Radial Turbine Flow Sensors for Liquids

SIKA® founded 1901
Dr. Siebert & Kühn GmbH & Co. KG

SIKA Dr.Siebert & Kühn GmbH & Co. KG · Struthweg 7–9 • 34260 Kaufungen • Germany • ☎.: +49 5605 803-0 • Fax: +49 5605 803-54 • e-mail: info@sika.net • www.SIKA.net

Series SIKA VR flow sensors

The characteristics

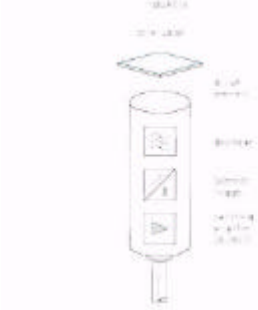
The medium flows into the sensor housing through a defined bore. The diameter of this bore depends on the specified measuring range and the connection size. The paddle wheel is set into motion by the flow entering the sensor housing. The rate of revolutions is proportional to the flowrate in question. The rotation is detected inductively or magnetically, depending on the version of the pick-up outside the sensor housing. The sensors are designed for minimum flows from 0,3 l/min. The sensors performe high accuracy combined with a reasonable price. If the sensor housing is supplied with a transparent cover (optionally available), it is possible to simultaneously monitor the flow visually. The flowsensor is connected mechanically via replaceable adapters with 3/8" BSP female or male thread or grommet or 1" BSP female or male thread or flanges.

Optimum positioning of the sensor is possible even after the sensor has been fitted, thanks to the rotatable adapters.

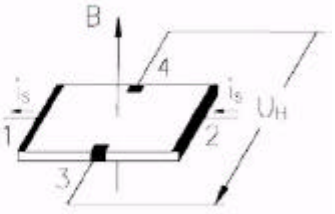
Measuring system

The electrical output signal of the measuring sensor used (inductive or meagnetic) is directly proportional to the number of revolutions of the rotor and therefore to the flowquantity. The electrical signals are pulses, the frequency changes depending on the speed of the rotor and therefore the flow speed. The paddle wheel has a ceramic axle which runs in plastic bearings. The symmetry of the axis bearing guarantees that minimum friction forces arise and therefore that even small quantities are recorded. Two versions of sensor are available:

inductive



magnetic



- Inductive system

The surfaces of the rotor blades are either metallically coated or have a stainless steel cap, depending on the medium. This means that when the rotor blades approach the measuring sensor, the sensor's inductivity changes and a pulse-shaped output signal is generated.

- Magnetic system

The rotor is fitted with permanent magnets which act on a Hall sensor housed in the pick-up. The pick-up electronics convert the Hall signal into a pulse-shaped electronic output signal.
A rectangular signal, the amplitude of which is reduced by approximately 1 Volt compared with the applied supply voltage, arises as the electrical output signal in the case of all pick-ups. The output signals can be further processed in the series SIKA TS 11500 electronics.
This series TS 11500 offers the possibility of both display and monitoring, and also permits conversion of the measured signal into a standardized signal (e.g. 0/4-20mA). The supply voltage for the measuring sensor is already incorporated in the electronic units. The flow sensors are supplied with function diagrams for original equipment applications, so that simple adaptation to downstream electronics is possible.

