



Other valves

VRG 2/VRG 3

Description

VRG valves provide a quality, cost effective solution for most water and chilled applications.

The valves are designed to be combined with following actuators:

- With AMV(E) 435 or AMV(E) 438 SU actuators.
- With AMV(E) 25, 25 SU/SD, 35 actuators (with adapter 065Z0311).

Combinations of actuators is evident under section "Dimension".

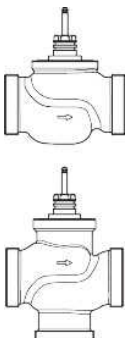
Features & benefits

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

Ordering

Product code numbers

2 & 3-way valves **VRG (external thread)**

Picture	DN	k _{vs} (m ³ /h)	Code No.	
			VRG 2	VRG 3
	15	0.63	065Z0131	065Z0111
		1.0	065Z0132	065Z0112
		1.6	065Z0133	065Z0113
		2.5	065Z0134	065Z0114
		4.0	065Z0135	065Z0115
	20	6.3	065Z0136	065Z0116
	25	10	065Z0137	065Z0117
	32	16	065Z0138	065Z0118
	40	25	065Z0139	065Z0119
	50	40	065Z0140	065Z0120

Example:

3-way valve; DN 15; k_{vs} 1.6; PN 16; T_{max} 130 °C; ext. thread

- 1× VRG 3 DN 15 valve

Code No.: **065Z0113**

Option:

- 3× Tailpieces

Code No.: **065Z0291**

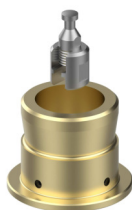
Accessories code numbers



065Z0315

**Stem heater for
AMV(E) 335/435,
AME 435 QM,
NovoCon M**

Stem heater for AMV(E)
335/435, AME 435 QM,
NovoCon M



065Z0311

**AdapAMx15/16/25/35
VRB/G,VF/L2009dn15-
50**

AdapAMx15/16/25/35-
VRB/G,VF/L2009dn15-
50



065Z0325

**Valve stuff.box
VRB,VRG,VF,VL
DN40,50g0**

Valve stuff.box
VRB,VRG,VF,VL
DN40,50g0



065Z0296

**Tailpiece DN50
PN16 int.thread
Rp2**

Tailpiece DN50 PN16
int.thread Rp2



065B2171

STEM HEATER

STEM HEATER



065Z0291

**Tailpiece DN15
PN16 int.thread
Rp#**

Tailpiece DN15 PN16
int.thread Rp#



065Z0321

**Valve stuff.box
VRB,VRG,VF,VL
DN15 g200**

Valve stuff.box
VRB,VRG,VF,VL DN15
g200



065Z0295

**Tailpiece DN40
PN16 int.thread
Rp1#**

Tailpiece DN40 PN16
int.thread Rp1#



065Z0324

**Valve stuff.box
VRB,VRG,VF,VL
DN32 g200**

Valve stuff.box
VRB,VRG,VF,VL DN32
g200



065Z0294

**Tailpiece DN32
PN16 int.thread
Rp1¼**

Tailpiece DN32 PN16
int.thread Rp1¼



065Z0292

**Tailpiece DN20
PN16 int.thread
Rp#**

Tailpiece DN20 PN16
int.thread Rp#



065Z0322

**Valve stuff.box
VRB,VRG,VF,VL
DN20 g200**

Valve stuff.box
VRB,VRG,VF,VL DN20
g200



065Z0293

**Tailpiece DN25
PN16 int.thread
Rp1**

Tailpiece DN25 PN16
int.thread Rp1



065Z0323

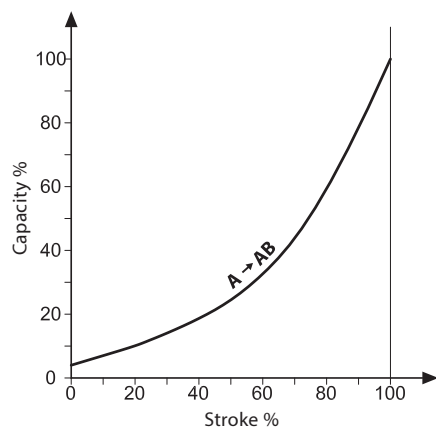
**Valve stuff.box
VRB,VRG,VF,VL
DN25 g200**

