Data sheet

Seated valves (PN 6)
VL 2 – 2-way valve, flange
VL 3 – 3-way valve, flange

Description

VL 2

VL 3

VL 2 and VL 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 or AMV(E) 56, AMV 423, AMV 523 actuators

Combinations with other actuators could be seen under Accessories.

Main data:

- DN 15-100
- k_{VS} 0.63-145 m^3/h
- PN 6
- Temperature:
  - Circulation water/glycolic water up to 50 %: 2 (–10*) … 120 °C
  - * 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 6, t_{max} 120 °C, flange connection

- *1× VL 2 DN 15 valve*
  Code No.: ***065Z0373***

2-way valve **VL 2**

DN	k_{VS} (m^3/h)	PN	$t_{max.}$ (°C)	Code No.
15	0.63	6	120	**065Z0371**
	1.0			**065Z0372**
	1.6			**065Z0373**
	2.5			**065Z0374**
	4.0			**065Z0375**
20	6.3			**065Z0376**
25	10			**065Z0377**
32	16			**065Z0378**
40	25			**065Z0379**
50	40			**065Z0380**
65	63			**065Z0381**
80	100			**065Z0382**
100	145			**065Z3426**

3-way valve **VL 3**

DN	k_{VS} (m^3/h)	PN	$t_{max.}$ (°C)	Code No.
15	0.63	6	120	**065Z0351**
	1.0			**065Z0352**
	1.6			**065Z0353**
	2.5			**065Z0354**
	4.0			**065Z0355**
20	6.3			**065Z0356**
25	10			**065Z0357**
32	16			**065Z0358**
40	25			**065Z0359**
50	40			**065Z0360**
65	63			**065Z0361**
80	100			**065Z0362**
100	145			**065Z3413**

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**

Service kits

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

Technical data

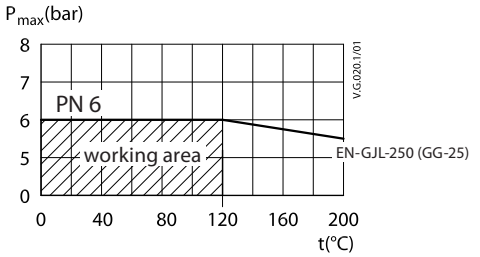
Nominal diameter	DN	15					20	25	32	40	50	65	80	100
k_{VS} value	m^3/h	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	40	63	100	145
Stroke	mm	10							15			20		30
Control range		30:1	50:1				100:1							
Control characteristic		LOG: port A-AB; LIN: port B-AB												
Cavitation factor z		≥ 0.4												
Leakage acc. to standard IEC 534		A - AB ≤ 0.05 % of k_{VS}												
		B - AB ≤ 1.0 % of k_{VS}												
Nominal pressure	PN	6												
Max. closing pressure	bar	4										2.5		1.0 [1]
Medium		Circulation water / glycolic water up to 50 %												
Medium pH		Min. 7, Max. 10												
Medium temperature	°C	2 (–10 [2]) … 120												
Connections		Flange PN 6 acc. to EN 1092-2												
Materials														
Valve body		Grey cast iron EN-GJL-250 (GG-25)												
Valve stem		Stainless steel												
Valve cone		Brass [3]												
Stuffing box sealing		EPDM												

