



VVF63..
VVF63..K

VXF63..

ACVATIX™

2- and 3-port valves with flanged connections, PN 40

V..F63..

From the large-stroke valve line

- High-performance valves for medium temperatures from -25...220 °C
- Valve body of cast steel GP240GH
- DN 15...150
- k_{vs} 0.2...315 m³/h
- Flange type 21, flange design B
- VVF63..K with pressure compensation to handle high differential pressure
- Equipable with electro-hydraulic actuators SKD., SKB., SKC..

Use

In boiler, district heating and refrigeration plants, cooling towers, heating groups, and in air handling units as control or shutoff valves.

For use in closed or open hydraulic circuits (observe cavitation).

Type summary

	Valves	Actuators				SKD.. ¹⁾		SKB..		SKC..	
		PN 40	Stroke			20 mm				40 mm	
			Positioning force			1000 N	2800 N		2800 N		
		Data sheet				N4561		N4664		N4566	
		Stock no.	DN	k _{vs} [m ³ /h]	S _v	Δp _s	Δp _{max}	Δp _s	Δp _{max}	Δp _s	Δp _{max}
								[kPa]			
Liquids Preferred flow direction A-AB with liquids for low noise operation and high kvs-values with all actuator types	VVF63.15-0.2 ²⁾	S55210-V100	15	0.2	> 50	4000	2000	4000	2000		
	VVF63.15-0.32 ²⁾	S55210-V101	15	0.32							
	VVF63.15-0.5 ²⁾	S55210-V102	15	0.5							
	VVF63.15-0.8 ²⁾³⁾	S55210-V103	15	0.8							
	VVF63.15-1.25 ²⁾³⁾	S55210-V104	15	1.25							
	VVF63.15-2 ²⁾³⁾	S55210-V105	15	2							
	VVF63.15-3.2 ²⁾³⁾	S55210-V106	15	3.2							
	VVF63.20-6.3	S55210-V107	20	6.3							
	VVF63.25-5 ²⁾³⁾	S55210-V108	25	5							
	VVF63.25-8 ²⁾³⁾	S55210-V109	25	8							
	VVF63.32-16	S55210-V110	32	16	> 100	1200	1100	3200			
	VVF63.40-12.5 ²⁾	S55210-V111	40	12.5							
	VVF63.40-20 ²⁾	S55210-V112	40	20							
	VVF63.50-31.5 ²⁾	S55210-V113	50	31.5							
	VVF63.65-50 ²⁾	S55210-V114	65	50							
	VVF63.80-80 ²⁾	S55210-V115	80	80							
VVF63.100-125 ²⁾	S55210-V116	100	125								
VVF63.125-200 ²⁾	S55210-V117	125	200								
VVF63.150-315 ²⁾	S55210-V118	150	315								
Liquids and Steam Compensated valves are optimized for a single flow direction for liquids and steam. DN 50..150: AB-A	VVF63.50-40K	S55210-V119	50	36	> 100	4000	1500	4000	2000		
	VVF63.65-63K	S55210-V120	65	63							
	VVF63.80-100K	S55210-V121	80	100							
	VVF63.100-150K	S55210-V122	100	150	> 50				4000	2000	
	VVF63.125-220K	S55210-V123	125	220							
	VVF63.150-315K	S55210-V124	150	315							

¹⁾ Usable up to a max. medium temperature of 150 °C

²⁾ Valve with supplemental designation ..F (e.g. VVF63.25-10F) – with special flange can be ordered exclusively for France.

³⁾ Valve with supplemental designation..L (e.g. VVF63.25-10L) – with parabolic plug can be ordered for special applications (low noise)



DN = Nominal size

k_{vs} = Flow nominal value of cold water (5...30 °C) through the fully opened valve (H₁₀₀) at a differential pressure of 100 kPa (1 bar)

S_v = Rangeability

Δp_s = Maximum permissible differential pressure at which the motorized valve still closes securely against the pressure

Δp_{max} = Maximum permissible differential pressure across the valve's throughport for the entire positioning range of the motorized valve

