Ultrasonic Massflow Measuring System

Exactsonic P DN250

Functional principle
non-invasive ultrasonic flow rate measurement based on transit time method

Application examples
Test bench measurements for motors, filter, turbo charger, clima, valves, …

Advantages
- marginal pressure loss
- short input and output sections
- low starting value
- high repeatability
- insensitive to contamination
- easy to maintain
- large number of nominal pipe sizes
- direction-sensing measurement
- correction of ‚backflow‘
- high turndown ratio (1:250)
- fast response time
- no separate evaluation unit necessary
- easy to install
- conform to e-CFR

Exactsonic P DN80

Types	
Type	**Artikel-No.**
ExactSonic P DN50 ZG1	B015/871
ExactSonic P DN80 ZG1	B015/872
ExactSonic P DN100 ZG1	B015/873
ExactSonic P DN150 ZG1	B015/874
ExactSonic P DN200 ZG1	B015/875
ExactSonic P DN250 ZG1	B015/876

other sizes on request

Design / Functional principle

Measuring tube / transit time ultrasonic flowmeter with integrated flow-straightener combined with precision absolute pressure transmitter 0.6 ... 1.2 bar abs; 0.1 % FSO and 4-wire Pt100 temperature sensor, class AA DIN EN 60751, optional with additional measurement of the relative humidity (rh); design according drawing 1 (ZG1) with integrated transducer SMART-UA

Measured variables	Unit of display
Gas mass flow m/t	kg/h
Standard flow rate NV/t	Nm³/h
Actual flow rate V/t	m³/h
Working pressure p	hPa
Working temperature T	°C

Measuring ranges (turn-down ratio 1 : 250)

Nominal diameter	Inside diameter [mm]	Actual flowrate [m³/h]	Actual flowrate [kg/h]	Massflow* [kg/h]
DN 50	58.3	1.0 ... 240	1.2 ... 290	3.0 ... 713
DN 80	80.0	1.8 ... 450	2.2 ... 540	5.5 ... 1340
DN 100	110.3	3.5 ... 860	4.0 ... 1030	10 ... 2550
DN 150	150.0	6.4 ... 1590	7.5 ... 1900	19 ... 4730
DN 200	200.0	11 ... 2830	14 ... 3400	33 ... 8400
DN 250	250.0	18 ... 4420	21 ... 5300	53 ... 13130

* Mass flow for example for = t_B +20 °C and p_B = 1013 hPa equates to a standard density of 1.204 kg/m³
** Mass flow for example for = t_B +20 °C and p_B = 2500 hPa equates to a standard density of 2.971 kg/m³

Initial value	± 0,1 m/s
Max. terminal value	± 25 m/s
Measurement accuracy	< 1 % of actual value
Repeatability	< ± 0,5 % of actual value
Input/output section (see Accessories)	to achieve as great a measurement accuracy as possible, an input section of 20 x Di is recommended. The output section should be no shorter than 5 x Di. These can be reduced and operation without flow straightener is also possible. However, this leads in both cases to increased measurement uncertainties, which are dependent on the path of the pipeline, disturbances and the actual working flow velocity. With defined air intake requirements, such as suction filters, the input sections can be shortened to 10 x Di. (Please state when placing order).

Medium

Air, gases and gas mixtures

Materials in contact with the medium
stainless steel 1.4571, 1.4404, 1.4301, ceramics, FKM, aluminium

Working pressure
up to 1.2 bar / 1200 hPa absolute pressure, alternatively up to 2.5 bar/ 2500 hPa absolute pressure, higher working pressure possible (on request)

Working temperature ranges	
Medium	-20 ... +60 °C
Permissible ambient	-20 ... +60 °C

