



2-port valves  
VVP47..(S)



3-port valves  
VXP47..



3-port valves with bypass  
VMP47..(S)

Acvatix™

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

**VVP47..(S)**

**VXP47..**

**VMP47..(S)**

- Bronze valve body CC491K (Rg5) max. 4% Pb
- DN 10, DN 15 and DN 20
- $k_{vs}$  0.25 to 4 m<sup>3</sup>/h
- Linear characteristic
- Flat seal male threaded connections G..B to ISO 228-1
- V..P47..S valves: Male threaded connections for use with Conex compression fittings for copper pipes
- Manual adjuster
- Can be combined with SFP.. and SSF.. electromotoric actuators or STP..65.. electrothermal actuators

## 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 re-heaters 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 and individual rooms

The VXP47.. 3-port valves together with SFP.. and SSF.. actuators are specially suited for changeover applications where small leakage rates are required.

## Type summary

| VVP47.. <sup>1)</sup><br>2-port | VVP47..S <sup>2)</sup><br>2-port | VXP47.. <sup>1)</sup><br>3-port | VMP47.. <sup>1)</sup><br>3-port<br>with bypass | VMP47..S <sup>2)</sup><br>3-port<br>with T-bypass | DN | k <sub>vs</sub><br>A → AB<br>[m³/h] | k <sub>vs</sub> <sup>3)</sup><br>B → AB<br>[m³/h] |
|---------------------------------|----------------------------------|---------------------------------|--|---|----|-------------------------------------|---|
| VVP47.10-0.25                   |                                  | VXP47.10-0.25                   | VMP47.10-0.25                                  |   | 10 | 0,25                                | 0,18  |
| VVP47.10-0.4                    |                                  | VXP47.10-0.4                    | VMP47.10-0.4                                   |   |    | 0,40                                | 0,28  |
| VVP47.10-0.63                   | VVP47.10-0.63S                   | VXP47.10-0.63                   | VMP47.10-0.63                                  | VMP47.10-0.63S                                    |    | 0,63                                | 0,44  |
| VVP47.10-1                      | VVP47.10-1S                      | VXP47.10-1                      | VMP47.10-1                                     | VMP47.10-1S                                       |    | 1,00                                | 0,70  |
| VVP47.10-1.6                    | VVP47.10-1.6S                    | VXP47.10-1.6                    | VMP47.10-1.6                                   | VMP47.10-1.6S                                     |    | 1,60                                | 1,12  |
| VVP47.15-2.5                    | VVP47.15-2.5S                    | VXP47.15-2.5                    | VMP47.15-2.5                                   | VMP47.15-2.5S                                     | 15 | 2,50                                | 1,75  |
| VVP47.20-4                      |                                  | VXP47.20-4                      |  |   | 20 | 4,00                                | 2,80  |

<sup>1)</sup> ☐ Flat seal male threaded connections

<sup>2)</sup> ☐ Male threaded connections for use with Conex compression fittings

<sup>3)</sup> ☐ Applies only to 3-port version

k<sub>vs</sub> = nominal flow rate of cold water (5...30 °C) through the fully opened valve (H<sub>100</sub>) at a differential pressure of 100 kPa (1 bar)

## Accessories

| Prod. No. | Stock no.   | Description   |
|-----------|-------------|---|
| ALG..2    | ALG..2      | Set of 2 fittings with threaded connections for 2-port valves or 3-port valves with bypass, consisting of: 2 union nuts, 2 discs and 2 flat seals<br>ALG..3B are brass fittings, for media temperatures up to 100 °C. |
| ALG..2B   | S55846-Z1.. |   |
| ALG..3    | ALG..3      | Set of 3 fittings with threaded connections for 3-port valves, consisting of:<br>3 union nuts, 3 discs and 3 flat seals<br><br>ALG..3B are brass fittings, for media temperatures up to 100 °C.                       |
| ALG..3B   | S55846-Z1.. |   |
| AL50      | AL50        | For mounting SFP.. actuators on zone valve V..P47..   |

## Ordering

The ALG.. threaded fittings, the SFP.., SSF.. and STP..65.. actuators as well as the supporting ring AL50 (needed for combination with SFP..) must be ordered as separate items.

