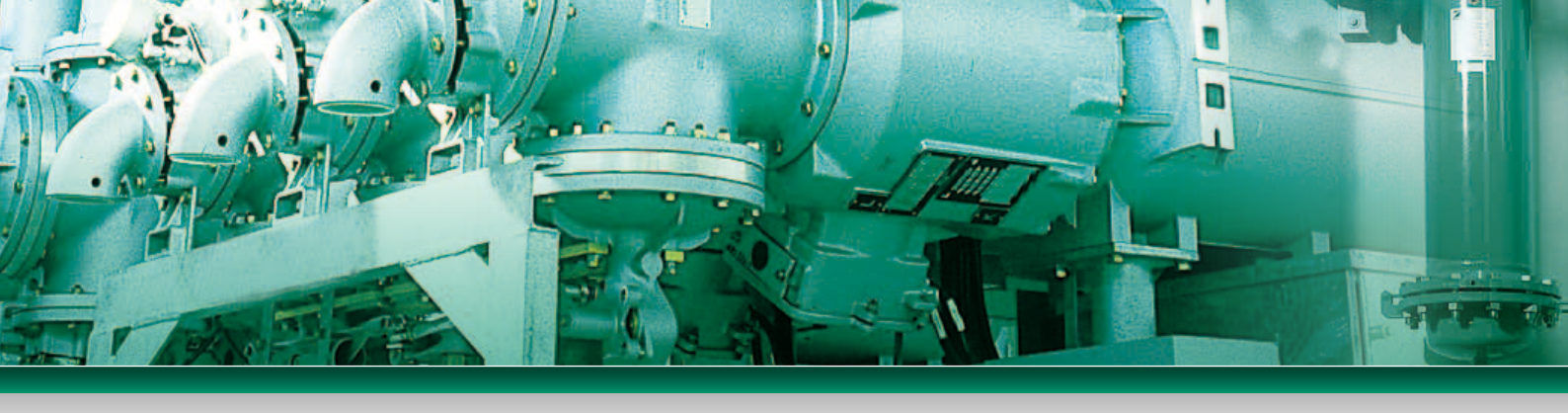
Simply a question of
better measurement

SCHMIDT® Technology

SCHMIDT® Flow Sensor SS 20.500

The ideal solution for flow measurement – even for dusty air and gases. Highly precise and compact!

- Industrial processes
- Cleanroom / pharmaceuticals
- Ventilation / air-conditioning



Flow measurement easily handled

To be able to measure air and gas flows precisely and with repeatability a number of 'correct' parameters are required. For many flow sensors orientation relative to flow direction is essential for quality of results. The choice of the right sensor is also dependent on the gas to be measured. Dust and aggressive gases will also impact on the quality of results and also causes increased maintenance and replacement, with evident additional costs. In areas with potential for explosion hazard, as found in powder handling and oil/gas plants for example, sensors with appropriate approval are required, and limits the options of sensor supplier.

This flow sensor makes selection easier

The **thermal SCHMIDT® Flow Sensor SS 20.500** offers an ideal solution for energy efficiency and complicated applications to include drying processes, exhaust discharge, glovebox and fume cupboard flows, volume flow control and many more. In addition to velocity the sensor also measures the process temperature and both of these parameters are available as independent outputs. This combined measurement capability reduces the number of tapping points, easing installation and also offers an obvious cost benefit. Extreme flow angles of 360 degrees axial and ± 45 degrees from vertical simplify positioning in the gas flow. A wide measuring range of 0.06 up to 35 m/s and trace-able calibration via a high precision adjustment ensures accuracy and reliability of measurement.

Dust and aggressive gases? No problem!

