SIEMENS

4440

Acvatix™

3-port seat valves PN16 with flanged connection VXF41..

- **Grey cast iron EN-GJL-250 valve body**
- **DN 15...150**
- **k_{vs} 1,9...300 m^3/h**
- **Can be equipped with SAX..-electromotoric or SKD..-, SKB..- and SKC..-electrohydraulic actuators**

Use

For use in district heating, heating, ventilating and air conditioning systems as a control valve for "mixing" or "diverting" functions.
For closed or open circuits.
Silicon-free valve versions with type suffix ..5 available

Type summary

Product number	DN	k_{vs} [m^3 / h]	S_v
VXF41.14	15	1.9	> 50
VXF41.15		3	
VXF41.24	25	5	
VXF41.25		7.5	> 100
VXF41.39	40	12	> 50
VXF41.40		19	> 100
VXF41.49	50		> 50
VXF41.50		31	> 100
VXF41.65	65	49	
VXF41.80	80	78	
VXF41.90	100	124	
VXF41.91	125	200	
VXF41.92	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)

High performance versions

Product number	Type suffix	Description	Examples
VXF41..**4**	4	Sealing gland with PTFE sleeves for up to 180 °C	VXF41.50**4**
VXF41..**5**	5	Sealing gland with PTFE sleeves, silicon-free version, for up to 180 °C	VXF41.40**5**

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*
VXF41.50	VXF41.50	3-port seat valve PN16 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 9.

Equipment combinations

Valves		Actuators							
		SAX.. [1) 2)]		SKD.. [2)]		SKB..		SKC..	
	H_{100}	Mixing	Diverting [3)]	Mixing	Diverting [3)]	Mixing	Diverting [3)]	Mixing	Diverting [3)]
	[mm]	[kPa]							
VXF41.14	20	800	200	800	200	800	200		
VXF41.15									
VXF41.24									
VXF41.25									
VXF41.39		500	150	750	150				
VXF41.40									
VXF41.49		350	100	500	100				
VXF41.50									
VXF41.65	40							500	200
VXF41.80								350	
VXF41.90								250	150
VXF41.91								175	100
VXF41.92								100	70

1) VXF41.14..VXF41.50 tight bypass with SAX.. actuators
2) Usable up to max. medium temperature of 150 °C
3) If noise is permitted, the same values apply as for mixing.

H_{100} = 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	-	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	-	120 s	1000 N	N4561
SKD32.21				Yes	30 s		
SKD32.51					120 s		
SKD82.50		AC 24 V		-			
SKD82.51				Yes			
SKD60			DC 0…10 V [1)]	-	30 s		
SKD62..				Yes			
SKB32.50	Electro-hydraulic	AC 230 V	3-position	-	120 s	2800 N	N4564
SKB32.51				Yes			
SKB82.50		AC 24 V		-			
SKB82.51				Yes			
SKB60			DC 0…10 V [1)]	-			
SKB62..				Yes			
SKC32.60	Electro-hydraulic	AC 230 V	3-position	-	120 s	2800 N	N4566
SKC32.61				Yes			
SKC82.60		AC 24 V		-			
SKC82.61				Yes			
SKC60			DC 0…10 V [1)]	-			
SKC62..				Yes			

Actuators SAX81.. and SAX61.. are UL listed

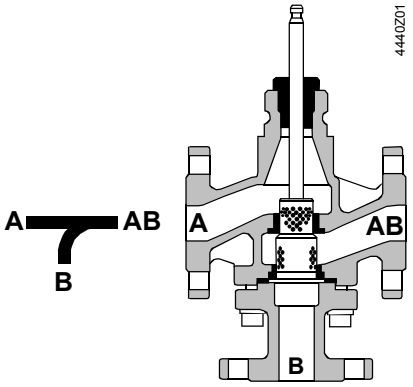
1) or DC 4…20 mA or 0…1000 Ω

Pneumatic actuators Available on request from your local office.

