

# SLIPPER & BUTTERFLY VALVES 3 - 4 PORT PN 6 (10...110°C)

VSG...-VSF...-VFG...-VFF... Eng.



- Valves for mixing or diverting
- Body and rotor in G25 cast iron; spindle in stainless steel
- Rotation angle 90°
- Unions: – DN 3/4" ...2" female screwed  
– DN 40...150 flanged PN6 (ISO 2084)



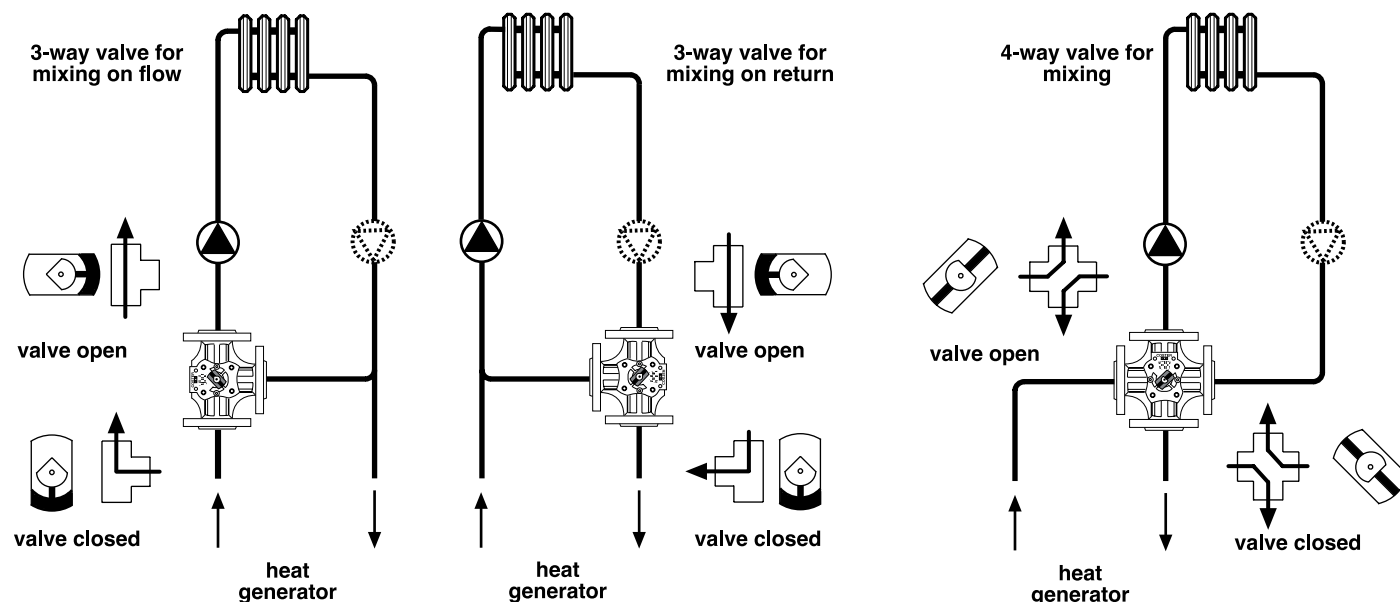
## 1. APPLICATION

Three and 4-port valves VSG...-VSF...-VFG...-VFF are designed for the control of water temperature in hydraulic circuits in heating and refrigeration plants with maximum working pressure of 600 kPa (6 bar). The 3-port valves can be used for mixing (two inputs and one output, constant flow and variable temperature) or as diverting valves (one input and two outputs, variable flow and constant temperature) according to the type of plant to be controlled; the 4-port valves are used almost exclusively as mixing valves. To operate them, depending on the valve size and the working pressure, CVC, CVH or CVF actuators of the rotary type can be used.

Permitted fluids:

- Hot water max. 110 °C
- Chilled water min. 10°C (glycol max. 50%)
- Water treated with hydrates and phosphates

## 2. SCHEMATIC DIAGRAMS



## 3. TECHNICAL DATA

Valve body	G 25 cast iron	Test pressure	1 MPa (10 bar)
Rotor	G 25 cast iron	Working pressure	600 kPa (6 bar)
Spindle	stainless steel	Rotation angle	90°
Rotor seal	Viton O-Ring	Let by	≤ 1.5 % Kvs
Spindle seal	Viton O-Ring	Fluid temperature	10...110 °C
Cover seal	Fasit 205	Type of control	equal percentage

