ENGINEERING
TOMORROW

Data sheet

VZL valve - 2/3/4-way

Description



Stem extension plug

VZL 2

VZL 3

VZL 4

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

The valves are used in combination with:
- AMV(E) 130(H)/140(H) ABNM A5 with extension plug;
- AMV(E) 13 (SU) and TWA-ZL actuators.

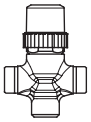
Note:
TWA-ZL thermal actuator does not close port B.

In case that stem extension plug is not used together with AMV(E) 130(H)/140(H) dead zone in valve close position will occur.

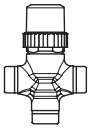
Main data:
- DN 15, 20
- k_{VS} 0.25-3.5 m^3/h
- PN 16
- Temperature:
  - Circ. water / glycolic water up to 50 %: 2 … 120 °C
- Reduced k_{VS} on B port (VZL 3 & VZL 4 only)
- Linear characteristic
- Linear bypass on 3 and 4 port valves
- Valves are supplied with screwed plastic cover for manual operation
- Connections: flat end or conex
- Water quality acc. to VDI 2035 requirements

Ordering

2-way valve **VZL 2**

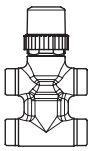
Picture	DN (mm)	k_{VS} (m^3/h)	max. Δp (bar)	Code No. Flat End	Code No. Conex
	15	0.25	2.5	**065Z2070**	**065Z2040**
		0.4	2.5	**065Z2071**	**065Z2041**
		0.63	2.5	**065Z2072**	**065Z2042**
		1.0	2.0	**065Z2073**	**065Z2043**
		1.6	2.0	**065Z2074**	**065Z2044**
	20	2.5	1.0	**065Z2075**	**065Z2045**
		3.5	1.0	**065Z2076**	**065Z2046**

3-way valve **VZL 3**

Picture	DN (mm)	k_{VS} (A - AB) m^3/h	k_{VS} (B - AB) m^3/h	max. Δp (bar)	Code No. Flat End
	15	0.25	0.25	2.5	**065Z2080**
		0.4	0.25	2.5	**065Z2081**
		0.63	0.40	2.5	**065Z2082**
		1.0	0.63	2.0	**065Z2083**
		1.6	1.0	2.0	**065Z2084**
	20	2.5	1.6	1.0	**065Z2085**
		3.5	2.5	1.0	**065Z2086**

Ordering *(continued)*

4-way valve **VZL 4**

Picture	DN (mm)	k_{VS} (A - AB) m³/h	k_{VS} (B - AB) m³/h	max. Δp (bar)	Code No. Flat End	Code No. Conex
	15	0.25	0.25	2.5	**065Z2090**	**065Z2060**
		0.4	0.25	2.5	**065Z2091**	**065Z2061**
		0.63	0.4	2.5	**065Z2092**	**065Z2062**
		1.0	0.63	2.0	**065Z2093**	**065Z2063**
		1.6	1.0	2.0	**065Z2094**	**065Z2064**
	20	2.5	1.6	1.0	**065Z2095**	**065Z2065**
		3.5	2.5	1.0	**065Z2096**	**065Z2066**

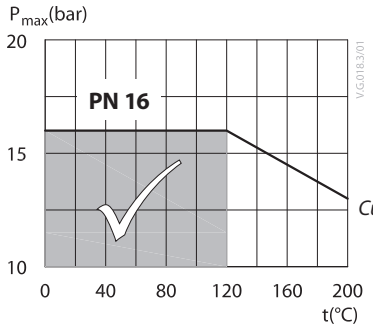
Accessories

Type	Pipe size	DN	Description	Code No.
Tailpieces with external thread	R ³/₈″	15	Consist of 2 union nuts, 2 tailpieces and 2 gaskets (Ms 58)	**065Z7015**
	R ½″	20		**003H6902**
Tailpieces for soldering	12 mm	15	Consist of 2 union nuts, 2 solder bushes and 2 gaskets (Ms 58)	**065Z7016**
	15 mm	20		**065Z7017**
Stuffing box				**065F0006**
Spindle extension adapter, 2 mm (5 pieces)				**003Z0249**