Valves	Actuators				SKD.. ¹⁾	SKB..	SKC..				
	Stroke				20 mm		40 mm				
PN 40	Positioning force				1000 N	2800 N	2800 N				
	Data sheet				N4561	N4664	N4566				
	Stock no.	DN	k _{vs} [m ³ /h]	S _v	Δp _s	Δp _{max}	Δp _s	Δp _{max}	Δp _s	Δp _{max}	
Steam ²⁾ Exclusive flow direction AB-A for steam. Also useful for maximum close-off pressure Δp _s and maximum differential pressure in operation (Δp _{max}) with liquids.	VVF63.15-0.2	S55210-V101	15	0.2	> 50	4000	2000	4000	2000	-	-
	VVF63.15-0.32	S55210-V103	15	0.32							
	VVF63.15-0.5	S55210-V105	15	0.5							
	VVF63.15-0.8	S55210-V107	15	0.8							
	VVF63.15-1.25	S55210-V109	15	1.25							
	VVF63.15-2	S55210-V111	15	2							
	VVF63.15-3.2	S55210-V113	15	3.2							
	VVF63.20-6.3 ³⁾	S55210-V116	20	5							
	VVF63.25-5	S55210-V117	25	5							
	VVF63.25-8	S55210-V119	25	8							
	VVF63.32-16 ³⁾	S55210-V154	32	15							
	VVF63.40-12.5	S55210-V123	40	12.5							
	VVF63.40-20	S55210-V125	40	20							
	VVF63.50-31.5	S55210-V127	50	31.5							
	VVF63.65-50	S55210-V129	65	50							
	VVF63.80-80	S55210-V131	80	80							
VVF63.100-125	S55210-V133	100	125								
VVF63.125-200	S55210-V135	125	200								
VVF63.150-315 ³⁾	S55210-V155	150	280								
	Stock no.	DN	k _{vs} [m ³ /h]	S _v	Δp _{max} [kPa]						
Liquids	VXF63.15-1.6	S55210-V131	15	1.6	> 100	2000	200	2000	200	-	-
	VXF63.15-2.5	S55210-V132	15	2.5							
	VXF63.15-4	S55210-V133	15	4							
	VXF63.20-6.3	S55210-V134	20	6.3							
	VXF63.25-6.3	S55210-V135	25	6.3							
	VXF63.25-10	S55210-V136	25	10							
	VXF63.32-16	S55210-V137	32	16							
	VXF63.40-16	S55210-V138	40	16							
	VXF63.40-25	S55210-V139	40	25							
	VXF63.50-31.5	S55210-V140	50	31.5							
	VXF63.65-50	S55210-V141	65	50							
	VXF63.80-80	S55210-V142	80	80							
	VXF63.100-125	S55210-V143	100	125							
	VXF63.125-200	S55210-V144	125	200							
VXF63.150-315	S55210-V145	150	315								

¹⁾ Usable up to a max. medium temperature of 150 °C

²⁾ Operate with opposite flow direction with steam

³⁾ Reduced k_{vs} value

Note




When using a stem heating element with a medium temperature of below $-5\text{ }^{\circ}\text{C}$, the stem sealing gland must be replaced. In this case, the sealing gland must be ordered separately.

DN	Stock number
DN 15...50	4 284 8806 0
DN 65...150	4 679 5629 0

Spare parts, Rev.-No.

See page 18

Accessories

Product number	Stock number	Description	Note	
ASZ6.6	S55845-Z108	Stem heating element	Required for medium temperatures $< 0\text{ }^{\circ}\text{C}$	
-	4 284 8806 0	Stem sealing gland	When using valves of the V..F63.. lines DN 15...50 with a stem heating element and a medium temperature below $-5\text{ }^{\circ}\text{C}$, the stem sealing gland must be replaced. With the gland 428488060 the valve can be used with water, water with antifreeze and brines between $-25\text{ }^{\circ}\text{C}$ and $150\text{ }^{\circ}\text{C}$.	
-	4 679 5629 0	Stem sealing gland	When using valves of the V..F63.. lines DN 65...150 with a stem heating element and a medium temperature below $-5\text{ }^{\circ}\text{C}$, the stem sealing gland must be replaced. With the gland 467956290 the valve can be used with water, water with antifreeze and brines between $-25\text{ }^{\circ}\text{C}$ and $150\text{ }^{\circ}\text{C}$.	

