



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

## VVF31...

- Grey cast iron EN-GJL-250 valve body
- DN 25...150
- $k_{vs}$  5...300 m<sup>3</sup>/h
- Can be equipped with SQX... motoric or SKD...-, SKB...- and SKC...- electrohydraulic actuators

### Use

For use in heating, ventilating, and air conditioning systems as a control or safety shutoff valve as per DIN 32730.

For closed circuits only (mind cavitation, refer to page 5).

## Type summary

Type	DN	$k_{vs}$ [m <sup>3</sup> /h]	$S_v$
VVF31.24	25	5	> 50
VVF31.25		7.5	
VVF31.39	40	12	
VVF31.40		19	
VVF31.50	50	31	> 100
VVF31.65	65	49	
VVF31.80	80	78	
VVF31.90	100	124	
VVF31.91	125	200	
VVF31.92	150	300	

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.

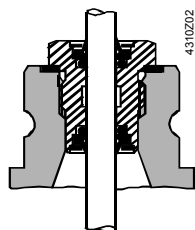
Example: 2 two-port valves VVF31.50

## Delivery

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

## Spare parts

EPDM sealing gland



for VVF31... DN 25...80 (stem-Ø 10 mm) **4 284 8806 0**  
for VVF31... DN 100...150 (stem-Ø 14 mm) **4 679 5629 0**

## Equipment combinations

Valves	Actuators								
	$H_{100}$	SQX...		SKD...		SKB...		SKC...	
		[mm]	$\Delta p_{max}$	$\Delta p_s$	$\Delta p_{max}$	$\Delta p_s$	$\Delta p_{max}$	$\Delta p_s$	$\Delta p_{max}$
[kPa]									
VVF31.24	20	300	1000	300	1000	300	1000		
VVF31.25									
VVF31.39									
VVF31.40									
VVF31.50									
VVF31.65									
VVF31.80									
VVF31.90	40							200	300
VVF31.91								150	200
VVF31.92								100	125

$H_{100}$  = Nominal stroke

$\Delta p_{max}$  = Maximum permissible differential pressure across valve's control path, valid for the entire actuating range of the motorized valve

$\Delta p_s$  = Maximum permissible differential pressure at which the motorised valve will close securely against the pressure (close off pressure)

## Actuator overview

Type	Actuator type	Operating voltage	Positioning signal	Spring return	Positioning time	Positioning force	Data sheet		
SQX32.00	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					30 s				
SKD32.51					AC 24 V			No	
SKD82.50		Yes							
SKD82.51		No							
SKD60		Yes							
SKD62...		DC 0...10 V <sup>1)</sup>			30 s			N4563	
SKB32.50	Electro-hydraulic	AC 230 V	3- position	No	120 s	2800 N	N4564		
SKB32.51								Yes	
SKB82.50		AC 24 V						No	
SKB82.51								Yes	
SKB60								No	
SKB62...								Yes	N4566
SKC32.60	Electro-hydraulic	AC 230 V	3- position	No	120 s	2800 N	N4564		
SKC32.61								Yes	
SKC82.60								No	
SKC82.61		AC 24 V						Yes	
SKC60								No	
SKC62...								Yes	N4566
								DC 0...10 V <sup>1)</sup>	

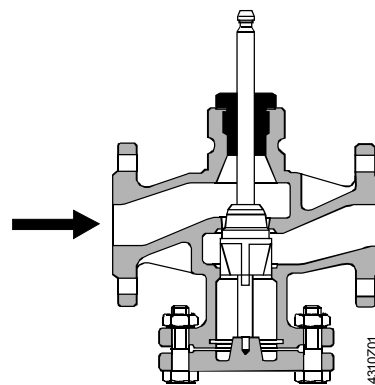
<sup>1)</sup> or DC 4...20 mA

## Pneumatic actuators

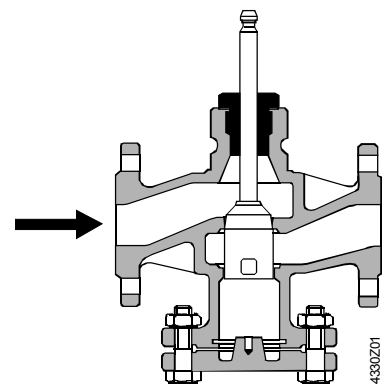
Pneumatic actuators are available on request from your local office.