[1] *1.5 bar at AMV(E) 55*

[2] *At temperatures from -10 up to +2 °C use stem heater*

[3] *At DN 100 red bronze CuSn5Zn5Pb5 (Rg 5)*

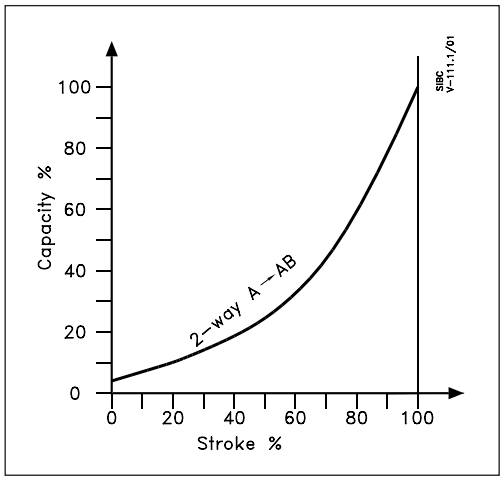
Pressure temperature diagram



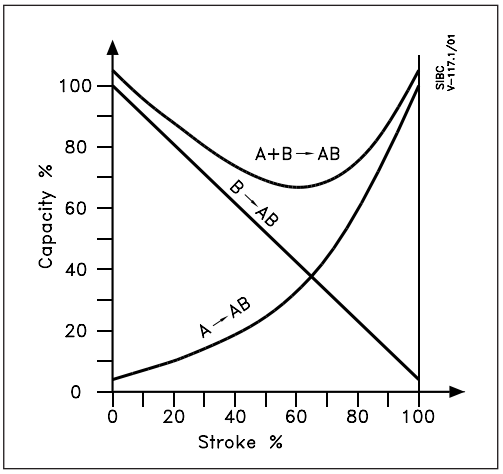
Maximum allowed operating pressure as a function of medium temperature (flanges according to EN 1092-2)

Valve characteristics

Valve characteristics log (2-way)



Valve characteristics log/lin (3-way)



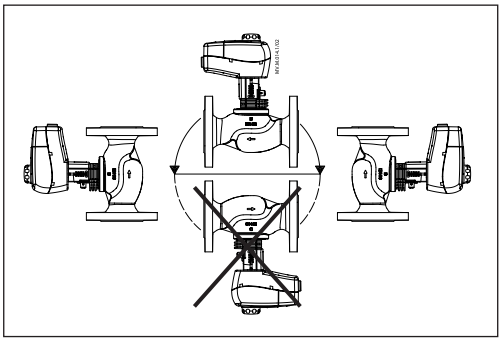
Installation

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.



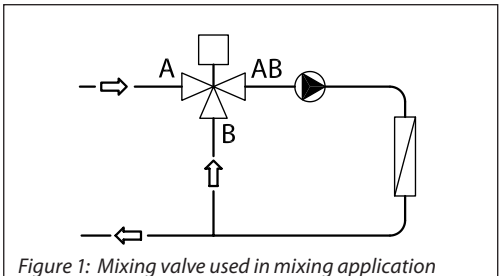


Figure 1: Mixing valve used in mixing application

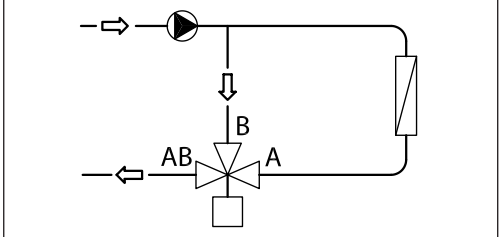
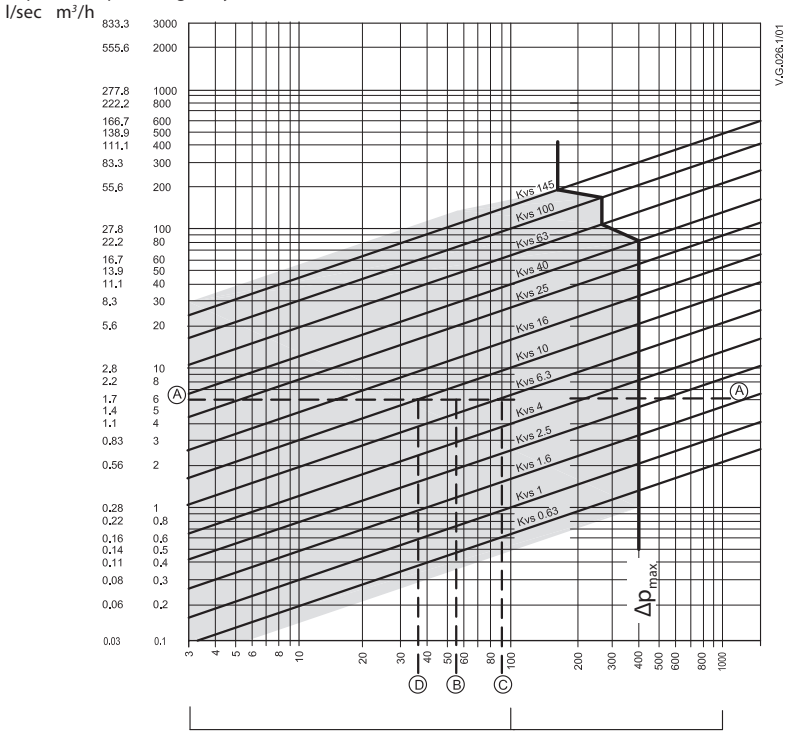


