Data sheet

Seated valves (PN 16)
VF 2 – 2-way valve, flange
VF 3 – 3-way valve, flange

Description

VF 2

VF 3

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 m^3/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

- *1× 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		200	**065B3230**
150	320			**065B3255**

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		200	**065B3125**
150	320			**065B3150**

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

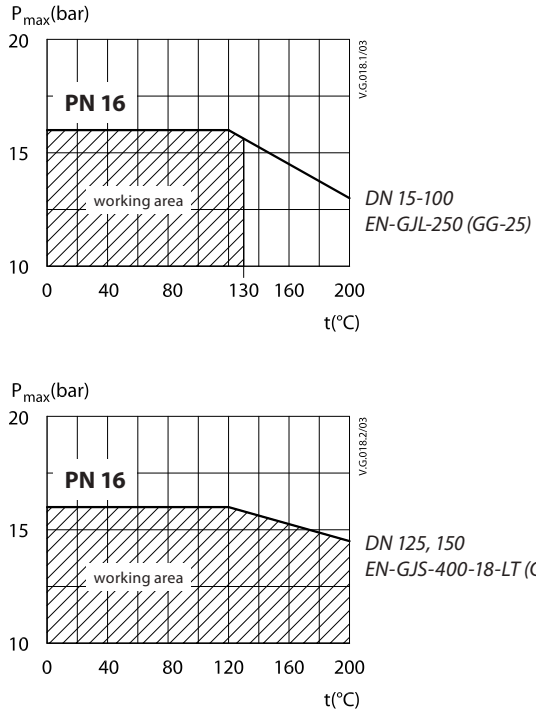
Type	DN	Code No.
Stuffing box	15	**065Z0321**
	20	**065Z0322**
	25	**065Z0323**
	32	**065Z0324**
	40,50	**065Z0325**
	65,80	**065Z0327**
	100	**065B1360**
	125,150	**065B0007**

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	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 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													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*

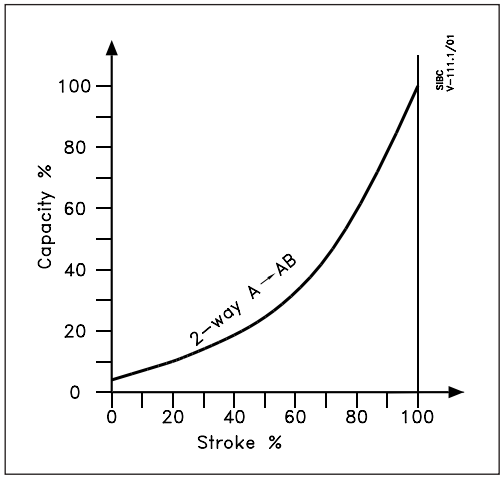
Pressure temperature diagram



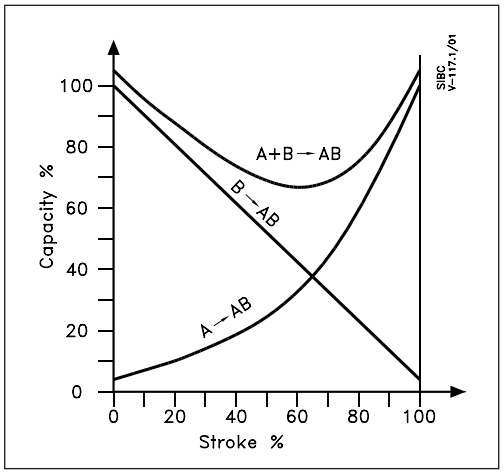
Maximum allowed operating pressure as a function of medium temperature (according to EN 1092-2)

Valve characteristics

Valve characteristics log (2-way)



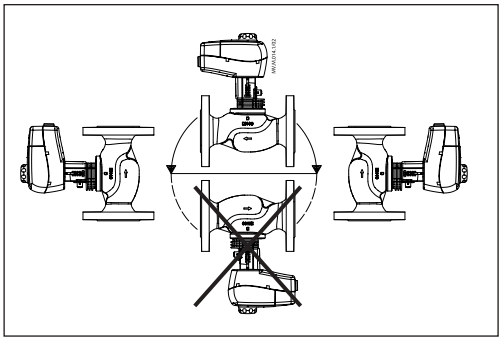
Valve characteristics log/lin (3-way)



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.

