



2-port zone valves



3-port zone valves

2-port and 3-port zone valves, PN16

With on/off characteristics

VVI46../2
VXI46../2

- Hot-pressed brass valve body
- DN 15, DN 20 and DN 25
- k_{vs} 2...5 m³/h
- Internally threaded connections Rp to ISO 7-1
- Combined with electromotoric actuators, type SUA.., SSA31.04, SFA.., 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, for example:
 - Separate floors in a building
 - Apartments
 - Individual rooms

Type summary

Type	Stock number	DN	Connections	PN class	k_{vs}  A → AB [m³/h]	
VVI46.15/2	S55249-V106	15	Internally threaded Rp	16	2.15	
VVI46.20/2	S55249-V107	20			3.5	
VVI46.25/2	S55249-V108	25			5.0	
Type	Stock number	DN	Connections	PN class	$k_{vs}^{1)}$  AB → A [m³/h]	$k_{vs}^{1)}$  AB → B [m³/h]
VXI46.15/2	S55249-V109	15	Internally threaded Rp	16	2.15	1.5
VXI46.20/2	S55249-V110	20			3.5	2.5
VXI46.25/2	S55249-V111	25			5.0	3.5
VXI46.25T/2	S55249-V112	25			5.5	4.5

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 number.

Example

Product number	Stock number	Product name	Quantity
VXI46.15/2	S55249-V109	3-port zone valve, PN16 DN15, kvs 2.15	1

Delivery

The valves and actuators are delivered in separate packaging. The actuator SUA21/3, SSA31.04, SFA.., STA.. must be ordered separately.

The AL50 supporting ring (necessary for combination with SFA.. or SUA..) is included in the delivery of V..I46...

Rev. no.

See *Revision number overview* on page 10.

Valves	Motoric actuators							
	SUA21/3		SSA31.04		SFA..		STA..	
	$\Delta p_{\max}$ [kPa]	Δp_s [kPa]	$\Delta p_{\max}$ [kPa]	Δp_s [kPa]	$\Delta p_{\max}$ [kPa]	Δp_s [kPa]	$\Delta p_{\max}$ [kPa]	Δp_s [kPa]
VVI46.15/2...20/2	400	400	300	300	300	300	200	200
VVI46.25/2	250	250	230	230	250	250	150	150
VXI46.15/2...20/2	400	-	300	-	300	-	200	-
VXI46.25/2	250	-	230	-	250	-	150	-
VXI46.25T/2¹⁾	200	-	-	-	200	-	140	-

$\Delta p_{\max}$ = 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)

¹⁾ $\Delta p_{\max}$ (AB-B) is 50 kPa for **VXI46.25T/2**

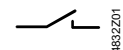
Actuator overview

Actuator	Operating voltage	Positioning		Positioning force	Datasheet
		signal	time		
SUA21/3	AC 230 V	3-wire on/off (SPST ¹⁾)	10 s	170 N	A6V10446174
SSA31.04²⁾	AC 230 V	3-position or SPDT	43 s	160 N	N4860
SFA21/18	AC 230 V	2-position	10 s	200 N	N4863
SFA71/18	AC 24 V				
STA321.65L10	AC 230 V	2-position	270 s	125 N	A6V14028280
STA161.65L10	AC 24 V	0...10 V	270 s ³⁾		
STA121.65L10	AC/DC 24 V	2-position/PDM	270 s		

