

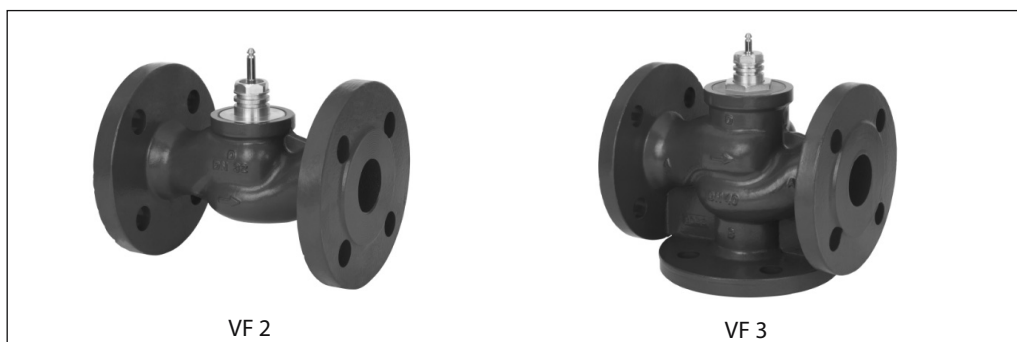
Data sheet

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 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 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 ³ /h) | t_{max} (°C) | Code No. |
|-----|---------------------------------|-------------------|-----------------|
| 15 | 0,63 | 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 | 200 | 065B3205 |
| 125 | 220 | | 065B3230 |
| 150 | 320 | | 065B3255 |

3-way valve VF 3

| DN | k_{vs} (m ³ /h) | t_{max} (°C) | Code No. |
|-----|---------------------------------|-------------------|-----------------|
| 15 | 0,63 | 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 | 200 | 065B1685 |
| 125 | 220 | | 065B3125 |
| 150 | 320 | | 065B3150 |

Ordering (continued)
Accessories - Adapter

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

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

| DN | Actuators | Power supply | Code No. Stem Heater | Code No. Adapter |
|----------|-----------------|--------------|----------------------|------------------|
| 15-80 | AMV(E) 335, 435 | 24 V | 065Z0315 | / |
| 15-50 | AMV(E) 438 SU | | | enclosed |
| 15-50 | AMV(E) 25/35 | | | 065Z0311 |
| 65-80 | AMV(E) 55, 56 | | | 065Z0312 |
| 100 | AMV(E) 55, 56 | | 065Z7020 | / |
| 100 | AMV 423, 523 | | / | / |
| 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 | |
|--------------------------------|-------------------|---|-----|------|-----|-----|-----|-------|----|----|----|----------------|-----|--|-----|---|--|---|--|-----|--|-----|--|
| | | 0,63 | 1,0 | 1,6 | 2,5 | 4,0 | 6,3 | 10 | 16 | 25 | 40 | 63 | 100 | 145 | 220 | 320 | | | | | | | |
| k_{vs} value | m ³ /h | | | | | | | | | | | | | | | | | | | | | | |
| 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_{vs} | | | | | | | |
| | | B - AB ≤ 1,0 % of k_{vs} | | | | | | | | | | | | | | | | | | | | | |
| Nominal pressure | PN | 16 | | | | | | | | | | | | | | | | | | | | | |
| Max. closing pressure (mixing) | 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⁾ | | | | | |
| | | 1 | | | | | | | | | | Not applicable | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | | PFTE | | | | | |