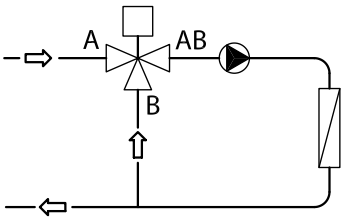


Figure 1: Mixing valve used in mixing application

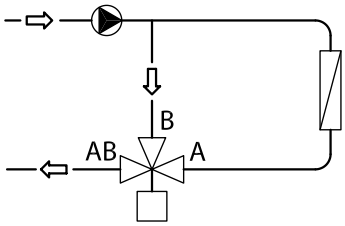
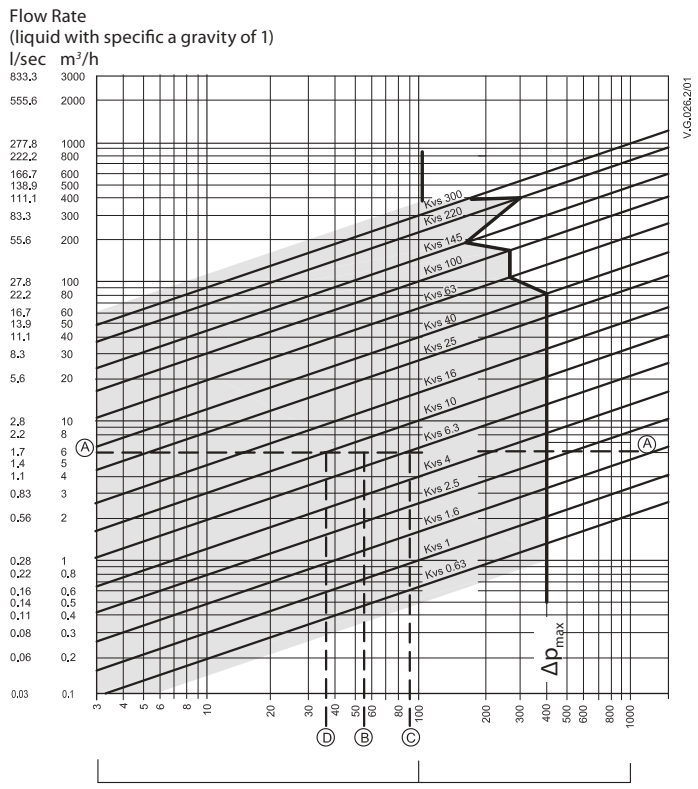


Figure 2: Mixing valve used in diverting application

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:

$$\text{Valve authority, a} = \frac{\Delta p1}{\Delta p1 + \Delta p2}$$

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: $\Delta p1 = \Delta p2$
$a = \Delta p½ \times \Delta p1 = 0.5$

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):

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

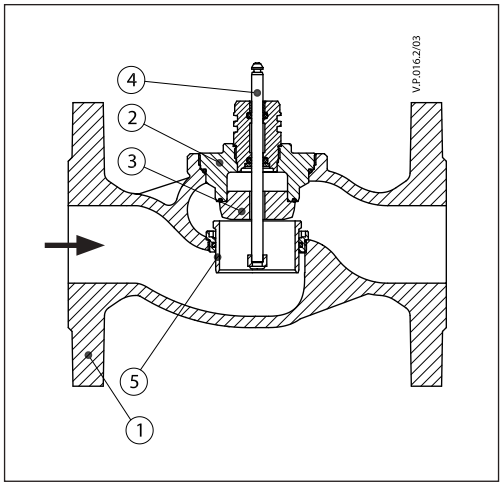
The second largest valve, with k_{VS} 10, would give a pressure drop of 36 kPa (point D):

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

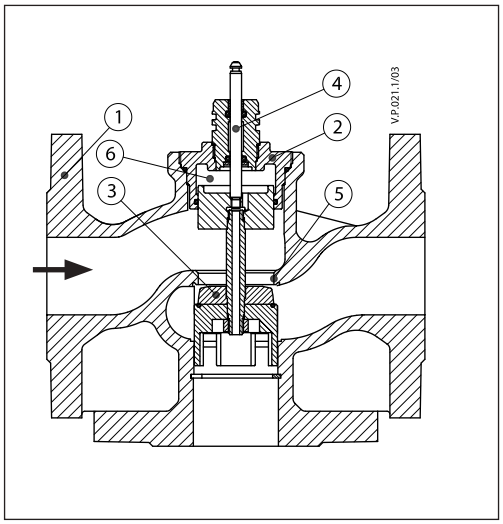
Generally, for a 3 port application, the smaller valve would be selected (resulting in a valve authority higher than 0.5 and therefore improved control). However, this will increase the total pressure and should be checked by the system designer for compatibility with available pump heads, etc. The ideal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

Design
(Design variations are possible)

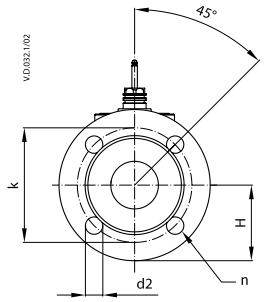
VF 2
1. Valve body
2. Valve insert
3. Valve cone
4. Valve stem
5. Moving valve seat (pressure relieved)



