



## 3-Port Seat Valves with Flange, PN 10

VXF31...

- Grey cast iron EN-GJL-250 valve body
- DN 15...150
- $k_{vs}$  2.5...315 m<sup>3</sup>/h
- Can be equipped with SQX... electromotoric or SKD...-, SKB...- and SKC...- electrohydraulic actuators

### Use

For use in heating, ventilating and air conditioning systems as a control valve for «mixing» or «diverting» functions.  
For closed circuits only.

## Type summary

Type	DN	$k_{vs}$ [m <sup>3</sup> /h]	$S_v$
VXF31.15-2.5	15	2,5	> 50
VXF31.15-4		4	
VXF31.24	25	5	
VXF31.25-6.3		6,3	
VXF31.25		7,5	
VXF31.25-10		10	
VXF31.39	40	12	
VXF31.40-16		16	
VXF31.40		19	
VXF31.40-25		25	
VXF31.50	50	31	> 100
VXF31.50-40		40	
VXF31.65	65	49	
VXF31.65-63		63	
VXF31.80	80	78	
VXF31.80-100		100	
VXF31.90	100	124	
VXF31.100-160		160	
VXF31.91	125	200	
VXF31.125-250		250	
VXF31.92	150	300	
VXF31.150-315		315	

DN = Nominal size

$k_{vs}$  = Nominal flow rate of cold water (5...30 °C) through the fully open valve ( $H_{100}$ ) by a differential pressure of 100 kPa (1 bar)

$S_v$  = Rangeability  $k_{vs} / k_{vr}$

$k_{vr}$  = Smallest  $k_v$  value, at which the flow characteristic tolerances can still be maintained, by a differential pressure of 100 kPa (1 bar)

### Accessories

Type	Description
ASZ6.5	Electric stem heating element, AC 24 V / 30 W, required for media below 0 °C

### Order

When ordering please give quantity, product name and type reference.

Example: 2 three-port valves VXF31.50

### Delivery

Valves, actuators and accessories are packed and supplied separately.  
The valves are supplied without counter-flanges and without flange gaskets.

### Spare parts

See overview, section „Spare parts“, page 10

## Equipment combinations

Valves	H <sub>100</sub> [mm]	Actuators							
		SQX... <sup>1)</sup>		SKD... <sup>1)</sup>		SKB...		SKC...	
		Mixing	Diverting <sup>2)</sup>	Mixing	Diverting <sup>2)</sup>	Mixing	Diverting <sup>2)</sup>	Mixing	Diverting <sup>2)</sup>
$\Delta p_{\max}$ [kPa]									
VXF31.15-2.5	20	300	100	300	100	300	100		
VXF31.15-4									
VXF31.24									
VXF31.25-6.3									
VXF31.25									
VXF31.25-10									
VXF31.39									
VXF31.40-16									
VXF31.40									
VXF31.40-25									
VXF31.50									
VXF31.50-40									
VXF31.65									
VXF31.65-63									
VXF31.80	40	175	60	275	60	70			
VXF31.80-100									
VXF31.90									
VXF31.100-160									
VXF31.91									
VXF31.125-250									
VXF31.92									
VXF31.150-315									

<sup>1)</sup> Usable up to maximum medium temperature of 150 °C

<sup>2)</sup> If noise is permitted, the same values apply as for mixing.

H<sub>100</sub> = Nominal stroke

$\Delta p_{\max}$  = Maximum permissible differential pressure across the valve (mixing: port A-AB, B-AB, diverting: port AB-A, AB-B), valid for the entire actuating range of the motorized valve

