

Sensor TA10 ... ZG1b (left) for use with transducer U10a (above right) and hand-held HTA and HTA-Ex (below right)

Measurable variable

- standard velocity N_v , standard volume flow NV/t , mass flow proportional
- norm:
temperature $t_n = +21\text{ °C}$,
pressure $p_n = 1014\text{ hPa}$
- temperature t
(hand-held HTA, HTA-Ex)

Functional principle

- measurement of flow according to the thermal measuring method (heat transfer method)

Design

- probe

Advantages

- high measuring dynamics N_v (up to 1 : 1000)
- small starting value: 0.2 m/s
- minimum reaction time
- low measuring uncertainty, even at lowest flow velocities
- direct air/gas mass flow-proportional measuring, largely irrespective of working pressure and temperature
- sensor has no moving parts
- greater working temperature and pressure ranges
- high time yield
- corrosion resistant
- lower pressure drop due to small dimensions

Medium

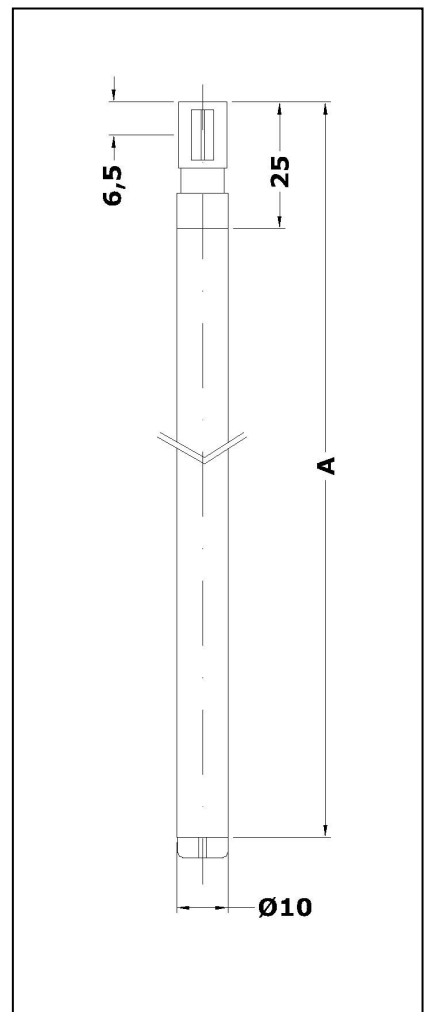
- clean gases, gas mixtures: air, nitrogen, methane, natural gas, argon, carbon dioxide, helium, sulphur hexafluoride, biogas ...

Range and examples of application

- mobile and stationary application
- compressed air and gas consumption and leakage measurements
- measuring
 - laminar flows in clean rooms or machines
 - in outgoing air, burner supply air and draughts
 - in climatic applications
 - in air in the rough vacuum range with pressures greater than 200 hPa abs.

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 abrasion and agglomeration do not occur on the sensor
- relative gas humidity of less than 100 % does not affect the measuring uncertainty if the working temperatures are less than +40 °C



Probe TA10 ... ZG1b
(Meas. A see Page 2)



Model designation / Order code (example)

TA10	-185	G	E	140	p16	Ex	ZG1
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Basic types

Type	Article No.
TA10- 185 GE 140 / p16 ZG1b	b013/300
TA10- 285 GE 140 / p16 ZG1b	b013/301
TA10- 385 GE 140 / p16 ZG1b	b013/302
TA10- 685 GE 140 / p16 ZG1b	b013/303

(1) Sensor type / Probe diameter

Thermal flow sensor, epoxy resin coated thin-film sensor element

Probe diameter 10 mm

(2) Sensor length measurement A

Standard length (see Basic types)

185, 285, 385, 685 mm

Fix sensor length based on

required insertion depth in the measurement cross section, sleeve or muff length, length of ball valve and length of probe guide piece (see Accessories)

(3) Medium

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

When calibrating/justifying sensor and evaluation unit for gases other than air the slightest possible measuring uncertainty is only achievable by ensuring fixed allocation of sensor to evaluation unit.

(4) Materials in contact with the medium

Stainless steel 1.4571, 1.4305, glass, epoxy resin

Measuring ranges

Measuring range	Article No.
0.2 ... 30 m/s	v_ta10_1b_30
0.2 ... 60 m/s	v_ta10_1b_60
0.2 ... 120 m/s	v_ta10_1b_120
0.2 ... 150 m/s	v_ta10_1b_150
0.2 ... 180 m/s	v_ta10_1b_180
0.2 ... 200 m/s	v_ta10_1b_200



Examples – measurable volume flows

meas. tube inside diameter Di [mm]	profile factor PF* [-]	smallest measur- able value [Nm ³ /h]	measuring range terminal values [Nm ³ /h] sensor measuring range					
			'30 m/s'	'60 m/s'	'120 m/s'	'150 m/s'	'180 m/s'	'200 m/s'
25	0.725	0.26	39	77	154	192	231	256
40	0.810	0.73	110	220	440	550	660	730
50	0.840	0.95	178	356	713	890	1070	1180
60	0.840	1.7	257	513	1030	1280	1540	1710
80	0.840	3.0	456	912	1820	2280	2740	3040
100	0.840	4.8	713	1425	2850	3560	4280	4750
120	0.840	6.8	1026	2050	4100	5130	6160	6840
150	0.840	11	1600	3210	6410	8020	9620	10600
200	0.840	19	2850	5700	11400	10700	17100	19000
300	0.840	43	6410	12820	25650	32060	38480	42750
400	0.840	76	11400	22800	45600	57000	68400	76000
500	0.840	120	17800	35600	71200	89100	106900	118800
1000	0.840	480	71200	142500	28500	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.

