



Acvatix™

3-port seat valves PN6 with flanged connection VXF21..

- Grey cast iron EN-GJL-250 valve body
- DN 25...100
- k_{vs} 1.9...160 m³/h
- Can be equipped with SAX..-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

Product number	DN	k_{vs} [m ³ / h]	S_v
VXF21.22	25	1,9	> 50
VXF21.25-2.5		2,5	
VXF21.23		3	
VXF21.25-4		4	
VXF21.24		5	
VXF21.25-6.3		6,3	
VXF21.25		7,5	
VXF21.25-10		10	
VXF21.39	40	12	
VXF21.40-16		16	
VXF21.40		19	
VXF21.40-25		25	
VXF21.50	50	31	> 100
VXF21.50-40		40	
VXF21.65	65	49	
VXF21.65-63		63	
VXF21.80	80	78	
VXF21.80-100		100	
VXF21.90	100	124	
VXF21.100-160		160	

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

Product number	Stock No.	Description
ASZ6.5	ASZ6.5	Electric stem heating element, AC 24 V / 30 W, required for media below 0 °C. For electrohydraulic actuators SKD..., SKB..., SKC..
ASZ6.6	S55845-Z108	Electric stem heating element, AC 24 V 30 W, required for media below 0 °C

Ordering

Example:

Product number	Stock number	Designation	Quantity
VXF21.50	VXF21.50	3-port seat valve PN6 with flanged connection	1

Delivery

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

Spare parts, Rev. no.

See overview, page 10.

Equipment combinations

Valves	H ₁₀₀ [mm]	Actuators							
		SAX.. ¹⁾		SKD.. ¹⁾		SKB..		SKC..	
		Mixing	Diverting ²⁾	Mixing	Diverting ²⁾	Mixing	Diverting ²⁾	Mixing	Diverting ²⁾
Δp_{\max} [kPa]									
VXF21.22	20	300	100	300	100	300	100		
VXF21.25-2.5									
VXF21.23									
VXF21.25-4									
VXF21.24									
VXF21.25-6.3									
VXF21.25									
VXF21.25-10									
VXF21.39									
VXF21.40-16									
VXF21.40									
VXF21.40-25									
VXF21.50									
VXF21.50-40									
VXF21.65									
VXF21.65-63	175	60	275	60					
VXF21.80	100	40	175	40		70			
VXF21.80-100									
VXF21.90	40							200	70
VXF21.100-160									

¹⁾ Usable up to maximum medium temperature of 150 °C

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

H₁₀₀ = Nominal stroke

Δp_{\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

Product number	Actuator type	Operating voltage	Positioning signal	Spring return	Positioning time	Positioning force	Data sheet
SAX31.00	Electro-motoric	AC 230 V	3- position	No	120 s	800 N	N4501
SAX31.03					30 s		
SAX81.00		AC/DC 24 V			120 s		
SAX81.03					30 s		
SAX61.03					DC 0...10 V ¹⁾		
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	30 s		
SKD82.51				Yes			
SKD60				No			
SKD62..				Yes			
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			
SKC32.60	Electro-hydraulic	AC 230 V	3- position	No	120 s	2800 N	N4566
SKC32.61				Yes			
SKC82.60		AC 24 V		No			
SKC82.61				Yes			
SKC60				No			
SKC62..				Yes			

Actuators SAX81.. and SAX61.. are UL listed

¹⁾ or DC 4...20 mA or 0...1000 Ω

Pneumatic actuators

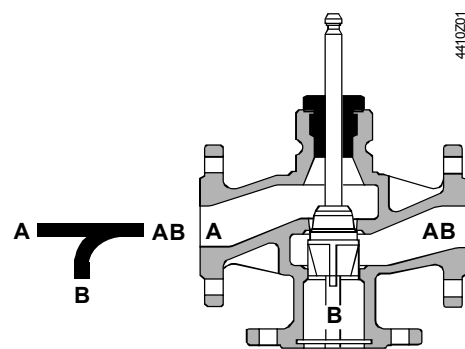
Available on request from your local office.



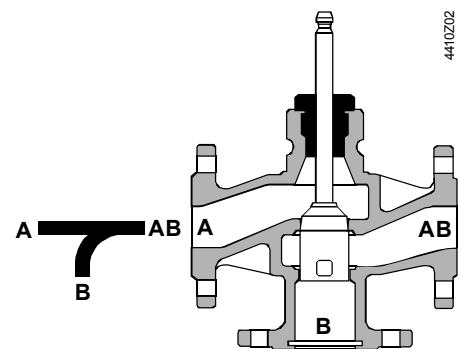
Application is possible only if the VXF21.. is used as a mixing valve.