Equipment combinations

Product number	Description	Stroke	Positioning force	Operating voltage	Positioning signal	Spring return time	Positioning time	LED	Manual adjuster	Auxiliary functions
SKD32.21	SKD32.21	20 mm	1000 N	AC 230 V	3-position	8 s	Opening: 30 s Closing: 10 s	-	Turn, Position is maintained	1), 2),
SKD32.50	SKD32.50					-	120 s			
SKD32.51	SKD32.51					8 s				
SKD60	SKD60			AC 24 V	0...10 V 4...20 mA 0...1000 Ω	-	Opening: 30 s Closing: 15 s	✓		3)
SKD62	SKD62					15 s				
SKD62U	SKD62U						-			
SKD62UA	SKD62UA					8 s				
SKD82.50	SKD82.50	3-position	-	120 s	-	-	1), 2),			
SKD82.51	SKD82.51									
SKD82.50U	SKD82.50U	8 s	-	120 s	-	-	1), 2),			
SKD82.51U	SKD82.51U									
SKB32.50	SKB32.50	20 mm	2800 N	AC 230 V	3-position	-	120 s	-	Turn, Position is maintained	1), 2),
SKB32.51	SKB32.51					10 s				
SKB60	SKB60					-				
SKB62	SKB62			AC 24 V	0...10 V 4...20 mA 0...1000 Ω	10 s	Opening: 120 s Closing:10 s	✓		3)
SKB62U	SKB62U									
SKB62UA	SKB62UA					-				
SKB82.50	SKB82.50					3-position	-	120 s		
SKB82.50U	SKB82.50U									
SKB82.51	SKB82.51	10 s	-	120 s	-	-	1), 2),			
SKB82.51U	SKB82.51U									
SKC32.60	SKC32.60	40 mm	2800 N	AC 230 V	3-position	-	120 s	-	Turn, Position is maintained	1), 2),
SKC32.61	SKC32.61					18 s				
SKC60	SKC60					-				
SKC62	SKC62			AC 24 V	0...10 V 4...20 mA 0...1000 Ω	20 s	Opening: 120 s Closing: 20 s	✓		3)
SKC62U	SKC62U									
SKC62UA	SKC62UA					-				
SKC82.60	SKC82.60					3-position	-	120 s		
SKC82.60U	SKC82.60U									
SKC82.61	SKC82.61	18 s	-	120 s	-	-	1), 2),			
SKC82.61U	SKC82.61U									

- 1) Auxiliary switch (optional)
- 2) Potentiometer (optional)
- 3) Position feedback, forced control, selection of valve characteristic
- 4) Plus sequence control, stroke limitation, and selection of acting direction

Ordering

Example

Product number	Stock number	Description
VXF63.32-16	S55210-V137	3-port valve with flange, PN 40, DN32

Delivery

Valves, actuators and accessories are packed and delivered as separate items.

Note





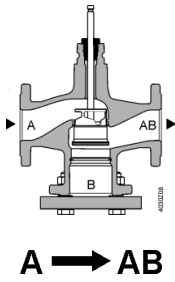
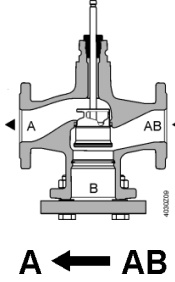
Counter-flanges, bolts and gaskets must be provided on site.

Product documentation

• Mounting Instructions	M4030 74 319 0749 0	DN 15...150
• Basic documentation	P4030	Contains background information and technical basic knowledge of valves

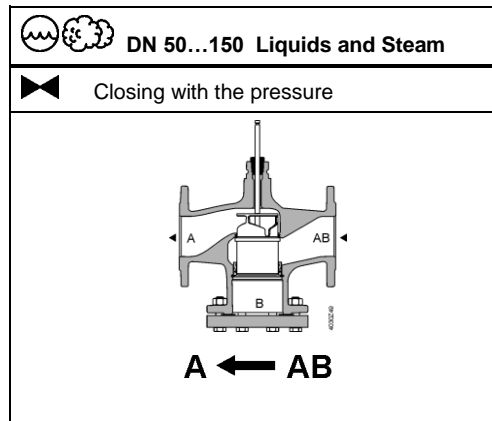
The illustrations below show the basic design of the valves. Constructional features, such as the shape of plugs, may differ.

2-port valves

 Liquids	 Steam (Liquids possible)
 Closing against the pressure	 Closing with the pressure
 <p style="text-align: center;">A → AB</p>	 <p style="text-align: center;">A ← AB</p>

2-port valves pressure compensated




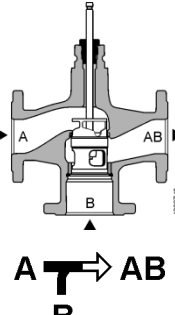
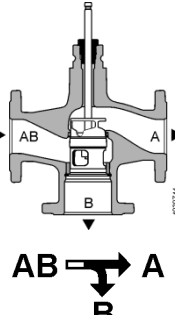
The VVF63..K valves use a pressure-compensated plug. This enables the same type of actuators to be used for the control of volumetric flow at higher differential pressures.



