



2-port zone valves



3-port zone valves

ACVATIX™

2-port and 3-port zone valves, PN16

VVI46../1
VXI46../1




With on/off characteristics

- Hot-pressed brass valve body (EN1982)
- DN 15, DN 20 and DN 25
- k_{vs} 2...5 m³/h
- Internally threaded connections Rp to ISO 7-1
- Manual adjuster
- Can be fitted with electromotoric actuators, type SFA.. or SUA21/1 and electrothermal actuators 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

Type	Stock number	DN	Connections	PN class	k_{vs}  A → AB [m ³ /h]	
VVI46.15/1	S55249-V100	15	Internally threaded Rp	16	2.0	
VVI46.20/1	S55249-V101	20			3.5	
VVI46.25/1	S55249-V102	25			5.0	
Type	Stock number	DN	Connections	PN class	$k_{vs}^{1)}$  AB → A [m ³ /h]	$k_{vs}^{1)}$  AB → B [m ³ /h]
VXI46.15/1	S55249-V103	15	Internally threaded Rp	16	2.0	1.4
VXI46.20/1	S55249-V104	20			3.5	2.45
VXI46.25/1	S55249-V105	25			5.0	3.5

¹⁾ 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.

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)

Ordering

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

Product number	Stock number	Description	Quantity
Example: VXI46.15/1	S55249-V100	3-port zone valve	1

Delivery The valves and actuators are delivered in separate packaging.
The type SUA21/1, SFA.. and STA.. actuator must be ordered separately.

Rev. no. See revision number overview, page 7.

Equipment combinations

Valves	Electromotoric actuators				Electrothermal actuators		
	SFA..		SUA21/1		STA..		
	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	
VVI46.15/1...20/1	300	300	300	300	200	200	
VVI46.25/1			250	250			
VXI46.15/1...20/1		300	300	300			300
VXI46.25/1							

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)
For noiseless operation, the value of 100 kPa should not be exceeded.

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

Actuator overview

Actuator	Operating voltage	Positioning signal	Positioning time	Positioning force	Data sheet
Electromotoric					
SFA21/18	AC 230 V	2- position	10 s	200 N	N4863
SFA71/18	AC 24 V				
SUA21/1	AC 230 V	3 wire on/off (SPST) ¹⁾	10 s	150 N	N4830
Thermal					
STA23	AC 230 V	2- position, PDM ²⁾	210 s	100 N	N4884
STA73	AC / DC 24 V		270 s		
STA63	AC 24 V	DC 0...10 V	270 s ³⁾		

