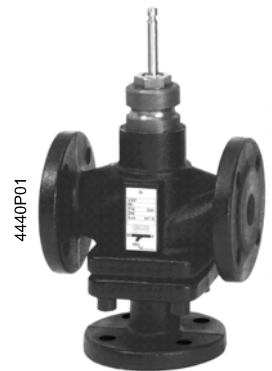


Three-port valves with flange, PN16

VXF41...



Three-port valves with flange, PN16

- Can be used as mixing or diverting valves
- Grey cast iron GG-25
- DN15...150 mm
- k_{vs} 1.9...300 m³/h
- Stroke 20 or 40 mm
- Can be equipped with actuators SQX..., SKD..., SKB... and SKC...

Use

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

For open and closed circuits.

Media

Standard versions with standard stem sealing gland for:

Cooling water Chilled water Low temperature hot water High temperature hot water Water with anti-freeze ^{1) 2)} Brine ^{1) 2)}	-25 ... +130 °C
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Special versions with special stem sealing gland for:

High temperature hot water Thermo oils	130 ... 180 °C
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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 max. -10 °C as per DIN 3158 (stress case I) or up to -25 °C as per DIN 3158 (stress case II)

Type summary

Standard version					
Type	DN [mm]	k_{vs} [m ³ /h]	S_v	$\Delta p_{vmax.}$	
				mixing kPa	diverting kPa
VXF41.14 ¹⁾	15/10	1,9	> 50	800	200 ²⁾
VXF41.15 ¹⁾	15	3			
VXF41.24 ¹⁾	25/20	5			
VXF41.25 ¹⁾	25	7,5			
VXF41.39 ¹⁾	40/32	12			
VXF41.40 ¹⁾	40	19			
VXF41.49 ¹⁾	50/40	19			
VXF41.50 ¹⁾	50	31	> 100		
VXF41.65	65	49	>100	500	
VXF41.80	80	78		350	
VXF41.90	100	124		250	150
VXF41.91	125	200		175	100
VXF41.92	150	300		100	70

Special versions with type suffix 4

For media and temperatures		Example:
High temperature hot water	130 ... 180 °C	VXF41.504
Thermo oils		

1) With tight bypass (actuator SQX...)

2) If noise is permitted, the same values apply as for mixing

DN = Nominal diameter

k_{vs} = Nominal flow value as per VDI 2173

S_v = Rangeability as per VDI 2173

$\Delta p_{vmax.}$ = Max. permissible differential pressure across the control path (II-I = mixing or I-II = diverting) of the valve valid for entire stroke range

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: **VXF41.50**

Delivery

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

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

Equipment combinations

Valves	H_{100} [mm]	Actuators ¹⁾							
		SQX... ^{2) 3)}		SKD... ²⁾		SKB...		SKC...	
		mixing	diverting	mixing	diverting	mixing	diverting	mixing	diverting
VXF41.14	20	800	200 ⁴⁾	800	200 ⁴⁾	800	200 ⁴⁾		
VXF41.15									
VXF41.24									
VXF41.25									
VXF41.39									
VXF41.40									
VXF41.49	40	350	100	500	100			500	200 ⁴⁾
VXF41.50									
VXF41.65									
VXF41.80									
VXF41.90									
VXF41.91									
VXF41.92									
Data sheet									
		4554		4561		4564			

1) Actuators available for delivery: • AC 24 V / AC 230 V with 3-position signal

• AC 24 V with proportional pos. signal DC 0...10 V or DC 4...20 mA

2) Usable up to max. medium temperature of 140 °C

3) The Δp_{max} and Δp values are valid for the new SQX32... / SQX82... and SQX62 actuators; deliverable from January 1999

4) If noise is permitted, the same values apply as for mixing

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

Δp_{max} = 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

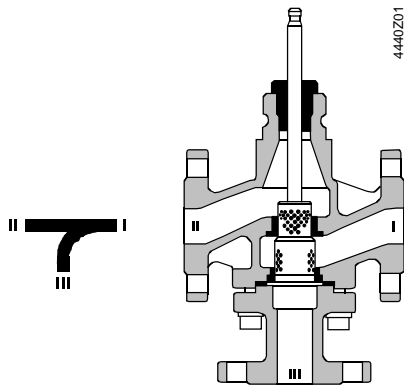


Pneumatic actuators are available on request from your local office.

Application is possible only if the VXF41... is used as a mixing valve.

Mechanical design

Valve cross-section



Depending on the nominal size, a guided perforated or slot plug is used that is directly connected to the valve stem.

