



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 m³/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 SSP.., SFP.. electromotoric actuators or STP..3.. 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..S 3-port valves together with SFP.. actuators are specially suited for changeover applications where small leakage rates are required.

Type summary

| VVP47.. ¹⁾ 2-port | VVP47..S ²⁾ 2-port | VXP47.. ¹⁾ 3-port | VMP47.. ¹⁾ 3-port with bypass | VMP47..S ²⁾ 3-port with T-bypass | DN | k_{vs} A → AB [m ³ /h] | k_{vs} ³⁾ B → AB [m ³ /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 |

¹⁾ Flat seal male threaded connections

²⁾ Male threaded connections for use with Conex compression fittings

³⁾ Applies only to 3-port version

k_{vs} = nominal flow rate of cold water (5...30 °C) through the fully opened valve (H_{100}) 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 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: 3 union nuts, 3 discs and 3 flat seals ALG..3B are brass fittings, for media temperatures up to 100 °C. |
| ALG..3B | S55846-Z1.. | |

Ordering

Please give valve and the required ALG.. threaded fittings. The ALG.. threaded fittings and the SSP.., SFP.. and STP..3.. actuators 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 | |
|----------------------|---------------------------|-----------------------|---------------------------|-----------------------|---------------------------|-----------------------|
| | SSP.. | | SFP.. | | STP..3.. | |
| | Δp_{max} [kPa] | Δp_s [kPa] | Δp_{max} [kPa] | Δp_s [kPa] | Δp_{max} [kPa] | Δp_s [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 | | | | | | |
| VXP47.20-4 | 175 | | 175 | | 100 | |
| 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 | N4864 | | N4865 | | N4884 | |



¹⁾ After a power failure or switching off the operating voltage the control path A → AB of the valve opens.

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

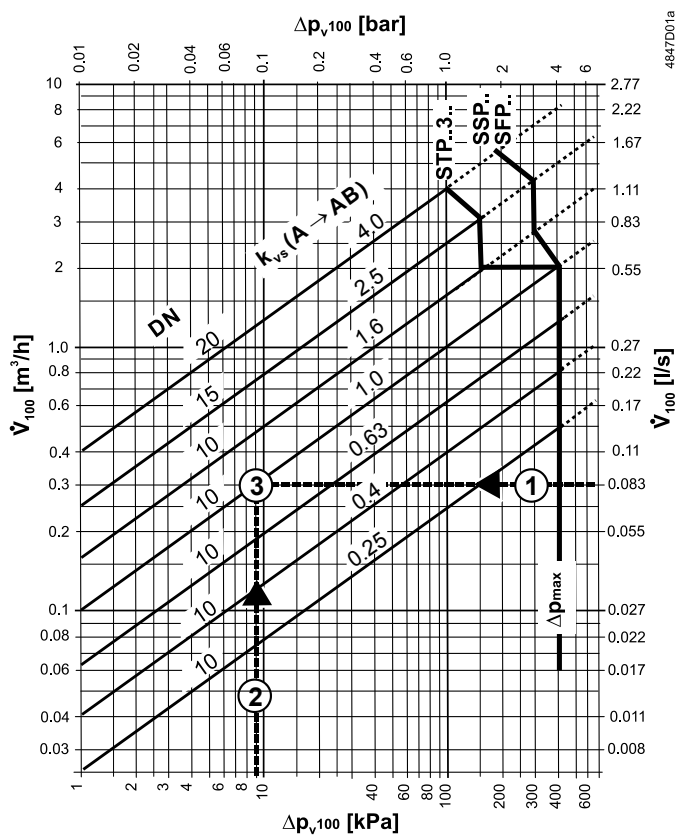
Δp_s = maximum permissible differential pressure (close of pressure) at which the motorized valve will close securely against the pressure

Overview of actuators

| Actuator | Type of actuator | Operating voltage | Positioning signal | Positioning time | Positioning force |
|--------------------------|------------------|-------------------|--------------------------------|---------------------|-------------------|
| SSP31 | Electromotoric | AC 230 V | 3-position | 150 s | 160 N |
| SSP81 | | AC 24 V | | 43 s | |
| SSP81.04 | | AC / DC 24 V | DC 0...10 V | 34 s | |
| SSP61 | | AC 230 V | 2-position | 10 s | |
| SFP21/18 | | AC 24 V | | | |
| SFP71/18 | Electrothermal | AC 230 V | 2-position | 210 s | 100 N |
| STP23 | | AC / DC 24 V | 2-position | 270 s | |
| STP73 | | | 2-position / PDM ¹⁾ | | |
| STP73PR/00 ³⁾ | | AC 24 V | DC 0...10 V | 270 s ²⁾ | |
| STS63 | | | | | |

