



## Other valves

**VZ 2/VZ 3/VZ 4**

## Description

VZ valves provide a high quality, cost effective solution for the control of hot and/or chilled water for fan coil units, small reheaters, and coolers in temperature control systems.

The valves are used in combination with AMV(E) 130/140, AMV(E) 130H/140H and AMV(E) 13 SU actuators.

### Main data:

- DN 15, 20
- $k_{VS}$  0.25 - 4.0 m<sup>3</sup>/h
- PN 16
- Logarithmic flow characteristic
- Temperature: Circ. water / glycolic water up to 50%: 2 ... 120 °C

### Features & benefits

- Reduced  $k_{VS}$  on B port (VZ3 & VZ4 only)
- Linear bypass on 3 and 4 port valves
- Valves are supplied with screwed plastic cover for manual operation
- Connections: flat end or conex

## Ordering

### Product code numbers

Type	Diameter [mm]	Kvs values [m <sup>3</sup> /h]	Kvs value (B-AB) [m <sup>3</sup> /h]	Closing differential pressure (mixing) [bar] [Max]	Differential pressure range [bar] [Max]	Code number	VVS DK
VZ 2	15	0.25			3.50	065Z5310	461000024
VZ 2	15	0.40			2.50	065Z5311	461000034
VZ 2	15	0.63			3.50	065Z5312	461000044
VZ 2	15	1.00			3.50	065Z5313	461000054
VZ 2	15	1.60			3.50	065Z5314	461000064
VZ 2	15	2.50			3.50	065Z5315	461000074
VZ 2	20	2.50			2.50	065Z5320	461000106
VZ 2	20	4.00			2.50	065Z5321	461000126
VZ 3	15	0.25	0.25	3.5		065Z5410	461010024
VZ 3	15	0.40	0.25	3.5		065Z5411	461010034
VZ 3	15	0.63	0.40	3.5		065Z5412	461010044
VZ 3	15	1.00	0.63	3.5		065Z5413	461010054
VZ 3	15	1.60	1.00	3.5		065Z5414	461010064
VZ 3	15	2.50	1.60	3.5		065Z5415	461010074
VZ 3	20	2.50	1.60	2.5		065Z5420	461010106
VZ 3	20	4.00	2.50	2.5		065Z5421	461010126
VZ 4	15	0.25	0.25	3.5		065Z5510	461020024
VZ 4	15	0.40	0.25	3.5		065Z5511	461020034
VZ 4	15	0.63	0.40	3.5		065Z5512	461020044
VZ 4	15	1.00	0.63	3.5		065Z5513	461020054
VZ 4	15	1.60	1.00	3.5		065Z5514	461020064
VZ 4	15	2.50	1.60	3.5		065Z5515	461020074
VZ 4	20	2.50	1.60	2.5		065Z5520	461020106
VZ 4	20	4.00	2.50	2.5		065Z5521	461020126

#### NOTE:

$k_{vs}$  - is the flow in m<sup>3</sup>/h of water at a temperature between 5 °C and 40 °C which passes through a valve open at the nominal stroke with 100 kPa (1 bar) pressure drop.

Max.  $\Delta p$  is the physical limit of differential pressure the valve will close against. The recommended  $\Delta p$  - values in parentheses () is based on the generation of noise, plug erosion etc. It should be checked against the  $\Delta p$  figure calculated from the chart on page 4 or the equation below, with the valve fully opened at the designed flow rate.

$$\Delta p_{\text{valve}} = S \left( \frac{Q}{k_{vs}} \right)^2$$

$S$  = specific gravity

$Q$  = flow rate in m<sup>3</sup>/h

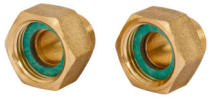
$\Delta p_{\text{valve}}$  = pressure drop across valve in bar (fully open)

Conversion factors

1 bar = 100 kPa = 14.5 psi

1 l/s = 1 kg/s = 3.6 m<sup>3</sup>/h

## Accessories code numbers



065Z7016

### TAIL PIECE SET FOR VZ DN15,SOLDERING

TAIL PIECE SET FOR VZ  
DN15,SOLDERING

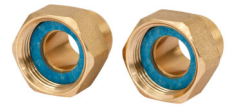
065Z7015

### TAIL PIECE SET FOR VZ DN15,THREADED

TAIL PIECE SET FOR VZ  
DN15,THREADED

003H6902

### Thread tailpieces, PN 25, DN 15, R 1/2; G 3/4, External Thread

Tailpiece ext.thr R1/2 PN25  
(G3/4)