DN15...50 with tight bypass when the SQX... actuator is used.

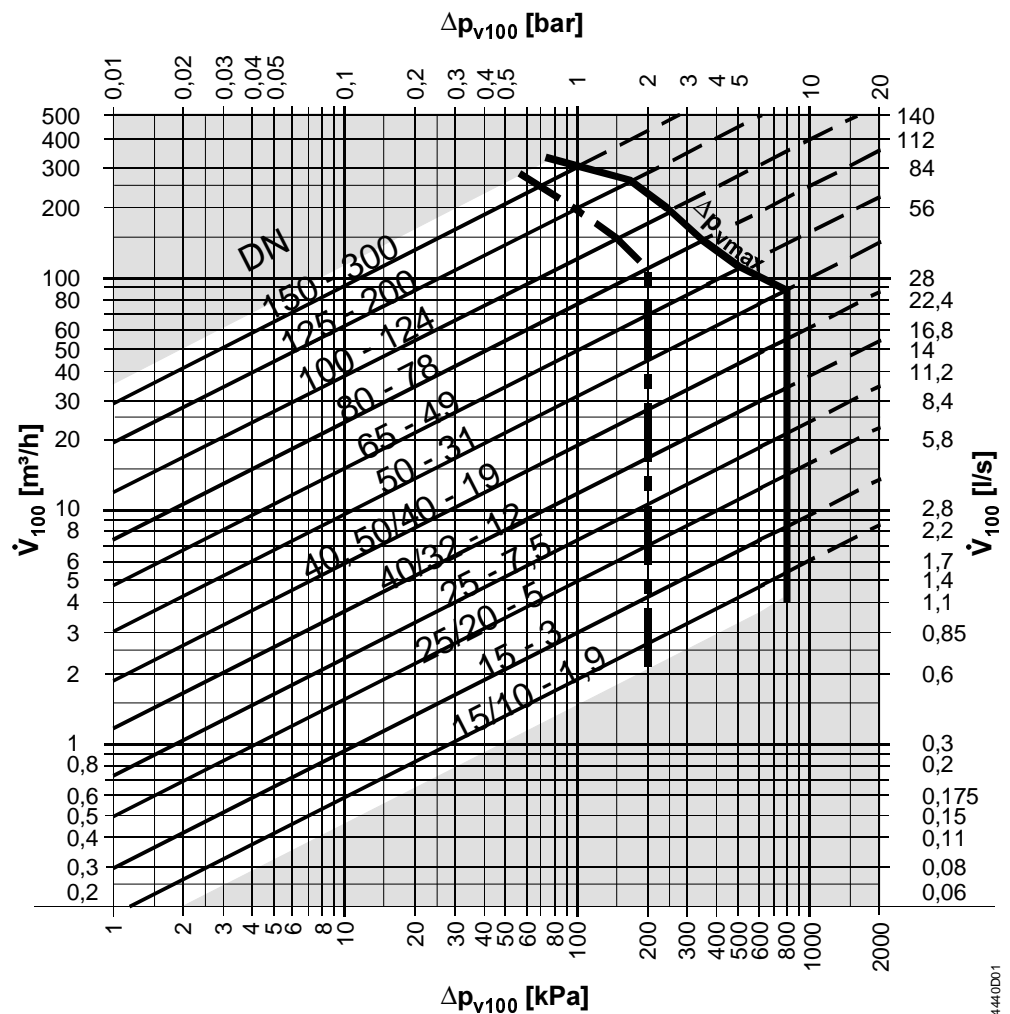
The seats are attached to the valve body with the aid of special gland material.

Disposal

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

Sizing

Sizing diagram



100 kPa = 1 bar \approx 10 mWG
 1 m³/h = 0.278 kg/s water at 20 °C

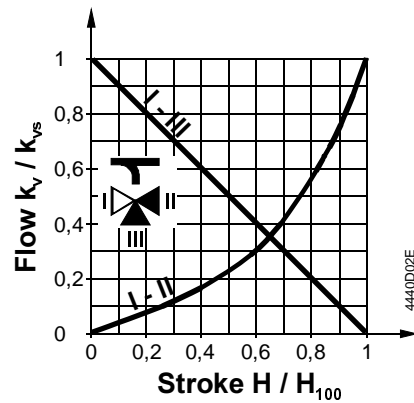
— = Δp_{vmax} = Max. permissible differential pressure across the **mixing valve's II-I control path** (actuator) valid for the entire stroke range

