Three-port seat valves with flange, PN10

VXF31...

Three-port seat valves with flange, PN10

- **Can be used as mixing or diverting valves**
- **Nodular cast iron GG-20 / GG-25**
- **DN25...150 mm**
- **k_{vs} 5...300 m^3/h**
- **Stroke 20 or 40 mm**
- **Can be equipped with actuators SQX..., SKD..., SKB... and SKC...**

Use

In heating, ventilating, and air conditioning systems as **a control valve for "mixing" or "diverting" functions**.
For closed circuits only.

Media

Standard versions with standard stem sealing gland for:	
Chilled water **Low temperature hot water** **High temperature hot water** **Water with anti-freeze** up to max. 50 % vol. [1) 2)] **Brine** [1) 2)]	−25 ... +120 °C

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	k_{vs}	S_v	$\Delta p_{vmax.}$	
				mixing	diverting
	[mm]	[m³/h]		kPa	kPa
VXF31.24	25/20	5			
VXF31.25	25	7.5	> 50		
VXF31.39	40/32	12			
VXF31.40	40	19			
VXF31.50	50	31		100	100
VXF31.65	65	49			
VXF31.80	80	78	> 100		70
VXF31.90	100	124			
VXF31.91	125	200			60
VXF31.92	150	300			50

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 the entire stroke range stroke range

Accessories

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

Ordering

Indicate type.
Example: **VXF31.50**

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		Actuators [1]							
		SQX... [2]		SKD...		SKB...		SKC...	
	H_{100}	mixing	diverting	mixing	diverting	mixing	diverting	mixing	diverting
	[mm]	Δp_{max} [kPa]							
VXF31.24									
VXF31.25									
VXF31.39									
VXF31.40	20	100	100	100	100	100	100		
VXF31.49									
VXF31.50									
VXF31.65		80	60		60				
VXF31.80		60	40	80	40		70		
VXF31.90								100	70
VXF31.91	40							100	60
VXF31.92								100	50
Data sheet		**4554**		**4561**		**4564**			

1) Actuators available for delivery:
- AC 24 V / AC 230 V with 3-position signal
- AC 24 V with DC 0...10 V or DC 4...20 mA proportional pos. signal

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

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

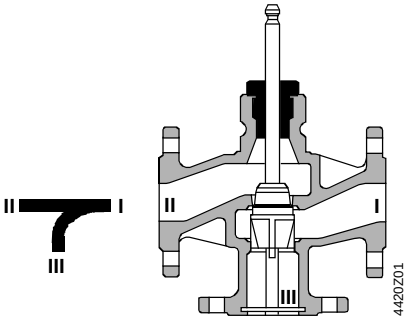
Δp_{max} = Max. permissible differential pressure across the control path (II-I = mixing or I-II = diverting) of the valve across the entire actuating range of the motorized valve

Pneumatic actuators

Pneumatic actuators are available on request from your local office.
⚠ **Application is possible only if the VXF31... is used as a mixing valve.**

Mechanical design

Valve cross-section



Guided parabolic plug which is integrated in the valve stem.

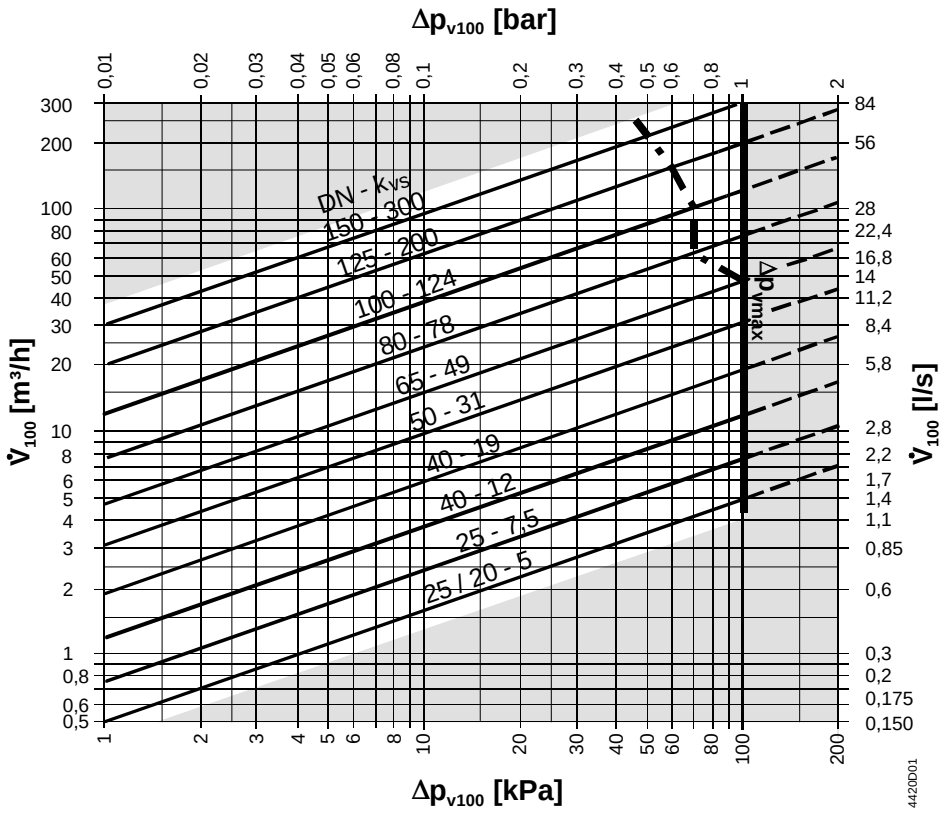
The seats are machined in the valve body.

