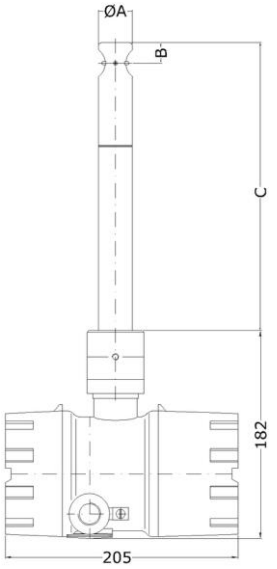
Vane wheel flow sensor
ZS25 ZG5 Ex-d

höntzsch
flow measuring technology

Vane wheel flow sensor ZS25 with integrated, configurable transducer UFA in a flameproof enclosure for applications in explosive atmospheres

Drawing 5



ZS25 ZG5 Ex-d

Measured variables
- (actual) flow velocity v [m/s] and
- (actual) flow rate [m³/h] in air/gases and water/liquids
- conversion to standard velocity/standard volume flow with input parameters pressure and temperature

Measuring ranges
- 0.3 ... 120 m/s air/gases
- 0.03 … 10 m/s water/ liquids

Functional principle
- vane wheel flow sensor
- sensing the vane rotation; non-contact inductive proximity switch

Media
- air, gas mixtures and clean gases
- water/liquids with viscosities up to 200 cSt

Design
- insertion probe with flameproof enclosure

Examples of application
- flow measurement of air, exhaust gas, process gas, …
- in processes with varying and/or unknown gas compositions
- flow monitoring in pharmaceutical installations
- monitoring neutralisation processes
- measurement of flammable liquids
- measuring in non-conductive liquids such as ultra pure water, for example in the semiconductor industry

Advantages
- accurate values even in varying and/or unknown gas compositions
- compact unit for explosive atmospheres with optional local display
- applications in Category 1 (Zone 0 and 20); transducer housing approved for Category 2 (Zone 1 and 21)
- no external isolation/supply unit necessary

Particles and humidity
- particles may restrict the fatigue strength of the vane wheel set
- relative gas humidity of less than 100 % does not affect the measurement uncertainty

Model designation / order code (example)							
ZS25/25	**-350**	**GF**	**E**	**350**	**p10**	**ZG5**	**Ex-d**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Basic types	
Type	**Article No.**
'stainless steel 100 °C'	
ZS25/25-**250**GFE/100/p10/ZG5 Ex-d	B002/255
ZS25/25-**350**GFE/100/p10/ZG5 Ex-d	B002/256
ZS25/25-**450**GFE/100/p10/ZG5 Ex-d	B002/257
ZS25/25-**550**GFE/100/p10/ZG5 Ex-d	B002/258
ZS25/25-**650**GFE/100/p10/ZG5 Ex-d	B002/259
'stainless steel 260 °C'	
ZS25/25-**250**GFE/260/p10/ZG5 Ex-d	B002/260
ZS25/25-**350**GFE/260/p10/ZG5 Ex-d	B002/261
ZS25/25-**450**GFE/260/p10/ZG5 Ex-d	B002/262
ZS25/25-**550**GFE/260/p10/ZG5 Ex-d	B002/263
ZS25/25-**650**GFE/260/p10/ZG5 Ex-d	B002/264
'stainless steel 370 °C'	
ZS25/25-**250**GFE/370/p10/ZG5 Ex-d	B002/265
ZS25/25-**350**GFE/370/p10/ZG5 Ex-d	B002/266
ZS25/25-**450**GFE/370/p10/ZG5 Ex-d	B002/267
ZS25/25-**550**GFE/370/p10/ZG5 Ex-d	B002/268
ZS25/25-**650**GFE/370/p10/ZG5 Ex-d	B002/269
'stainless steel 500 °C'	
ZS25/25-**250**GFE/500/p10/ZG5 Ex-d	B002/270
ZS25/25-**350**GFE/500/p10/ZG5 Ex-d	B002/271
ZS25/25-**450**GFE/500/p10/ZG5 Ex-d	B002/272
ZS25/25-**550**GFE/500/p10/ZG5 Ex-d	B002/273
ZS25/25-**650**GFE/500/p10/ZG5 Ex-d	B002/274
'titanium 100 °C'	
ZS25/25-**250**GFT/100/p10/ZG5 Ex-d	B002/280
ZS25/25-**350**GFT/100/p10/ZG5 Ex-d	B002/281
ZS25/25-**450**GFT/100/p10/ZG5 Ex-d	B002/282
ZS25/25-**550**GFT/100/p10/ZG5 Ex-d	B002/283
ZS25/25-**650**GFT/100/p10/ZG5 Ex-d	B002/284
'titanium 260 °C'	
ZS25/25-**250**GFT/260/p10/ZG5 Ex-d	B002/285
ZS25/25-**350**GFT/260/p10/ZG5 Ex-d	B002/286
ZS25/25-**450**GFT/260/p10/ZG5 Ex-d	B002/287
ZS25/25-**550**GFT/260/p10/ZG5 Ex-d	B002/288
ZS25/25-**650**GFT/260/p10/ZG5 Ex-d	B002/289