- 1) PDM = Pulse-Duration-Modulation
 2) refer to data sheet N4880 for details
 3) Variant for PDM and parallel flow

Sizing

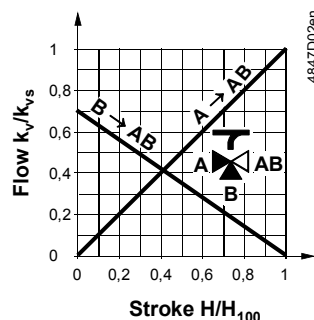


Example:

- 1 \dot{V}_{100} = 0.083 l/s
 2 $\Delta p_{v,100}$ = 9 kPa
 3 Required k_{vs} -value = 1.0 m³/h

- $\Delta p_{v,100}$ = differential pressure across the fully open valve and control path A → AB 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

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 → 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

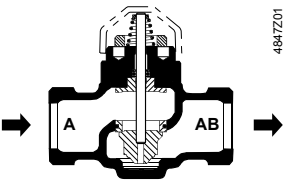

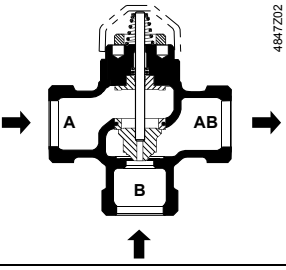
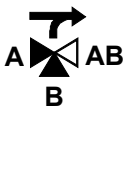
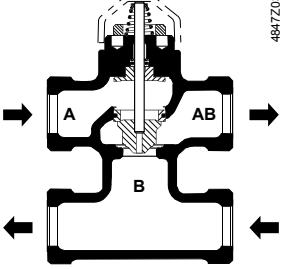
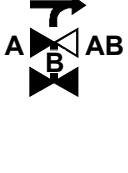
- Combined disc / plug flow restrictor
- Seat ring embedded in through-port A → AB
- Seat machined into bypass B → AB.
- Continuously lubricated sealing rings
- Conical return springs, for more compact valve construction

Engineering notes

Also refer to "Mounting notes" and "Commissioning", page 5.

The 2-port valves should preferably be installed in the return, where the stem seal will be exposed to lower temperatures.

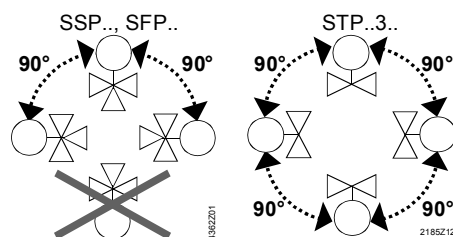
Recommendation: A strainer should be fitted upstream of the valve. This increases reliability.

| Valve construction | Valve series | Valve flow in control mode | | | Valve stem | |
|--|--|----------------------------|----------|-----------|---|----------|
| | | Inlet A | Inlet B | Outlet AB | Retracted | Extended |
| 2-port valves  | VVP47..(S)  | variable | variable | variable | Retracted: A → AB opens Extended: A → AB closes | |
| 3-port valves  | VXP47..  | variable | variable | constant | Retracted: A → AB opens, B → AB closes Extended: A → AB closes, B → AB opens | |
| 3-port valves with bypass  | VMP47.. (S)  | variable | variable | constant | Retracted: A → AB opens, B → AB closes Extended: A → AB closes, B → AB 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 4.

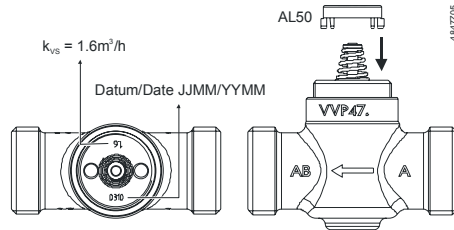
The valves are delivered in single packs; Mounting Instructions 74 319 0301 0 are enclosed with the packaging.

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 ¹⁾ 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.

¹⁾ Included in delivery of the SFP.. actuator



Commissioning



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



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

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



The valve must be dismantled and separated into its various constituent materials before disposal.

Legislation may demand special handling of certain components, or it may be sensible from an ecological point of view.

Current local legislation must be observed.

Warranty

The technical data supplied for these valves is valid only for valves used in conjunction with the actuators listed under "Equipment combinations", page 2.

