



Variable Area Flow Meters

VS Series



Precise measuring in water flow

Design and function

VS series flow meters operate with the float principle. A float is located in a conical plastic tube. The float rises and falls as the medium passes depending on flow. The current flow is indicated on the scale at the top of the float. These instruments use a water scale in l/h and a % scale as standard. Optional air scales are also available for various operating pressures. Monitoring of the flow rate is facilitated by two adjustable indicators. Limit switches are available as accessories.

Advantages

- Unbreakable and corrosion resistant
- Radially extendable
- Special self-adhesive scales for liquid and gaseous media
- Check rail for accessories (limit switches)
- Size (DN), measuring range and material marked on tube
- Floats and stops generally made of PVDF
- Measuring ranges 1.5...60.000 l/h

Installation instructions

- The flow meters should be installed in a vertical position and free of stress in the pipe system
- An inlet and outlet section must be provided; inlet about 10 x DN, outlet about 5 x DN

Notes on use

- Hydraulic shocks must be avoided as these can damage the instrument
- Install the instrument with care, the tube must not come into contact with solvents
- Ensure that the plastic union nuts are tight prior to use

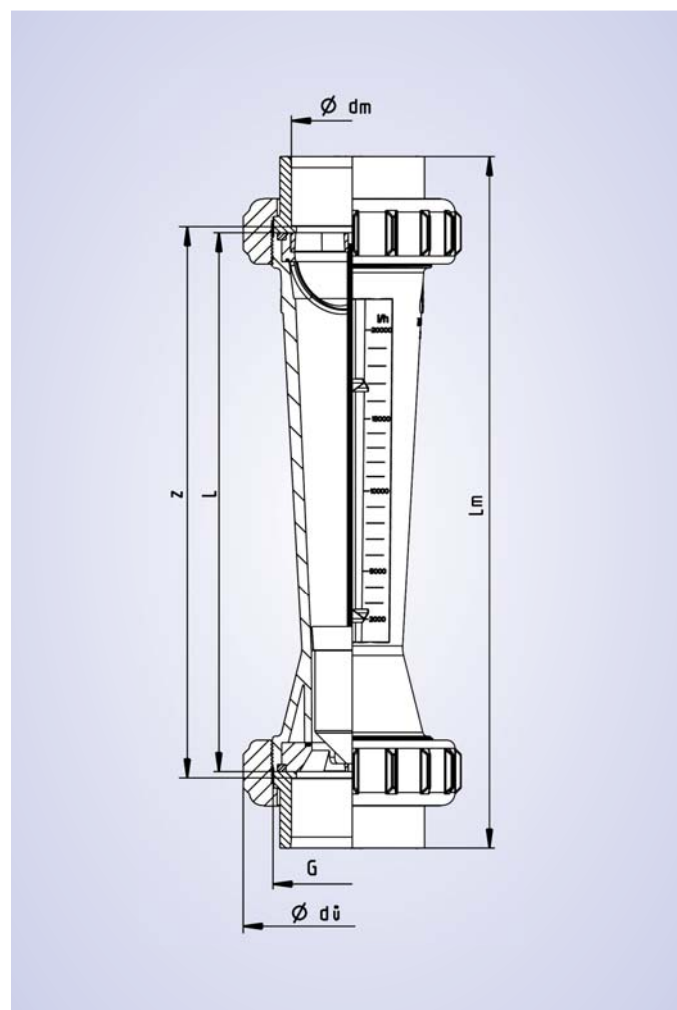
Dimensions

VS1... L = 335 mm

G	DN	d _m	L	z	L _m	d _ü
1½"	25	32	335	341	385	60
2"	32	40	335	341	393	72
2¼"	40	50	335	341	403	83
2¾"	50	63	335	341	417	103
3½"	65	75	335	341	429	122

VS3... L = 165...200 mm

G	DN	d _m	L	z	L _m	d _ü
¾"	10	16	165	171	199	35
1"	15	20	185	191	223	43
1½"	25	32	200	206	250	60



Technical data

Series	VS11...	VS12...	VS13...
		VS32...	VS33...
General data			
Accuracy	Class 4 according to VDE/DIN 3513, page 2		
Nominal pressure rating 20 °C	PN 10		
Medium temperature	0...60 °C	0...100 °C	0...40 °C
Materials			
Tube	PA	PSU	PVC
Float	PVDF		
O-ring	EPDM		

Measuring accuracy VS1... and VS3...