- - - = Δp_{vmax} = Max. permissible differential pressure across the **diverting valve's I-II control path** (actuator) valid for the entire stroke range

Δp_{v100} = Pressure difference across the fully opened valve (actuator) across the control path (II-I = mixing or I-II = diverting) at flow \dot{V}_{100}

\dot{V}_{100} = Flow in m³/h

Valve flow characteristic



Valve flow characteristic in the **through-port**

0... 30 %: linear

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

Bypass

0...100 %: linear

Mixing: Flow from port II and port III to port I

Diverting: Flow from port I to port II and port III

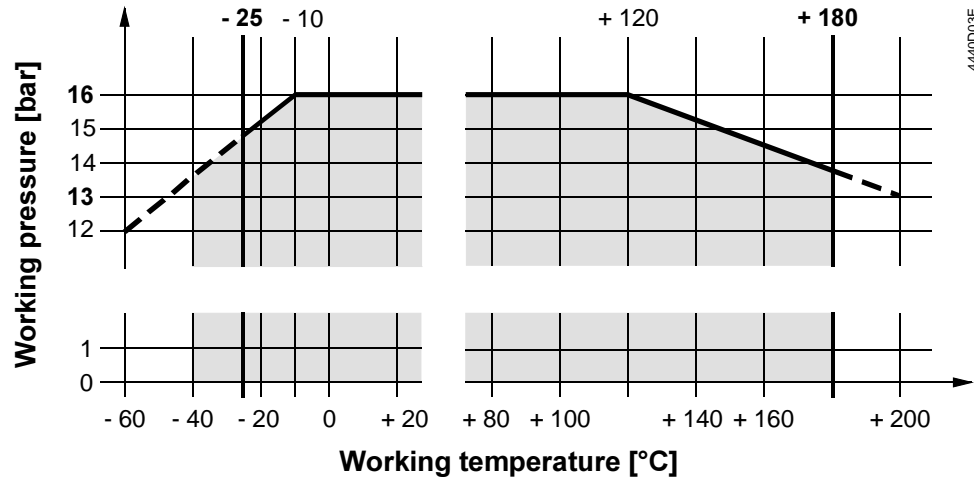
Port I = constant flow

Port II = variable flow

Port III = bypass (variable flow)

Use the three-port valve primarily as a mixing valve

Working pressure and temperature



Working pressure staged as per ISO 7268 and EN 1333

at operating temperatures of $-25 \dots +180 \text{ °C}$ as per DIN 4747 and DIN 3158.

Note Engineering

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.



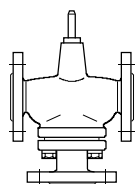
For media below 0 °C, use the electric **ASZ6.5 stem heating element** to prevent the valve stem from freezing in the sealing gland. For safety reasons, the stem heating element has been designed for **AC 24 V / 30 W** operating voltage.

Mounting

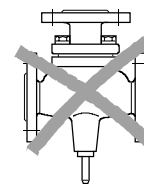
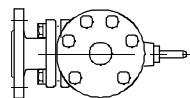
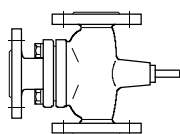
Both valve and actuator can easily be assembled at the mounting location. Neither special tools nor adjustments are required.

The valve is supplied with mounting instructions.

Mounting positions



Permissible

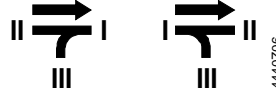


Not permissible

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



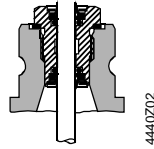
For actuator service work: Turn off the pump and the operating voltage, close the shutoff valves, depressurize the pipes and allow them to cool down. Disconnect the electrical connections, where required, from the terminals. Re-commission the valve only if the actuator has been mounted correctly.

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

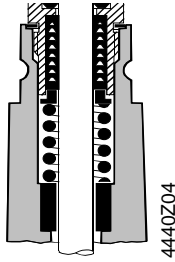
Standard version



Replacement for EPDM-O-ring sealing gland, including flat seal made from copper, for cooling water, chilled water, low temperature hot water, high temperature hot water, and brine $-25 \dots +130 \text{ }^\circ\text{C}$

For VXF41... DN15...40 (Stem dia. 10 mm) **4 284 8806 0**
 For VXF41... DN50 ... 150 (Stem dia. 14 mm) **4 679 5629 0**

Special version



Replacement for PTFE sealing gland, including flat seal made from copper, for high temperature hot water, saturated steam, hot steam, and thermo oils $130 \dots 180 \text{ }^\circ\text{C}$