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

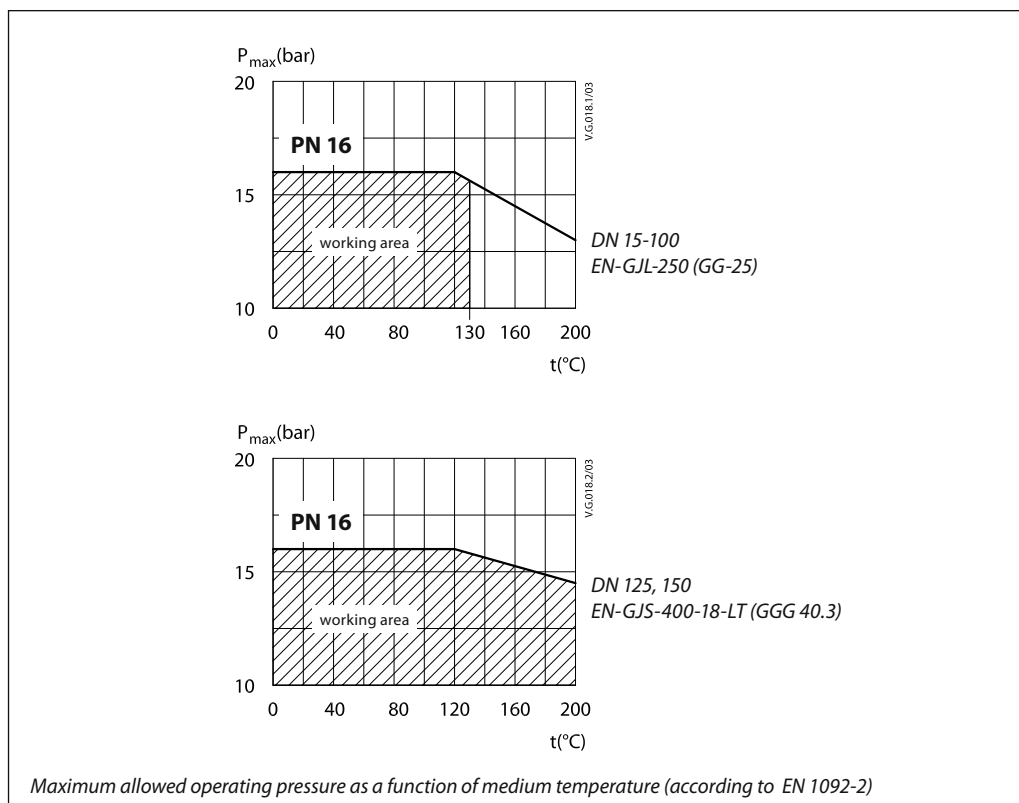
²⁾ for actuators AMV(E) 55

³⁾ for actuators AMV(E) 56

⁴⁾ for actuators AMV(E) 85, AMV(E) 86

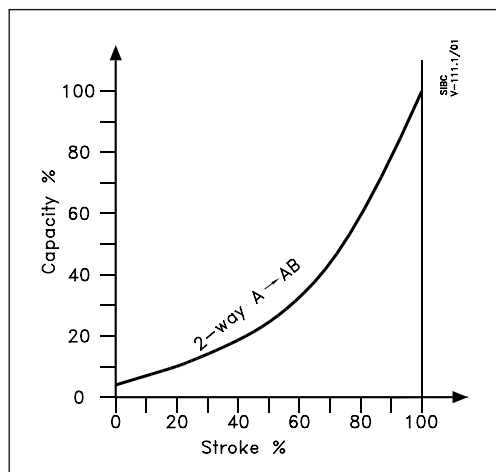
⁵⁾ At temperatures from -10 up to +2 °C use stem heater

Pressure temperature diagram

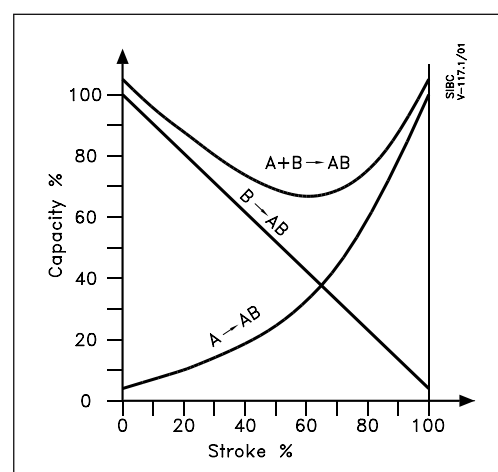


Valve characteristics

Valve characteristics log (2-way)



Valve characteristics log/lin (3-way)