Basic types (cont'd)

Type	Article No.
'titanium 370 °C'	
ZS25/25-**250**GFT/370/p10/ZG5 Ex-d	B002/290
ZS25/25-**350**GFT/370/p10/ZG5 Ex-d	B002/291
ZS25/25-**450**GFT/370/p10/ZG5 Ex-d	B002/292
ZS25/25-**550**GFT/370/p10/ZG5 Ex-d	B002/293
ZS25/25-**650**GFT/370/p10/ZG5 Ex-d	B002/294

(1) Sensor type / diameter

Vane wheel flow sensor ZS25 with sensor Ø 25 mm and shaft Ø 25 mm

(2) Sensor length - measurement C (see Drawing 5, Page 1)

250 / 350 / 450 / 550 / 650 mm

(3) Medium

... GF ...	air/gases and water/liquids

(4) Materials in contact with the medium

Design	Material
... E ... stainless steel	stainless steel 1.4404 / AISI 316L, ceramics Al_2O_3 99.9 % design '100 °C': VITON®, PTFE seal design '260 °C': PTFE seal design '370 °C' and '500 °C': pure graphite seal
... T ... titanium	titanium 3.7035 (Grade 2), ceramics Al_2O_3 99.9 % design '100 °C': VITON®, PTFE seal design '260 °C': PTFE seal design '370 °C' and '500 °C': pure graphite seal

(5) Permissible temperature of the medium

Design	Temperature
... 100 ...	-20 ... +100 °C (constant)
... 260 ...	-40 ... +260 °C (constant) -40 ... +300 °C (short-term)
... 370 ...	-40 ... +370 °C (constant) -40 ... +400 °C (short-term)
... 500 ...	-40 ... +500 °C (constant) -40 ... +550 °C (short-term)

Ambient temperature	-20 ... +50 °C

(6) Maximum working pressure

up to 10 bar / 1 MPa kPa overpressure
(higher working pressure on request)

(7) Design

as in Drawing 5 (Page 1)

dimensions	A	Ø 25 mm	B	13.9 mm	C	250/350/450/550/650 mm

(8) ATEX protection

for gas	: ⟨Ex⟩ II 1/2 G Ex ia/d e [ia] IIC T6 Ga/Gb
for dust	: ⟨Ex⟩ II 1/2 D Ex ia/tb IIIC TX Da/Db
sensor	: Category 1 (Zone 0 or 20)
transducer housing	: Category 2 (Zone 1 or 21)

Measuring range / vane wheel type

Measuring range air/gases*	Measuring range water/liquids**	Vane wheel type	Article No.
with 'stainless steel' probe			
0.4 ... 20 m/s	0.04 ... 7.5 m/s	mn 20 E	V_MN20GFE
0.5 ... 40 m/s	0.05 ... 10 m/s	mn 40 E	V_MN40GFE
1.0 ... 80 m/s	0.08 ... 10 m/s	mn 80 E	V_MN80GFE
1.4 ... 120 m/s	0.10 ... 10 m/s	mn 120 E	V_MN120GFE
with 'titanium' probe			
0.3 ... 20 m/s	0.03 ... 7.5 m/s	mn 20 T	V_MN20GFT
0.4 ... 40 m/s	0.04 ... 10 m/s	mn 40 T	V_MN40GFT
0.8 ... 80 m/s	0.06 ... 10 m/s	mn 80 T	V_MN80GFT
1.2 ... 120 m/s	0.08 ... 10 m/s	mn 120 T	V_MN120GFT

Measurement uncertainty	for air/gases and water	: < 1.5 % of measured value + 0.5 % FS
Repeatability	for air/gases and water	: ±(0.05 % FS + 0.02 m/s)

* with an air/gas density of approx. 1.2 kg/m³
** the specified measuring ranges for applications in liquids are only practicable as long as there is no cavitation around the vane wheel

Ex-d transducer housing	
Dimensions	outside diameter/length/height: approx. 110/205/182 mm
Material	aluminium cast alloy max. 0.5 % Mg, coated
Protection	IP68, IEC 529 and EN 60 529
Connection	glands for shielded cables with outside diameter 5 ... 9 mm; contacting of overall screen on the ground terminal in the housing; via "Ex-e" screw terminals for wires with cross-section 0.14 – 1.5 mm²
Alignment	rotatable by approx. 350 ° and lockable
Setup	dual chamber system consisting of: 1) electronics in Ex-d protection (flameproof enclosure) 2) connections in Ex-e protection (increased safety) with terminal block and cable glands

Electromagnetic Compatibility (EMC)
according to EN 61 000-6-2 / IEC77

Installation position
any

Transducer UFA integrated in the connection housing	
Analog output flow	4 ... 20 mA resistance max. 500 Ohm
Output limit value or quantity pulse	potential-free relay contact (normally-open), max. 300 mA / 27 VDC
Communication port	HART® via modem adapter for PC connection and UCOM PC software UCOM (see Accessories)
	output signals are electrically isolated from the power supply
Self-monitoring	parameter settings, sensor interface; in the case of error: analog output < 3.6 mA
Power supply	24 V DC (20 ... 27 V DC)
Power consumption	less than 5 W
Setting parameters (selection depending on parameter set)	analog output, time constant, profile factor, tube inside diameter, limit value or quantity pulse (rating adjustable), switchover actual/standard flow with parameters 'working pressure' and 'working temperature'

