SIEMENS

4384

acvatix

2-Port Seat Valves with Flange, PN 40

VVF61...K

- **Cast steel GP240GH valve body**
- **DN 15...40**
- **k_{vs} 0.7...19 m^3/h**
- **Can be equipped with SKD...- or SKB...- electrohydraulic actuators**

Use

In remote heating plants for noise-free operation at differential pressures between 50 and 200 kPa (o.5 and 2 bar) as control and safety shutoff valve.
For closed and open circuits (mind cavitation, refer to page 5).

Type summary

Type	DN	k_{vs} [m^3 / h]	S_v
VVF61.12K	15	0.7	>50
VVF61.13K		1.2	
VVF61.14K		1.9	
VVF61.15K		3	
VVF61.23K	25		
VVF61.24K		5	
VVF61.25K		7.5	>100
VVF61.39K	40	12	>50
VVF61.40K		19	

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 VVF61.25K

Delivery

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

Spare parts

For overview, see «Spare parts», page 9

Equipment combinations

Valves		Actuators			
		SKD... [1]		SKB...	
	H_{100}	Δp_{max}	Δp_s	Δp_{max}	Δp_s
	[mm]	[kPa]			
VVF61.12K…15K	20	400	4000	400	4000
VVF61.23K…25K			2250		
VVF61.39K…40K					2000

[1] Usable up to maximum medium temperature of 150 °C
H_{100} = Nominal stroke
Δp_{max} = Maximum permissible differential pressure across the valve, valid for the entire actuating range of the motorized valve
Δp_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
SKD32.50	Electro-hydraulic	AC 230 V	3-position	No	120 s	1000 N	N4561
SKD32.21				Yes	30 s		
SKD32.51					120 s		
SKD82.50		AC 24 V		No			
SKD82.51				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	2800 N	N4564
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

Pneumatic actuators

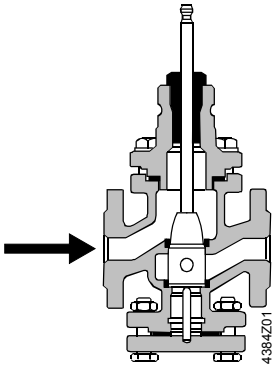
DN 15, DN 25 and DN 40 can also be used with pneumatic actuators.

For Δp_{max} and Δp_s the values as listed in the data sheet for the VVF41... (N4340) are valid.

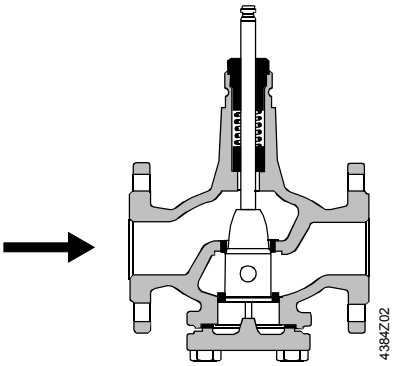
Contact your local office or branch for more information.