Figure 2: Mixing valve used in diverting application

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):

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

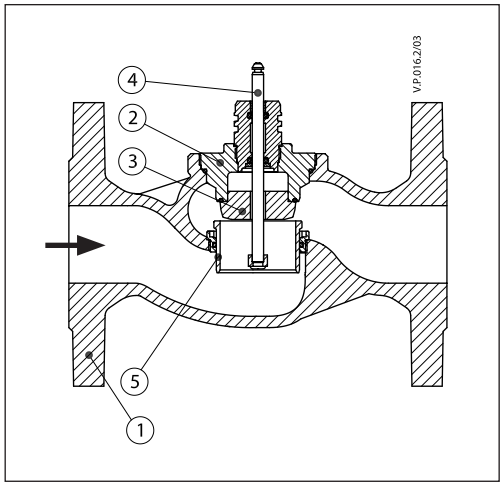
The second largest valve, with k_{VS} 10, would give a pressure drop of 36 kPa (point D):

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

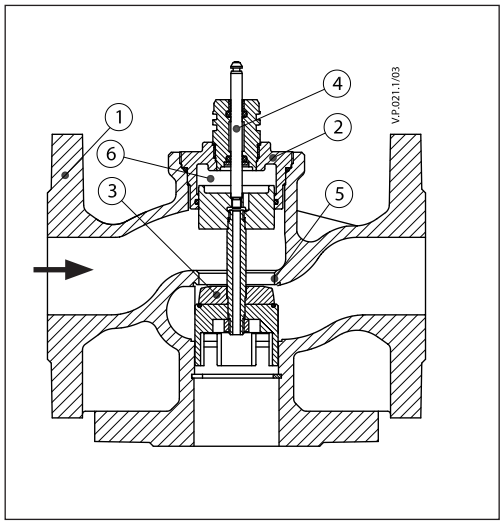
Generally, for a 3 port application, the smaller valve would be selected (resulting in a valve authority higher than 0.5 and therefore improved control). However, this will increase the total pressure and should be checked by the system designer for compatibility with available pump heads, etc. The ideal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

Design
(Design variations are possible)

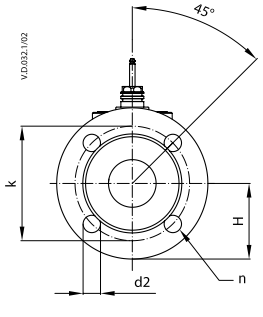
VL 2
1. Valve body
2. Valve insert
3. Valve cone
4. Valve stem
5. Moving valve seat (pressure relieved)



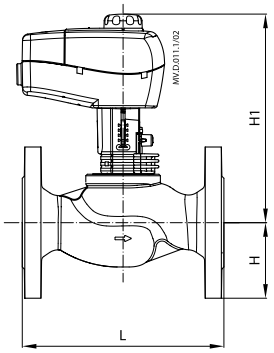
VL 3
1. Valve body
2. Valve insert
3. Valve cone
4. Valve stem
5. Valve seat
6. Pressure relieve chamber



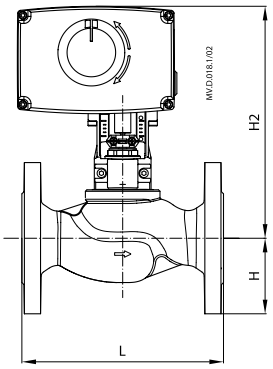
Dimensions



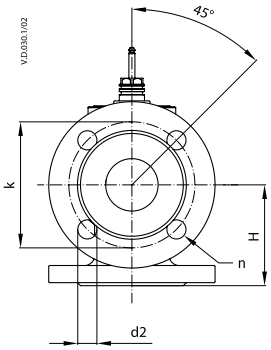
VL 2 (DN 15-80)



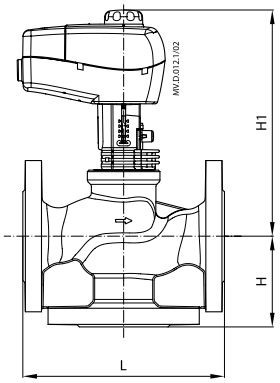
AMV(E) 335, 435 +
VL 2 (DN 15-80)



