Simply a question of
better measurement

SCHMIDT® Technology

Flow sensor HVAC 100
(548000)

Instruction for use

Version 547996.02

Subject to modifications

Important Information

These instructions for use must be read completely and observed carefully, before putting the unit into operation.

For more detailled information visit our website:

www.schmidt-sensors.com

If any questions left contact SCHMIDT Technology directly.

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 in these instructions for use - will forfeit any warranty and exclude any liability.

The unit is designed exclusively for the use described below. 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 certain purpose and cannot be held liable for accidental or sequential damage in connection with the delivery, performance or use of this unit.

Application range

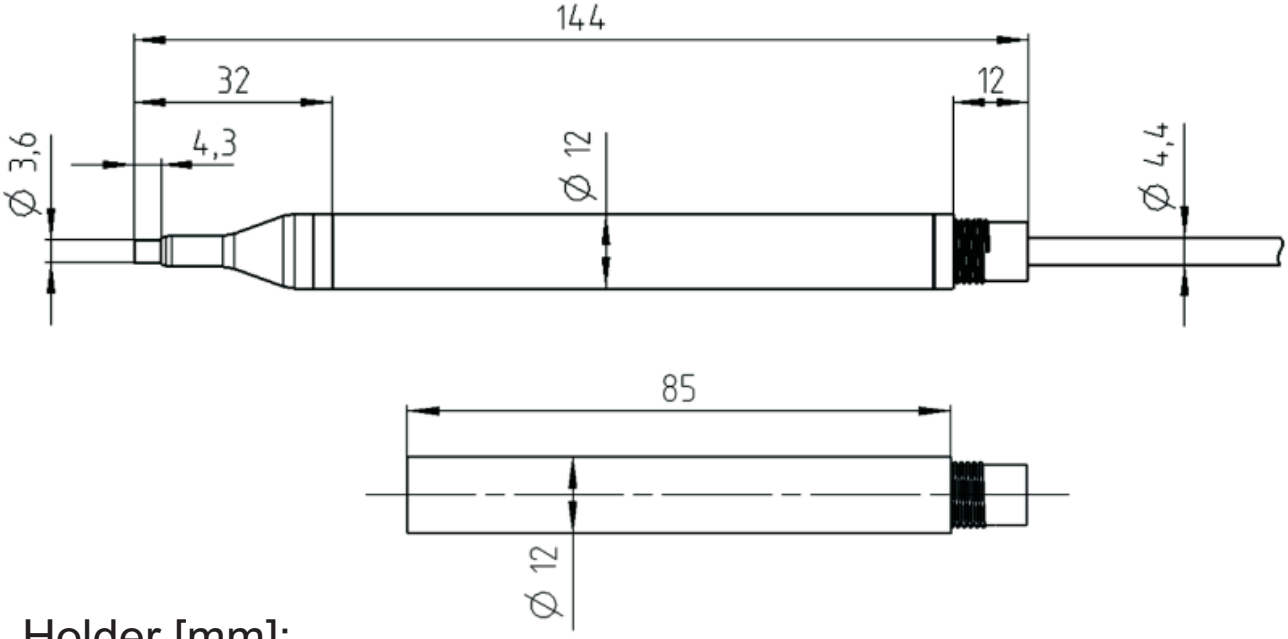
The **SCHMIDT® Flow sensor HVAC 100** is designed for stationary measurement of the flow velocity as well as the temperature of clean air at atmospheric pressure conditions.

It measures the standard velocity w_N [m/s] based on standard conditions of 1013.25 hPa and 20 °C. Thus, the resulting output signal is independent from the pressure and temperature of the medium to be measured.