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

Technical design / 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

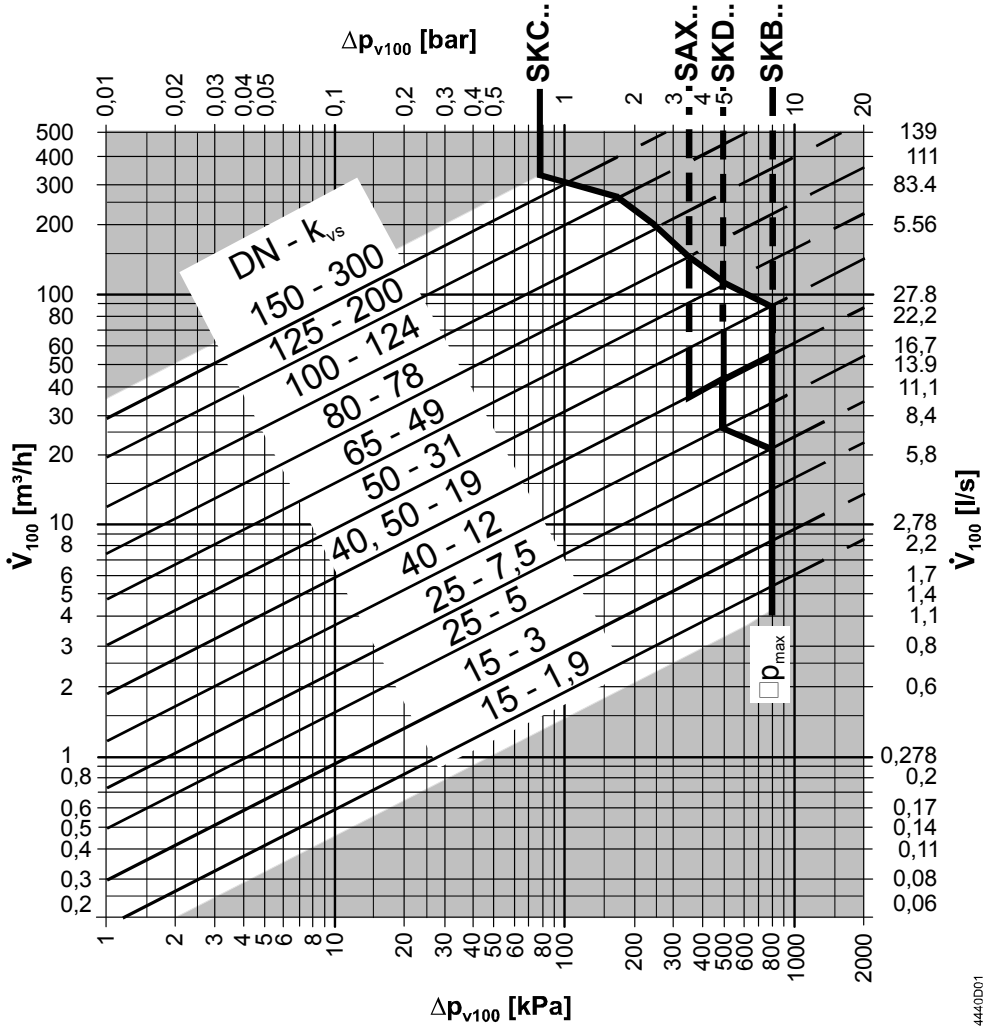
When SAX.. actuators are used, DN 15…50 with tight bypass.

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

Schematic representation, design variations are possible.

