



3-Port Seat Valves with Male Thread, PN 16

VXG41...

- Bronze CuSn5Zn5Pb2 valve body
- DN 15...50
- k_{vs} 1.6...40 m³/h
- Flat sealing connections with external thread G...B to ISO 228-1
- Sets of ALG...3 screwed fittings with threaded connection available from Siemens
- Can be equipped with SQX... electromotoric or SKD... and SKB... electrohydraulic actuators

Use

For use in heating, ventilating and air conditioning systems as a control valve for mixing and diverting functions.

For closed and open circuits (mind cavitation on page 5)

Type summary

Type	DN	k_{vs} [m ³ /h]	S_v
VXG41.1301 ¹⁾	15	1.6	> 50
VXG41.1401 ¹⁾		2.5	
VXG41.15		4.0	
VXG41.20	20	6.3	> 100
VXG41.25	25	10	
VXG41.32	32	16	
VXG41.40	40	25	
VXG41.50	50	40	

¹⁾ These types, as a standard, are equipped with a tight bypass. The other valves with tight bypass, see table «Special versions»

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)

Special versions

Type	Type suffix	Description	Example
VXG41...01	01	Tight bypass, leakage rate 0...0.02 %. VXG41.1301 and VXG41.1401 are as standard equipped with a tight bypass.	VXG41.2001

Accessories

Type	Description
ALG...3	Set of 3 screwed fittings for 3-port valves, consisting of - 3 union nuts - 3 discs and - 3 flat seals
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 valves VXG41.25
2 sets of screwed fittings ALG253

Delivery

Valves, actuators and accessories are packed and supplied separately.

Spare parts

See overview, section „Spare parts“, page 10

Equipment combinations

Valves	Actuators						Fitting sets
	SQX... ¹⁾		SKD... ¹⁾		SKB...		
	Mixing	Diverting	Mixing	Diverting	Mixing	Diverting	Type
	Δp_{max}						
VXG41.1301	800	200 ²⁾	800	200 ²⁾	800	200 ²⁾	ALG153
VXG41.1401							ALG203
VXG41.15							ALG253
VXG41.20							ALG323
VXG41.25							ALG403
VXG41.32	150 ²⁾						
VXG41.40	525	150 ²⁾	775	150 ²⁾		150 ²⁾	ALG403
VXG41.50	300	100 ²⁾	450	100 ²⁾		100 ²⁾	ALG503

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

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

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

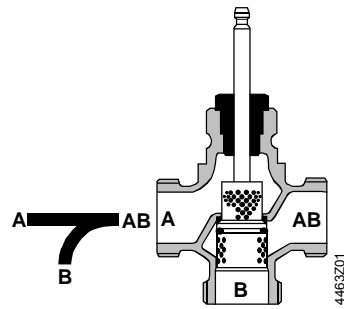
Actuator overview

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 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		Yes							
SKD60		DC 0...10 V ¹⁾		No	30 s			N4563	
SKD62...		Yes							
SKB32.50		Electro-hydraulic		AC 230 V	3-position			No	120 s
SKB32.51	Yes								
SKB82.50	AC 24 V		No						
SKB82.51			Yes						
SKB60			DC 0...10 V ¹⁾	No		N4566			
SKB62...			Yes						

¹⁾ or DC 4...20 mA

Note: Pneumatic actuators are available on request from your local office or branch.
Application is possible only if the VXG41... is used as a mixing valve.