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 recommendation: water should be treated as specified in VDI 2035 |
| | Temperature of medium | 1...110 °C, or max. 120 °C for short periods ¹⁾ |
| | Rangeability S_v | > 50 as in VDI 2173 |
| | Nominal stroke | 2.5 mm |
| Norms and standards | Pressure Equipment Directive | PED 97/23/EC |
| | Pressure Accessories | as per article 1, section 2.1.4 |
| | Fluid group 2 | without CE-marking as per article 3, section 3 (sound engineering practice) |
| | Environmental compatibility | ISO 14001 (Environment) ISO 9001 (Quality) SN 36350 (Environmentally compatible products) RL 2002/95/EG (RoHS) |
| 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 7 |
| | 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 | W1 $\frac{1}{8}$ -14 to BS84 |
| Actuator connection | M30 x 1.5 | |
| Weight | refer to "Dimensions", page 7 | |
| Accessories | 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 |

¹⁾ ALG..B fittings for media temperatures up to 100 °C

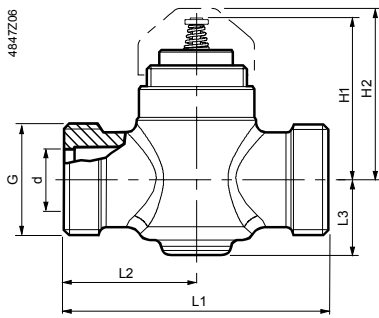
S_v = rangeability k_{vs} / k_{vr}

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).

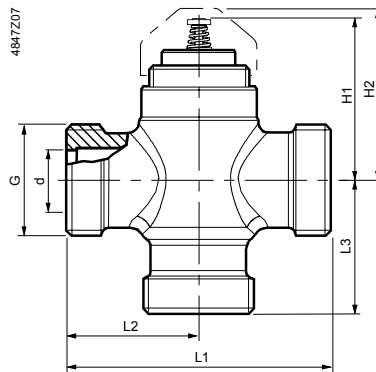
k_{vr} = the lowest value for k_v at which the flow characteristic tolerance is still maintained, at a differential pressure of 100kPa (1 bar)

Dimensions

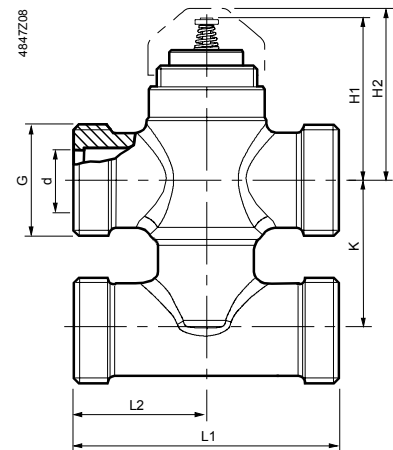
2-port valves
VVP47..



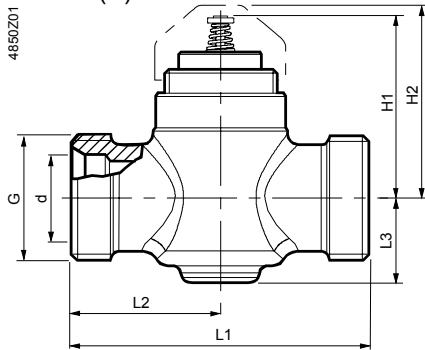
3-port valves
VXP47..



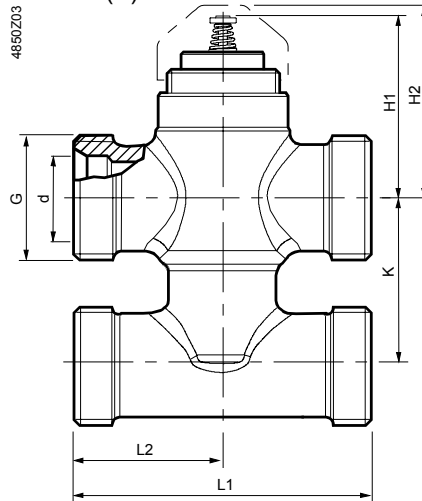
3-port valves with bypass VMP47..