### Example:

| Product number | Stock number | Description                     | Quantity |
|----------------|--------------|---------------------------------|----------|
| VXP47.10.1     | VXP47.10.1   | 3-port Terminal Unit Valve PN16 | 4        |
| ALG133         | ALG133       | Threaded Fittings               | 4        |

For 3-port valves with bypass VMP47.. order two sets of ALG..2 or ALG..2B threaded fittings.

## Delivery

Valves, actuators and fittings are packed and supplied separately.

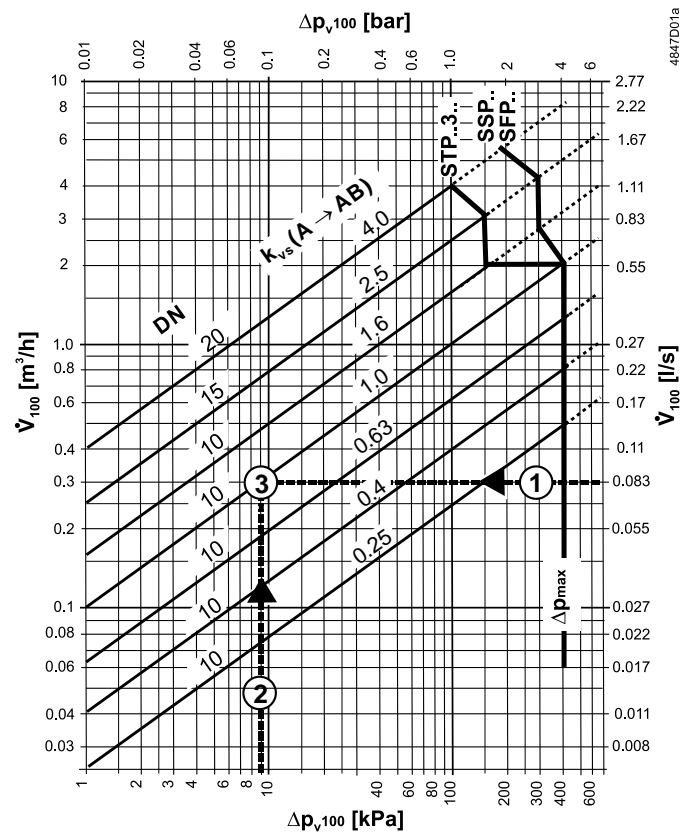
# Equipment combinations

| Valves               | Electromotoric actuators |                |                  |                | Electrothermal actuators |                |  |  |  |
|----------------------|--------------------------|----------------|------------------|----------------|--------------------------|----------------|--|--|--|
|                      | actuators                |                |                  |                |                          |                |  |  |  |
|                      | SSF..                    |                | SFP..            |                | STP..65..                |                |  |  |  |
|                      | p <sub>max</sub>         | p <sub>s</sub> | p <sub>max</sub> | p <sub>s</sub> | p <sub>max</sub>         | p <sub>s</sub> |  |  |  |
|                      | [kPa]                    | [kPa]          | [kPa]            | [kPa]          | [kPa]                    | [kPa]          |  |  |  |
| VVP47.10-0.25...0.4  | 400                      | 1000           | 400              | 1000           | 400                      | 700            |  |  |  |
| VVP47.10-0.63...1(S) |                          | 500            |                  | 500            | 250                      | 250            |  |  |  |
| VVP47.10-1.6(S)      | 300                      | 300            | 300              | 300            | 150                      | 150            |  |  |  |
| VVP47.15-2.5(S)      |                          |                |                  |                |                          |                |  |  |  |
| VVP47.20-4           | 175                      | 175            | 175              | 175            | 100                      | 100            |  |  |  |
| VXP47.10-0.25...0.4  | 400                      |                | 400              |                | 400                      |                |  |  |  |
| VXP47.10-0.63...1    |                          |                |                  |                | 250                      |                |  |  |  |
| VXP47.10-1.6         | 300                      |                | 300              |                | 150                      |                |  |  |  |
| VXP47.15-2.5         |                          |                |                  |                | 100                      |                |  |  |  |
| VXP47.20-4           | 175                      |                | 175              |                |                          |                |  |  |  |
| VMP47.10-0.25...0.4  | 400                      |                | 400              |                | 400                      |                |  |  |  |
| VMP47.10-0.63...1(S) |                          |                |                  |                | 250                      |                |  |  |  |
| VMP47.10-1.6(S)      | 300                      |                | 300              |                | 150                      |                |  |  |  |
| VMP47.15-2.5(S)      |                          |                |                  |                |                          |                |  |  |  |
| Data sheet           | A6V15348910              |                | N4865            |                | A6V14028280              |                |  |  |  |

