



2-port valves
VVI46.15 to VVI46.25



3-port valves
VXI46.15 to VXI46.25



2-port valves
VVS46.15 to VVS46.25



3-port valves
VXS46.15 to VXS46.25



2-Port and 3-Port Zone Valves, PN16

VVI46...
VXI46...
VVS46...
VXS46...

- Hot-pressed brass valve body
- DN15, DN20 and DN25
- $k_{vs} 2...5 \text{ m}^3/\text{h}$
- Internally threaded connections, Rp... to ISO 7/1 (V...I146...) or solder connections (V...S46...)
- Manual adjuster
- Can be fitted with motorized actuators, type SFA... or thermic actuators, type STA...

Use

- For use in ventilation and air-conditioning systems for water-side terminal unit control in closed circuits, e.g. for induction units, fan-coil units, small reheaters and small re-coolers.
 - 2-pipe systems with 1 heat exchanger for heating and cooling
 - 4-pipe systems with 2 separate heat exchangers for heating and cooling
- In closed-circuit zone heating systems, e.g. for:
 - Separate floors in a building
 - Apartments
 - Individual rooms

Type summary

VVI46... 2-port	VXI46... 3-port	DN	Connections	k_{vs}	k_{vs}	k_{vs}	$\Delta p_{v,max}$ [kPa]
				A → AB ¹⁾ [m ³ /h]	AB → A ²⁾ [m ³ /h]	AB → B ²⁾ [m ³ /h]	
VVI46.15	VXI46.15	15	Internally threaded Rp	2.0	2.0	1.4	100 ³⁾
VVI46.20	VXI46.20	20		3.5	3.5	2.45	
VVI46.25	VXI46.25	25		5.0	5.0	3.5	
VVS46.15	VXS46.15	15	Solder connections	2.0	2.0	1.4	
VVS46.20	VXS46.20	20		3.5	3.5	2.45	
VVS46.25	VXS46.25	25		5.0	5.0	3.5	

k_{vs} = Nominal flow rate of cold water (5...30 °C) through the fully open valve (H_{100}), by a differential pressure of 100 kPa (1 bar)

$\Delta p_{v,max}$ = Maximum permissible differential pressure across the valve's control path, based on the given design concept, valid for the entire stroke

¹⁾ 2-port valves

²⁾ 3-port valves

The k_{vs} values in bypass B of the 3-port valves represent only 70 % of the k_{vs} value in the straight-through control path AB ↔ A. This compensates for the flow resistance of the heat exchanger or radiator, so keeping the overall flow rate \dot{V}_{100} as constant as possible.

³⁾ Where $\Delta p_{v,max}$ is above 100 kPa, there is an increased risk of noise and erosion on the seat and plug

Ordering

When ordering, please specify the quantity, product name and type code.

The type SFA... and STA... actuators must be ordered separately.

Example

10 3-port zone valves, type VXI46.15

Delivery

The valves and actuators are delivered in separate packaging.

