SIEMENS

4842

Two-port valves
VVI46.15 to VVI46.25

Three-port valves
VXI46.15 to VXI46.25

Two-port valves
VVS46.15 to VVS46.25

Three-port valves
VXS46.15 to VXS46.25

acvatix

Two-port and three-port zone valves, PN16

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

- **Hot-pressed brass valve body**
- **DN15, DN20 and DN25**
- **k_{vs} 2 to 5 m^3/h**
- **Internally threaded connections, Rp… to ISO 7/1 (V…146…) or solder connections (V...S46…)**
- **Manual adjuster**
- **Can be fitted with motorized actuators, SFA... and SSA… , or thermic actuators, type STA…**

Application

- 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.
  - Two-pipe systems with one heat exchanger for heating and cooling
  - Four-pipe systems with two separate heat exchangers for heating and cooling
- In closed-circuit zone heating systems, e.g. for:
  - Separate floors in a building
  - Apartments
  - Individual rooms

Types

VVI46... Two-port	VXI46... Three-port	DN	Connections	k_{vs} A → AB [1)] [m³/h]	k_{vs} AB → A [2)] [m³/h]	k_{vs} AB → B [2)] [m³/h]	Δp_{vmax} [kPa]
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	

1) Two-port valves
2) Three-port valves
3) Where Δp_{vmax} is above 100 kPa, there is an increased risk of noise and erosion on the seat and plug

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

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

Ordering

When ordering, please specify the quantity, product name and type code.
The type SFA…, SSA… and STA… actuators must be ordered separately.

Example **1 three-port zone valve, type VXI46.15**

Delivery

The valves and actuators are delivered in separate packaging.

Compatibility

Valves	Motoric actuators SFA...		SSA...		Thermal actuators STA...	
	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]
VVI46.15 ... 20	100	300	100	150	100	150
VVI46.25		200				
VVS46.15 ... 20		300				
VVS46.25		200				
VXI46.15 ... 25						
VXS46.15 ... 25						
Data sheet	**4863**		**4893**		**4877**	

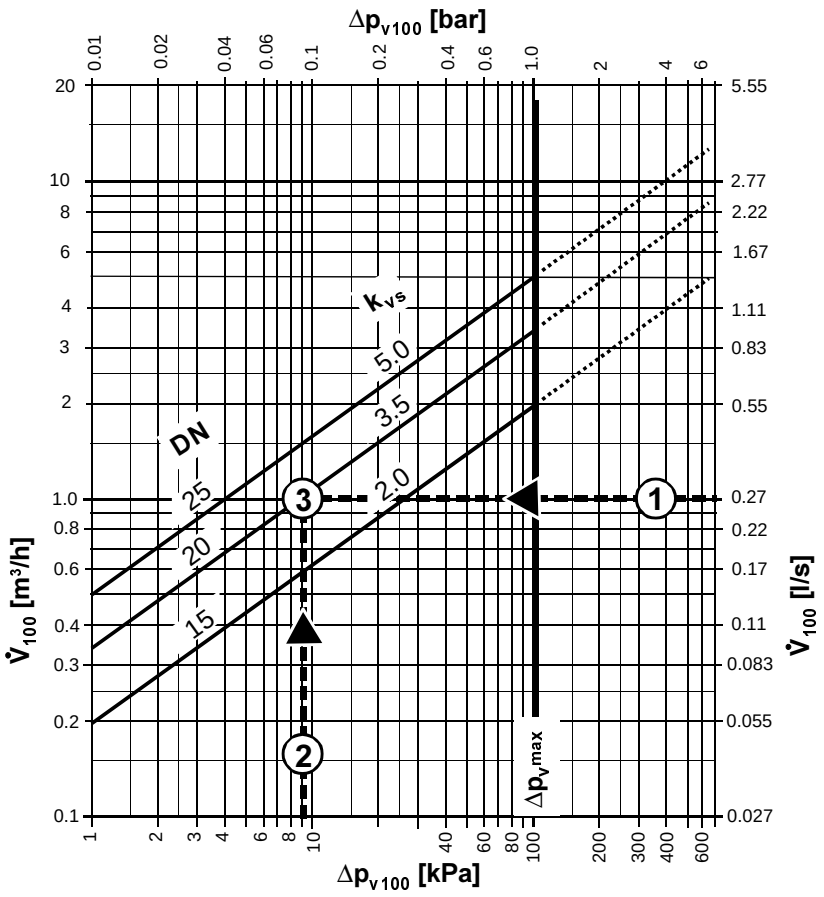
Δp_{max} = Maximum permissible differential pressure across the valve's control path, valid for the entire actuating range of the motorized valve

