

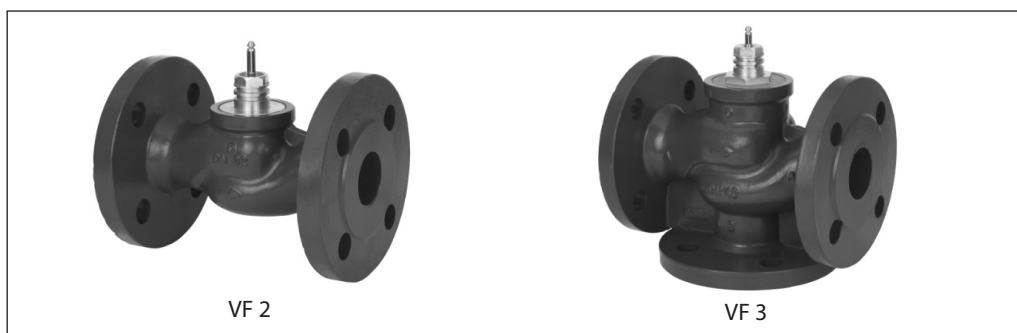
## Data sheet

### 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.

#### Features:

- Bubble tight design
- Snap mechanical connection together with AMV(E) 335, AMV(E) 435
- Dedicated 2-port valve
- Suitable for diverting applications (3-port)

#### Main data:

- DN 15-150
- $k_{vs}$  0,63-320 m<sup>3</sup>/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 PN 16 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 <sup>3</sup> /h)	$T_{max.}$ (°C)	Code No.
15	0,63	130	<b>065Z0271</b>
	1,0		<b>065Z0272</b>
	1,6		<b>065Z0273</b>
	2,5		<b>065Z0274</b>
	4,0		<b>065Z0275</b>
20	6,3	130	<b>065Z0276</b>
25	10		<b>065Z0277</b>
32	16		<b>065Z0278</b>
40	25		<b>065Z0279</b>
50	40		<b>065Z0280</b>
65	63	130	<b>065Z0281</b>
80	100		<b>065Z0282</b>
100	145		<b>065B3205</b>
125	220	200	<b>065B3230</b>
150	320		<b>065B3255</b>

#### 3-way valve VF 3

DN	$k_{vs}$ (m <sup>3</sup> /h)	$T_{max.}$ (°C)	Code No.
15	0,63	130	<b>065Z0251</b>
	1,0		<b>065Z0252</b>
	1,6		<b>065Z0253</b>
	2,5		<b>065Z0254</b>
	4,0		<b>065Z0255</b>
20	6,3	130	<b>065Z0256</b>
25	10		<b>065Z0257</b>
32	16		<b>065Z0258</b>
40	25		<b>065Z0259</b>
50	40		<b>065Z0260</b>
65	63	130	<b>065Z0261</b>
80	100		<b>065Z0262</b>
100	145		<b>065B1685</b>
125	220	200	<b>065B3125</b>
150	320		<b>065B3150</b>

**Ordering (continued)**
**Accessories - Adapter**

DN	Actuators	max.Δp (bar)	Code No.
15-50	AMV(E) 25, 35, 323, 423, 523	4,0	<b>065Z0311</b>
65-80	AMV(E) 55, 56, 323, 423, 523	2,5	<b>065Z0312</b>

**Accessories - Stem heater** (for new valve generation DN 15-80 and standard valves DN 100-150)

DN	Actuators	Power supply (V)	Code No.	
			Stem Heater	Adapter
15-80	AMV(E) 335, 435	24	<b>065Z0315</b>	/
15-50	AMV(E) 438 SU			<b>enclosed</b>
15-50	AMV(E) 25/35			<b>065Z0311</b>
65-80	AMV(E) 55, 56			<b>065Z0312</b>
100	AMV(E) 55, 56		<b>065Z7020</b>	/
100	AMV 423, 523		/	/
125, 150	AMV(E) 55, 56		<b>065Z7022</b>	/
125, 150	AMV(E) 85, 86		<b>065Z7021</b>	/