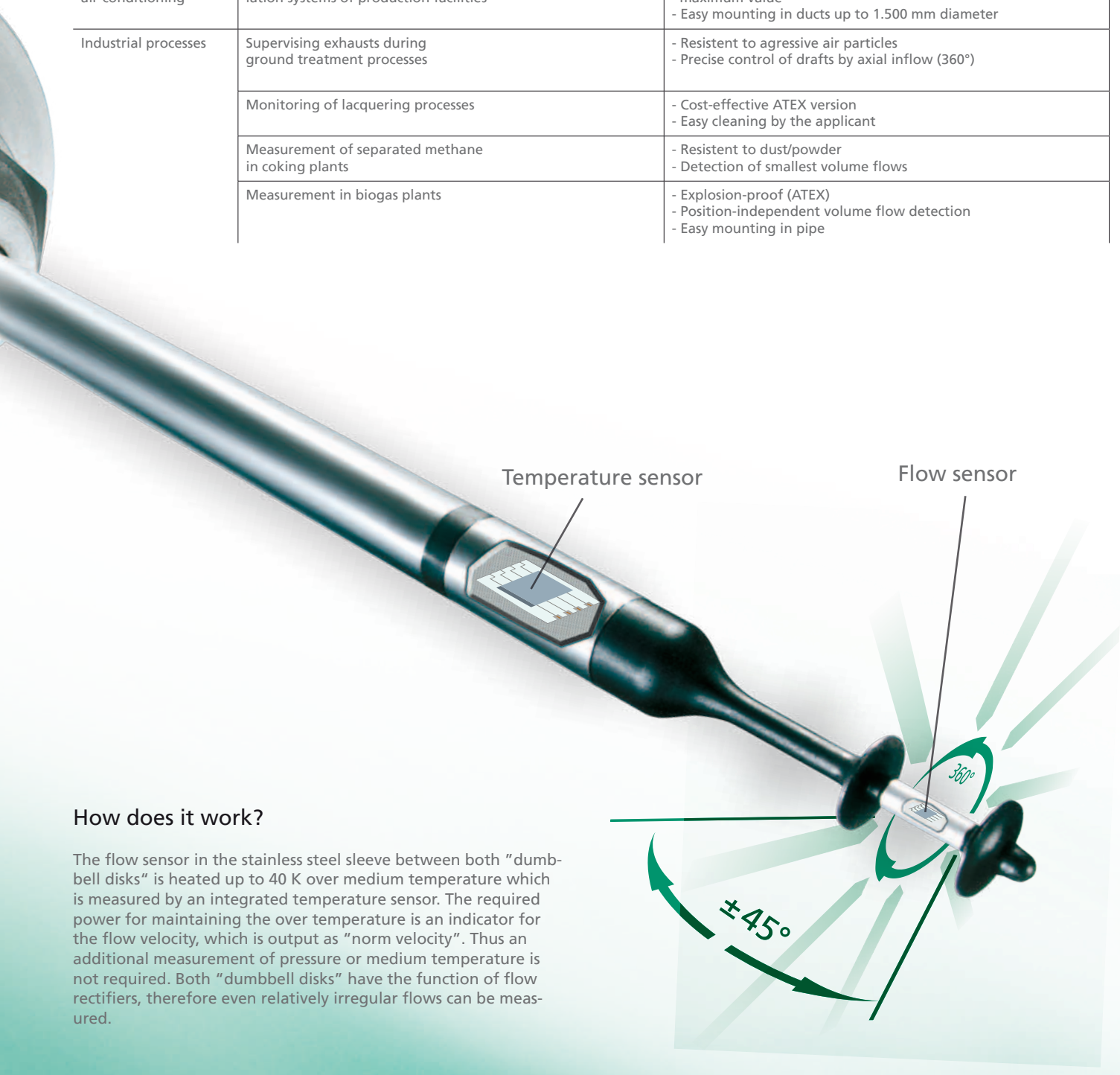
The patented dumbbell head makes measurement possible in dust laden applications without influencing the measured value. If required, a mechanical cleaning is easily carried out by the user. Optionally and if required the sensor is available ATEX certified for use in hazardous areas and with a special protective coating for resistance to aggressive mediums, trace acids for example

Accuracy in black and white

Also as an option the sensor is available with high precision adjustment. This option includes the supply of an ISO calibration certificate with recorded accuracy and repeatability. This calibration is carried out in house at Schmidt Technology with traceability to National Standards. A recalibration service is also offered.

