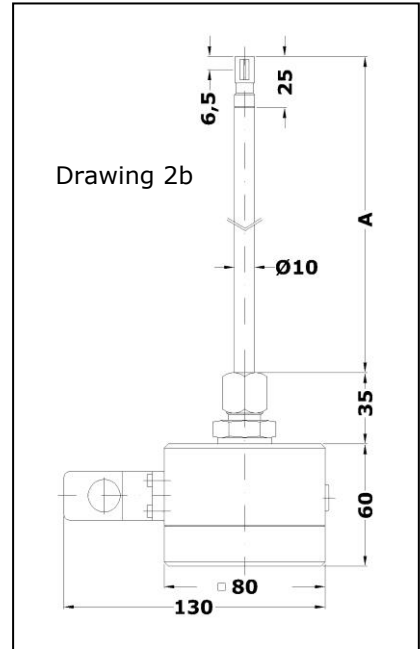


Sensor TA10 ... ZG2b with integrated transducer U10a/U10M



TA10 ... ZG2b (Meas. A Page 2)

Measurable variable

- standard velocity N_v , standard volume flow NV/t , mass flow proportional
- standard basis adjustable, default: temperature $t_n = +21\text{ °C}$, pressure $p_n = 1014\text{ hPa}$

Functional principle

- measurement of flow according to heat transfer method
- temperature dependence of measurement compensated over complete temperature operating range

Design

Probe with integrated transducer

Gases

- pure gases, gas mixtures: air, nitrogen, methane, natural gas, argon, carbon dioxide, helium, sulphur hexafluoride, landfill gas ...
- calibration with many gases or gas mixtures can be carried out to achieve the best possible measuring uncertainty

Advantages

- high measuring dynamics N_v (up to 1 : 1000)
- measuring range from 0.2 m/s
- low measuring uncertainty, even at lowest flow velocities
- direct air/gas mass flow-proportional measuring, making additional pressure and temperature measuring unnecessary
- sensor has no moving parts
- stainless steel sensor housing
- higher working temperature and pressure ranges
- low installation costs
- negligible pressure drop thanks to its size
- long life
- sterilisable (sensor material-resistance allowing)
- optional: LCD-display, keypad
- parameterization and optimal integration with PC software

Range and examples of application

- measuring
 - air velocity
 - compressed air and gas consumption, leakages
 - laminar flows in clean rooms or machines
 - in outgoing air, burner supply air and draughts
 - in climatic applications
 - in air in low vacuum range with pressures greater than 200 hPa abs.

Output variables

- analog 4 ... 20 mA, 0 ... 10 V
- M-Bus
- quantity pulse / limit value

Particles, condensation, humidity in the gas

- charges in the gas caused by particles such as dust and fibres do not affect the measurement, as long as there is no abrasion and no deposits on the sensor
- deviations in values as a result of variable air humidity in normal atmospheric conditions are covered by the measuring uncertainty specifications



Design (example)

| | | | | | | | |
|-------------|-------------|----------|----------|------------|------------|-------------|---------------|
| TA10 | -165 | G | E | 140 | p16 | ZG2b | /M-Bus |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |

Basic types

| Type | with U10a electronics Article No. | with U10M electronics Article No. |
|---|--------------------------------------|--------------------------------------|
| TA10 - 165 GE 140 / p16 ZG2b | B013/050 | - |
| TA10 - 165 GE 140 / p16 ZG2b/M-Bus | - | B013/060 |
| TA10 - 265 GE 140 / p16 ZG2b | B013/051 | - |
| TA10 - 265 GE 140 / p16 ZG2b/M-Bus | - | B013/061 |
| TA10 - 365 GE 140 / p16 ZG2b | B013/052 | - |
| TA10 - 365 GE 140 / p16 ZG2b/M-Bus | - | B013/062 |
| TA10 - 665 GE 140 / p16 ZG2b | B013/053 | - |
| TA10 - 665 GE 140 / p16 ZG2b/M-Bus | - | B013/063 |
| TA10 - 965 GE 140 / p16 ZG2b | B013/054 | - |
| TA10 - 965 GE 140 / p16 ZG2b/M-Bus | - | B013/064 |

(1) Sensor type / Probe diameter

Thermal flow sensor
Probe diameter 10 mm

(2) Probe measurement A

| | |
|---------------------------|---|
| Standard length | 165, 265, 365, 665, 965 mm |
| Fix probe length based on | insertion depth in measurement cross section, muff length, length of ball valve and probe guide piece (see Accessories) |

(3) Gases

Air, clean gases, gas mixtures with consistent ratio of mixture

(4) Materials in contact with the medium

Stainless steel 1.4571, 1.4305, 1.4404, glass, epoxy resin

Measuring ranges air/nitrogen

| | Article No. |
|-----------------|---------------|
| 0.2 ... 60 m/s | v_ta10_2b_60 |
| 0.2 ... 120 m/s | v_ta10_2b_120 |
| 0,2 ... 150 m/s | v_ta10_2b_150 |
| 0.2 ... 180 m/s | v_ta10_2b_180 |
| 0.2 ... 200 m/s | v_ta10_2b_200 |