Valve cross section

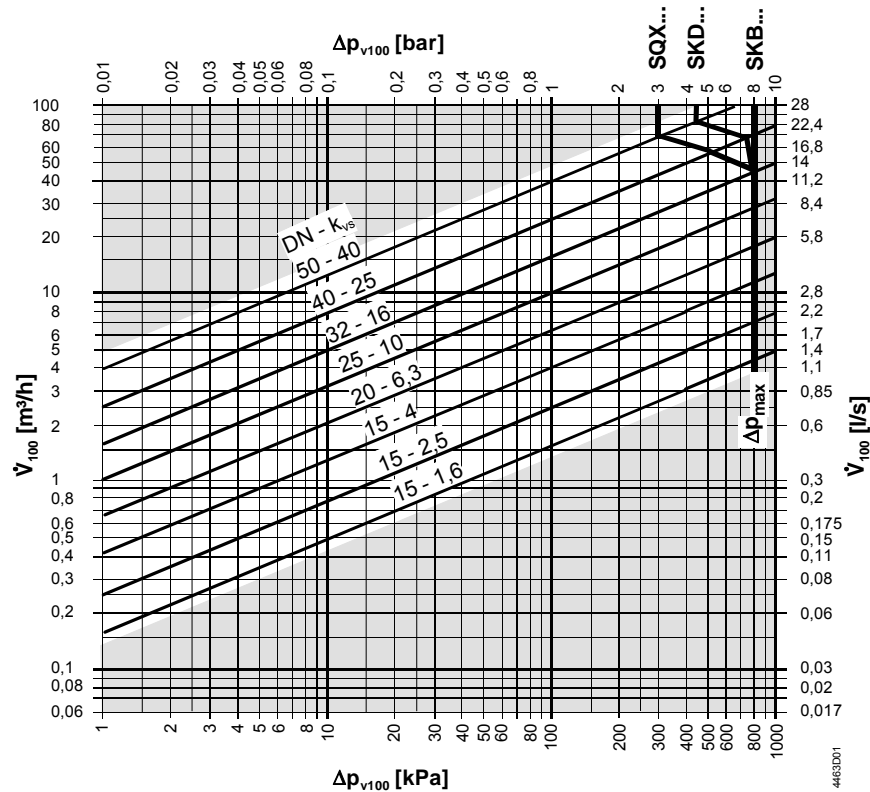


Guided perforated plug which is integrated in the valve stem.

A pressed-in stainless steel seat ring is used as seat A – AB.

Sizing

Flow diagram
«Mixing»



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

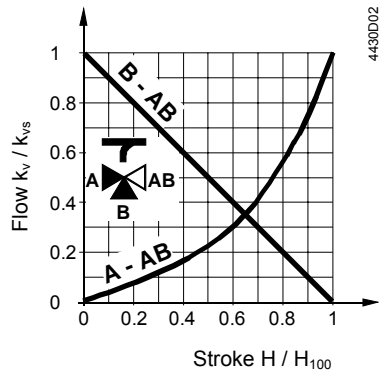
Δp_{v100} = Differential pressure across the fully open valve and the valve's control path A – AB, B - AB by a volume flow V_{100}

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

100 kPa = 1 bar \approx 10 mWC

1 m³/h = 0.278 l/s water at 20 °C

Valve flow characteristic



Through-port

0 ... 30 %: linear
 30 ... 100 %: $n_{gl} = 3$ to 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 I = constant flow

Port II = variable flow

Port III = bypass (variable flow)

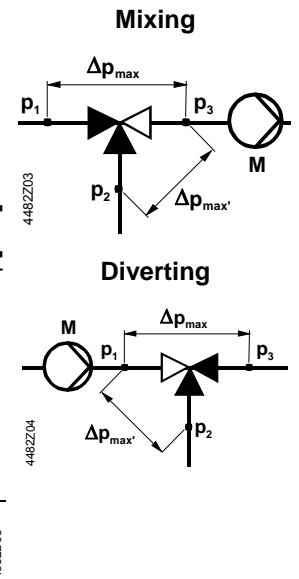
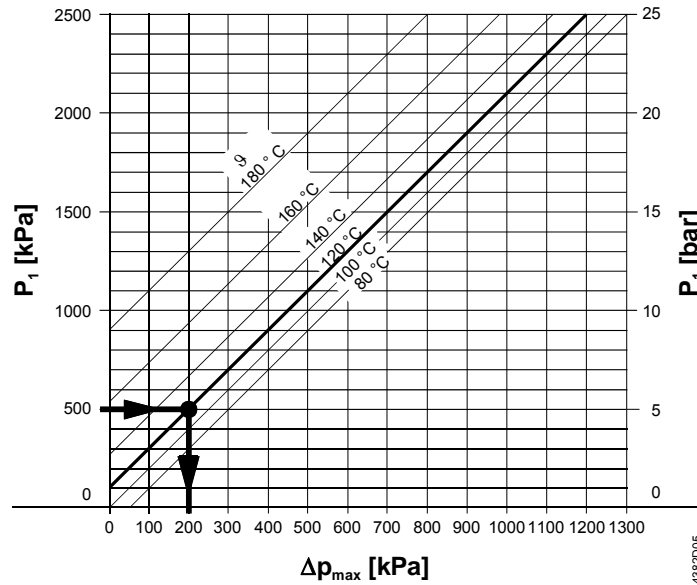
Use the 3-port valve primarily as a mixing valve.

