

→ Series VE

→ Series VL



ELECTRONIC
FLOW MONITORS AND SENSORS



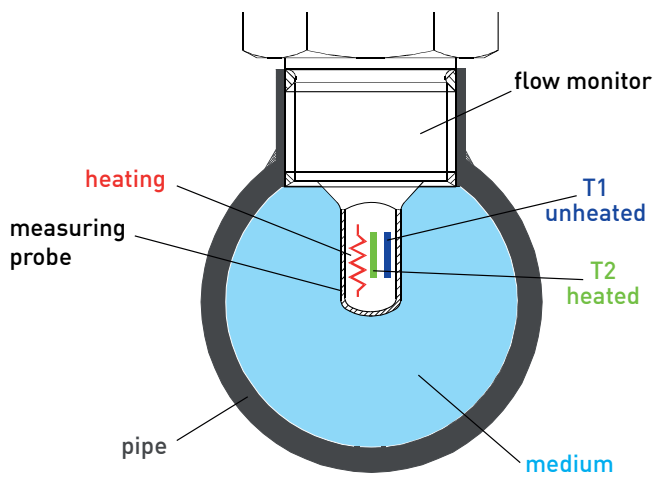
Electronic flow monitors for liquids

Principle of operation

The electronic flow monitor works on the principle of the detection of temperature differences. The cylindrical measuring probe contains two temperature sensors. These have optimum heat conducting contact with the medium and are thermally well insulated from each other. One sensor is heated with a constant electrical power while the other sensor is not heated and thus takes on the temperature of the medium. When the medium is not in motion, the temperature difference between the two sensors stabilizes at a constant level.

The flowing medium cools down the heated sensor. The changing temperature difference between the two sensors depends on the velocity and is a parameter for monitoring the specified minimum flow rate. This signal is sent to a comparator which controls a transistor output signal. With a potentiometer the output signal is set to the requested set point. When the flow rate fails to reach this limit, the transistor activates the output signal. A six position LED array displays the proximity to the alarm point which has been specified.





Applications

- Protection for pumps against dry running
- Monitoring lubrication circuits
- Cooling and heating circuits
- Air-conditioning units
- Monitoring for pipe breaks
- Monitoring for leaks

Advantages

- No moving parts in the flow
- Switching possible at very low flow
- High pressure capability
- Can be used for a wide range of pipe sizes

VES compact version

Here the flow sensor and the corresponding switching transducer form a single unit. This means that flow can be monitored directly at the point of measurement.

VEG separate version

The flow sensor installed in the pipe is connected to the switching transducer by a connecting lead. The electronic unit has been designed for installation on a mounting rail. This means that several points of measurement can be monitored from a central location.



Electronic flow monitors for liquids

Series VE



Technical data

Sensor	Compact version		Separate version	
Type	VES08	VES09	VEG08	VEG09
Length of measuring probe L1	31 mm	48 mm	31 mm	48 mm
Thread length L2	15 mm	29 mm	15 mm	35 mm
Temperature gradient	4 °C/s			
Stand-by time	Approx. 2...15 s			
Response time	Approx. 1...13 s			
Max. pressure rating	200 bar			
Medium temperature	-20...85 °C			
Process connection	G½ male			
Degree of protection EN 60529	IP67			
Material in contact with fluid	Stainless steel 1.4571			
Electrical connection	4-pin plug connector M12 x 1			
Oder code				
	VES08	VES09	VEG08	VEG09

Technical data

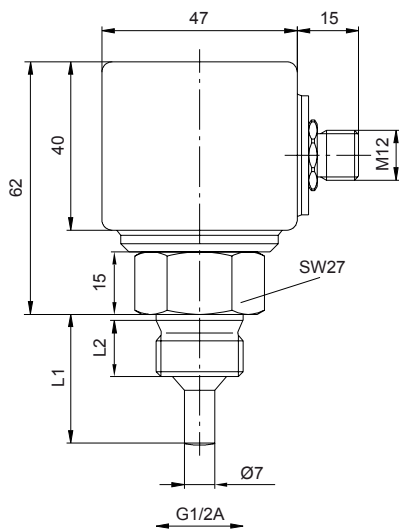
Switching transducer	Integrated		Separate	
Display	6 LEDs: 1 red = alarm 2 yellow = switching point		3 - 6 green = flow	
Power supply	24 VDC (±10 %)		24 VDC (±20 %) [standard]	230 VAC (+10%/-20%) [on request]
Current consumption	70 mA		80 mA	35 mA
Output signal	PNP, open collector		Relay, closing contact	Relay, change over contact
Max. switching voltage			230 VAC / 250 VDC	230 VAC / 60 VDC
Max. output current / switching current	400 mA (25 °C)		1 A	4 A
Max. switching capacity			125 VA / 60 W	1000 VA / 60 W
Material housing	PBT		PC-GF	
Oder code				
			EU3011V0000126	EU3011V0000240

