Three-port seat valves with flange, PN40

VXF61...





DN15 and 25 DN40...150

Three-port seat valves with flange, PN40

- · Can be used as mixing or diverting valves
- DN15...150 mm
- DN15 and 25: cast steel GS-C 25 N DN40...150: cast steel GS-45
- k_{vs} 1.9...300 m³/h
- Stroke 20 or 40 mm
- Can be equipped with actuators SQX..., SKD... and SKB...

Use

In district heating, heating, ventilating, and air conditioning systems as a control valve for "mixing" or "diverting" functions.

For open and closed circuits.

Media

Standard versions with standard stem sealing gland for:

| Cooling water | |
|------------------------------|-------------|
| Chilled water | |
| Low temperature hot water | −25 +220 °C |
| High temperature hot water | |
| Water with anti-freeze 1) 2) | |
| Brine 1) 2) | |

Special versions with thermal insulator and special stem sealing gland for:

| Thermo oils | 220 300/350 °C ³⁾ |
|--------------|------------------------------|
| Refrigerants | not permissible 4) |

- 1) Media below 0 °C: ASZ6.5 stem heating element required to prevent freezing of the valve stem in the sealing gland.
- 2) Water with anti-freeze and brine: up to -10 °C as per DIN 3158 (stress case I) or up to -25 °C as per DIN 3158 (stress case II)
- 3) For applications with thermo oils of 220...300/350 °C, a thermal insulator between the valve and the actuator is required.
 - The maximum permissible temperatures in dependence of valve body material are described in the sections "Notes" and "Engineering notes".
- 4) For these applications, special refrigerant valves with magnetic actuators are used; refer to data sheets 4700...4799

Type summary

Standard version

| Туре | DN | k _{vs} | S _v | Δp _{vmax} . | |
|----------|-------|---------------------|----------------|----------------------|-------------------|
| | | | | mixing | diverting |
| | [mm] | [m ³ /h] | | kPa | kPa |
| VXF61.14 | 15/10 | 1.9 | | | |
| VXF61.15 | 15 | 3 | > 50 | 1600 | |
| VXF61.24 | 25/20 | 5 | | | |
| VXF61.25 | 25 | 7.5 | >100 | | 500 ¹⁾ |
| VXF61.39 | 40/32 | 12 | > 50 | 1200 | |
| VXF61.40 | 40 | 19 | | | |
| VXF61.50 | 50 | 31 | 1 | 1000 | |
| VXF61.65 | 65 | 49 | | 800 | 350 |
| VXF61.80 | 80 | 78 | >100 | 500 | 250 |
| VXF61.90 | 100 | 124 | | 300 | 150 |
| VXF61.91 | 125 | 200 | | 200 | 100 |
| VXF61.92 | 150 | 300 | | 100 | 70 |

Special versions with type suffix 2

| For media and temperatures: | | Example: |
|-----------------------------|----------------|----------------------|
| Thermo oils | 220 300/350 °C | VXF61.50 2 2) |

- 1) If noise is permitted, the same values apply as for mixing
- 2) Thermal insulator for special version (type suffix: 2), required for thermo oils from 220 °C to max. 300/350 °C; factory-mounted in the valve on delivery.

Accessories

Electric stem heating element, AC 24 V, required for media below 0 °C: ASZ6.5

Ordering

When ordering, please indicate type reference and type suffix (where required).

Example: VXF61.50

Delivery

Both the valve and the actuator are packed and supplied separately.

The special version (type suffix: **2**) for thermo oils is delivered with factory-mounted thermal insulator in the valve.

The valves are supplied without counter-flanges and without flange gaskets.