065Z7017

### TAIL PIECE SET FOR VZ DN20,SOLDERING

TAIL PIECE SET FOR VZ  
DN20,SOLDERING

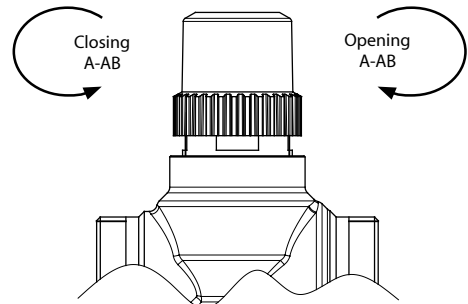
## Functions

### Operation

#### Manual operation

Valves are supplied with screwed plastic cover for manual operation.

**Note: The flow is reduced on 75 % in case of using plastic cover.**



## Product details

### General data

Control characteristic	Logarithmic
Control range	min. 50:1
Leakage loss, closed valve	A - AB $\leq 0.05$ % of $k_{vs}$
	B - AB $\leq 1$ % of $k_{vs}$
Medium	Circulation water / Glycolic water up to 50 %
Medium temperature	2 ... 120 (°C)
Max. operating pressure	1 bar
Stroke	5.5 mm
Connection	External thread (flat connection (MS 58) or conex))

### Sizing

#### Example

Flow rate: 0.3 m<sup>3</sup>/h

System pressure drop: 20 kPa

Locate the horizontal line representing a flow rate of 0.3 m<sup>3</sup>/h (line A). The valve authority is given by the equation:

$$\text{Valve authority, } N = \frac{\Delta P_1}{\Delta P_1 + \Delta P_2}$$

Where:

$\Delta P_1$  = pressure drop across the fully open valve,

$\Delta P_2$  = pressure drop across the rest of the circuit with a fully open valve

The ideal valve would give a pressure drop equal to the system pressure drop (i.e. an authority of 0.5):

$$\text{If } P_1 = P_2$$

$$N = P_1 / 2P_1 = 0.5$$

In this example an authority of 0.5 would be given by a valve having a pressure drop of 20 kPa at that flow rate (point B).

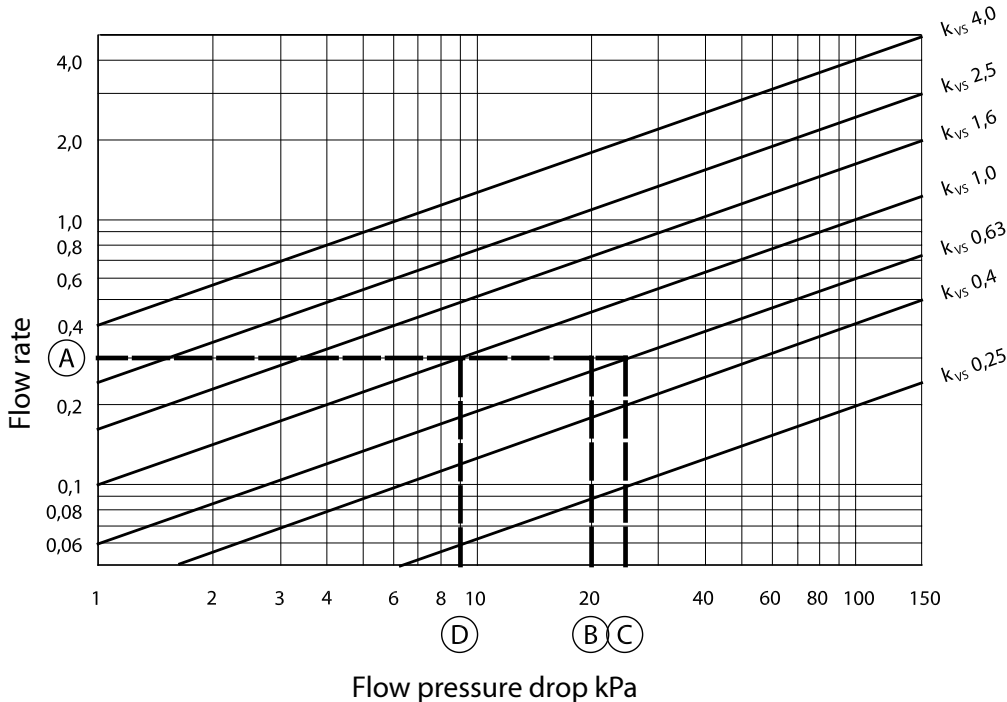
The intersection of line A with a vertical line drawn from B lies between two diagonal lines; this means that no ideally-sized valve is available. The intersection of line A with the diagonal lines gives the pressure drops stated by real, rather than ideal, valves. In this case, a valve with  $k_{vs}$  0.6 would give a pressure drop of 25 kPa (point C):

