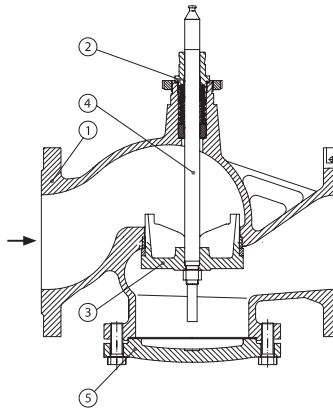
VF 3 DN 100

- 1. Valve body
- 2. Stuffing box
- 3. Valve cone
- 4. Valve stem



VF 2 DN 125-150

- 1. Valve body
- 2. Stuffing box
- 3. Valve cone
- 4. Valve stem
- 5. Blind flange



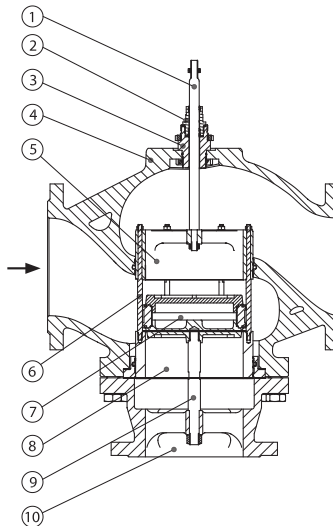
VF 3 DN 125-150

- 1. Valve body
- 2. Stuffing box
- 3. Valve cone
- 4. Valve stem



VF 3 DN 200-300

- 1. Stem
- 2. Stuffing box
- 3. Insert body
- 4. Valve body
- 5. Seat A
- 6. Saddle stem
- 7. Cone component
- 8. Seat B
- 9. Support stem
- 10. Valve body extension



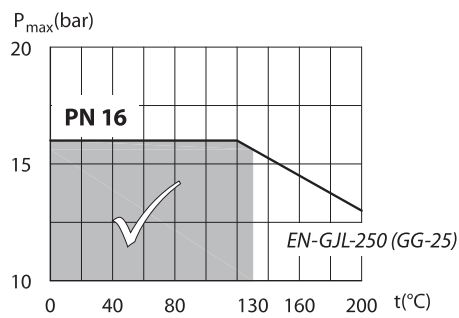
Materials

Materials	DN	15	20	25	32	40	50	65	80	100	125	150	200	250	300		
Valve body		Grey cast iron EN-GJL-250 (GG-25)									Ductile iron EN-GJS-400-18-LT (GGG 40.3)			Grey cast iron EN-GJL-250 (GG-25)			
Valve stem		Stainless steel															
Valve cone		Brass								Red bronze CuSn5Zn5Pb5 (Rg 6)		GGG 40			non-magnetic stainless steel		
Stuffing box sealing		EPDM									PTFE			EPDM			

Pressure and temperature data

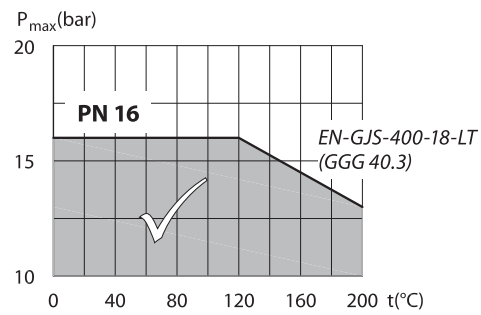
Pressure temperature diagram

DN 15-100
DN 200-300



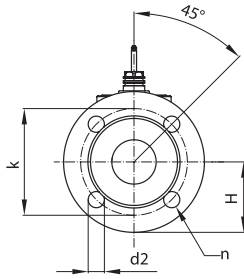
Maximum allowed operating pressure as a function of medium temperature (according to EN 1092-2)

DN 125-150

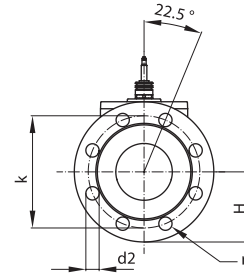


Maximum allowed operating pressure as a function of medium temperature (according to EN 1092-2)