Sizing

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

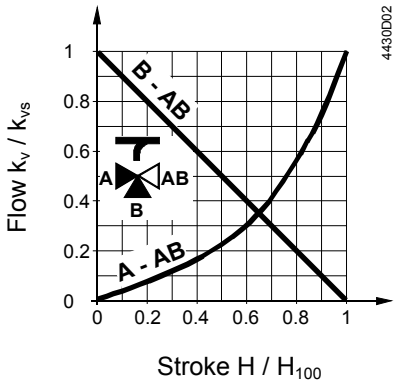
Δp_{v100} = Differential pressure across the fully open valve and the valve's control path A → AB, B → AB by a volume flow V_{100}

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

100 kPa = 1 bar ≈ 10 mWC

1 m^3/h = 0.278 l/s water at 20 °C

Valve flow characteristic



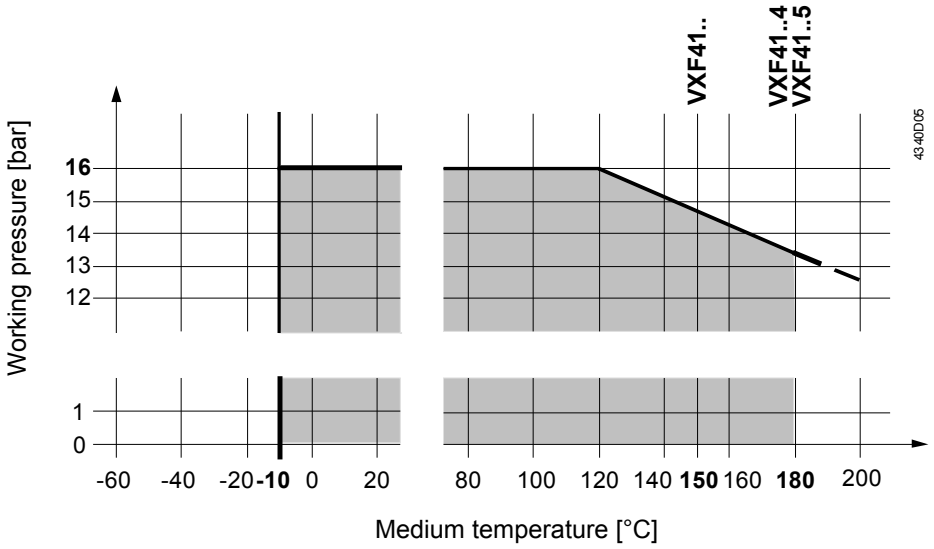
Through-port
0...30 %: → linear
30...100 %: → n_{gl} = 3 as per VDI / VDE 2173

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.

⚠ In open circuits the valve plug may seize as the result of scale deposits. In these applications, only the most powerful SKB.. or SKC.. actuators should be used. Further the valve should be exercised at regular intervals (two to three times per week). A strainer MUST be fitted at the valve inlet.

⚠ To ensure the reliability of the valve, we recommend the fitting of a strainer at the valve inlet even in closed circuits.

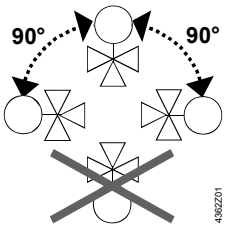
⚠ For media below 0 °C, use the electric stem heating element to prevent the valve stem from freezing in the sealing gland. For safety reasons, the stem heating element has been designed for AC 24 V / 30 W operating voltage.

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.

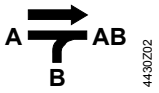
Orientation



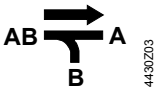
Direction of flow

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

VXF41.. valves require no maintenance.