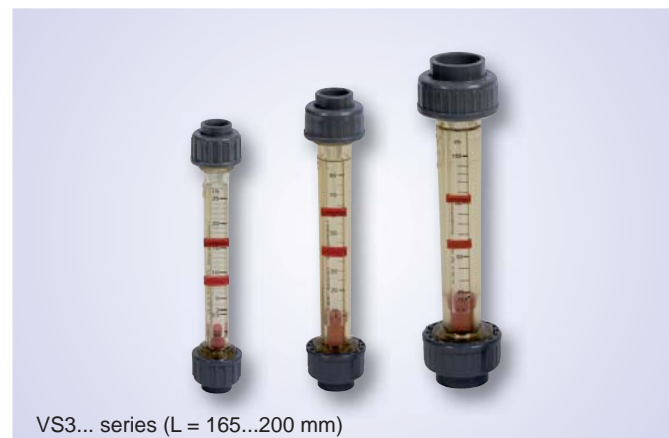
Flow rate in %	10	20	30	40	50	60	70	80	90	100
Total error of measured value in %	13.00	8.00	6.33	5.50	5.00	4.67	4.43	4.25	4.11	4.00
Total error of range in %	1.3	1.6	1.9	2.2	2.5	2.9	3.1	3.4	3.7	4.0

VS1...			
Type	Nominal size	Measuring range l/h (water)	Pressure drop mbar*
VS1_25 A...	DN 25	50...500	22.84
VS1_25 B...		100...1000	
VS1_32 C...	DN 32	150...1500	22.84
VS1_32 E...		250...2500	
VS1_40 D...	DN 40	200...2000	24.99
VS1_40 F...		300...3000	
VS1_40 G...		600...6000	
VS1_50 G...	DN 50	600...6000	24.99
VS1_50 H...		1000...10000	
VS1_50 I...		1500...15000	28.23
VS1_65 J...	DN 65	2000...20000	45.67
VS1_65 K...		3000...30000	
VS1_65 L...		8000...60000	47.24

* within total measuring range

VS3...			
Type	Nominal size	Measuring range l/h (water)	Pressure drop mbar*
VS3_10 P...	DN 10	1.5...15	4.51
VS3_10 Q...		2.5...25	
VS3_10 R...		5...50	
VS3_10 T...		10...100	
VS3_15 S...	DN 15	8...80	4.38
VS3_15 U...		15...150	
VS3_15 V...		20...200	
VS3_25 U...	DN 25	15...150	8.12
VS3_25 W...		30...300	
VS3_25 A...		50...500	
VS3_25 B...		100...1000	

* within total measuring range



Measuring ranges in air

VS1... Series (L= 335 mm), pressure range 0...4 bar

Type	Nominal size	0 bar	1 bar	2 bar	3 bar	4 bar
		m³/h STP*	m³/h STP*	m³/h STP*	m³/h STP*	m³/h STP*
VS1_25 A...	DN 25	1.5...14	3...20	3...24	3...28	4...31
VS1_25 B...		2.5...29	4...41	5...50	5...58	6...65
VS1_32 C...	DN 32	4...45	6...63	7...77	8...90	9...100
VS1_32 E...		7...79	10...111	12...136	14...158	16...177
VS1_40 D...	DN 40	6...58	9...82	11...100	12...116	14...130
VS1_40 F...		9...108	13...152	16...186	18...216	21...241
VS1_40 G...		17...174	24...246	30...301	34...348	39...389
VS1_50 G...	DN 50	17...175	24...247	30...302	34...350	39...392
VS1_50 H...		29...301	41...425	51...520	58...602	65...674
VS1_50 I...		53...405	75...572	92...700	106...810	119...907
VS1_65 J...	DN 65	55...545	78...770	96...942	110...1090	124...1220
VS1_65 K...		80...758	113...1072	139...1311	160...1516	180...1697