2-port valves
VVP47..(S)



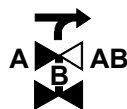
3-port valves with T-bypass
VMP47..(S)



| Product number | DN | G [Inch] | 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 |
| VVP47.10-0.63S ... 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 | W1¼-14 | 22,2 | 46 | ≈ 49 | 65 | 32,5 | 19 | 0,34 |
| VVP47.20-4 | 20 | G1B | 20 | 49 | ≈ 52 | 80 | 40 | 23 | 0.44 |

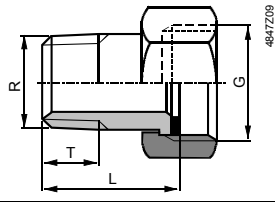


| Product number | DN | G [Inch] | d [mm] | H1 [mm] | H2 [mm] | L1 [mm] | L2 [mm] | L3 [mm] | Weight [kg] |
|---------------------|----|-------------|-----------|------------|------------|------------|------------|------------|----------------|
| VXP47.10-0.25...1.6 | 10 | G½B | 10.5 | 46 | ≈ 49 | 60 | 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 |

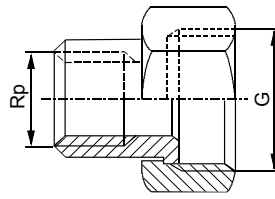


| Product number | DN | G [Inch] | d [mm] | H1 [mm] | H2 [mm] | K [mm] | L1 [mm] | L2 [mm] | Weight [kg] |
|-------------------------|----|-------------|-----------|------------|------------|-----------|------------|------------|----------------|
| VMP47.10-0.25...1.6 | 10 | G½B | 10.5 | 46 | ≈ 49 | 40 | 60 | 30 | 0.4 |
| VMP47.10-0.63S ... 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 | W1¼-14 | 22,2 | 46 | ≈ 49 | 40 | 65 | 32,5 | 0,48 |

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

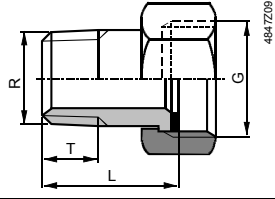


| Prod. no. /stock no. | Prod. No. | Stock no. | Connection pipe side | G [Inch] | Rp [Inch] |
|----------------------|-----------|-----------|-------------------------|-------------|--------------|
| ALG132 | | | External thread | G ½ | R ⅜ |
| ALG142 | | | External thread | G ¾ | R ½ |

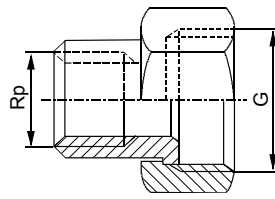


| | | | | | |
|--------|---------|-------------|-----------------|-----|------|
| ALG122 | | | Internal thread | G ¾ | Rp ⅜ |
| ALG152 | ALG152B | S55846-Z100 | Internal thread | G 1 | Rp ½ |

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



| Prod. no. /stock no. | Prod. No. | Stock no. | Connection pipe side | G [Inch] | Rp [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 |

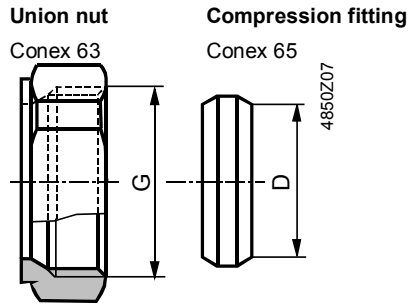
**Overview fitting combinations
(with V..P47..)**

| ALG... type | for valve type | DN | G [inch] | R [inch] | Rp [inch] | L [mm] | T [mm] |
|-------------|---------------------|----|-------------|-------------|--------------|-----------|-----------|
| ALG132 | VVP47.10-0.25...1.6 | 10 | G ½ | R ⅜ | | ≈ 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 | k _{vs} - value | DN | G [inch] | Type Conex (from specialist supplier) | | D [mm] |
|--------------------------------|-------------------------|----|----------|---------------------------------------|------------------------------|--------|
| | | | | Product-Nr. | | |
| VVP47.10-..S VMP47.10-..S | 0,63...1,6 | 10 | G½ | Conex 63 + | E--10CO063-- + | 15 |
| VVP47.15-2.5S VMP47.15-2.5S | 2,5 | 15 | W1½-14 | Conex 63 + | G--10CO063-- + | 22 |
| | | | | Conex 65 | E--10CO065-- G--10CO065-- | |

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 |
|---------------|---------------|-------------------------------------|--------|
| 74 676 0295 0 | 74 676 0295 0 | Manual knob for small valves 2.5 mm | 10 |

Revision numbers

| Product number | Valid from manufacturing date | Product number | Valid from manufacturing date | Product number | Valid from manufacturing date |
|----------------|-------------------------------|----------------|-------------------------------|----------------|-------------------------------|
| VVP47.. | 0809 ¹⁾ | VXP47.. | 0809 ¹⁾ | VMP47.. | 0809 ¹⁾ |

¹⁾ MMY = Month, Year of manufacturing