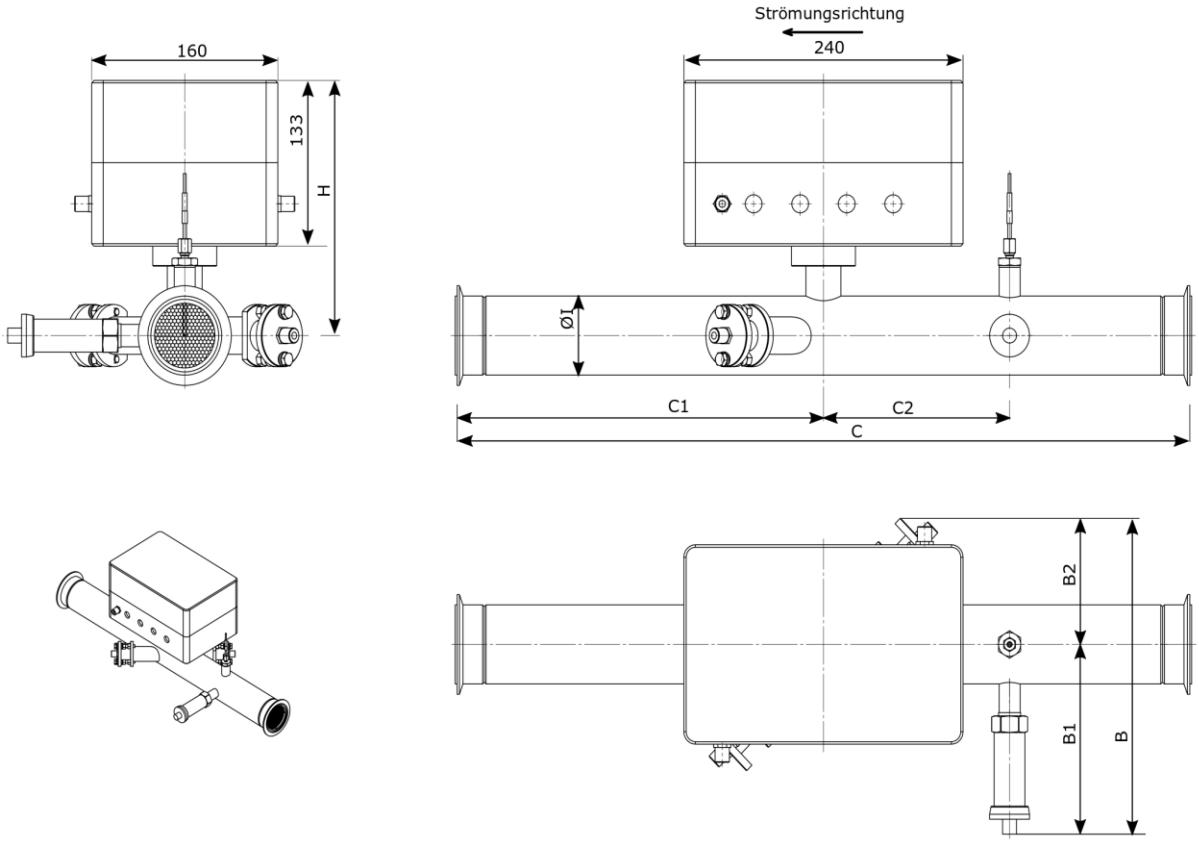
Transducer SMART-UA in the AS102 housing		
Sampling rate	resolution	: 1 kHz
Input t: Pt100 / rh*	resolution	: 0,1 K / __%*
Input p: 4-20 mA	resolution time constant	: 1 hPa : 0.125 s
Analog output	default on request (changeable inside by a connector) time constant	: 0 ... 10 V, impedance 1 kOhm : 4 ... 20 mA, load max. 500 Ohm 16-bit resolution (1/65000) : max. 1 kHz (1 ms), adjustable Output is not galvanically isolated Connection via 5-pin screw flange socket
TCP/IP	AK Protocol according VDA rule of 'Standardization exhaust gas measurement technology'; via RJ45 connection socket	
USB	USB Interface for logging, safety access, factory reset, …	
Supply	24 V DC	
Consumption	< 15 W	
LCD display in housing cover	touch intelligence - illuminated and installed in the housing lid, display of various modes and parameter levels, multi-level security areas	

* optional

Electromagnetic compatibility (EMC)
According EN 61 000-6-2 and EN 61 000-6-4

Transducer and connection housing	
Dimensions	240 / 160 / 134 mm (B / H / T)
Connection	Different plug connectors for power supply, analog output, TCP/IP, USB, …

Installation position /orientation	
Any	In general, the best result is achieved by calibrating and adjusting the measuring devices as close to the real application.