**Service kits**

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

## Data sheet

## Seated valves VF 2, VF 3

### Technical data

Nominal diameter	DN	15						20	25	32	40	50	65	80	100	125	150
k <sub>VS</sub> value	m³/h	0,63	1,0	1,6	2,5	4,0	6,3	10	16	25	40	63	100	145	220	320	
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		A - AB bubble tight design												0,05 % of k <sub>VS</sub>			
		B - AB ≤ 1,0 % of k <sub>VS</sub>															
Nominal pressure	PN	16															
Max. closing pressure <sup>1)</sup> - for VF 2 - for VF 3 (in mixing applications)	bar	4										2,5	1,0 <sup>2)</sup> 1,5 <sup>3)</sup>	0,5 <sup>4)</sup> 1,0 <sup>3)</sup> 3,0 <sup>5)</sup>	0,2 <sup>4)</sup> 0,5 <sup>3)</sup> 1,5 <sup>5)</sup>		
Max. closing pressure <sup>1)</sup> - for VF 3 (diverting applications)		1										0,6	0,3	0,5 <sup>4)</sup> 0,6 <sup>3), 5)</sup>	0,2 <sup>4)</sup> 0,5 <sup>3)</sup> 0,6 <sup>5)</sup>		
Medium		Circulation water/glycolic water up to 50 %															
Medium pH		Min. 7, Max. 10															
Medium temperature	°C	2 (-10 <sup>6)</sup> ) ... 130												2 (-10 <sup>6)</sup> ) ... 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 6)		GGG 40	
Stuffing box sealing		EPDM												PFTE			

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

<sup>2)</sup> for actuators AMV(E) 56, AMV 423, AMV 523

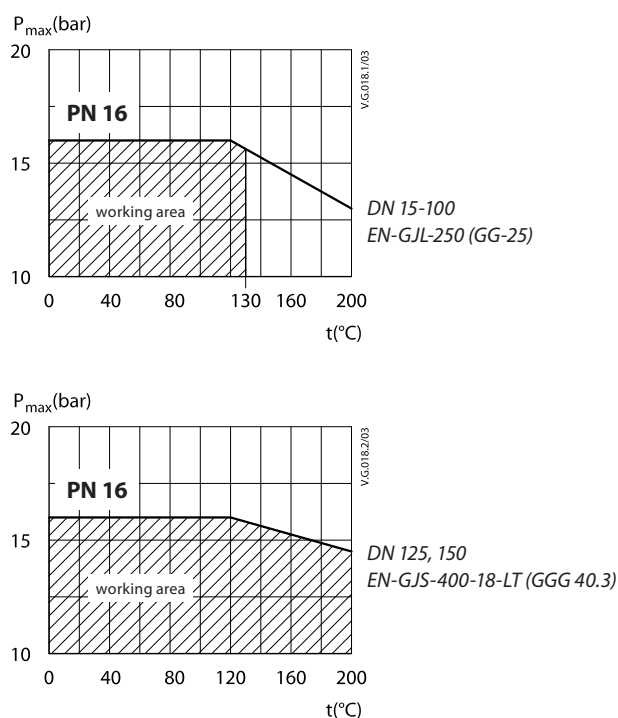
<sup>3)</sup> for actuators AMV(E) 55

<sup>4)</sup> for actuators AMV(E) 56

<sup>5)</sup> for actuators AMV(E) 85, AMV(E) 86

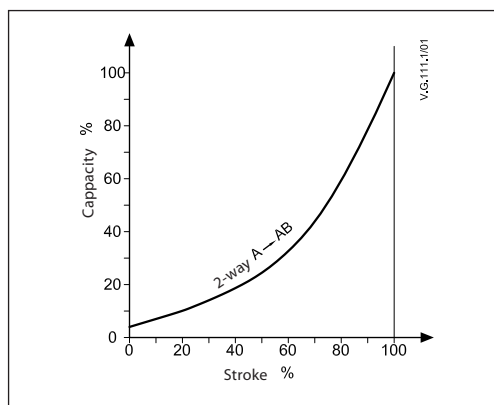
<sup>6)</sup> At temperatures from -10 up to +2 °C use stem heater