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.



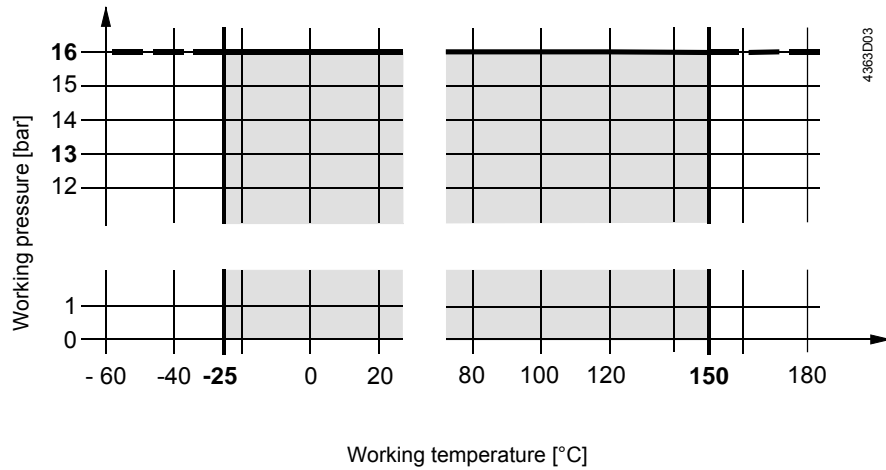
- Δp_{max} = Differential pressure with valve almost closed, at which cavitation can largely be avoided
- ... Situation for bypass
- p_1 = Static pressure at inlet
- p_2 = Static pressure at outlet
- M = Pump
- ϑ = Water temperature

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 Δp_{max} is 200 kPa (2 bar).

Working pressure and temperature



Working pressure and medium temperature staged as per ISO 7005

Current local legislation must be observed.

Notes

Engineering



In open circuits, there is a risk of valve plug seizing caused by scale deposits. Thus, use only the most powerful actuator SKB... for these applications. Additionally, periodic actuation (twice or three times per week) must be planned. With closed and open circuits always use a strainer upstream of the valve to increase the valve's functional safety.

Ensure cavitation-free flow, refer to page 5.

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



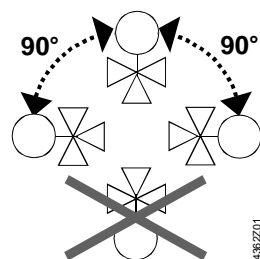
For media below 0 °C, use the electric ASZ6.5 stem heating element to prevent the valve stem from freezing in the sealing gland. For safety reasons, the stem heating element has been designed for AC 24 V / 30 W operating voltage.

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 4 319 9563 0.

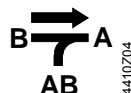
Orientation



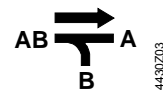
Direction of flow

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

VXG41... 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, refer to «Order». If the stem is damaged in the gland range, replace the entire stem-plug-unit.

Disposal



Contact your local office or branch.

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».

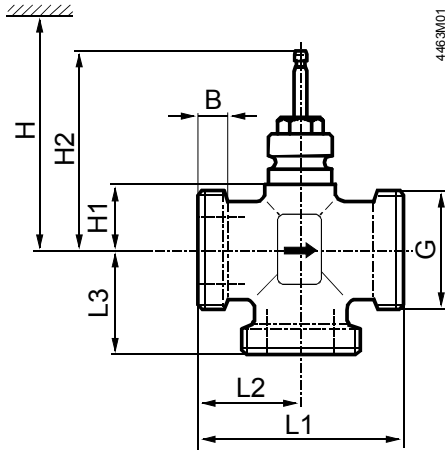
All terms of the warranty will be invalidated by the use of actuators from other manufacturers.

