2-port valves
VVP47.10-0.25 to VVP47.20-4.0

3-port valves
VXP47.10-0.25 to VXVP47.20-4.0

3-port valves with T-bypass
VMP47.10-0.25 to VMP47.15-2.5

acvatix

2-port and 3-port terminal unit valves, PN16

VVP47...
VXP47...
VMP47...

- **Bronze valve body CC491K (Rg5)**
- **DN10, DN15 and DN20**
- **k_{vs} 0.25…4 m^3/h**
- **Flat-sealing connections with external thread G…B to ISO 228/1 for:**
  - **Type ALG… screwed fittings (threaded connection) available from Siemens**
  - **SERTO SO21… compression fittings (any specialist supplier)**
  - **Screwed fittings for solder connections (any specialist supplier)**
- **Manual adjuster**
- **Can be fitted with type SSP... motorized actuators or type STP… thermal actuators**

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

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Types

VVP47... 2-port	VXP47... 3-port	VMP47... 3-port with T-bypass	DN	k_{vs} A → AB [m^3/h]	k_{vs} [1)] B → AB [m^3/h]	Dp_{vmax} [2)] [kPa]
VVP47.10-0.25	**VXP47.10-0.25**	**VMP47.10-0.25**	10	0.25	0.18	100
VVP47.10-0.4	**VXP47.10-0.4**	**VMP47.10-0.4**		0.40	0.28	
VVP47.10-0.63	**VXP47.10-0.63**	**VMP47.10-0.63**		0.63	0.44	
VVP47.10-1	**VXP47.10-1**	**VMP47.10-1**		1.00	0.70	
VVP47.10-1.6	**VXP47.10-1.6**	**VMP47.10-1.6**		1.60	1.12	
VVP47.15-2.5	**VXP47.15-2.5**	**VMP47.15-2.5**	15	2.50	1.75	
VVP47.20-4	**VXP47.20-4**		20	4.00	2.80	40

[1)] Applies only to 3-port version

[2)] 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 opened valve (H_{100}) at a differential pressure of 100kPa (1bar).

Δp_{vmax} = Maximum admissible pressure differential across the control path of the valve (depending on construction) valid for the entire stroke range

Accessories

Screwed fittings: see «Dimensions» on page 7.

Ordering

When ordering, please specify the quantity, product name and type code, plus the quantity of ALG… screwed fittings required, if any. The ALG…screwed fittings (Siemens) and the type SSP… and STP… actuators must be ordered as separate items.

Example

1 3-port valve with T-bypass, type VMP47.10-1, and
4 sets ALG13 screwed fittings

Delivery

The valves, actuators and screwed fittings are packed separately.

Compatibility

Valves	SSP… motorized actuators		STP… thermal actuators	
	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]
VVP47.10-0.25 ... 1.6	100	100	100	100
VVP47.15-2.5				
VVP47.20-4	40	40	40	40
VXP47.10-0.25 ... 1.6	100		100	
VXP47.15-2.5				
VXP47.20-4	40		40	
VMP47.10-0.25 ... 1.6	100		100	
VMP47.15-2.5				
Datenblatt	**4864**		**4878**	