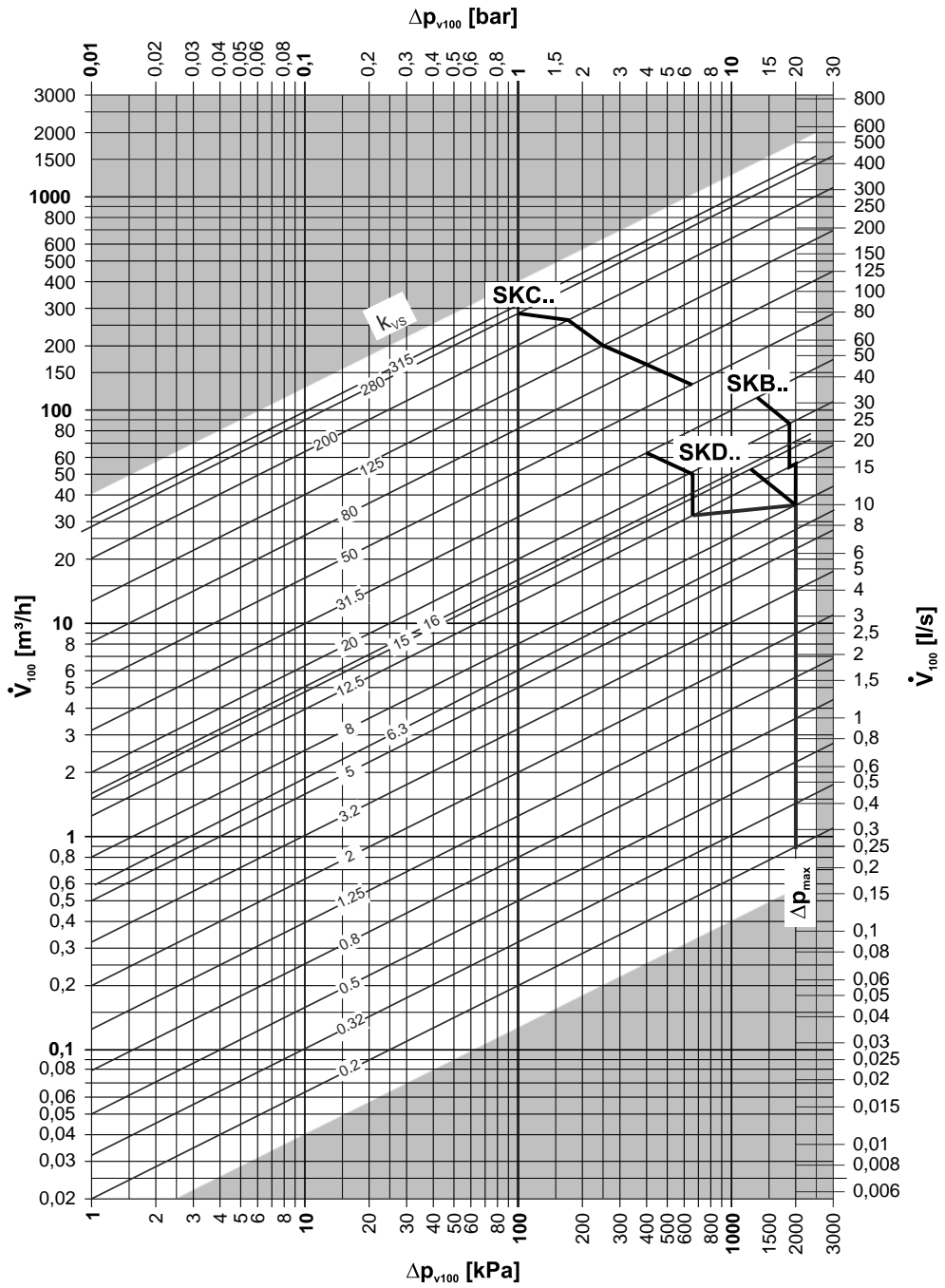
Note

2-port valves do not become 3-port valves by removing the blank flange!

3-port valves

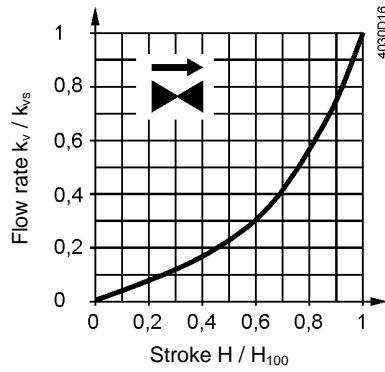
 Liquids	
 Mixing valve (preferred use)	 Diverting valve
 <p style="text-align: center;">A T B → AB</p>	 <p style="text-align: center;">AB T B → A</p>

Flow chart



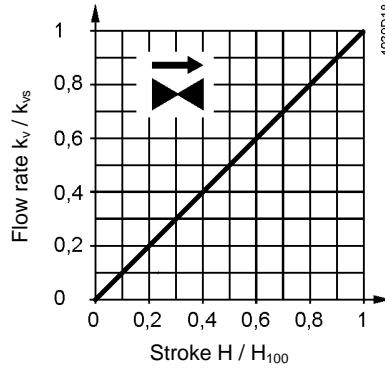
Δp_{max} values apply for the mixing function. Δp_{max} values for the diverting function see table "Type summary", page 3