Technical design / mechanical design

Valve cross section



DN 15 and DN 25
closes against pressure

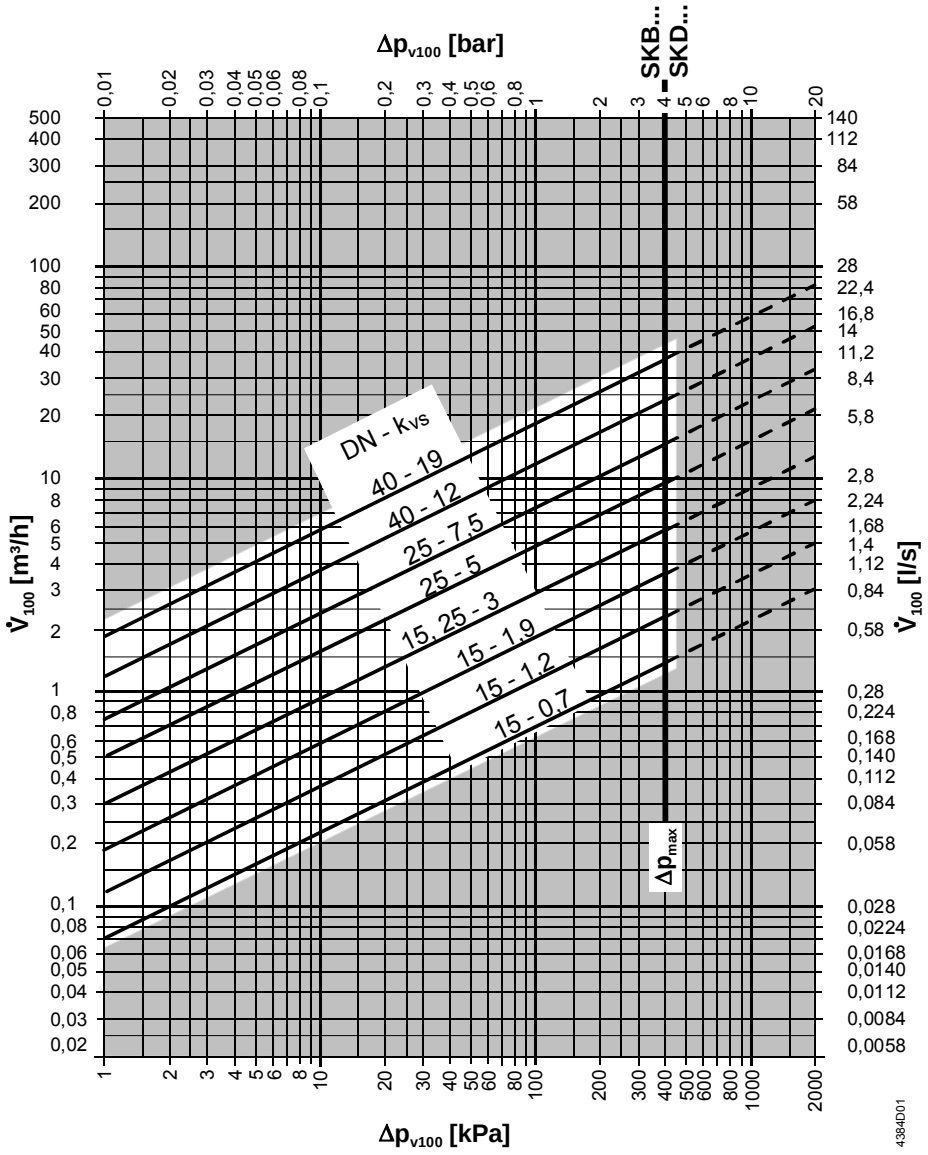


DN 40
closes against pressure

A guided parabolic, is used that is directly connected to the valve stem.
The seat is screwed to the valve body with the aid of special gland material.

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

Flow diagram



Δp_{max} = Maximum permissible differential pressure across the valve, valid for the entire actuating range of the motorised valve

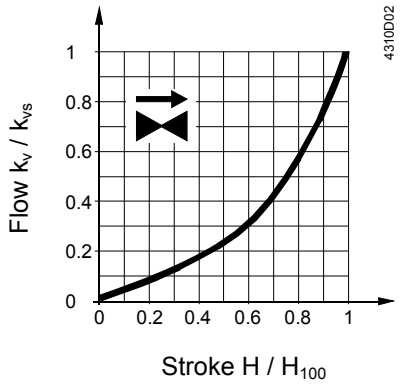
Δp_{v100} = Differential pressure across the fully open valve and the valve's control path by a volume flow V_{100}