1) SPST = single pole, single throw

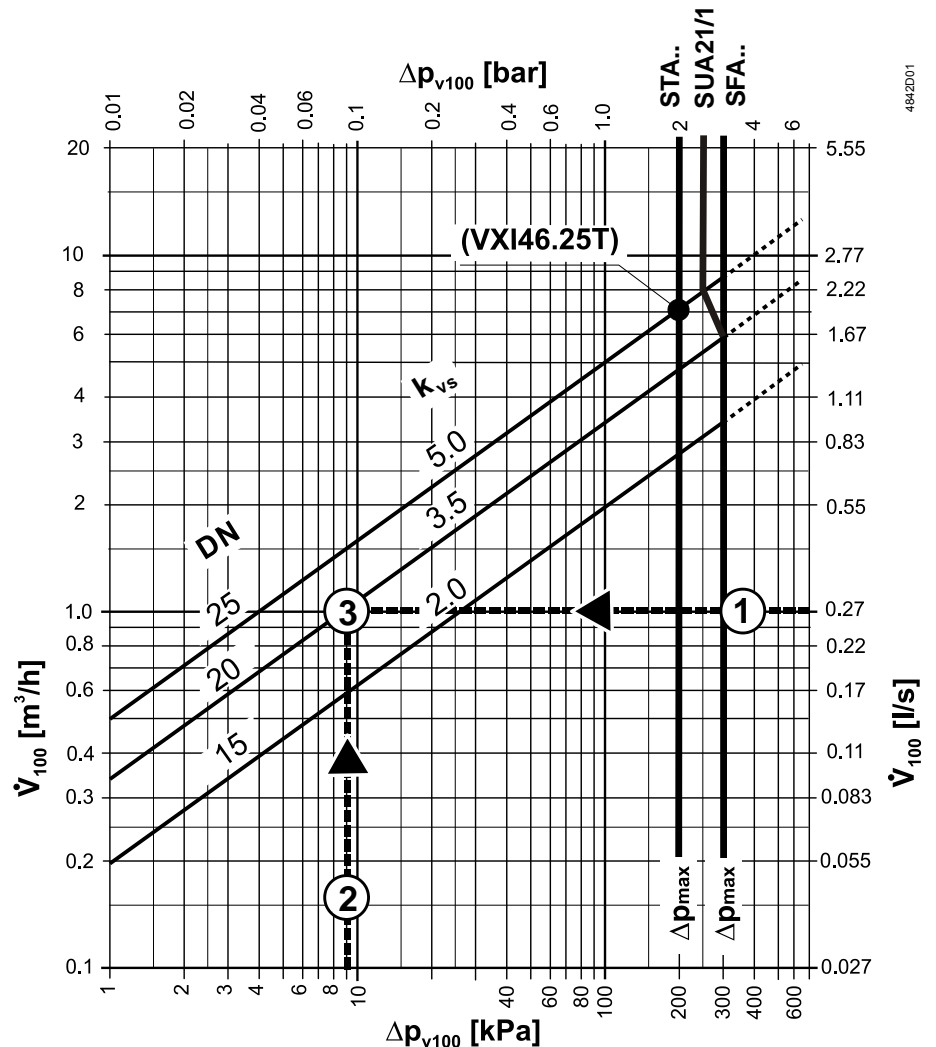
2) PDM = Pulsdurationmodulation

3) refer to data sheet N4880 for details

Technical design / 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 (to open position)

Sizing



Example:

1 $\dot{V}_{100} = 0.27$ l/s

2 $\Delta p_{V100} = 9$ 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) by a volume flow \dot{V}_{100}

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

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

100 kPa = 1 bar ≈ 10 mWC

1 m³/h = 0.278 l/s water at 20 °C

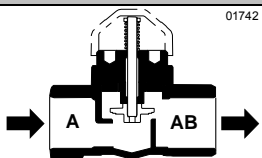

Engineering notes



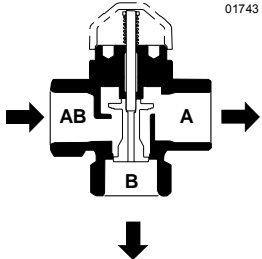

See also «Mounting notes» and «Commissioning notes».

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 2-port valves	Valve series	Valve flow in control mode		Valve stem	
		Inlet A	Outlet AB	Retracted	Extended
	VVI46../1 	variable	variable	A → AB closes	A → AB opens

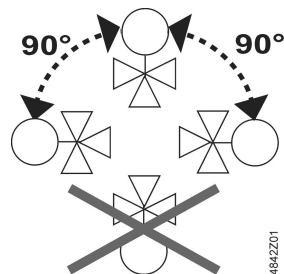
Warning! The direction of flow **MUST** be as indicated by the arrow, from A → AB.

Valve construction 3-port diverting valves	Valve series	Valve flow in control mode			Valve stem	
		Port AB	Port A	Port B	Retracted	Extended
	VXI46../1 	Inlet: constant	Outlet: variable	Outlet: variable	AB → A closes AB → B opens	AB → A opens AB → B closes

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

Mounting notes

Orientation

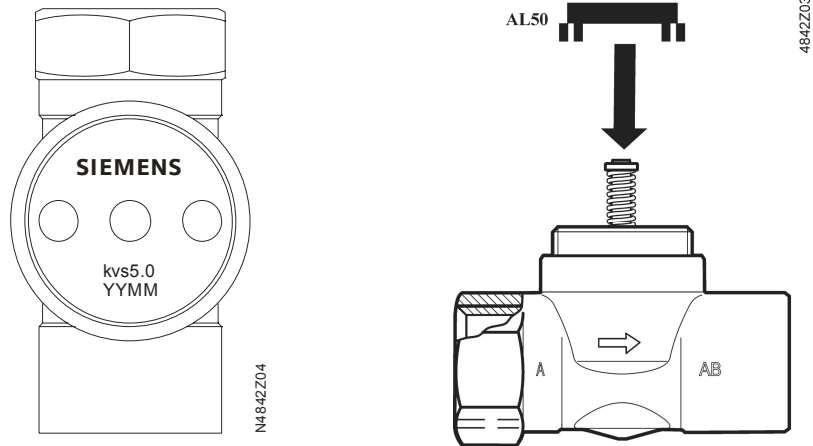


The specified direction of flow must be observed in all cases (see also «Engineering notes»).

The Mounting Instructions 74 319 0717 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.

The AL50 supporting ring must be put into position before mounting the actuator SFA.. on to the valve.



Commissioning notes

Manual adjustment

In the straight-through control path A → AB, respectively AB → A 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%.

Maintenance notes

V..I46../1 valves require no maintenance.

Caution

When doing service work on the valve/actuator:

- Deactivate the pump and turn off the power supply
- Close the shutoff valves
- Fully reduce the pressure in the piping system and allow pipes to completely cool down

If necessary, disconnect the electrical wires.

Before putting the valve into operation again, make sure the manual knob or the actuator is correctly fitted.

Stem sealing gland

The stem sealing gland cannot be exchanged. In the case of leakage, the entire valve must be replaced. Contact your local office or branch.