Technical data

Control characteristic		Linear
Control range		min. 30:1
Leakage loss, closed valve		A - AB ≤ 0.05 % of k_{VS}
		B - AB ≤ 1 % of k_{VS}
Medium		Circulation water / Glycolic water up to 50 %
Medium temperature	°C	2 … 120
Max. operating pressure	bar	16
Stroke	mm	2.8
Connection		External thread (flat connection (MS 58) or conex)
Materials		
Body		Brass CuZn40Pb2
Seat cone and steam		Brass CuZn39Pb3
Stuffing box		EPDM

Pressure temperature diagram



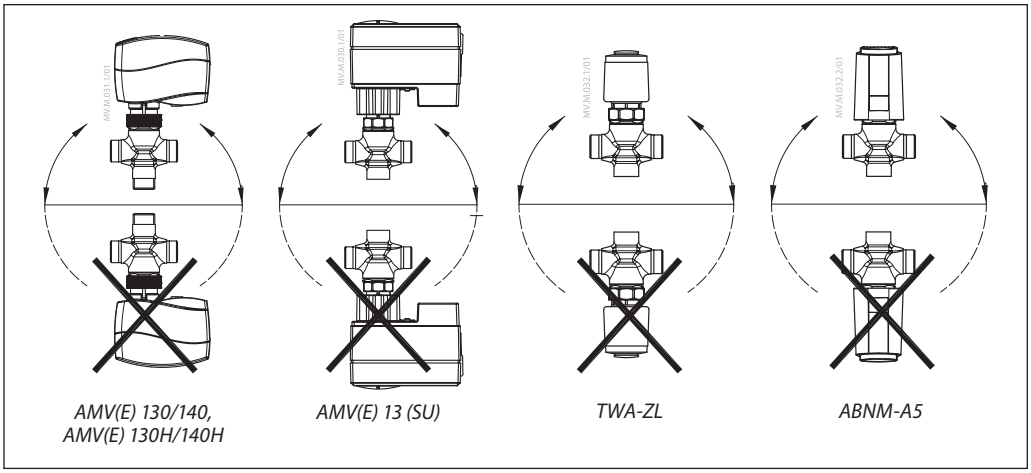
Maximum allowed operating pressure as a function of medium temperature (according to EN 1092-3)

Disposal

The valve must be dismantled and the elements sorted into various material groups before disposal.

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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 and 4-way mixing valves
3-way and 4-way valves are mixing valves 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 it is a solution to install valve in return pipe (fig. 2).

To prevent damages, starting max. Δp must not exceed 1 bar for DN 20 and 2/2.5 bar for DN 15, when installing the valve.

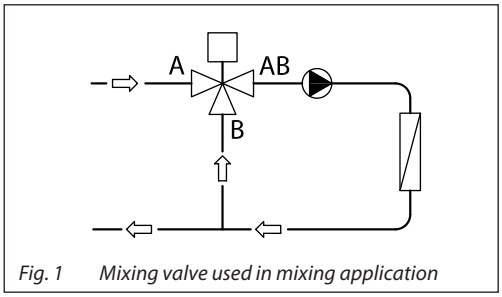


Fig. 1 Mixing valve used in mixing application

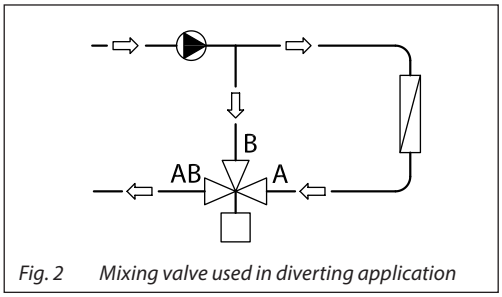
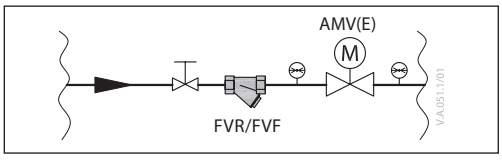


