

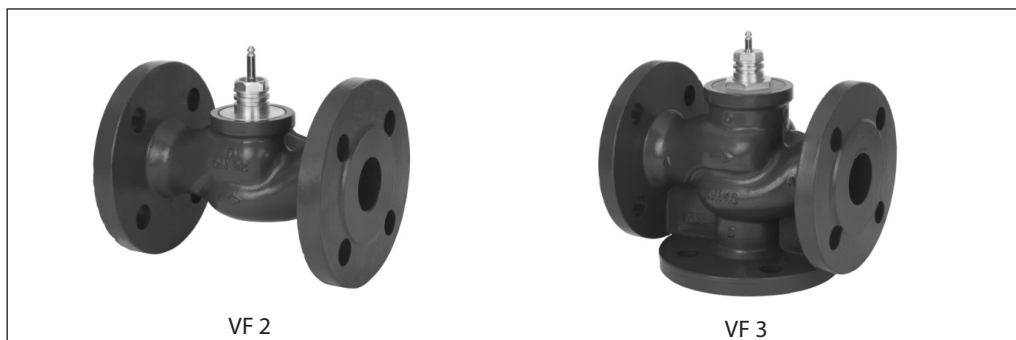
Data sheet

Seated valves (PN 16)

VF 2 – 2-way valve, flange

VF 3 – 3-way valve, flange

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
- DN 65-80 with AMV(E) 335 or AMV(E) 435 actuators
- DN 100 with AMV(E) 55, AMV(E) 56, AMV 423 or AMV 523 actuators
- DN 125, 150 with AMV(E) 55, AMV(E) 56, AMV(E) 85 or AMV(E) 86 actuators.

Combinations with other actuators could be seen under Accessories.

Main data:

- DN 15-150
- k_{vs} 0.63-320 m³/h
- PN 16
- Temperature:
 - Circulation water/glycolic water up to 50 %:
 - 2 (-10*) ... 130 °C (DN 15-100)
 - 2 (-10*) ... 200 °C (DN 125, 150)
- * At temperatures from -10 °C up to +2 °C use stem heater
- Flange connections
- Compliance with Pressure Equipment Directive 97/23/EC

Ordering

Example:
2-way valve, DN 15, k_{vs} 1.6, PN 16,
 t_{max} 130 °C, flange connection

- 1x VF 2 DN 15 valve
Code No.: **065Z0273**

2-way valve VF 2

DN	k_{vs} (m ³ /h)	PN	$t_{max.}$ (°C)	Code No.
15	0.63	16	130	065Z0271
	1.0			065Z0272
	1.6			065Z0273
	2.5			065Z0274
	4.0			065Z0275
20	6.3			065Z0276
25	10			065Z0277
32	16			065Z0278
40	25			065Z0279
50	40			065Z0280
65	63		065Z0281	
80	100		065Z0282	
100	145		065B3205	
125	220		065B3230	
150	320		065B3255	
			200	

3-way valve VF 3

DN	k_{vs} (m ³ /h)	PN	$t_{max.}$ (°C)	Code No.
15	0.63	16	130	065Z0251
	1.0			065Z0252
	1.6			065Z0253
	2.5			065Z0254
	4.0			065Z0255
20	6.3			065Z0256
25	10			065Z0257
32	16			065Z0258
40	25			065Z0259
50	40			065Z0260
65	63		065Z0261	
80	100		065Z0262	
100	145		065B1685	
125	220		065B3125	
150	320		065B3150	
			200	

Ordering (continued)
Accessories - Adapter

DN	Actuators	max.Δp (bar)	Code No.
15-50	AMV(E) 15, 25, 35, 323, 423, 523	4.0	065Z0311
65-80	AMV(E) 55, 56, 323, 423, 523	2.5	065Z0312

Accessories - Stem heater

DN	Actuators	Power supply	Code No.
15-80	AMV(E) 335, 435	24 V	065Z0315
15-50	AMV(E) 438 SU		065B2171
65-100	AMV(E) 55, 56		065Z7020
125, 150	AMV(E) 55, 56		065Z7022
125, 150	AMV(E) 85, 86		065Z7021

