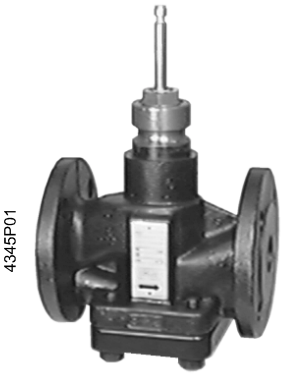
Two-port seat valves with flange, PN16

VVF45...



Two-port seat valves with flange, PN16

- **Spheroidal cast iron GGG-40**
- **DN50...150 mm**
- **k_{vs} 19...300 m^3/h**
- **Stroke 20 or 40 mm**
- **Can be equipped with actuators SKB... and SKC...**
- **Valves DN15...40 mm from GGG-40; see data sheet 4373**

Use

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

Media

Standard versions with standard stem sealing gland for:	
Cooling water **Chilled water** **Low pressure hot water** **High pressure hot water** **Water with anti-freeze** [1) 2)] **Brine** [1) 2)]	−25 ... +140 °C

Special versions with special stem sealing gland for:	
High temperature hot water **Saturated steam** (up to max. 6 bar abs.) **Hot steam** (up to max. 6 bar abs.) **Thermo oil**	140 ... 180 °C
Refrigerants	not permissible [3)]

1) Media below 0 °C: ASZ6.5 stem heating element required to prevent freezing of the valve stem in the sealing gland
2) Water with anti-freeze and brine: up to −10 °C as per DIN 3158 (stress case I) or up to −25 °C as per DIN 3158 (stress case II)
3) For these applications, special refrigerant valves with magnetic actuators are used; refer to data sheets 4700...4799

Type summary

Standard version

Type	DN [mm]	k_{vs} [m^3 / h]	S_v	$\Delta p_{vmax.}$ [kPa]
VVF45.49	50/40	19	>50	1200
VVF45.50	50	31		
VVF45.65	65	49		1000
VVF45.80	80	78	>100	700
VVF45.90	100	124		450
VVF45.91	125	200		300
VVF45.92	150	300		200

Special versions with type suffix 4

For media and temperatures		Example:
High pressure hot water **Saturated steam** (max. 6 bar abs.) **Hot steam** (max. 6 bar abs.) **Thermo oils**	140 ... 180 °C	VVF45.50**4**

DN = Nominal diameter
k_{vs} = Nominal flow value as per VDI 2173
S_v = Rangeability as per VDI 2173
$\Delta p_{vmax.}$ = Max. permissible differential pressure across the valve's control path, valid for the entire stroke range

Accessories

Electric stem heating element, AC 24 V, required for media below 0 °C: **ASZ6.5**

Ordering

When ordering, please indicate type reference and type suffix (where required).
Example: **VVF45.50**

Delivery

Both the valve and the actuator are packed and supplied separately.

The valves are supplied without counter-flanges and without flange gaskets.

Equipment combinations

Valves		Actuators [1]			
		SKB...		SKC...	
	H_{100} [mm]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]
VVF45.49	20	1200	1600		
VVF45.50					
VVF45.65				1000	
VVF45.80				700	
VVF45.90	40			450	1600
VVF45.91				300	
VVF45.92				200	
Data sheet		**4564**			

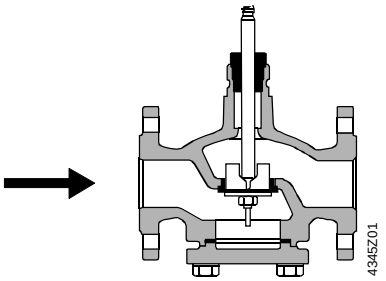
1) Actuators available for delivery:
- AC 24 V / AC 230 V with 3-position signal
- AC 24 V with proportional pos. signal DC 0...10 V or DC 4...20 mA

H_{100} = 100% stroke of the valve and the actuator
Δp_{max} = Max. permissible differential pressure across the valve's control path across the entire actuating range of the motorized valve
Δp_s = Maximum permissible differential pressure (closing pressure) at which the motorized valve will close securely against pressure

Pneumatic actuators ⚠ Do not use VVF45... with pneumatic actuators.