Fig. 2 Mixing valve used in diverting application

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



Sizing

Example

Design data:
Flow rate: 0.3 m^3/h
System pressure drop: 20 kPa

Locate the horizontal line representing a flow rate of 0.3 m^3/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:
ΔP1 = pressure drop across the fully open valve,
ΔP2 = 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):

If ΔP1 = ΔP2,

$$N = \frac{\Delta P_1}{\Delta P_1 + \Delta P_2} = 0.5$$

In this example an authority of 0.5 would be given by a valve having a pressure drop of 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} 0.63 would give a pressure drop of 25 kPa (point C):

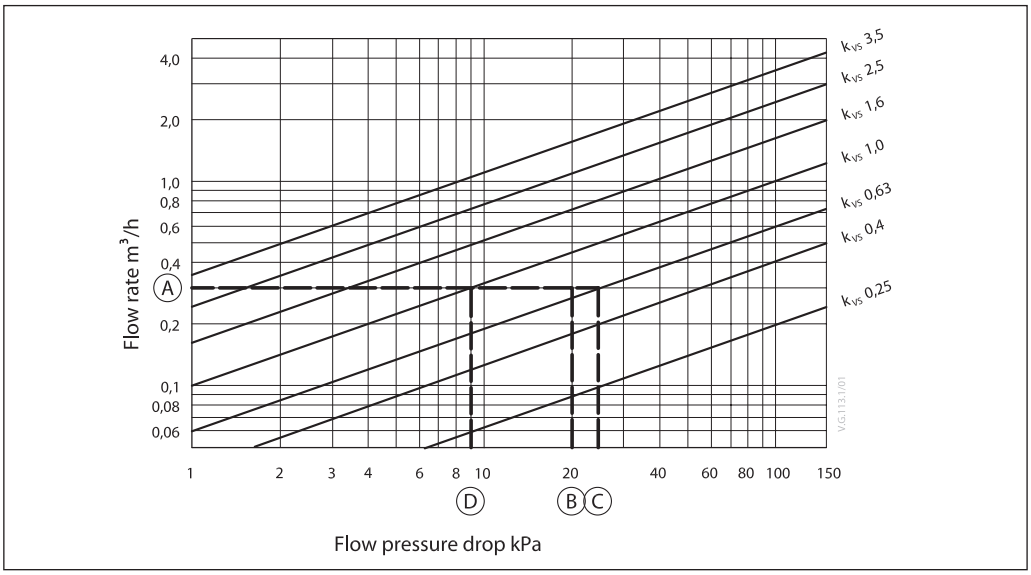
$$\text{hence valve authority} = \frac{25}{25+20} = 0.56$$

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

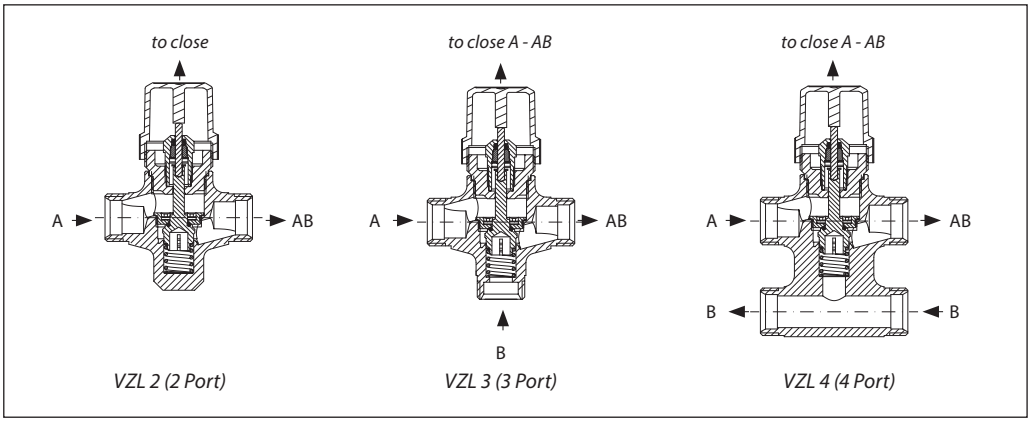
$$\text{hence valve authority} = \frac{9}{9+20} = 0.31$$

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.