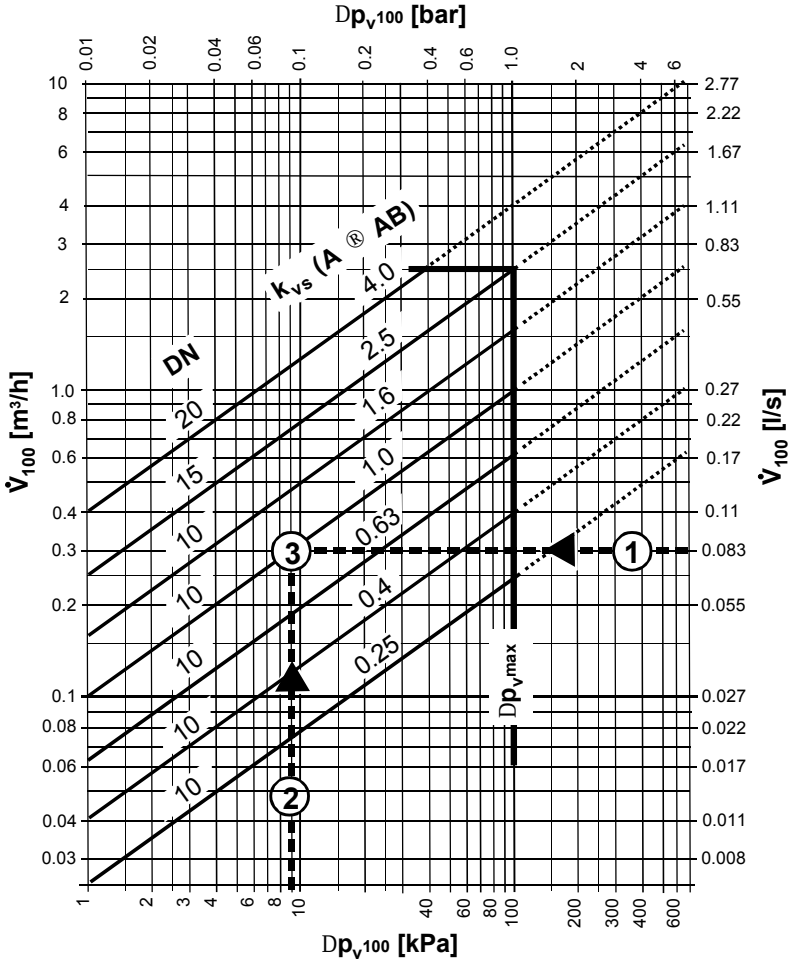
Δp_{max} = Maximum admissible pressure differential across the control path of the valve for the entire actuating range of the motorized valve

Δp_s = Maximum admissible pressure differential (closing pressure) at which the motorized valve will close reliably against the pressure

Overview of actuators

Actuator	Type of actuator	Operating voltage	Positioning signal	Positioning time	Positioning force
SSP31...	Motorized	AC 230 V	3-position	150 s	100 N
SSP81...		AC 24 V			
SSP81.04				43 s	
SSP61...		AC/DC 24 V	DC 0 ...10 V	34 s	
STP21...	Thermal	AC 230 V	2-position	180 s	105 N
STP71...		AC 24 V			

Sizing



Example:

1 $\dot{V}_{100}$ = 0.0 83 l/s

2 Δp_{v100} = 9 kPa

3 k_{vs} value = 1.0 m^3/h

Δp_{v100} = Pressure differential across the fully open valve and control path A → AB at a flow rate of $\dot{V}_{100}$

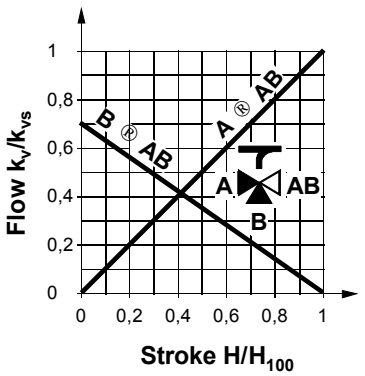
$\dot{V}_{100}$ = Flow rate across the fully open valve (H_{100})

Δp_{vmax} = Maximum admissible pressure differential across the control path of the valve (depending on construction) valid for the entire stroke range

100 kPa = 1 bar ≈ 10 mWG

1 m^3/h = 0.278 l/s water at 20 °C

Valve characteristics



With valve types VXP47.../VMP47..., the k_{vs} values in **bypass B** represent only 70% of the k_{vs} value in the **straight-through control path, A ® AB.**
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.

Mechanical design

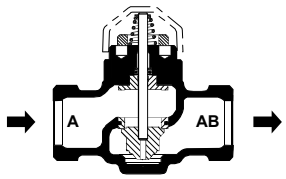
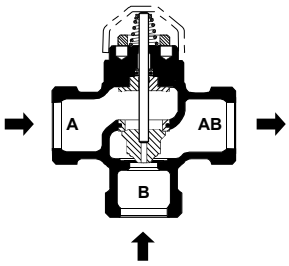
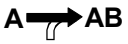
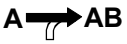
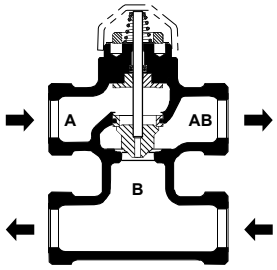
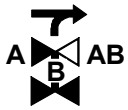
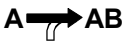
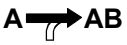
- Combined disc/plug flow restrictor
- Seat ring embedded in through-port A → AB
- Seat machined into bypass B → AB.
- Continuously lubricated sealing rings
- Conical return springs, for more compact valve construction

Engineering notes

See also «Mounting» and «Commissioning».