Valve stuff.box
VRB,VRG,VF,VL DN25
g200

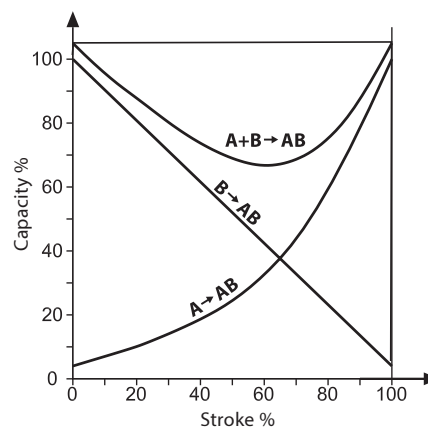
Functions

Valve characteristics

Valve characteristics log (2-way)



Valve characteristics log/lin (3-way)



Product details

General data

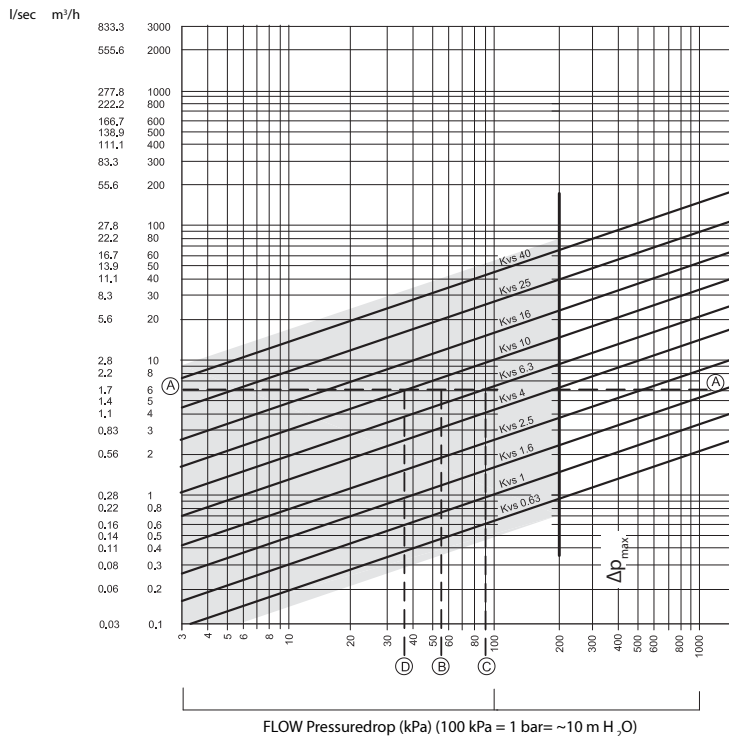
Technical data

Nominal diameter	DN	15					20	25	32	40	50
k _{VS} value	m³/h	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25	40
Stroke	mm	10							15		
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									
		B - AB ≤ 1.0 % of k _{VS}									
Nominal pressure	PN	16									
Max. closing pressure	bar	Mixing: 4									
		Diverting: 1									
Medium		Circulation water / glycolic water up to 50 %									
Medium pH		Min. 7, Max. 10									
Medium temperature	°C	2 (−10 1)) ... 130 ¹⁾									
Connections		ext. thread									

¹⁾ At temperatures from -10 up to +2 °C use stem heater

Sizing

Flow Rate (liquid with specific gravity of 1)



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: $\Delta p_1 = \Delta p_2$

$$a = \frac{\Delta p_1}{\Delta p_1 - \Delta p_2} = 0.5$$

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)

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

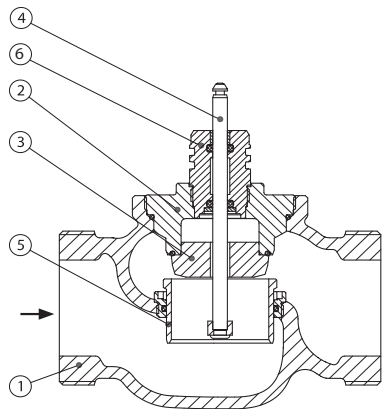
Generally, for a 3 port application, the smaller valve would be selected (resulting in a valve authority higher than 0.5 and therefore improved control). However, this will increase the total pressure and should be checked by the system designer for compatibility with available pump heads, etc. The ideal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



Design

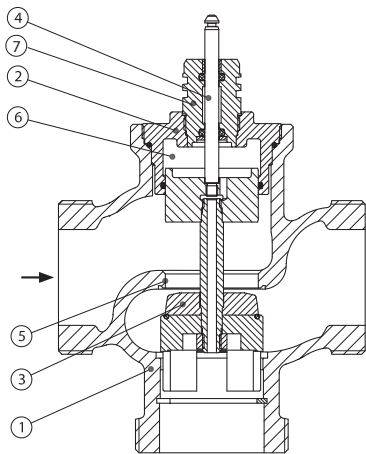
(Design variations are possible)

