

Simply a question of  
**better measurement**



**SCHMIDT<sup>®</sup> Flow Sensor**  
**SS 20.600**  
**Quick Guide**

# SCHMIDT® Flow Sensor SS 20.600

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Subject to modifications

# 1 Important information

- This quick guide must be read completely and observed carefully, before putting the unit into operation.

**For detailed information on mounting and operation of the sensor, a comprehensive manual (535084.02) is available at:**

[www.schmidt-sensors.com](http://www.schmidt-sensors.com) or [www.schmidttechnology.de](http://www.schmidttechnology.de)

**In case of doubt, please observe the information given there.**

- Any claims under the manufacturer's liability for damage resulting from non-observance or non-compliance with these instructions will become void.
- Tampering with the device in any way whatsoever - with the exception of the designated use and the operations described - will forfeit any warranty and exclude any liability.
- The unit is designed exclusively for the use described below (refer to chapter 2). In particular, it is not designed for direct or indirect protection of personal or machinery.
- **SCHMIDT Technology** cannot give any warranty as to its suitability for a certain purpose and cannot be held liable for accidental or sequential damage in connection with the delivery, performance or use of this unit.

## 2 Application range

The **SCHMIDT® Flow Sensor SS 20.600** is designed for stationary measurement of flow velocity as well as the temperature of air and gases.

The sensor measures the normal velocity  $w_N$  (unit: m/s), based on normal conditions of 1013.25 hPa and 20 °C. The output signal is linear and independent from pressure and temperature of the medium to be measured.



When using the sensor outdoors, it must be protected against direct exposure to the weather.



When using the sensor in **ATEX** areas the **Supplementary instructions for use in explosive atmosphere ATEX (535689.02)** must be read and observed carefully.



Information and safety instructions for the use in media having an oxygen percentage of > 21 % can be found in the general Instructions for Use (535084.02).

### 3 Assembly



Position the sensor head always at the most advantageous position for flow measurement, typically in the middle of the pipe.

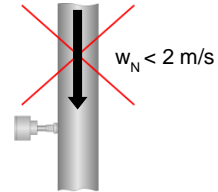


The sensor measures unidirectional, the axial tilting of the sensor head relative to flow direction should not exceed  $\pm 3^\circ$

The sensor should preferably be installed in horizontal pipes.

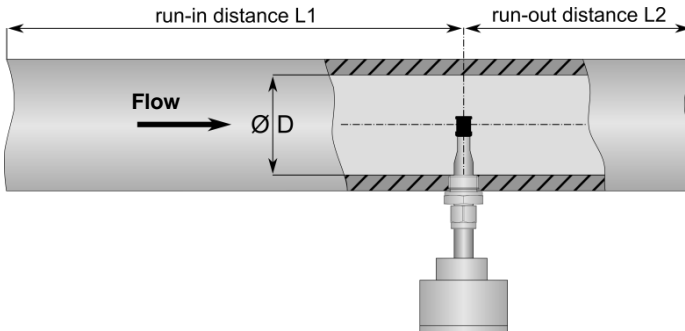
Installation in a vertical pipe with downward flow should be avoided, as the lower measuring range limit will be increased.

In case of a downward flow at 16 bar overpressure, correct measurement values will be given at a flow velocity above 2 m/s.



Correct measurements require a flow low in turbulence.

This can be achieved by providing sufficiently long and straight distances without flow disturbing structures in front of and behind the sensor.



The minimum run-in (L1) and run-out (L2) distances are defined by the type of the flow obstacle upstream of the measuring position and the inner pipe diameter D.

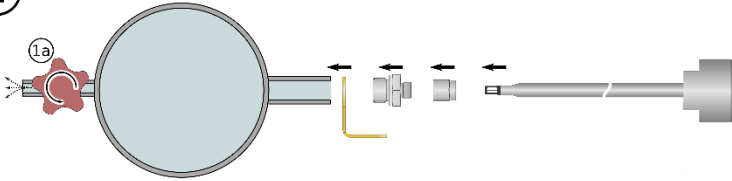
Flow obstacle upstream of measuring distance	Minimum distance length of	
	Run-in (L1)	Run-out (L2)
Light bend ( $< 90^\circ$ )	10 x D	5 x D
Reduction / expansion / $90^\circ$ bend or T-junction	15 x D	5 x D
Two $90^\circ$ bends in one plane (2-dimensional)	20 x D	5 x D
Two $90^\circ$ bends (3-dimensional change in direction)	35 x D	5 x D
Shut-off valve	45 x D	5 x D

# Installation

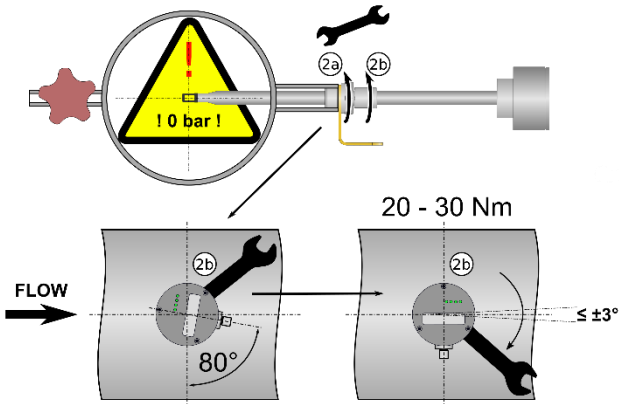


The sensor may only be mounted and dismantled when no pressure is applied.