Valve characteristics
2-port valves



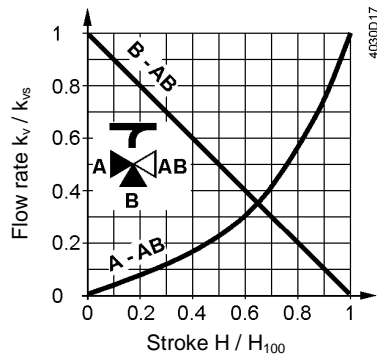
0...30 %: Linear
30...100 %: Equal percentage
 $n_{gl} = 3$ to VDI / VDE 2173
For high k_{vs} values the valve characteristic is optimized for maximum volumetric flow k_{V100} .

For product lines:
VVF63.125-220K
VVF63.150-315K



0...100 %: Linear

3-port valves



Throughport A-AB

0...30 %: Linear
30...100 %: Equal percentage
 $n_{gl} = 3$ to VDI / VDE 2173

For high k_{vs} values the valve characteristic is optimized for maximum volumetric flow k_{V100} .

Bypass B-AB

0...100 %: Linear

Port AB = constant volumetric flow

Port A = variable volumetric flow

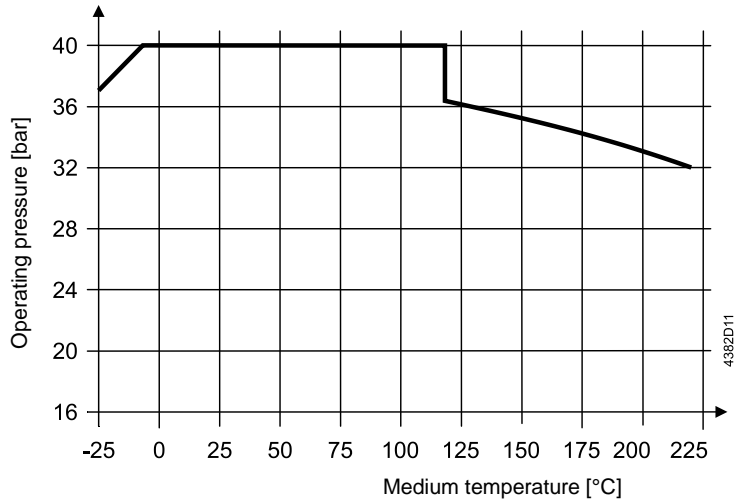
Port B = Bypass (variable volumetric flow)

Mixing: Volumetric flow from port A and port B to port AB

Diverting: Volumetric flow from port AB to port A and port B

Operating pressure and medium temperature

Liquids
with V..F63..

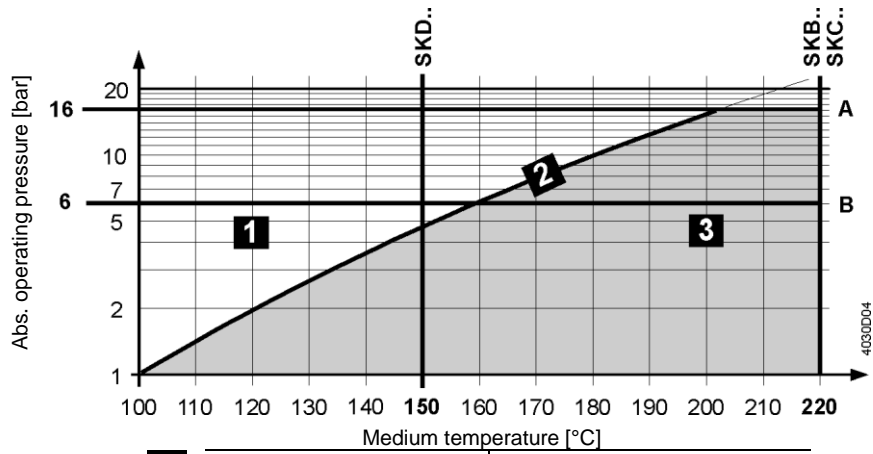


Operating pressure and operating temperatures according to ISO 7005, EN 1092, DIN 4747 and EN 12284

Notes

All relevant local directives must be observed

Saturated steam
Superheated steam
with VVF63..