- ☐ p<sub>max</sub> maximum permissible differential pressure across the control path of the valve valid for the entire actuating range of the motorized valve
- ☐ p<sub>s</sub> maximum permissible differential pressure (close of pressure) at which the motorized valve will close securely against the pressure
- 1) Only while stock lasts

## Actuator overview

| Actuator     | Type of actuator | Operating voltage | Positioning signal | Positioning time | Positioning force |
|--------------|------------------|-------------------|--------------------|------------------|-------------------|
| SSF331.09H   | Electromotoric   | AC 230 V          | 3-position         | 16 s/mm          | 200 N             |
| SSF131.09H   |                  | AC 24 V           |                    |                  |                   |
| SSF161.05HF  |                  | AC / DC 24 V      | DC 0...10 V        | 5 s/mm           |                   |
| SFP21/18     |                  | AC 230 V          | 2-position         | 10 s             | 135 N             |
| SFP71/18     |                  | AC 24 V           |                    |                  |                   |
| STP121.65L10 | Electrothermal   | AC / DC 24 V      |                    | 2-position       | 4.5 min           |
| STP121.65L20 |                  |                   |                    |                  |                   |
| STP121.65/00 |                  |                   |                    |                  |                   |
| STP321.65L10 |                  | AC 230 V          |                    |                  |                   |
| STP321.65L20 |                  |                   |                    |                  |                   |
| STP321.65/00 |                  |                   |                    |                  |                   |
| STP161.65L10 |                  | AC 24 V           | DC 0...10 V        | 30 s/mm          |                   |
| STP162.65L10 | AC / DC 24 V     |                   |                    |                  |                   |

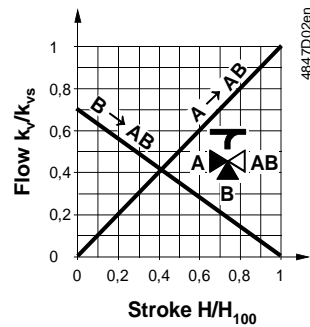


## Example:

- 1  $\dot{V}_{100} = 0.083 \text{ l/s}$
- 2  $\Delta p_{100} = 9 \text{ kPa}$
- 3 Required  $K_{vs}$ -value =  $1.0 \text{ m}^3/\text{h}$

- $\Delta p_{100}$  = differential pressure across the fully open valve and control path A  $\rightarrow$  AB by a volume flow  $\dot{V}_{100}$
- $\dot{V}_{100}$  = volume flow through the fully open valve ( $H_{100}$ )
- $\Delta p_{\text{max}}$  = 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  $\text{m}^3/\text{h}$  = 0.278  $\text{l/s}$  water at 20 °C

## Valve characteristics



With valve types VXP47../VMP47...(S), the  $k_{vs}$  values in bypass B represent only 70 % of the  $k_{vs}$  value in the straight-through control path, A  $\rightarrow$  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.

- 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

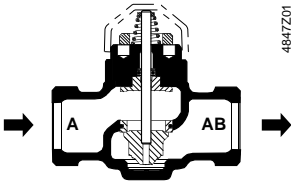

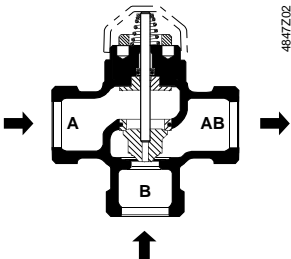
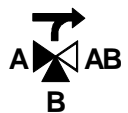
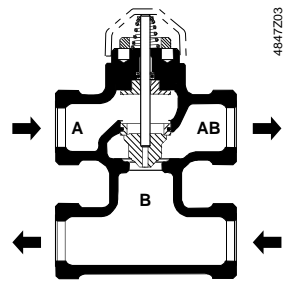

Engineering notes

Also refer to "Mounting notes" and "Commissioning", page 7.