Equipment combinations

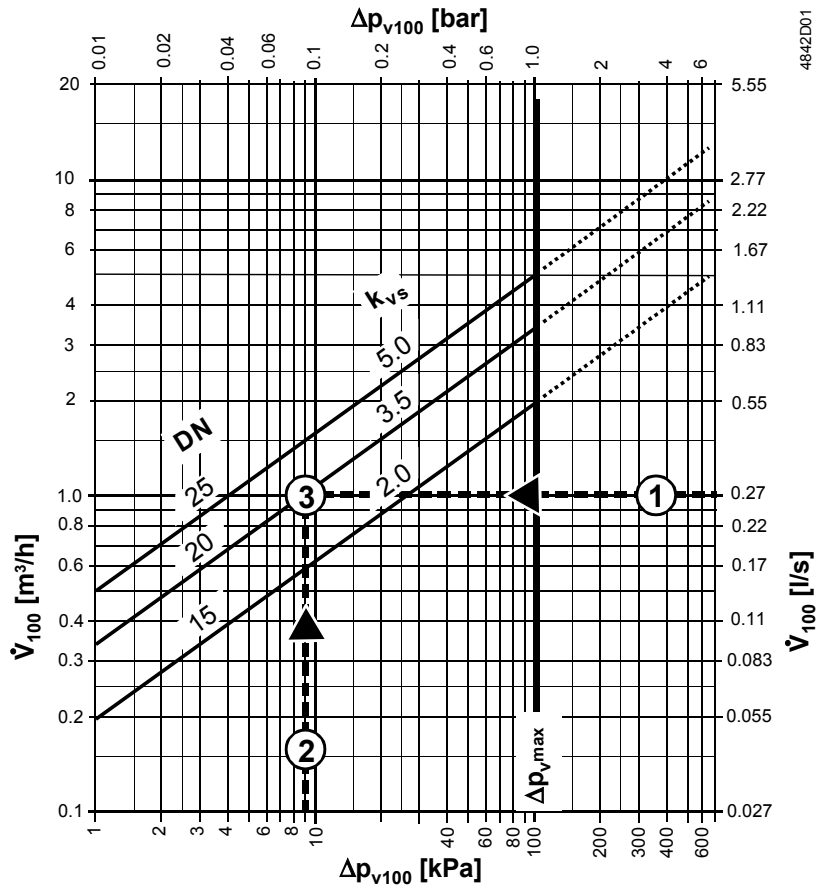
Valves	Motoric actuators SFA...		Thermal actuators STA...		
	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	
VVI46.15 ... 20	100	300	100	150	
VVI46.25		200			
VVS46.15 ... 20		300			
VVS46.25		200			
VXI46.15 ... 25					
VXS46.15 ... 25					
Data sheet	4863		4877		

Δp_{max} = Maximum permissible differential pressure across the valve's control path, valid for the entire actuating range of the motorized valve (maximum recommended operating differential pressure)

Δp_s = Maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close off pressure)

Overview of actuators

Actuator	Type of actuator	Operating voltage	Positioning signal	Positioning time	Positioning force
SFA21/18	Motoric	AC 230 V	2-position	40 s	105 N
SFA71/18		AC 24 V			
STA21...	Thermal	AC 230 V	2-position	180 s	
STA71...		AC/DC 24 V			



Example:

- 1 \dot{V}_{100} = 0.27 l/s
- 2 Δp_{v100} = 9 kPa
- 3 k_{vs} value required = 3.5 m³/h

Δp_{v100} = Differential pressure across the fully open valve and the valve's control path A → AB (2-port valves), AB → A (3-port diverting valves) or A → AB (3-port mixing valves) by a volume flow \dot{V}_{100}

\dot{V}_{100} = Volume flow through the fully open valve (H_{100})

Δp_{vmax} = Maximum permissible differential pressure across the valve's control path, based on the given design concept, valid for the entire stroke

100 kPa = 1 bar ≈ 10 mWG

1 m³/h = 0.278 l/s water at 20 °C

Mechanical design

- Disc throttling element
- Seat ring embedded in through-port
- Seat machined into through-port and bypass
- Reservoir for continuous lubrication of sealing rings
- Return spring



See also «Mounting» and «Commissioning».

It is not allowed to put a shut off at the bypass port B.

Recommendation:

A strainer should be fitted upstream of the valve. This increases reliability.

Valve construction	Valve series	Valve flow in control mode		Valve stem	
		Inlet A	Outlet AB	Retracted	Extended
<p>01742</p>	<p>VV...46...</p>	Variable	Variable	<p>A → AB closes</p>	<p>A → AB opens</p>

Warning

The direction of flow **MUST** be as indicated by the arrow, from A → AB.

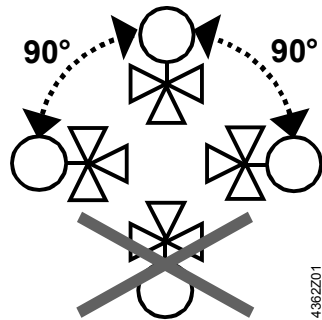
Valve construction	Valve series	Valve flow in control mode			Valve stem	
		AB	A	B	Retracted	Extended
<p>01743</p>	<p>VX...46...</p>	Inlet: constant	Outlet: variable	Outlet: variable	<p>AB → A closes</p> <p>AB → B opens</p>	<p>AB → A opens</p> <p>AB → B closes</p>
<p>01743</p>	<p>VX...46...</p>	Outlet: constant	Inlet: variable	Inlet: variable	<p>AB ← A closes</p> <p>AB ← B opens</p>	<p>AB ← A opens</p> <p>AB ← B closes</p>

Warning

The direction of flow **MUST** be as indicated by the arrow, from AB → A and AB → B (diverting valves) or A → AB and B → AB (mixing valves).