Accessories (optional)

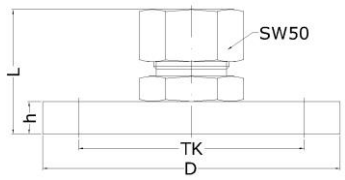
	Description	Article No.
LCD display	1st row: 'instantaneous value': flow rate or flow velocity 2nd row: 'counter' or 'error code' 2 x 16-digit, character height 5.5 mm, working temperature range -20 ... +50 °C display rotatable in 90 °-stages on removing the Ex-d housing window cover	A010/520
Calibration certificate v/FA		KLB
HART® modem adapter	for changing setting parameters, for PC-USB connection	A010/101
PC software UCOM	for configuring the transducer via RS232	A010/052

Ex-d transducer housing
with optional LCD display

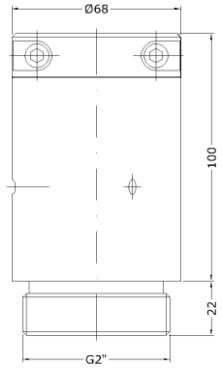
Accessories (cont'd)

Probe guide piece	Description	Article No.
SFB 25 E-70 / F-DN50 PN16 ZG1 Drawing 1, Page 8	working temperature range -40 ... +550 °C max. working pressure 2 bar/200 kPa flanged connection or ball valve probe fixing with clamping bush, materials: stainless steel, graphite flange DN50 PN16 according to DIN installation length L 70 mm	B004/110
SFK 25 E-100 / G 2" ZG2 with clamping yoke Drawing 2, Page 8	working temperature range -20 … +240 °C max. working pressure 10 bar/1 MPa screw thread connection or ball valve with inside thread G 2" installation length 100 mm materials: stainless steel, VITON® lip seal, VITON® O-ring, incl. hook spanner and hexagon wrench key	B004/210
SFB 25 E-54 / G 1¼" ZG5 with clamping bush Drawing 5, Page 8	working temperature range -20 ... +240 °C max. working pressure 2 bar/200 kPa screw thread connection or ball valve with inside thread G 1¼" installation length 54 mm materials: stainless steel, VITON®, PTFE clamping bush	B004/510

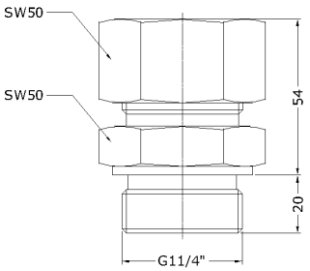
Probe guide piece
Drawing 1



Probe guide piece
Drawing 2



Probe guide piece
Drawing 5



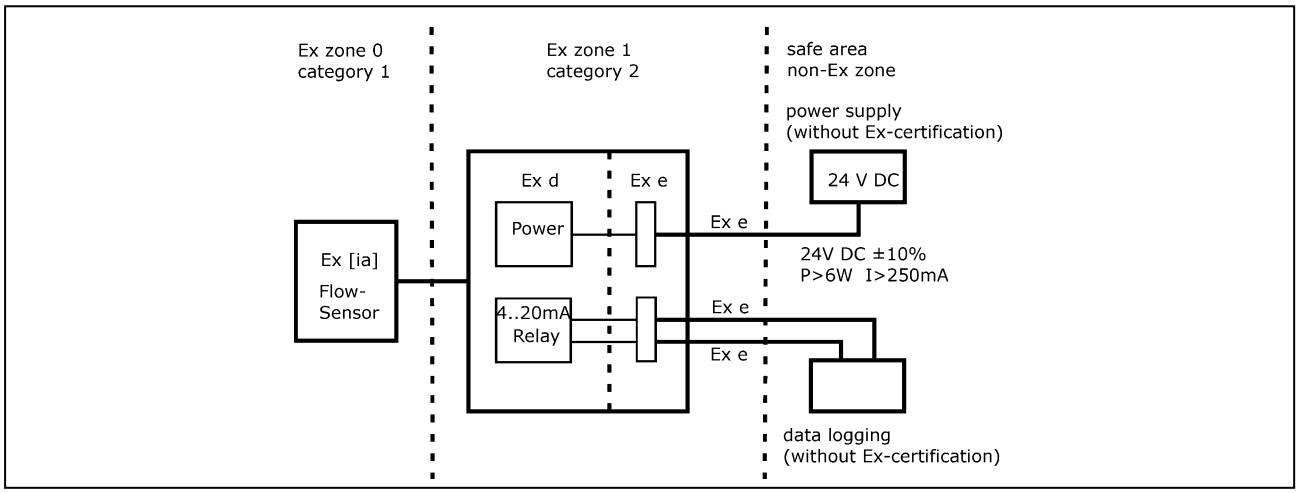


Diagram of Ex-Zones

® Registered trademark:
Dupont: VITON
HART: HART Communication Foundation

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