Service kits

Type	DN	Code No.
Stuffing box	15	065Z0321
	20	065Z0322
	25	065Z0323
	32	065Z0324
	40,50	065Z0325
	65,80	065Z0327
	100	065B1360
	125,150	065B0007

Technical data

Nominal diameter	DN	15				20	25	32	40	50	65	80	100	125	150		
		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
Stroke	mm	10				15				20		30				40	
Control range		30:1	50:1				100:1										
Control characteristic		LOG: port A-AB; LIN: port B-AB															
Cavitation factor z		≥ 0.4															
Leakage acc. to standard IEC 534		A - AB ≤ 0.05 % of k _{vs} B - AB ≤ 1.0 % of k _{vs}															
Nominal pressure	PN	16															
Max. closing pressure	bar	4				2.5		1.0 ¹⁾ 1.5 ²⁾		0.5 ³⁾ 1.0 ²⁾ 3.0 ⁴⁾		0.2 ³⁾ 0.5 ²⁾ 1.5 ⁴⁾					
Medium		Circulation water/glycolic water up to 50 %															
Medium pH		Min. 7, Max. 10															
Medium temperature	°C	2 (-10 ⁵⁾) ... 130											2 (-10 ⁵⁾) ... 200				
Connections		Flange PN 16 acc. to EN 1092-2															
Materials																	
Valve body		Grey cast iron EN-GJL-250 (GG-25)										Ductile iron EN-GJS-400-18-LT (GGG 40.3)					
Valve stem		Stainless steel															
Valve cone		Brass									Red bronze CuSn5Zn5Pb5 (Rg 5)		GGG 40				
Stuffing box sealing		EPDM												PTFE			