Mounting

Orientation



4362Z01

The specified direction of flow must be observed in all cases (see also «Engineering notes»).

The valves are delivered in a multipack (10 pieces). Mounting instructions 74 319 0300 0 are enclosed with the packaging.

The valve and actuator are easily assembled directly on site. There is no need for special tools or calibration.

Warning 

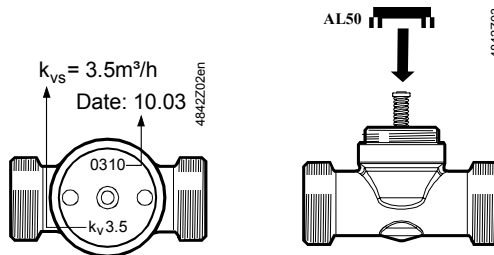
Solder-type valves, V...S46...:

When soldering the connections, the temperature in the vicinity of the O-ring must not exceed 150 °C.

To ensure this, the valve body should be adequately cooled with a wet cloth.

AL50 supporting ring

The AL50 supporting ring must be put into position before mounting the actuator onto the valve.



Commissioning

Manual adjustment

In the straight-through control path A - AB, the valve is opened by a return spring. The straight-through path can be closed manually with the manual adjustment button. With 3-port valves, this method can be used to open bypass B to 70 %.

Warning 

Before performing any service work on the valve and/or actuator:

Switch OFF the pump and power supply, close the main shut-off valve in the pipework, release pressure in the pipes and allow them to cool down completely. If necessary, disconnect electrical connections from terminals. The valve may be commissioned only with the manual adjuster pre-set or with a correctly mounted actuator.

Disposal



The valve must be dismantled and separated into its various constituent materials before disposal.

Observe all local and applicable laws.

Warranty

The technical data supplied for these valves is valid only for valves used in conjunction with the actuators described under «Equipment combinations».

Use with third-party actuators invalidates any warranty offered by Siemens Building Technologies / HVAC Products.

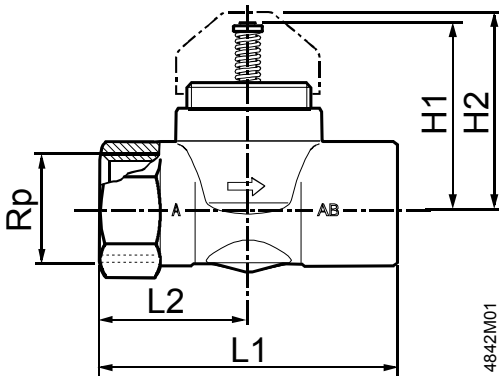
Technical data

Operating data	PN class	PN16 to EN1333
	Valve characteristic	The trim is designed for ON/OFF control only
	Leakage	According to DIN EN 1349
	2-port valve:	
	Path A → AB	0...0.05 % of k_{vs}
	3-port valve	
	Path AB – A	0...0.05 % of k_{vs}
	Bypass AB – B	Max. 2...5 % of k_{vs}
	Admissible media	Chilled water, low-temperature hot water and water with frost protection additives. Recommendation: Water should be treated as specified in VDI 2035
	Temperature of medium	1...110 °C, or max. 120 °C for brief periods
Admissible operating pressure	1600 kPa (16 bar)	
Nominal stroke	2.5 mm	
Materials	Valve body	Hot-pressed brass (EN1982)
	Stem	Stainless steel
	Plug, seat, gland	Brass
	Stem seal	EPDM O-rings (max. 150 °C)
Dimensions / Weight	Dimensions	See «Dimensions»
	Threaded connections	Rp to ISO7/1 (internal thread)
	Actuator connection	M30 x 1.5
	Weight	See «Dimensions»