1	Water	-
2	Wet steam	To be avoided
3	Saturated steam Superheated steam	Permissible operating range
A	Subcritical pressure ratio	
B	Supercritical pressure ratio	

Medium compatibility and temperature ranges

	Temperature range		VVF63..	VXF63..	VVF63..K	
	T _{min} [°C]	T _{max} [°C]				
Cold water	1	25	■	■	■	-
Low-temperature hot water	1	130	■	■	■	-
High-temperature hot water	130	150	■	■	■	-
	150	180	■	■	■	-
	180	220	■	■	■	-
Water with antifreeze	-25	130	■	■	- ¹⁾	V..F63: For medium temperatures below -5 °C, the stem sealing gland must be replaced (DN15..50: 4 284 8806 0) (DN 65..150: 4 679 5629 0).
	-10	130	■	■	- ¹⁾	
	-5	130	■	■	■	
	130	150	■	■	■	
Cooling water	1	25	■	■	■	Open circuits
Brines	-25	130	■	■	- ¹⁾	V..F63: For medium temperatures below -5 °C, the stem sealing gland must be replaced (DN15..50: 4 284 8806 0) (DN 65..150: 4 679 5629 0).
	-10	130	■	■	- ¹⁾	
	-5	130	■	■	■	
	130	150	■	■	■	
Saturated steam	100	150	■	-	■	-
	150	200	■	-	■	-
	200	220	■	-	■	-
Superheated steam	120	150	■	-	■	Min. dryness at inlet: 0.98
	150	220	■	-	■	
Heat transfer oils	20	220	■	■	■	On the basis of mineral oil, Thermal oil
Super-clean water (Demineralized and deionized water)	1	150	-	-	-	-
Demineralized water according to VDI2035 / SWKI_BT102-01	1	130	■	■	■	-

¹⁾ Differentiation due to saturated steam curve

²⁾ Open circuits

³⁾ VVF63..K can't be used with media below -5 °C due to the compensation sealing material

Fields of use

Fields of use		Valve	
		VVF63..	VXF63..
Generation	Boiler plants	■	■
	District heating plants	■	-
	Refrigeration plants	■	■
	Cooling towers ¹⁾	■	■
Distribution	Heating groups	■	■
	Air handling units	■	■

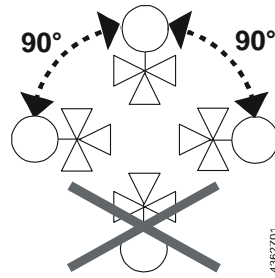
¹⁾ Open circuits

Engineering notes

Mounting location	Preferably mount the valves at the return, as the temperature is lower there and the strain on the stem sealing gland is lower.
Dirt trap	Mount a dirt filter or dirt trap before the valve to ensure proper functioning, and a long service life of the valve. Remove dirt, welding beads, etc. from the valves and pipes.
Cavitation	Cavitation can be avoided by limiting the pressure differential across the valve depending on the medium temperature and the prepressure.

Mounting notes

Mounting position



Mounting positions apply to both 2- and 3-port valves.

Commissioning notes



The valve may be put into operation only if actuator and valve are correctly assembled.

Note

Ensure that actuator stem and valve stem are rigidly connected in all positions.

Function check

Valve	Throughport A→AB or AB→A	Bypass B→AB
Valve stem extends	Closes	Opens
Valve stem retracts	Opens	Closes

Maintenance notes

The valves are maintenance-free.



When servicing valves or actuators:

- 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.

Disposal

Do not dispose of the device as unsorted municipal waste.

- Special handling of individual components may be mandated by law or make ecological sense.
- Observe all local and currently applicable laws and regulations.

Warranty

Application-related technical data are guaranteed only when the valves are used in connection with the Siemens actuators listed under "Equipment combinations", page 3.

When used with actuators of other manufacture, any warranty by Siemens becomes void.