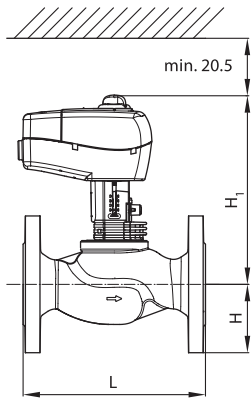
Dimensions



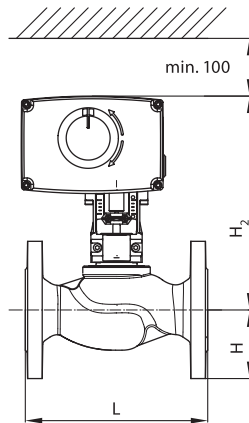
VF 2 (DN 15-65)



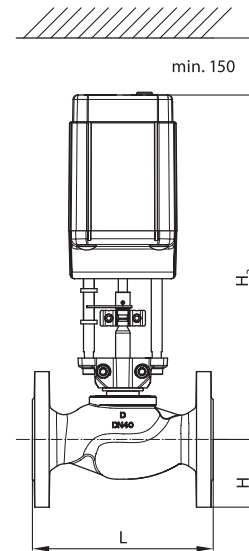
VF 2 (DN 80)



AMV(E) 335, 435 + VF 2 (DN 15-80)



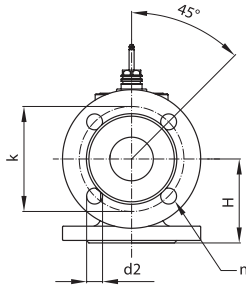
AMV(E) 438 SU + VF 2 (DN 15-50)
AMV(E) 25 (SU/SD),35 + VF 2 (DN 15-50) +
adapter **065Z0311**



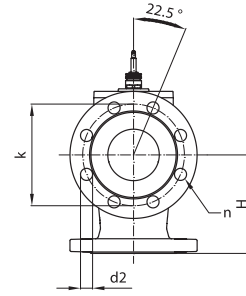
AMV(E) 56 +
VF 2 (DN 65-80) +
adapter **065Z0312**

Type	DN	L	H	H ₁	H ₂	H ₃	k	d ₂	n	Weight (kg)
		mm								
VF 2	15	130	47.5	191	216	-	65	14	4	1.93
	20	150	52.5	194	218	-	75	14	4	2.65
	25	160	57.5	197	222	-	85	14	4	3.23
	32	180	70	202	226	-	100	19	4	4.97
	40	200	75	213	237	-	110	19	4	6.59
	50	230	82.5	218	242	-	125	19	4	8.53
	65	290	92.5	254	-	428	145	19	4	15.92
80	310	100	258	-	432	160	19	8	18.13	

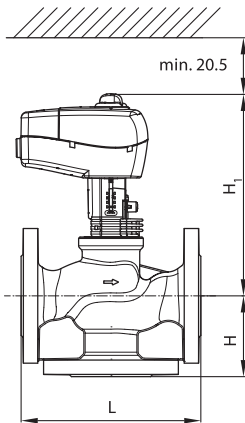
Note: If stem heater is used dimension H₁ is increased for 28 mm and H₂ for 32 mm.



