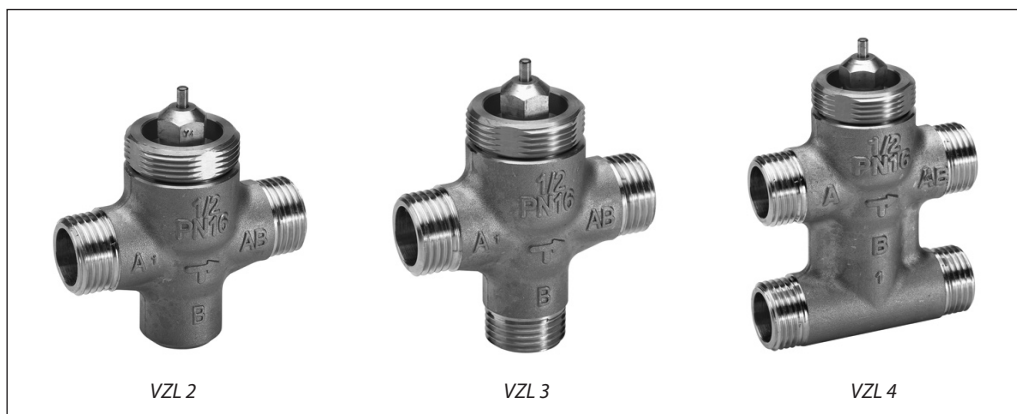


Data sheet

2, 3 and 4 - way valves VZL

Description



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) 130/140, AMV(E) 130H/140H, AMV(E) 13 SU and TWA-Z actuators.

Main data:

- DN 15, 20
- k_{vs} 0.25 - 3.5 m³/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)
- Soft sealing on plug gives complete shut-off
- 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

Ordering

VZL 2 Valve

Picture	DN (mm)	k_{vs} (m ³ /h)	max. Δp (bar)	Code No. VZL 2	
				Flat End	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

VZL 3 Valve

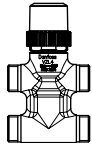
Picture	DN (mm)	k_{vs} (A - AB) (m ³ /h)	k_{vs} (B - AB) (m ³ /h)	max. Δp (bar)	Code No. VZL 3	
					Flat End	Conex
	15	0.25	0.25	2.5	065Z2080	065Z2050
		0.4	0.25	2.5	065Z2081	065Z2051
		0.63	0.40	2.5	065Z2082	065Z2052
		1.0	0.63	2.0	065Z2083	065Z2053
		1.6	1.0	2.0	065Z2084	065Z2054
	20	2.5	1.6	1.0	065Z2085	065Z2055
		3.5	2.5	1.0	065Z2086	065Z2056

Data sheet

2, 3 and 4- way valves VZL

Ordering (continuous)

VZL 4 Valve

Picture	DN (mm)	k_{VS} (A - AB) (m ³ /h)	k_{VS} (B - AB) (m ³ /h)	max. Δp (bar)	Code No. VZL 4	
					Flat End	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

NOTE:

k_{VS} - is the flow in m³/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. Δp is the physical limit of differential pressure the valve will close against.

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

S = specific gravity (1000 kg/m³)

Q = flow rate in m³/h

Δp_{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 m³/h

Accessories

Type	Code No.
Stuffing box	065F0006

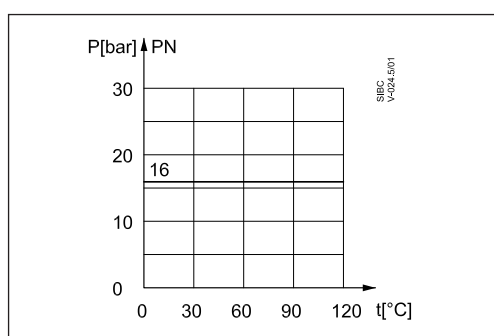
Connection	Pipe size	DN	Description	Code No.
Tailpieces with external thread	R 3/8"	15	Consist of 2 union nuts, 2 tailpieces and 2 gaskets (Ms 58)	065Z7015
	R 1/2"	20		003H6902