### Pressure temperature diagram

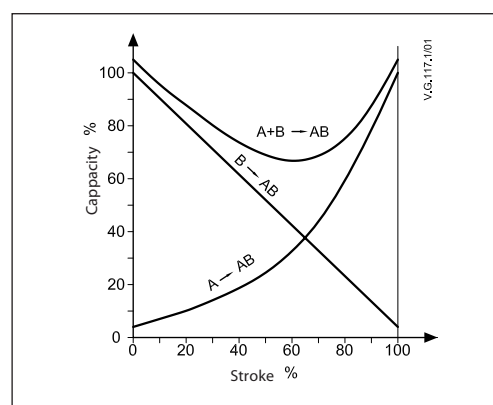


## Valve characteristics

### 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.

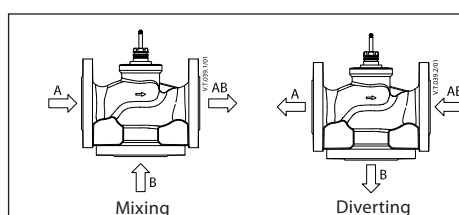
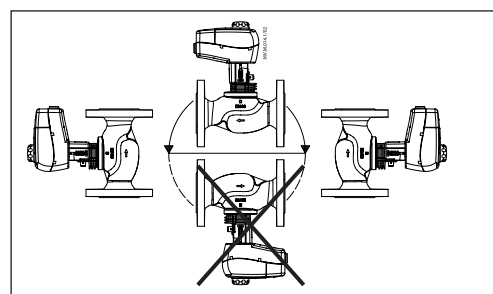


Fig. 1: Mixing or diverting connection

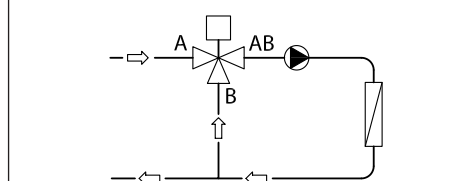


Fig. 2: Mixing valve used in mixing application

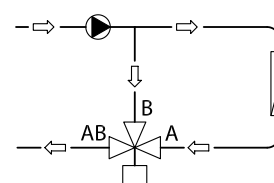


Fig. 3: Mixing valve used in diverting application

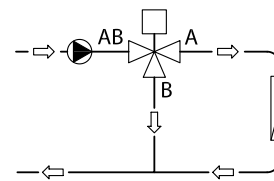


Fig. 4: Diverting valve used in diverting application

### 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).

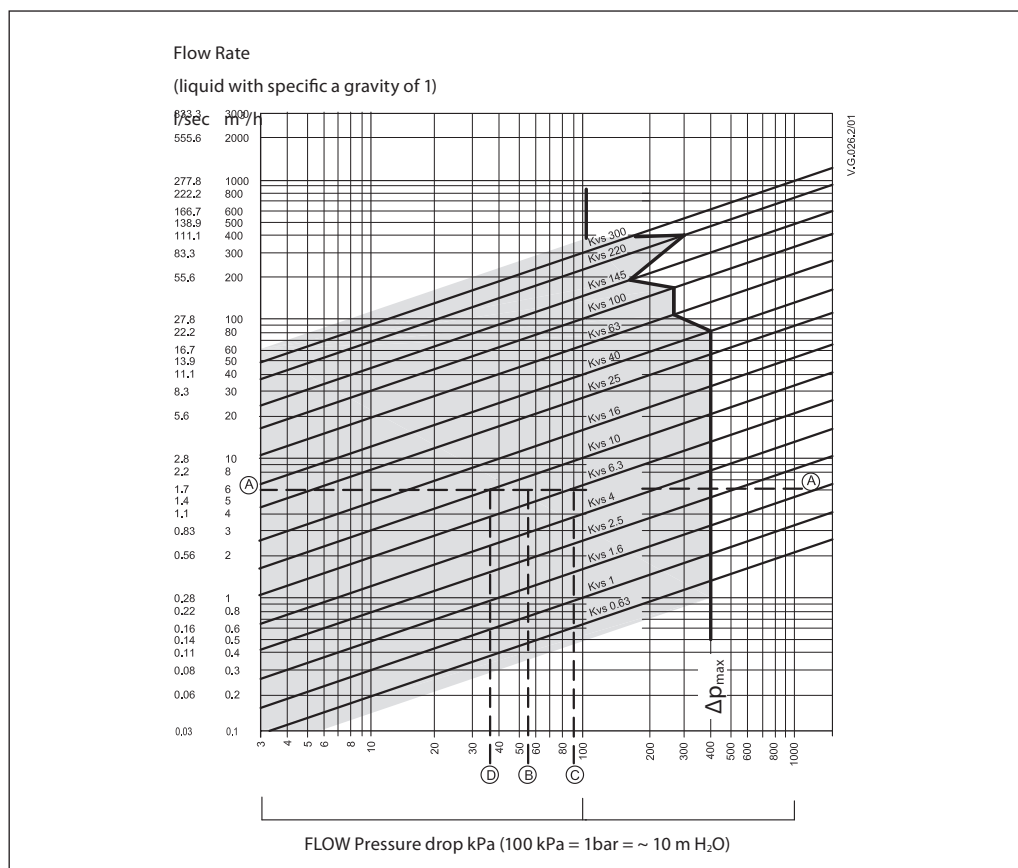
3-way valve can be also installed as diverting valve in diverting application (fig.4) meaning that AB port is inlet and A and B ports are outlets.