$$\text{hence valve authority} = \frac{25}{25+20} = 0.56$$

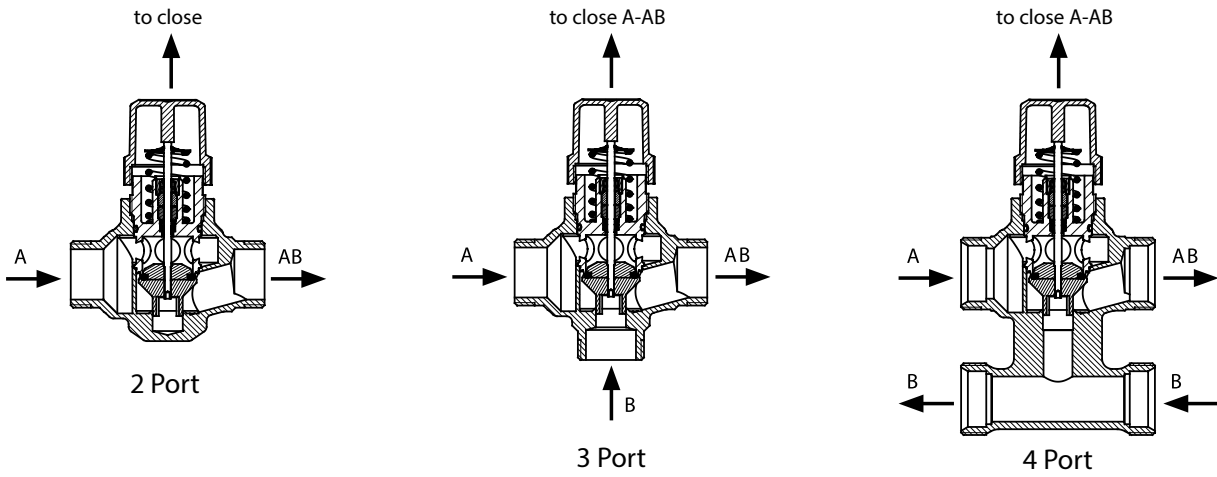
The second-largest valve, with  $k_{vs}$  1, would give a pressure drop of 9 kPa (point D):

$$\text{hence valve authority} = \frac{9}{9+20} = 0.31$$

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



## Design

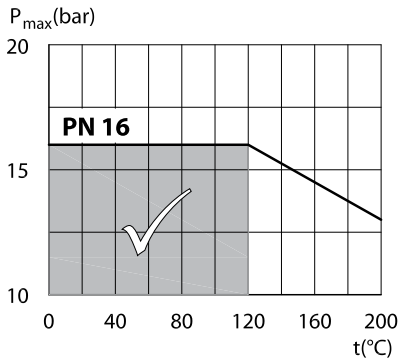


## Materials

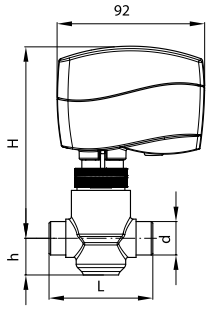
Body, seat and cone	Dezincing free brass CuZn36Pb2As
Stem	Stainless steel
Stuffing box	EPDM

## Pressure and temperature data

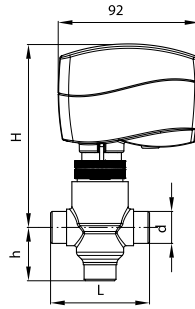
### Pressure temperature diagram



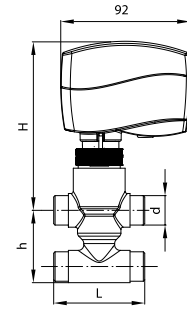
## Dimensions



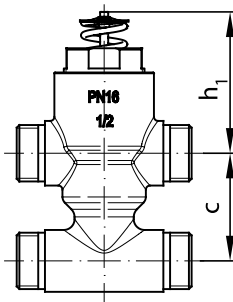
AMV(E) 130/140 + VZ 2



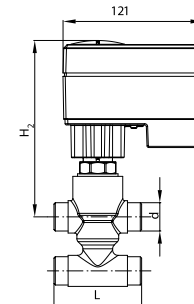
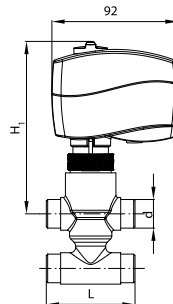
AMV(E) 130/140 + VZ 3



AMV(E) 130/140 + VZ 4



AMV(E) 130H/140H + VZ .