#### 4. MODELS

Code	DN	Kvs <sup>(1)</sup> m <sup>3</sup> /h	Rotor <sup>(3)</sup>	Suitable actuators		
				CVC	CVH	CVF
				kPa (bar) <sup>(2)</sup>	kPa (bar) <sup>(2)</sup>	kPa (bar) <sup>(2)</sup>
3-port threaded	inches					
VSG 320	3/4"	13	slipper	30 (0.3)	50 (0.5)	–
VSG 325	1"	13	slipper	30 (0.3)	50 (0.5)	–
VSG 332	1"1/4	19	slipper	20 (0.2)	50 (0.5)	–
VSG 340	1"1/2	29	slipper	20 (0.2)	50 (0.5)	–
VSG 350	2"	57	slipper	20 (0.2)	50 (0.5)	–
VFG 320	3/4"	13	butterfly	30 (0.3)	50 (0.5)	–
VFG 325	1"	13	butterfly	30 (0.3)	50 (0.5)	–
VFG 332	1"1/4	19	butterfly	20 (0.2)	50 (0.5)	–
VFG 340	1"1/2	29	butterfly	20 (0.2)	50 (0.5)	–
VFG 350	2"	57	butterfly	20 (0.2)	50 (0.5)	–
3-port flanged	mm.					
VSF 340	40	29	slipper	20 (0.2)	50 (0.5)	–
VSF 350	50	57	slipper	20 (0.2)	50 (0.5)	–
VSF 365	65	81	slipper	–	40 (0.4)	–
VSF 380	80	170	slipper	–	40 (0.4)	–
VSF 3100	100	240	slipper	–	30 (0.3)	50 (0.5) <sup>(4)</sup>
VSF 3125	125	470	slipper	–	–	50 (0.5)
VSF 3150	150	700	slipper	–	–	50 (0.5)
VFF 340	40	29	butterfly	20 (0.2)	50 (0.5)	–
VFF 350	50	57	butterfly	20 (0.2)	50 (0.5)	–
VFF 365	65	81	butterfly	–	40 (0.4)	–
VFF 380	80	170	butterfly	–	40 (0.4)	–
VFF 3100	100	240	butterfly	–	30 (0.3)	50 (0.5) <sup>(4)</sup>
VFF 3125	125	470	butterfly	–	–	50 (0.5)
VFF 3150	150	700	butterfly	–	–	50 (0.5)
4-port threaded	inches					
VFG 420	3/4"	13	butterfly	30 (0.3)	50 (0.5)	–
VFG 425	1"	13	butterfly	30 (0.3)	50 (0.5)	–
VFG 432	1"1/4	19	butterfly	20 (0.2)	50 (0.5)	–
VFG 440	1"1/2	29	butterfly	20 (0.2)	50 (0.5)	–
VFG 450	2"	57	butterfly	20 (0.2)	50 (0.5)	–
4-port flanged	mm.					
VFF 440	40	29	butterfly	20 (0.2)	50 (0.5)	–
VFF 450	50	57	butterfly	20 (0.2)	50 (0.5)	–
VFF 465	65	81	butterfly	–	40 (0.4)	–
VFF 480	80	170	butterfly	–	40 (0.4)	–
VFF 4100	100	240	butterfly	–	30 (0.3)	50 (0.5) <sup>(4)</sup>
VFF 4125	125	470	butterfly	–	–	50 (0.5)
VFF 4150	150	700	butterfly	–	–	50 (0.5)

(1) Kvs – Flow coefficient: Flow in m<sup>3</sup>/h with valve open and pressure drop of 100 kPa.

(2) Δp max. – Maximum differential pressure permitted by actuator. 100 kPa = 10 mWG = 1 bar

(3) Type of rotor. For 3-port valves there are two modes of operating:

- slipper = left or right lateral port always open,
- butterfly = central port always open.

(4) Attachment possible only using AVF 171 linkage kit.

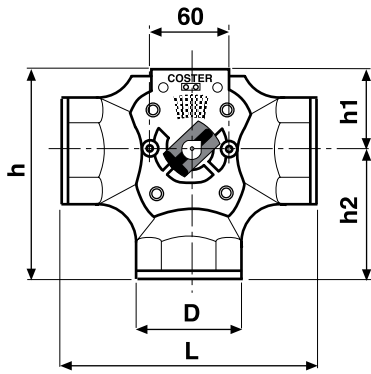
#### 5. INSTALLATION

Before installing the valve ensure that the pipework is free from extraneous material such as residues from welding or threading. The pipework must not be subject to vibrations and must be perfectly aligned with the valve connections in order to avoid dangerous stresses. Care must be taken to respect the direction of the fluid according to the type of hydraulic circuit to be controlled.