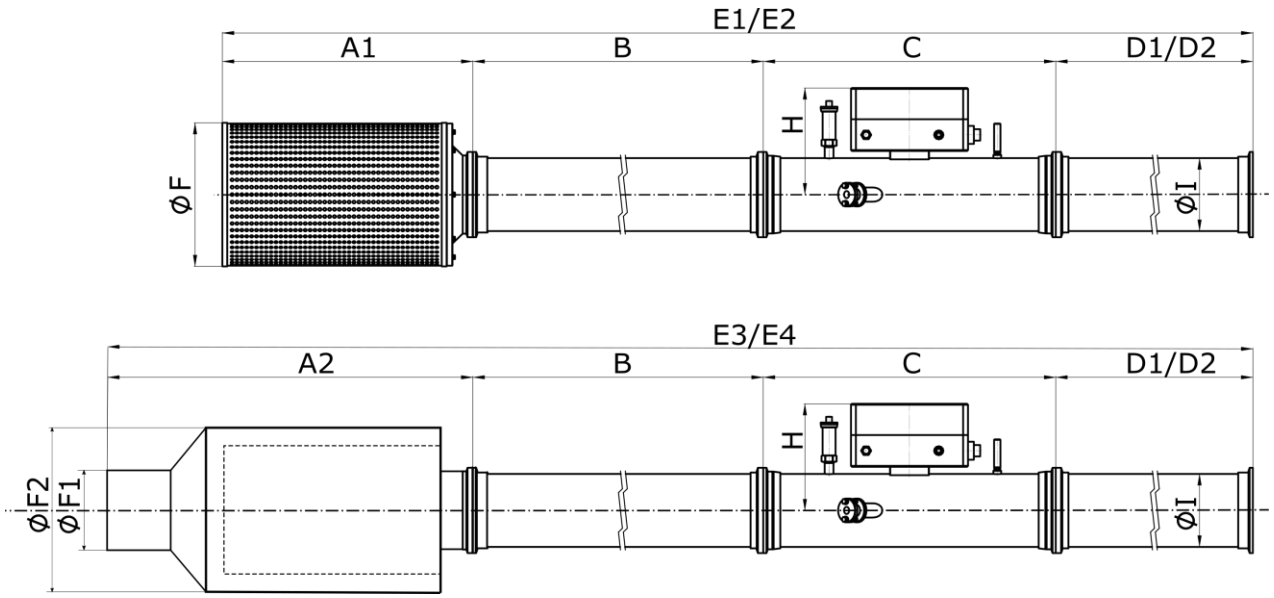
(1) Nominal pipe size / Inside pipe diameter / Dimensions / Sensor weight

Nominal pipe size [mm]	Inside pipe diameter Ø I [mm]	Sensor-length C [mm]	Length 1 C1 [mm]	Length 2 C2 [mm]	Width B [mm]	Width 1 B1 [mm]	Width 2 B2 [mm]	Height H [mm]
50	58.3	**250**	150	100	220	120	100	356
80	80.0	**250**	150	100	220	120	100	401
100	110.3	**330**	180	150	250	150	100	526
150	150.0	**330**	180	150	300	150	150	513
200	200.0	**330**	180	150	300	150	150	513
250*	250.0	**600**	350	250	400	200	200	513

* Ausführung DN 250: with flat pipe ends and not with cone flange

DAkkS Kalibrierung

Calibration Range	Description	Art.-No.
up to 5500 m³/h	incl. certificate	CQ-5500 DAKKS
up to 1600 m³/h	incl. certificate	CQ-1600 DAKKS
up to 100 m³/h	incl. certificate	CQ-100 DAKKS



