Simply a question of
better measurement

SCHMIDT® Technology

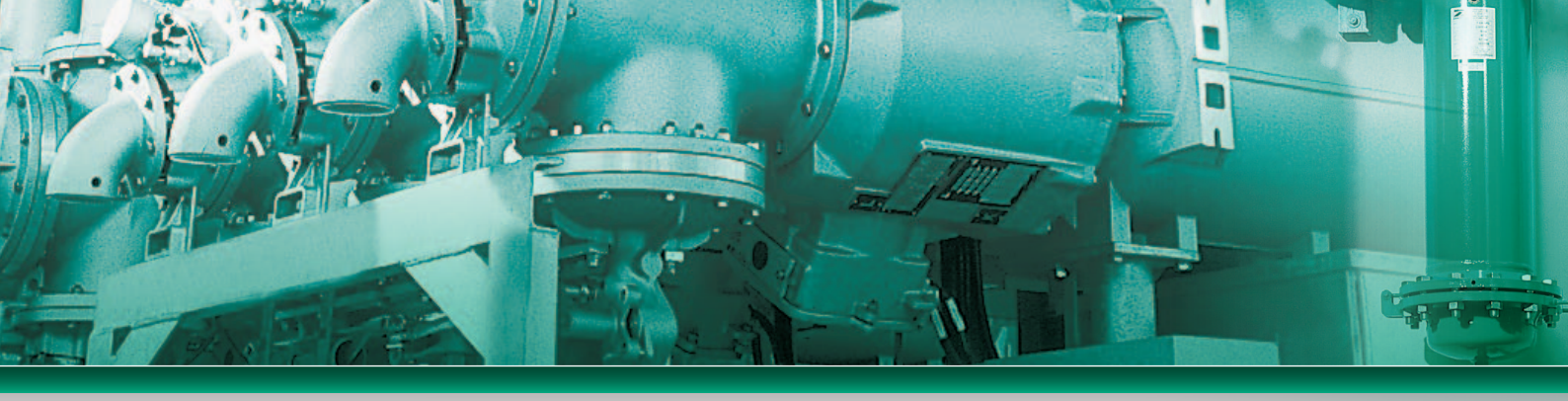


SCHMIDT® Flow Sensor SS 20.261

The cost-effective alternative in pressurised systems up to 10 bars.

Compressed air technology

Industrial processes



A cost analysis that can save you money

Compressed air is an expensive energy

The creation of compressed air is a cost-intensive process. It will therefore pay you to optimize the compressed-air networks. The first step is the knowledge how and where the optimization can be made. When considering the losses in a compressed-air system, the leaks in the system reach a percentage of about 42 % of the total loss. Other important aspects are the design of the system and the control.

Calculation example

In a production plant of an average size (approx. 250 employees), a compressed-air network with a compressor power of 960 m³/h is installed. The compressor has a power consumption of 100 kWh and an operating time of 80 %. The system runs 16 hours a day (2 shifts) and 276 days per year.

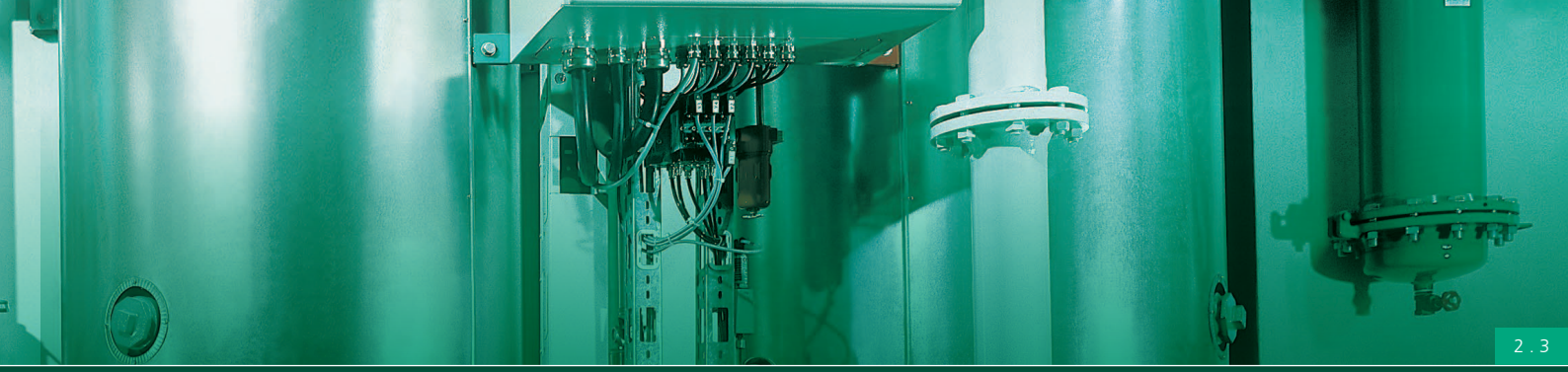
	Annual operating hours	Energy consumption	Energy price	Energy costs	Losses	Losses per year
Before the optimization	4416 hours	353,280 kWh	0.06 ¤/kWh	21,197 ¤	25 %	5,300 ¤
After the optimization	4416 hours	282,624 kWh	0.06 ¤/kWh	16,957 ¤	5 %	848 ¤