## Actuator overview

Type	Actuator type	Operating voltage	Positioning signal	Spring return	Positioning time	Positioning force	Data sheet		
SQX32.00	Electro-motoric	AC 230 V	3- position	No	150 s	700 N	N4554		
SQX32.03					35 s				
SQX82.00		AC 24 V			150 s				
SQX82.03					35 s				
SQX62					DC 0...10 V <sup>1)</sup>				
SKD32.50	Electro-hydraulic	AC 230 V	3- position	No	120 s	1000 N	N4561		
SKD32.21				Yes	30 s				
SKD32.51				No	120 s				
SKD82.50		AC 24 V		No	120 s				
SKD82.51				Yes	120 s				
SKD60				DC 0...10 V <sup>1)</sup>	No			30 s	
SKD62...				DC 0...10 V <sup>1)</sup>	Yes			30 s	
SKB32.50	Electro-hydraulic	AC 230 V	3- position	No	120 s	2800 N	N4564		
SKB32.51				Yes					
SKB82.50		AC 24 V		No				120 s	
SKB82.51				Yes				120 s	
SKB60				DC 0...10 V <sup>1)</sup>				No	120 s
SKB62...				DC 0...10 V <sup>1)</sup>				Yes	120 s
SKC32.60	Electro-hydraulic	AC 230 V	3- position	No	120 s	2800 N	N4564		
SKC32.61				Yes					
SKC82.60		AC 24 V		No				120 s	
SKC82.61				Yes				120 s	
SKC60				DC 0...10 V <sup>1)</sup>				No	120 s
SKC62...				DC 0...10 V <sup>1)</sup>				Yes	120 s

<sup>1)</sup> or DC 4...20 mA

## Pneumatic actuators

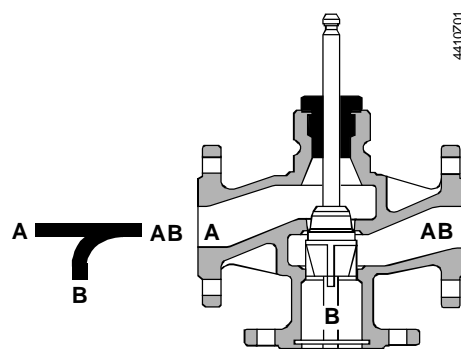
Available on request from your local office.



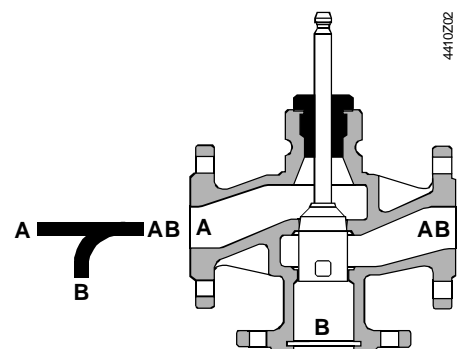
**Application is possible only if the VXF31... is used as a mixing valve.**