The valves should preferably be installed in the return, where the spindle seal will be exposed to lower temperatures.

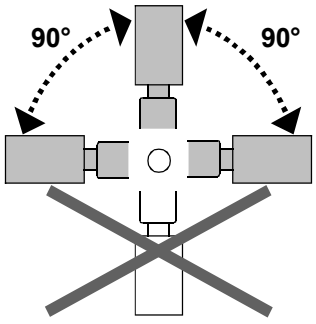
Recommendation: **A strainer should be fitted upstream of the valve. This increases reliability.**

Valve construction	Valve series	Valve flow in control mode			Valve stem	
		Inlet A	Inlet B	Outlet AB	Retracted	Extended
2-port valves 	**VVP47...** 	Variable		Variable	 Valve opens	Valve closes
3-port valves 	**VXP47...** 	Variable	Variable	Constant	 Valve opens  Valve closes	 Valve closes  Valve opens
3-port valves with T-bypass 	**VMP47...** 	Variable	Variable	Constant	 Valve opens  Valve closes	 Valve closes  Valve opens

Warning **The direction of flow MUST be as indicated by the arrow, i.e. only from A ® AB and B ® AB.**
The 3-port valve types VXP47... and VMP47... may be used only in mixing applications.

Mounting instructions

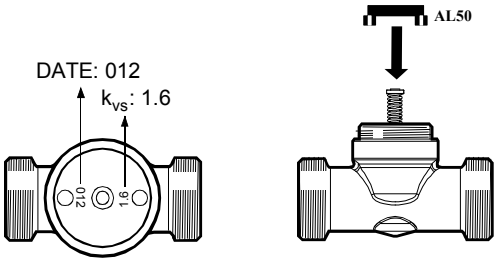
Orientation



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 0301 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.

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 control path A ® AB** can be opened either electrically via the actuator, or by adjustment with the manual button. In the case of 3-port valves, this throttles or closes **bypass B**.

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.

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	Pressure class	PN16 to EN1333
	Valve characteristic	
	Path A → AB	Linear
	Bypass B → AB	Linear
	Leakage	To VDE/VDI 2174
	Path A → AB	0…0.05 % of k_{vs}
	Bypass B → AB	0…0.05 % 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	> 50 as in VDI 2173
	Admissible operating pressure	1600 kPa (16 bar)
	Nominal stroke	2.5 mm
Materials	Valve body	Bronze CC491K (Rg5)
	Stem	Stainless steel
	Plug, seat ring, gland	Brass
	Stem seal	EPDM O-rings
Dimensions / Weight	Dimensions	See «Dimensions» (table)
	Threaded connections	
	Valve	G… (inches) to ISO 228/1
	Screwed fitting	R/Rp... to ISO 7/1, G... to ISO 228/1
	Actuator connection	M30 x 1.5
	Weight	See «Dimensions» (table)
Accessories	ALG… screwed fittings (supplier: Siemens)	Nut, nipple and flat seal for steel pipes with gas pipe threads
	SERTO SO 21… compression fitting (obtainable from suppliers to the trade)	Nut and compression fitting for seamless copper and mild-steel piping
	Solder fittings (obtainable from suppliers to the trade)	For copper and steel pipes

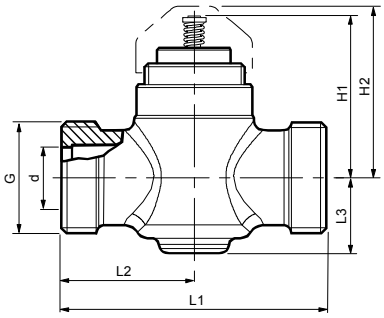
S_v = Rangeability k_{vs} / k_{vr}

k_{vs} = Nominal flow rate of chilled water (5 to 30 °C) through the fully opened valve (H_{100}) at a differential pressure of 100kPa (1bar).