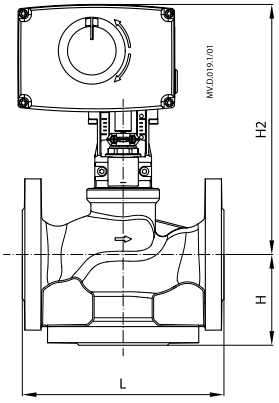
AMV(E) 438 SU +
VL 2 (DN 15-50)



VL 3 (DN 15-80)



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

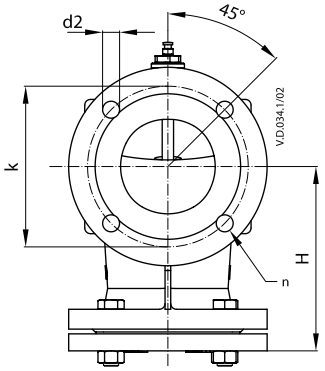


AMV(E) 438 SU +
VL 3 (DN 15-50)

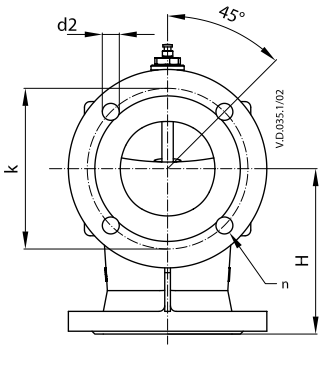
Type	DN	L	H	H1	H2	k	d2	n	Weight
		mm							(kg)
VL 2	15	130	40	193	213	55	11	4	1.48
	20	150	45	195	215	65	11	4	2.07
	25	160	50	199	219	75	11	4	2.59
	32	180	60	203	223	90	14	4	3.82
	40	200	65	209	229	100	14	4	5.28
	50	230	70	215	235	110	14	4	6.74
	65	290	80	250	-	130	14	4	13.90
	80	310	95	253	-	150	19	4	17.22
VL 3	15	130	63	192	212	55	11	4	1.93
	20	150	70	194	214	65	11	4	2.68
	25	160	75	198	218	75	11	4	3.59
	32	180	80	203	223	90	14	4	5.17
	40	200	90	227	247	100	14	4	7.08
	50	230	100	239	259	110	14	4	10.11
	65	290	120	245	-	130	14	4	16.15
	80	310	155	261	-	150	19	4	22.36

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

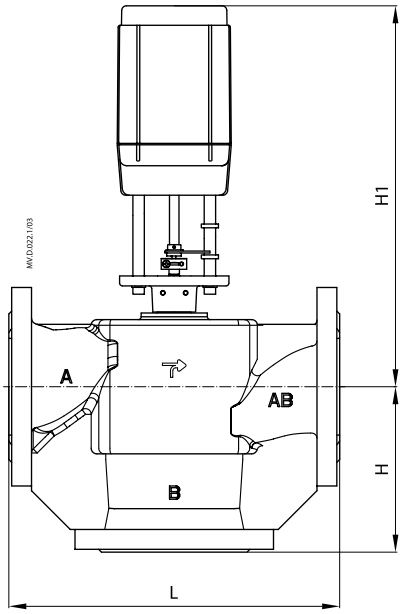
Dimensions *(continued)*



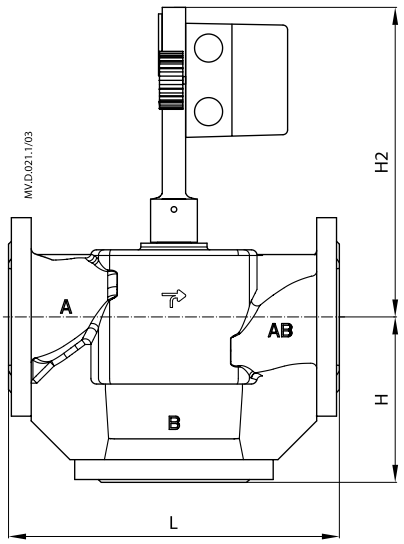
VL 2 (DN 100)



VL 3 (DN 100)



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



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

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

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