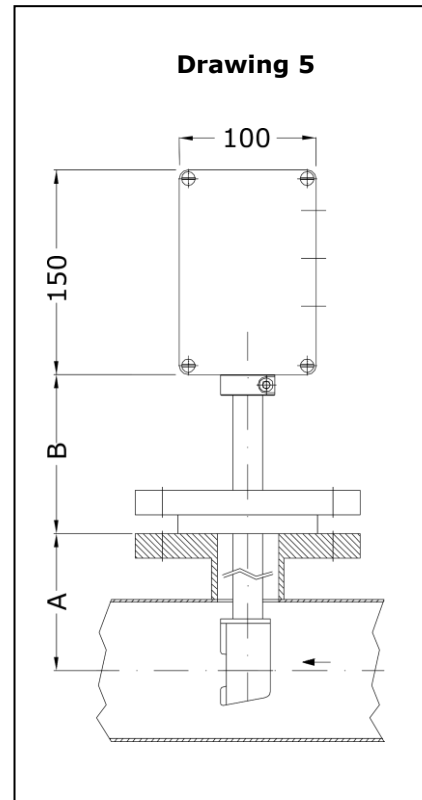


Probe VA(T)40 according Drawing 5  
 with welded and lapped flange fixation



Probe with welded- / lapped  
 flange design

**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 welded and rotatable lapped flange connection and AS102 housing; optional with integrated transducer

**Measured variables**

- actual flow velocity  $v$  [m/s]
- actual flow rate [m<sup>3</sup>/h]
- conversion to standard velocity/standard volume flow with input parameters pressure and temperature

**Measuring range**

- 0.5 ... 40 m/s

**Media**

- primarily single-phase gas mixtures, e.g. air, nitrogen, oxygen, methane, natural gas, ammonia, argon, carbon monoxide, superheated steam, biogas, exhaust gas, etc.
- other gases or gas mixtures on request

**Advantages**

- compact unit with optional integrated transducer
- optional with LCD-display in non-hazardous area
- also connectable to different separate transducers
- optional with integrated temperature measurement
- modular design with different sensor- and sealing materials
- with isolation/supply unit for use in category 1 (zone 0 and zone 20)
- low starting value (0.5 m/s)
- high turndown ratio (1 : 80)
- long-term stability
- no moving parts
- easy to clean
- high durability
- corrosion-resistant
- largely unaffected by gas composition
- marginal pressure loss

**Range and examples of application**

flow measurement in explosive atmospheres: air, outlet air, sludge activation air, engine intake air, natural gas, exhaust gas, process gas, biogas, car exhaust emissions, flare gas, overheated steam, ...

**Particles, humidity and condensation**

- dust or fibre particles in the gas do not affect the measurement, as long as these are not abrasive or accumulate on the sensor
- measurement uncertainty remains unaffected by a relative gas humidity of less than 100 % and a slight accumulation of condensate on the sensor

Model designation (example)					
VA40/21,3	G	E	40 m/s	p3	ZG5
VAT40/21,3	G	E	40 m/s	p3	ZG5
(1)	(2)	(3)	(4)	(5)	(6)

Types	
Type	Article No.
VA 40/21,3 GE 40 m/s p3 ZG5	B009/500
VA 40/21,3 GH 40 m/s p3 ZG5	B009/506
VA 40/21,3 GT 40 m/s p3 ZG5	B009/510
VAT 40/21,3 GE 40 m/s p3 ZG5	B009/550
VAT 40/21,3 GH 40 m/s p3 ZG5	B009/556
VAT 40/21,3 GT 40 m/s p3 ZG5	B009/560

(1) Sensor type / Sensor diameter	
VA 40/21,3	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
VAT 40/21,3	like above, but with additional integrated PT100 temperature sensor

