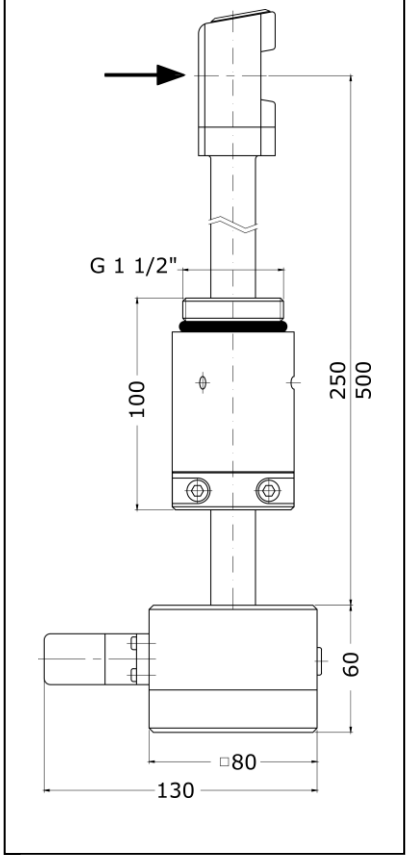
Vortex flow sensor VA40 ... ZG10 with integrated transducer UVA, capable of parameterization



Drawing 10



Vortex Flow Sensor VA40

Measurable variable
- actual flow velocity v [m/s] and
- actual flow rate [m^3/h] in air/gases
- conversion to standard velocity/standard volume flow rate by input parameter working pressure and temperature

Measuring range
- 0.5 ... 40 m/s

Functional principle
- vortex meter for measuring flow velocity, flow rate and volume
- ultrasonic measurement of the vortex shedding



Kármán vortex street

Design
- insertion probe with probe guide piece and AS80 housing

Medium
- corrosive, caustic gases
- gases containing chlorine and hydrogen chloride
- gases containing SO_2- and NO_x
- gases that form acids when wet
- primarily single-phase gas mixtures, e.g. air, nitrogen, oxygen, methane, natural gas, ammonia, argon, carbon monoxide, exhaust gas, etc.
- other gases or gas mixtures on request

Advantages
- small starting value (0.5 m/s)
- high measuring dynamics (1 : 80)
- no moving parts
- high time yield
- very corrosion resistant
- operates largely irrespective of the gas composition
- minor pressure drop
- application in Ex-protection Category 3G and 3D (zone 2 and zone 22) permissible
- applications up to SIL2/SC3

Range, and examples of application
- flow measurement in particle-laden exhaust air/gas
- alternative to metallic design like Hastelloy, stainless steel, titanium or tantalum
- gas load with mono-chloroacetic acid, hydrochloric acid fumes

Particles, humidity and condensation
- charges in the gas caused by particles such as dust and fibres do not affect the measurement, as long as abrasion and agglomeration do not occur on the sensor
- relative gas humidity of less than 100 % does not affect the measuring uncertainty
- slight condensation adsorption on the sensor does not affect the measurement

Model designation (example)							
VA40/21.3	**-250**	**G**	**K**	**40 m/s**	**100**	**p3**	**ZG10**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Types

Type	Article No.
VA40/21.3 -250 GK 40 m/s 100 / p3 ZG10	B009/720
VA40/21.3 -500 GK 40 m/s 100 / p3 ZG10	B009/721

(1) Sensor type / Sensor diameter

Vortex flow sensor VA40 with sensor head width across corners 40 mm and shaft Ø 21.3 mm for insertion in openings with a diameter greater than 40 mm

(2) Sensor length (see Drawing/page 1)

250 / 500 mm

(3) Medium

... G ...	air / gases

(4) Materials in contact with the medium

Design	Material
... K ...	PVDF conductive, ceramics

(5) Measuring range

Design	Measuring range
... 40 m/s ...	0.5 ... 40 m/s
Measuring uncertainty	< 1.0 % of meas. value + 0.03 m/s
Repeatability	± 0.2 % of meas. value + 0.025 % of terminal value

Examples for measurable volume flows see table/page 6

(6) Working temperature / seal material

Design	Material	Working temperature range of medium	Article No.
't_{max} +100 °C'			
	FKM	-20 ... +100 °C	B009/080
	Silicone	-30 ... +100 °C	B009/086
	EPDM	-30 ... +100 °C	B009/087
	KALREZ® Compound 4079	0 ... +100 °C	B009/083
	PFA	-20 ... +100 °C	B009/084

Permissible ambient temperature (Connection housing AS80, see page 3)

Design	Ambient temperature
without options: - 'ATEX Cat. 3G and 3D', (page 5) - 'LCD'	-30 ... +60 °C
with option 'LCD'	-5 ... +60 °C
with option 'ATEX Cat. 3G and 3D', (page 5)	-30 ... +60 °C

(7) Max. working pressure / sensor protection
up to 3 bar / 300 kPa above atmospheric
ingress protection IP68