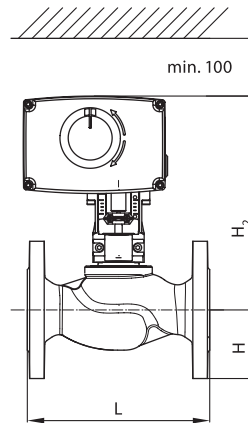
VF 3 (DN 15-65)



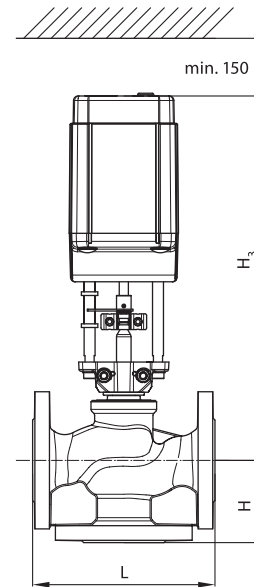
VF 3 (DN 80)



AMV(E) 335, 435 + VF 3 (DN 15-80)



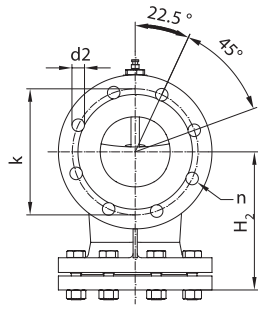
AMV(E) 438 SU + VF 3 (DN 15-50)
AMV(E) 25 (SU/SD),35 + VF 3 (DN 15-50) +
adapter **065Z0311**



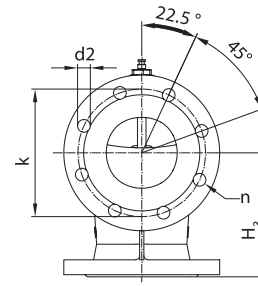
AMV(E) 56 + VF 3 (DN 65-80) +
adapter **065Z0312**

Type	DN	L	H	H ₁	H ₂	H ₃	k	d ₂	n	Weight (kg)
VF 3	15	130	63	191	216	-	65	14	4	2.61
	20	150	70	194	218	-	75	14	4	3.55
	25	160	75	197	222	-	85	14	4	4.54
	32	180	80	202	226	-	100	19	4	6.90
	40	200	90	230	255	-	110	19	4	9.05
	50	230	100	243	267	-	125	19	4	12.79
	65	290	120	254	-	428	145	19	4	19.18
80	310	155	270	-	444	160	19	8	23.73	

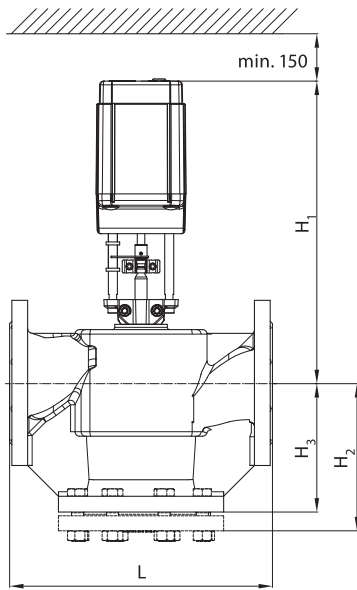
Note: If stem heater is used dimension H₁ is increased for 28 mm and H₂ for 32 mm.



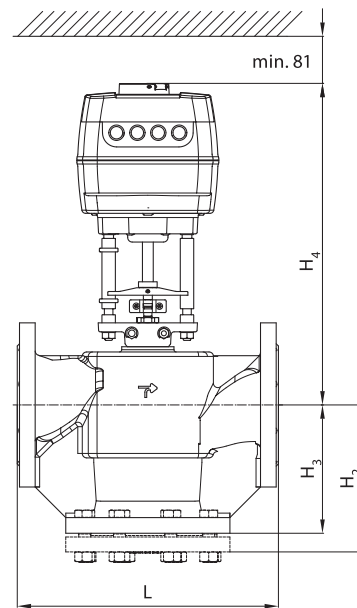
VF 2 (DN 100)



VF 3 (DN 100)



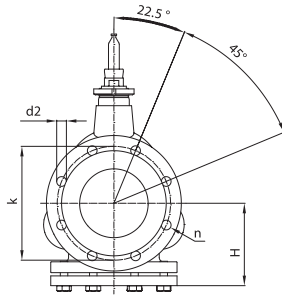
AMV(E) 55, 56 + VF 2, VF 3 (DN 100)