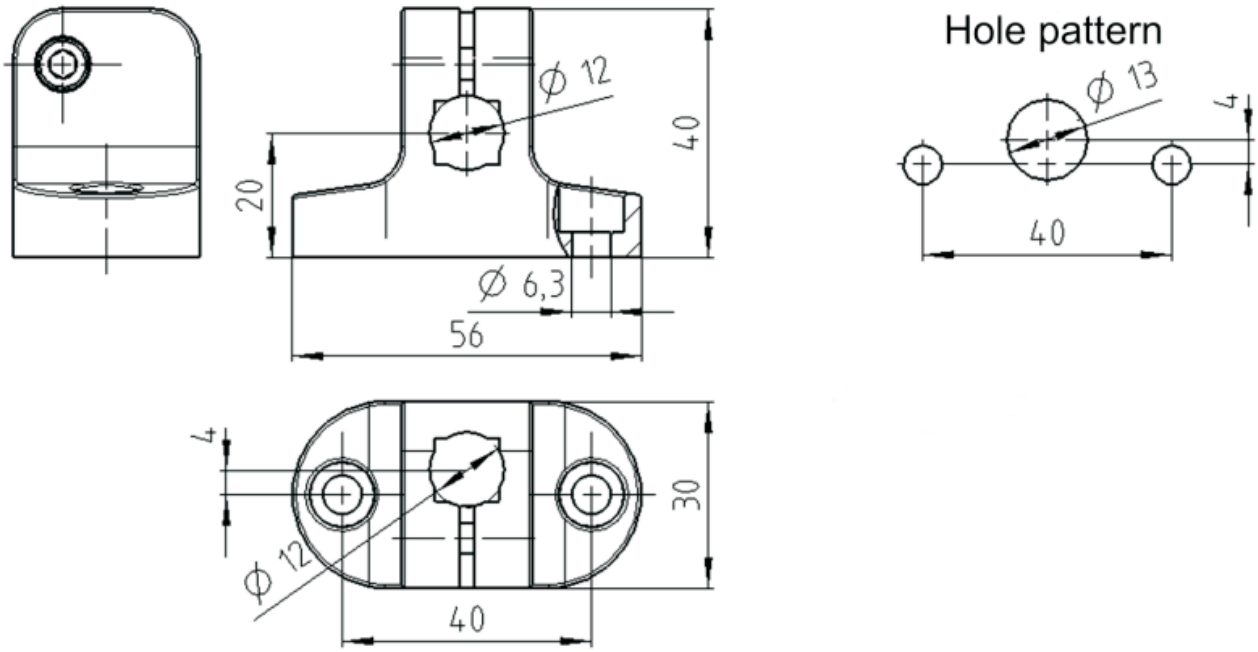
The sensor is designed for the use inside closed rooms and is not suitable for outdoor use.

Dimensions

Basic sensor and extension tube [mm]:

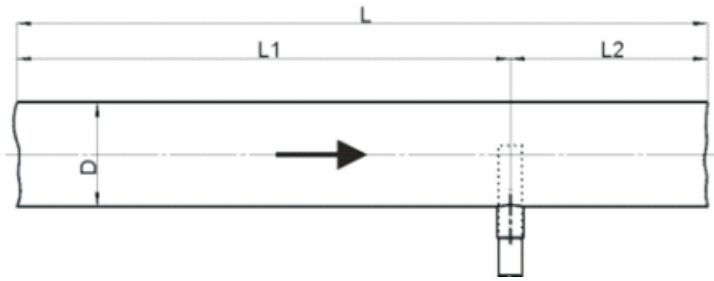


Holder [mm]:



Mounting instructions

For correct measurement results a quiet (low in turbulence) air flow is needed. To obtain this a sufficiently long distance in front of the sensor (run-in distance) and behind the sensor (run-out distance) is needed (see table below).



The required abatement distances (in relation to the characteristic dimension A (= inner pipe diameter D or in case of a rectangular flow channel: width w or hight h (whichever is smaller)) in case of different fault causes are listed in the table below.

Flow obstacle upstream of sensor position	Run-in distance (L1)	Run-out distance (L2)
Light bend (< 90°)	**10 x A**	**5 x A**
Reduction / expansion / 90° bend	**15 x A**	**5 x A**
Two 90° bends in a plane (2-dimensional)	**20 x A**	**5 x A**
Two 90° bends (3-dimensional)	**35 x A**	**5 x A**
Shut-off valve	**45 x A**	**5 x A**

The sensor tip has to be installed in the middle of the pipe.