Measuring uncertainty / Time constant / Damping

| | |
|---|-------------------------------------|
| Measurement uncertainty for flow velocities Nv with 1014 hPa and +21 °C | |
| less than/equal to 40 m/s | : 2 % of test value + 0.02 m/s |
| greater than 40 m/s | : 2.5 % of test value |
| time constant (U10a) | : adjustable to 1 s and multiples |
| damping (U10M) | : adjustable to 0.5 s und multiples |



Storing a characteristic for use in other gases

| based on | Article No. |
|--|----------------------------|
| calibration in air and conversion of air characteristic for another gas, up to 60 m/s. | TA_TRANSFO (on request) |
| real gas calibration for achieving slightest measuring uncertainties | (on request) |

Examples for measurable volume flows

| meas. tube inside diameter Di [mm] | profile factor PF* [-] | smallest measurable value [Nm ³ /h] | measuring range terminal values [Nm ³ /h] sensor measuring range | | | | |
|------------------------------------|------------------------|--|--|-----------|-----------|-----------|-----------|
| | | | '60 m/s' | '120 m/s' | '150 m/s' | '180 m/s' | '200 m/s' |
| 25 | 0.725 | 0.26 | 77 | 154 | 192 | 231 | 256 |
| 40 | 0.810 | 0.73 | 220 | 440 | 550 | 660 | 730 |
| 50 | 0.840 | 1.2 | 356 | 713 | 890 | 1070 | 1180 |
| 60 | 0.840 | 1.7 | 513 | 1030 | 1280 | 1540 | 1710 |
| 80 | 0.840 | 3.0 | 912 | 1820 | 2280 | 2740 | 3040 |
| 100 | 0.840 | 4.8 | 1425 | 2850 | 3560 | 4280 | 4750 |
| 120 | 0.840 | 6.8 | 2050 | 4100 | 5130 | 6160 | 6840 |
| 150 | 0.840 | 11 | 3210 | 6410 | 8020 | 9620 | 10600 |
| 200 | 0.840 | 19 | 5700 | 11400 | 14250 | 17100 | 19000 |
| 300 | 0.840 | 43 | 12820 | 25650 | 32060 | 38480 | 42750 |
| 400 | 0.840 | 76 | 22800 | 45600 | 57000 | 68400 | 76000 |
| 500 | 0.840 | 120 | 35600 | 71200 | 89100 | 106900 | 118800 |
| 1000 | 0.840 | 480 | 142500 | 285000 | 356300 | 427600 | 475000 |

Standard volume flow measuring range specifications with centric positioning of the sensor, irrotational afflux and amply-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.

(5) Permissible temperature

| | |
|---------|---|
| medium | -10 ... +140 °C |
| ambient | -25 ... +50 °C -5 ... +50 °C with option 'LCD' |

(6) Maximum working pressure

| |
|--|
| max. 16 bar / 1.6 MPa above atmospheric |
| greater than 16 bar / 1.6 MPa on request |

(7) Design

| |
|---|
| probe with connection housing; as drawing ZG2b (Page 1) |
|---|

(8) Bus system

| | |
|--------|--|
| /M-Bus | M-Bus according to EN13757-2 and EN13757-3 |
|--------|--|

Ingress protection / Fitting position

| |
|--|
| sensor IP68 |
| any installation position with atmospheric pressure, with pressures above atmospheric direction of flow not from above |



Connection housing AS80

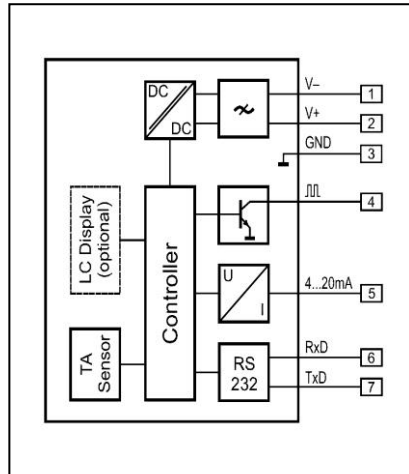
| | |
|----------------------|-------------------------------------|
| measurements | 80 / 80 / 60 mm (L / W / H) |
| connection | GO 070 with terminal screws |
| terminal connections | see Page 4 (U10a) and Page 5 (U10M) |
| protection | IP65, IEC 529 und EN 60 529 |