VRG 2



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

VRG 3

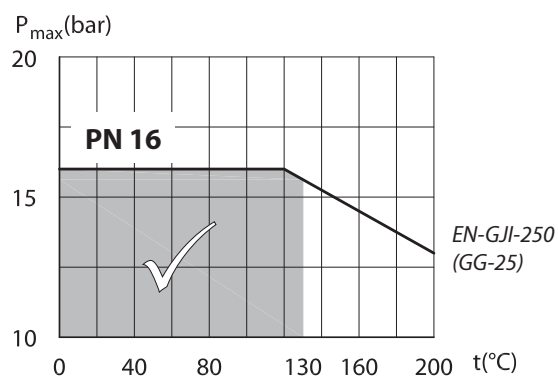


- 1. Valve body
- 2. Valve insert
- 3. Valve cone
- 4. Valve stem
- 5. Valve seat
- 6. Pressure relieve chamber
- 7. Stuffing box

Materials

Valve body	Grey cast iron EN-GJL-250 (GG-25)
Valve stem	Stainless steel
Valve cone	Brass
Stuffing box sealing	EPDM

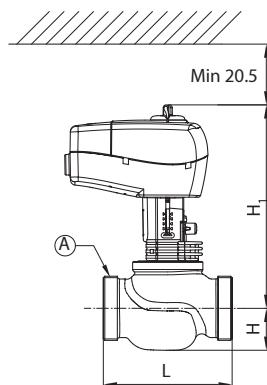
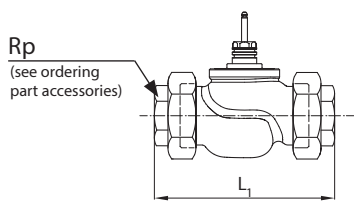
Pressure and temperature data



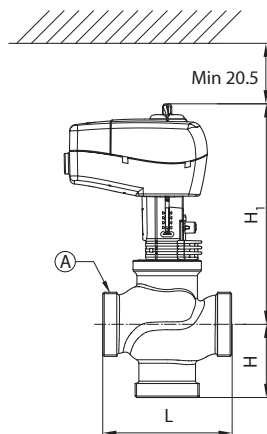
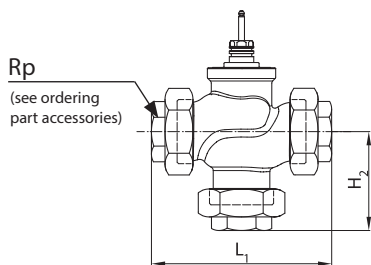
Maximum allowed operating pressure as a function of medium temperature.



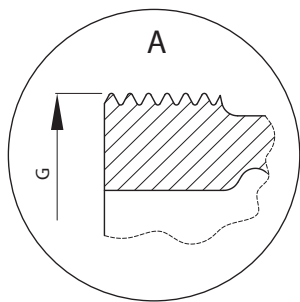
Dimensions



AMV(E) 335, 435 + VRG 2

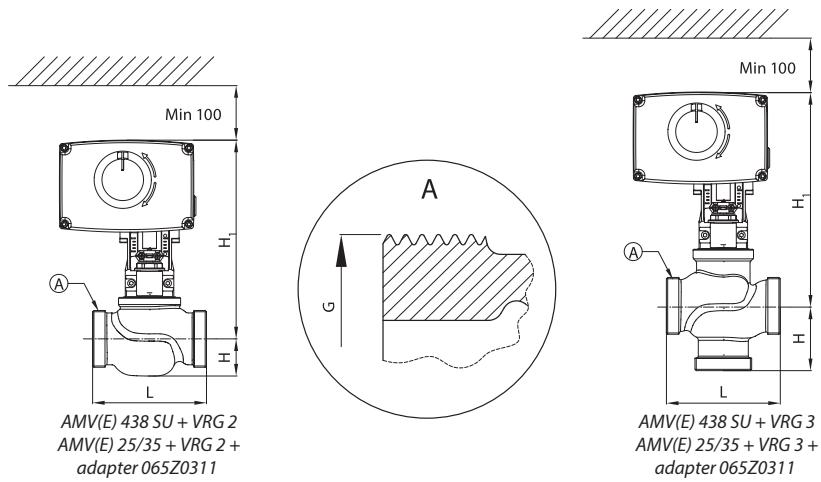


AMV(E) 335, 435 + VRG 3



Type	DN	G*	L	H	H ₁	L ₁	H ₂	Weight
		Connection						kg
VRG 2	15	1	80	29	191	128	-	0.66
	20	1 1/4	80	31	193	128		0.78
	25	1 1/2	95	32	197	151		1.07
	32	2	112	35	201	178		1.48
	40	2 1/4	132	45	213	201		2.60
	50	2 3/4	160	48	217	234		3.64
VRG 3	15	1	80	40	191	128	64	0.71
	20	1 1/4	80	45	193	128	69	0.90
	25	1 1/2	95	50	196	151	78	1.22
	32	2	112	58	201	178	91	1.82
	40	2 1/4	132	75	230	201	110	3.17
	50	2 3/4	160	83	243	234	120	5.01