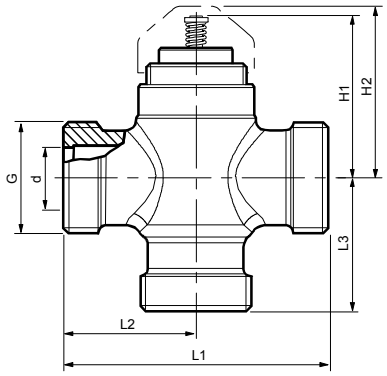
k_{vr} = The lowest value for k_v at which the characteristic tolerance is still maintained, at a differential pressure of 100kPa (1 bar)

Dimensions

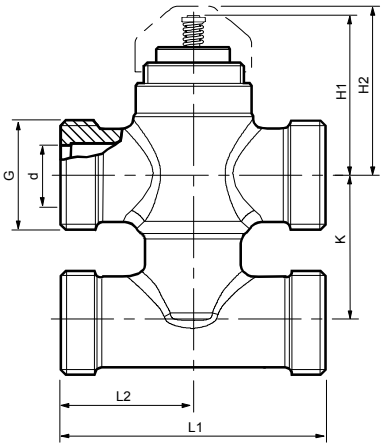
2-port valves
VVP47...



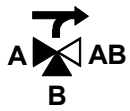
3-port valves
VXP47…



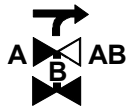
3-port valves with T bypass
VMP47…



Valve type	DN	G [ins]	d [mm]	H1 [mm]	H2 [mm]	L1 [mm]	L2 [mm]	L3 [mm]	Weight [kg]
VVP47.10-0.25 … 1.6	10	G½B	10.5	46	≈ 49	60	30	19	0.32
VVP47.15-2.5	15	G¾B	14	46	≈ 49	65	32.5	19	0.34
VVP47.20-4	20	G1B	20	49	≈ 52	80	40	23	0.44



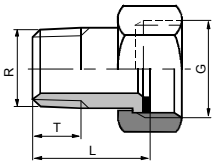
Valve type	DN	G [ins]	d [mm]	H1 [mm]	H2 [mm]	L1 [mm]	L2 [mm]	L3 [mm]	Weight [kg]
VXP47.10-0.25 … 1.6	10	G½B	10.5	46	≈ 49	60	30	30	0.32
VXP47.15-2.5	15	G¾B	14	46	≈ 49	65	32.5	32.5	0.37
VXP47.20-4	20	G1B	20	49	≈ 52	80	40	40	0.5



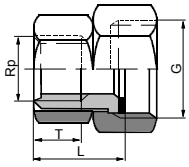
Valve type	DN	G [ins]	d [mm]	H1 [mm]	H2 [mm]	K [mm]	L1 [mm]	L2 [mm]	Weight [kg]
VMP47.10-0.25 … 1.6	10	G½B	10.5	46	≈ 49	40	60	30	0.4
VMP47.15-2.5	15	G¾B	14	46	≈ 49	40	65	32.5	0.48

Screwed fittings

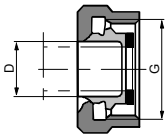
Flat-sealing screwed fittings
ALG13 and 14 with external thread



ALG15 with internal thread



Compression fittings
SERTO SO 21...



For valve type	DN	G [ins]	Type ALG…[1] (Siemens)	R [ins]	Rp [ins]	L [mm]	T [mm]	Type SERTO SO 21...[2] (from specialist supplier)	D [mm]
VVP47.10-0.25 ... 1.6	10	G½	**ALG13**	R⅜		≈ 24	≈ 9	**SO 21-12-1/2”**	12
VXP47.10-0.25 ... 1.6								**SO 21-14-1/2”**	14
VMP47.10-0.25 ... 1.6								**SO 21-15-1/2”**	15
VVP47.15-2.5	15	G¾	**ALG14**	R½		≈ 29.5	≈ 12	**SO 21-17-3/4”**	17
VXP47.15-2.5								**SO 21-18-3/4”**	18
VMP47.15-2.5									
VVP47.20-4	20	G1	**ALG15**		Rp½	≈ 23	≈ 13		
VXP47.20-4									

[1] Type ALG… screwed fittings and flat seal available from Siemens
[2] SERTO SO21… compression fittings, obtainable from supplier to the trade
DN = Nominal bore
G = Valve thread (internal, cylindrical)
D = External diameter for seamless copper and mild-steel piping