Connection	Pipe size	DN	Description	Code No.
Tailpieces for soldering	12 mm	15	Consist of 2 union nuts, 2 solder bushes and 2 gaskets (Ms 58)	065Z7016
	15 mm	20		065Z7017

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	2 ... 120 °C
Max. operating pressure	16 bar
Stroke	2.8 mm
Connection	External thread (Flat connection (MS 58) or conex)
Materials	
Body, seat cone and steam	Brass
Stuffing box	EPDM

Pressure temperature diagram



Disposal

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

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).

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

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.

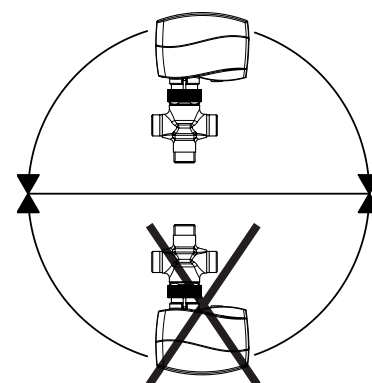
Install the valve so that the actuator will be mounted in a vertical or horizontal position but not upside down.

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

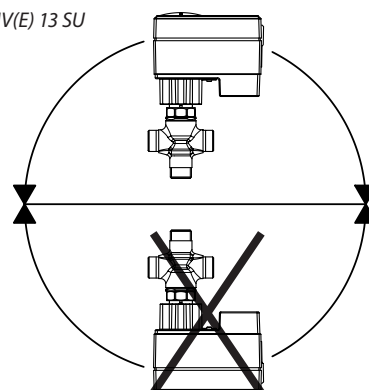
The valve must not be installed in an explosive atmosphere or at an ambient temperature higher than 50 °C or lower than 2 °C. It must not be subjected to steam jets, water jets or dripping liquid.

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.

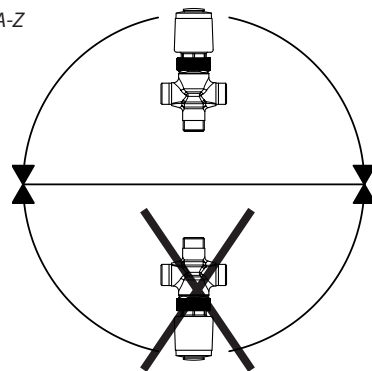
AMV(E) 130/140, AMV(E) 130H, 140H



AMV(E) 13 SU



TWA-Z



Installation (continuous)

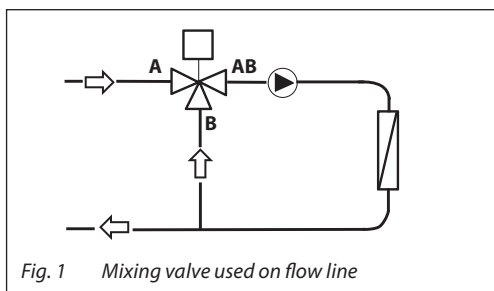


Fig. 1 Mixing valve used on flow line

Ensure that the direction of flow is correct as shown in typical application examples (fig.1 and 2).

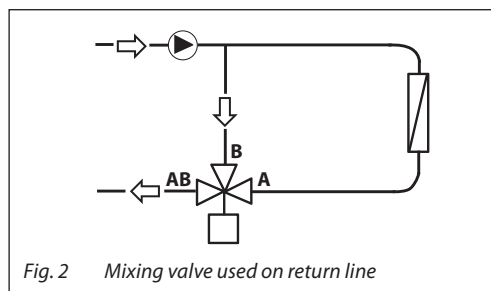


Fig. 2 Mixing valve used on return line

The three way valve must be installed as a mixing valve. If possible the valves should be positioned in the return side.