VS1... Series (L = 335 mm), pressure range 5...8 bar

Type	Nominal size	5 bar	6 bar	7 bar	8 bar
		m³/h STP*	m³/h STP*	m³/h STP*	m³/h STP*
VS1_25 A...	DN 25	4...34	5...37	5...39	4.5...42
VS1_25 B...		7...71	7...76	8...82	7.5...87
VS1_32 C...	DN 32	10...110	11...119	12...127	12...135
VS1_32 E...		18...193	19...209	20...223	21...237
VS1_40 D...	DN 40	15...142	16...153	17...164	18...174
VS1_40 F...		23...264	24...286	26...305	27...324
VS1_40 G...		42...426	45...461	49...492	51...522
VS1_50 G...	DN 50	42...428	45...463	49...495	51...525
VS1_50 H...		72...737	77...797	83...851	87...903
VS1_50 I...		130...992	141...1073	150...1146	159...1215
VS1_65 J...	DN 65	135...1335	146...1444	156...1542	165...1635
VS1_65 K...		197...1857	212...2008	227...2145	240...2274

VS3... series (L = 165...200 mm), pressure range 0...5 bar

		0 bar	1 bar	2 bar	3 bar	4 bar	5 bar
		m³/h STP*	m³/h STP*	m³/h STP*	m³/h STP*	m³/h STP*	m³/h STP*
VS3_10 P...	DN 10	0.01...0.55	0.15...0.80	0.17...0.9	0.20...1.1	0.25...1.20	0.25...1.3
VS3_10 Q...		0.2...0.95	0.25...1.3	0.3...1.6	0.4...1.9	0.4...2.1	0.5...2.4
VS3_10 R...		0.5...1.9	0.7...2.7	0.8...3.4	1.0...3.8	1.2...4.2	1.2...4.6
VS3_10 T...		0.8...3.0	1.0...4.2	1.2...5.4	1.4...6.4	1.6...7.0	1.6...7.4
VS3_15 S...	DN 15	0.6...2.8	0.8...4	1.0...5.0	1.2...5.6	1.4...6.4	1.4...7.0
VS3_15 U...		1.4...5.6	2...8	2...10	3...12	3...13	3...14
VS3_15 V...		1.5...7.0	2...10	3...13	3...15	4...17	4...18
VS3_25 U...	DN 25	1.0...6.5	1...9	1.5...11	2...13	2...14.5	2...16
VS3_25 W...		1.5...11	2...15	2.5...18	3...22	3...24	4...26
VS3_25 A...		3...18	4...25	5...30	5...35	6...40	6...44
VS3_25 B...		6...30	8...44	10...54	12...62	12...70	15...75

* standard conditions for temperature and pressure, 0 °C, 0 bar positive pressure

VS3... Series (L = 165...200 mm), pressure range 6...10 bar

Type	Nominal size	6 bar m ³ /h STP*	7 bar m ³ /h STP*	8 bar m ³ /h STP*	9 bar m ³ /h STP*	10 bar m ³ /h STP*
VS3_10 P...	DN 10	0.26...1.45	0.30...1.5	0.3...1.6	0.3...1.7	0.35...1.8
VS3_10 Q...		0.5...2.5	0.5...2.7	0.6...2.9	0.6...3.0	0.6...3.2
VS3_10 R...		1.2...5.0	1.4...5.4	1.4...5.8	1.6...6.0	1.6...6.4
VS3_10 T...		2.0...8.0	2.0...8.8	2.0...9.0	2.0...10	2...10
VS3_15 S...	DN 15	1.5...7.5	1.5...8.0	1.5...8.5	2.0...9.0	2.0...9.5
VS3_15 U...		3.5...15	3.5...16.5	4...17	4...18	4...19
VS3_15 V...		4...20	5...21	5...23	5...23	5...25
VS3_25 U...	DN 25	2...17	2.5...18	2.5...19.5	3...20	3...21
VS3_25 W...		4...28	4...30	4...33	5...34	5...35
VS3_25 A...		8...48	8...50	8...54	8...56	10...60
VS3_25 B...		15...80	15...85	20...90	20...95	20...100

* standard conditions for temperature and pressure, 0 °C, 0 bar positive pressure.