(8) Design
as in drawing 10 (s. page 1)

Connection housing AS80	
measurements	80 / 80 / 60 mm (L / B / H)
connection	connector GO 070 with terminal screws
terminal connections	see page 6
type of protection	IP65

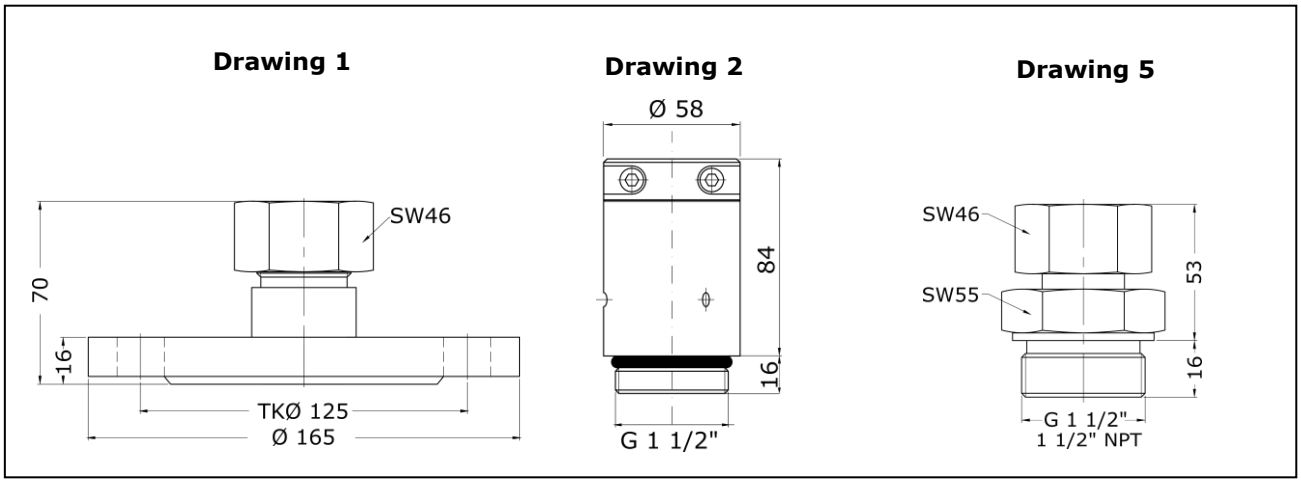
Probe guide pieces *

Designation	Description	**Article no.**
with screw thread connection		
SFK 21.3 PVDF-84 / G 1 1/2" **Drawing 2** (page 4)	connection: outside thread G 1 1/4" max. pressure: 6 bar / 600 kPa temperature: -20 … +120 °C materials: PVDF, FKM fixation: clamp yoke length: 84 mm	B004/206
SFB 21.3 E-53 / G 1 1/2 " **Drawing 5** (page 4)	connection: outside thread G 1 1/2" max. pressure: 3 bar / 300 kPa temperature: -20 … +240 °C materials: stainless steel, PTFE, FKM fixation: clamping bush length: 53 mm	B004/504
SFB 21.3 E-53 / G 1 1/2 " with metallic sealing edge **Drawing 5** (page 4)	connection: outside thread G 1 1/2" max. pressure: 3 bar / 300 kPa temperature: -20 … +240 °C Materialien: stainless steel, PTFE fixation: clamping bush length: 53 mm	B004/511
SFB 21.3 E-53 / NPT 1 1/2 " **Drawing 5** (page 4)	connection: outside thread NPT 1 1/2" max. pressure: 3 bar / 300 kPa temperature: -20 … +240 °C materials: stainless steel, PTFE, FKM fixation: clamping bush length: 53 mm	B004/509

***** Probe guide pieces are obligatory for process connection via screw socket or flange connector. They are adjustable, rotatable and permanently attached to the probe shaft.
It is to be ensured that sensor length, screw socket or flange connector height as well as probe insertion depth match up. Other probe guide pieces are available on request.

Probe guide pieces * (cont'd)		
Designation	**Description**	**Article no.**
with flange connection		
SFB 21.3 E-70 / F-DN50 PN16 **Drawing 1** (see below)	connection: flange DN50PN16 EN1092-1 max. pressure: 3 bar / 300 kPa temperature: -20 … +240 °C materials: stainless steel, PTFE fixation: clamping bush length: 70 mm	B004/103
SFB 21.3 H-70 / F-DN50 PN16 **Drawing 1** (see below)	connection: flange DN50PN16 EN1092-1 max. pressure: 3 bar / 300 kPa temperature: -40 … +240 °C materials: Hastelloy, PTFE fixation: clamping bush length: 53 mm	B004/105
SFB 21.3 E-70 / F-ANSI 2" 150 lbs **Drawing 1** (see below)	connection: flange 2" 150 lbs ANSI B16.5 max. pressure: 3 bar / 300 kPa temperature: -40 … +240 °C materials: stainless steel, PTFE fixation: clamping bush length: 53 mm	B004/512

***** Probe guide pieces are obligatory for process connection via screw socket or flange connector. They are adjustable, rotatable and permanently attached to the probe shaft.
It is to be ensured that sensor length, screw socket or flange connector height as well as probe insertion depth match up. Other probe guide pieces are available on request.