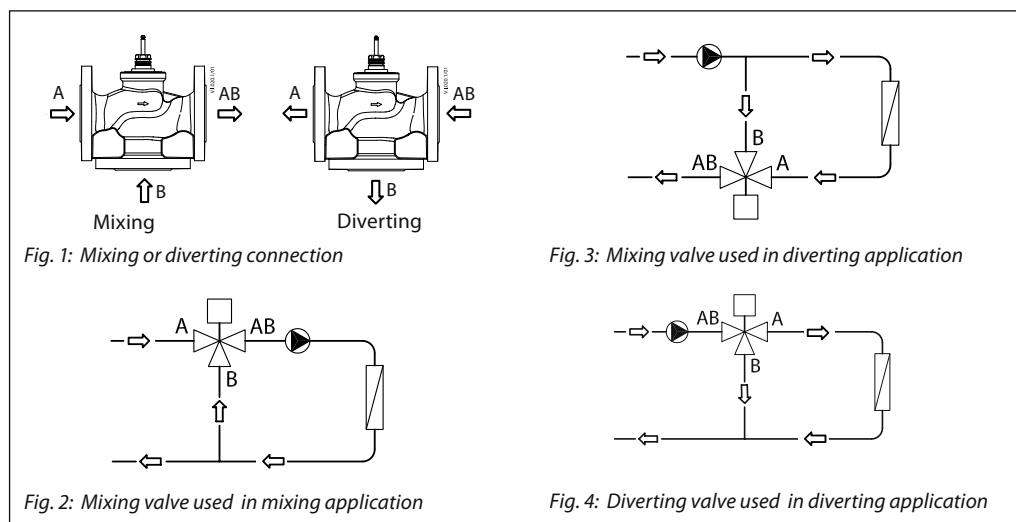
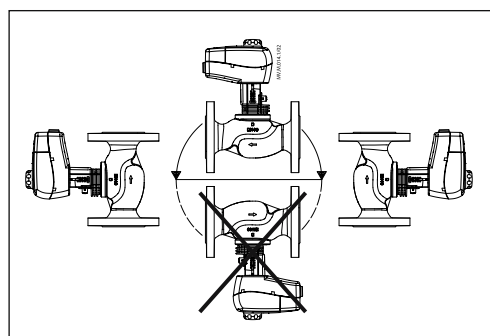


Installation

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.



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).

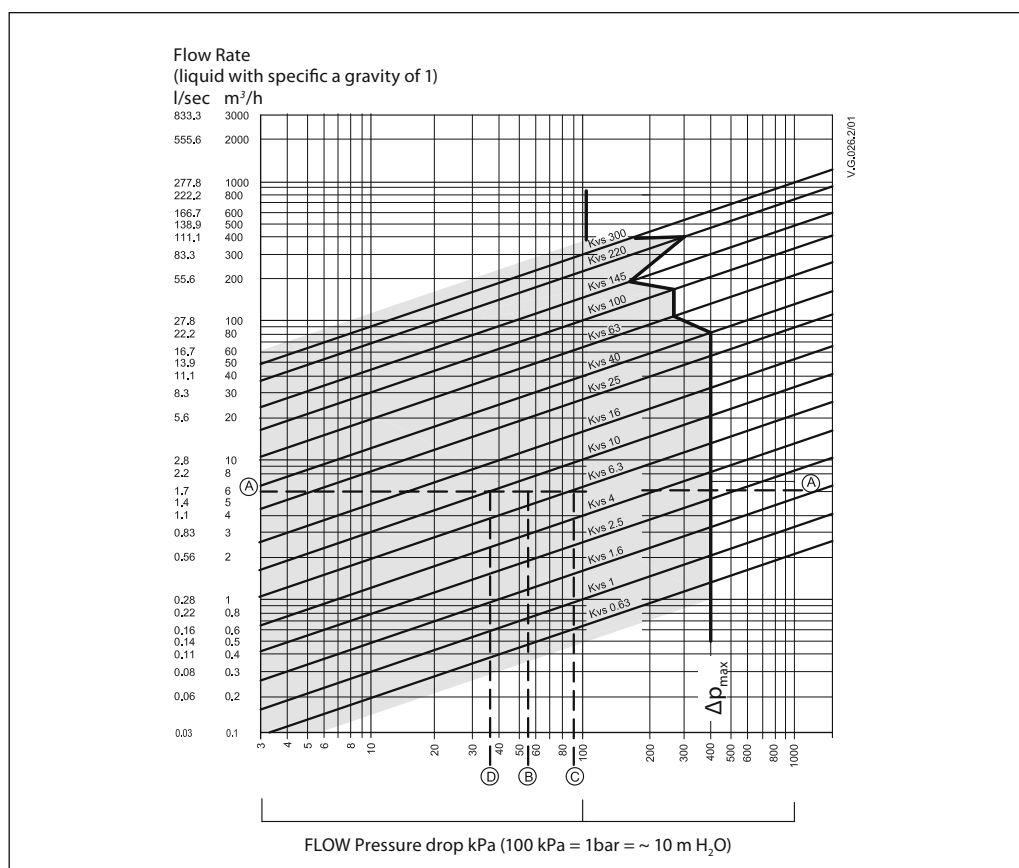
3-way valve can be also installed as diverting valve in diverting application (fig.4) meaning that AB port is inlet and A and B ports are outlets.