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 ≈ 10 mWG

1 m^3/h = 0.278 kg/s water at 20 °C

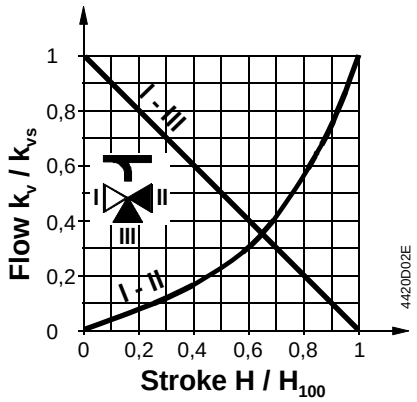
——— = $\Delta p_{vmax.}$ = Max. permissible differential pressure across the **mixing valve's II-I control path** (actuator) valid for the entire stroke range

– · – = $\Delta p_{vmax.}$ = 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 m^3/h

Valve flow characteristic



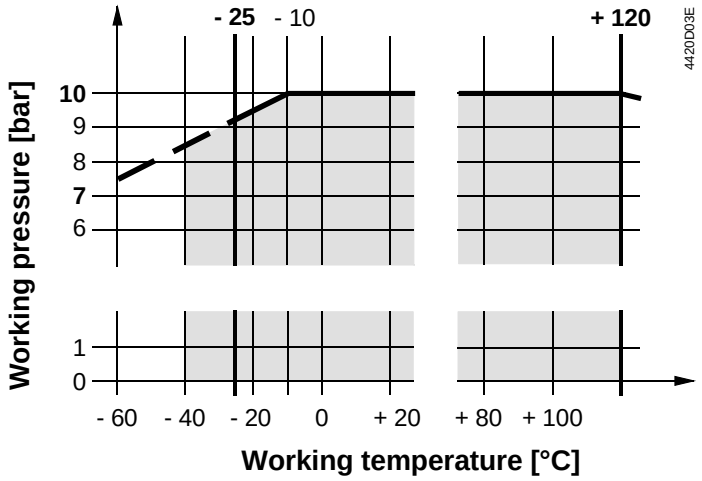
Use the three-port valve primarily as a mixing valve

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

Working pressure and temperature



Working pressure staged as per ISO 7268 and EN 1333 at operating temperatures of −25 ... +120 °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.

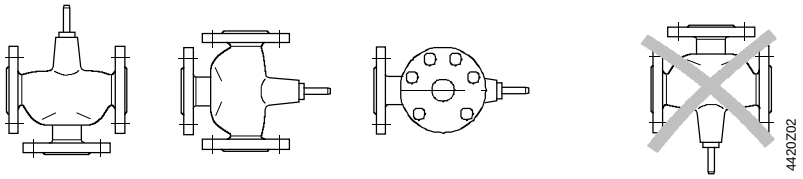
⚠ We generally recommend that you install a **strainer even with closed circuits** to increase the valve's functional safety.

⚠ **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.