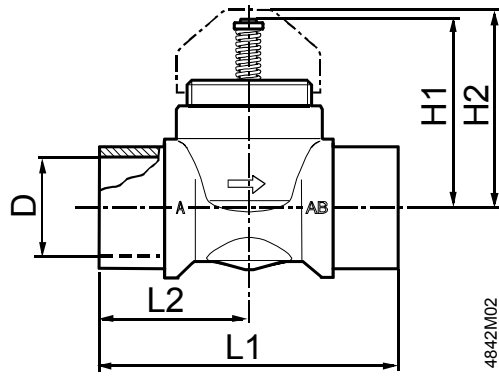
Dimensions

2-port valves

VVI46...

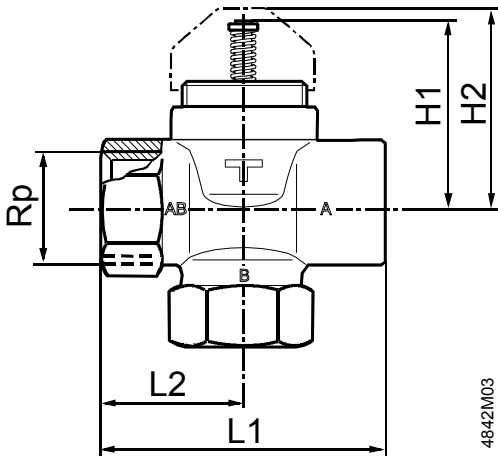


VVS46...

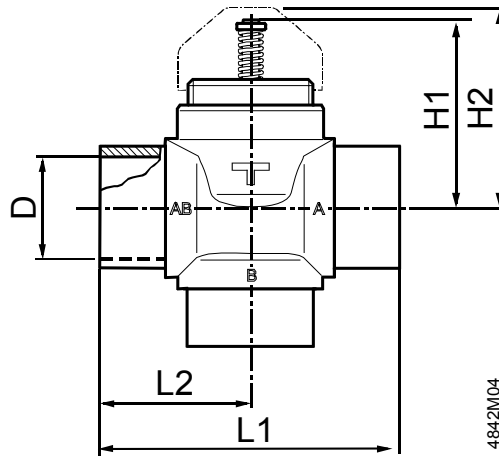


3-port valves

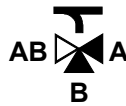
VXI46...



VXS46...



Valve type	DN	Rp [ins]	D ¹⁾		H1 [mm]	H2 [mm]	L1 [mm]	L2 [mm]	Weight [kg]
			[mm]	[ins]					
VVI46.15	15	Rp $\frac{1}{2}$			45.2	48	60	30	0.28
VVI46.20	20	Rp $\frac{3}{4}$			45.2	48	65	32.5	0.31
VVI46.25	25	Rp1			45.2	48	84	42	0.52
VVS46.15	15		16,0	$\frac{5}{8}$	45.2	48	66	33	0.27
VVS46.20	20		22,37	$\frac{7}{8}$	45.2	48	70	35	0.32
VVS46.25	25		28,75	$1\frac{1}{8}$	45.2	48	89	44.5	0.48



Valve type	DN	Rp [ins]	D ¹⁾		H1 [mm]	H2 [mm]	L1 [mm]	L2 [mm]	Weight [kg]
			[mm]	[ins]					
VXI46.15	15	Rp $\frac{1}{2}$			45.2	48	60	30	0.34
VXI46.20	20	Rp $\frac{3}{4}$			45.2	48	65	32.5	0.38
VXI46.25	25	Rp1			45.2	48	84	42	0.63
VXS46.15	15		16,0	$\frac{5}{8}$	45.2	48	66	33	0.32
VXS46.20	20		22,37	$\frac{7}{8}$	45.2	48	70	35	0.39
VXS46.25	25		28,75	$1\frac{1}{8}$	45.2	48	89	44.5	0.56

¹⁾ For seamless, round copper tubes according to DIN EN 1057