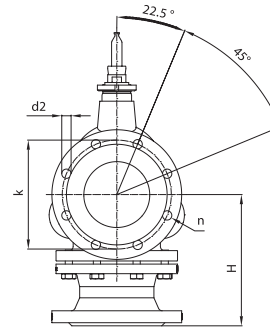
AMV(E) 65x + VF 2, VF 3 (DN 100)

Type	DN	L	H ₁	H ₂	H ₃	H ₄	k	d ₂	n	Weight (kg)
		mm								
VF 2	100	350	406	196	175	450	180	18	8	39.0
VF 3										34.0

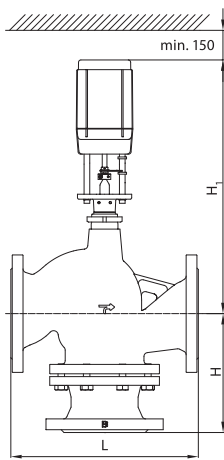
Note: If stem heater is used dimension H remains the same.



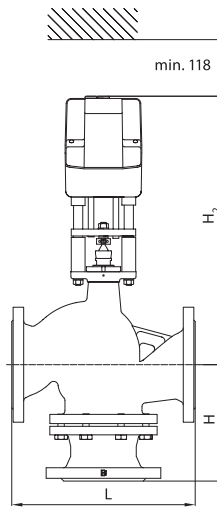
VF 2 (DN 125, 150)



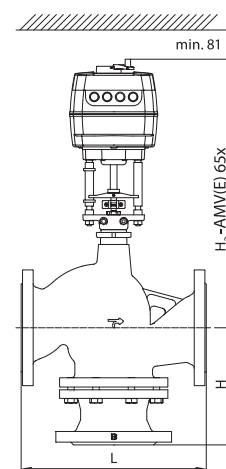
VF 3 (DN 125, 150)



AMV(E) 55, 56 + VF 2, VF 3 (DN 125, 150)



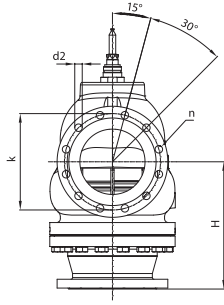
AMV(E) 85, 86 + VF 2, VF 3 (DN 125, 150)



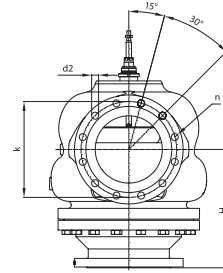
AMV(E) 65x + VF 2, VF 3 (DN 125, 150)

Type	DN	L	H	H ₁	H ₂	H ₃	k	d ₂	n	Weight (kg)
		mm								
VF 2	125	400	160	555	629	595	210	18	8	54.0
	150	480	200	560	682	648	240	22	8	79.0
VF 3	125	400	250	555	629	595	210	18	8	65.3
	150	480	300	560	682	648	240	22	8	92.0

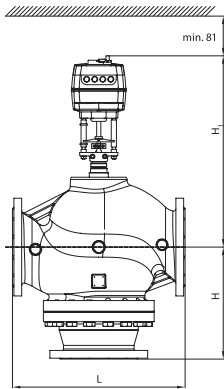
Note: If stem heater is used dimensions H₁ and H₂ remain the same.



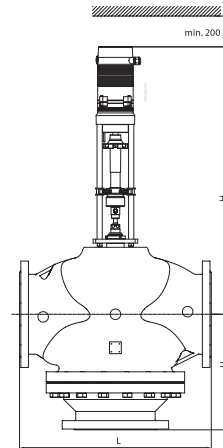
VF 3 (DN 200)



VF 3 (DN 250-300)



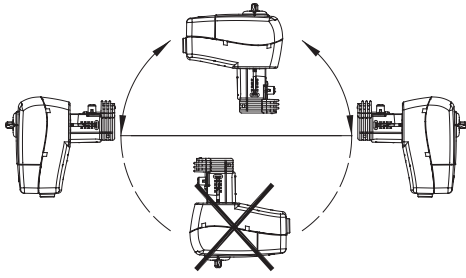
AME 685 + VF 3 (DN 200-300)