Technical Data

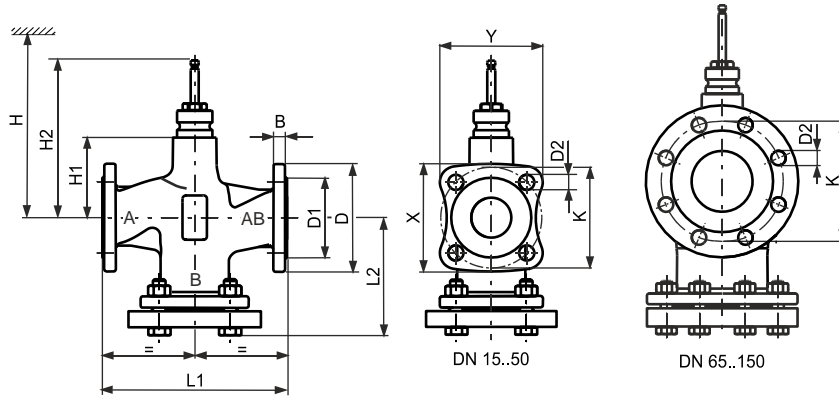
Functional data	PN class	PN 40
	Connection	Flange
	Operating pressure	See Section "Operating pressure and medium temperature" page 11
	Valve characteristics ¹⁾	See section "Valve characteristics", page 9
	Leakage rate Throughport	DN 15...150: 0...0.01 % of k_{VS} value (Class IV)
	Bypass Bypass	0.5...2 % of k_{VS} value with SKD..., SKB..., SKC..
	Permissible media	See table "Medium compatibility and temperature ranges", page 11 Heat transfer oils
	Medium temperature	-25...220 °C ²⁾ VVF63..K: -5...220 °C
	Rangeability	DN15 kvs 0.2 ... 1.25: >50 DN15 kvs 2 ... DN150: >100
	Nominal stroke	Up to DN 50: 20 mm From DN 65: 40 mm
Materials	Valve body	DN 15...150: cast steel GP240GH
	Blank flange VVF..	DN 15...150: P265GH
	Valve stem, seat, plug	Stainless steel
	Stem sealing gland	Stainless steel DN 15...150: FEPM (silicone-free)
	Compensation sealing	Stainless steel DN 50...150: FEPM (silicone-free)
Norms and directives	Pressure Equipment Directive	PED 2014/68/EU
	Pressure Accessories	Scope: Article 1, section 1 Definition: Article 2, section 5
	Liquid group 2:	
	≤ DN 40	without CE-marking, as per article 4, section 3 (sound engineering practice) ³⁾
	DN 50...80	Category I, Module A, with CE-marking, as per article 14, section 2
	DN 100...150	Category II, Module A2, with CE-marking, as per article 14, section 2 notified body number 0036
	EU Conformity (CE)	
	DN 50...150	A5W00006523 ⁴⁾
	PN class	ISO 7268
	Operating pressure	ISO 7005, EN 1092, DIN 4747, EN 12284
Flanges	ISO 7005	
Length of flanged valves	DIN EN 558-1, line 1	
Valve characteristic	VDI 2173	
Leakage rate	Throughport, Bypass according to EN 60534-4 / EN 1349	
Water treatment	VDI 2035	

Environmental conditions	Storage: IEC 60721-3-1	Class	1K3
		Temperature	-15...55 °C
		Rel. humidity	5...95 % r.h.
	Transport: IEC 60721-3-2	Class	2K3, 2M2
		Temperature	-30...65 °C
		Rel. humidity	< 95 % r.H.
	Operation: IEC 60721-3-3	Class	3K5, 3Z11
		Temperature	-15...55 °C
		Rel. humidity	5...95 % r.h.
Environmental compatibility	The product environmental declaration A5W00049179 ⁴⁾ , A5W00049180 ⁴⁾ and A5W00049181 ⁴⁾ contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal).		
Dimensions / Weight	Dimensions	See „Dimensions“, page 15 + 16	
	Weight	See „Dimensions“, page 15 + 16	

- ¹⁾ For certain valve lines and high k_{vS} values, the valve characteristic is optimized for maximum volumetric flow k_{V100}
- ²⁾ With SKD.: Usable up to a max. medium temperature of 150 °C
For medium temperatures < -5 °C, the stem sealing gland must be replaced, please see page 4.
- ³⁾ Valves where $PS \times DN < 1000$, do not require special testing and cannot carry the CE label.
- ⁴⁾ The documents can be downloaded from <http://www.siemens.com/bt/download>

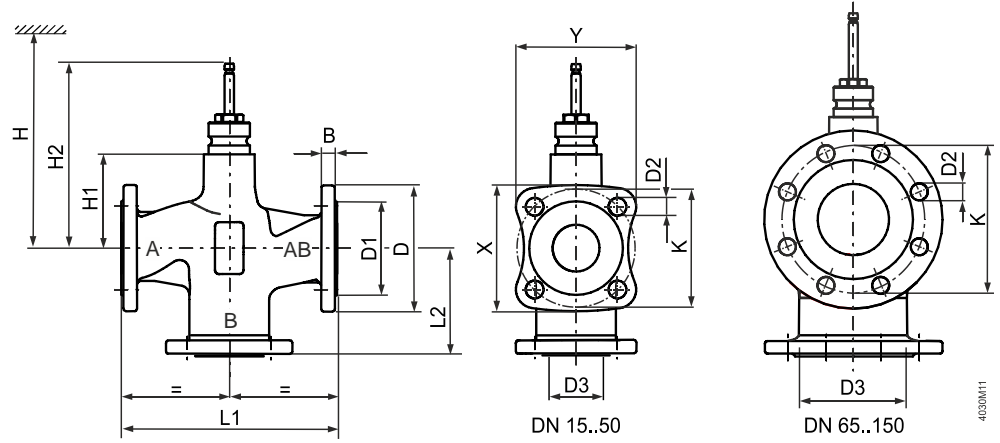
Dimensions

VVF63..