## Technical design / mechanical design

### Valve cross section



DN 25 and DN 40  
closes against pressure



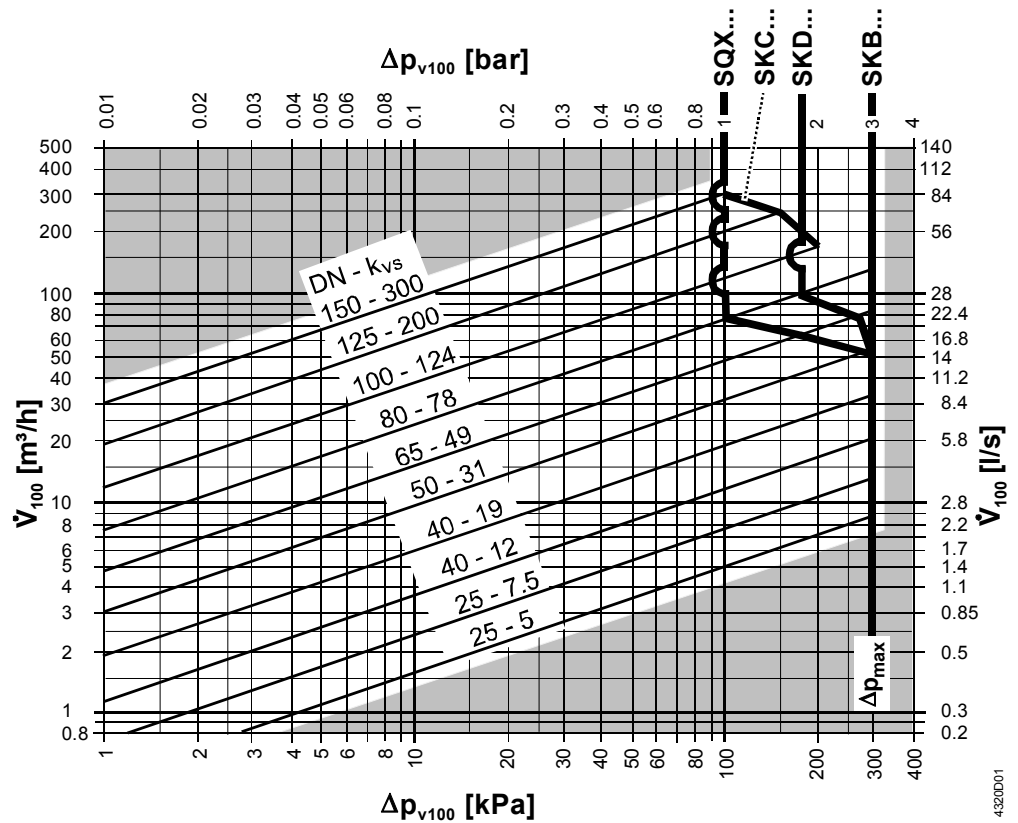
DN 50...100  
closes against pressure

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



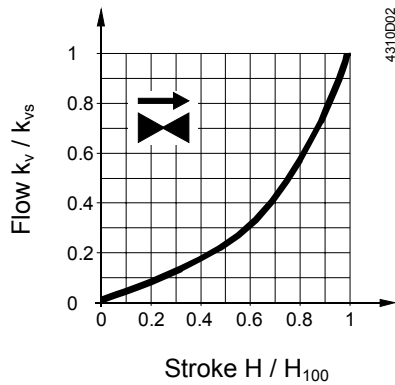
**The two-port seat valve does not become a three-port valve by removing the blank flange!**

Flow diagram



- $\Delta p_{max}$  = Maximum permissible differential pressure across the valve's control path, valid for the entire actuating range of the motorised valve
- $\Delta p_{v100}$  = Differential pressure across the fully open valve by a volume flow  $V_{100}$
- $V_{100}$  = Volumetric flow through the fully open valve ( $H_{100}$ )
- 100 kPa = 1 bar  $\approx$  10 mWC
- 1  $m^3/h$  = 0.278 l/s water at 20 °C