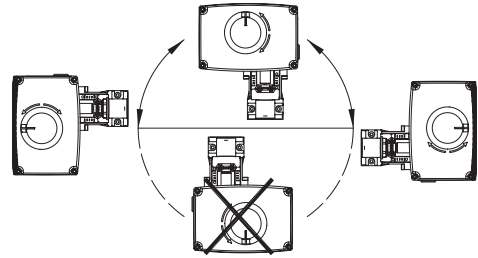
AME 855 + VF 3 (DN 200-300)

Type	DN	L	H	H ₁	H ₂	k	d ₂	n	Weight (kg)
		mm							
VF 3	200	600	389	766	1006	295	23	12	236
	250	730	440	778	1018	355	26	12	443
	300	850	490	811	1051	410	28	12	590

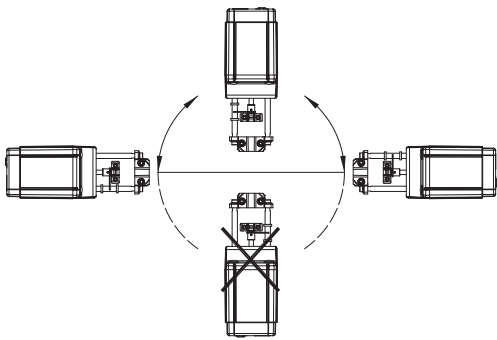
Installation



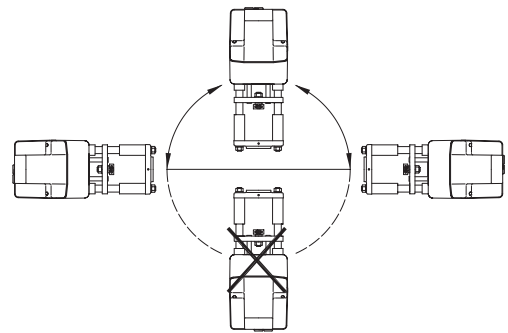
AMV(E) 335/435



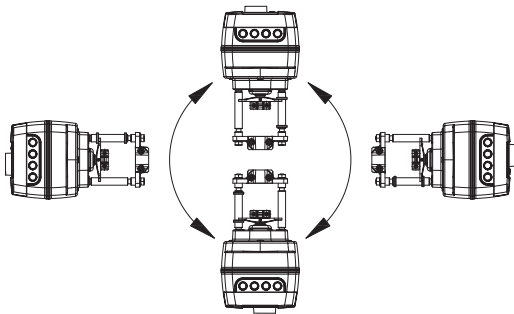
AMV(E) 25(SU/SD)/35/438 SU



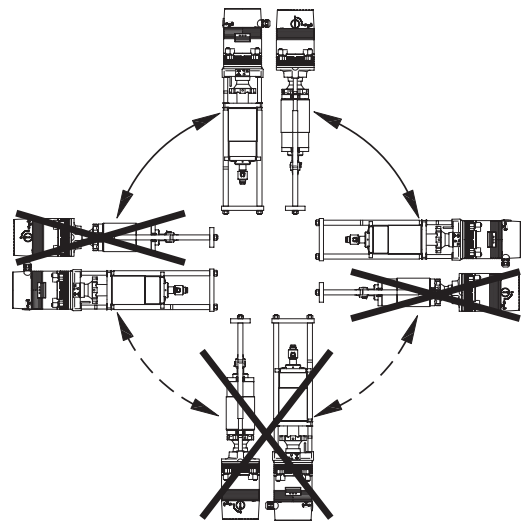
AMV(E) 55/56



AMV(E) 85/86



AMV(E) 65x, 685



AME 855

$T_{max} \leq 150 \text{ }^{\circ}\text{C}$ for AMV(E) 25 (SU/SD), 35

$T_{max} \leq 200 \text{ }^{\circ}\text{C}$ for other AMV(E)

$T_{max} = 150 \dots 200 \text{ }^{\circ}\text{C}$ AMV(E) 25 (SU/SD), 35

Valve mounting

Before mounting the valve be sure that the pipes are clean and free from abrasion.