¹⁾ SPST = single pole, single throw

²⁾ SSA31.04 could not be used with VVI46.25T/2

³⁾ In control mode (warm-up time) min. running time approx. 30 s/mm

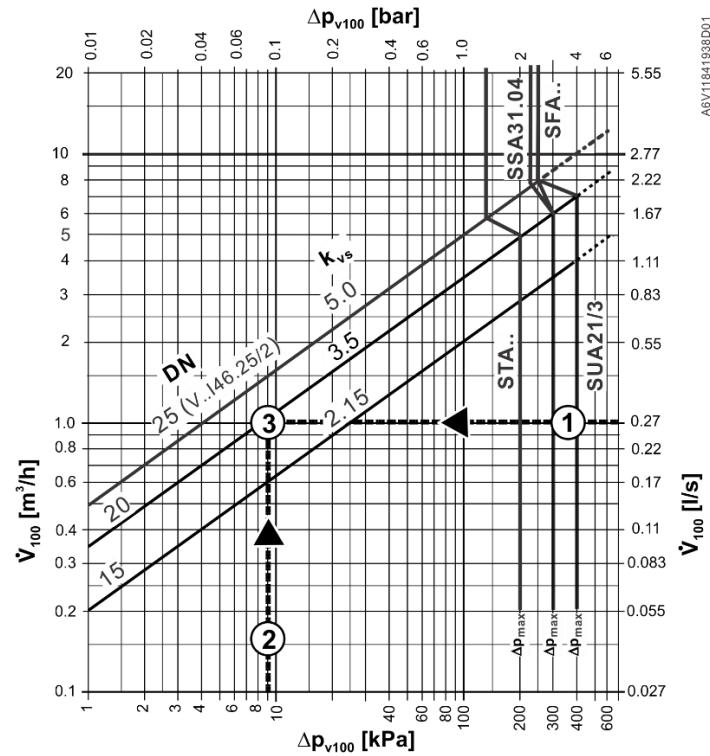


Technical design / mechanical design

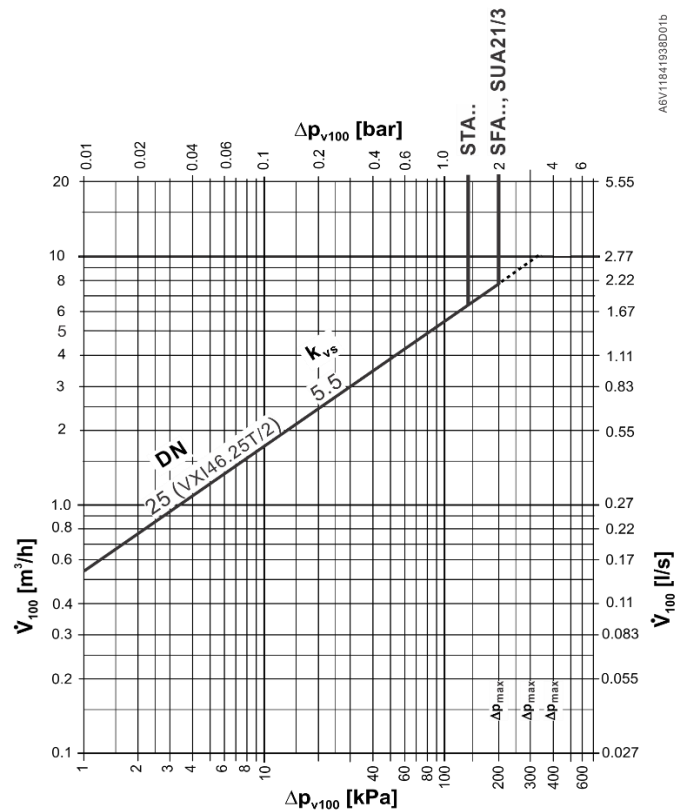
- Disc throttling element
- Seat ring embedded in through-port
- Seat machined into through-port and bypass
- Reservoir for continuous lubrication of sealing rings
- Return spring (to open position)

Example:

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



A6V11841938D01



A6V11841938D01b

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 $\approx$ 10 mWC

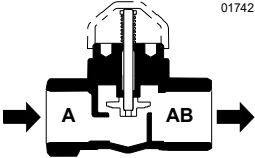
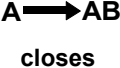
1 m^3/h = 0.278 l/s water at 20 °C

Refer to *Mounting notes* and *Commissioning notes*.

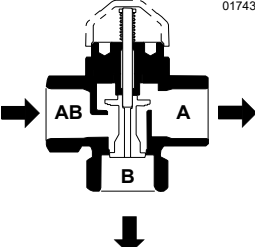
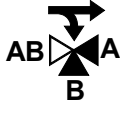
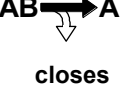
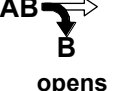
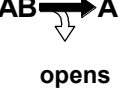
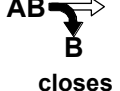


It is NOT allowed to put a shut off at the bypass port B.

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

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

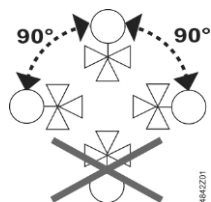
Warning The direction of flow **MUST** be as indicated by the arrow, from A → AB.

Valve construction	Valve series	Valve flow in control mode			Valve stem	
		Port AB	Port A	Port B	Retracted	Extended
3-port diverting valves 	VXI46../2 	Inlet: constant	Outlet: variable	Outlet: variable	 closes  opens	 opens  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 (refer to *Engineering notes*).

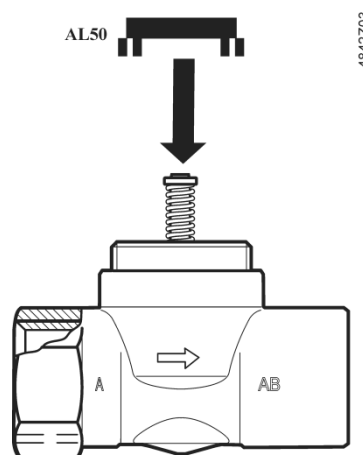
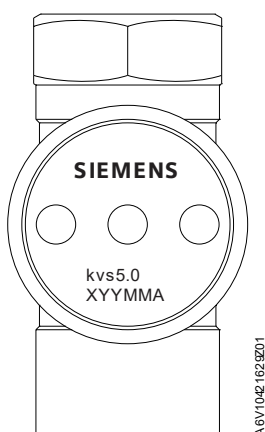
The mounting instructions 74 123 0114 0 B are enclosed with the packaging.