Warning ⚠ 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, 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 16 to ISO 7268
	Working pressure		to ISO 7005 within the permissible "medium temperature" range according to the diagram on page 5
	Flow characteristic		
	through-port	0…30 %	linear
		30…100 %	equal percentage; n_{gl} = 3 to VDI / VDE 2173
	bypass	0…100 %	linear
	Leakage rate		
	through-port		0…0.02 % of k_{vs} value to DIN EN 1349
	bypass	DN 15…50	0…0.02 % of k_{vs} value with SAX.. actuator
		DN 15…150	0.5…2 % of k_{vs} value with SKD.., SKB.. and SKC.. actuators
	Permissible media	water	chilled water, cooling water, low temperature hot water, high temperature hot water, water with anti-freeze; recommendation: water treatment to VDI 2035
		brine	
		heat transfer oils	(use only valves with suffix 4 or 5)
	Medium temperature [1]		
	water, brine [2]	VXF41..	-10…150 °C
		VXF41..4, VXF41..5	≤ 180 °C
	hot water	VXF41..4, VXF41..5	≤ 180 °C
	heat transfer oils	VXF41..4, VXF41..5	≤ 180 °C (use only valves with suffix 4 or 5)
	Rangeability S_v		refer to "Type summary", page 2
	Nominal stroke		DN 15…50: 20 mm DN 65…150: 40 mm
Industry standards	Pressure Equipment Directive Pressure Accessories		PED 97/23/EC as per article 1, section 2.1.4
	Fluid group 2	DN 15…50	without CE-marking as per article 3, section 3 (sound engineering practice)
		DN 65…125	category I, with CE-marking
		DN 150	category II, with CE-marking, test authority number 0036
	Environmental compatibility		ISO 14001 (Environment) ISO 9001 (Quality) SN 36350 (Environmentally compatible products) RL 2002/95/EG (RoHS)
Materials	Valve body		grey cast iron EN-GJL-250
	Stem		stainless steel
	Plug, seats		stainless steel
	Sealing gland [3]		standard version: brass, silicon-free high performance version: stainless steel
	Gland materials		standard version: EPDM O-rings, silicon-free high performance version: VXF41..4 PTFE sleeves VXF41..5 PTFE sleeves, silicon-free
Dimensions / Weight	Refer to "Dimensions", page 8		
	Flange connections		to ISO 7005

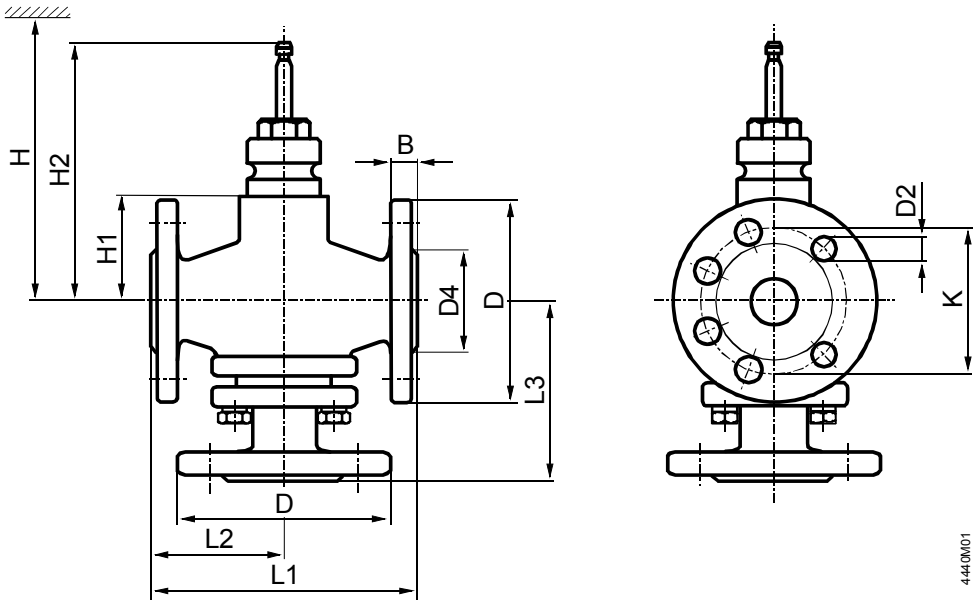
[1] For 150…180 °C use electrohydraulic SKB.. or SKC.. actuators.

[2] Electric stem heating element required for media below 0 °C.

[3] Silicon-free version to 180 °C with type suffix 5.