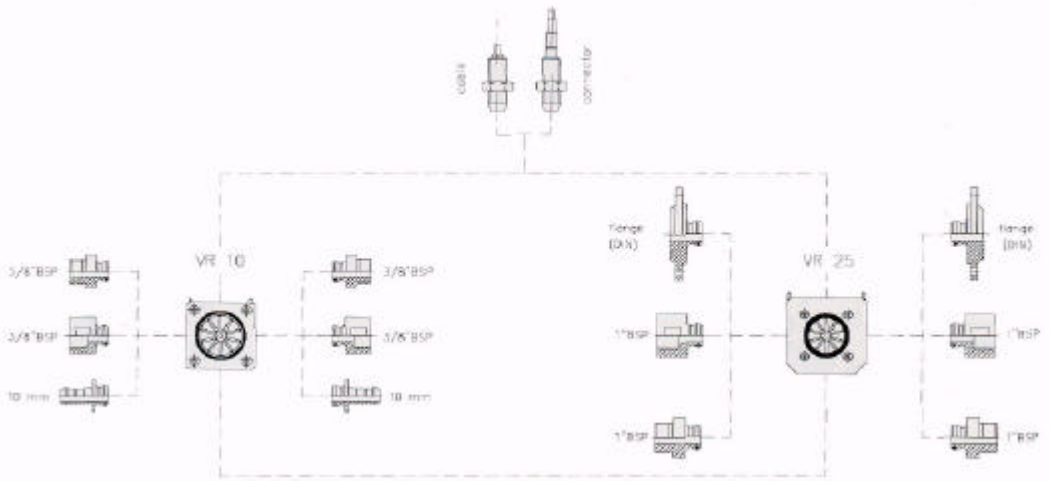
SIKA Dr. Siebert & Kühn GmbH & Co. KG, Struthweg 7–9, D-34260 Kaufungen, Tel.: +49 5605 803-0, Fax: +49 5605 803-54, e-mail: info@sika.net, www.SIKA.net

Significant features of the SIKA flow sensors, series VR

- Can be used for DN 10 to DN 100 pipelines
- Measuring range from 0.3 l/min. to 1000 l/min.
- Wide selection of materials for a broad range of applications, including for aggressive media
- Can be used for temperatures of up to 100 °C and pressures of up to 100 bar
- Viscosity-stable for liquids up to 10 cSt.
- Wide range of instrumentation

Materials:

- POM (Hostaform)
- PVDF
- Brass
- Stainless steel



Possible connection modes VR10:
male thread, female thread, grommet stainless steel

Possible connection modes VR25:
male thread, female thread, flange

SIKA Dr. Siebert & Kühn GmbH & Co. KG, Struthweg 7–9, D-34260 Kaufungen, Tel.: +49 5605 803-0, Fax: +49 5605 803-54, e-mail: info@sika.net, www.SIKA.net

Flow sensor
Series VR 10

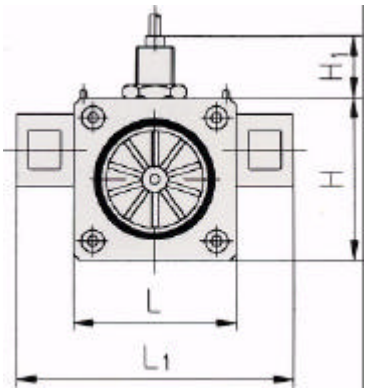
Type VR 10 K1
POM - Housing

Type VR 10 K2
PVDF-Housing

Type VR 10 VA/MS
stainless steel or brass housing

Type	Measuring range l/min.	Specified measuring range (accuracy ± 3% FS) l/min	Housing material	Bore Diameter mm	Average pulses per i	PN	Tmax.	Electrical sensor (standard version)	Weight
VR10K1-2	0,3-1,5	0,5-1,5	Plastic POM	2	10.200	16	60°C	inductive NPN	0,2kg
VR10K1-5	0,5-10	2-10		5	3.345				
VR10K1-7	0,7-12	2-12		7	1.755				
VR10K 2-2	0,3-1 ,5	0,5-1,5	Plastic PVDF	2	10.200				
VR10K2-5	0,5-10	2-10		5	3.345				
VR10K2-7	0,7-12	2-12		7	1.755				
VR1 OVA-2	0,3-1,5	0,5-1,5	Stainless steel	2	4.955	100	100°C	Hall sensor NPN	0,6kg
VR1 OVA-5	0,5-10	2-10		5	1.580				
VR1 OVA-7	0,7-12	2-12		7	860				
VR 10 MS-2	0,3-1,5	0,5-1,5	Brass	2	4.955				
VR 10 MS-5	0,5-10	2-10		5	1.580				
VR 10 MS-7	0,7-12	2-12		7	860				