$\dot{V}_{100}$ = Volume 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



0…30 % → linear

30…100 % → equal percentage

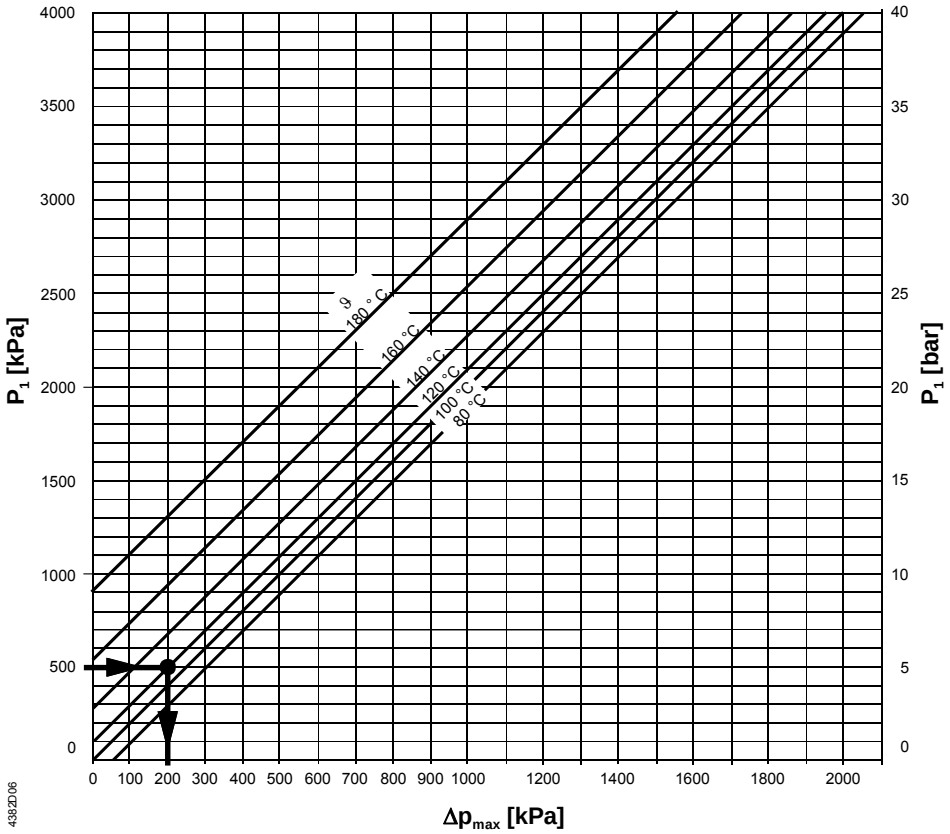
n_{gl} = 3 as per VDI / VDE 2173

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.



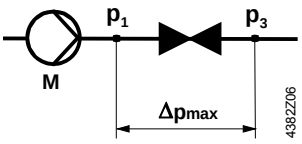
Δp_{max} = Differential pressure with valve almost closed, at which cavitation can largely be avoided

p_1 = Static pressure at inlet

p_3 = Static pressure at outlet

M = Pump

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).

Chilled water example:

Spring water cooling as an example of avoiding cavitation:

Chilled water = 12 °C

p_1 = 500 kPa (5 bar)

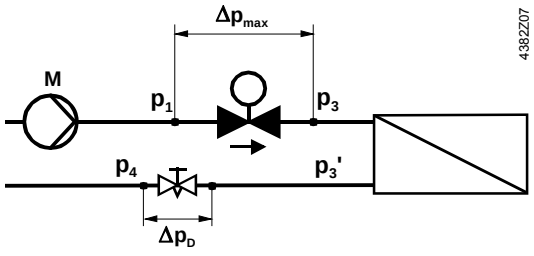
p_4 = 100 kPa (1 bar) (atmospheric pressure)

Δp_{max} = 300 kPa (3 bar)

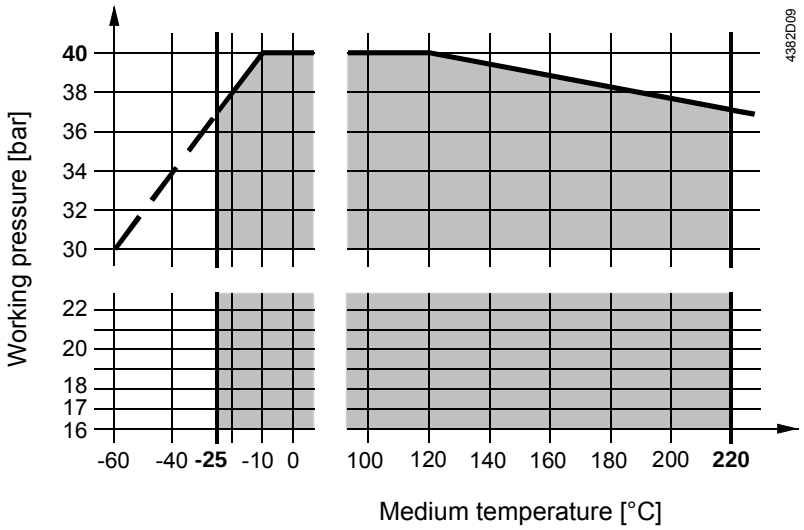
$\Delta p_{3\text{-}3'}$ = 20 kPa (0.2 bar)

Δp_D (throttle) = 80 kPa (0.8 bar)

p_3' = pressure after consumer in kPa



Working pressure and medium temperature



Working pressure and medium temperature staged as per ISO 7005

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… 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.

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 even in closed circuits.

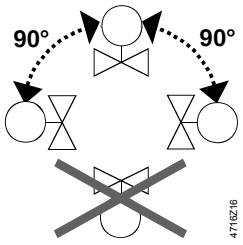
⚠ For media below 0 °C, use the electric ASZ6.5 stem heating element to prevent the valve stem from freezing in the sealing gland. For safety reasons, the stem heating element has been designed for AC 24 V / 30 W operating voltage.