* G ... external thread DIN ISO 228/01
If stem heater is used dimension H1 is increased for 31 mm.



Type	DN	G*	L	H	H ₁
		Connection	mm		
VRG 2	15	1	80	29	216
	20	1 1/4	80	31	218
	25	1 1/2	95	32	222
	32	2	112	35	226
	40	2 1/4	132	45	237
	50	2 3/4	160	48	242
VRG 3	15	1	80	40	216
	20	1 1/4	80	45	218
	25	1 1/2	95	50	222
	32	2	112	58	226
	40	2 1/4	132	75	255
	50	2 3/4	160	83	268

* G ... external thread DIN ISO 228/01

If stem heater is used dimension H₁ is increased for 5 mm.

Installation

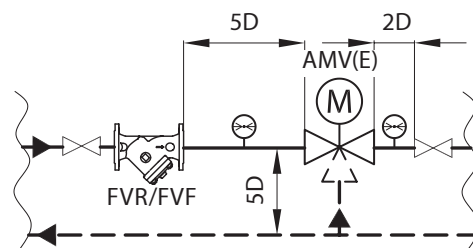
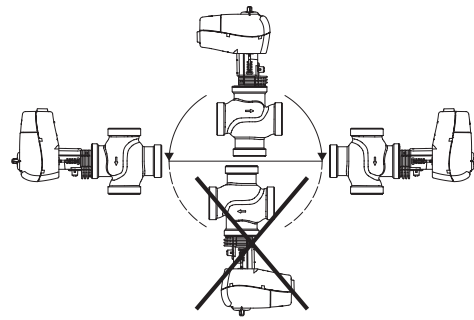
Valve mounting

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 except by diverting, where valve can be mounted opposite to the flow direction (flow opposite to indication on the 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.

Always install the valve with the arrow on the body in the same direction as the flow. In order to avoid turbulence, which will affect the measuring accuracy, it is recommended to have a straight length of pipe up and downstream from the valve as shown (D - diameter of pipe).

Note: Install a strainer upstream of the valve (e.g. Danfoss FVR/FVF)



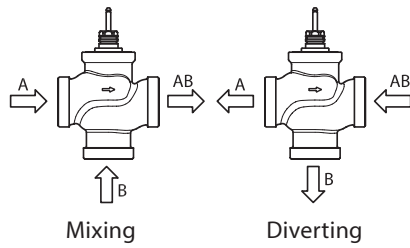


Fig. 1: Mixing and diverting configurations

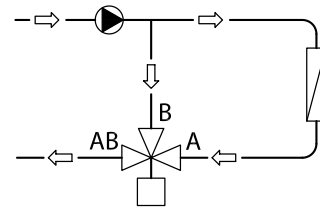


Fig. 3: Mixing valve applied in a diverting arrangement

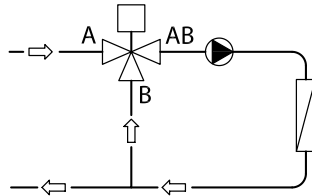


Fig. 2: Mixing valve operating in a mixing arrangement

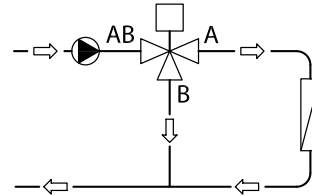


Fig. 4: Diverting valve operating in a diverting arrangement

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: Maximal closing pressure for mixing and diverting installation are not the same. Please refer to values stated in Technical data section.

Certificates, declarations and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Certification body	Approval topic
Manufacturer's Declaration	Danfoss MD 220621EN801101.01	Danfoss	Pressure, PED, EU RoHS
Export Control Declaration	Butterfly, other valves, Manual balancing valves, one pipe solution valves and hot water balancing valves	Danfoss	
UA Declaration	Danfoss UA 10.01.23 Heat Control Valves	Danfoss	
EAC Declaration	EAC KZ 7100841.13.12.02339	EAC - Eurasian Customs Union	MD

Contact details

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