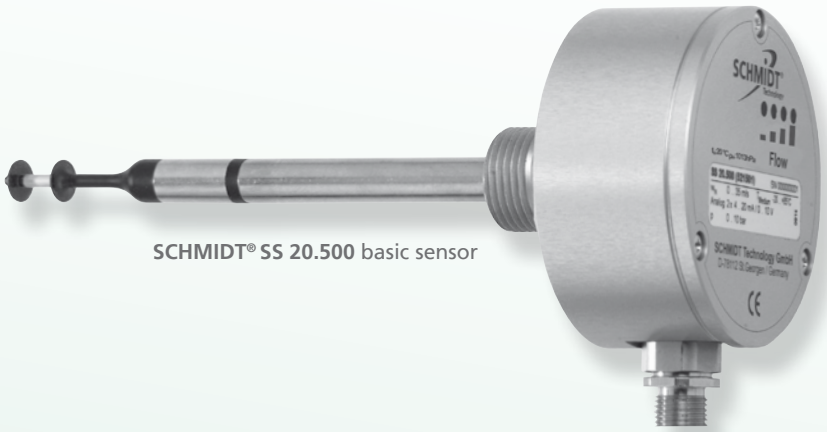
Practical examples

Branch	application	The solution with SS 20.500
Cleanroom/ pharmaceuticals	Laminar flow control during cleaning processes	- Highly precise and safe control of laminar flow at 0,45 m/s - Chemically resistent to detergents
	Control of supply air in a biological degradation process	- Easy installation in complete system - Extremely wide measuring range from 0,06 … 35 m/s, -40 °C … +85 °C
Ventilation/ air-conditioning	Monitoring and control of supply and exhaust air in big ventilation systems of production facilities	- Easy detection of volume flows from “nearly zero“ up to maximum value - Easy mounting in ducts up to 1.500 mm diameter
Industrial processes	Supervising exhausts during ground treatment processes	- Resistent to agressive air particles - Precise control of drafts by axial inflow (360°)
	Monitoring of lacquering processes	- Cost-effective ATEX version - Easy cleaning by the applicant
	Measurement of separated methane in coking plants	- Resistent to dust/powder - Detection of smallest volume flows
	Measurement in biogas plants	- Explosion-proof (ATEX) - Position-independent volume flow detection - Easy mounting in pipe

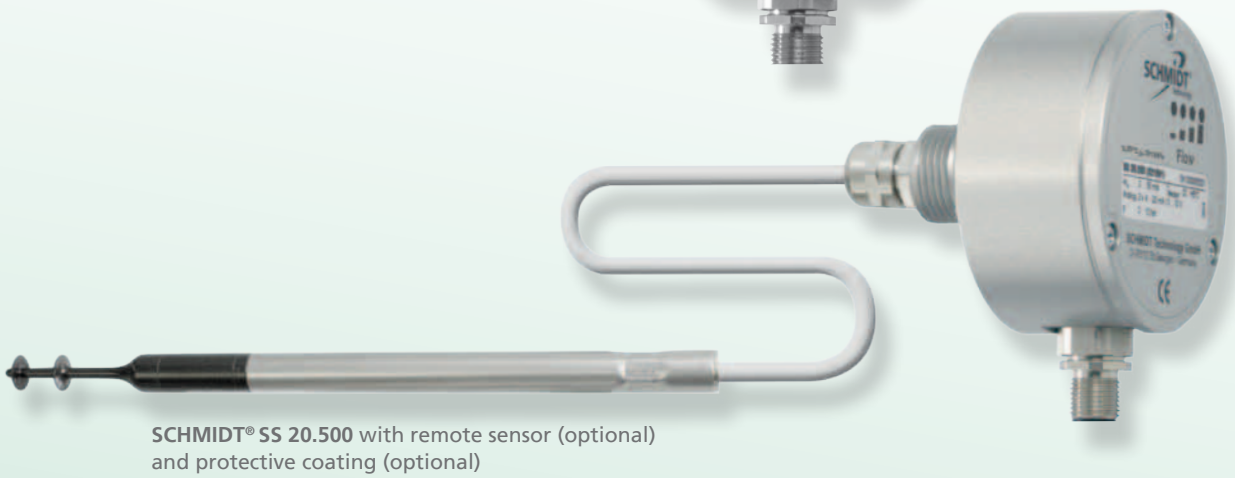


How does it work?