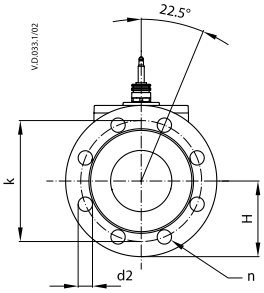
VF 3
1. Valve body
2. Valve insert
3. Valve cone
4. Valve stem
5. Valve seat
6. Pressure relieve chamber



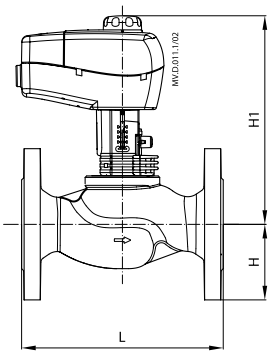
Dimensions



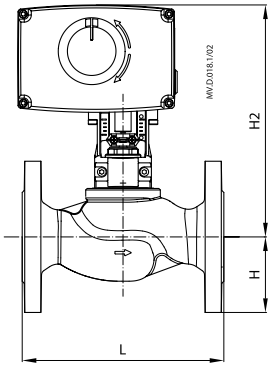
VF 2 (DN 15-65)



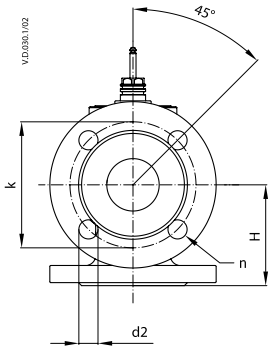
VF 2 (DN 80)



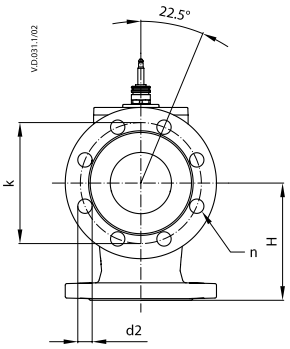
AMV(E) 335, 435 +
VF 2 (DN 15-80)



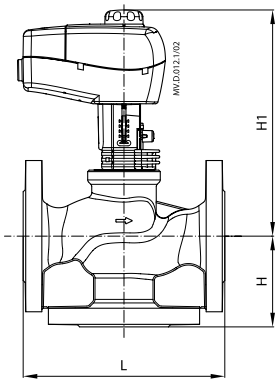
AMV(E) 438 SU +
VF 2 (DN 15-50)



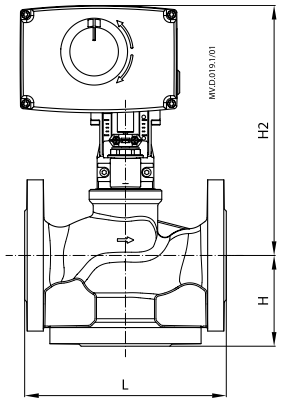
VF 3 (DN 15-65)



VF 3 (DN 80)



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

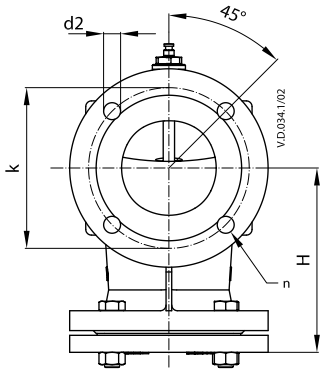


AMV(E) 438 SU +
VF 3 (DN 15-50)

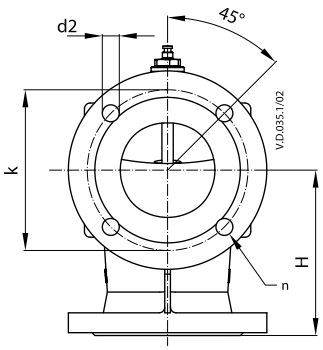
Type	DN	L	H	H1	H2	k	d2	n	Weight
		mm							(kg)
VF 2	15	130	47.5	192.5	212.5	65	14	4	1.93
	20	150	52.5	194.5	214.5	75	14	4	2.65
	25	160	57.5	198.5	218.5	85	14	4	3.23
	32	180	70	203	223	100	19	4	4.97
	40	200	75	209	229	110	19	4	6.59
	50	230	82.5	214.5	234.5	125	19	4	8.53
	65	290	92.5	249.5	269.5	145	19	4	15.92
	80	310	100	253	273	160	19	8	18.13
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.