**Note:**  
**Only valves DN 15-150 are suitable for diverting installation. Maximal closing pressure for mixing and diverting installation are not the same. Please refer to values stated in Technical data section.**

## 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<sub>1</sub> = pressure drop across the fully open valve  
Δp<sub>2</sub> = 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:

$$\Delta p_1 = \Delta p_2$$

$$a = \frac{\Delta p_1}{2 \times \Delta p_1} = 0,5$$

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<sub>VS</sub> 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<sub>VS</sub> 10, would give a pressure drop of 36 kPa (point D):

$$\text{hence valve authority} = \frac{36}{36 + 55} = 0,395$$

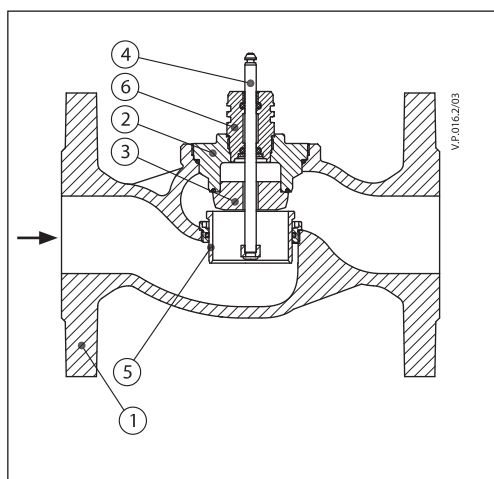
Generally, for a 3 port application, the smaller valve would be selected (resulting in a valve authority higher than 0,5 and therefore improved control). However, this will increase the total pressure and should be checked by the system designer for compatibility with available pump heads, etc. The ideal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

## Design

(Design variations are possible)