Technical design / mechanical design

Valve cross section



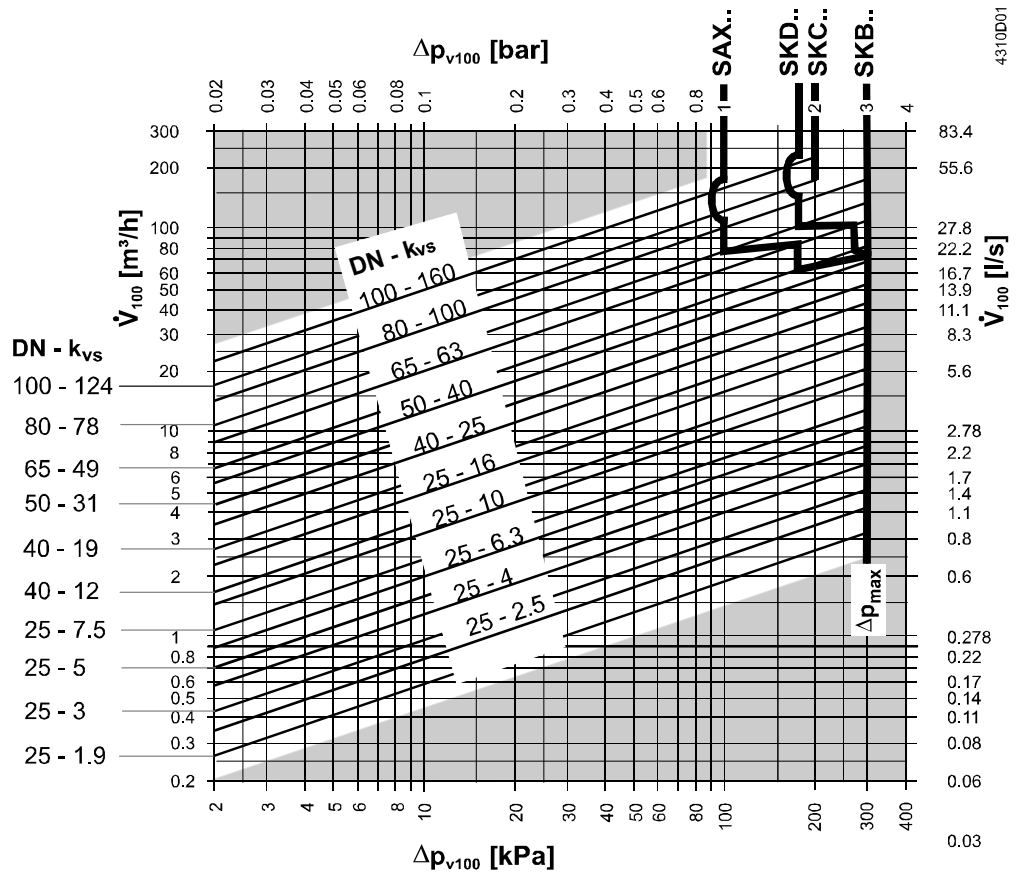
DN 25 and DN 40
closes against pressure



DN 50...100
closes against pressure

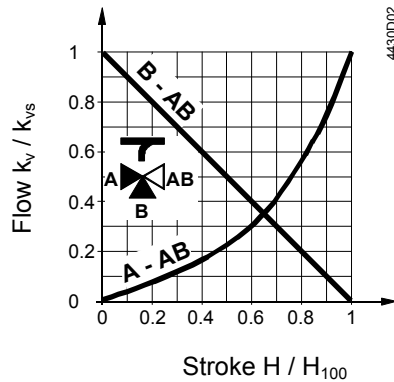
Guided plug which is integrated in the valve stem. The seats are machined in the valve body. Schematic representation, design variations are possible.