**The valve can be installed in any position except that with the spindle pointing downwards.**

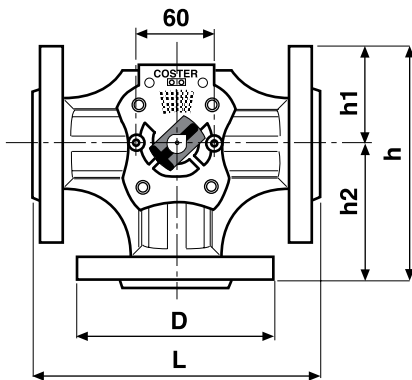
**6. DIMENSIONS**

**3-PORT THREADED**



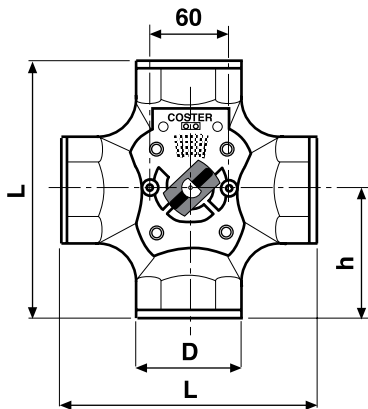
MODEL	D mm	L mm	h mm	h1 mm	h2 mm
VSG-VFG 320	56	130	113	48	65
VSG-VFG 325	56	130	113	48	65
VSG-VFG 332	70	142	119	48	71
VSG-VFG 340	80	160	137	57	80
VSG-VFG 350	93	190	156	61	95

**3-PORT FLANGED**



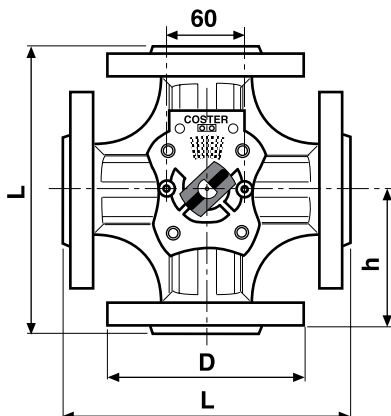
MODEL	D mm	L mm	h mm	h1 mm	h2 mm	holes No.xmm
VSF-VFF 340	130	180	155	65	90	4 x 14
VSF-VFF 350	140	200	170	70	100	4 x 14
VSF-VFF 365	160	230	195	80	115	4 x 14
VSF-VFF 380	190	250	220	95	125	4 x 18
VSF-VFF 3100	210	280	245	105	140	4 x 18
VSF-VFF 3125	240	300	270	120	150	8 x 18
VSF-VFF 3150	265	350	307	132	175	8 x 18

**4-PORT THREADED**



MODEL	D mm	L mm	h mm
VFG 420	56	130	65
VFG 425	56	130	65
VFG 432	70	142	71
VFG 440	80	160	80
VFG 450	93	190	95

**4-PORT FLANGED**



MODEL	D mm	L mm	h mm	holes No.xmm
VFF 440	130	180	92	4x14
VFF 450	140	200	102	4x14
VFF 465	160	230	116	4x14
VFF 480	190	250	125	4x18
VFF 4100	210	280	140	4x18
VFF 4125	240	300	150	8x18
VFF 4150	265	350	175	8x18

**7. CONSTRUCTION**

The body of the valve and the rotor are in G25 cast iron, while the protruding spindle is in stainless steel. The rotor is inserted in the body of the valve and is sealed by one or two O-rings which have the double purpose of keeping the rotor perfectly centred inside the valve body, thereby preventing any direct contact between the two metal surfaces, and creating a friction that guarantees a uniform rotary movement. Finally, the valve (up to dimension DN80) has an aluminium or cast iron cover. Sealing is guaranteed by a flat gasket in Fasit 205 between cover and valve body and by Viton O-Ring between the cover and the protruding spindle. A brass coupling and the two threaded protrusions sited on the cover at the side of the spindle permit correct coupling with the actuator for operating the valve.