The 2-port valves should preferably be installed in the return, where the stem 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<br>              | VVP47..(S)<br>   | variable                   |          | variable  | A → AB<br>opens                         | A → AB<br>closes                        |
| 3-port valves<br>             | VXP47..<br>     | variable                   | variable | constant  | A → AB<br>opens<br><br>B → AB<br>closes | A → AB<br>closes<br><br>B → AB<br>opens |
| 3-port valves with bypass<br> | VMP47.. (S)<br> | variable                   | variable | constant  | A → AB<br>opens<br><br>B → AB<br>closes | A → AB<br>closes<br><br>B → AB<br>opens |

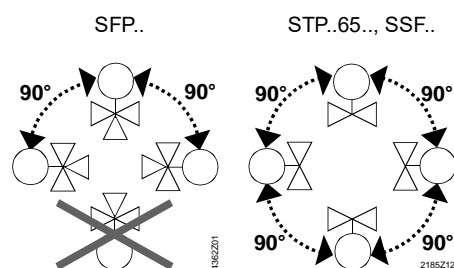
Warning

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..(S) may only be used in mixing applications.

## Mounting notes

### Orientation



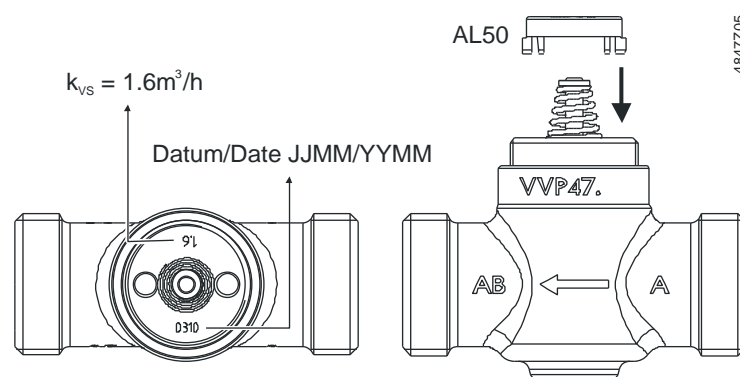
The specified direction of flow must be observed in all cases, also refer to "Engineering notes", page 5.

The valves are delivered in single packs; Mounting Instructions 74 319 0301 0 are enclosed with the packaging.

The valve and actuator can be easily assembled 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 SFP.. onto the valve. Only the equipment combination V..P47.. and SFP.. requires supporting ring AL50.



## Commissioning

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**Commission the valve only if the manual knob or actuator have been mounted correctly.**

### 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.

## Maintenance

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### Warning

V..P47..(S) 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 certain the manual knob or the actuator is correctly fitted.

### Stem sealing gland Disposal

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

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

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The technical data supplied for these valves is valid only for valves used in conjunction with the actuators listed under "Equipment combinations", page 3.

**Use with third-party actuators invalidates any warranty offered by Siemens Switzerland Ltd / HVAC Products.**

## Technical data

|                                     |   |  |
|-------------------------------------|---|--|
| Operating data                      | PN class  | PN 16 to EN 1333   |
|                                     | Permissible operating pressure  | 1600 kPa (16 bar)  |
|                                     | Valve characteristic  |  |
|                                     | Path A → AB   | linear   |
|                                     | Bypass B → AB   | linear   |
|                                     | Leakage rate  | to DIN EN 1349   |
|                                     | Path A → AB   | 0...0.05 % of $k_{VS}$ value   |
|                                     | Bypass B → AB   | 0...0.05 % of $k_{VS}$ value   |
|                                     | Permissible media   | chilled water, low-temperature hot water and water with frost protection additives<br>recommendation: water should be treated as specified in VDI 2035 |
|                                     | Temperature of medium   | 1...110 °C, or max. 120 °C for short periods <sup>1)</sup>   |
| Standards, directives and approvals | Rangeability $S_v$  | > 50 as in VDI 2173  |
|                                     | Nominal stroke  | 2.5 mm   |
|                                     | Pressure Equipment Directive  | PED 2014/68/EU   |
|                                     | Pressure Accessories  | Scope: Article 1, section 1<br>Definitions: Article 2, section 5   |
|                                     | Fluid group 2   | without CE-marking as per article 4, section 3 (sound engineering practice) <sup>2)</sup>  |
| Environmental compatibility         | EAC Conformity  | Eurasia Conformity   |
|                                     | The product environmental declaration CE1E4847en <sup>3)</sup> contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal). |  |

<sup>1)</sup> ALG..B fittings for media temperatures up to 100 °C

<sup>2)</sup> Valves where  $PS \times DN < 1000$ , do not require special testing and cannot carry the CE label.

