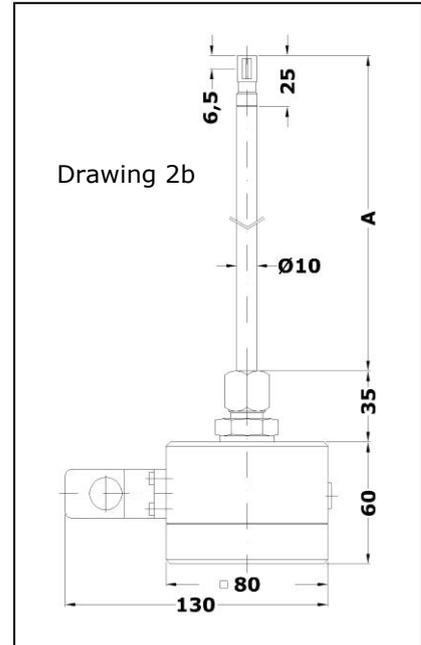




Sensor TA10 ... ZG2b with integrated transducer U10a/U10M



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

Measurable variable

- standard velocity N_v , standard volume flow NV/t , mass flow proportional
- standard basis adjustable, standard: 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, double-spaced LCD: volume flow / counter
- 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
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Basic types

Type	with U10a electronics Article No.	with U10M electronics Article No.
TA10 - 165 GE 140 / p16 ZG2b	B013/050	-
TA10M - 165 GE 140 / p16 ZG2b	-	B013/060
TA10 - 265 GE 140 / p16 ZG2b	B013/051	-
TA10M - 265 GE 140 / p16 ZG2b	-	B013/061
TA10 - 365 GE 140 / p16 ZG2b	B013/052	-
TA10M - 365 GE 140 / p16 ZG2b	-	B013/062
TA10 - 665 GE 140 / p16 ZG2b	B013/053	-
TA10M - 665 GE 140 / p16 ZG2b	-	B013/063
TA10 - 965 GE 140 / p16 ZG2b	B013/054	-
TA10M - 965 GE 140 / p16 ZG2b	-	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	10700	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)

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

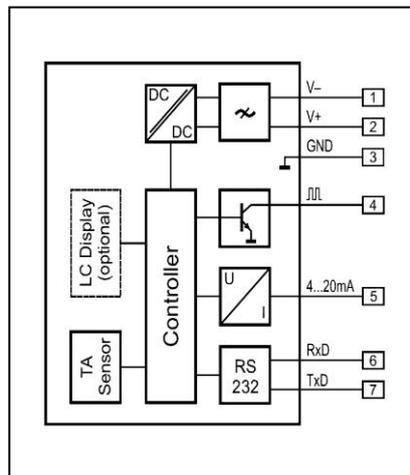
measurements	80 / 80 / 60 mm (L / W / H)
connection	GO 070 with terminal screws
terminal connections	see Page 4 (U10a) and Page 5 (U10M)
protection	IP65

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

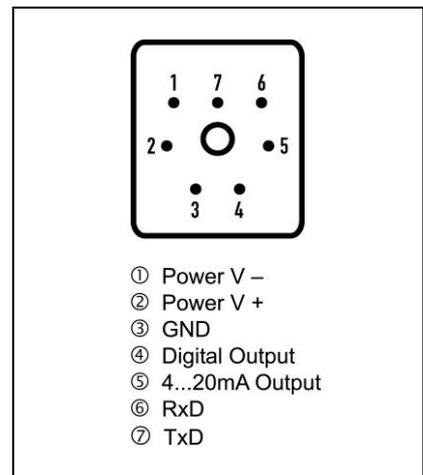
analog output flow	4 ... 20 mA (linear), output every second, burden max. 400 Ohm
pulse output	for quantity measurement, open collector / max. 30 V, 20 mA / duration 0.5 s, max. pulse frequency 1 Hz per volume unit NV
PC interface	RS232
connection	output signals electrically isolated from power supply 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