(2) Medium	
... G ...	air/gases

(3) Materials in contact with the medium	
Design	Material
... E ...	stainless steel, sensor housing 1.4581, connection tube 1.4404, ceramics, silicone-free sensor
... H ...	Hastelloy 2.4610 / HC4, ceramics, silicone-free sensor
... T ...	titanium 3.7035 (grade 2), ceramics, silicone-free sensor

(4) Measuring range	
Design	Measuring range
... 40 m/s ...	0.5 ... 40 m/s

Measurement uncertainty*	< 1.0 % of measured value + 0.03 m/s
Repeatability*	± 0.2 % of measured value + 0.025 % of terminal value

\* Only for versions with pairs of values with linearization of characteristics; by use of the KKZ-function other specifications are possibly valid

**Examples of measurable flow rates (see also (4) on page 2)**

measuring tube inside diameter Di [mm]	profile factor PF* [-]	smallest measurable value [m <sup>3</sup> /h]	terminal value [m <sup>3</sup> /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

Flow rate measuring range specifications with centric positioning of sensor, non-rotational (vortex-free) inlet flow and amply dimensioned input/output sections (see Information for use VA Probes U206).

\* 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.

**Working temperature \*/ seal material**

Temperature class of the sensor	Seal material	Working temperature range of <b>medium</b>	Artlice No.
100 °C	FKM (Standard)	-20 ... +100 °C	B009/080
	KALREZ® 4079	0 ... +100 °C	B009/083
	KALREZ® 6375	0 ... +100 °C	B009/085
	PFA	-20 ... +100 °C	B009/084
180 °C	FKM (Standard)	-20 ... +180 °C	B009/090
	KALREZ® 4079	0 ... +180 °C	B009/092
	KALREZ® 6375	0 ... +180 °C	B009/095
	PFA	-20 ... +180 °C	B009/094
240 °C	FKM (Standard)	-20 ... +240 °C	B009/097
	PFA	-20 ... +240 °C	B009/098

\* When used in hazardous areas, the media and ambient temperature are limited according to the valid operating instructions

**Permissible ambience temperature \***

with integrated transducer UVA, w/o display	-25 ... +60 °C
with integrated transducer UVA, with option LCD-Display	-25 ... +60 °C
without integrated transducer UFA	-5 ... +60 °C

\* When used in hazardous areas, the media and ambient temperature are limited according to the valid operating instructions

### (5) Maximum working pressure

up to 3 bar / 300 kPa overpressure

### (6) Design

as in drawing 5 (Page 1)

### Installation length (see Drawing ZG5, Page 1)

Measurement A*	for sensor in design		
	stainless steel '... E ...'	Hastelloy '... H ...'	titanium '... T ...'
	Article No.	Article No.	Article No.
max. 250 mm	B009/110	B009/130	B009/150
251 ... 500 mm	B009/111	B009/131	B009/151
501 ... 750 mm	B009/112	B009/132	B009/152

\* Longer lengths on request

**Measurement B** 114 mm\*\*

\*\* The surface temperature of the transducer housing must not exceed +60 °C!

### Connection housing AS102

Dimensions	L/W/H: 100/80/150 mm
Material	die-cast aluminium G Al Si12 / DIN 1725
Protection class	IP65, IEC 529 and EN 60 529
Connection	bush for shielded cables with external diameter 5 ... 10 mm, contacting of the overall copper shielding by the metallic screwed cable glands

### Electromagnetic Compatibility (EMC)

according to EN 61 000-6-2 and EN 61 000-6-4

### Installation position

any	horizontal positioning is recommended if condensate on the sensor cannot be ruled out
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### Option ATEX-protection

type of protection	Comment	Article No.
for gas: CE <Ex> II 1/2 G Ex ia IIC T6 Ga/Gb Categorie 1/2G (zone 0/1) for dust: CE <Ex> II 1/2D Ex ia IIIC TX Da/Db Categorie 1/2D (zone 20/21)	only in conjunction with: • Isolation/supply unit LDX2 and 'non-Ex evaluation unit' or • compatible separate evaluation unit with Ex-input (see below)	VAEX0 * excluded are: - VAT-sensors - temperature of medium less than -20 °C - titanium sensors
CE <Ex> II 3 G Ex ec IIC T6 Gc X CE <Ex> II 3 D Ex tc IIIC TX Dc X	Category 3G (zone 2) Category 3D (zone 22)	VAEX2E *