The temperature measuring sleeve must be in direct contact with the measured medium. That means that a minimum immersion depth (MID) of 35 mm is required.

The sensor is mounted by using the included mounting clamp. The insertion depth can be adjusted steplessly. If the sensor is too short it can be extended by using one or more (recommended max. 3 pcs.) extension tubes (one is included; more tubes can be ordered as accessories, Part-No. 551300).

Electrical connection

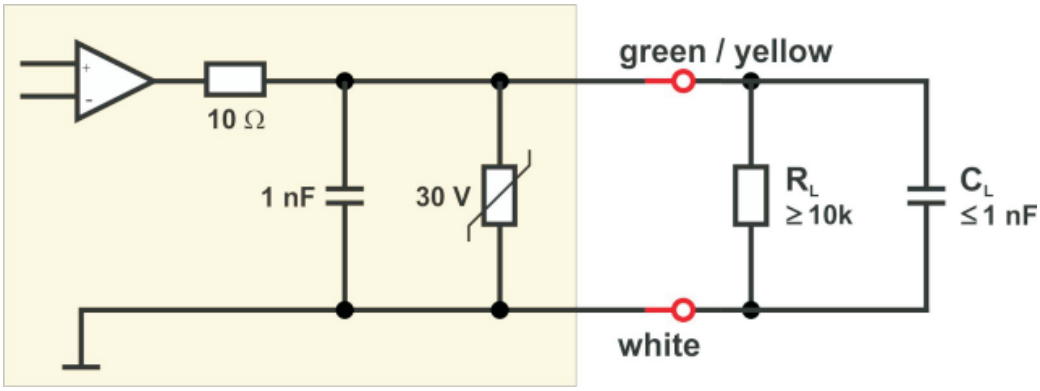
The sensor is equipped with a 4-pin cable of 2 m length.

Function	Wire color
Operating voltage: $+U_B$	**brown**
Output signal: Flow velocity w_N	**yellow**
Output signal: Temperature (medium) T_M	**green**
Operating voltage: GND	**white**

During electrical installation ensure that no voltage is applied and inadvertent activation is not possible.

For proper operation the sensor requires a power supply of 24 V_{DC} ± 20 % with a current of typ. 35 mA, maximum 80 mA. The analog outputs are realised as voltage outputs (0 ... 10 V) related to GND.

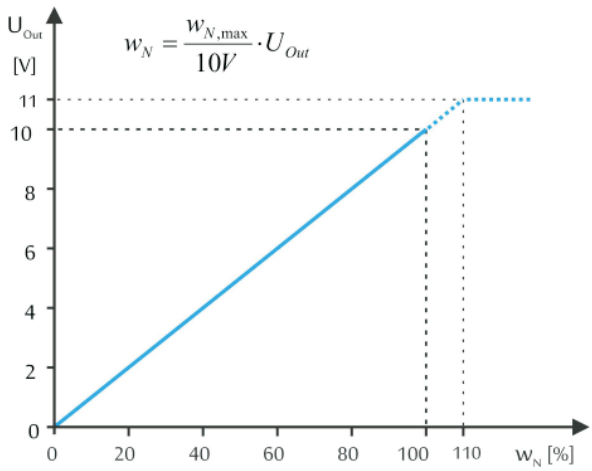
The connected burden must be at least 10 kΩ with a maximum capacity of 1 nF.

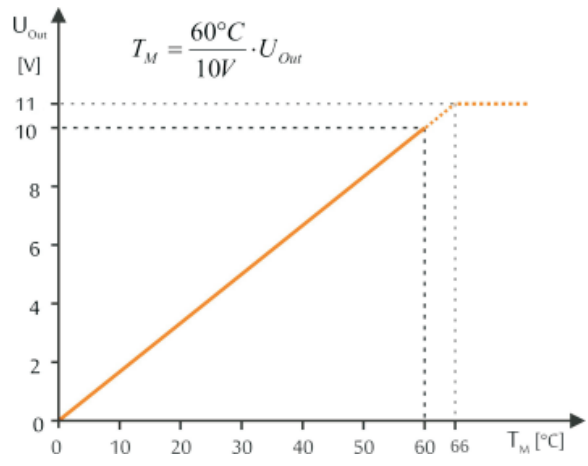


Voltage drops on the connection cables (especially in GND wire) have to be considered in some cases.