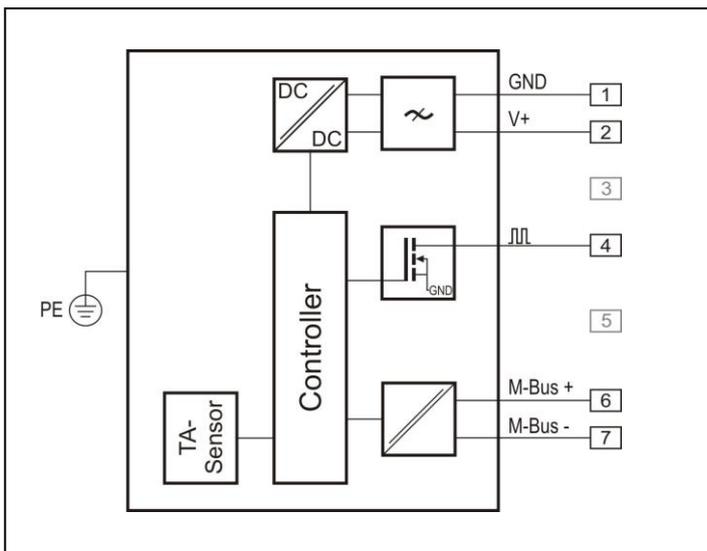
Transducer U10M (M-Bus) integrated in sensor connection housing

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 m ³ readable, bus address (0) and baud rate (2400) preset and alterable via M-Bus, galvanically isolated
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

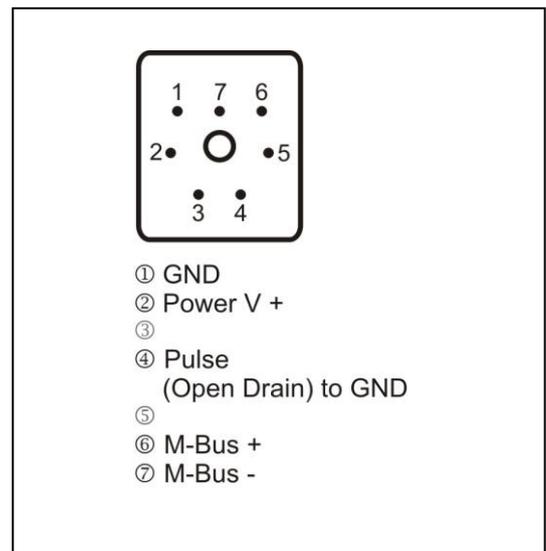
Setting parameter with PC software UCOM (see below) alterable

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



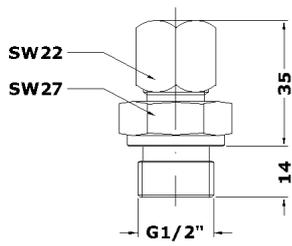
Options		
	Description	Article No.
local LCD with quantity counter	illuminated, in housing cover, 2 x 16 digit, 3 mm high, temperature range -5 ... +50 °C, row 1 – instantaneous value (volume flow) row 2 – quantity counter (volumes)	A010/007
ATEX type of protection category 3G and 3D (zone 2 and zone 22) (U10a only)	Ex nA IIC T4 Gc and Ex tc IIIC T135°C Dc	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	for software UCOM, connection PC Sub-D 9-pin, plug to mains supply 230VAC/24VDC	A010/004
interface converter USB / RS232	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 60 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	unlimited and repeated positioning at low pressures above atmospheric (max. 3 bar) / sub atmospheric, 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	unlimited and repeated positioning even at higher pressures above atmospheric / sub atmospheric, clamping device for safe-guarding fixing of probe, 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
Drawing 7 probe guide piece SFB 10 E-60 / G 1/2" ZG7 with chain guard, clamp clip and anti-twist device	unlimited and repeated positioning even at higher pressures above atmospheric / sub-atmospheric, clamping device for safe-guarding fixing of probe 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



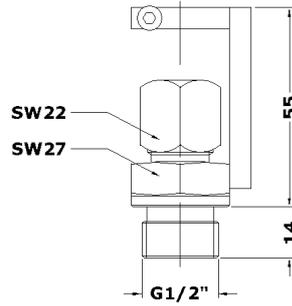
Drawing 5

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