Flow diagram
"Mixing"



- Δp_{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
- Δp_{V100} = Differential pressure across the fully open valve and the valve's control path A → AB, B → AB by a volume flow 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 m³/h:

- 0...30 % → linear
- 30...75 % → equal-percentage ($n_{gl} = 3$) as per VDI / VDE 2173
- 75...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

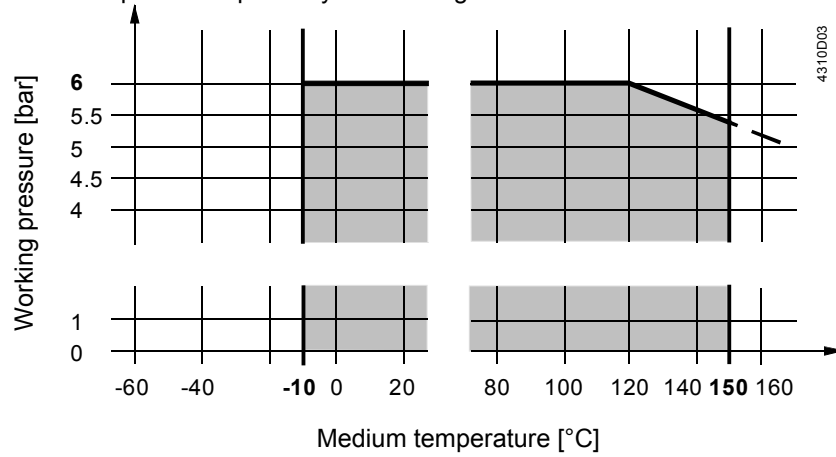
Port AB = → constant flow

Port A = → variable flow

Port B = → bypass (variable flow)

Working pressure and medium temperature

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



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.



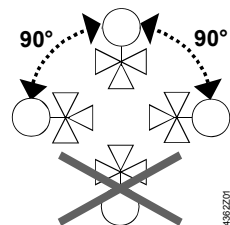
For media below 0 °C, use the electric stem heating element to prevent the valve stem from freezing in the sealing gland. For safety reasons, the stem heating element has been designed for AC 24 V / 30 W operating voltage.

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

Warning

VXF21.. 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", page 3.

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

Technical data

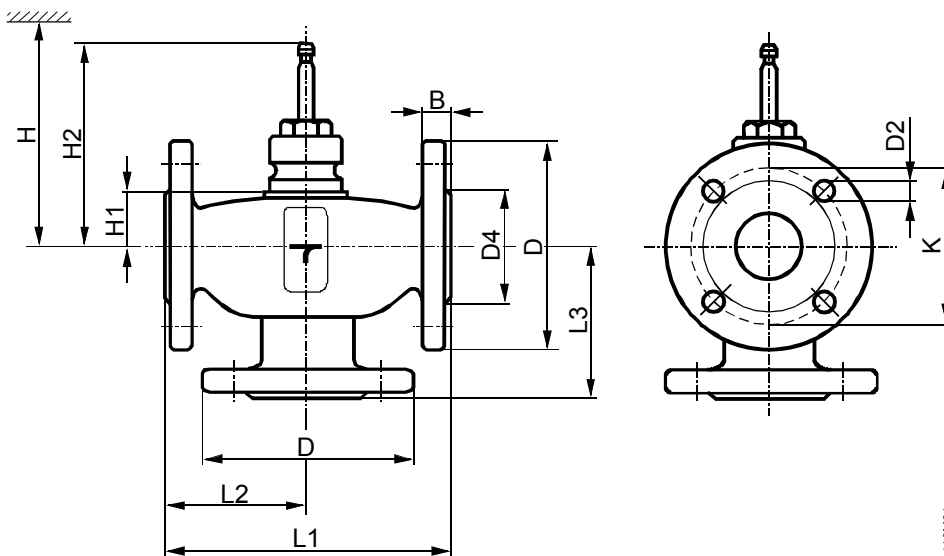
Functional data	PN class	PN 6 to ISO 7268		
	Working pressure	to ISO 7005 within the permissible "medium temperature" range according to the diagram on page 6		
	Flow characteristic	through-port	0...30 %	linear
			30...100 %	equal percentage; $n_{gl} = 3$ to VDI / VDE 2173 ¹⁾
		bypass	0...100 %	linear
	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 ²⁾	-10...+150 °C		
	Rangeability S_v	to DN 40:		>50
		DN 50...100:		>100
	Nominal stroke	DN 25...80:		20 mm
		DN 100:		40 mm
Industry standards	Pressure Equipment Directive	PED 97/23/EC		
	Pressure Accessories	as per article 1, section 2.1.4		
	Fluid group 2	without CE-marking as per article 3, section 3 (sound engineering practice)		
Environmental compatibility	ISO 14001	(Environment)		
	ISO 9001	(Quality)		
Materials	SN 36350	(Environmentally compatible products)		
	RL 2002/95/EG	(RoHS)		
Materials	Valve body	grey cast iron EN-GJL-250		
	Stem	stainless steel		
	Plug	DN 25...40:	brass	
DN 50...100:		bronze		
Materials	Sealing gland	Brass, silicon-free		
	Gland materials	EPDM O rings, silicon-free		
Dimensions / Weight	Refer to "Dimensions", page 9			
	Flange connections	to ISO 7005		