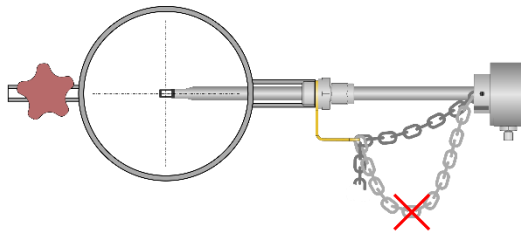
1



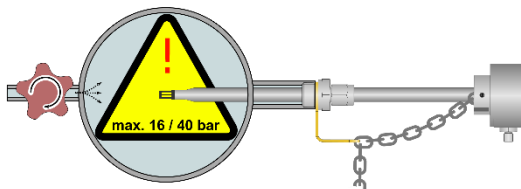
2



3



4





In case of mechanical strain (e.g. vibration), the nut of the compression fitting must be secured additionally (e.g. a screw lock).



The alignment surface of the sensor's enclosure must not be used for countering.



Before pressurisation, the pressure-tight assembly as well as the correct fastening of the compression fitting and the discarding protection must be checked.

This check must be repeated periodically.



If the sensor head is immersed in water and operated under pressure, the sensor may be damaged irreversibly.

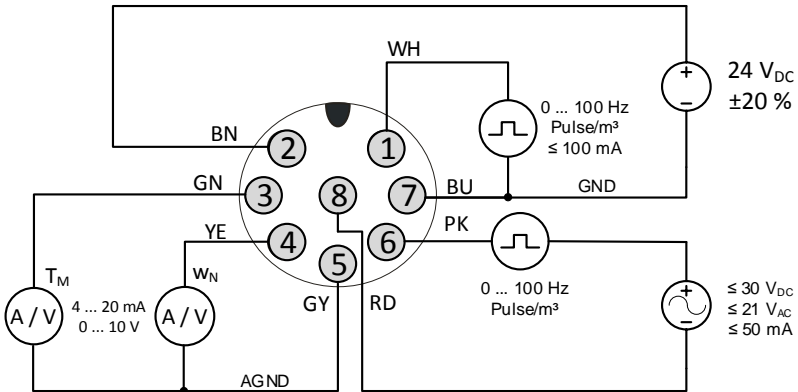


The sensor measures unidirectional, the axial tilting of its head relative to flow direction should not exceed  $\pm 3^\circ$ .

## 4 Electrical connection



Make sure that no operating voltage is active during electrical installation and that the operating voltage cannot be switched on inadvertently.



View on plug-in connector of sensor



To operate the sensor a supply voltage of  $24 V_{DC} \pm 20 \%$  with a minimum current<sup>1</sup> of 200 mA is required.



The appropriate protection class III (SELV) respective PELV (according EN 50178) has to be considered.

The specified wire colors are valid when one of the **SCHMIDT®** connecting cables is used.

<sup>1</sup> Without signal current of pulse output 2 (relay).

Pin	Name	Function	Wire colour
1	Pulse 1	Output signal: Flow velocity / volume (digital: PNP) <sup>2</sup>	White (WH)
2	U <sub>B</sub>	Operating voltage: 24 V <sub>DC</sub> ± 20 %	Brown (BN)
3	Analog T <sub>M</sub>	Output signal: Temperature of medium (Auto-U/I)	Green (GN)
4	Analog w <sub>N</sub>	Output signal: Flow velocity (analog: Auto-U/I)	Yellow (YE)
5	AGND	Reference potential for analog outputs	Gray (GY)
6	Pulse 2	Output signal: Flow velocity / volume (digital: Relay) <sup>3</sup>	Pink (PK)
7	GND	Operating voltage: Ground	Blue (BU)
8	Pulse 2	Output signal: Flow velocity / volume (digital: Relay) <sup>3</sup>	Red (RD)

**Table 1**

Typically, AGND has to be selected as measuring reference potential for the signal output to avoid problems with mass offset.

Depending on the value of the connected load resistance R<sub>L</sub>, each analog output switches between operation as voltage interface “U” (0 ... 10 V) or current interface “I” (4 ... 20 mA) automatically (“Auto-U/I”).

The switching threshold is set by a load resistance of R<sub>L</sub> = 500 ... 550 Ω (hysteresis = 50 Ω), the maximum load capacity is 10 nF.

For voltage mode, a load resistance of at least 10 kΩ is recommended.

## 5 Commissioning

The valid measuring ranges and the configuration of the signal outputs are specified on the rating plate.

After applying the supply voltage, the sensor signals the initialization of the measuring operation by means of all four LEDs (sequence: red, orange, green). The flow output signal will at first adopt a higher value and then settle to the correct measurement value after about 10 seconds.

LEDs flashing in red indicate an error. For detailed error description, please refer to the general **Instructions for Use** (535084.02, page 25).

## 6 Calculation of volume flow

**SCHMIDT Technology** provides a "flow calculator" on its homepage for the calculation of flow velocity or volume flow in (circular) pipes or (rectangular) shafts for the different sensor types:

[www.schmidt-sensors.com](http://www.schmidt-sensors.com) or [www.schmidttechnology.de](http://www.schmidttechnology.de)

<sup>2</sup> Highside driver (galvanically not isolated; current limited to 100 mA; load to GND)

<sup>3</sup> Galvanically decoupled (max. 30 VDC / 21 VAC / 50 mA)



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