The first step to save costs

The basis for the system optimization is the precise and continuous analysis of the compressed-air system's actual consumption. To calculate this, the operator must know the actual volume flows of the system, the distribution of the compressed air in the network and, finally, also the volume flows during the idle periods – the leakage quantities. This data will help you to plan the optimization measures which have to be taken. The solution is: the use of volume flow sensors. They measure all the required data such as leakage quantities, consumption and distribution to the individual consumers (for a unambiguous cost allocation). This may help to adjust the maintenance intervals to the actual status of the system.

Consumption of process gases

In many production processes, not only compressed air but also other gases are used. These can be shielding gases such as CO_2, helium or argon. In combustion processes, the fuel gas quantity is relevant. The use of an accurate and pressure-resistant volume flow sensor is the optimum solution for these applications in order to save costs and to guarantee a safe process sequence.



The measuring factors

Easy measurement with the SCHMIDT® Flow Sensor SS 20.261

The accurate volume flow measurement in compressed-air systems is used to:

- save energy and increase the energy efficiency by a continuous leakage detection and an optimum compressor control
- calculation of compressed-air consumption and contracting
- system monitoring to avoid production downtimes and to guarantee a cost-effective and status-oriented maintenance

Measuring other gases?

For a lot of industrial areas, the detection of the different gas quantities is interesting since the cost minimization is not only important for the compressed air.

In many areas, the consumption has to be controlled and leakages must be detected, for example:

- production of electronic components
- application of shielding gases
- drying processes with inert gases and others



Application examples

- Packing machines
- Injection moulding machines
- Textile machines
- Pneumatic conveyance system
- Surface coating
- Installation of compressed-air tools
- Production of insulating material



Easy volume flow measurement

SCHMIDT® Flow Sensor SS 20.261 One measurement instead of many measured values

The thermal flow sensor SS 20.261 works by the hot wire principle of a thermal anemometer. That's why the application in systems with overpressure is very simple since only the temperature and pressure values must be measured and calculated. The sensor measures the correct flow velocity independently of the pressure (up to 10 bars). The linear output signals of flow and temperature are individual current signals 4 ... 20 mA – from 0 m/s to 40, 60 or 90 m/s. The measured value is output as standard velocity which can be converted easily in the volume flow of the used tube diameter (see table on the last page).

Installing, connecting, measuring

The optimum position in the tube and the selection of the best measuring point are very important for the correct installation of the "Plug and Play" sensor. The sensor is placed in a tube section with a uniform flow without turbulences. Therefore the run-in distance must correspond to at least 10 times the tube diameter and the run-out distances to 5 times the tube diameter. This will avoid the influence of valves, tube bends etc. The installation itself is very easy: Screw the sensor on the weld-in sleeve – adjust the sensor tip in the center of the tube – tighten the compression fitting – connect the wires – ready.

Precision? We can provide you written proof!

On request, the high precision calibrated sensor can be delivered with a factory calibration certificate which documents the accuracy and the reproducibility. SCHMIDT Technology carries out the measurement in reference wind channels which are especially designed for this purpose – of course the calibration can be renewed at any time.

Intelligent technology

Due to the chamber head technology, the sensor is suitable for a very large velocity range from 0.2 m/s to 90 m/s. The sensor is fitted into tubes with diameters between DN 25 and DN 600 and is able to precisely detect volume flows of up to 74,000 m^3/h.Even the smallest volume flows such as leakages can be precisely measured during the idle periods of the system.





Advantages

- Direct measurement of the standard flow velocity up to 90 m/s without additional pressure or temperature compensations or calculations
- Maintenance-free without moving parts
- Integrated temperature measurement
- High precision calibration with factory calibration certificate (optional)
- Compact design and easy installation
- Integrated sensor "Blow Out" protection (In case accidental loosening of the compression fitting occurs under pressure)
- Suitable for tube diameters from DN 25 to DN 600
- LED status display
- Overpressure up to 10 bars



Everthing in view
The LED display is used for the function monitoring and for a quick error analysis on site.