Mechanical design

Valve cross-section



For all nominal sizes, a guided slot plug is used that is directly connected to the valve stem.

The seat is attached to the valve body with the aid of special sealing gland material.

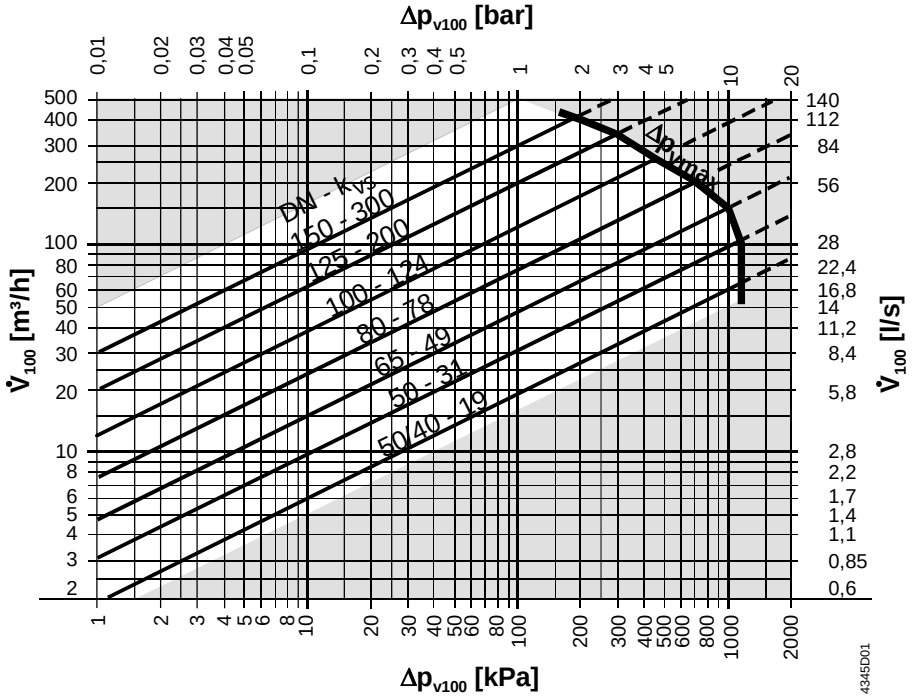
⚠ **The two-port seat valve does not become a three-port valve by removing the blank flange.**

Disposal

The various material types used require that you disassemble the unit and sort the components prior to disposal.

Sizing

Flow diagram



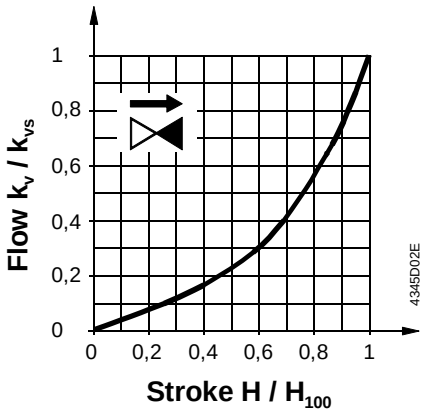
$\Delta p_{vmax.}$ = Maximum permissible differential pressure across the valve's control path, valid for the entire stroke range

Δp_{v100} = Differential pressure across the fully opened valve across the control path at $\dot{V}_{100}$ flow in kPa or in bar