Product number	DN	kg	B	Ø D	Ø D1	Ø D2	L1	L2	X	Y	Ø K	H1	H2	H		
														SKD	SKB	SKC
VVF63..	15	5.3	14	95	46	14 (4x)	130	87,5	79	76	65	63	159,5	563	638	-
	20	6.5	16	105	56	14 (4x)	150	99,5	86,6	83	75	63	144,4	563	638	-
	25	7.5	15	115	65	14 (4x)	160	104,5	94,4	90,1	85	63	159,5	563	638	-
	32	10.6	17	140	76	19 (4x)	180	119	115,6	110,7	100	60	156,5	560	635	-
	40	12.3	16	150	84	19 (4x)	200	129	123,2	117,8	110	60	156,5	560	635	-
	50	13.4	16	165	99	19 (4x)	230	146	135,2	128,4	125	100	196,5	600	675	-
	65	29.1	17	185	118	19 (8x)	290	178	-	-	145	115	231,5	-	-	690
	80	36.9	17	200	132	19 (8x)	310	190	-	-	160	115	231,5	-	-	690
	100	49.8	17	235	156	23 (8x)	350	212,5	-	-	190	146	262,5	-	-	721
VVF63..K	125	73.0	17	270	184	28 (8x)	400	242	-	-	220	159	275,5	-	-	734
	150	102.4	17	297	211	28 (8x)	480	284	-	-	250	186,5	303	-	-	762
	50	17.4	16	165	99	19 (4x)	230	146	135,2	128,4	125	100	196,5	600	675	-
	65	29.2	17	185	118	19 (8x)	290	178	-	-	145	115	231,5	-	-	690
	80	37.1	17	200	132	19 (8x)	310	190	-	-	160	115	231,5	-	-	690
	100	50.2	17	235	156	23 (8x)	350	212,5	-	-	190	146	262,5	-	-	721
125	73.7	17	270	184	28 (8x)	400	242	-	-	220	159	275,5	-	-	734	
150	103.9	17	297	211	28 (8x)	480	284	-	-	250	186,5	303	-	-	762	


VXF63..



Product number	DN	K _G	B	Ø D	Ø D1	Ø D2	Ø D3 ¹⁾	L1	L2	X	Y	Ø K	H1	H2	H		
															SKD	SKB	SKC
VXF63..	15	4.3	14	95	46	14 (4x)	25	130	65	79	76	65	63	159,5	563	638	-
	20	5.2	16	105	56	14 (4x)	35	150	75	86,6	83	75	63	159,5	563	638	-
	25	6.0	15	115	65	14 (4x)	38	160	80	94,4	90,1	85	63	159,5	563	638	-
	32	8.0	17	140	76	19 (4x)	46	180	90	115,6	110,7	100	60	156,5	560	635	-
	40	9.4	16	150	84	19 (4x)	57	200	100	123,2	117,8	110	60	156,5	560	635	-
	50	13.5	16	165	99	19 (4x)	69	230	115	135,2	128,4	125	100	196,5	600	675	-
	65	23.5	17	185	118	19 (8x)	86	290	145	-	-	145	115	231,5	-	-	690
	80	30.1	17	200	132	19 (8x)	100	310	155	-	-	160	115	231,5	-	-	690
	100	39.8	17	235	156	23 (8x)	123	350	175	-	-	190	146	262,5	-	-	721
	125	58.4	17	270	184	28 (8x)	149	400	200	-	-	220	159	275,5	-	-	734
	150	84.0	17	297	211	28 (8x)	174	480	240	-	-	250	186,5	303	-	-	762

Spare parts

Stem sealing gland

Product number	DN	Stock number	Comments	
VVF63.. VXF63.. VVF63..K	DN 15...50	74 284 0061 0	Standard version with FEPM-O-ring for medium temperatures between -5 °C and 220 °C.	
VVF63.. VXF63.. VVF63..K	DN 65...150	S55846-Z114	Standard version with FEPM-O-ring for medium temperatures between -5 °C and 220 °C.	
VVF63.. VXF63..	DN 15...50	4 284 8806 0	When operating with medium temperatures below -5 °C. With the gland 428488060 the valve can be used with water, water with antifreeze and brines between -25 °C and 150 °C.	
VVF63.. VXF63..	DN 65...150	4 679 5629 0	When operating with medium temperatures below -5 °C. With the gland 467956290 the valve can be used with water, water with antifreeze and brines between -25 °C and 150 °C.	