Note:
Only valves DN 15-50 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_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: $\Delta p_1 = \Delta p_2$

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

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):

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

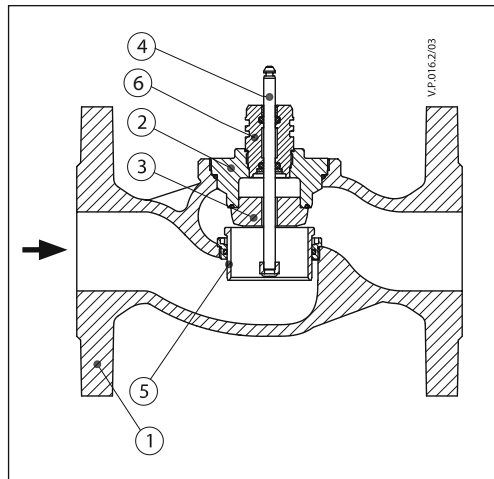
Generally, for a 3 port application, the smaller valve would be selected (resulting in a valve authority higher than 0.5 and therefore improved control). However, this will increase the total pressure and should be checked by the system designer for compatibility with available pump heads, etc. The ideal authority is 0,5 with a preferred range of between 0,4 and 0,7.

Design

(Design variations are possible)

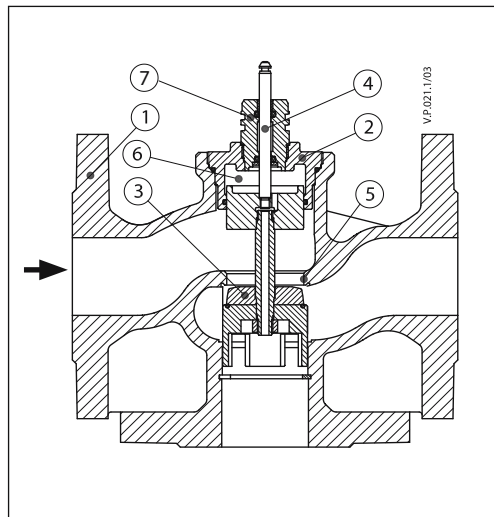
VF 2

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

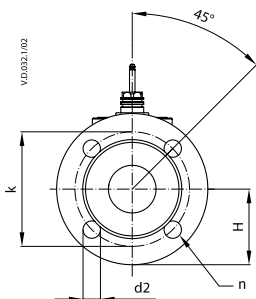


VF 3

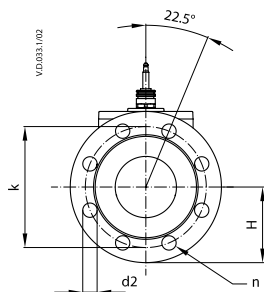
- 1. Valve body
- 2. Valve insert
- 3. Valve cone
- 4. Valve stem
- 5. Valve seat
- 6. Pressure relieve chamber
- 7. Stuffing box



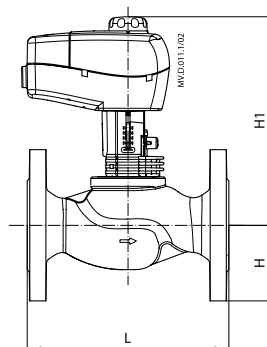
Dimensions



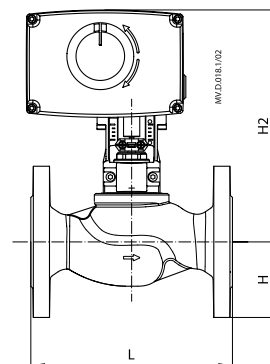
VF 2 (DN 15-65)