Working range of sensors

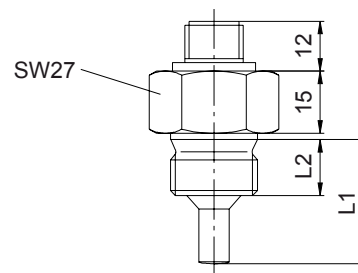
Set point range (detection range water: 1...150 cm/s; oil: 3...300 cm/s)										
Pipe size	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 150
Water [l/min]	0.1...18	0.2...33	0.3...52	0.6...91	0.8...124	1.3...199	2.2...335	3.1...462	5.2...784	11.4...1707
Oil * [l/min]	0.4...36	0.7...66	1...105	2...182	2.5...247	4...397	6.7...670	9.2...920	15.7...1568	34...3414

* Oil medium viscosity (approx. 80 mm² / s at 20 °C)

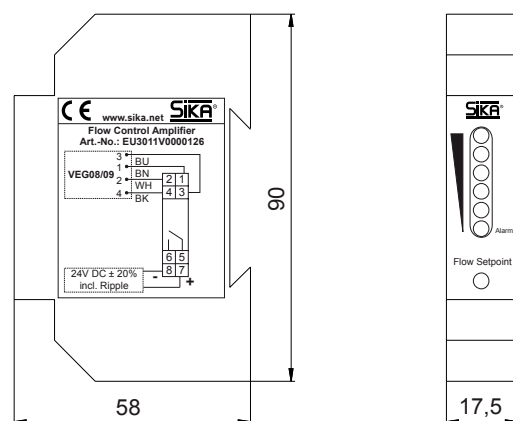
VES (compact version)



VEG (separate version)



Switching transducer EU3011V0000126



Electronic flow sensors for gases

Series VL

The sensors of the series VL operate on the calorimetric principle without moving parts. The operation and adjustment is done in a user-friendly manner via three capacitive buttons and the 4-digit 7 segment display. The display head on the housing body can be rotated through 330° and the display can be additionally turned through 180° for an overhead installation. The housing body can be also adjusted through 330° together with the electric connection.

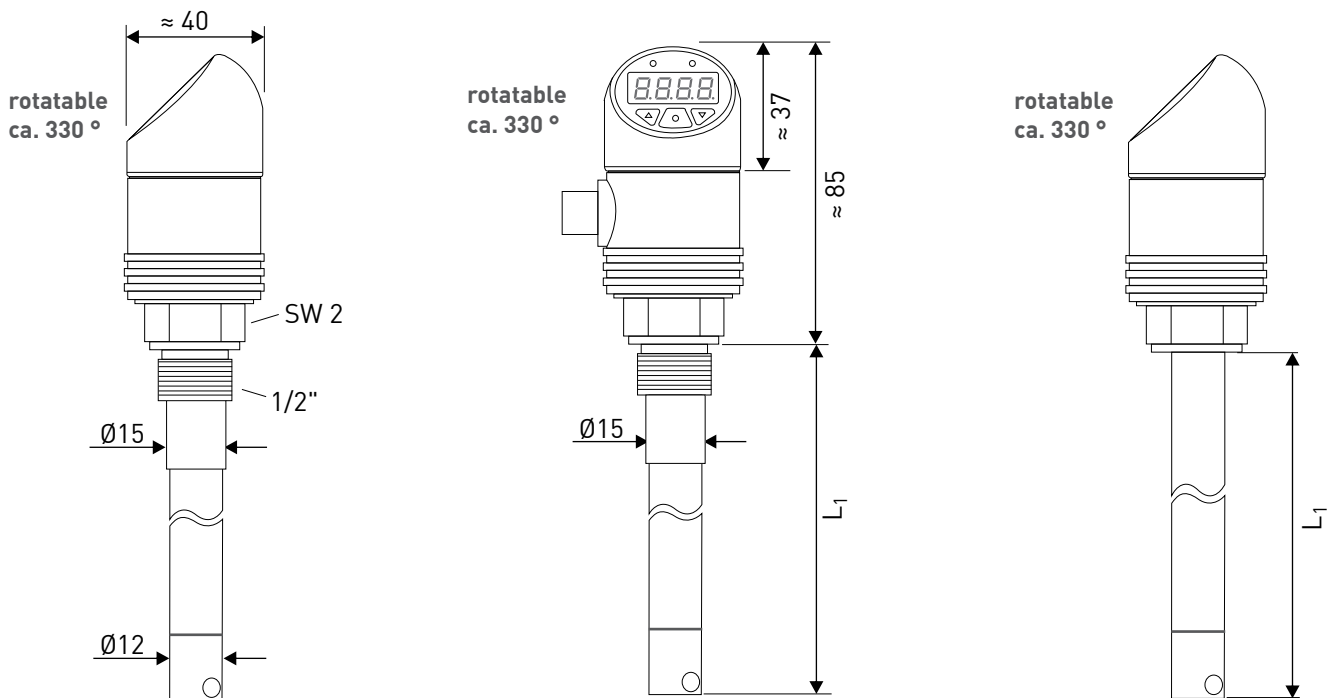
- Local display
- Analogue output: 4...20 mA
- Alarm output
- Peak value memory min/max
- Menu navigation according to VDMA 245741-4