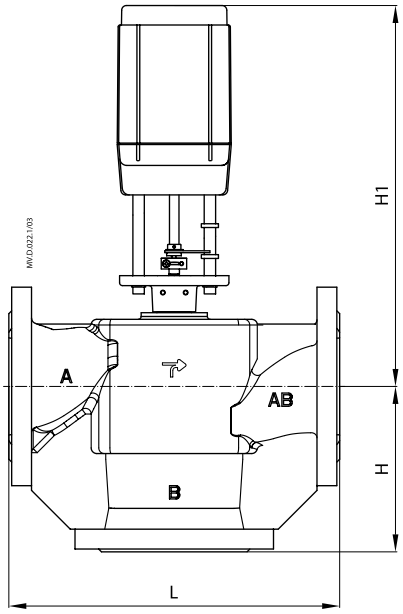
Dimensions *(continued)*



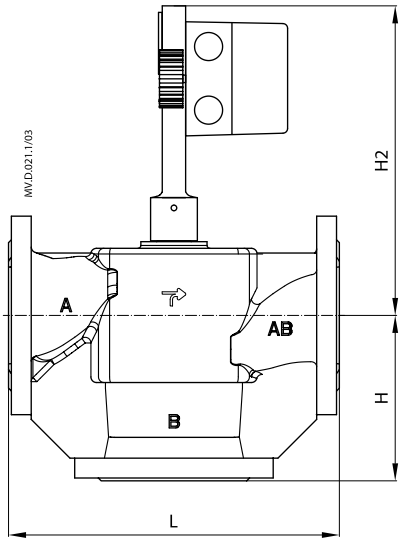
VF 2 (DN 100)



VF 3 (DN 100)



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

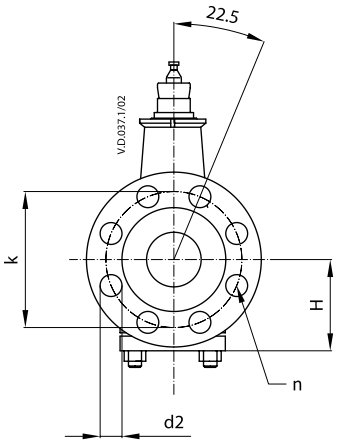


AMV 423, 523 +
VF 2, VF 3 (DN 100)

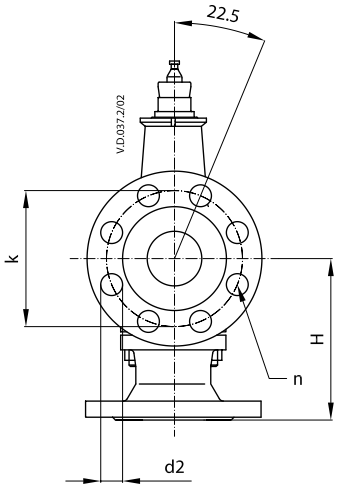
Type	DN	L	H	H1	H2	k	d2	n	Weight
		mm							(kg)
VF 2	100	350	196	406	317	170	18	4	39.0
VF 3			175						34.0

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

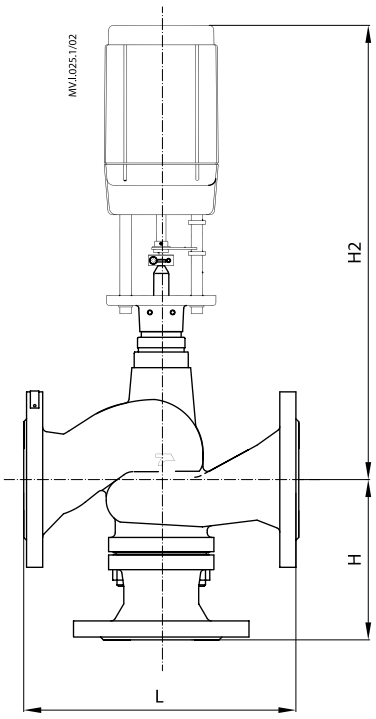
Dimensions *(continued)*



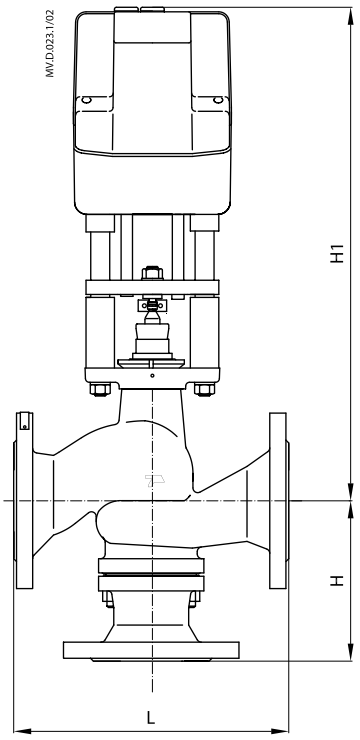
VF 2 (DN 125, 150)



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
		mm							(kg)
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.