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			
SSA31...		AC 230 V	3-position	150 s	
SSA81...		AC 24 V			
SSA61...		AC/DC 24 V	DC 0 ...10 V	34 s	
STA21...	Thermal	AC 230 V	2-position	180 s	
STA71...		AC 24 V			

Valve sizing



Example:

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

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

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

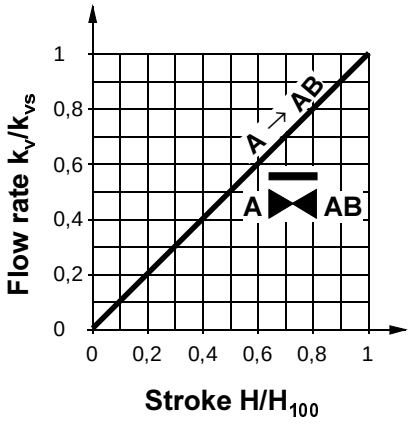
Δp_{vmax} = Maximum permissible differential pressure across the valve's control path, based on the given design concept, valid for the entire stroke

100 kPa = 1 bar ≈ 10 mWG

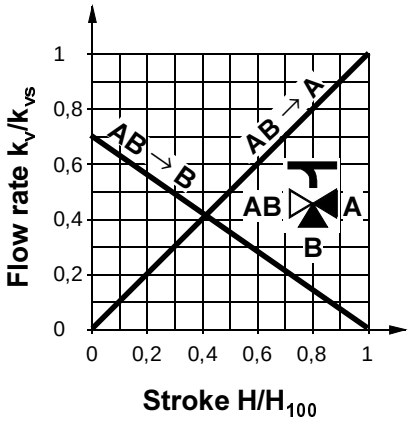
1 m^3/h = 0.278 l/s water at 20 °C

Valve characteristics

Two-port valves, VV…46...



Three-port valves, VX...46...



The k_{vs} values in **Bypass B** of the three-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.

Design

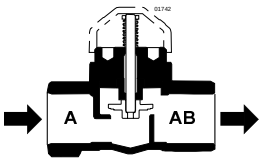
- Disc throttling element
- Seat ring embedded in through-port
- Seat machined into through-port and bypass
- Reservoir for continuous lubrication of sealing rings
- Return spring

Engineering notes

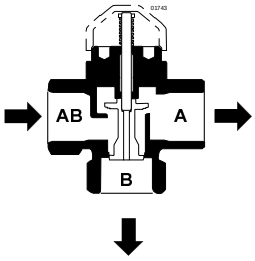
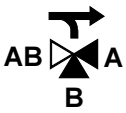
See also «Mounting» and «Commissioning».

The valves should preferably be installed in the flow.

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
Two-port valves 	VV...46... 	Variable	Variable	A → AB Valve closes	A → AB Valve opens

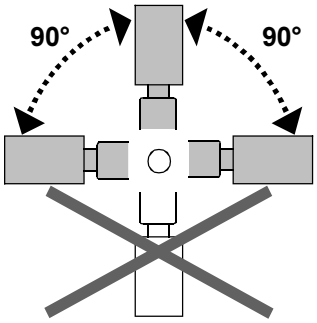
Warning **The direction of flow MUST be as indicated by the arrow, from A →AB.**

Valve construction	Valve series	Valve flow in control mode			Valve stem	
		Inlet AB	Outlet A	Outlet B	Retracted	Extended
Three-port valves 	VX...46... 	Constant	Variable	Variable	AB → A Valve closes AB → B Valve opens	AB → A Valve opens AB → B Valve closes

Warning **The direction of flow MUST be as indicated by the arrow, from AB → A or AB → B.**
The three-port valves VXI46... and VXS46... are used primarily in diverting applications.