Dimensions

Dimensions in mm



DN	B	D	D2	D4	K	L1	L2	L3	H1	H2	H				
		Ø	Ø	Ø							SAX..	SKD..	SKB..	SKC..	[kg]
15	16	95	14 (4x)	46	65	130	65	114	64	160.5	> 506	> 464	> 639		4.7
25	18	115		65	85	160	80	118							6.7
40	20	150	19 (4x)	84	110	200	100	140	57	153.5	> 499	> 457	> 632		11.3
50		165		99	125	230	115	145	96	192.5	> 538	> 496	> 671		18.5
65		185		118	145	290	145	180	114	230.5				> 689	29
80	22	200	19 (8x)	132	160	310	155	200	126	242.5				> 701	36.5
100	24	220		156	180	350	175	225	146	262.5				> 721	51.5
125	26	250		184	210	400	200	255	163	279.5				> 738	70
150		285	23 (8x)	211	240	480	240	290	186	302.5				> 761	104

DN = Nominal size

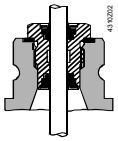
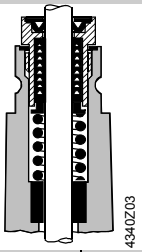
H = Total actuator height plus minimum distance to the wall or the ceiling for mounting, connection, operation, maintenance etc.

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

		Sealing gland			Set
					Plug with stem, circlip, sealing
Product number	**DN**	**VXF41..**	**VXF41..4**	**VXF41..5**	**VXF41.., VXF41..4, VXF41..5**
VXF41.14	15	4 284 8806 0	4 284 8829 0	4 284 9538 0	For these valves a plug is not possible
VXF41.15	15	4 284 8806 0	4 284 8829 0	4 284 9538 0	
VXF41.24	25	4 284 8806 0	4 284 8829 0	4 284 9538 0	
VXF41.25	25	4 284 8806 0	4 284 8829 0	4 284 9538 0	
VXF41.39	40	4 284 8806 0	4 284 8829 0	4 284 9538 0	
VXF41.40	40	4 284 8806 0	4 284 8829 0	4 284 9538 0	
VXF41.49	50	4 679 5629 0	4 679 5630 0	4 284 9540 0	74 676 0097 0
VXF41.50	50	4 679 5629 0	4 679 5630 0	4 284 9540 0	74 676 0098 0
VXF41.65	65	4 679 5629 0	4 679 5630 0	4 284 9540 0	74 676 0053 0
VXF41.80	80	4 679 5629 0	4 679 5630 0	4 284 9540 0	74 676 0054 0
VXF41.90	100	4 679 5629 0	4 679 5630 0	4 284 9540 0	74 676 0055 0
VXF41.91	125	4 679 5629 0	4 679 5630 0	4 284 9540 0	74 676 0056 0
VXF41.92	150	4 679 5629 0	4 679 5630 0	4 284 9540 0	74 676 0057 0

Revision numbers

Product number	Valid from rev. no.	Product number	Valid from rev. no.	Product number	Valid from rev. no.
VXF41.14	..05	VXF41.144	..04	VXF41.145	..04
VXF41.15	..05	VXF41.154	..04	VXF41.155	..04
VXF41.24	..05	VXF41.244	..04	VXF41.245	..04
VXF41.25	..05	VXF41.254	..04	VXF41.255	..04
VXF41.39	..05	VXF41.394	..04	VXF41.395	..04
VXF41.40	..05	VXF41.404	..04	VXF41.405	..04
VXF41.49	..04	VXF41.494	..03	VXF41.495	..03
VXF41.50	..04	VXF41.504	..03	VXF41.505	..03
VXF41.65	..03	VXF41.654	..02	VXF41.655	..02
VXF41.80	..03	VXF41.804	..02	VXF41.805	..02
VXF41.90	..03	VXF41.904	..02	VXF41.905	..02
VXF41.91	..03	VXF41.914	..02	VXF41.915	..02
VXF41.92	..03	VXF41.924	..02	VXF41.925	..02