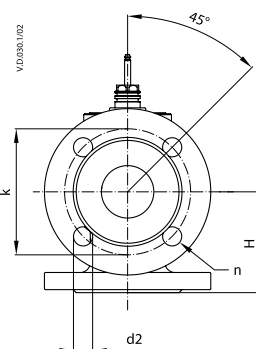
VF 2 (DN 80)



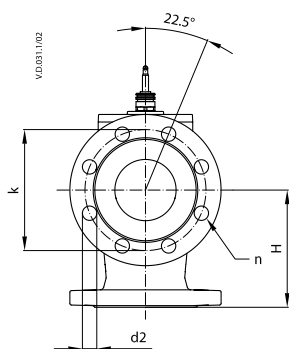
AMV(E) 335, 435 +
VF 2 (DN 15-80)



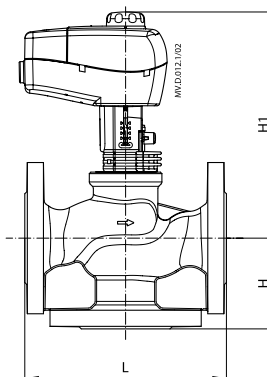
AMV(E) 438 SU +
VF 2 (DN 15-50)



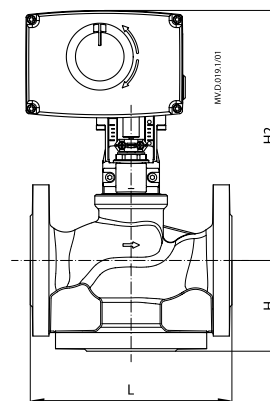
VF 3 (DN 15-65)



VF 3 (DN 80)



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



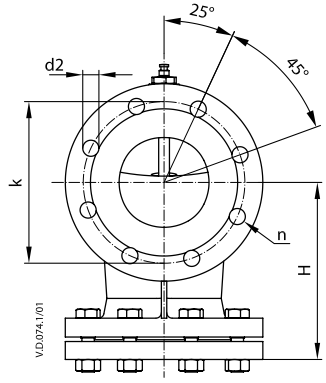
AMV(E) 438 SU +
VF 3 (DN 15-50)

| Type | DN | L | H | H1 | H2 | k | d2 | n | Weight (kg) |
|------|-----|-----|------|-----|-----|-----|----|-------|-------------|
| | | 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 | |

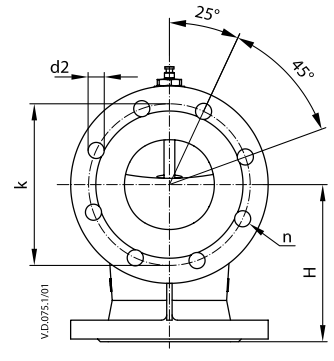
Note:

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

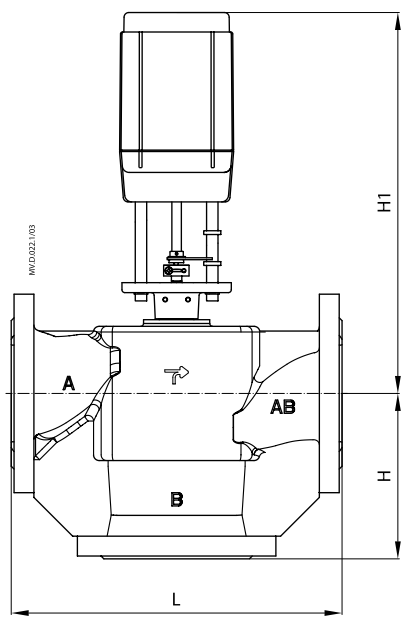
Dimensions (continued)