The flow sensor in the stainless steel sleeve between both ”dumbbell disks“ is heated up to 40 K over medium temperature which is measured by an integrated temperature sensor. The required power for maintaining the over temperature is an indicator for the flow velocity, which is output as ”norm velocity”. Thus an additional measurement of pressure or medium temperature is not required. Both “dumbbell disks” have the function of flow rectifiers, therefore even relatively irregular flows can be measured.



SCHMIDT® SS 20.500 basic sensor



SCHMIDT® SS 20.500 with remote sensor (optional)
and protective coating (optional)

You have the choice!

Besides standard sensor lengths, customized lengths up to 1000 mm are available on request. Selecting a customized length allows ideal positioning of the measuring element in the flow stream.

The aerodynamically shaped dumbbell head offers optimal performance where problematic flow characteristics exist and the crevice free design allows easy cleaning. As an option and where applications demand a special protective coating is available.

Everything in view

The LED display is dual function. In 'normal' operation the 4 x LED's illuminate steady green in sequence. In 'fault' condition reportable faults are indicated by red flashing LED's. The instrument will output V and mA and change-over is automatic.

SCHMIDT® SS 20.500 Ex
with remote sensor (optional)

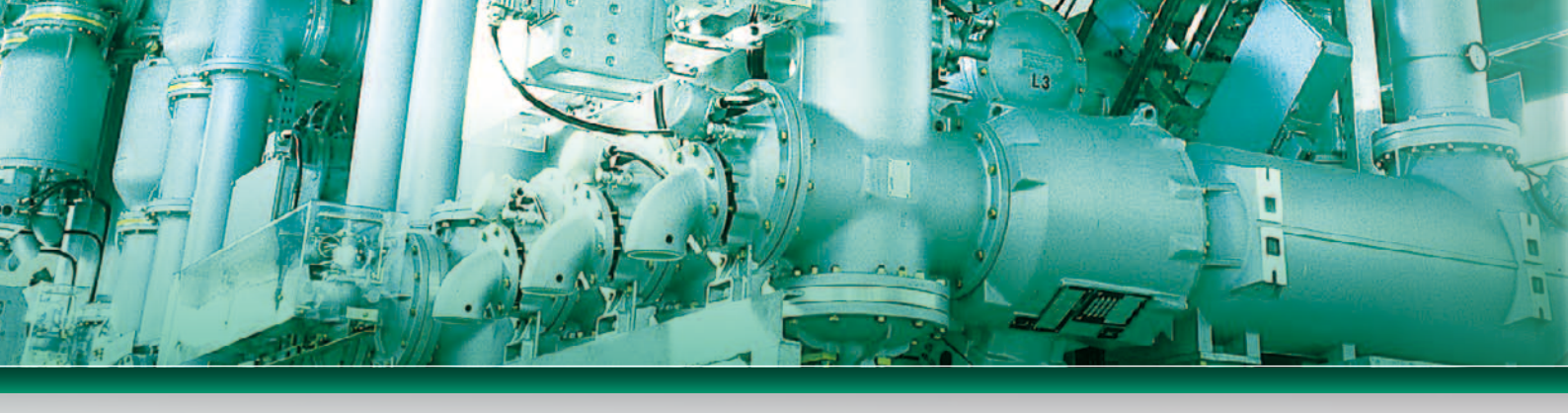
ATEX design
Applicable in inflammable environments

The optional ATEX version SS 20.500 Ex has been designed for applications in potentially explosive atmospheres – gas and dusts – of zone 2. For this purpose special protective functions are integrated amongst others, i. e. the protective sleeve for the plug-in connector of connecting cable and the earthing terminal on the housing. For difficult installation situations the version "remote" is recommended. In this case the additional earthing on the sensor tube has to be considered for the ATEX version.