Limit switches

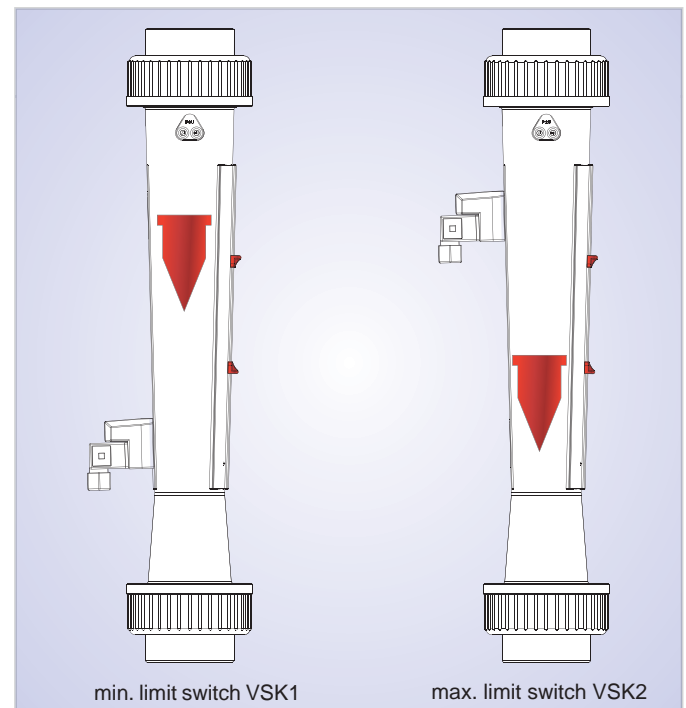
Application

The limit switches VSK1 and VSK2 serve for external monitoring of limited flow rates on our variable area flow meters. They are fitted on the check rail on the flow meter and can be adjusted to any switching point on the respective scale.





Function

The magnet in the float closes or opens a reed contact encapsulated in the limit switch. The switching function is bistable. This means that switching state is also maintained when the magnetic float is at a distance from the contact. Important to note when retrofitting limit switches is that the standard float must be replaced with a magnetic float.

Switching states



Technical data	
Switching voltage	max. 230 V AC/DC
Switching capacity	max. 10 W/12 VA
Switching current	max. 0.5 A
Contact resistance	200 mOhm
Insulation resistance	10 ¹¹ Ohm
Ambient temperature	0...55 °C
Degree of protection	IP 65 according to DIN 40050
Switching hysteresis	1-2 mm float travel

Limit switches	Float		Order code
	below	above	
min. limit switch			VSK1
max. limit switch			VSK2

Order code

VS1...

Ordering example		VS11	25 A	11	W0
Tube material					
	PA Trogamid	VS11			
	PSU	VS12			
	PVC	VS13			
Nominal size and measuring range l/h water					
	DN 25				
		50...500	25 A		
		100...1000	25 B		
	DN 32				
		150...1500	32 C		
		250...2500	32 E		
	DN 40				
		200...2000	40 D		
		300...3000	40 F		
		600...6000	40 G		
	DN 50				
		600...6000	50 G		
		1000...10000	50 H		
		1500...15000	50 I		
	DN 65				
		2000...20000	65 J		
		3000...30000	65 K		
		8000...60000	65 L		
Float					
	Standard			11	
	with magnet (for use with limit switches)			21	
Scale					
	Water l/h and %				W0
	Air 0 bar				00
	Air 1 bar				10
	Air 2 bar				20
	Air 3 bar				30
	Air 4 bar				40
	Air 5 bar				50
	Air 6 bar				60
	Air 7 bar				70
	Air 8 bar				80

VS3...

Ordering example		VS32	10 P	11	W0
Tube material					
	PA Trogamid	VS32			
	PVC	VS33			
Nominal size and measuring range l/h water					
DN 10	1.5...15		10 P		
	2.5...25		10 Q		
	5...50		10 R		
	10...100		10 T		
DN 15	8...80		15 S		
	15...150		15 U		
	20...200		15 V		
DN 25	15...150		25 U		
	30...300		25 W		
	50...500		25 A		
	100...1000		25 B		
Float					
	Standard			11	
	with magnet (for use with limit switches)			21	
Scale					
	Water l/h and %				W0
	Air 0 bar				00
	Air 1 bar				10
	Air 2 bar				20
	Air 3 bar				30
	Air 4 bar				40
	Air 5 bar				50
	Air 6 bar				60
	Air 7 bar				70
	Air 8 bar				80
	Air 9 bar				90
	Air 10 bar				Z0

Our Production and Sales Range



Flow Sensors without moving Parts



Turbine Flow Sensors



Flow Switches



Pressure Gauges and Pressure Sensors



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Electronic Digital Thermometers, Dial Thermometers



Measuring Instruments



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Subject to technical modification