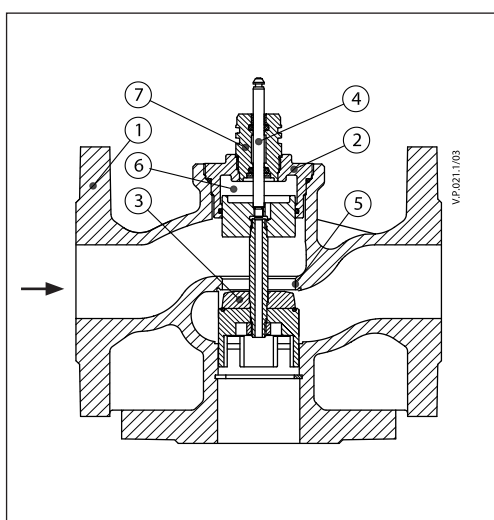
### VF 2

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

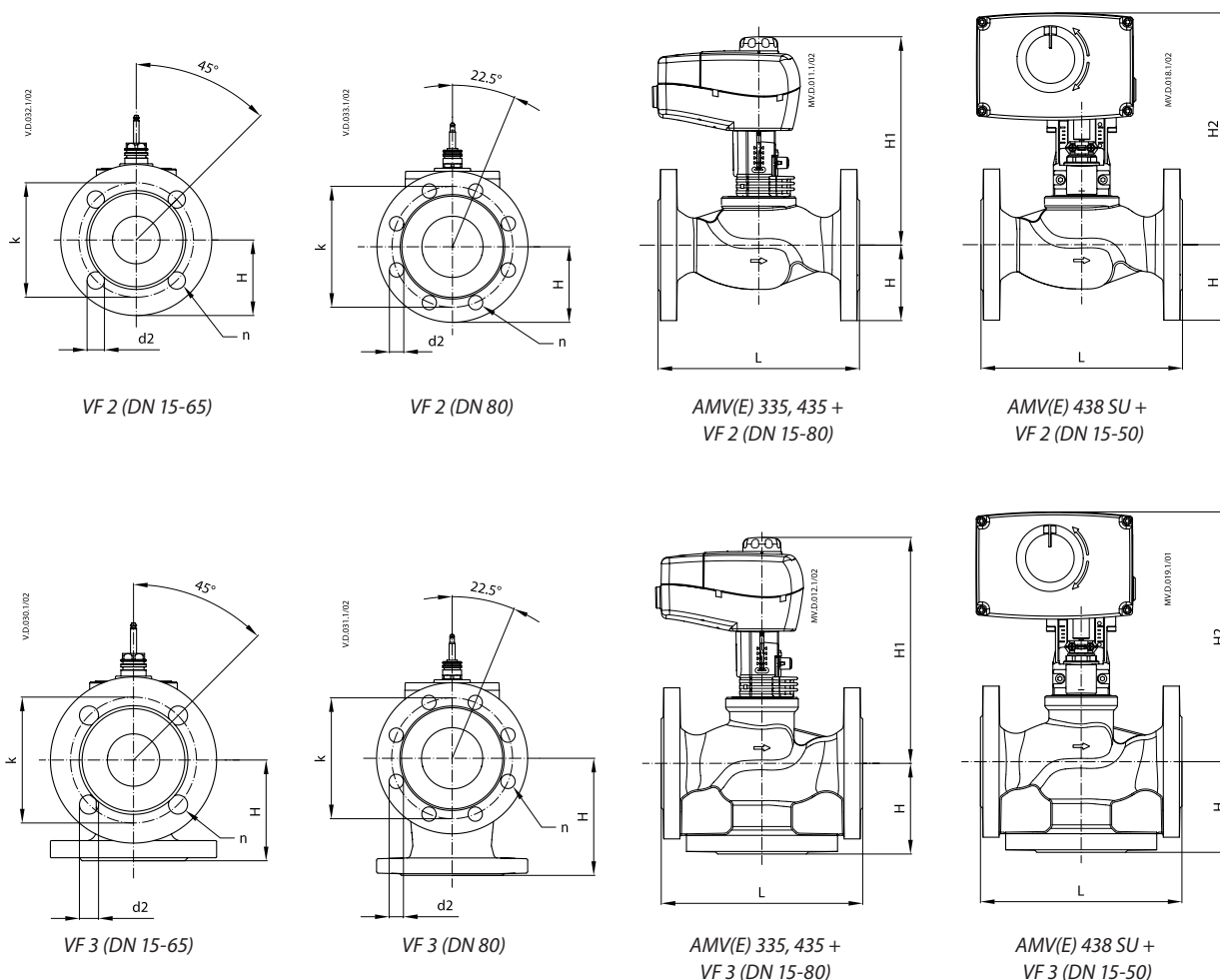


### VF 3

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



Dimensions

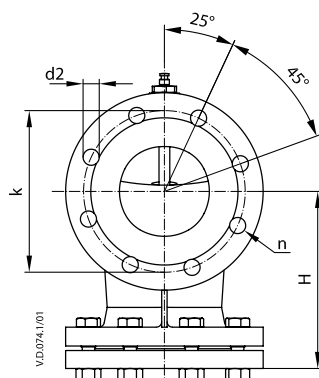


Type	DN	L	H	H1	H2	k	d2	n	Weight (kg)
		mm							
VF 2	15	130	47,5	191	216	65	14	4	1,93
	20	150	52,5	194	218	75	14	4	2,65
	25	160	57,5	197	222	85	14	4	3,23
	32	180	70	202	226	100	19	4	4,97
	40	200	75	213	237	110	19	4	6,59
	50	230	82,5	218	242	125	19	4	8,53
	65	290	92,5	254	279	145	19	4	15,92
	80	310	100	258	283	160	19	8	18,13
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	279	145	19	4	19,18
	80	310	155	270	295	160	19	8	23,73

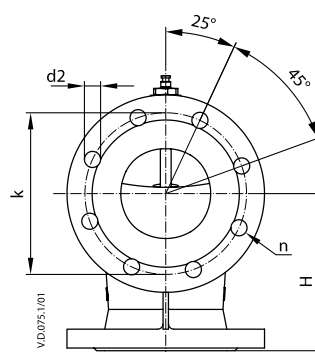
**Note:**

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

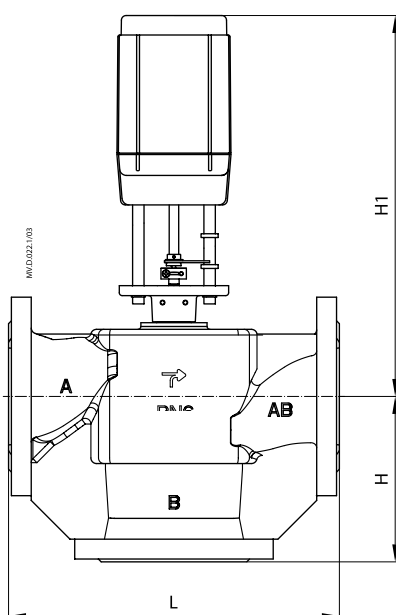
Dimensions (continued)