Sizing

Example

Design data:

Flow rate: 0.3 m³/h

System pressure drop: 20 kPa

Locate the horizontal line representing a flow rate of 0.3 m³/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:

ΔP_1 = pressure drop across the fully open valve,

ΔP_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 kvs 0.63 would give a pressure drop of 25 kPa (point C):

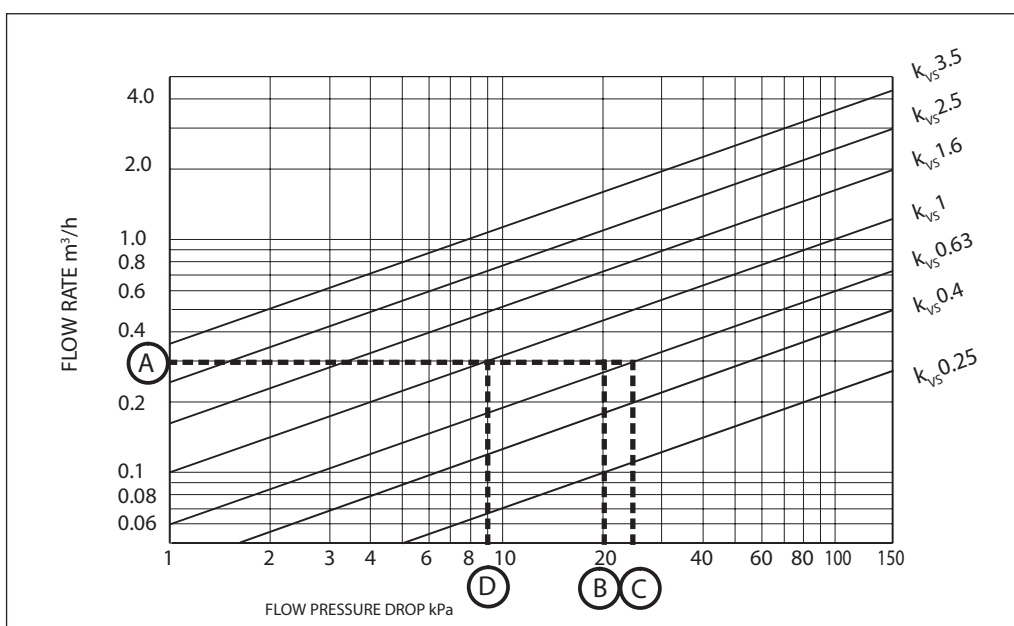
$$\text{hence valve authority} = \frac{25}{25 + 20} = 0.56$$

The second-largest valve, with kvs 1, would give a pressure drop of 9 kPa (point D):

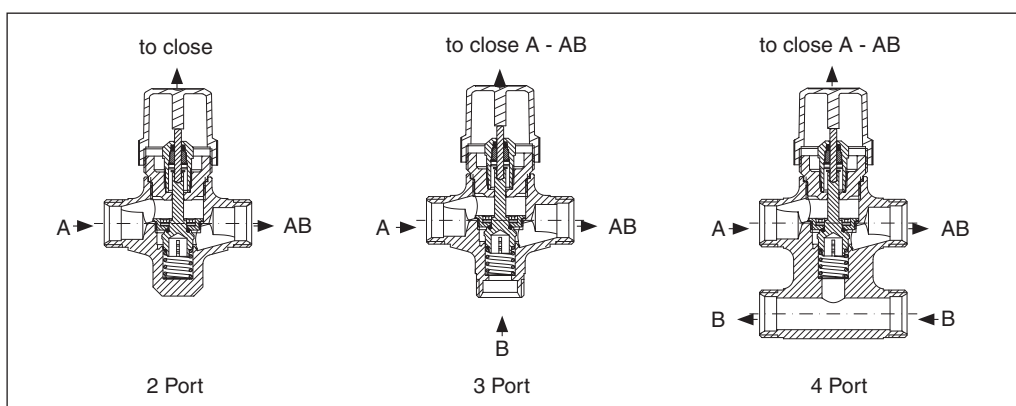
$$\text{hence valve authority} = \frac{9}{9 + 20} = 0.31$$

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.