Mounting

Orientation

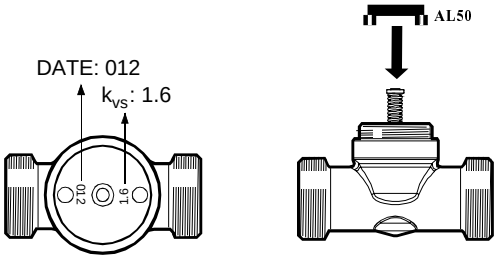


The specified direction of flow must be observed in all cases (see also «Engineering notes»).
The valves are delivered in a multiple pack. Mounting instructions 74 319 0300 0 are enclosed with the packaging.
The valve and actuator are easily assembled directly on site. There is no need for special tools 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

The **straight-through path A → AB** (for two-port vales) or **AB → A** (three-port valves) can be closed manually with the manual adjustment button.
With three-port valves, this method can be used to open bypass B to 70 %. In the straight-through control path, the valves are opened by a return spring.

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, dis-connect 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.

Warranty

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

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	
	Two-port valve:	
	Path A → AB	Linear
	Three-port valve	
	Path AB → A	Linear
	Bypass AB → B	Linear
	Leakage	
	Two-port valve:	
	Path A → AB	0…0.05 % of k_{vs}
	Three-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
	Rangeability S_v	> 10 as in VDI 2173
	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» (table)
	Threaded connections	Rp to ISO7/1 (internal thread)
	Actuator connection	M30 x 1.5
	Weight	See «Dimensions» (table)

S_v = Rangeability k_{vs} / k_{vr}

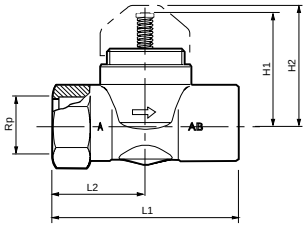
k_{vs} = Nominal flow rate of cold water (5 to 30 °C) through the fully open valve (H_{100}), by a differential pressure of 100 kPa (1 bar)

k_{vr} = The smallest k_v value, at which the flow-characteristic tolerances can still be maintained by a differential pressure of 100 kPa (1 bar)

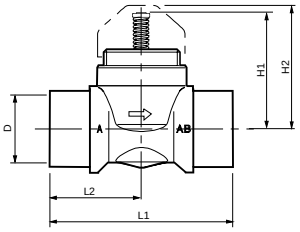
Dimensions

Two-port valves

VVI46...

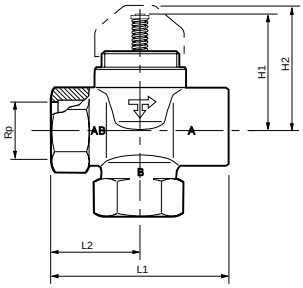


VVS46...

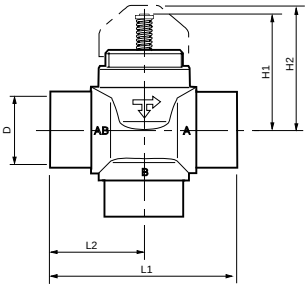


Three-port valves

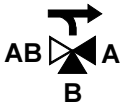
VXI46...



VXS46...



Valve type	DN	Rp [ins]	D [mm]	H1 [mm]	H2 [mm]	L1 [mm]	L2 [mm]	Weight [kg]
VVI46.15	15	Rp½		45.2	48	60	30	0.28
VVI46.20	20	Rp¾		45.2	48	65	32.5	0.31
VVI46.25	25	Rp1		45.2	48	84	42	0.52
VVS46.15	15		15	45.2	48	66	33	0.27
VVS46.20	20		22	45.2	48	70	35	0.32
VVS46.25	25		28	45.2	48	89	44.5	0.48



Valve type	DN	Rp [ins]	D [mm]	H1 [mm]	H2 [mm]	L1 [mm]	L2 [mm]	Weight [kg]
VXI46.15	15	Rp½		45.2	48	60	30	0.34
VXI46.20	20	Rp¾		45.2	48	65	32.5	0.38
VXI46.25	25	Rp1		45.2	48	84	42	0.63
VXS46.15	15		15	45.2	48	66	33	0.32
VXS46.20	20		22	45.2	48	70	35	0.39
VXS46.25	25		28	45.2	48	89	44.5	0.56