$\dot{V}_{100}$ = Flow in m^3/h or in l/s

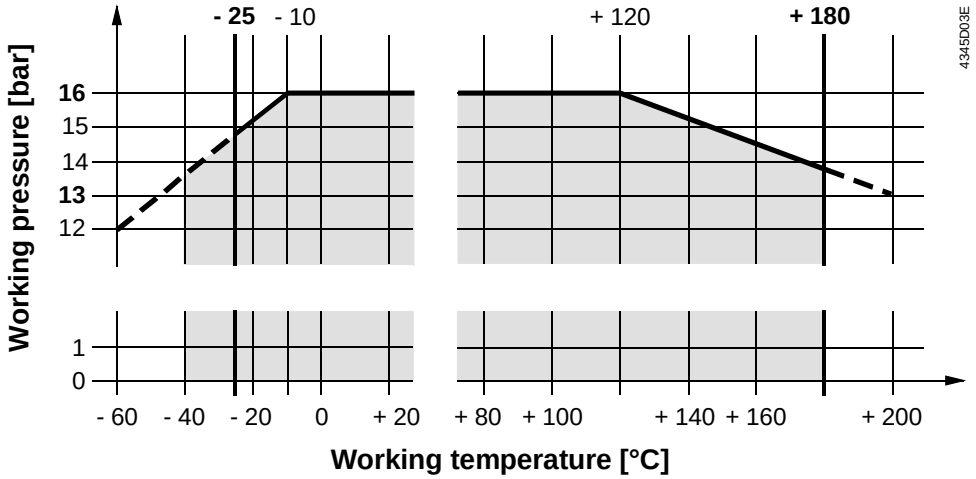
100 kPa = 1 bar ≈ 10 mWG

Valve flow characteristic



Valve flow characteristic
0... 30 % ⇒ linear
30... 100 % ⇒ n_{gl} = 3 as per VDI / VDE 2173

Working pressure and temperature



Working pressure staged as per ISO 7268 and EN 1333
at operating temperatures of –25 ... +180 °C as per DIN 4747 and DIN 3158.

Note

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.
Water quality requirements as per VDI 2035.

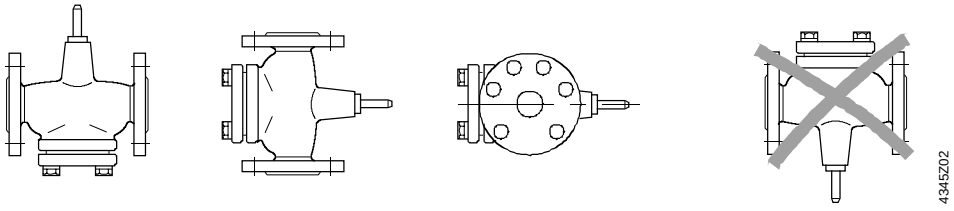
⚠ **In open circuits**, there is a risk of valve plug seizing caused by scale deposits. Thus, use only the most powerful actuators SKB... or SKC... for these applications. Additionally, periodic actuation (twice or three times per week) must be planned.
Always use a **strainer** upstream of the valve.
We generally recommend that you install a **strainer even with closed circuits** 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.

Mounting positions



Permissible Not permissible

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.**

Stem retracts: Increasing flow
Stem extends: Decreasing flow

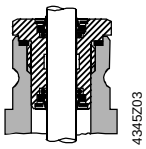
Service ⚠ **For actuator service work: Turn off the pump and the operating voltage, close the shutoff valves, depressurize the pipes and allow them to cool down. Disconnect the electrical connections, where required, from the terminals. Re-commission the valve only if the actuator has been mounted correctly.**

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.