Valve flow characteristic



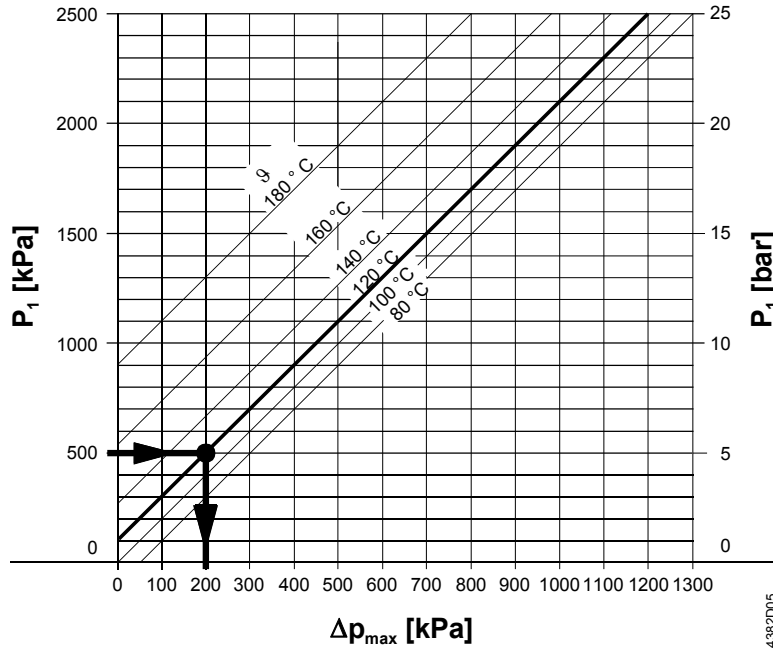
- 0...30 % → linear
- 30...100 % → equal percentage
- $n_{gl} = 3$  as per VDI / VDE 2173

**Cavitation**

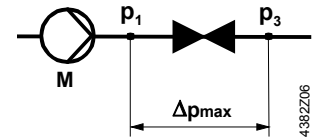
Cavitation accelerates wear on the valve plug and seat, and also results in undesirable noise. Cavitation can be avoided by not exceeding the differential pressure shown in the flow diagram on page 4, and by adhering to the static pressures shown below.

**Note on chilled water**

To avoid cavitation in chilled water circuits ensure sufficient counter pressure at valve outlet, e.g. by a throttling valve after the heat exchanger. Select the pressure drop across the valve at maximum according to the 80 °C curve in the flow diagram below.



- $\Delta p_{max}$  = Differential pressure with valve almost closed, at which cavitation can largely be avoided
- $p_1$  = Static pressure at inlet
- $p_3$  = Static pressure at outlet
- M = Pump
- $\vartheta$  = Water temperature

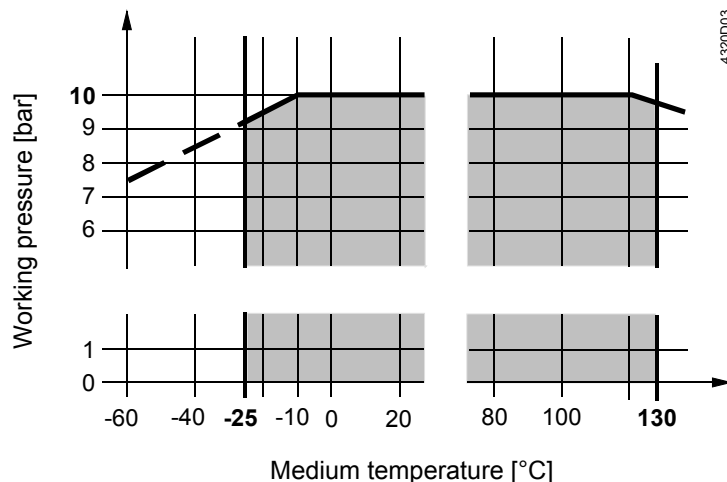


**High temperature hot water example:**

Pressure  $p_1$  at valve inlet: 500 kPa (5 bar)  
 Water temperature: 120 °C

From the diagram above, it will be seen that with the valve almost closed, the maximum permissible differential pressure  $\Delta p_{max}$  is 200 kPa (2 bar).

## Working pressure and medium temperature



**Working pressure staged as per ISO 7268 and EN 1333  
at medium temperatures of -25...+130 °C as per DIN 4747-1**

## 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.



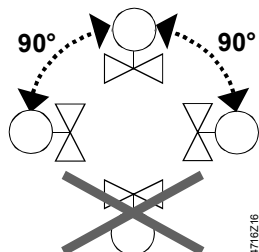
For media below 0 °C, use the electric ASZ6.5 stem heating element to prevent the valve stem from freezing in the sealing gland. For safety reasons, the stem heating element has been designed for AC 24 V / 30 W operating voltage.