<sup>3)</sup> The documents can be downloaded from <http://siemens.com/bt/download>.

$S_v$  = rangeability  $k_{VS} / k_{vF}$

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

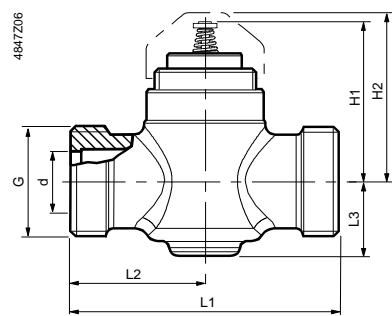
$k_{vF}$  = the lowest value for  $k_v$  at which the flow characteristic tolerance is still maintained, at a differential pressure of 100kPa (1 bar)



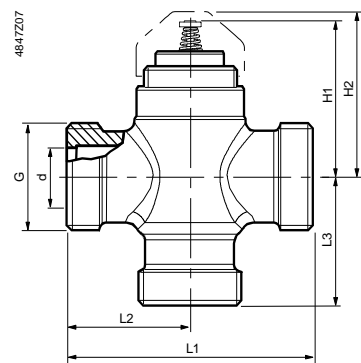
|                     |  |   |
|---------------------|--|---|
| Materials           | Valve body   | bronze CC491K (Rg5) max. 4% Pb  |
|                     | Stem   | stainless steel   |
|                     | Plug, seat ring, gland   | brass   |
|                     | Stem seal  | EPDM O-rings  |
| Dimensions / weight | Dimensions   | refer to "Dimensions", page 10  |
|                     | Threaded connections (V..P47..)  |   |
|                     | Valve  | G..B to ISO 228-1   |
|                     | Threaded fittings  | R/Rp.. to ISO 7-1, G.. to ISO 228-1                                   |
|                     | Threaded connections (V..P47..S)   |   |
|                     | Valve DN 10  | G..B to ISO 228-1   |
|                     | Valve DN 15  | W1½-14 to BS84  |
| Accessories         | Actuator connection  | M30 x 1.5   |
|                     | Weight   | refer to "Dimensions", page 10  |
|                     | ALG..2, ALG..3 threaded fittings (supplier: Siemens)                       | nut, nipple and flat seal for steel pipes with gas-pipe threads       |
|                     | SERTO SO 00021.. threaded fittings (available from suppliers to the trade) | nut and compression fitting for seamless copper and mild-steel piping |
|                     | Welded fittings (available from suppliers to the trade)                    | for copper and steel piping   |

Dimensions

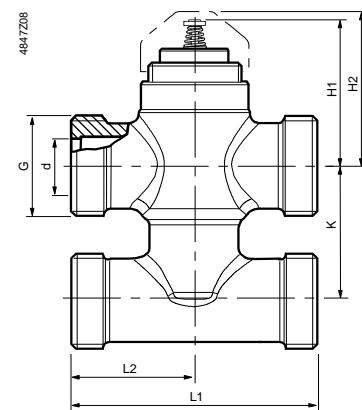
2-port valves  
VVP47..



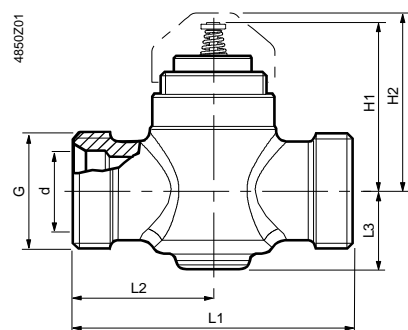
3-port valves  
VXP47..



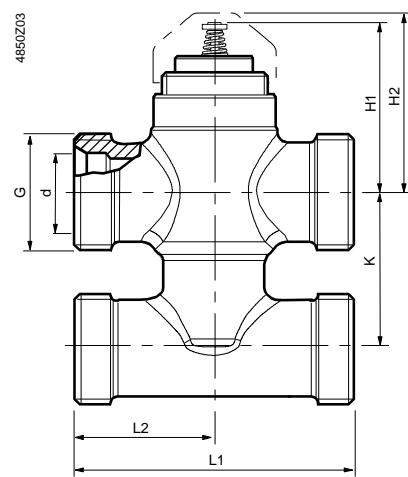
3-port valves with bypass  
VMP47..