¹⁾ for actuators AMV(E) 56, AMV 423, AMV 523

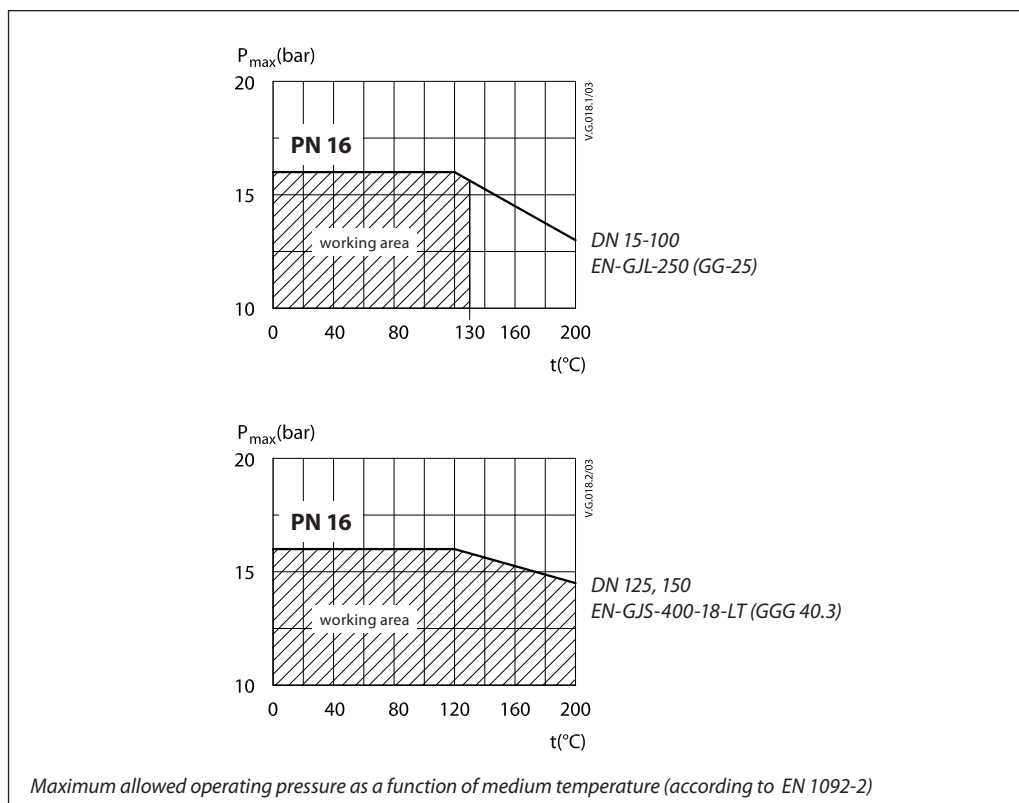
²⁾ for actuators AMV(E) 55

³⁾ for actuators AMV(E) 56

⁴⁾ for actuators AMV(E) 85, AMV(E) 86

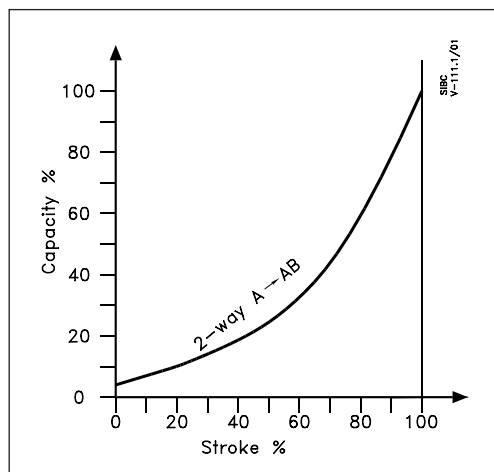
⁵⁾ At temperatures from -10 up to +2 °C use stem heater

Pressure temperature diagram

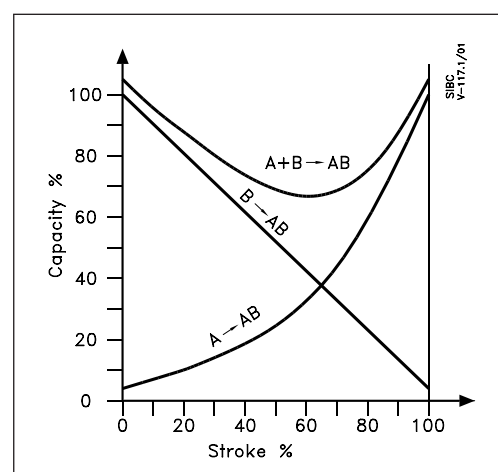


Valve characteristics

Valve characteristics log (2-way)



Valve characteristics log/lin (3-way)

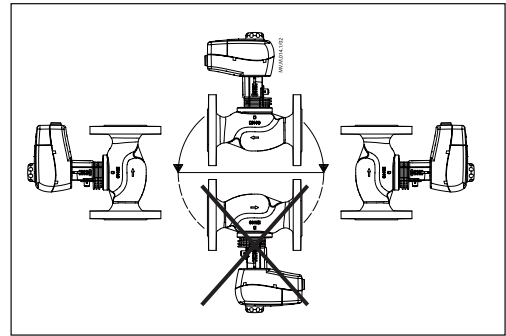


Installation

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.



Application schemes for 3-way mixing valves

3-way valve is mixing valve meaning that A and B ports are inlet ports, and AB port is outlet port (fig. 1). In case valve should be used as diverting valve (which is in general not allowed) it is a solution to install valve in return pipe (fig. 2).

Remark:

3-way valve can be used as diverting valve (AB is inlet port, A and B are outlet ports) but only up to differential pressure over the valve equal to 1/10 of max. closing pressure stated in Technical data section.