## Technical design / mechanical design

### Valve cross section



DN 15... 40  
closes against pressure

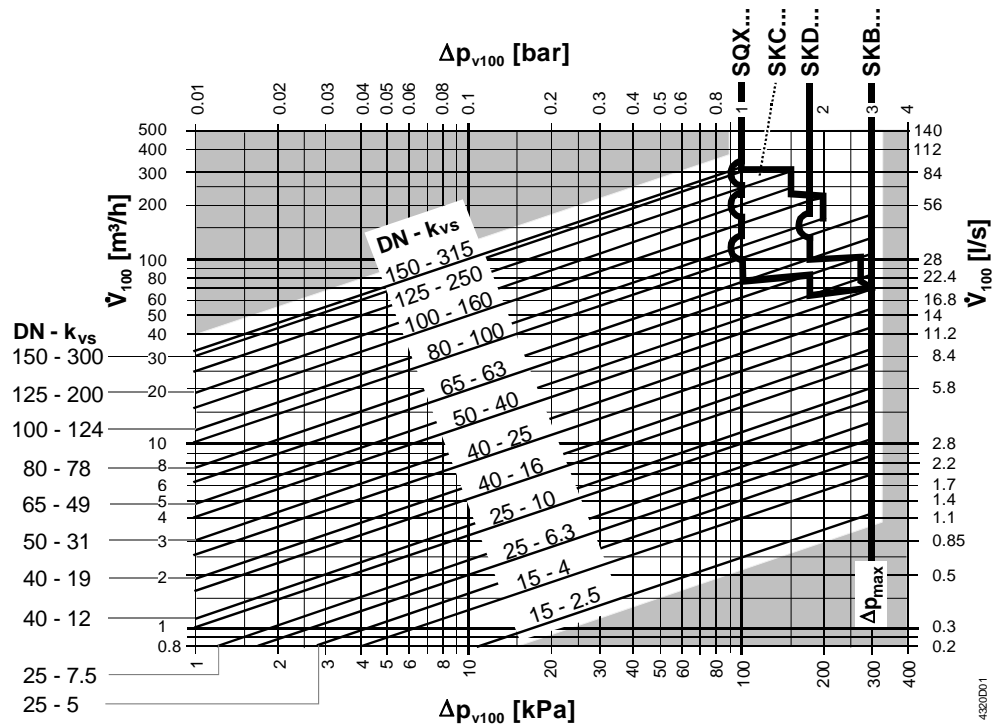


DN 50... 150  
closes against pressure

Guided plug which is integrated in the valve stem.  
The seats are machined in the valve body.

## Sizing

### Flow diagram «Mixing»



$\Delta p_{max}$  = Maximum permissible differential pressure across the valve (mixing: port A-AB, B-AB, diverting: port AB-A, AB-B), valid for the entire actuating range of the motorised valve

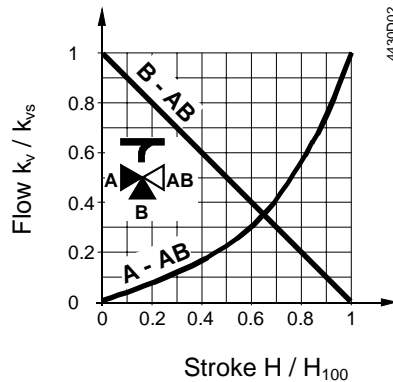
$\Delta p_{V100}$  = Differential pressure across the fully open valve and the valve's control path A → AB, B → AB by a volume flow  $\dot{V}_{100}$

$\dot{V}_{100}$  = Volumetric flow through the fully open valve ( $H_{100}$ )

100 kPa = 1 bar ≈ 10 mWC

1 m³/h = 0.278 l/s water at 20 °C

### Valve flow characteristic



#### Through-port

0...30 %: linear

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

$k_{vs}$ -values 100, 160, 250, 315 m³/h:

0...30 % → linear

30...75 % → equal-percentage ( $n_{gl} = 3$ ) as per VDI / VDE 2173

5...100 % → optimized for maximal flow  $k_{v100}$

#### Bypass

0...100 %: linear

**Mixing:** Flow from port A and port B to port AB

**Diverting:** Flow from port AB to port A and port B

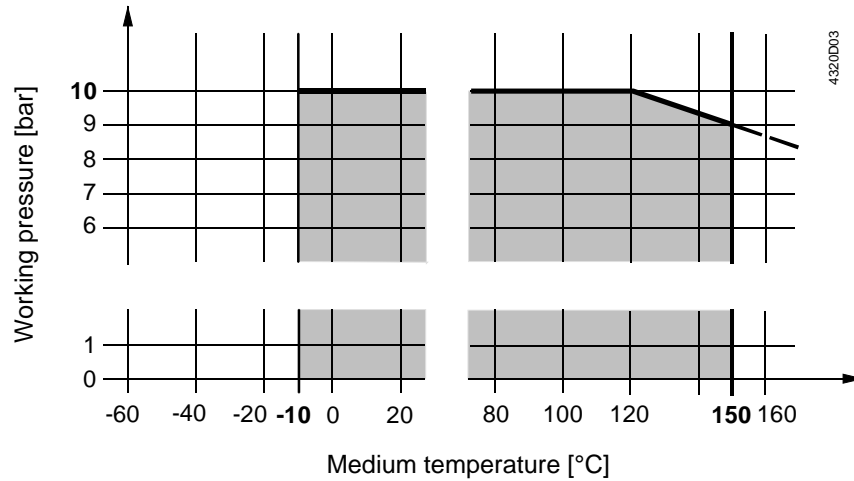
Port AB = constant flow

Port A = variable flow

Port B = bypass (variable flow)

Use the 3-port valve primarily as a mixing valve.

## Working pressure and medium temperature



### Working pressure and medium temperature staged as per ISO 7005

Current local legislation must be observed.

## 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.



Always use a strainer upstream of the valve to increase the valve's functional safety.