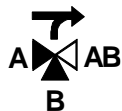
2-port valves  
VVP47..(S)



3-port valves with T-bypass  
VMP47..(S)



| Product number          | DN | G<br>[Inch] | d<br>[mm] | H1<br>[mm] | H2<br>[mm] | L1<br>[mm] | L2<br>[mm] | L3<br>[mm] | Weight<br>[kg] |
|-------------------------|----|-------------|-----------|------------|------------|------------|------------|------------|----------------|
| VVP47.10-0.25...1.6     | 10 | G½B         | 10.5      | 46         | ≈ 49       | 60         | 30         | 19         | 0.32           |
| VVP47.10-0.63S ... 1.6S | 10 | G½B         | 15.2      | 46         | ≈ 49       | 60         | 30         | 19         | 0.32           |
| VVP47.15-2.5            | 15 | G¾B         | 14        | 46         | ≈ 49       | 65         | 32.5       | 19         | 0.34           |
| VVP47.15-2.5S           | 15 | W1½-14      | 22.2      | 46         | ≈ 49       | 65         | 32.5       | 19         | 0.34           |
| VVP47.20-4              | 20 | G1B         | 20        | 49         | ≈ 52       | 80         | 40         | 23         | 0.44           |

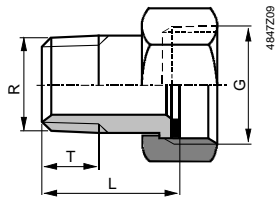


| Product number      | DN | G<br>[Inch] | d<br>[mm] | H1<br>[mm] | H2<br>[mm] | L1<br>[mm] | L2<br>[mm] | L3<br>[mm] | Weight<br>[kg] |
|---------------------|----|-------------|-----------|------------|------------|------------|------------|------------|----------------|
| VXP47.10-0.25...1.6 | 10 | 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            |

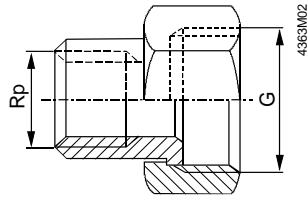


| Product number          | DN | G<br>[Inch] | d<br>[mm] | H1<br>[mm] | H2<br>[mm] | K<br>[mm] | L1<br>[mm] | L2<br>[mm] | Weight<br>[kg] |
|-------------------------|----|-------------|-----------|------------|------------|-----------|------------|------------|----------------|
| VMP47.10-0.25...1.6     | 10 | G½B         | 10.5      | 46         | ≈ 49       | 40        | 60         | 30         | 0.4            |
| VMP47.10-0.63S ... 1.6S | 10 | G½B         | 15.2      | 46         | ≈ 49       | 40        | 60         | 30         | 0.4            |
| VMP47.15-2.5            | 15 | G¾B         | 14        | 46         | ≈ 49       | 40        | 65         | 32.5       | 0.48           |
| VMP47.15-2.5S           | 15 | W1½-14      | 22.2      | 46         | ≈ 49       | 40        | 65         | 32.5       | 0.48           |

Sets of threaded fittings  
with  
flat seal:  
Set of 2  
(for V..P47..)

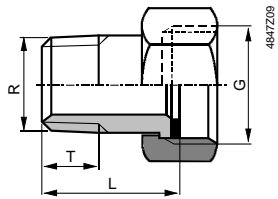


| Prod. no. /stock no. | Prod. No. Stock no. | Connection<br>pipe side | G      | Rp     |
|----------------------|---------------------|-------------------------|--------|--------|
|                      |                     |                         | [Inch] | [Inch] |
| ALG132               |                     | External thread         | G ½    | R ⅜    |
| ALG142               |                     | External thread         | G ¾    | R ½    |

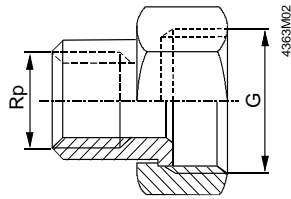


|        |                     |                 |     |      |
|--------|---------------------|-----------------|-----|------|
| ALG122 |                     | Internal thread | G ¾ | Rp ⅜ |
| ALG152 | ALG152B S55846-Z100 | Internal thread | G 1 | Rp ½ |

Set of 3  
(for V..P47..)



| Prod. no. /stock no. | Prod. No. Stock no. | Connection<br>pipe side | G      | Rp     |
|----------------------|---------------------|-------------------------|--------|--------|
|                      |                     |                         | [Inch] | [Inch] |
| ALG133               |                     | External thread         | G ½    | R ⅜    |
| ALG143               |                     | External thread         | G ¾    | R ½    |