Nominal pipe size	Inside pipe diameter Ø I [mm]	Air filter open A1 [mm]	Flow rectifier A2 [mm]	Input section B [mm]	Sensor length C [mm]	Output section D1* [mm]
DN 50	58.3	356	556	506	184	256
DN 80	80.0	401	601	806	189	406
DN 100	110.3	526	700	1006	254	506
DN 150	150.0	513	713	1518	280	768
DN 200	200.0	513	713	2018	330	1018
DN 250	250.0	513	713	2018	330	1018

Nominal pipe size	Output section D1/D2** [mm]	Overall length E1/E2** [mm]	Overall length E3/E4** [mm]	Air filter open -Ø Ø F [mm]	Flow rectifier Ø F1 [mm]	Flow rectifier Ø F2 [mm]
DN 50	256/254	1302/1300	1302/1300	150	60	200
DN 80	406/404	1802/1800	1802/1800	198	80	250
DN 100	506/504	2292/2290	2292/2290	243	110	300
DN 150	768/759	3079/3070	3079/3070	303	150	350
DN 200	1018/1009	3879/3870	3879/3870	303	on request	on request
DN 250	1018/1009	3879/3870	3879/3870	303	on request	on request

* with flange at the end of the output section (D1, E1 and E3)

** with flat pipe ends on the output section (D2, E2 and E4)

Air filter / flow rectifier with cone flange (KF) connection for tension ring / chain assembly

	Air filter open Article-No.	**Flow rectifier Article-No.**
Air filter DN 50	B015/611-S05	B015/611-S06
Air filter DN 80	B015/612-S05	B015/612-S06
Air filter DN 100	B015/613-S05	B015/613-S06
Air filter DN 150	B015/614-S05	B015/614-S07
Air filter DN 200	B015/615-S05	B015/615-S07
Air filter DN 250	on request	on request

Pipe sections for input/output sections for tension ring/chain assembly				
Stainless steel 1.4301 or 1.4571				
			Installation length [mm]	Article No.
Input section	ZF/KF	DN 50	506	B015/611-S01
Output section	KF/ZF	DN 50	256	B015/611-S02
Output section	KF/flat	DN 50	254	B015/611-S04
Input section	ZF/KF	DN 80	806	B015/612-S01
Output section	KF/ZF	DN 80	406	B015/612-S02
Output section	KF/flat	DN 80	404	B015/612-S04
Input section	ZF/KF	DN 100	1006	B015/613-S01
Output section	KF/ZF	DN 100	506	B015/613-S02
Output section	KF/flat	DN 100	504	B015/613-S04
Input section	ZF/KF	DN 150	1518	B015/614-S01
Output section	KF/ZF	DN 150	768	B015/614-S02
Output section	KF/flat	DN 150	759	B015/614-S04
Input section	ZF/KF	DN 200	2018	B015/615-S01
Output section	KF/ZF	DN 200	1018	B015/615-S02
Output section	KF/flat	DN 200	1009	B015/615-S04

Pipe connection
with tension ring or chain
Flange on both sides for quick connectors. DIN or ANSI integral flange connection, on request.

Tension rings/chains for cone and intermediate flange (ZF) connection			
each with silicone flat seal ring			
			Article No.
Ring	DN	50	B015/611-S03
Ring	DN	80	B015/612-S03
Ring	DN	100	B015/613-S03
Chain	DN	150	B015/614-S03
Chain	DN	200	B015/615-S03

Cone flanges (KF) for welding on for customer adaptations			
each with FKM O-ring seal			
			Article No.
Cone flange	DN	50	B015/611-S10
Cone flange	DN	80	B015/612-S10
Cone flange	DN	100	B015/613-S10
Cone flange	DN	150	B015/614-S10
Cone flange	DN	200	B015/615-S10

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Subject to change