It is essential that the pipes are lined up squarely with the valve at each connection and that they are free from vibrations.

Install the motorized control valves with the actuator in a vertical or horizontal position in accordance to recommendations described in Installation above.

Leave sufficient clearance to facilitate the dismantling of the actuator from the valve body for maintenance purposes.

Note that the actuator may be rotated up to 360° with respect to the valve body by loosening the retaining fixture. After this operation retighten.

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)

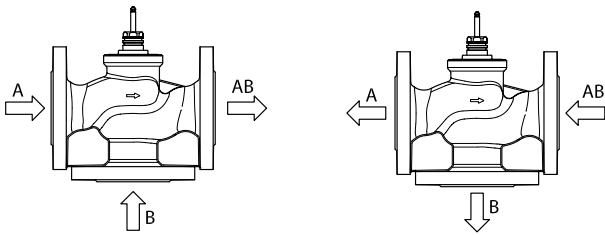
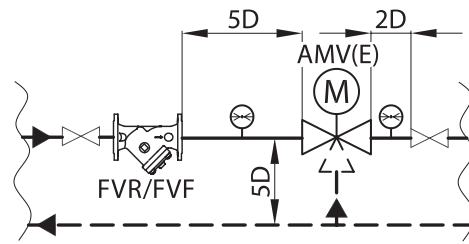


Fig. 1: Mixing or diverting connection

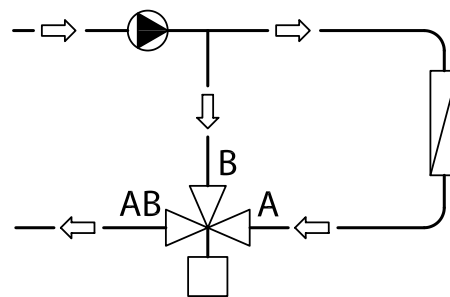


Fig. 3: Mixing valve used in diverting application

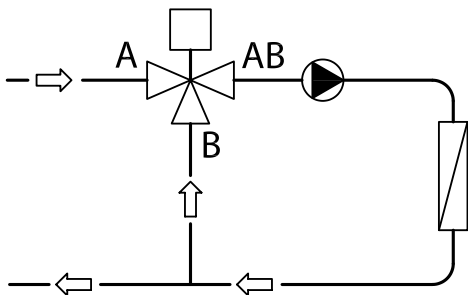


Fig. 2: Mixing valve used in mixing application

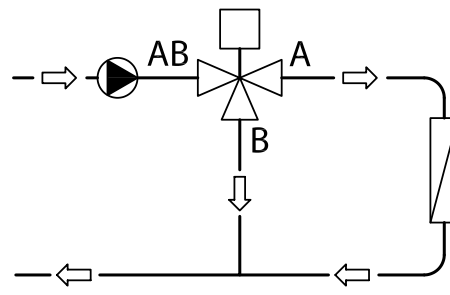


Fig. 4: Diverting valve used in diverting application

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	Certification body	Approval topic
Export Control Declaration	Motorized control valves	Danfoss	
Manufacturer's Declaration	Manufacturer's declaration BF06012025-en01	Danfoss	Pressure, PED
EU Declaration	PL08-28_230612EN0854103_declaration of conformity_rev6_Control Valves.docx.pdf	Danfoss	Pressure, PED
Export Control Declaration	Butterfly, other valves, Manual balancing valves, one pipe solution valves and hot water balancing valves	Danfoss	
UA Declaration	Danfoss UA 10.01.23 Heat Control Valves	Danfoss	
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