Technical Data

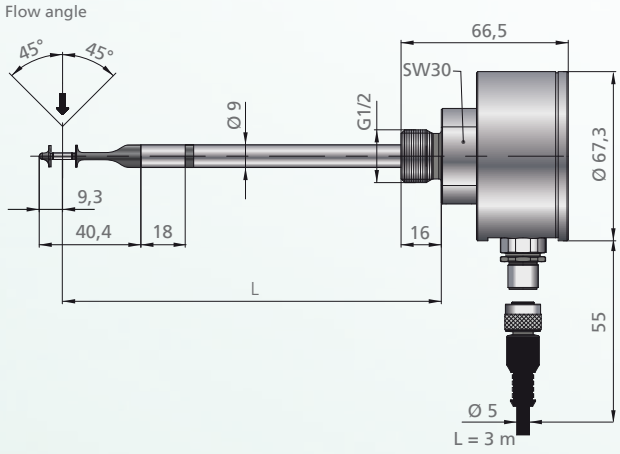
Data	
Measuring quantity w_N	standard flow velocity w_N normalized to T_N = 20 °C and p_N = 1013.25 hpa
Measuring fluid	air, nitrogen, other gases on request
Measuring range flow w_N	0 … 1/2,5/5/10/20/35 m/s
Lower detection limit w_N	0,06 m/s
Temp. range measuring T_M	-40 °C … +85 °C
Accuracy	
Standard w_N	±(3 % v. Mw. +[0,4 % v. MBE; min. 0,02 m/s]) [1]
High precision (optional) w_N	±(1 % v. Mw. +[0,4 % v. MBE; min. 0,02 m/s]) [1]
Repeatability w_N	±1 % v. Mw.
Response time t_{90} w_N	1 s (jump from 0 auf 5 m/s air)
Temperature gradient w_N	≤ 2 K/min @ 5 m/s
Measuring accuracy T_M (w_N > 1 m/s)	±0,4 K (10 °C … 30 °C); ±1 K (remaining measuring range)
Operating temperature	
Sensor	-40 °C … +85 °C
Electronics	-20 °C … +70 °C
Storage temperature	-40 °C … +85 °C
Material	
Housing	aluminium, anodised
Sensor tube	stainless steel 1.4571
Sensor head	PBT fibre-glass reinforced, stainless steel 1.4571
Protective coating (optional)	polyurethane derivative
Protective sleeve	aluminium, anodized
Sensor cable (remote sensor)	(PUR, halogenfree, UL)
General Data	
Medium environment	non-condensing (up to 95 % rF)
Maximum pressure - compact sensor - remote sensor	 10 bar atmospheric (700 hPa … 1.300 hPa)
Display	4 x Duo-LEDs (green/red/orange)
Supply voltage	24 V AC/DC ± 20 %
Current consumption	60 mA typ. (max. 170 mA)
Analog outputs for temperature and velocity Auto U/I	0 … 10 V/4 mA… 20 mA (short-circuit protected) voltage output: R_L > 500 Ω current output: R_L < 500 Ω change-over hysteresis: 50 Ω
Electrical connection	plug-in connection M12, screwed, 5-pin
Maximum cable length	voltage output: 15 m, current output: 100 m
Mounting position	any
Minimum inmersion	58 mm (< 58 mm on request)
Protection class	IP67 (sensor head) / IP65 (housing)/III
ATEX-category	II 3D Ex tc IIIC T125 °C Dc IP64 II 3G Ex nA IIC T4 Gc
Sensor length	100/150/161,5 (remote Version)/350/≤ 1000 mm
Weight by mass	200 g max. (without cable)

[1] under reference conditions, related to the calibration reference

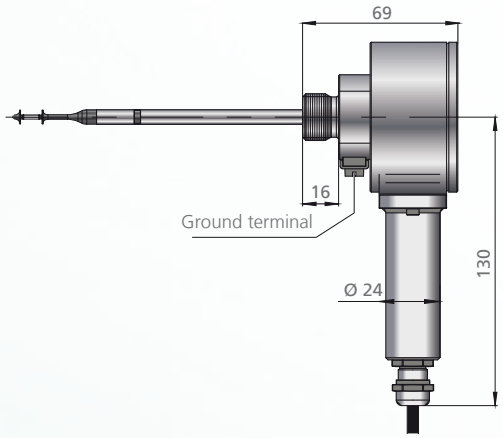


Physical Dimensions (mm)