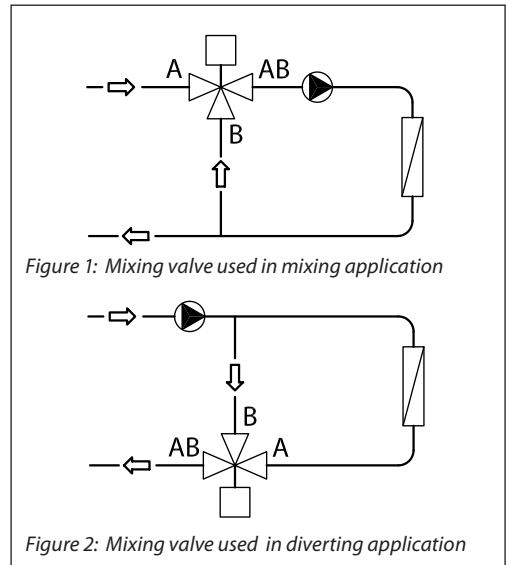


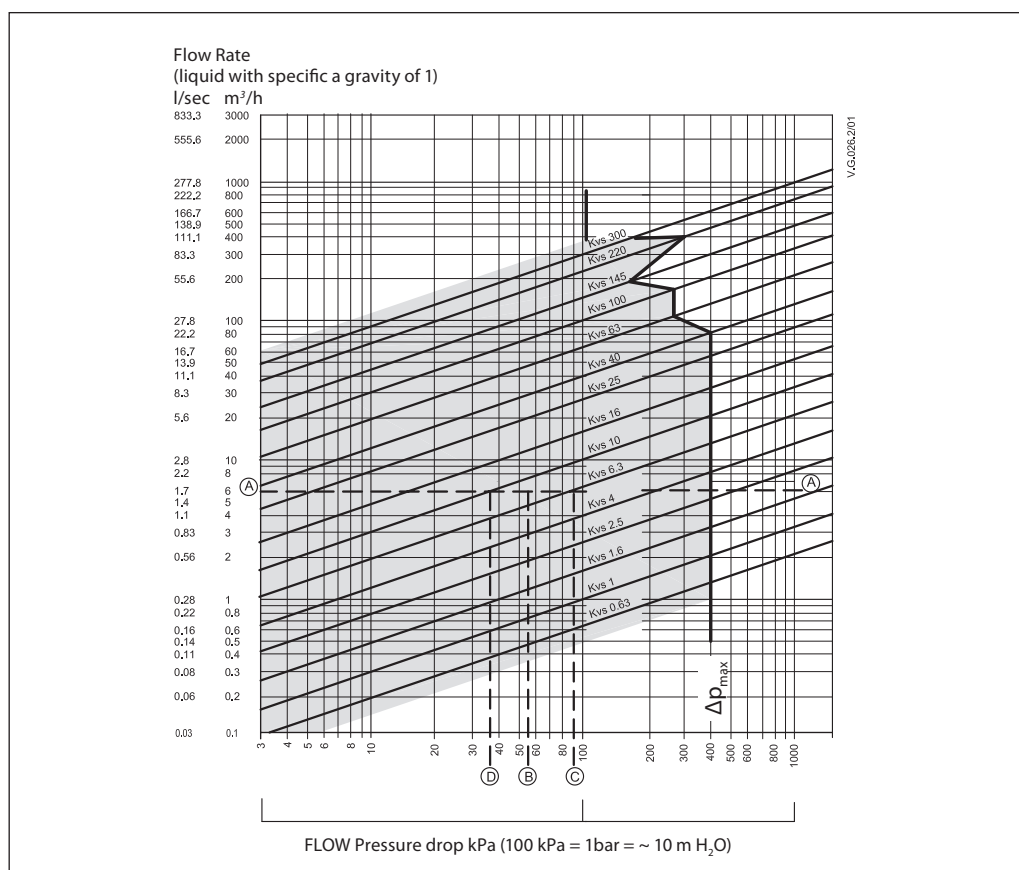
Figure 1: Mixing valve used in mixing application

Figure 2: Mixing valve used in diverting application

Disposal

The valve must be dismantled and the elements sorted into various material groups before disposal.