Equipment combinations

| Valves | | Actuators 1) | | | | | | |
|----------|------------------|-------------------|-----------|------------------|-----------|--------|-----------|--|
| | | SKD ²⁾ | | SKB | | SKC | | |
| | H ₁₀₀ | mixing | diverting | mixing | diverting | mixing | diverting | |
| | [mm] | | | Δp_{max} | [kPa] | | | |
| VXF61.14 | | | | | | | | |
| VXF61.15 | | 1200 | 500 | 1600 | | | | |
| VXF61.24 | | | | | | | | |
| VXF61.25 | 20 | | | | 500 | | | |
| VXF61.39 | | | | 1200 | | | | |
| VXF61.40 | | | | | | | | |
| VXF61.50 | | | | 1000 | | | | |
| VXF61.65 | | | | | | 800 | 350 | |
| VXF61.80 | | | | | | 500 | 250 | |
| VXF61.90 | 40 | | | | | 300 | 150 | |
| VXF61.91 | | | | | | 200 | 100 | |
| VXF61.92 | | | | | | 100 | 70 | |
| Data she | et | 45 | 61 | 4564 | | | | |

- 1) Actuators available for delivery: AC 24 V / AC 230 V with 3-position control
 - AC 24 V with proportional control DC 0...10 V or DC 4...20 mA
- 2) Usable up to max. medium temperature of 140 °C

 H_{100} = 100% stroke of the valve and the actuator

 $\Delta p_{\text{max}} = \text{Max. permissible differential pressure across the control path (II-I = mixing or I-II = diverting)}$ of the valve across the entire actuating range of the motorized valve

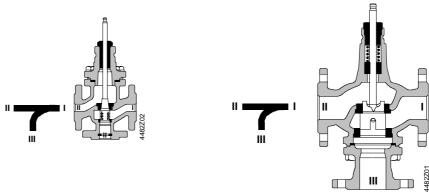
Pneumatic actuators



Pneumatic actuators are available on request from your local office.

Application is possible only if the VXF61... is used as a mixing valve.

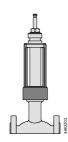
Mechanical design Valve cross-section



DN15 and 25 DN40...150

Depending on the nominal size, a guided parabolic, perforated or slot plug is used that is directly connected to the valve stem. The seats are attached to the valve body with the aid of special gland material.

Thermal insulator

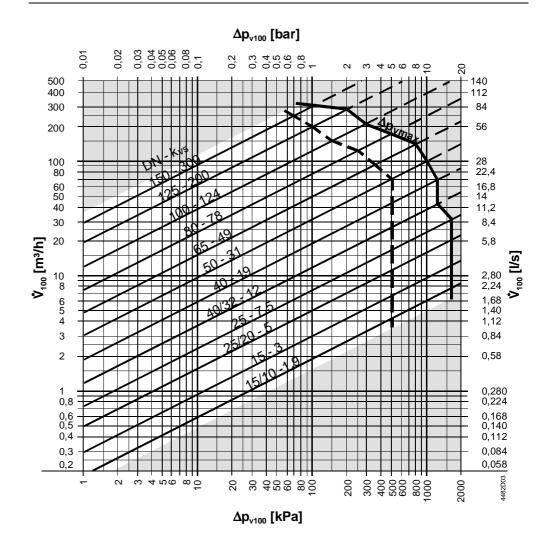


Thermal insulator for special version (type suffix: **2**), required for thermo oils from 220 °C to max. 300/350 °C; factory-mounted in the valve on delivery.

Disposal

The various material types used require that you disassemble the unit and sort the components prior to disposal.

Sizing Sizing diagram



 $100 \text{ kPa} = 1 \text{ bar} \approx 10 \text{ mWG}$

 $1 \text{ m}^{3}/\text{h}$ 0.278 kg/s water at 20 °C

 $\Delta p_{vmax.}$ = Max. permissible differential pressure across the mixing valve's II-I control path

(actuator) valid for the entire stroke range

Max. permissible differential pressure across the diverting valve's I-II control path $\Delta p_{vmax.} =$

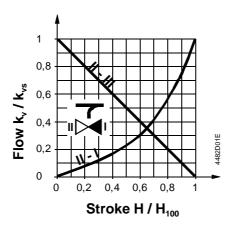
(actuator) valid for the entire stroke range

Pressure difference across the fully opened valve (actuator) across the control path Δp_{v100}

(II-I = mixing or I-II = diverting) at flow \dot{V}_{100}

Flow in m³/h \dot{V}_{100}

Valve flow characteristic



Use the three-port valve primarily as a mixing valve

Valve flow characteristic in the

Through-port

0... 30 %:

 $n_{ql} = 3$ as per VDI / VDE 2173 30...100 %:

Bypass

0...100 %: linear

Flow from port II and port III Mixing:

to port I

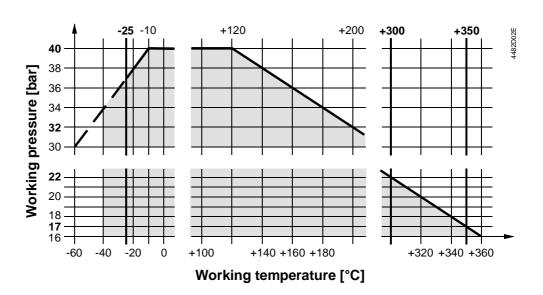
Diverting: Flow from port I

to port II and port III

Port I constant flow Port II variable flow

Port III bypass (variable flow)

Working pressure and temperature



Working pressure staged as per ISO 7268 and EN 1333 at operating temperatures of $-25 \dots +300/350$ °C as per DIN 4747 and DIN 3158.

Notes Engineering

We recommend installation in the return pipe, as the temperatures in this pipe are lower for applications in heating systems, which in turn, extends the stem sealing gland's life. Water quality requirements as per VDI 2035.



In open circuits, there is a risk of valve plug seizing caused by scale deposits. Thus, use only the most powerful actuators SKB... or SKC... for these applications. Additionally, periodic actuation (twice or three times per week) must be planned. Always use a strainer upstream of the valve.

We generally recommend that you install a strainer even with closed circuits to increase the valve's functional safety.



For media below 0 °C, use the electric ASZ6.5 stem heating element to prevent the valve stem from freezing in the sealing gland. For safety reasons, the stem heating element has been designed for AC 24 V / 30 W operating voltage.



The maximum permissible temperatures in dependence of valve body materials are:

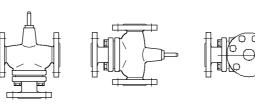
- GS-C 25 N = max. 350 °C (DN15 and DN25) - GS-45 = max. 300 °C (DN40...150)

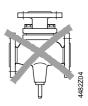
Mounting

Both valve and actuator can easily be assembled at the mounting location. Neither special tools nor adjustments are required.

The valve is supplied with mounting instructions.

Mounting positions





Permissible

Not permissible

Direction of flow:

When mounting, pay attention to the valve's flow direction symbol:

Mixing from II / III to I

Diverting from I to II / III





Commissioning



Commission the valve only if the actuator has been mounted correctly.

Stem retracts: Through-port opens, bypass closes Stem extends: Through-port closes, bypass opens

Service



For actuator service work: Turn off the pump and the operating voltage, close the shutoff valves, depressurize the pipes and allow them to cool down. Disconnect the electrical connections, where required, from the terminals. Re-commission the valve only if the actuator has been mounted correctly.

Stem sealing gland

The glands can be exchanged without removing the valve, provided the pipes are depressurized and cooled off and the stem surface is unharmed. If the stem is damaged in the gland range, replace the entire stem-plug-unit. Contact your local office or branch.

Spare parts

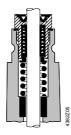
DN15 and DN25: Standard version DN15 ... 150: Special version 2



Replacement for PTFE-O-ring sealing gland, including flat seal made from copper, for cooling water, chilled water, low temperature hot water, high temperature hot water, saturated steam, super-heated steam, thermo oils and brine $-25\ ...\ +300/350\ ^{\circ}\text{C}$

For VVF61... DN15 and 25 (Stem dia. 10 mm) 4 284 8829 0 For VVF61 ... 2 DN15 ... 150 (Stem dia. 10 mm) 4 284 8829 0

DN40 ... 150: Standard version



Replacement for PTFE-O-ring sealing gland, including flat seal made from copper, for cooling water, chilled water, low temperature hot water, high temperature hot water, saturated steam, super-heated steam and brine $-25\ldots+220~^\circ\text{C}$

For VVF61... DN40 ... 150 (Stem dia. 14 mm) 4 679 5630 0

Warranty

The use of third-party actuators expressly voids any warranty claims.