**8. OPERATION**

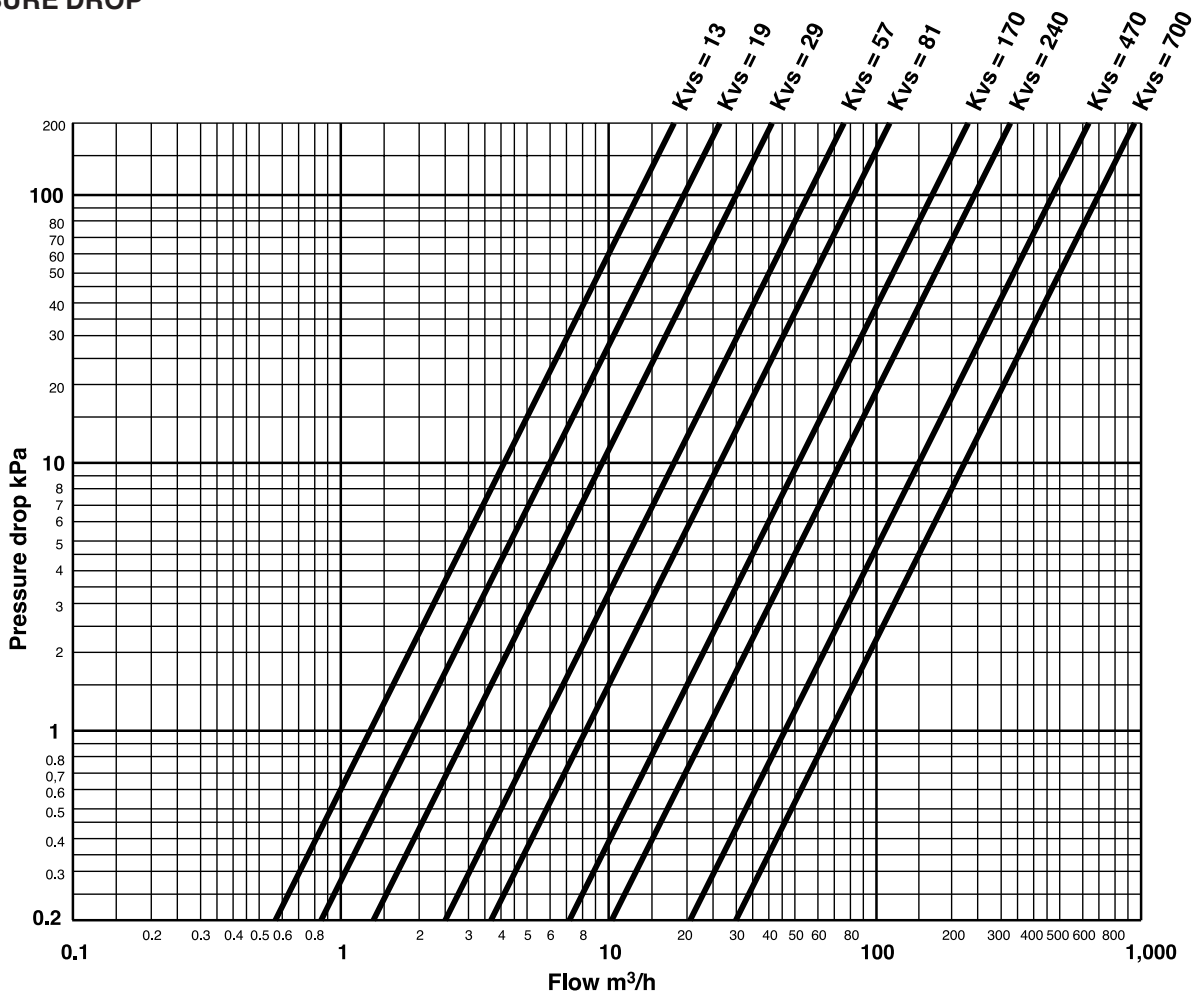
The control element of the valve is a rotor (sector or butterfly in 3-port valves, butterfly in 4-port valves) which, operated by rotating the protruding spindle, regulates the flow between the two input ports and the output port in 3-port plants; between the boiler circuit and the plant circuit in the 4-port. The position of the sector or butterfly is shown on an index plate on the outside of the valve. Two indicators, one blue and one red, moveable according to how the valve is mounted, measure the direction of movement and the position of the internal rotor.

The rotation angle is 90°.

The valve can be operated:

- manually using the handle supplied,
- automatically if coupled with a suitable actuator (see section 4. MODELS).

**9. PRESSURE DROP**



Kvs = Flow coefficient: Flow in m<sup>3</sup>/h with valve open and pressure drop of 100 kPa  
100 kPa = 10 mWG = 1 bar

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