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: $\Delta p_1 = \Delta p_2$
 $a = \Delta p_1 / 2 \times \Delta p_1 = 0.5$

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):

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

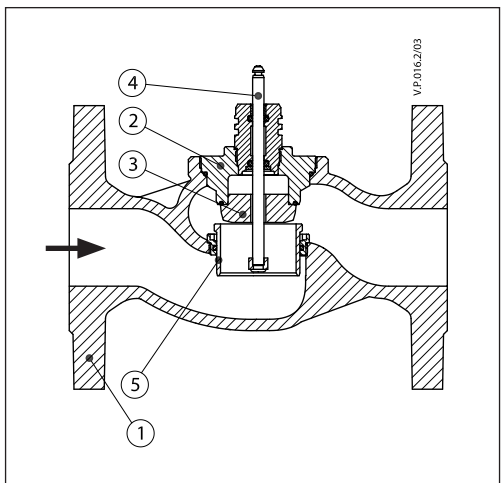
Generally, for a 3 port application, the smaller valve would be selected (resulting in a valve authority higher than 0.5 and therefore improved control). However, this will increase the total pressure and should be checked by the system designer for compatibility with available pump heads, etc. The ideal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

Design

(Design variations are possible)

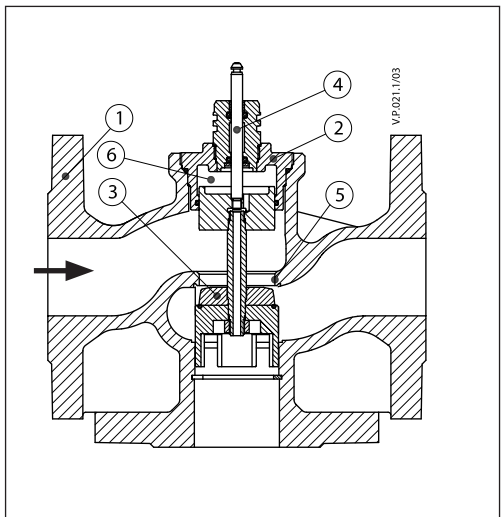
VF 2

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

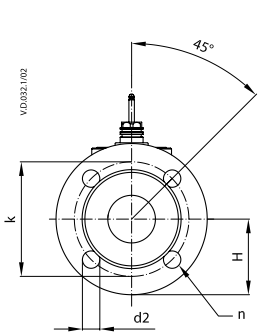


VF 3

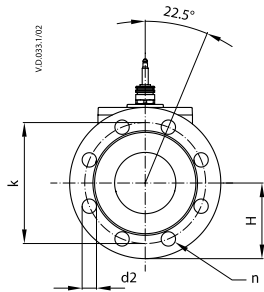
- 1. Valve body
- 2. Valve insert
- 3. Valve cone
- 4. Valve stem
- 5. Valve seat
- 6. Pressure relieve chamber



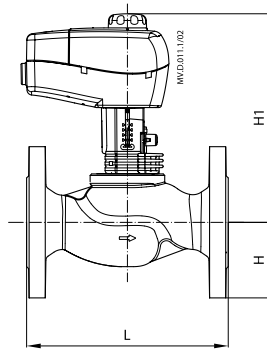
Dimensions



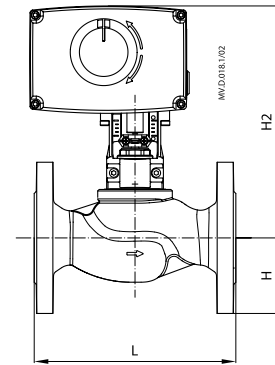
VF 2 (DN 15-65)



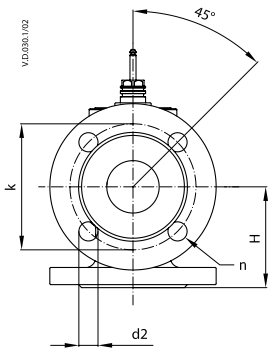
VF 2 (DN 80)



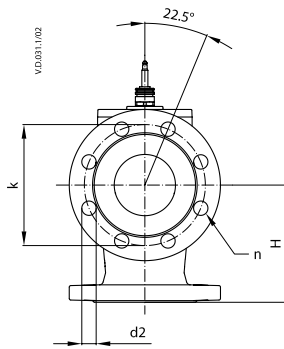
AMV(E) 335, 435 +
VF 2 (DN 15-80)