The technical data Δp_{max} , Δp_{s} , leakage rate, noise level and life apply only when used together with the Landis & Staefa actuators as listed in "Type summary".

Technical data

PN class PN40

Valve flow characteristic

Through-port

0 ... 30 % linear

 $30 \dots 100 \%$ $n_{gl} = 3 \text{ as per VDI / VDE } 2173$

Bypass

0... 100% linear

Leakage rate

Through-port 0 ... 0.02 % of k_{vs} value, VDI / VDE 2173 Bypass 0.5...2 % of k_{vs} value, VDI / VDE 2173 Permissible pressure 4000 kPa (40 bar), ISO 7268 / EN 1333 Working pressure DIN 4747 / DIN 3158 in the range of

 $-25 \dots +300/350$ °C

Flange connections ISO 7005

Stroke

- DN15... 50 20 mm - DN65... 150 40 mm

Materials Valve body

DN15 and 25 cast steel GS-C 25 N as per DIN 17245 DN40... 150 cast steel GS-45 as per DIN 1681

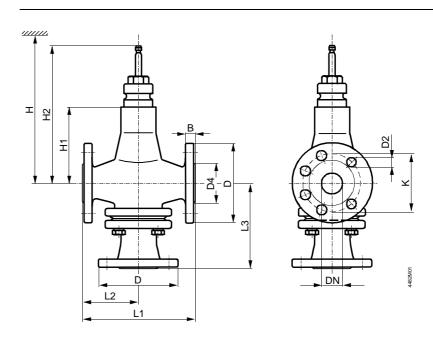
Seat, plug, and stem stainless steel

Sealing gland

Standard version stainless steel Gland materials PTFE sleeves

CM1N4482E / 07.2001 6/8

Dimensions



| DN | В | D | D2 | D4 | H1 | H2 | K | L1 | L2 | L3 | Weight |
|------|----|------|---------|------|-----|-------|-----|-----|-----|-----|--------|
| [mm] | | dia. | dia. | dia. | | | | | | | [kg] |
| 15 | 14 | 95 | 14 (4x) | 46 | 96 | 192.5 | 65 | 130 | 65 | 65 | 4.5 |
| 25 | 16 | 115 | | 65 | 111 | 207.5 | 85 | 160 | 80 | 80 | 7.4 |
| 40 | 18 | 150 | 18 (4x) | 84 | 136 | 232.5 | 110 | 200 | 100 | 162 | 17.0 |
| 50 | 20 | 165 | | 99 | | | 125 | 230 | 115 | 170 | 21.0 |
| 65 | 22 | 185 | 18 (8x) | 118 | 162 | 278.5 | 145 | 290 | 145 | 215 | 34.0 |
| 80 | 24 | 200 | | 132 | 170 | 286.5 | 160 | 310 | 155 | 230 | 42.0 |
| 100 | | 235 | 22 (8x) | 156 | 180 | 296.5 | 190 | 350 | 175 | 250 | 62.0 |
| 125 | 26 | 270 | 26 (8x) | 184 | 200 | 316.5 | 220 | 400 | 200 | 280 | 86.0 |
| 150 | 28 | 300 | | 211 | 225 | 341.5 | 250 | 480 | 240 | 305 | 124.0 |

| DN | | Н | |
|------|-------|-------|-------|
| [mm] | SKD | SKB | SKC |
| 15 | > 596 | > 671 | |
| 25 | > 611 | > 686 | |
| 40 | | > 711 | |
| 50 | | | |
| 65 | | | > 737 |
| 80 | | | > 745 |
| 100 | | | > 755 |
| 125 | | | > 775 |
| 150 | | | > 800 |

DN = Nominal diameter

- H = Total actuator height plus minimum distance to the wall or the ceiling for mounting, connection, operation, service, etc.
- H1 = Dimension from the pipe centre to install the actuator (upper edge)
- H2 = Valve in the "Closed" position means that the stem is fully extended

Dimensions in mm