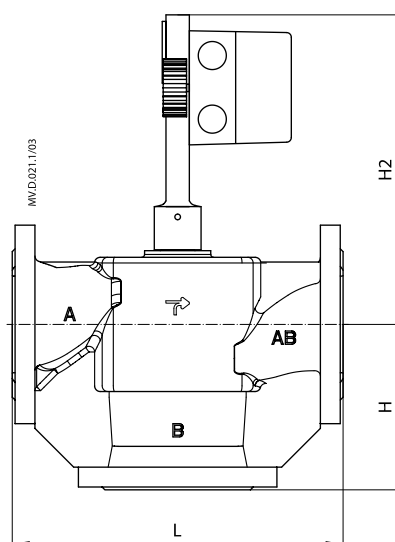
VF 2 (DN 100)



VF 3 (DN 100)



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



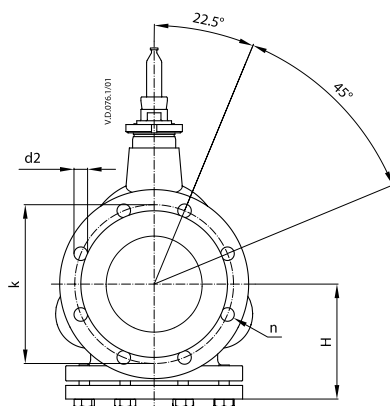
AMV 423, 523 +  
VF 2, VF 3 (DN 100)

Type	DN	L	H	H1	H2	k	d2	n	Weight (kg)
		mm							
VF 2	100	350	196	406	317	170	18	8	39,0
VF 3			175						34,0

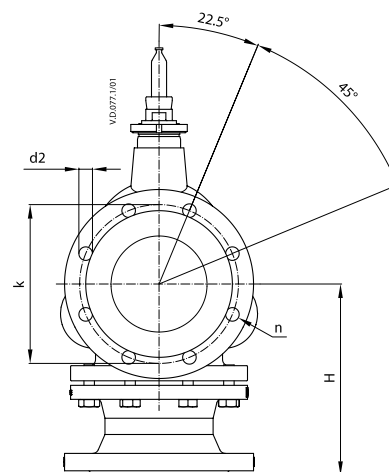
**Note:**

If stem heater is used dimension H remains the same.

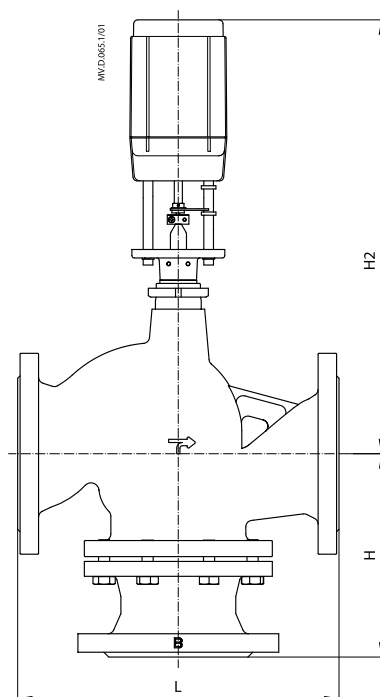
Dimensions (continued)



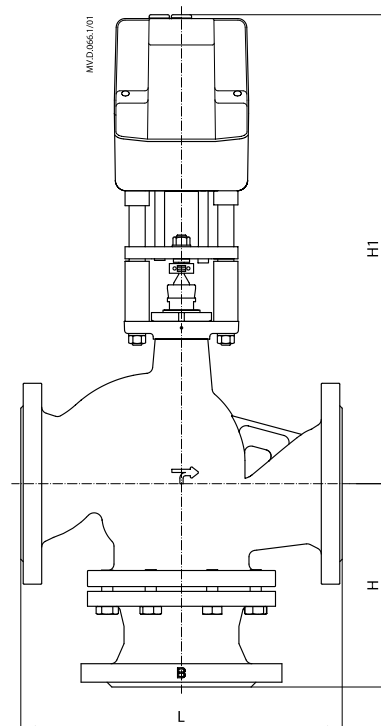
VF 2 (DN 125, 150)



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.