For VXF41... 4 DN15...40 (Stem dia. 10 mm) **4 284 8829 0**
 For VXF41... 4 DN50 ... 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

Function data

PN class	PN16
Valve flow characteristic	
Through-port	linear
0 ... 30 %	$n_{gl} = 3$ as per VDI / VDE 2173
30 ... 100 %	
Bypass	linear
0... 100%	
Leakage rate	
Through-port	0 ... 0.02 % of k_{vs} value, VDI / VDE 2173
Bypass	
DN15... 50 with SQX... actuator	0 ... 0.02 % of k_{vs} value, VDI / VDE 2173
DN15... 150 with actuators	
SKD..., SKB... and SKC...	0.5...2% of k_{vs} value
Permissible pressure	1600 kPa (16 bar), ISO 7268 / EN 1333
Working pressure	DIN 4747 / DIN 3158 in the range of $-25 \dots +180 \text{ }^\circ\text{C}$
Flange connections	ISO 7005
Stroke	
– DN15 ... 50	20 mm
– DN65 ... 150	40 mm

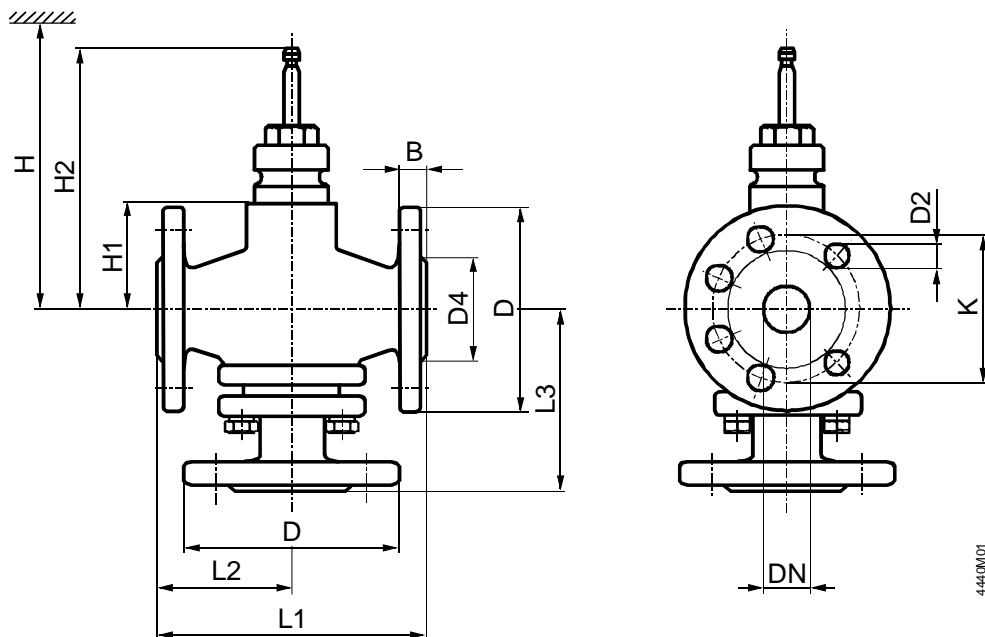
Materials

Valve body
 Seat, plug, and stem
 Sealing gland
 Standard version
 Special version
 Gland materials

GG-25 as per DIN EN 1561
 stainless steel

 brass
 stainless steel
 EPDM-O-rings, PTFE sleeves

Dimensions



DN	B	D	D2	D4	H1	H2	K	L1	L2	L3	Weight
[mm]		dia.	dia.	dia.							[kg]
15	14	95	14 (4x)	46	64	160.5	65	130	65	114	4.9
25	16	115		65	64	160.5	85	160	80	118	6.8
40	18	150		84	57	153.5	110	200	100	140	11.7
50	20	165	19 (4x)	99	96	192.5	125	230	115	145	19
65	20	185		118	114	230.5	145	290	145	180	29
80	22	200		132	126	242.5	160	310	155	200	36
100	24	220	19 (8x)	156	146	262.5	180	350	175	225	52
125	26	250		184	163	279.5	210	400	200	255	71
150	26	285	23 (8x)	211	186	302.5	240	480	240	290	96

DN	H			SKC...
[mm]	SQX...	SKD...	SKB...	
15	> 489	> 564	> 639	
25	> 489	> 564	> 639	
40	> 482	> 557	> 632	
50	> 521	> 596	> 671	
65				> 689
80				> 701
100				> 721
125				> 738
150				> 761

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