Technical data

Functional data	PN class	PN 16 to ISO 7268	
	Operating pressure	to ISO 7005/DIN 4747-1 within the permissible medium temperature range according to the diagram on page 6	
	Flow characteristic		
	• Through-port 0...30 %	• linear	
	• Through-port 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 standard version	• 0.5...2% of k_{vs} value	
	• Bypass special vers. (VXG41...01)	• 0...0.02% of k_{vs} value	
	Permissible media	water	cooling water, chilled water, low temperature hot water, high temperature hot water, water with anti-freeze;
		brine	• recommendation: water treatment to VDI 2035
	Medium temperature		-25...+150 °C
	Rangeability S_v		DN 15: > 50 DN ≥20:>100
Nominal stroke		20 mm	
Pressure Equipment Directive		PED 97/23/EC	
Industry standards	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)	
	Valve body	bronze CuSn5Zn5Pb2	
Materials	Seat, plug, stem	stainless steel	
	Sealing gland	dezincification-free brass, silicon-free	
	gland materials	EPDM O rings, silicon-free	
Dimensions / Weight	Refer to «Dimensions»		
	External thread connections	G...B to ISO 228-1	

¹⁾ Media below 0 °C: ASZ6.5 stem heating element required to prevent freezing of the valve stem in the sealing gland.

Dimensions




DN = Nominal size

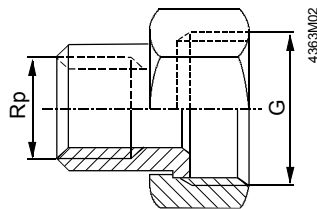
H = Total actuator height plus minimum distance to the wall or the ceiling for mounting, connection, operation, service, etc.

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

Type	DN	B [mm]	G [inch]	L1 [mm]	L2 [mm]	L3 [mm]	H1 [mm]	H2 [mm]	SQX...	SKD...	SKB...	 [kg]
VXG41.1301	15	10	G1B	100	50	50	26	122.5	> 451	> 526	> 601	1.30
VXG41.1401												
VXG41.15												
VXG41.20	20	14	G1¼B	105	52.5	52.5	34	130.5	> 459	> 534	> 609	1.42
VXG41.25	25		G1½B									1.65
VXG41.32	32	G2B	105	52.5	52.5	34	130.5	> 459	> 534	> 609	2.10	
VXG41.40	40	15	G2¼B	130	65	65	46	142.5	> 471	> 546	> 621	2.80
VXG41.50	50	16	G2¾B	150	75	75						3.90

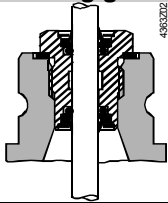
Screwed fittings



Type	for valve type	G [inch]	Rp [inch]
ALG15...	VXG41.11...15	G1	Rp½
ALG20...	VXG41.20	G1¼	Rp¾
ALG25...	VXG41.25	G1½	Rp1
ALG32...	VXG41.32	G2	Rp1¼
ALG40...	VXG41.40	G2¼	Rp1½
ALG50...	VXG41.50	G2¾	Rp2

- On valve side: cylindrical thread to ISO 228-1
- On pipe side: with cylindrical thread to ISO 7-1

Order numbers for spare parts

		Sealing gland	Set
			Plug with stem, circlip, sealing
Type	DN		
VXG41.1301	15	4 284 8874 0	74 676 0166 0
VXG41.1401	15	4 284 8874 0	74 676 0167 0
VXG41.15	15	4 284 8874 0	74 676 0135 0
VXG41.1501	15	4 284 8874 0	74 676 0137 0
VXG41.20	20	4 284 8874 0	74 676 0121 0
VXG41.2001	20	4 284 8874 0	74 676 0126 0
VXG41.25	25	4 284 8874 0	74 676 0122 0
VXG41.2501	25	4 284 8874 0	74 676 0127 0
VXG41.32	32	4 284 8874 0	74 676 0123 0
VXG41.3201	32	4 284 8874 0	74 676 0128 0
VXG41.40	40	4 284 8874 0	74 676 0124 0
VXG41.4001	40	4 284 8874 0	74 676 0129 0
VXG41.50	50	4 284 8874 0	74 676 0125 0
VXG41.5001	50	4 284 8874 0	74 676 0130 0