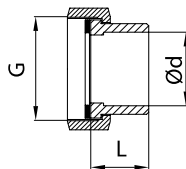


AMV(E) 13 SU + VZ .

Valve type	d	L	H	H <sub>1</sub>	H <sub>2</sub>	h	h <sub>1</sub>	c	Valve weight (kg)
	mm								
VZ 2 / DN 15	G 1/2"	65	119	125	155	26.5	52.5	-	0.38
VZ 2 / DN 20	G 3/4"	77							0.49
VZ 3 / DN 15	G 1/2"	65				35			0.39
VZ 3 / DN 20	G 3/4"	77				65			0.50
VZ 4 / DN 15	G 1/2"	65				40			0.51
VZ 4 / DN 20	G 1/2"	65				50			0.62

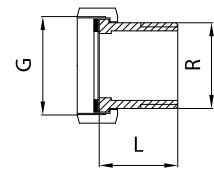
### Tailpieces for soldering

G	Ød	L	Weight (kg)
	mm		
1/2"	12	15	0.11
3/4"	15	20	0.17



### Tailpieces with external thread

G	R	L	Weight (kg)
	(")	(mm)	
1/2"	3/8	23	0.11
3/4"	1/2	26	0.17



## Installation

### Hydraulic connections

Mount according to flow direction as indicated on the valve body. AB is always the outlet port; inlets are A (two port) or A and B (three or four port).

### Valve mounting

Before mounting the valve be sure that the pipes are clean and free from swarf. It is essential that the pipes are lined up squarely with the valve at each connection and are free from vibrations.

The valve should be adequately supported to prevent stress being applied to the connections during operation. A maximum tightening torque of 25 to 30 Nm should be applied to the connections.

Install the valve so that the actuator will be mounted in a vertical or horizontal position but not upside down.

Leave sufficient clearance to allow the dismantling of the actuator from the valve body for maintenance purposes.

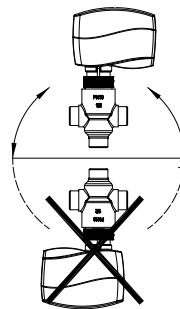
The valve must not be installed in an explosive atmosphere or at an ambient temperature higher than 50 °C or lower than 2 °C. It must not be subjected to steam jets, water jets or dripping liquid.

**Note that the actuator may be rotated up to 360° with respect to the valve body, by loosening the retaining fixture. After this operation retighten.**

Ensure that the direction of flow is correct as shown in typical application examples (fig.1 and 2). The three way valve must be installed as a mixing valve. If possible the valves should be positioned in the return side.

The valve is supplied complete with installation instructions. The water quality should meet VDI 2035 requirements.

AMV(E) 130/140, AMV(E) 130H/140H + VZ



AMV(E) 13 SU + VZ

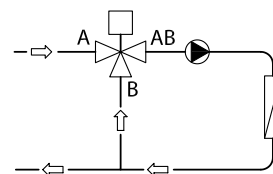
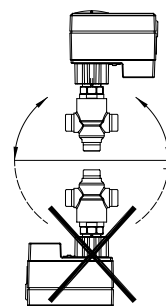


Fig. 1 Mixing valve used in mixing application

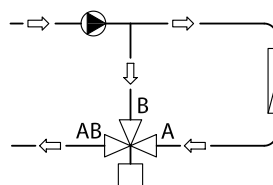
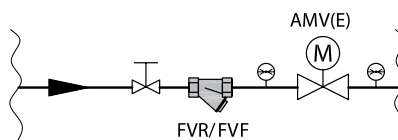


Fig. 2 Mixing valve used in diverting application

**Note:**

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



## 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.

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Export Control Declaration	<a href="#">Butterfly, other valves, Manual balancing valves, one pipe solution valves and hot water balancing valves</a>	Danfoss	
UA Declaration	<a href="#">Danfoss UA 10.01.23 Heat Control Valves</a>	Danfoss	

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