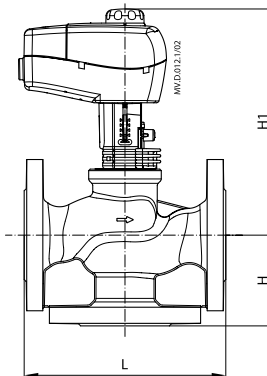
AMV(E) 438 SU +
VF 2 (DN 15-50)



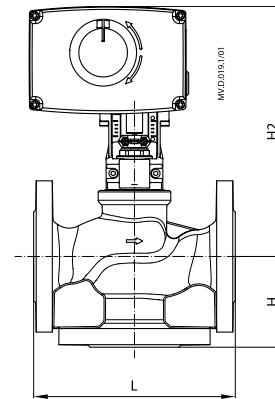
VF 3 (DN 15-65)



VF 3 (DN 80)



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



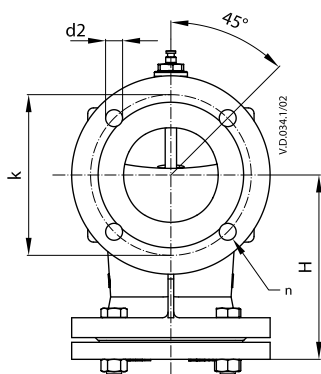
AMV(E) 438 SU +
VF 3 (DN 15-50)

Type	DN	L	H	H1	H2	k	d2	n	Weight (kg)
VF 2	15	130	47.5	192.5	212.5	65	14	4	1.93
	20	150	52.5	194.5	214.5	75	14	4	2.65
	25	160	57.5	198.5	218.5	85	14	4	3.23
	32	180	70	203	223	100	19	4	4.97
	40	200	75	209	229	110	19	4	6.59
	50	230	82.5	214.5	234.5	125	19	4	8.53
	65	290	92.5	249.5	269.5	145	19	4	15.92
VF 3	15	130	63	192	212	65	14	4	2.61
	20	150	70	194	214	75	14	4	3.55
	25	160	75	198	218	85	14	4	4.54
	32	180	80	203	223	100	19	4	6.90
	40	200	90	227	247	110	19	4	9.05
	50	230	100	239	259	125	19	4	12.79
	65	290	120	245	265	145	19	4	19.18
80	310	155	261	281	160	19	8	23.73	

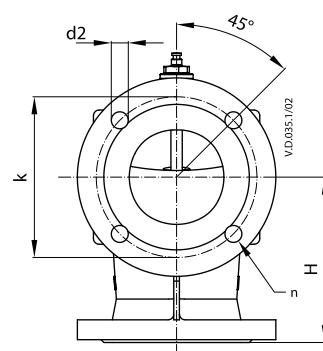
Note:

If stem heater is used dimension H is increased for 31 mm, dimension H2 is increased for 5 mm.

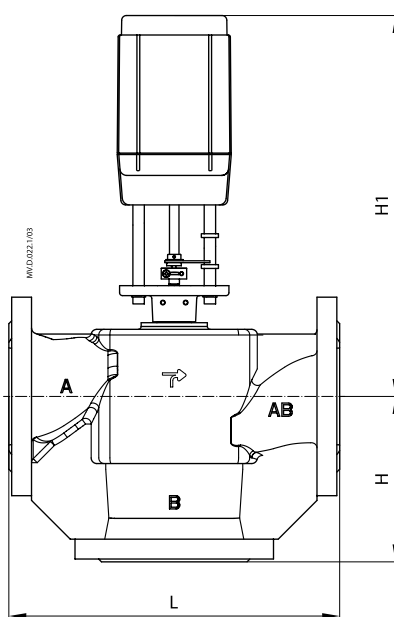
Dimensions (continued)