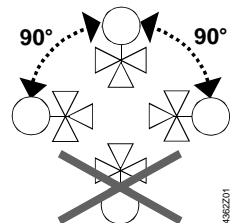
For media below 0 °C, use the electric ASZ6.5 stem heating element to prevent the valve stem from freezing in the sealing gland. For safety reasons, the stem heating element has been designed for AC 24 V / 30 W operating voltage.

### 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 74 319 0519 0.

### Orientation



### Direction of flow

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

Mixing from  
A / B to AB



Diverting from  
AB to A / B



### Commissioning



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

Valve stem retracts: through-port A – AB opens, bypass B closes

Valve stem extends: through-port A – AB closes, bypass B opens

## Maintenance

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### Warning

VXF31... 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 actuator is correctly fitted.

### 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.

### Disposal



Before disposal the valve must be dismantled and separated into its various constituent materials.

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

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The technical data given for these applications is valid only in conjunction with the Siemens actuators as detailed under «Equipment combinations».

All terms of the warranty will be invalidated by the use of actuators from other manufacturers.

## Technical data

Functional data	PN class	PN 10 to ISO 7268	
	Working pressure	to ISO 7005 within the permissible medium temperature range according to the diagram on page 6	
	Flow characteristic		
	through-port	0...30 %	linear
		30...100 %	equal percentage; $n_{gl} = 3$ to VDI / VDE 2173 <sup>1)</sup>
	bypass	0...100 %	linear
	Leakage rate		
	through-port	0...0.02 % of $k_{vs}$ value to DIN EN 1349	
	bypass	0.5...2 % of $k_{vs}$ value	
	Permissible media	chilled water, low temperature hot water, high temperature hot water, water with anti-freeze, brine; recommendation: water treatment to VDI 2035	
	Medium temperature <sup>2)</sup>	-10...+150 °C	
	Rangeability $S_v$	DN 15...40:	>50
		DN 50...150:	>100
Nominal stroke	DN 15...80:	20 mm	
	DN 100...150:	40 mm	
Industry standards	Pressure Equipment Directive	PED 97/23/EC	
	Pressure Accessories	as per article 1, section 2.1.4	
	Fluid group 2:	<ul style="list-style-type: none"> <li>• DN 15...100</li> <li>• DN 125...150</li> </ul>	<ul style="list-style-type: none"> <li>• without CE-marking as per article 3, section 3 (sound engineering practice)</li> <li>• category I, with CE-marking</li> </ul>
Materials	Valve body	grey cast iron EN-GJL-250	
	Stem	stainless steel	
	Plug	DN 15...40:	brass
		DN 50...150:	bronze
	Sealing gland	Brass, silicon-free	
Gland materials	EPDM O rings, silicon-free		
Dimensions / Weight	Refer to «Dimensions»		
	Flange connections	to ISO 7005	

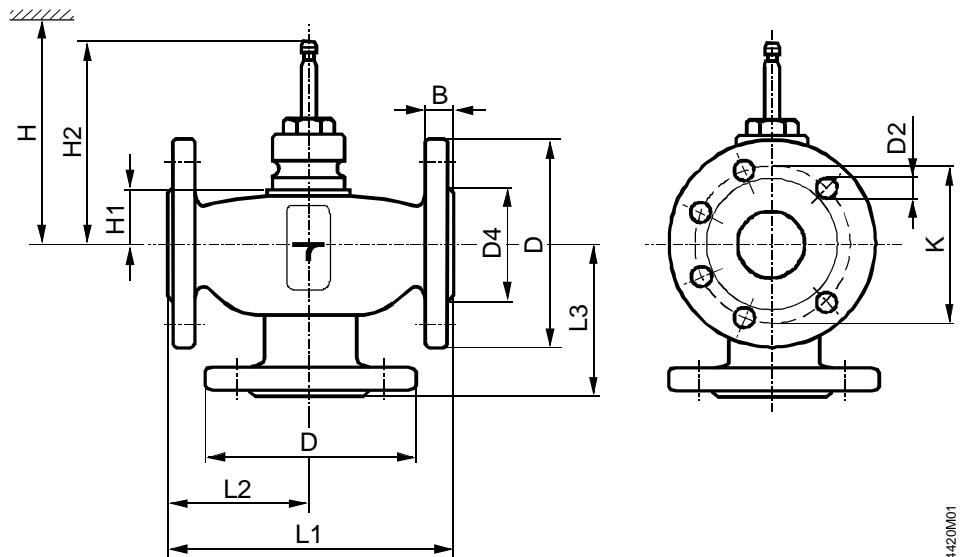
<sup>1)</sup>  $k_{vs}$ -values 100, 160, 250, 315 m<sup>3</sup>/h: flow characteristic is over 75 % stroke optimized for maximal flow  $k_{v100}$ , see page 5.