Transducer U10a (4 ... 20mA) integrated in sensor connection housing

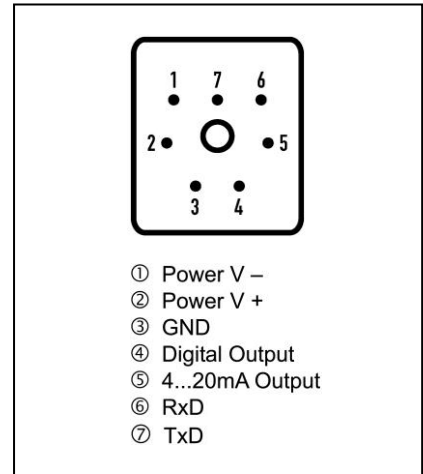
| | |
|---|---|
| analog output flow | 4 ... 20 mA (linear), output every second, burden max. 400 Ohm |
| pulse output | for quantity measurement, open collector / max. 30 V, 20 mA / duration 0.5 s, max. pulse frequency 1 Hz per volume unit NV |
| PC interface | RS232 |
| connection | output signals electrically isolated from power supply appliance plug with GO 070 FAM fitted to connection housing, contact box GO 070 WF for terminal screw connection, for cables with outside diameter 4 ... 10 mm and cross section 0.14 ... 0.5 mm ² |
| power supply | 24 V DC +/- 5 % |
| power consumption | less than 5 W, power cables electrically isolated from connection cables |
| housing | AS80 |
| EMC | EN 61 000-6-2 and EN 61 000-6-4 |
| setting parameter | analog output, time constant, profile factor, tube inside diameter, quantity pulse, working pressure, standard basis, standard density |
| Setting parameter with PC software UCOM and programming adapter (see below) alterable | |



Optional LCD in housing cover



Wiring diagram U10a



Pin assignment GO 070



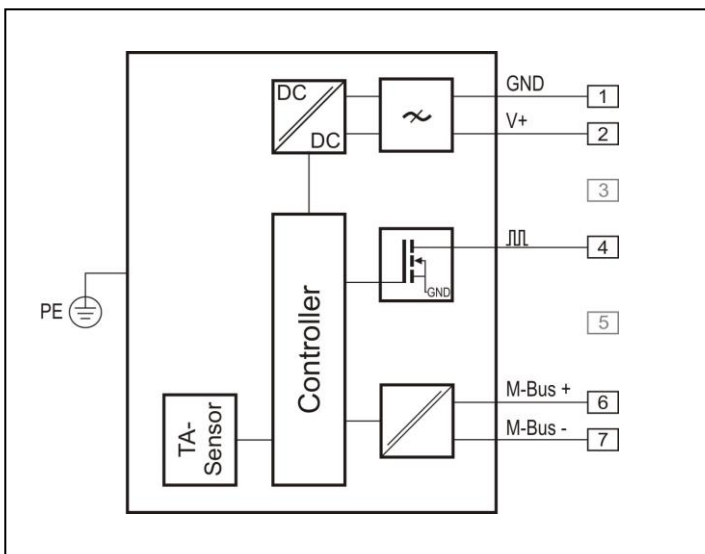
Transducer U10M (M-Bus) integrated in sensor connection housing

| | |
|-------------------|--|
| pulse output | for quantity measurement open drain to GND (Pin 4) / max. 32 V, 20 mA / pulse duration 0.5 s max. pulse frequency 1 Hz per volume unit NV internal current limiting / thermal circuit breaker |
| connection | appliance plug with GO 070 FAM fitted to connection housing, contact box GO 070 WF for terminal screw connection, for cables with outside diameter 4 ... 10 mm and cross section 0.14 ... 0.5 mm ² |
| bus system | M-Bus according to EN13757-2 and EN13757-3, measurable variables: NI/s, NI/min, NI/h, Nm ³ /s, Nm ³ /min, Nm ³ /h and kg/h, as well as quantity counter in Nm ³ readable, bus address (0) and baud rate (2400) preset and alterable via M-Bus, galvanically isolated Bus Load: 2 Unit Loads (3mA) |
| power supply | 24 V DC +/- 10 % |
| power consumption | less than 2 W, power cables electrically isolated from connection cables |
| housing | AS80 |
| EMC | EN 61 000-6-2 und EN 61 000-6-4 |
| setting parameter | physical variables, baud rate, bus address, damping, profile factor, tube inside diameter, standard basis, standard density, working pressure, quantity pulse, limit value |

