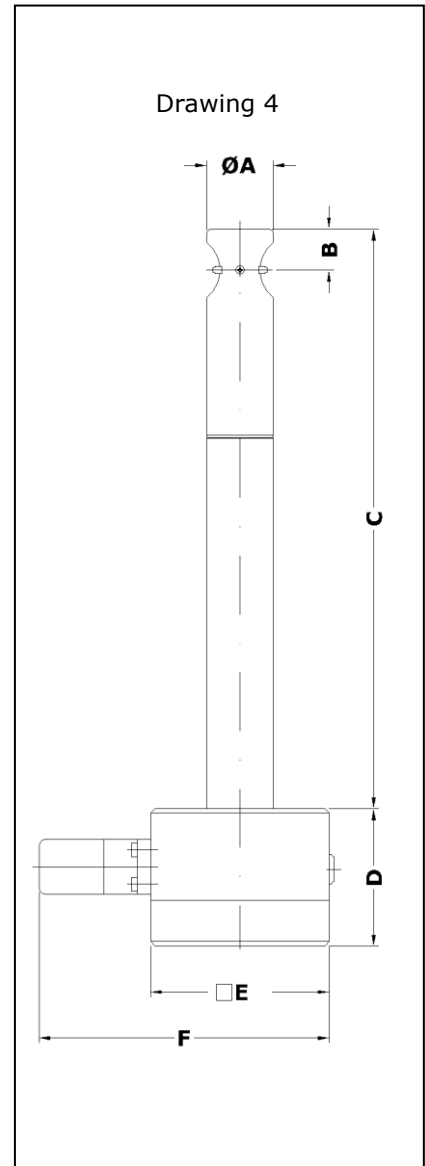


Flow measurement with sensors ZS25 at working temperatures up to +500 °C optional with integrated and configurable transducer UFA



Vane wheel flow sensor ZS25
(see Page 3 for dimensions)

Measurable variable

- (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

- 0.4 ... 120 m/s air/gases
- 0.04 ... 10 m/s water/liquids

Functional principle

- vane wheel flow sensor
- scanning the vane rotation; non-contact inductive proximity switch

Design

- insertion probe with AS80 housing

Media

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

Advantages

- low starting value
- large measuring range span
- maximum fatigue strength thanks to vane wheel which is easy on the bearings
- corrosion resistant
- sterilisable
- high working temperature and pressure ranges
- accurate values even in varying and/or unknown gas compositions
- low pressure drop
- easy adjustment to process parameter
- compact unit with optional local display

Range and examples of application

- flow rate measuring, e.g. of air, exhaust gas, process gas
- monitoring flow in pharmaceutical works
- monitoring neutralisation processes
- monitoring laminar flow
- measuring in non-conductive liquids such as ultra pure water, for example in the semiconductor industry

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 (example) | | | | | | | |
|-----------------------------|-------------|-----------|----------|------------|------------|-----------|------------|
| ZS25/25 | -350 | GF | E | 350 | p10 | Ex | ZG4 |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |

| Basic types | | |
|--|------------------------|--------------|
| Type | Transducer/ Output | Article No. |
| '100 °C' / integrated UFA | | |
| ZS25/25- 250 GFE/100/p10/ZG4 | UFA-int / 4-20 mA | B002/190-UFA |
| ZS25/25- 350 GFE/100/p10/ZG4 | UFA-int / 4-20 mA | B002/191-UFA |
| ZS25/25- 450 GFE/100/p10/ZG4 | UFA-int / 4-20 mA | B002/192-UFA |
| ZS25/25- 550 GFE/100/p10/ZG4 | UFA-int / 4-20 mA | B002/193-UFA |
| ZS25/25- 650 GFE/100/p10/ZG4 | UFA-int / 4-20 mA | B002/194-UFA |
| '260 °C' / integrated UFA | | |
| ZS25/25- 250 GFE/260/p10/ZG4 | UFA-int / 4-20 mA | B002/195-UFA |
| ZS25/25- 350 GFE/260/p10/ZG4 | UFA-int / 4-20 mA | B002/196-UFA |
| ZS25/25- 450 GFE/260/p10/ZG4 | UFA-int / 4-20 mA | B002/197-UFA |
| ZS25/25- 550 GFE/260/p10/ZG4 | UFA-int / 4-20 mA | B002/198-UFA |
| ZS25/25- 650 GFE/260/p10/ZG4 | UFA-int / 4-20 mA | B002/199-UFA |
| '370 °C' / integrated UFA | | |
| ZS25/25- 250 GFE/370/p10/ZG4 | UFA-int / 4-20 mA | B002/200-UFA |
| ZS25/25- 350 GFE/370/p10/ZG4 | UFA-int / 4-20 mA | B002/201-UFA |
| ZS25/25- 450 GFE/370/p10/ZG4 | UFA-int / 4-20 mA | B002/202-UFA |
| ZS25/25- 550 GFE/370/p10/ZG4 | UFA-int / 4-20 mA | B002/203-UFA |
| ZS25/25- 650 GFE/370/p10/ZG4 | UFA-int / 4-20 mA | B002/204-UFA |
| '500 °C' / integrated UFA | | |
| ZS25/25- 250 GFE/500/p10/ZG4 | UFA-int / 4-20 mA | B002/205-UFA |
| ZS25/25- 350 GFE/500/p10/ZG4 | UFA-int / 4-20 mA | B002/206-UFA |
| ZS25/25- 450 GFE/500/p10/ZG4 | UFA-int / 4-20 mA | B002/207-UFA |
| ZS25/25- 550 GFE/500/p10/ZG4 | UFA-int / 4-20 mA | B002/208-UFA |
| ZS25/25- 650 GFE/500/p10/ZG4 | UFA-int / 4-20 mA | B002/209-UFA |
| '100 °C' / separate evaluation unit | | |
| ZS25/25- 250 GFE/100/p10/ZG4 | sep. eval. unit / v/FA | B002/190 |
| ZS25/25- 350 GFE/100/p10/ZG4 | sep. eval. unit / v/FA | B002/191 |
| ZS25/25- 450 GFE/100/p10/ZG4 | sep. eval. unit / v/FA | B002/192 |
| ZS25/25- 550 GFE/100/p10/ZG4 | sep. eval. unit / v/FA | B002/193 |
| ZS25/25- 650 GFE/100/p10/ZG4 | sep. eval. unit / v/FA | B002/194 |
| '260 °C' / separate evaluation unit | | |
| ZS25/25- 250 GFE/260/p10/ZG4 | sep. eval. unit / v/FA | B002/195 |
| ZS25/25- 350 GFE/260/p10/ZG4 | sep. eval. unit / v/FA | B002/196 |
| ZS25/25- 450 GFE/260/p10/ZG4 | sep. eval. unit / v/FA | B002/197 |
| ZS25/25- 550 GFE/260/p10/ZG4 | sep. eval. unit / v/FA | B002/198 |
| ZS25/25- 650 GFE/260/p10/ZG4 | sep. eval. unit / v/FA | B002/199 |

| Basic types (cont.) | | |
|--|------------------------|-------------|
| Type | Transducer/ output | Article no. |
| '370 °C' / separate evaluation unit | | |
| ZS25/25- 250 GFE/370/p10/ZG4 | sep. eval. unit / v/FA | B002/200 |
| ZS25/25- 350 GFE/370/p10/ZG4 | sep. eval. unit / v/FA | B002/201 |
| ZS25/25- 450 GFE/370/p10/ZG4 | sep. eval. unit / v/FA | B002/202 |
| ZS25/25- 550 GFE/370/p10/ZG4 | sep. eval. unit / v/FA | B002/203 |
| ZS25/25- 650 GFE/370/p10/ZG4 | sep. eval. unit / v/FA | B002/204 |
| '500 °C' / separate evaluation unit | | |
| ZS25/25- 250 GFE/500/p10/ZG4 | sep. eval. unit / v/FA | B002/205 |
| ZS25/25- 350 GFE/500/p10/ZG4 | sep. eval. unit / v/FA | B002/206 |
| ZS25/25- 450 GFE/500/p10/ZG4 | sep. eval. unit / v/FA | B002/207 |
| ZS25/25- 550 GFE/500/p10/ZG4 | sep. eval. unit / v/FA | B002/208 |
| ZS25/25- 650 GFE/500/p10/ZG4 | sep. eval. unit / v/FA | B002/209 |

(1) Sensor type / Sensor diameter
Vane wheel flow sensor ZS25 with sensor Ø 25 mm and shaft Ø 25 mm