Technical data	
Probe length L₁	100...400 mm selectable, increments of 50 mm
Process connection	Without, G $\frac{1}{2}$, G $\frac{3}{4}$, G1, G 1 $\frac{1}{2}$, 1/2" NPT or clamp screw connection G $\frac{1}{2}$
Measuring range	0...10 m/s, 0...20 m/s or 0...30 m/s
Accuracy	±5 % of range* in the range 10...100 % of reading
Temperature error	±0.01 % / K
Repeatability	±2 %
Response time	Approx. 2 s
Measured medium	Air or non-aggressive gases
Temperature ranges	
→ Medium	-20...70 °C
→ Ambient	0...60 °C
→ Storage	-20...80 °C
Pressure rating	PN 10
Displays	4 digit 7 segment, red, height 8.5 mm, reversable Status LED for alarm output
Display error	±0.2 % of range ±1 digit
Operation	3 buttons, according to VDMA 24574-1 to 24574-4
Degree of protection EN 60529	Sensor IP67 Electronics IP65 (with mounted cable socket)

* Reference conditions 20 °C, 1013 hPa

Electrical data	
Electrical connection	5-pin cable socket M12 x 1
Power supply	24 VDC ($\pm 10\%$)
Current consumption	≤ 21 mA
Output signals	
Analogue output → Current signal → Scaling → Works scaling → Max. burden	4...20 mA / 3-wire Programmable 0...100 % of measuring range 500 Ω
Alarm output → Signal shape → Max. output current / switching current → Switching point → Hysteresis → Alarm delay	PNP open collector 200 mA Programmable Programmable 0...999.9 sec programmable



Material in contact with media	
Process connection	Stainless steel 1.4571
Sensor tube	Stainless steel 1.4571
Sensor element	Al ₂ O ₃ with glass passivation
Sensor holder	FKM

Order code	Example → VL35	1	10	0100
Type				
VL	VL35			
Process connection				
Without (without clamp screw connection G½)		0		
G½		1		
G¾		2		
G 1		4		
G 1½		5		
½" NPT		6		
Without (with clamp screw connection G½)		7		
Measuring range				
0...10 m/s			10	
0...20 m/s			20	
0...30 m/s			30	
Probe length L₁				
100 mm				0100
150 mm				0150
200 mm				0200
250 mm				0250
300 mm				0300
350 mm				0350
400 mm				0400

Accessories	Length	Order code	
Connection cable with 5 pin cable socket M12 x 1, angle type molded lead 5 x 0.34 mm², sheathing material PVC (T_{max} = 80 °C)*	1 m	XVVX040	
	2 m	XVVX051	
	3 m	XVVX039	
	5 m	XVVX041	
	10 m	XVVX042	
4 pin cable socket M12x1 angle type, unassembled		VT1331	

* Connection cable with UL approval on request