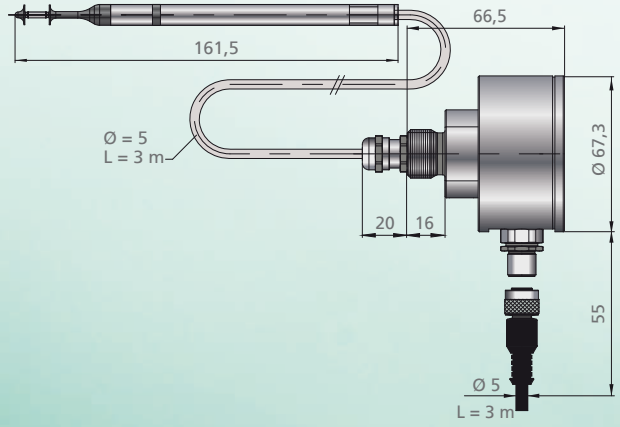
Basic sensor



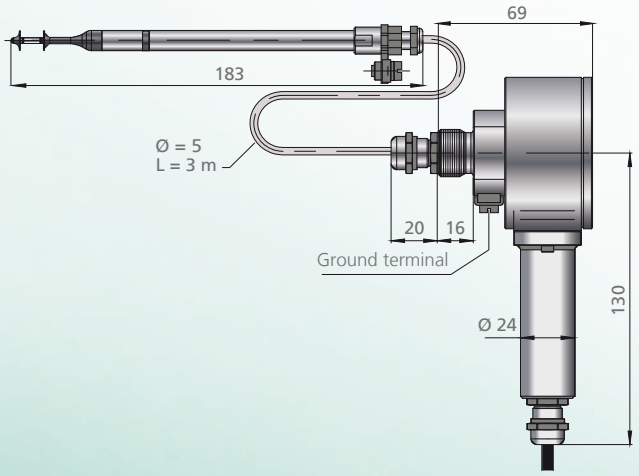
ATEX design SS 20.500 Ex (optional)



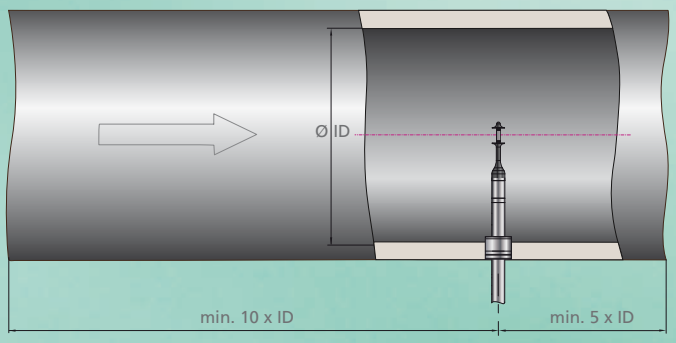
Remote sensor

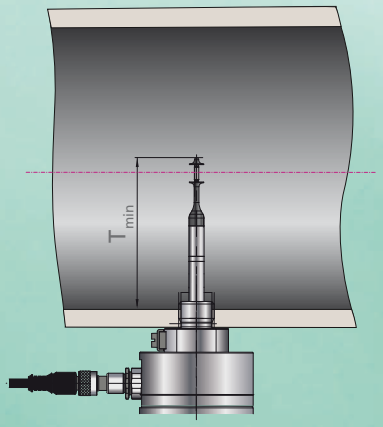


Remote sensor ATEX design (optional)



Mounting instructions

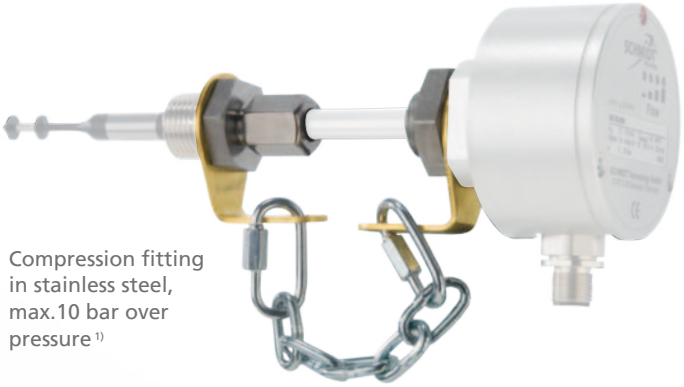




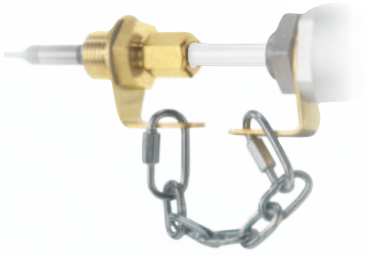
T_{min}: Minimum inmersion depth > 58 mm
(smaller depth of immersion on inquiry)