(2) Sensor length dimension C (see Drawing 4, 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 1.4404 / AISI 316L, ceramics Al ₂ O 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 of the medium |
|-------------|--|
| ... 100 ... | -20 ... +100 °C (continuous) |
| ... 260 ... | -40 ... +260 °C (continuous) -40 ... +300 °C (short-time) |
| ... 370 ... | -40 ... +370 °C (continuous) -40 ... +400 °C (short-time) |
| ... 500 ... | -40 ... +500 °C (continuous) -40 ... +550 °C (short-time) |

Permissible temperature of the ambience *

| | |
|---|----------------|
| with separate evaluation unit | -40 ... +80 °C |
| with integrated transducer UFA | -40 ... +60 °C |
| with integrated transducer UFA, with optional 'LCD display' | -5 ... +60 °C |

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

(6) Max. working pressure / Type of protection for sensor
up to 10 bar / 1 MPa kPa above atmospheric
protection class IP68

| (7) Option 'Ex' | | |
|---|----------|---|
| Type of protection | Art.-No. | Comment |
| CE <Ex> II 3 G Ex ec IIC T6 Gc X Gas-Ex: Categorie 3G (Zone 2) | FAEX2E * | only in connection with: • evaluation unit |
| CE <Ex> II 3 D Ex tc IIIC TX Dc X Dust-Ex: Categorie 3D (Zone 22) | FAEX2E * | only in connection with: • evaluation unit |
| CE <Ex> II 2 G Ex ia IIC T6 Gb Gas-Ex: Category 2G (Zone 1) | FAEX1 * | only in connection with: • isolation/supply unit LDX2 <u>and</u> 'non-Ex evaluation unit or compatible separate evaluation unit with Ex-output |

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

| (8) Design | | | | |
|--------------------------|-----------|-----------|--------------------------|--|
| as in Drawing 4 (Page 1) | | | | |
| dimensions | A Ø 25 mm | B 13,9 mm | C 250/350/450/550/650 mm | |
| | D 60 mm | E 80 mm | F 130 mm | |

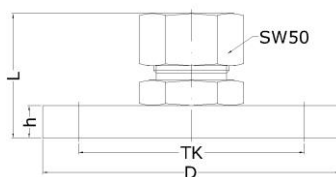
| Measuring range / vane wheel type | | | |
|--|---------------------------------|--|-------------|
| Measuring range air/gases* | Measuring range water/liquids** | Vane wheel type | Article No. |
| with 'stainless steel' probe | | | |
| 0.4 ... 20 m/s | 0.04 ... 7.5 m/s | mn 20 E | V_MN20GFE |
| 0.5 ... 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 |
| 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/m ³ | | | |
| ** the specified measuring ranges for applications in liquids are only practicable as long as there is no cavitation around the vane wheel | | | |

| Connection housing AS80 | |
|--------------------------------|---------------------------------------|
| dimensions | 80 / 80 / 60 mm (L / W / H) |
| connection | connector GO 070 with terminal screws |
| terminal assignment | see Page 6 |
| protection class | IP65 |

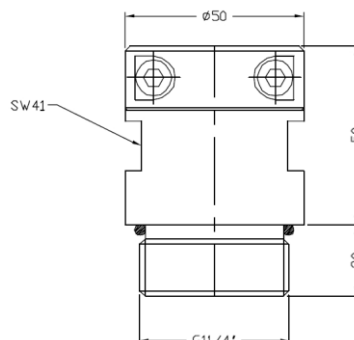
| Output / transducer (see Pages 2 & 3, 'Basic types') | |
|---|---|
| output 4-20 mA / integrated UFA | UFA integrated in the housing (see Page 6) |
| output sensor v/FA / separate evaluation unit necessary | Höntzsch evaluation unit with v/FA input necessary for signal evaluation |
| output sensor v/FA-Ex, sensor with option 'Ex' for use in Category 2G (Zone1) / sep. eval. unit necessary | Höntzsch evaluation unit with intrinsically safe v/FA-Ex signal input or with v/FA input in conjunction with a series connected isolation/supply unit necessary for signal evaluation |