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

AL50 supporting ring

The AL50¹⁾ supporting ring must be put into position before mounting the actuator SFA.. and SUA.. onto the valve.

¹⁾ Included in delivery



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 %. (exception: VXI46.25T/2)

Maintenance notes

Caution



V..I46../2 valves require no maintenance.

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



- Before disposal, the valve must be dismantled and separated into its various constituent materials.
- Legislation may demand special handling of certain components, or it may be sensible from an ecological point of view.
- Please observe current local legislation.

Warranty

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

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

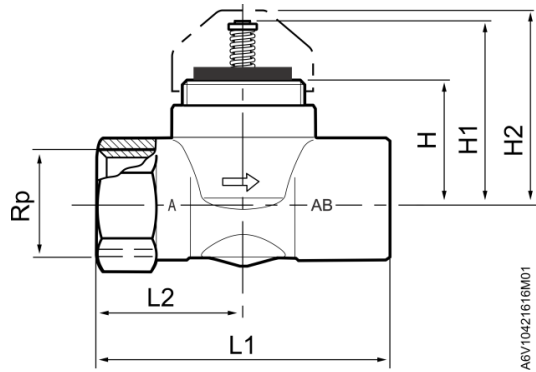
Technical data

Functional data	PN class	PN 16 to EN 12266-1
	Permissible operating pressure	1600 kPa (16 bar)
	Valve characteristic	The valves are for ON/OFF control, but also can be operated by modulating DC 0...10 V and 3-position actuators.
	Leakage rate 2-port valve: Path A → AB 3-port valve: Path AB → A Bypass AB → B Bypass A → B VXI46.25T/2	To DIN EN 1349 0...0.05 % 0...0.05 % Max. 2...5 % 0...0.05 %
	Permissible media	Chilled water, low-temperature hot water and water with antifreeze; Recommendation: water treatment to VDI 2035
	Medium temperature	1...110 °C
	Nominal stroke	2.5 mm
Standards	Environmental compatibility	ISO 14001 (environment) ISO 9001 (Quality) 2011/65/EC (RoHS)
Materials	Valve body	Hot-pressed brass (Exception: VXI46.25T/2) Casting Bronze (VXI46.25T/2)
	Stem	Stainless steel
	Plug, seat, gland	Brass
	Sealing gland	EPDM-O-rings
	Bonnet	Brass
Dimensions/Weight	Dimensions	Refer to <i>Dimensions</i>
	Threaded connections	Rp to ISO 7-1 (internally threaded)
	Actuator connection	M30 x 1.5
	Weight	Refer to <i>Dimensions</i>

Dimensions

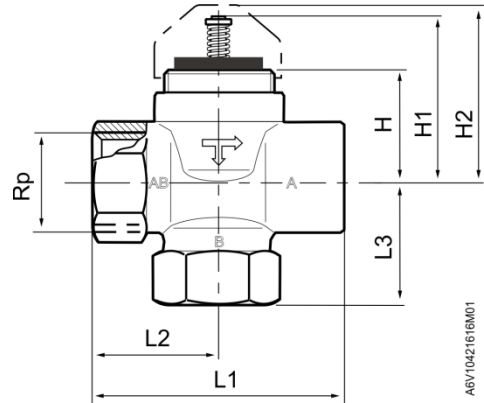
2-port valves

VVI46../2

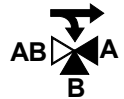


3-port valves

VXI46../2



Valve type	DN	Rp [inch]	H [mm]	H1 [mm]	H2 [mm]	L1 [mm]	L2 [mm]	 [kg]
VVI46.15/2	15	Rp 1/2	31	45.2	48	60	30	0.27
VVI46.20/2	20	Rp 3/4	31	45.2	48	65	32.5	0.30
VVI46.25/2	25	Rp 1	31	45.2	48	84	45	0.54



Valve type	DN	Rp [inch]	H [mm]	H1 [mm]	H2 [mm]	L1 [mm]	L2 [mm]	L3 [mm]	 [kg]
VXI46.15/2	15	Rp 1/2	31	45.2	48	60	30	30	0.33
VXI46.20/2	20	Rp 3/4	31	45.2	48	65	32.5	32.5	0.37
VXI46.25/2	25	Rp 1	31	45.2	48	84	45	40	0.65
VXI46.25T/2	25	Rp 1	31	45.2	48	84	42	40	0.69

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

Spare parts

Type	Stock-No.	Description	Number
AL50	AL50 ¹⁾	Supporting ring	40

¹⁾ Multipack of 40 pieces

Revision number overview

Type	Valid from rev. no.	Type	Valid from rev. no.
VVI46.15/2	..A	VXI46.15/2	..A
VVI46.20/2	..A	VXI46.20/2	..A
VVI46.25/2	..A	VXI46.25/2	..A
		VXI46.25T/2	..A

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