Simply a question of
better measurement

SCHMIDT® Technology

SCHMIDT® Flow Sensor
SS 20.700
Quick Guide

SCHMIDT® Flow Sensor SS 20.700

Table of Contents

Imprint:

Version: 562146.02A
Subject to modifications

1 Important information

- This quick guide must be read completely and observed carefully, before putting the **SS 20.700** (article number: 562140) into operation.

  For detailed information on mounting, operation and conformity of this sensor, a comprehensive manual (568365.02) is available:

  www.schmidt-sensors.com **or** **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.
- The corresponding **declarations of conformity** can be found at the above-mentioned internet addresses.

2 Application range

The **SCHMIDT® Flow Sensor SS 20.700** is designed for stationary measurement of the 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 the pressure and temperature of the medium to be measured.

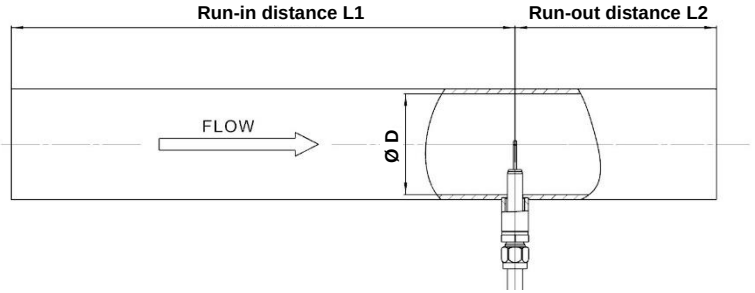
When using the sensor outdoors, it must be protected against direct exposure to the weather.

Information as well as safety instructions for the use in media having an oxygen percentage of > 21 % or requiring PWIS-conformity can be found in the general Instructions for Use (568365.02).

3 Assembly

Determination of installation site

Correct measurements require a flow, low in turbulence. This can be achieved by providing sufficiently long and straight distances without disturbances in front of and behind the sensor. The minimum run-in and run-out distances are defined by the type of the flow obstacle upstream of the measuring distance 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°)	**10 x D**	**5 x D**
Reduction / expansion / 90° bend or T-junction	**15 x D**	**5 x D**
Two 90° bends in one plane (2-dimensional)	**20 x D**	**5 x D**
Two 90° bends (3-dimensional change in direction)	**35 x D**	**5 x D**
Shut-off valve	**45 x D**	**5 x D**

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

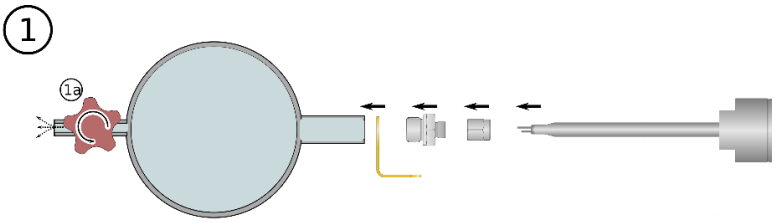
In case of mechanical strain (e.g. vibration), the nut of the compression fitting must be secured additionally (e.g. screw lock).

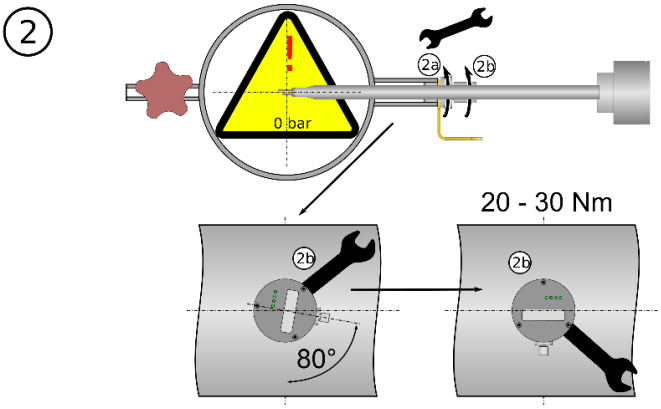
The alignment surface of the sensor's enclosure must not be used for countering.

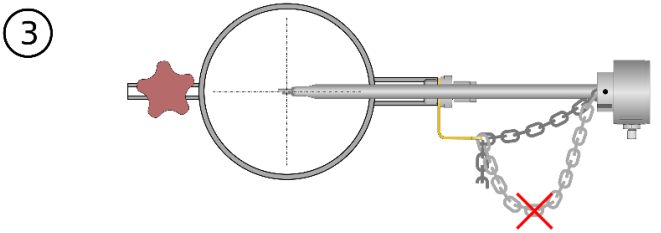
Before pressurization, the pressure-tight assembly as well as the fastening of the compression fitting and the discarding protection must be checked. This check must be repeated periodically.