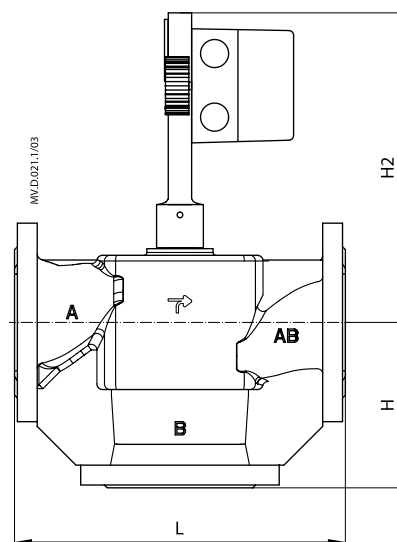
VF 2 (DN 100)



VF 3 (DN 100)



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

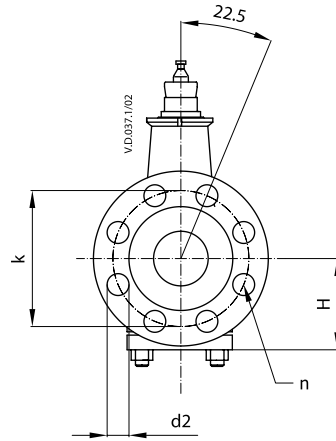


AMV 423, 523 +
VF 2, VF 3 (DN 100)

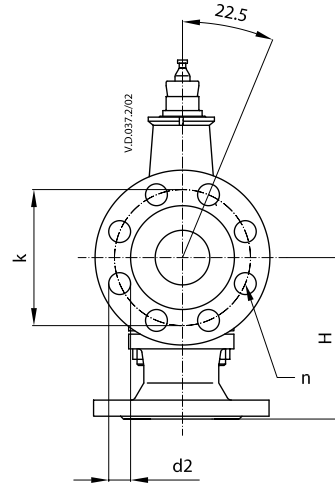
Type	DN	L	H	H1	H2	k	d2	n	Weight (kg)
VF 2	100	350	196	406	317	170	18	4	39.0
VF 3			175						34.0

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

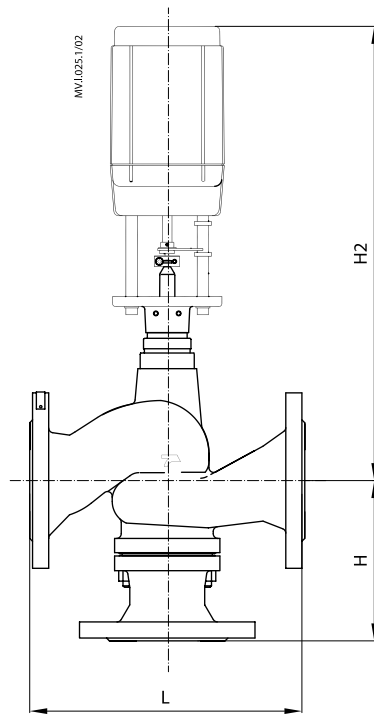
Dimensions (continued)



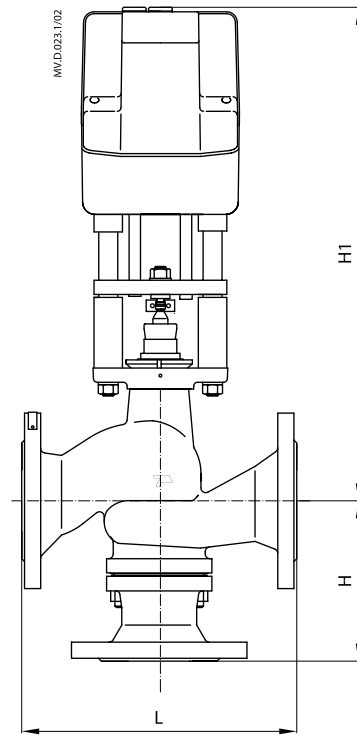
VF 2 (DN 125, 150)



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)

Type	DN	L	H	H1	H2	k	d2	n	Weight (kg)
		mm							
VF 2	125	400	160	629	555	210	18	8	54.0
	150	480	200	682	560	240	22	8	79.0
VF 3	125	400	250	629	555	210	18	8	65.3
	150	480	300	682	560	240	22	8	92.0

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