| Accessories | | |
|---|--|-------------|
| | Description | Article no. |
| | calibration certificate v/FA | KLB |
| probe guide piece SFB 25 E-70 / F-DN50 PN16 ZG1 for max. +550 °C as in drawing 1 | for any repeated positioning with lower pressures above atmospheric (max. 2 bar / 200 kPa) / subatmospheric pressures, working temperature range -40 ... +550°C, through hole 25 mm, to single ended flange nipples or ball valve with flange, probe attachment by clamping bush, materials: stainless steel, graphite, flange DN50 PN16 in conformity with DIN, installation length L 70 mm | B004/110 |
| probe guide piece SFK 25 E-50 / G 1 1/4" ZG2 with clamping yoke as in drawing 2 | for any repeated positioning even with higher excess pressure (max. 10 bar/1 MPa) / low pressure, through hole 25 mm, connection by screw thread sleeve or ball valve inside thread G 1 1/4", working temp. range -20 ... +240 °C, installation length 50 mm, materials: stainless steel, VITON® lip-seal, VITON® O-ring | B004/211 |
| probe guide piece SFB 25 E-54 / G 1 1/4" ZG5 with clamping bush as in drawing 5 | for any repeated positioning with marginal excess pressure (max. 2 bar/ 200 kPa) / low pressure, through hole 25 mm, connection by screw thread sleeve or ball valve with inside thread G 1 1/4", working temp. range -20 ... +240 °C, installation length 54 mm, materials: stainless steel, VITON®, PTFE clamping bush | B004/510 |

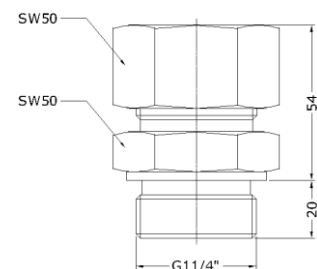
Probe guide piece drawing 1



Probe guide piece drawing 2



Probe guide piece drawing 5



Transducer UFA-int, integrated in the sensor connection housing

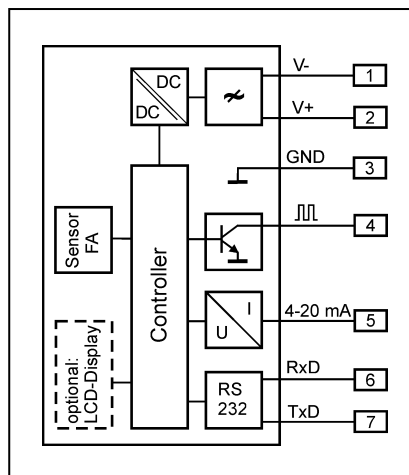
| | |
|--|--|
| analog output/resistance | 4 ... 20 mA = 0 ... ___ m/s, resistance max. 400 Ohm |
| output 'limit value' or 'quantity pulse' | Open Collector / max. 50 mA / max. 27 V DC, pulse duration 0.5 s |
| PC interface | RS232 |
| | output signals electrically isolated from the power supply |
| self-monitoring | parameter settings, sensor interface; in case of error: analog output less than 3.6 mA |
| connection | connector GO 070 with terminal screws |
| power supply | 24 V DC (20 ... 27 V DC) |
| power consumption | less than 3 W |
| working temp. range | -40 ... +60 °C |
| housing | sensor connection housing AS80 |
| EMC | EN 61 000-6-2 and EN 61 000-6-4 |
| setting parameter | analog output, profile factor/coefficient, pipe inside diameter, time constant, sensor type, measurement range, medium, limit value or quantity pulse (valency adjustable), switching actual/standard flow with setting parameters, 'actual pressure' and 'actual temperature' ... |
| setting parameter with PC software UCOM and programming adapter (see below) changeable | |

Accessories (cont.) / options

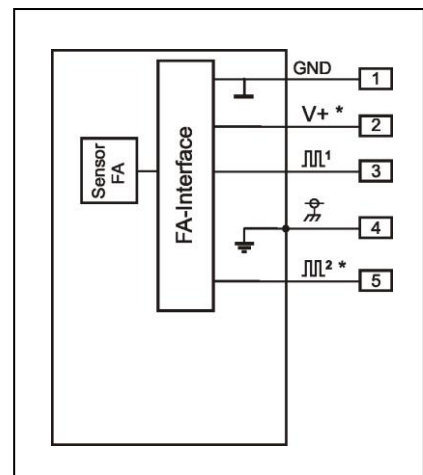
| | Description | Art. No. |
|------------------------------------|---|----------|
| LCD display in housing cover | 2 x 16 digit, numerals 3 mm high, working temperature range -5...+60 °C | A010/007 |
| PC software UCOM | for configuring the UFA/int via RS232 | A010/052 |
| programming adapter GO 070 / 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 |



optional LCD display in the housing cover



Wiring diagram with integrated UFA



Wiring diagram sensor for separate evaluation unit (* optional)

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