Accessories

LED wall display (accessories)
(see separate brochure)
For local indication an LED wall display is available.
The advantages:
· Display in m/s or m³/h
· Programmable output signal
· Two programmable relay outputs
· Voltage supply 85 – 230 V AC
· Voltage supply of the connected sensor
· Separate version with sum function



Compression fitting in stainless steel, max.10 bar over pressure [1)]



Compression fitting in brass, max.10 bar over pressure [1)]

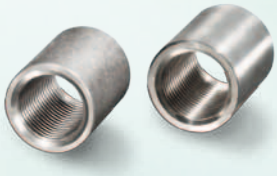
[1)] also available as compression fitting for atmospheric pressure (without pressure losses)

Protective clip
To protect the dumbbell head from serious mechanical influences a protective clip made of stainless steel can be attached to the sensor tube. This accessory part is especially recommendable i. e. in "clean workbenches", to avoid unintended contact during operation. The protective clip is designed in a way to eliminate aerodynamic influence.

Coupler socket with screw type terminals

Mounting flange

Compression fitting in brass or stainless steel for atmospheric pressure



Weelding sleeve steel or stainless steel

Order information SCHMIDT® Flow Sensor SS 20.500

	Description	Article number					
Basic sensor	SCHMIDT® Flow Sensors SS 20.500; output signal 4 ... 20 mA and 0 ... 10 V	521 501 -	X	Y	Z	P	A
	Options						
Mechanical type	sensor length 100 mm		1				
	sensor length 150 mm		2				
	sensor length 350 mm		3				
	special length (> 100 mm to 1.000 mm): length: _____mm		9				
	remote sensor with 3 m cable		4				
Measuring ranges and calibration	measuring range 0 ... 1 m/s			1			
	measuring range 0 ... 2,5 m/s			6			
	measuring range 0 ... 5 m/s			2			
	measuring range 0 ... 10 m/s			3			
	measuring range 0 ... 20 m/s			4			
	measuring range 0 ... 35 m/s			5			
	standard calibration				1		
	high-precision flow calibration, including ISO calibration certificate				2		
Protection type	without protective coating					1	
	with protective coating					2	
	without ATEX design (SS 20.500)						1
	ATEX design (SS 20.500 Ex)						2

	Description	Article number
Accessories	connecting cable 5 pole, cable length 5 m, with open cable end sleeves	523 565
	connecting cable 5 pole, length can be selected, with cable end sleeves, free of halogen	523 566
	coupler socket 5-pin, with screw type terminals for cable Ø 4 … 6 mm	523 562
	mounting flange made of galvanized stee	301 048
	compression fitting stainless steel G½, atmospheric pressure	532 160
	compression fitting brass G½, atmospheric pressure	517 206
	compression fitting brass G½, max. 10 bar, with protection against pressure losses	524 891
	compression fitting stainless steel G½, max. 10 bar, with protection against pressure losses	524 919
	welding sleeve steel G ½, according to EN 10241, 5 pieces	524 916
	welding sleeve stainless steel G ½, according to EN 10241, 2 pieces	524 882
	attachable protective clip for dumbbell head against mechanical influences, stainless steel	531 026
	power supply unit 24 V DC output, supply voltage 115/230 V AC	300 640
	SCHMIDT® LED display MD 10.010; in wall housing to show the volume flow and flow velocity (or other measured variables), 85 … 250 V AC and sensor supply	527 320
	SCHMIDT® LED display MD 10.010; similar to 527 320, but with 24 V DC voltage supply	528 240
	SCHMIDT® LED display MD 10.015; in wall housing to show the volume flow and flow velocity (or other measured variables), with additional sum function and second measuring input, 85 … 250 V AC and sensor supply	527 330
	SCHMIDT® LED display MD 10.015; similar to 527 330, but with 24 V DC voltage supply	528 250
	assembly kit for pipe assembly suitable for MD 10.010 / 10.015, including pipe clamps and collar for adjustment to the pipe diameter	531 394

Form 1094/08/11/2000/2 · Art. No. 526747.02 · Subject to technical modifications

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