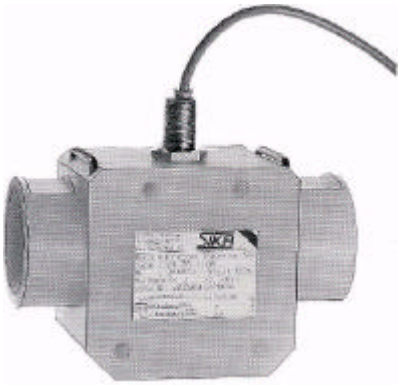
Measuring over-range : 20% possible, regard higher wear
Repeatability: ±1%FS
Batch dispersal: on request
Dimensions: H= 50mm
Hi = 19 mm (Hallsensor)
L = 50mm
L1 = 85mm
Standard connection: 3/8" BSP female thread
(3/8" BSP male thread and
grommet as option)



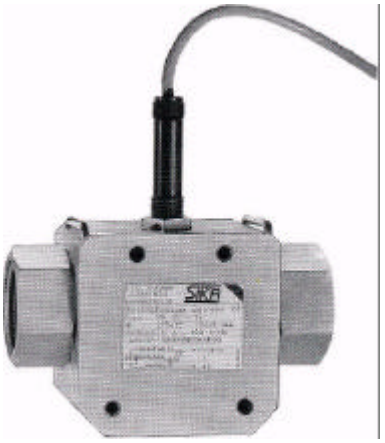
SIKA Dr. Siebert & Kühn GmbH & Co. KG, Struthweg 7–9, D-34260 Kaufungen, Tel.: +49 5605 803-0, Fax: +49 5605 803-54, e-mail: info@sika.net, www.SIKA.net

Flow Sensor
Series VR 25

Type VR 25 K1
POM -Housing



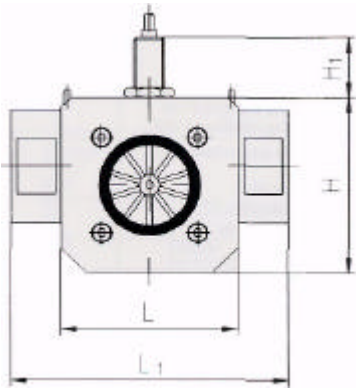
Type VR 25 K2
PVDF - Housing



Type VR 25 VA/MS
stainless steel or brass housing

Type	Measuring range l/min.	Specified measuring range (accuracy ± 3% FS) l/min	Housing-material	Bore Diameter mm	Average pulses per l	PN	T max.	Electrical sensor (Standard version)	Weight
VR 25 K1 -8	2-30	3-30	Plastic POM	8	1.216	16	60°	inductive NPN	0,5 kg
VR25 K1 - 12	3-60	5-60		12	607				
VR25K1 - 16	4-100	6-100		16	252				
VR 25 K 2-8	2-30	3-30	Plastic PVDF	8	1.216				
VR25K2-12	3-60	5-60		12	607				
VR 25 K 2-1 6	4-100	6-100		16	252				
VR 25 VA-8	2-30	3-30	Stainless Steel	8	544	100	100°C	Hall sensor NPN	1,8 kg
VR25 VA-12	3-60	5-60		12	295				
VR25 VA-16	4-100	6-100		16	126				
VR 25 MS-8	2-30	3-30	Brass	8	544				
VR 25 MS-1 2	3-60	5-60		12	295				
VR 25 MS-1 6	4-100	6-100		16	126				

Measuring over-range: 20 % possible, regard higher wear
Repeatability: Batch ± 1 % F S
dispersal: Max. on request
pressure drop: 0,5 bar
Dimensions: H = 70 m m
Hi = 24 mm (Hall sensor)
Standard connection: L = 70 m m
L1 = 1 1 0 mm
1" BSP female thread
(1" BSP male thread and flange connection as option)