Probe guide pieces SF

Design - Transducer UVA, integrated in the sensor connection housing	
analog output flow / burden	4 ... 20 mA / max. 400 Ohm
output limit value or quantity pulse	open collector / max. 50 mA / max. 27 V DC
PC interface	RS232
	the output signals are electrically isolated from the power supply
self-monitoring	parameter settings, sensor interface; in case of error: analog output less than 3,6 mA
connection	connector GO 070 with terminal screws, for connection cable diameter 4 ... 10 mm and wire cross section 0.14 ... 0.5 mm²
power supply	24 V DC (20 ... 27 V DC)
power consumption	less than 3 W
working temperature range	-30 ... +60 °C
housing	sensor connection housing AS80
EMV	EN 61 000-6-2 and EN 61 000-6-4
setting parameter	analog output, time constant, profile factor/coefficient, tube inside diameter, limit value or impulse of quantity (weight variable), switching actual/standard flow with setting parameters 'working pressure' and 'working temperature'
setting parameter with PC software UCOM and programming adapter (see below) may be modified	

Functional Safety / Safety Integrity Level (SIL)
according to DIN EN 61508 part 1 to part 7 and DIN EN 61511 part 1 to part 3, SIL2; please pay attention to our document U400.

Accessories (optional)		
	Description	**Art No.**
ATEX cat. 3G (zone 2) ATEX cat. 3D (zone 22)	CE <Ex> II 3 G Ex ec IIC T6 Gc X CE <Ex> II 3 D Ex tc IIIC TX Dc X	VAEX2E
LCD in housing cover	2 x 16 digit, 3 mm high, working temperature range -5 ...+60 °C	A010/007
calibration certificate		KLB
PC software UCOM	for config. transducer via RS232	A010/052
programming adapter G0 070 / RS232	for software UCOM, connection PC Sub-D 9-pin, power plug 230VAC/24VDC	A010/004
interface converter USB / RS232	PC connection : USB plug type A on instrument : Sub-D 9-pin	A010/100
flange DN50 PN16	flange for screwing on to a probe guide piece with outside thread G 1½"	B004/998

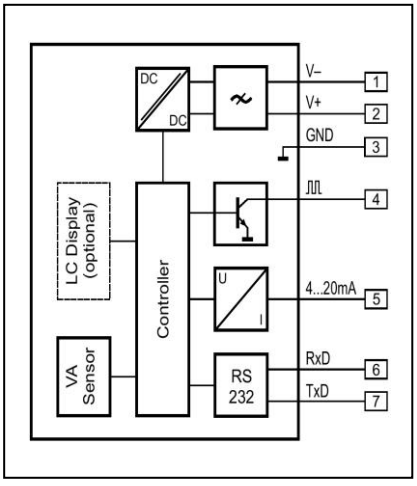
Examples – measurable volume flows (see also under '(5) Measuring range', page 2)			
measuring tube inside diameter Di [mm]	profile factor PF* [-]	smallest measurable value [m³/h]	terminal value [m³/h]
80	0.719	6.5	520
100	0.738	10.4	835
120	0.761	15.5	1240
150	0.796	26	2030
200	0.842	48	3810
300	0.845	108	8600
400	0.850	193	15400
500	0.860	304	24300
750	0.860	684	54700
1000	0.860	1215	97300
1250	0.860	1900	152000
1500	0.860	2735	218800

Volume flow measuring range specifications with centric positioning of the sensor, irrotational afflux and sufficiently dimensioned input and output section (see Instruction Manual).

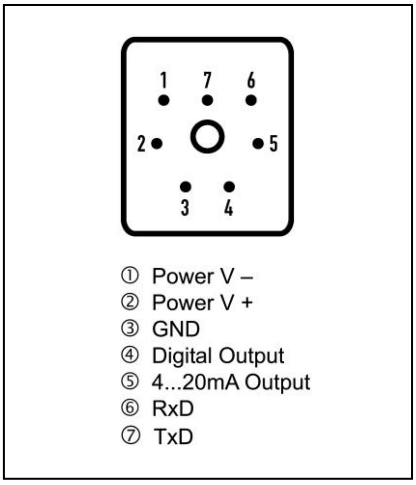
* The profile factor PF describes the ratio of average flow velocity in the measurement cross section and the flow velocity measured from the sensor. The afore-mentioned operating conditions apply.



optional LCD in housing cover



wiring diagram transducer UVA



pin configuration plug GO 070

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Subjects to alteration