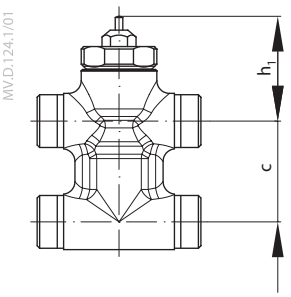


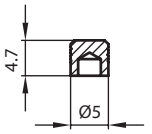
Design



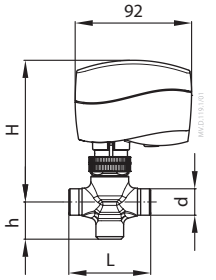
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Dimensions

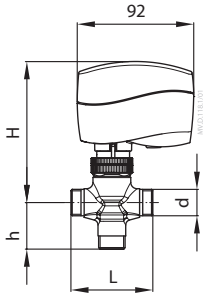




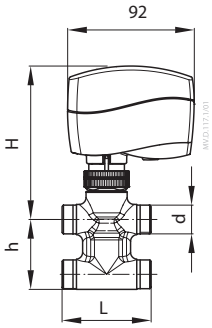
Stem extension plug



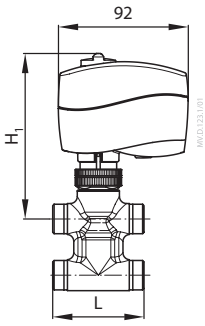
AMV(E) 130/140 + VZL 2 + stem extension plug



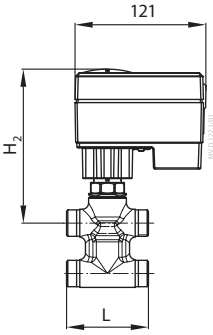
AMV(E) 130/140 + VZL 3 + stem extension plug



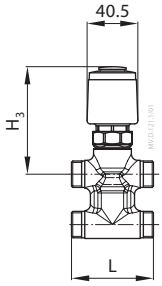
AMV(E) 130/140 + VZL 4 + stem extension plug



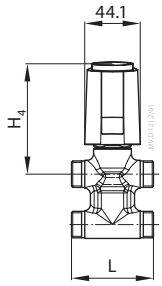
AMV(E) 130H/140H + VZL + stem extension plug



AMV(E) 13 SU + VZL



TWA-ZL + VZL



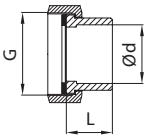
ABNM A5 + VZL + stem extension plug

Valve type	d	L	H	H_1	H_2	H_3	H_4	c	h	h_1	Valve weight (kg)
		mm									
VZL 2 DN 15	G ½"	65	111	117	140	88	93.5	-	29.5	47.5	0.27
VZL 2 DN 20*	G ¾"	77	117	123	146	94	99.5		34.0		0.47
VZL 3 DN 15	G ½"	65	111	117	140	88	93.5		35.0		0.28
VZL 3 DN 20	G ¾"	77	117	123	146	94	99.5		35.0		0.40
VZL 4 DN 15	G ½"	65	111	117	140	88	93.5	40	51.0		0.39
VZL 4 DN 20*	G ¾"	77	117	123	146	94	99.5	50	65.0		0.59

** conex valves DN 20 - G $1^1/_8$" 14 TPI*

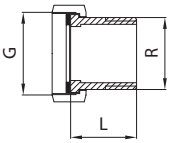
Tailpieces for soldering

G	Ød	L	Weight (kg)
	mm		
½"	12	15	0.11
¾"	15	20	0.17



Tailpieces with external thread

G	R (")	L (mm)	Weight (kg)
½"	$^3/_8$	23	0.11
¾"	½	26	0.17



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