SIKA Dr. Siebert & Kühn GmbH & Co. KG, Struthweg 7–9, D-34260 Kaufungen, Tel.: +49 5605 803-0, Fax: +49 5605 803-54, e-mail: info@sika.net, www.SIKA.net

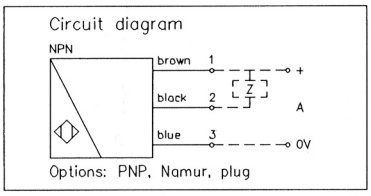
Series VR 10 / VR 25

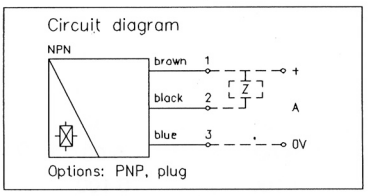
Material, options

Types	VR 10 K1 / VR 25 K1	VR 10 K2 / VR 25 K2	VR 10 MS / VR 25 MS	VR 10 VA/ VR 25 VA
Housing	POM	PVDF	Brass	Stainless steel 1.4305 (1.4571)
Cover	POM (Makrolon transparente)	PVDF (Makrolon transparente)	Brass	Stainless steel 1.4305(1.4571)
Adapter	PVDF (Ms, stainless steel)	PVDF (brass, stainless steel)	Brass	Stainless steel 1.4305 (1.4571)
Rotor	PVDF with stainless steel caps (1.4310)	PVDF with stainless steel caps (1.4310)	PA 6.6	PVDF
Shaft	Zirconiumoxide ZrO2-TZR	Zirconiumoxide ZrO2-TZR	Zirconiumoxide ZrO2-TZR	Zirconiumoxide ZrO2-TZRI
Bearing	Iglidur	Iglidur (VR10) PVDF (VR25)	Iglidur	Iglidur
O-Ring	FKM (EPDM)	FKM (EPDM)	FKM (EPDM)	FKM (EPDM)
Magnets	---	---	5 pcs. (10) Sm_2Co_{17}	5 pcs. (2,10) Sm_2Co_{17}

Electrical data

Versions	Plastic version (POM or PVDF)	Metal version (brass or stainless steel)
Supply voltage	10-30 VDC	10-24 V D C
Residual ripple	+ /- 10 %	+ /- 10 %
Max current consumption	10 mA	35 m A
Max. output current	200 mA	100 mA
Output	9-29 V. rectangular signal	9-23 V. rectangular signal
Output circuit	NPN (PNP/ Namur)	NPN (PNP)
Frequency	10-1000 Hz	10-1000 Hz
Protection class	IP 67	IP 67
Connection	cable 2 m	cable 2 m





Order code plastic version (POM or PVDF)						
	VR	02	k1	IPN	0	13
Flow sensor DN 10 DN 25	VR10 VR25					
Measuring range DN 10 0,3-1.5 l/min 0.5-10 l/min 0,7-14 l/min		02 05 07				
Measuring range DN 25 2-30 l/min 3-60 l/min 4-100 l/min		08 12 16				
Housing material POM Housing material PVDF			K1 K2			
Sensor and output signal Inductive-PNP Inductive-NPN Inductive Namur				IPN INP INA		
					0	
Connection DN 10 Female thread 3/8" BSP Male thread 3/8"BSP Grommet 10 mm						13 A2 T1
Connection DN 25 Female thread 1"BSP Male thread 1"BSP Flange						I5 A5 F1

Order code metal version (brass or stainless steel)						
	VR10	02	k1	IPN	0	1 3
Flow sensor DN 10 DN 25	VR10 VR25					
Measuring range DN 10 3-1.5 l/min 0.5-10 l/min 0.7-14 l/min		02 05 07				
Measuring range DN 25 2-30 l/min 3-60 l/min 4-100 l/ min		08 12 16				
Housing materials stainless steel, laiton			VA MS			
Sensor and output signal Hall-Sensor PNP Hall-Sensor NPN				NPN HNP		
					0	
Connection DN 10 Female thread 3/8 " BSP Filetage male 3/8" BSP Grommet 10 m m						13 A2 T1
Connection DN 25 Female thread 1" BSP Male thread 1"BSP Flange						15 AS F1