Disposal

Do not dispose of the device as household waste.

Warning

Due to the tensioned spring return, valve disassembly may result in flying parts causing possible injury.

Only authorized staff may disassemble valves with tensioned spring return!

Disposal

- Special handling of individual components may be mandated by law or make ecological sense.
- Observe all local and currently applicable laws and regulations.

Warranty

The technical data given for these applications is valid only in conjunction with the Siemens actuators as detailed under «Equipment combinations», page 2.

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

Technical data

Functional data	PN class	PN 16 to EN 1333
	Permissible operating pressure	1600 kPa (16 bar)
	Valve characteristic	The valves are designed for ON/OFF control only, however they can be operated by modulating DC 0...10 V thermal actuators too.
	Leakage rate	To DIN EN 1349
	2-port valve: Path A → AB	0...0.05% of k_{VS} -value
	3-port valve: Path AB → A	0...0.05% of k_{VS} -value
	Bypass AB → B	Max. 2...5% of k_{VS} -value
	Permissible media	Chilled water, low-temperature hot water and water with antifreeze; Recommendation: water treatment to VDI 2035
	Medium temperature	1...110 °C, short-term max. 120 °C
	Nominal stroke	2.5 mm
Materials	Valve body	Hot-pressed brass (EN1982)
	Stem	Stainless steel
	Plug, seat, gland	Brass
	Sealing gland	EPDM-O-rings
	Dimensions / Weight	Dimensions
Threaded connections		Rp to ISO 7-1 (internally threaded)
Actuator connection		M30 x 1.5
Weight		Refer to «Dimensions»
Standards, directives and approvals		Pressure Equipment Directive
	Pressure Accessories	Scope: Article 1, section 1 Definitions: Article 2, section 5
	Fluid group 2	without CE-marking as per article 4, section 3 (sound engineering practice) ¹⁾
	EAC Conformity	Eurasia Conformity
	Environmental compatibility	The product environmental declaration CB1E4842en ²⁾ contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).

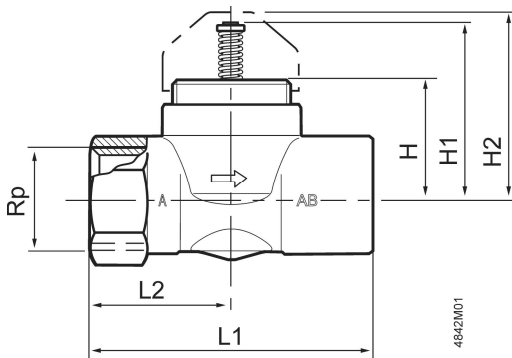
¹⁾ Valves where $PS \times DN < 1000$, do not require special testing and cannot carry the CE label.

²⁾ The documents can be downloaded from <http://siemens.com/bt/download>.

Dimensions

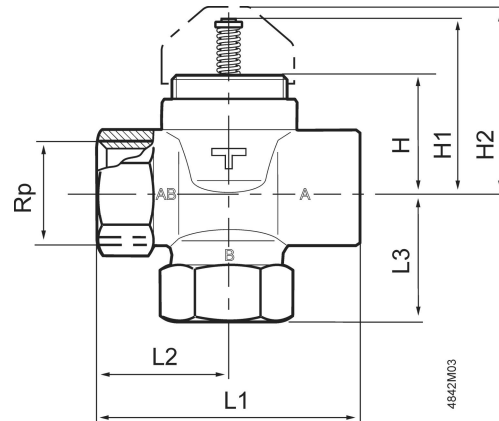
2-port valves


VVI46../1

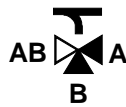



3-port valves

VXI46../1



Valve type	DN	Rp [inch]	H [mm]	H1 [mm]	H2 [mm]	L1 [mm]	L2 [mm]	 [kg]
VVI46.15/1	15	Rp ½	31	45.2	48	60	30	0.28
VVI46.20/1	20	Rp ¾	31	45.2	48	65	32.5	0.31
VVI46.25/1	25	Rp 1	31	45.2	48	84	42	0.52



Valve type	DN	Rp [inch]	H [mm]	H1 [mm]	H2 [mm]	L1 [mm]	L2 [mm]	L3 [mm]	 [kg]
VXI46.15/1	15	Rp ½	31	45.2	48	60	30	30	0.34
VXI46.20/1	20	Rp ¾	31	45.2	48	65	32.5	32.5	0.38
VXI46.25/1	25	Rp 1	31	45.2	48	84	42	40	0.63

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

Revision number overview

Type	Valid from rev. no.	Type	Valid from rev. no.
VVI46.15/1	..A	VXI46.15/1	..A
VVI46.20/1	..A	VXI46.20/1	..A
VVI46.25/1	..A	VXI46.25/1	..A

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