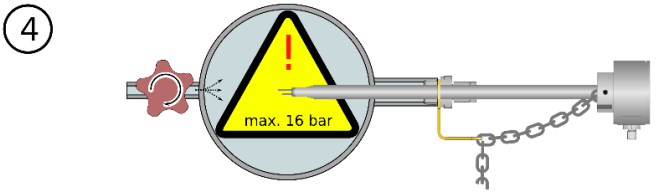
The components of the pressure protection kit (bolt, chain and bracket) have to be checked regularly for integrity.

Condensing humidity or liquids at the sensor elements will cause strong deviations of the measured values.
After drying the sensor works correctly again.


1
1a


2
2a
2b
0 bar
20 - 30 Nm
2b
2b
80°


3


4
max. 16 bar

4 Electrical connection

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

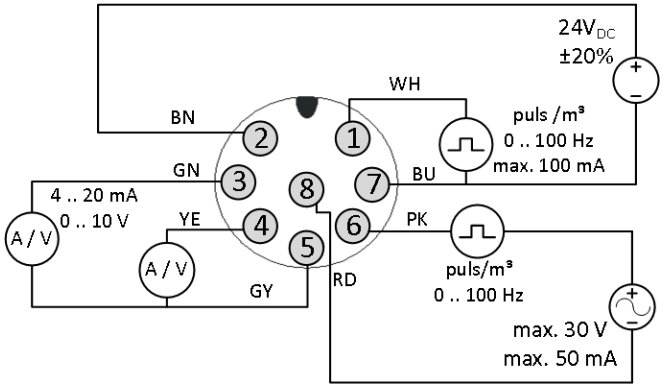
The flow sensor has two connectors:

- Main connector (male, 8-pin):
  - Connection of voltage supply
  - Output of measuring signals
- Module connector (female, 5-pin):
  - Connection of an optional extension module

A supply voltage of 24 V_{DC} ± 20 % / 250 mA is required to operate the sensor.

For more information, please refer to the general “Instructions for Use” (568365.02, page 17 seq.).

For assignment and wiring of the 8-pin main connector (M12, A-coded, male), see the following sketch and table.



View on connector of sensor

Depending on the value of the connected load resistances R_L, the analog outputs switch between the operation as voltage interface (“U”: 0 … 10 V) and current interface (“I”: 4 … 20 mA) automatically (“Auto-U/I”).

The switching threshold is set to a load resistance of R_L = 500 … 550 Ω. However, a value $R_L \leq 300$ Ω (I-mode) or $R_L \geq 10$ k Ω (U-mode) should be selected for reliable switchover detection.

These loads should be connected to AGND (pin no. 5).

By default, both pulse outputs map the flow velocity w_N proportionally to frequency interval (typ. f = 0 … 100 Hz), optionally (by ordering) they output a discrete volume unit (e.g. 1 pulse/m^3).

Pin	Name	Function	Wire colour
1	Pulse 1	Output signal: Flow / volume (pulse)[1]	White
2	U_B	Operating voltage: +24 V_{DC} ± 20 %	Brown
3	Analog T_M	Output signal: Temperature of medium (analog: U/I)	Green
4	Analog w_N	Output signal: Flow velocity (analog: U/I)	Yellow
5	AGND	Reference potential for analog outputs	Gray
6	Pulse 2	Output signal: Flow / volume (relay)[2]	Pink
7	GND	Operating voltage: Ground	Blue
8	Pulse 2	Output signal: Flow / volume (relay)[2]	Red

The specified wire colours are valid when one of the **SCHMIDT®** connecting cables[3] is used.

The metal sensor enclosure is indirectly coupled to GND (varistor, parallel to 100 nF) and should be connected to a protective potential, e.g. PE (depending on the shielding concept).

Consider the appropriate protection class III (SELV or PELV).

Only expansion modules from **SCHMIDT Technology** may be connected to the module connector.

5 Commissioning

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

After applying the supply voltage, the sensor signals the initialization of measuring mode with all four LEDs in its enclosure cover (simultaneously red, orange and green) as well as the light ring. The flow output signals 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”.

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) ducts for the different sensor types:

www.schmidt-sensors.com or www.schmidttechnology.de

[1] Highside driver (connect load to GND = pin no. 7; max. load current = 100 mA)
[2] Galvanically decoupled output of relay (max. 30 VDC / 50 mA)
[3] All shielded, but cable shield is not connected to cable jack on variant 524942.

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