\* remark: media and ambient temperature according to the valid operating instructions

<b>Output v/VA, v/VA-Ex, 4-20 mA or 0-10 V</b>	
output sensor v/VA	Höntzsch evaluation unit ** with v/VA input is necessary for signal interpretation
output sensor v/VA-Ex, (sensor mit 'type of protection Ex-i', see above)	Höntzsch evaluation unit** with intrinsically safe input v/VA-Ex or an evaluation unit with input v/VA together with a series connection isolation/supply unit LDX2 is necessary for signal interpretation
output 4-20 mA <u>or</u> 0-10 V	with transducer UVA integrated in the connection housing (see below)
<b>** e. g. UVA, µP Vortex, VT-VA, VP-VA or VTP-VA</b>	

<b>optional transducer UVA, integrated in the sensor connection housing</b>		
(please select)	Description	Article No.
UVA / 4-20 mA / 24 VDC	analog output flow 4 ... 20 mA resistance max. 400 Ohm	A016/002-S01
UVA / 0-10 V / 24 VDC	analog output flow 0 ... 10 V impedance max. 1 kOhm	A016/005-S01
output temperature (only for VAT sensors)	analog output temperature 4 ... 20 mA resistance max. 200 Ohm Scaling is permanently set at the factory according to customer requirements and cannot be changed.	A016/000
output limit value or quantity pulse	potential-free relay contact (normally open contact), max. 300 mA / 27 VDC	
PC interface	RS232	
	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 or <-0.2 V	
connection	'push in' PCB terminals; no tools necessary for strand connection; disconnect strands by applying pressure with a pen or screwdriver; for strands with cross-section 0.14 ... 1.5 mm <sup>2</sup>	
power supply	24 V DC (20 ... 27 V DC)	
power consumption	less than 5 W	
setting parameter	analog output, time constant, profile factor, tube inside diameter, limit value or quantity pulse (quality rating adjustable), switch from actual/standard flow with setting parameters 'working pressure' and 'working temperature'	
setting parameter with PC software UCOM and PC connection cable (see Accessories) alterable		

<b>compatible separate evaluation units (necessary in conjunction with sensors VA40/21,3 ... ZG5 and VAT40/21,3 ... ZG5 without integrated transducer UVA)</b>	
for non-Ex applications	UVA, µP-Vortex, VT-VA, VP-VA, VTP-VA
for Ex applications	isolation/supply unit LDX2 in LDG16 housing in combination with evaluation units UVA, µP-Vortex, VT-VA, VP-VA, VTP-VA in LDG housings (additional requirement: Ex-input t, p)

<b>Accessories (optional)</b>		
	<b>Description</b>	<b>Article No.</b>
LCD in housing cover*°	row 1: 'instantaneous value': flow rate or flow velocity row 2: 'quantity counter' or 'error code'; 2 x 16 digit, character height 5.5 mm working temperature range -25 ... +60 °C	A010/016
Calibration certificate		KLB
PC software UCOM*°	for configuring transducers UFA and UVA via RS232 interface, PC connection cable RJ22 / sub-D 9-pin additional requirement	A010/052
PC connection cable RJ22 / sub-D 9-pin*°	for configuring transducers UFA and UVA in LDG16 or AS102 housing via RS232 interface together with UCOM software; transducer connection: RJ22 PC connection: sub-D 9-pin	A010/051
Interface converter*° USB / RS232	for connecting PC to USB port and Höntzsch programming adapter to RS232 interface; PC connection: USB plug type A prog. adapter connection: sub-D 9-pin	A010/100
<b>*° only in conjunction with integrated transducer UVA (see above)</b>		