

Simply a question of
better measurement



SCHMIDT® Flow Sensor SS 20.261

The cost-effective alternative in
pressurised systems up to 8 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 CO₂, 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 8 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).

Precision?
We can provide you written proof!

On request, the high precision calibrated sensor can be delivered with an ISO 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 Nm³/h. Even the smallest volume flows such as leakages can be precisely measured during the idle periods of the system.

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.





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 ISO 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 8 bars



Everything 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
- Voltage supply of the connected sensor
- Separate version with sum function

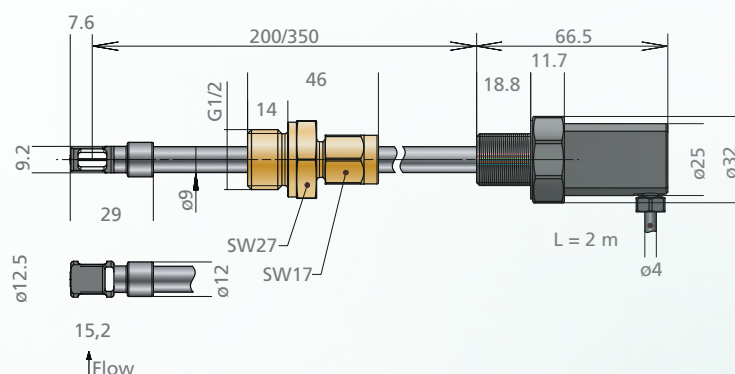


Technical data

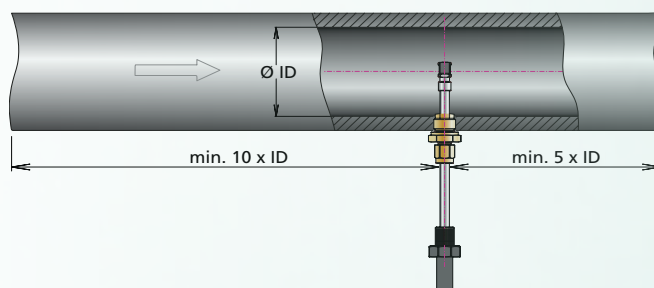
Measurement specific data	
Measurement value	standard velocity w_N based on standard conditions $T_N = 20\text{ °C}$ and $p_N = 1,013.25\text{ hPa}$
Medium to be measured	air, nitrogen, other gases upon request (flammable gases are not allowed)
Measuring range of flow w_N)	0 ... 40/60/90 m/s
Smallest measurable flow velocity	0.2 m/s
Measuring accuracy	
Standard	$\pm 5\%$ of measured value + 0.4 % of measuring range
High precision calibration	$\pm 3\%$ of measured value + 0.4 % of measuring range
Reproducibility w_N	$\pm 1.5\%$ of measured value
Response time t_{90}	3 s (jump from 0 to 5 m/s)
Temperature gradient	8 K/min @ 5 m/s
Pressure dependence	independent of the pressure of the medium
Temperature measuring range	-20 ... +85 °C
Temperature measuring accuracy	$\pm 1\text{ K}$ @ $w_N > 2\text{ m/s}$
Operating temperature	
Sensor	-20 ... +85 °C
Electronics	0 ... 70 °C

Material	
Housing	PBT, glass fiber reinforced
Sensor tube	stainless steel 1.4571
Sensor element	ceramics, passivated glass
Compression fitting	brass
Connecting cable	PVC
Mounting	compression fitting made of brass, G $\frac{1}{2}$
General data	
Operating pressure	0 ... 8 bar
Medium, gas state	non-condensing (up to 95 % relative humidity)
Output signals	2 x 4 ... 20 mA, $R_L \leq 300\ \Omega$, $C_L \leq 10\text{ nF}$
Maximum cable length	100 m
Display	green LED: Operating state red LED: Sensor defective
Supply voltage	24 V DC $\pm 10\%$, 60 mA
Stabilization time	approx. 10 s after switch-on
Connection	permanently connected cable, 4 cores, length 2 m, with cable end sleeves
Probe length	200/350 mm
Mounting tolerance	$\pm 3^\circ$ to flow direction
Installation position	as desired (except in case of a downward flow and $w_N < 2\text{ m/s}$ at the same time)
Type of protection	IP 65

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 m ³ /h for sensor measuring range (w _N) for air:				Suitable for compressors with approx. kW		
DN	Inch	Inside	Cross section	Minimum measured value	Maximum measured value	Maximum measured value	Maximum measured value	Maximum measured value	Maximum measured value	Maximum measured value
		[mm]	[cm ²]		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	1 1/4	32,8	8,45	0,48	97	145	218	11	16	24
		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
125	5	107,1	90,09	5,23	1.046	1.568	2.353	114	170	256
		125,0	122,7	7,17	1.435	2.152	3.229	156	234	351
125	6	131,7	136,2	7,98	1.597	2.395	3.593	174	260	391
		150,0	176,7	10,40	2.079	3.119	4.678	226	339	508
150	6	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; overpressure up to 8 bars and compression fitting made of brass; cable length 2 m	526 335-	X	Y	Z
Options					
Sensor length	sensor length 200 mm		1		
	sensor length 350 mm		2		
Measuring ranges & 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
	high precision calibration with ISO calibration certificate				2
Description		Article number			
Accessories	welding sleeve G½, steel, according to EN 10241, 5 units	524 916			
	LED display in the wall housing to show the volume flow and the flow velocity (available as of the 4th quarter of 2010)	527 320			
	LED display in the wall housing, similar to 527 320 but with an additional sum function and a second measuring input (available as of the 4th quarter of 2010)	527 330			
	ball valve	upon request			

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