<sup>2)</sup> Electric stem heating element ASZ6.5 required for media below 0 °C.



## Dimensions

Dimensions in mm



4420/M01

Type	DN	B	D Ø	D2 Ø	D4 Ø	K	L1	L2	L3	H1	H2	H				5 kg [kg]
												SQX...	SKD...	SKB...	SKC...	
VXF31.15-2.5	15	14	95	14 (4x)	46	65	130	65	65	40,5	137	> 465	> 540	> 615		3,3
VXF31.15-4																
VXF31.24	25	16	115	14 (4x)	65	85	160	80	80	34	130,5	> 459	> 534	> 609		6,3
VXF31.25-6.3																
VXF31.25																
VXF31.25-10	40	18	150	19 (4x)	84	110	200	100	100	39	135,5	> 464	> 539	> 614		10,4
VXF31.39																
VXF31.40-16																
VXF31.40	50	20	165	19 (4x)	99	125	230	115	115	60	156,5	> 485	> 560	> 635		13,8
VXF31.40-25																
VXF31.50	65	20	185	19 (4x)	118	145	290	145	145	60	156,5	> 485	> 560	> 635		18,5
VXF31.65																
VXF31.65-63	80	22	200	19 (4x)	132	160	310	155	155	60	156,5	> 485	> 560	> 635		24,1
VXF31.80																
VXF31.80-100	100	24	220	19 (8x)	156	180	350	175	175	93	209,5				> 666	36,5
VXF31.90																
VXF31.100-160	125	26	250	19 (8x)	184	210	400	200	200	104	220,5				> 677	50
VXF31.91																
VXF31.125-250	150	26	285	23 (8x)	211	240	480	240	240	120	236,5				> 693	70
VXF31.92																
VXF31.150-315																

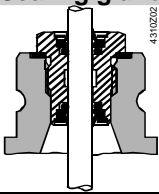
DN = Nominal size

H = Total actuator height plus minimum distance to the wall or the ceiling for mounting, connection, operation, maintenance 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

## Order numbers for spare parts

Type	Sealing gland 	Set  Plug with stem, circlip, sealing
VXF31.15-2.5	4 284 8806 0	74 676 0198 0
VXF31.15-4	4 284 8806 0	74 676 0199 0
VXF31.24	4 284 8806 0	74 676 0034 0
VXF31.25-6.3	4 284 8806 0	74 676 0200 0
VXF31.25	4 284 8806 0	74 676 0035 0
VXF31.25-10	4 284 8806 0	74 676 0201 0
VXF31.39	4 284 8806 0	74 676 0036 0
VXF31.40-16	4 284 8806 0	74 676 0202 0
VXF31.40	4 284 8806 0	74 676 0037 0
VXF31.40-25	4 284 8806 0	74 676 0203 0
VXF31.50	4 284 8806 0	74 676 0038 0
VXF31.50-40	4 284 8806 0	74 676 0204 0
VXF31.65	4 284 8806 0	74 676 0039 0
VXF31.65-63	4 284 8806 0	74 676 0205 0
VXF31.80	4 284 8806 0	74 676 0040 0
VXF31.80-100	4 284 8806 0	74 676 0206 0
VXF31.90	4 679 5629 0	74 676 0088 0
VXF31.100-160	4 679 5629 0	74 676 0207 0
VXF31.91	4 679 5629 0	74 676 0089 0
VXF31.125-250	4 679 5629 0	74 676 0208 0
VXF31.92	4 679 5629 0	74 676 0090 0
VXF31.150-315	4 679 5629 0	74 676 0090 0