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 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

VVF61...K 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 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 2.
All terms of the warranty will be invalidated by the use of actuators from other manufacturers

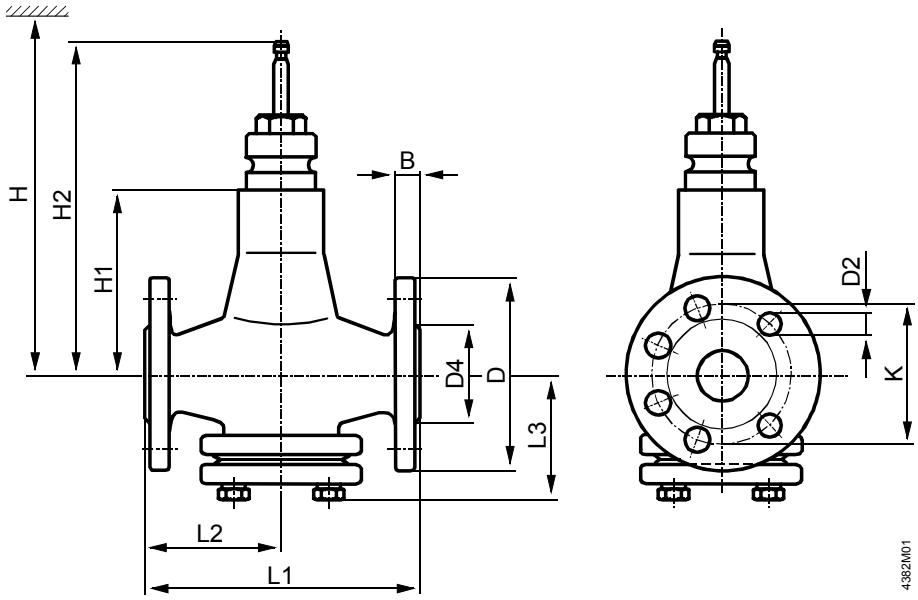
Technical data

Functional data	PN class		PN 40 to ISO 7268
	Working pressure		to ISO 7005 within the permissible medium temperature range according to the diagram on page 6
	Flow characteristic	• 0…30 % • 30…100 %	• linear • equal percentage; n_{gl} = 3 to VDI / VDE 2173
	Leakage rate		0…0.02 % of k_{vs} value to DIN EN 1349
	Permissible media:		cooling water, chilled water, low temperature hot water, high temperature hot water, water with anti-freeze; recommendation: water treatment to VDI 2035
	Medium temperature [1]		-25…220 °C
	Rangeability S_v		> 50 (VVF61.25K: > 100)
	Nominal stroke		20 mm
Industry standards	Pressure Equipment Directive		PED 97/23/EC
	Pressure Accessories		as per article 1, section 2.1.4
	Fluid group 2:	• DN 15…25	• without CE-marking as per article 3, section 3 (sound engineering practice)
		• DN 40	• category I, with CE-marking
Materials	Valve body		cast steel GP240GH
	Stem		stainless steel
	Plug, seat		stainless steel
	Sealing gland [3]		stainless steel
	Gland materials		PTFE sleeves
Dimensions / Weight	Refer to «Dimensions», page 9		
	Flange connections		to ISO 7005

[1] Electric stem heating element ASZ6.5 required for media below 0 °C.

Dimensions

Dimensions in mm



DN	B	D	D2	D4	K	L1	L2	L3	H1	H2	H		kg
		Ø	Ø	Ø							SKD…	SKB…	[kg]
15	16	95	14 (4x)	46	65	130	65	90	96	192,5	>596	>671	7,4
25	18	115		67	85	160	80	107	111	207,5	>611	>686	10
40		150	18 (4x)	84	110	200	100	102	136	232,5	>636	>711	16

DN = Nominal size

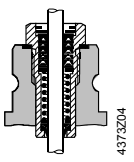
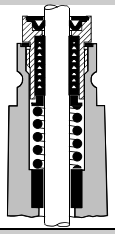
H = Total actuator height plus minimum distance to the wall or the ceiling for mounting, connection, operation, maintenance etc.

H1 = Dimension from the pipe centre to install the actuator (upper edge)

H2 = Valve in the «Closed» position means that the valve stem is fully extended

Spare parts

Order number for spare parts

Type	DN	Sealing gland		Set
		 4373204	 4382206	Plug with stem, circlip, sealing
VVF61.12 K	15	4 284 8829 0		74 676 0171 0
VVF61.13 K	15	4 284 8829 0		74 676 0172 0
VVF61.14 K	15	4 284 8829 0		74 676 0173 0
VVF61.15 K	15	4 284 8829 0		74 676 0174 0
VVF61.23 K	25	4 284 8829 0		74 676 0195 0
VVF61.24 K	25	4 284 8829 0		74 676 0196 0
VVF61.25 K	25	4 284 8829 0		74 676 0197 0
VVF61.39 K	40		4 679 5630 0	
VVF61.40 K	40		4 679 5630 0	