### 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 0509 0.

### Orientation



### Direction of flow

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

### Commissioning



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

Valve stem retracts: valve opens = increasing flow

Valve stem extends: valve closes = decreasing flow

## Maintenance

### Warning



VVF31... 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.

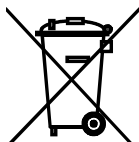
### Stem sealing gland

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

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

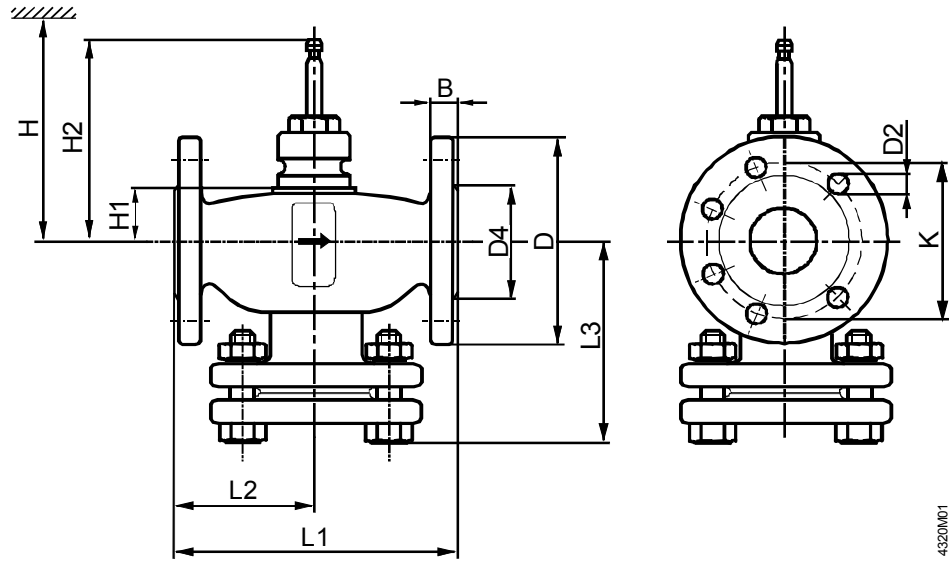
All terms of the warranty will be invalidated by the use of actuators from other manufacturers.

### Technical data

Functional data	PN class	PN 10 to EN 1333	
	Working pressure	to DIN 4747-1 within the permissible medium temperature range according to the diagram on page 6	
	Flow characteristic	<ul style="list-style-type: none"> <li>• 0...30 % • linear</li> <li>• 30...100 % • equal percentage; <math>n_{gl} = 3</math> to VDI / VDE 2173</li> </ul>	
	Leakage rate	0...0.02 % of $k_{vs}$ value to DIN EN 1349	
	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	-25...+130 °C	
	Rangeability $S_v$	to DN 40: >50 DN 40...150: >100	
	Nominal stroke	DN 25...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 25...100 • without CE-marking as per article 3, section 3 (sound engineering practice)</li> <li>• DN 125...150 • category I, with CE-marking</li> </ul>	
Materials	Valve body	grey cast iron EN-GJL-250	
	Stem	stainless steel	
	Plug	DN 25...40: brass DN 50...150: bronze	
	Sealing gland	brass	
Dimensions / Weight	Gland materials	EPDM O rings	
	Refer to «Dimensions»		
	Flange connections	to ISO 7005	

**Dimensions**

Dimensions in mm



4320M01

Valve	DN	B	D Ø	D2 Ø	D4 Ø	K	L1	L2	L3	H1	H2	H				Weight [kg]
												SQX...	SKD...	SKB...	SKC...	
VVF31.24	25	16	115	14 (4x)	65	85	160	80	104	34	130.5	> 459	> 534	> 609		6.3
VVF31.25																
VVF31.39	40	18	150	19 (4x)	84	110	200	100	126	39	135.5	> 464	> 539	> 614		10.4
VVF31.40																
VVF31.50	50	20	165	19 (4x)	99	125	230	115	143	60	156.5	> 485	> 560	> 635		13.8
VVF31.65	65		185		118	145	290	145	173							18.5
VVF31.80	80	22	200	19 (8x)	132	160	310	155	185	93	209.5					24.1
VVF31.90	100	24	220		156	180	350	175	205							36.5
VVF31.91	125	26	250	19 (8x)	184	210	400	200	232	104	220.5					50
VVF31.92	150		285		23 (8x)	211	240	480	240	275	120					236.5

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