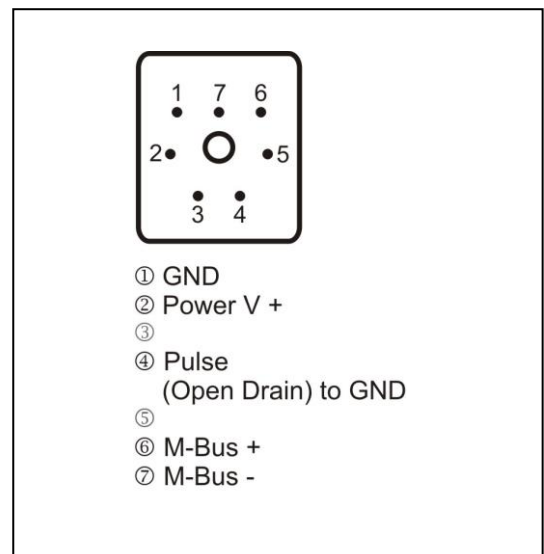
Setting parameter with PC software UCOM (see below) alterable

Note:

- After each startup the first communication determines the protocol to be used via the M-Bus. Switching between M-Bus protocol and access via UCOM is done with a new startup.
- Parameterization of single devices in the bus is possible via UCOM software.
- Communication parameter for using the UCOM software:
2400 baud / even parity / 8 data bits / 1 stop bit / no flow control



Wiring diagram U10M



Pin assignment GO 070



| Options | | |
|---|---|-------------|
| | Description | Article No. |
| local LCD with quantity counter (U10a only) | illuminated, in housing cover, 2 x 16 digit, 3 mm high, temperature range -5 ... +50 °C, row 1 – instantaneous value (volume flow) row 2 – quantity counter (volumes) | A010/007 |
| local LCD with keypad and quantity counter (U10M only) | illuminated, in housing cover, multi rows, grafical, temperature range -5 ... +50 °C, display options: <ul style="list-style-type: none"> - instantaneous value (volume flow and temperature) - volume - grafical overview of the instantaneous values of the last 10 seconds | A010/530 |
| ATEX type of protection category 3G and 3D (zone 2 and zone 22) (U10a only) | Ex nA IIC T4 Gc X and Ex tc IIIC T135°C Dc X | TAEX2 |

| Accessories | | |
|--|---|-------------|
| | Description | Article No. |
| PC software UCOM | for configuring transducer U10a via RS232 or M-Bus (U10M) | A010/052 |
| programming adapter GO 070 / RS232 (U10a only) | for software UCOM, connection PC Sub-D 9-pin, plug to mains supply 230VAC/24VDC | A010/004 |
| interface converter USB / RS232 (U10a only) | connects PC with USB interface and Höntzsch programming adapter with RS232 interface, PC connection: USB plug type A programming adapter: sub-D 9-pin | A010/100 |
| ball valve | installation length 75 mm, through hole 15 mm, stainless steel 1.4408, seal PTFE, working temperature range max. +200 °C, working pressure 64 bar/6.4 MPa rel., connection thread G 1/2" inside (DIN/ISO 228) | B004/900 |
| calibration certificate Nv | minimum 6 standard calibration values | KLB |
| Drawing 5 probe guide piece SFB 10 E-35 / G 1/2" ZG5 | for any repeated positioning with lower overpressure (max. 3 bar) / underpressure for connecting to screw socket or ball valve with inside thread G 1/2", threaded height 22 mm, working temperature range -20 ... +240 °C, installation length 35 mm, materials: stainless steel, VITON®, PTFE clamping bush | B004/503 |
| Drawing 6 probe guide piece SFB 10 E-60 / G 1/2" ZG6 with clamp clip and anti-twist device | for any repeated positioning with higher overpressure / underpressure, clamping device for safeguarding the probe attachment, for connecting to screw socket or ball valve with inside thread G 1/2", working temperature range -20 ... +240 °C, installation length 55mm, materials: stainless steel, VITON®, PTFE clamping bush | B004/600 |



Accessories (cont.)

Drawing 7

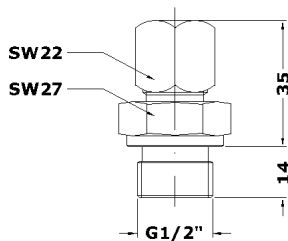
probe guide piece
SFB 10 E-60 / G 1/2" ZG7
with chain guard, clamp
clip and anti-twist device

for any repeated positioning with higher overpressure / underpressure, clamping device for safeguarding the probe attachment and chain guard, for connecting to screw socket or ball valve with inside thread G 1/2", working temperature range -20 ... +240 °C, installation length 55mm, materials: stainless steel, VITON®, PTFE clamping bush

B004/601

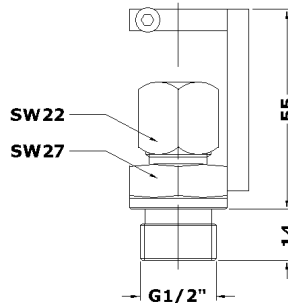
Drawing 5

Probe guide piece
SFB 10 E-35 / G 1/2" ZG5



Drawing 6

Probe guide piece
SFB 10 E-60 / G 1/2" ZG6



Drawing 7

Probe guide piece
SFB 10 E-60 / G 1/2" ZG7
with chain guard