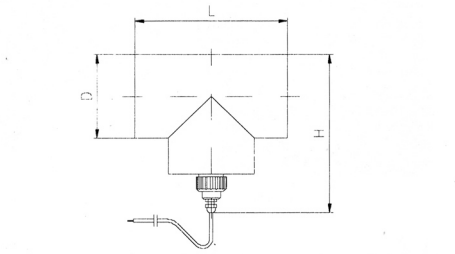
Flow sensor series VR 00

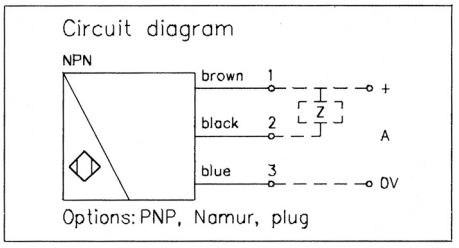
Series VR 00 with PVC - Fitting

Type	Measuring range l/min.	Housing material	DN	Average pulses per l	PN bar (20°C)	T max	Electrical sensor (standard version)
VR 00 K3-40	15 - 300	PVC	40	54	10	60°C	Inductive NPN
VR 00 K3-50	25 - 400		50	32			
VR 00 K3-65	40 - 500		65	18			
VR 00 K3-80	50 - 700		80	13			
VROOK3-100	65-1000		100	8,5			

Materials, options						
Type	VR 00 with PVC -Fitting					
Measuring accuracy	+ /- 3 %					
Max. pressure drop	0,06 bar					
Dimensions	DN	40	50	65	80	100
	H	200	216	240	260	290
	L	117	144	170	200	245
	D	60	76	91	109	132
Housing, probe	PVC					
Rotor	PVDF with stainless steel clips					
Axis	ceramic					
Bearing	Iglidur					
Standard connection	1" BSP Female thread, (1 " BSP Male thread and flange connection as option)					
Electrical data						
Supply voltage	10-30 V DC					
Residual ripple,	+ /- 1 0 %					
Max. current consumption	10 mA					
Max. current output	200 mA					
Output	9-29 V, Rectangular signal					
Output circuit	NPN (PNP Namur)					
Frequency	10 – 100 H z					

Order code 3 VR 00 K3		VR 00	40	K 3	IPN	0	KF
Measuring range	15-300 l/min 25-400 l/min 40-500 l/min 700 50-l/min 65-1000 l/min non-calibrated (without fitting		40 50 65 80 1H 00				
Housing and Fiting- material PVC				K3			
Sensor- and output signal	Inductive PNP Inductive NPN Inductive Namur				IPN INP INA		
Installation	with PVC-fitting without fitting					0 1	
Connection	Fixed fitting						KF





Calibration is not possible without a fitting!

SIKA Dr. Siebert & Kühn GmbH & Co. KG, Struthweg 7–9, D-34260 Kaufungen, Tel.: +49 5605 803-0, Fax: +49 5605 803-54, e-mail: info@sika.net, www.SIKA.net

Our Production and Sales Range

Flow Measurement Equipment

Axial Turbine Flow Sensor

Flow Switches

Pressure Gauges and Pressure Sensors

Industrial Thermometers

Electronic Digital Thermometer, Dial Thermometer

Measuring Instruments

Temperature Sensors

Calibrators, DKD-Laboratory

Your able partner for measurement and control

SIKA® founded 1901
Dr. Siebert & Kühn GmbH & Co. KG

…measurement…control…calibration

Phone: 0700 CALL SIKA
Phone: +49 5605 803-0
Fax: +49 5605 803-54/60
E-Mail: info@sika.net
Internet: http://www.sika.net
Struthweg 7-9, 34260 Kaufungen
P. O. Box 11 13, 34254 Kaufungen
Germany

Subject to technical modification

VR 04/2008/e