Spare parts

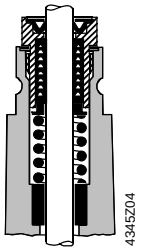
Standard version



Replacement for EPDM-O-ring sealing gland, including flat seal made from copper, for cooling water, chilled water, low temperature hot water, high temperature hot water, and brine −25 ... +140 °C

For VVF45... DN50 ... 150 (Stem dia. 14 mm) **4 679 5629 0**

Special version



Replacement for PTFE sealing gland, including flat seal made from copper, for high temperature hot water, saturated steam, hot steam, and thermo oils 140... 180 °C

For VVF45... **4** DN50 ... 150 (Stem dia. 14 mm) **4 679 5630 0**

Warranty

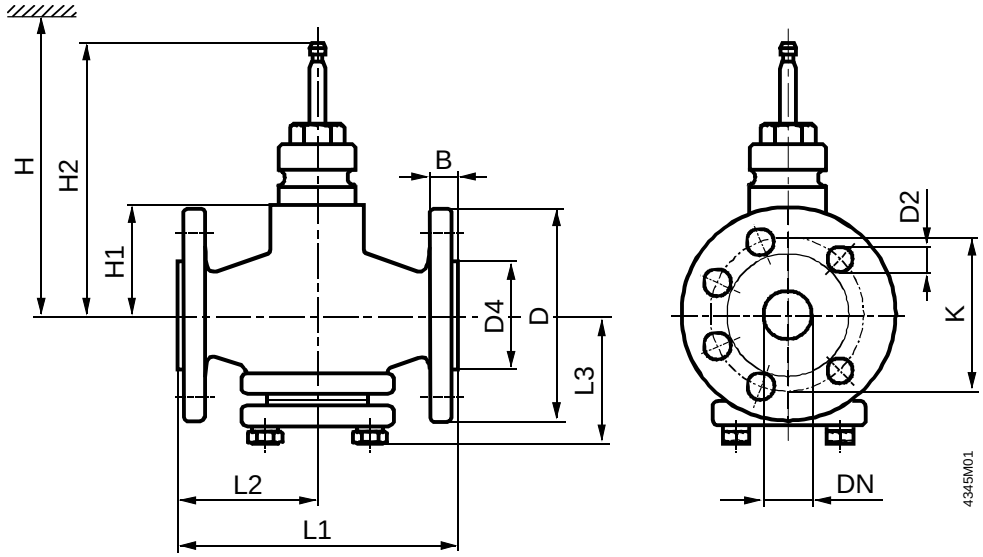
The use of third-party actuators expressly voids any warranty claims.

The technical data Δp_{max}, Δp_s, leakage rate, noise level and life apply only when used together with the Landis & Staefa actuators as listed in "Type summary".

Technical data

Function data	PN class	PN16
	Valve flow characteristic	
	0 ... 30 %	linear
	30 ... 100 %	n_{gl} = 3 as per VDI / VDE 2173
	Leakage rate	0 ... 0.02 % of k_{vs} value, VDE / VDI 2173
	Permissible pressure	1600 kPa (16 bar), ISO 7268 / EN 1333
	Working pressure	DIN 4747 / DIN 3158 in the range of −25 ... +180 °C
	Flange connections	ISO 7005
	Stroke	
	– DN50	20 mm
	– DN65 ... 150	40 mm
Materials	Valve body	spheroidal cast iron GGG-40 as per DIN 1693
	Seat, plug, and stem	stainless steel
	Sealing gland	
	Standard version	brass
	Special version	stainless steel
	Gland materials	EPDM-O-rings, PTFE sleeves

Dimensions



DN	B	D	D2	D4	H1	H2	K	L1	L2	L3	Weight
[mm]		dia.	dia.	dia.							[kg]
50		165	19 (4x)	99	96	192.5	125	230	115	96	15,5
65		185		118	114	230.5	145	290	145	126	24
80	19	200		132	126	242.5	160	310	155	148	29
100		220	19 (8x)	156	146	262.5	180	350	175	165	41
125		250		184	163	279.5	210	400	200	184	58
150		285	23 (8x)	211	186	302.5	240	480	240	210	80

DN	H	
[mm]	**SKB...**	**SKC...**
50	> 671	
65		> 689
80		> 701
100		> 721
125		> 738
150		> 761

DN = Nominal diameter

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

Dimensions in mm

Replaces CE1N4353E