Signalizations

Both outputs are linear to the depending measurement quantity up to max. 10% higher than the measurement range. From there on the output remains at maximum.





If the sensor is in the correct operational state, it is ready for measurement approx. 30 s after switching on the supply voltage. Its status is signalized by an LED:

Symbol	Light	Status
○	Off	power supply: Not connected, pole-reversed, too low
●	Green flashing	1 x sensor is ready @ w_N < 25 % of meas. range 2 x @ w_N 25 % - 75 % of meas.range 3 x @ w_N > 75 % of meas.range
◐	Red blinking	Sensor defective / supply voltage too high

Calculation of volume flow

To calculate the standard volume flow the measured standard air velocity has to be multiplied with the cross section area of the pipe A and the corresponding profile factor PF, which is depending on the pipe diameter (e.g. 0.827 at a pipe diameter of 200 mm).

Detailed Information as well as a helpful flow calculation tool is available on the website of SCHMIDT Technology:

www.schmidt-sensors.com

Technical Data

Measuring parameters	Standard velocity w_N of air, based on standard conditions 20 °C and 1013.25 hPa Medium temperature T_M
Medium to be measured	Clean air
Measuring range w_N (Measuring accuracy[1] w_N)	0 … 2.5 m/s (±(4 % of meas. value + 0.05 m/s)) 0 … 10 m/s (±(4 % of meas. value + 0.2 m/s)) 0 … 20 m/s (±(4 % of meas. value + 0.4 m/s))
Lower detection limit w_N	0.2 m/s
Reproducibility w_N	±1.5 % of measured value
Response time (t_{90}) w_N	10 s (jump from 0 to 5 m/s)
Temperature gradient w_N	< 1.5 K/min at 5 m/s
Measuring range T_M	0 ... +60 °C
Measuring accuracy T_M (w_N > 2 m/s)	±1 K (10 ... 30 °C); ±2 K in remaining intervall
Operating temperature	-10 … 60 °C
Humidity range	0 ... 95 % rel. humidity (RH), non-condensing
Operating pressure	Atmospheric (700 ... 1,300 hPa)
Operating voltage U_B	24 V_{DC} ± 20 %
Current consumption	typ. < 35 mA, max. 80 mA
Analog outputs - Signal type - Mininum burden - Maximum load capacity	Flow velocity, medium temperature 0 ... 10 V 10 kΩ 1 nF
Electrical connection	Non-detachable connecting cable, pigtail, length 2 m, 4-pin
Type of protection	IP 40
Protection class	III (SELV)
Min. immersion depth (MID)	35 mm
Mounting	Clamp (included)
Standard probe	Length: 144 mm Weight: about 50 g Materials: PC, ABS, Brass nickel plated
Extension tube	Length: extending length 85 mm Material: ABS

[1] Under conditions of the reference.

Certificate of Conformity

SCHMIDT Technology GmbH herewith declares that the product

SCHMIDT Flow Sensor HVAC 100

Part-No. **548000**

is in compliance with the following guidelines of the council for the harmonization of the regulations of the members within the European Community:

No.: 2014/30/EU

Text: Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to **electromagnetic compatibility (EMC)**

The assessment of EMC for industrial applications refers to the following European standards:

- Electromagnetic emission:
  EN 61000-6-3: 2007/A1:2011/AC:2012
- Electromagnetic immunity:
  EN 61000-6-2: 2006+A1:2011

This certificate declares the confirmation to the mentioned guidelines but does not give any warranty to properties. The safety instructions written down in the instructions for use have to be considered. The above mentioned product was tested in a typical application.

St. Georgen, Sept. 2016

Helmar Scholz
Head of R&D