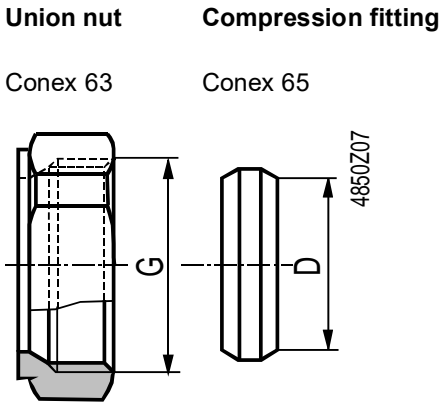
|        |                     |                 |     |      |
|--------|---------------------|-----------------|-----|------|
| ALG123 |                     | Internal thread | G ¾ | Rp ⅜ |
| ALG153 | ALG153B S55846-Z101 | Internal thread | G 1 | Rp ½ |

Overview fitting combinations  
(with V..P47..)

| ALG... type | for valve type      | DN | G<br>[inch] | R<br>[inch] | Rp<br>[inch] | L<br>[mm] | T<br>[mm] |
|-------------|---------------------|----|-------------|-------------|--------------|-----------|-----------|
| ALG132      | VVP47.10-0.25...1.6 | 10 | G ½         | R ¾         |              | ≈ 24      | ≈ 9       |
| ALG133      | VXP47.10-0.25...1.6 |    |             |             |              |           |           |
| 2 x ALG132  | VMP47.10-0.25...1.6 |    |             |             |              |           |           |
| ALG142      | VVP47.15-2.5        | 15 | G ¾         | R ½         |              | ≈ 29.5    | ≈ 12      |
| ALG143      | VXP47.15-2.5        |    |             |             |              |           |           |
| 2 x ALG142  | VMP47.15-2.5        |    |             |             |              |           |           |
| ALG152      | VVP47.20-4          | 20 | G 1         |             | Rp ½         | ≈ 23      | ≈ 13      |
| ALG152B     |                     |    |             |             |              |           |           |
| ALG153      | VXP47.20-4          |    |             |             |              |           |           |
| ALG153B     |                     |    |             |             |              |           |           |

DN = Nominal size  
G = Valve thread (internal cylindrical)

Conex  
compression  
fittings  
(for V..P47..S)



| For valve type                 |                         | DN | G<br>[inch] | Type Conex<br>(from specialist<br>supplier) | Product-Nr.                       | D<br>[mm] |
|--------------------------------|-------------------------|----|-------------|---|-----------------------------------|-----------|
|                                | k <sub>VS</sub> - value |    |             |   |                                   |           |
| VVP47.10-..S<br>VMP47.10-..S   | 0.63...1.6              | 10 | G ½         | Conex 63<br>+<br>Conex 65                   | E--10CO063--<br>+<br>E--10CO065-- | 15        |
| VVP47.15-2.5S<br>VMP47.15-2.5S | 2.5                     | 15 | W1 ½-14     | Conex 63<br>+<br>Conex 65                   | G--10CO063--<br>+<br>G--10CO065-- | 22        |

DN = nominal size  
G = valve thread (internal, cylindrical)  
D = external diameter for seamless copper and mild-steel piping

## Spare parts

| Type        | Stock No.                 | Description                 | Number |
|-------------|---------------------------|-----------------------------|--------|
| S55845-Z182 | S55845-Z182 <sup>1)</sup> | ALQ1 Protecting Cap M30x1.5 | 10     |

<sup>1)</sup> Multipack of 10 pieces

## Revision numbers

| Product number | Valid from manufacturing date | Product number | Valid from manufacturing date | Product number | Valid from manufacturing date |
|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|
| VVP47..        | 0809 <sup>1)</sup>            | VXP47..        | 0809 <sup>1)</sup>            | VMP47..        | 0809 <sup>1)</sup>            |

<sup>1)</sup> MMY = Month, Year of manufacturing

Issued by:  
Siemens Switzerland Ltd  
Smart Infrastructure  
Global Headquarters  
Theilerstrasse 1a  
CH-6300 Zug  
Switzerland  
Tel. +41 58 724-2424  
[www.siemens.com/buildingtechnologies](http://www.siemens.com/buildingtechnologies)

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