"All inclusive"
The flow sensor SS 20.261 is delivered with a compression fitting made of brass which allows an easy, safe and quick installation.



LED wall display (accessories)
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 or 24 V DC
· Voltage supply of the connected sensor
· Separate version with sum function



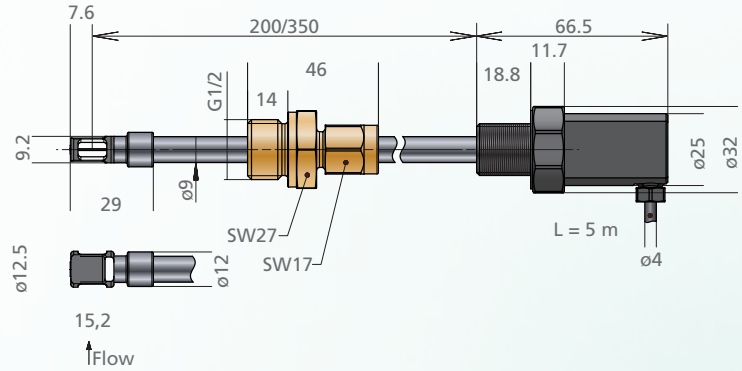
Technical data

Measurement specific data	
Measurement value	Standard velocity w_N based on standard conditions T_N = 20 °C and p_N = 1,013.25 hPa temperature of the medium T_m
Medium to be measured	Air, nitrogen, other gases upon request
Measuring range of flow w_N	0 … 40/60/90 m/s
Smallest measurable flow velocity w_N	0.2 m/s
Measuring accuracy	
Standard w_N [1]	± (5 % of measured value + 0.4 % of fmr)
High precision calibration w_N [1]	± (3 % of measured value + 0.4 % of fmr)
Response time (t_{90}) w_N	3 s (jump from 0 to 5 m/s)
Temperature gradient	8 K/min at 5 m/s
Pressure dependence	Independent of the pressure of the medium
Temperature measuring range T_m	-20 … +85 °C
Temperature measuring accuracy T_m	± 1 K at w_N > 2 m/s
Operating temperature	
Sensor	-20 … +85 °C
Electronics	-20 … 70 °C

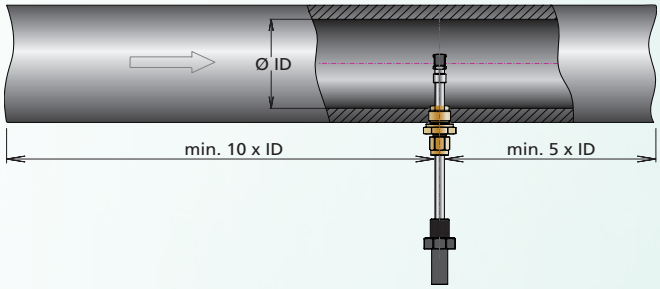
[1] under reference conditions, related to the calibration reference
fmr = final measuring range

Material	
Housing	PBT, glass fiber reinforced
Sensor tube	Stainless steel 1.4571
Sensor element	Ceramics, passivated glass
Connecting cable	PVC
Mounting	Compression fitting made of brass, G½
General data	
Operating pressure	0 … 10 bar
Humidity	Measuring mode: non-condensing (< 95 % RH)
Output signals	2 x 4…20 mA, $R_L \leq 300\ \Omega$, $C_L \leq 10$ nF
Maximum cable length	100 m
Display	Green LED: Operating state Red LED: Sensor defective
Supply voltage	24 V DC ± 10 %, 60 mA
Stabilization time	Approx. 10 s after switch-on
Connection	Permanently connected cable, 4 cores, length 5 m, with cable end sleeves
Probe length	200/350 mm
Mounting tolerance	± 3° to flow direction
Installation position	As desired (except in case of a downward flow and w_N < 2 m/s at the same time)
Type of protection	IP 66 / III or PELV

Dimensions (mm):



Installation:





The right choice

Measuring ranges of standard volume flow for the use in tubes

Measuring tube		Measuring tube diameter		Measuring ranges of standard volume flow m³/h for sensor measuring range (w_N) for air:				Suitable for compressors with approx. kW		
		Inside	Cross section	Minimum measured value	Maximum measured value	Maximum measured value	Maximum measured value	Maximum measured value	Maximum measured value	Maximum measured value
DN	Inch	[mm]	[cm²]		40 m/s	60 m/s	90 m/s	40 m/s	60 m/s	90 m/s
25	1	26,0	5,31	0,30	61	91	137	7	10	15
		28,5	6,38	0,37	73	110	165	8	12	18
32		32,8	8,45	0,48	97	145	218	11	16	24
	1 1/4	36,3	10,35	0,57	115	172	258	12	19	28
40	1 1/2	39,3	12,13	0,65	131	196	294	14	21	32
		43,1	14,59	0,80	159	239	358	17	26	39
		45,8	16,47	0,91	181	272	407	20	30	44
50	2	51,2	20,59	1,14	229	343	515	25	37	56
		54,5	23,33	1,30	260	391	586	28	42	64
		57,5	25,97	1,45	291	436	654	32	47	71
		64,2	32,37	1,82	365	547	820	40	59	89
65	2 1/2	70,3	38,82	2,20	439	659	988	48	72	107
		76,1	45,48	2,59	519	778	1.167	56	85	127
80	3	82,5	53,46	3,07	614	920	1.380	67	100	150
100	4	100,8	79,80	4,62	924	1.386	2.079	100	151	226
		107,1	90,09	5,23	1.046	1.568	2.353	114	170	256
125	5	125,0	122,7	7,17	1.435	2.152	3.229	156	234	351
125		131,7	136,2	7,98	1.597	2.395	3.593	174	260	391
150	6	150,0	176,7	10,40	2.079	3.119	4.678	226	339	508
		159,3	199,3	11,77	2.353	3.530	5.295	256	384	576
		182,5	261,6	15,54	3.108	4.661	6.992	338	507	760
		190,0	283,5	16,87	3.373	5.060	7.590	367	550	825
200		206,5	334,9	19,99	3.998	5.997	8.996	435	652	978
250		260,4	532,6	32,01	6.402	9.602	14.404	696	1.044	1.566
300		309,7	753,3	45,56	9.112	13.668	20.502	990	1.486	2.228
350		339,6	905,8	54,91	10.981	16.472	24.707	1.194	1.790	2.686
400		388,8	1.187,3	72,23	14.446	21.670	32.505	1.570	2.355	3.533
450		437,0	1.499,9	91,47	18.294	27.440	41.161	1.988	2.983	4.474
500*		486,0	1.855,1	113,53	22.706	34.059	51.089	2.468	3.702	5.553
550*		534,0	2.239,6	137,39	27.477	41.216	61.824	2.987	4.480	6.720
600*		585,0	2.687,8	165,27	33.054	49.581	74.371	3.593	5.389	8.084

* Not for installation through ball valve
Use the SCHMIDT® flow calculator on our homepage for an easy conversion,
e.g. in case of other gases or measuring units: www.schmidttechnology.de/de/sensorik

Order information SCHMIDT® Flow Sensor SS 20.261

	Description	Article number			
Basic sensor	SCHMIDT® Flow Sensor SS 20.261; output signal 4 ... 20 mA; 2 x overpressure up to 10 bars and compression fitting; cable length 5 m	526 335-	X	Y	Z
	Options				
Sensor length	Sensor length 200 mm, brass G½		1		
	Sensor length 350 mm, brass G½		2		
	Sensor length 200 mm, stainless steel R½ (PT)		3		
	Sensor length 350 mm, stainless steel R½ (PT)		4		
Measuring range, adjustment accuracy and calibration	Measuring range 0 ... 40 m/s			1	
	Measuring range 0 ... 60 m/s			2	
	Measuring range 0 ... 90 m/s			3	
	Standard calibration				1
	Standard adjustment with factory calibration certificate				3
	High precision adjustment with factory calibration certificate				2

	Description	Article number
Accessories	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
	Power supply unit 24 V DC / 1 A output, supply voltage 115 / 230 V AC	535 282
	SCHMIDT® LED display MD 10.010 in wall housing to show volume flow and flow velocity, 85 ... 250 V AC and sensor power 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, similar to 527 320 but with an additional sum function and a second measuring input	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 / MD 10.015, including pipe clamps and collar for adjustment to the pipe diameter	531 394
	Probe ball valve 1" inside thread, brass nickel-plated, PN 32, connection flow sensor: ½" inside thread incl. plug and chain	530 940
	Probe ball valve 1¼" inside thread, brass nickel-plated, PN 20, connection flow sensor: ½" inside thread incl. plug and chain	530 941
	Probe ball valve 1½" inside thread, brass nickel-plated, PN 20, connection flow sensor: ½" inside thread incl. plug and chain	530 942
	Probe ball valve 2" inside thread, brass nickel-plated, PN 20, connection flow sensor: ½" inside thread incl. plug and chain	530 943
	Probe ball valve, ¾" inside thread, brass nickel-plated, PN 40; with thread adapter on ½" compression fitting	532 355
	Welded socket steel outside thread ¾", 5 pieces	531 200
	Welded socket stainless steel outside thread 3/4", 2 pieces	531 201

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