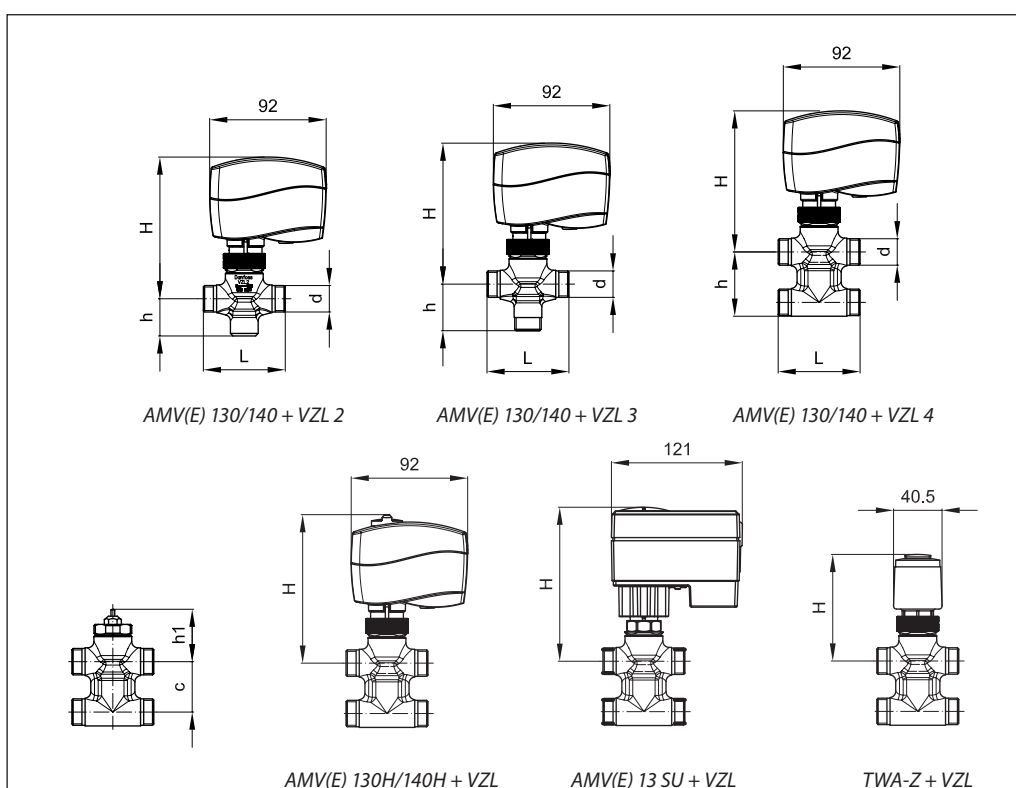
The ideal authority is 0.5 with a preferred range of between 0.4 and 0.7.



Design



Dimensions

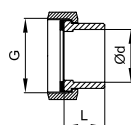


Valve type	d	L (mm)	H (mm)				c (mm)	h (mm)	h ₁ (mm)	Valve weight (kg)
			AMV(E) 13SU	AMV(E) 130/140	AMV(E) 130H/140H	TWA-Z				
VZL 2 DN 15	G 1/2"	65	140	111	117	88	40	29.5	47.5	0.27
VZL 2 DN 20*	G 3/4"	77	146	117	123	94		34.0		0.47
VZL 3 DN 15	G 1/2"	65	140	111	117	88		35.0		0.28
VZL 3 DN 20*	G 3/4"	77	146	117	123	94		35.0		0.40
VZL 4 DN 15	G 1/2"	65	140	111	117	88	50	51.0	65.0	0.39
VZL 4 DN 20*	G 3/4"	77	146	117	123	94	50	65.0		0.59

* conex valves DN 20 - G 1 1/8" 14 TPI

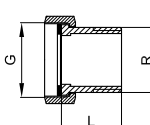
Tailpieces for soldering

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



Tailpieces with external thread

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



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