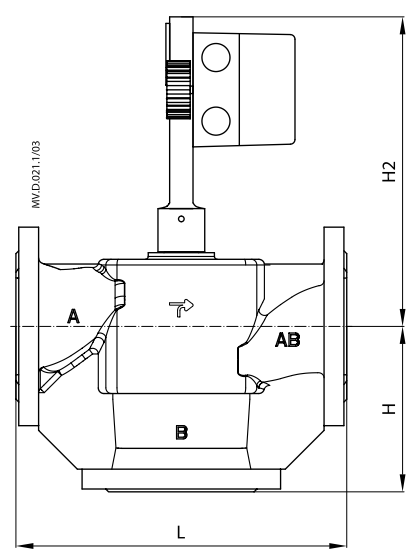
VF 2 (DN 100)



VF 3 (DN 100)



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

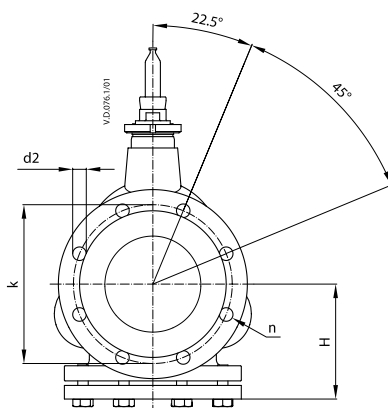


AMV 423, 523 +
VF 2, VF 3 (DN 100)

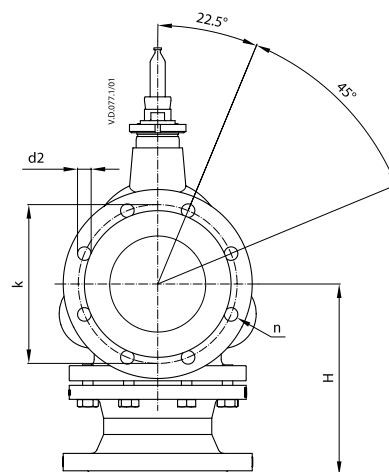
| Type | DN | L | H | H1 | H2 | k | d2 | n | Weight (kg) |
|------|-----|-----|-----|-----|-----|-----|----|---|-------------|
| | | | | | | | | | |
| VF 2 | 100 | 350 | 196 | 406 | 317 | 170 | 18 | 8 | 39,0 |
| VF 3 | | | 175 | | | | | | 34,0 |

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

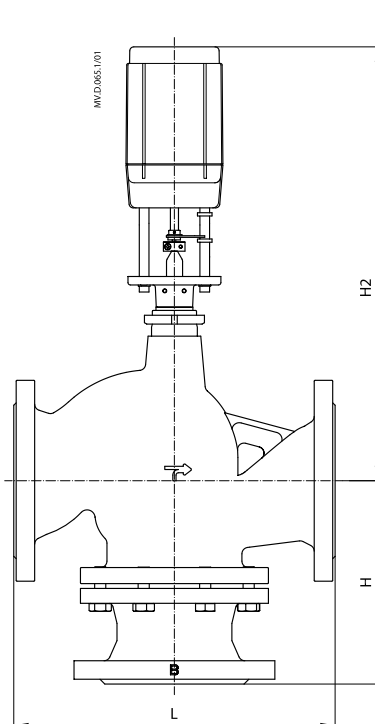
Dimensions (continued)



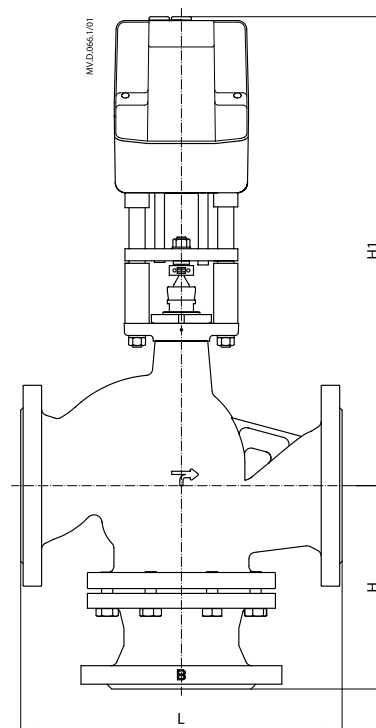
VF 2 (DN 125, 150)



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.