¹⁾ k_{vs} -values 100, 160 m³/h: flow characteristic is over 75 % stroke optimized for maximal flow k_{v100} , see page 5.

²⁾ Electric stem heating element required for media below 0 °C

Dimensions

Dimensions in mm



4410M01

Product number	DN	B	D Ø	D2 Ø	D4 Ø	K	L1	L2	L3	H1	H2	H				[kg]
												SAX..	SKD..	SKB..	SKC..	
VXF21.22	25	14	100	11 (4x)	58	75	150	75	75	34	130,5	> 476	> 534	> 609		3,8
VXF21.25-2.5																
VXF21.23																
VXF21.25-4																
VXF21.24																
VXF21.25-6.3																
VXF21.25																
VXF21.25-10																
VXF21.39	40	16	130	14 (4x)	78	100	180	90	90	39	135,5	> 481	> 539	> 614		6,6
VXF21.40-16																
VXF21.40																
VXF21.40-25																
VXF21.50	50	16	140	14 (4x)	88	110	200	100	100							7,6
VXF21.50-40																
VXF21.65	65	16	160	14 (4x)	108	130	240	120	120							11,7
VXF21.65-63																
VXF21.80	80	18	190	19 (4x)	124	150	260	130	130	60	156,5	> 502	> 560	> 635		16,2
VXF21.80-100																
VXF21.90	10	18	210	19 (4x)	144	170	300	150	150	91	207,5					23
VXF21.100-160	0															

DN = Nominal size

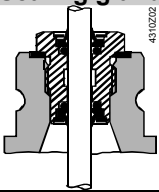
H = Total actuator height plus minimum distance to the wall or the ceiling for mounting, connection, operation, maintenance etc.

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

Spare parts

Order numbers for spare parts

Product number	Sealing gland	Set
		
VXF21.22	4 284 8806 0	74 676 0140 0
VXF21.25-2.5	4 284 8806 0	74 676 0198 0
VXF21.23	4 284 8806 0	74 676 0141 0
VXF21.25-4	4 284 8806 0	74 676 0199 0
VXF21.24	4 284 8806 0	74 676 0034 0
VXF21.25-6.3	4 284 8806 0	74 676 0200 0
VXF21.25	4 284 8806 0	74 676 0035 0
VXF21.25-10	4 284 8806 0	74 676 0201 0
VXF21.39	4 284 8806 0	74 676 0036 0
VXF21.40-16	4 284 8806 0	74 676 0202 0
VXF21.40	4 284 8806 0	74 676 0037 0
VXF21.40-25	4 284 8806 0	74 676 0203 0
VXF21.50	4 284 8806 0	74 676 0038 0
VXF21.50-40	4 284 8806 0	74 676 0204 0
VXF21.65	4 284 8806 0	74 676 0039 0
VXF21.65-63	4 284 8806 0	74 676 0205 0
VXF21.80	4 284 8806 0	74 676 0040 0
VXF21.80-100	4 284 8806 0	74 676 0206 0
VXF21.90	4 679 5629 0	74 676 0088 0
VXF21.100-160	4 679 5629 0	74 676 0207 0

Revision numbers

Product number	Valid from rev. no.	Product number	Valid from rev. no.	Product number	Valid from rev. no.
VXF21.22	..B	VXF21.25-10	..B	VXF21.65	..B
VXF21.25-2.5	..B	VXF21.39	..B	VXF21.65-63	..B
VXF21.23	..B	VXF21.40-16	..B	VXF21.80	..B
VXF21.25-4	..B	VXF21.40	..B	VXF21.80-100	..B
VXF21.24	..B	VXF21.40-25	..B	VXF21.90	..B
VXF21.25-6.3	..B	VXF21.50	..B	VXF21.100-160	..B
VXF21.25	..B	VXF21.50-40	..B		