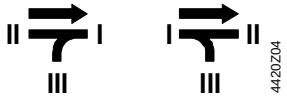
Mounting positions



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

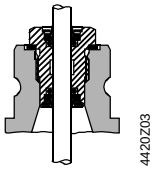
Service ⚠ **For actuator service work: Turn off the pump and the operating voltage, close the shutoff valves, depressurize the pipes and allow them to cool down. Disconnect the electrical connections, where required, from the terminals. Re-commission the valve only if the actuator has been mounted correctly.**

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 chilled water, low temperature hot water, high temperature hot water, and brine −25 ... +120 °C

For VXF31... DN25...80	(Stem dia. 10 mm)	**4 284 8806 0**
For VXF31... DN100...150	(Stem dia. 14 mm)	**4 679 5629 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

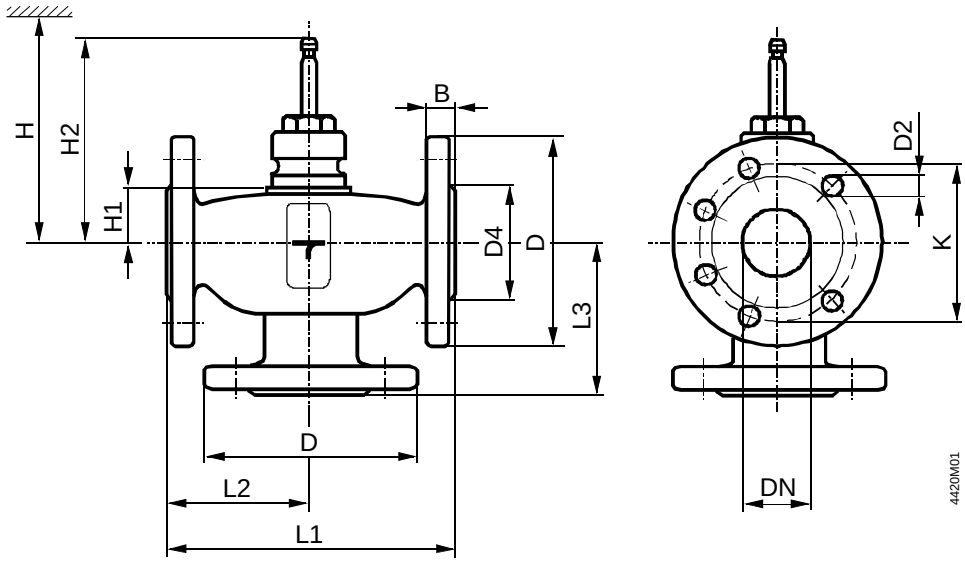
Function data

PN class	PN10
Valve flow characteristic	
Through-port	
0 ... 30 %	linear
30 ... 100 %	n_{gl} = 3 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
Permissible pressure	1000 kPa (10 bar), ISO 7268 / EN 1333
Working pressure	DIN 4747 / DIN 3158 in the range of −25 ... +120 °C
Flange connections	ISO 7005
Stroke	
– DN25 ... 80	20 mm
– DN100 ... 150	40 mm

Materials

Valve body	GG-20/GG-25 as per DIN 1561
Valve stem	stainless steel
Plug	
DN25 ... 65	brass
DN80 ... 150	bronze
Sealing gland	
Standard version	brass
Gland materials	EPDM-O rings

Dimensions



DN [mm]	B	D dia.	D2 dia.	D4 dia.	H1	H2	K	L1	L2	L3	Weight [kg]
25	16	115	14 (4x)	65	34	130.5	85	160	80	80	4.6
40	18	150		84	39	135.5	110	200	100	100	8.0
50	20	165	19 (4x)	99			125	230	115	115	11.7
65		185		118	60	156.5	145	290	145	145	14.7
80	22	200		132			160	310	155	155	18.8
100	24	220	19 (8x)	156	93	209.5	180	350	175	175	29.0
125	26	250		184	104	220.5	210	400	200	200	42.0
150		285	23 (8x)	211	120	236.5	240	480	240	240	61.0

DN	H			
[mm]	**SQX...**	**SKD...**	**SKB...**	**SKC...**
25	> 459	> 534	> 609	
40	> 464	> 539	> 614	
50				
65	> 485	> 560	> 635	
80				
100	> 516	> 591	> 666	> 666
125	> 527	> 602	> 677	> 677
150	> 543	> 618	> 693	> 693

DN = Nominal diameter

H = Total actuator height plus minimum distance to wall or 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

replaces CE1N4442E