Measuring uncertainty / Time constant

Measuring uncertainty for flow velocity Nv	
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	: in seconds

(5) Permissible temperature of the medium

-10 ... +140 °C

(6) Maximum working pressure

up to 16 bar / 1.6 MPa above atmospheric
higher working pressures on request

(7) Option Ex-protection

Design	Article No.
EEx ia IIC T4 Category 2G/Zone 1 necessary when using with HTA-Ex	ta10_1b_ex1
EEx ia IIC T4 Category 1G/Zone 0 necessary when using with U15-Ex	ta10_1b_ex0

(8) Design

Probe; as in Drawing ZG1b (see Page 1)



Connection cable / Connection

standard sensor connection cable length 3 m, direct outlet, resistant up to +140 °C, other cable lengths on request.

If cable lengths deviate from the norm ergibt sich die kleinstmögliche Messunsicherheit nur bei fester Zuordnung von Sensor und Auswerteeinheit.

connection (IP67) for

transducer U10a, hand-held HTA : plug 423-5 with gilded contacts

transducer U15-Ex, hand-held HTA-Ex : plug 423-8 with gilded contacts

Ingress protection / Fitting position

Ingress protection: Sensor IP68; cable outlet IP65

Any fitting position

Elektromagnetic compatibility (EMC)

IEC 1000-4, EN 50081, EN61000

Necessary compatible, separate evaluation units

for non-Ex applications

- transducer U10a
- hand-held HTA

for Ex applications

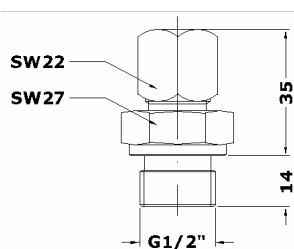
- transducer U15-Ex
EEx ia IIC T4 Category 1 (Zone 0)
- hand-held HTA-Ex
EEx ia IIC T4 Category 2 (Zone 1)



Accessories		
	Description	Article No.
Calibration certificate Nv	min. 6 standard calibration values	klb
probe guide piece SFB 10 E-35 / G 1/2" ZG5 as in Drawing 5	unlimited and repeated positioning at low pressures above atmospheric (max. 3 bar) / subatmospheric, 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®, TEFLON® clamping bush	b004/503
probe guide piece SFB 10 E-60 / G 1/2" ZG6 without chain safety device with clamping yoke as in Drawing 6	unlimited and repeated positioning even at higher pressures above atmospheric / subatmospheric, clamping device for safeguarding 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 55 mm, materials: stainless steel, VITON®, TEFLON® clamping bush	b004/600
probe guide piece SFB 10 E-60 / G 1/2" ZG7 with chain safety device as in Drawing 7	unlimited and repeated positioning even at higher pressures above atmospheric / sub-atmospheric, clamping device for safe-guarding fixing of probe and chain safety device, for connecting to screw socket or ball valve with inside thread G 1/2", working temperature range -20 ... +240 °C, installation length 55 mm, materials: stainless steel, VITON®, TEFLON® clamping bush	b004/601

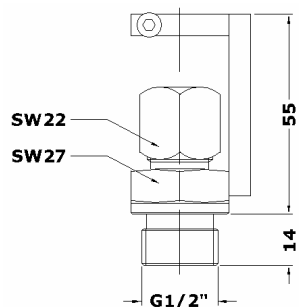
Drawing 5

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



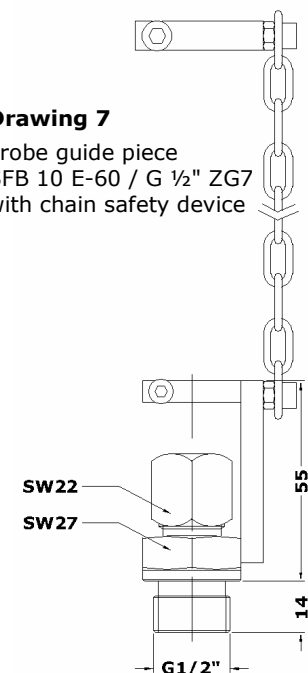
Drawing 6

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



Drawing 7

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





Accessories (cont.)		
	Description	Article No.
Direction indicator RZ10	for recognition of direction of flow and insertion depth, adjustable, suitable for sensor TA10 with 10 mm diameter	b099/948
HG10/18A-130	handle with collet chuck suitable for TA10...ZG1b as well as extion tubes VS18, not impervious	b099/947
VS18A-350	aluminium extension rod, with screw thread, Ø 18 mm, 350 mm long, O-ring seal VITON [®] , working temperature range -25 ... +240 °C	b099/010
Direction indicator RZ18	for recognition of direction of flow and insertion depth, adjustable, suitable for extension rods with 18 mm diameter	b099/951
Ball valve	installation length 60 mm, through hole 15 mm, material stainless steel 1.4408, seal PTFE, working temperature range max. +200 °C, max. working pressure 64 bar/6.4 MPa rel., inside connection thread G 1/2" (DIN/ISO 228)	b004/900

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