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better measurement



**SCHMIDT® Flow Sensor
SS 20.500 Ex
– Supplement for use ATEX
Instructions for Use**

SCHMIDT® Flow Sensor

SS 20.500 Ex – ATEX version

Table of Contents

1	Important information.....	3
2	Transport and storage	4
3	Safety instructions for explosive atmospheres	5
4	Application range.....	6
5	Mounting instructions.....	7
6	Electrical connection and protective sleeve assembly	9
7	Type plate - Labeling	11
8	Declarations of conformity	12
9	Type-examination certificate	13

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Errors and technical modifications subject to change

1 Important information

The present instructions for use contain all ATEX specific information for fast commissioning and safe operation of the version of **SCHMIDT® Flow Sensor SS20.500 Ex** suitable for ATEX.

- Please also read the "Instructions for Use SS 20.500" (material no.: 523375.02) as the present instructions for use are supplementary instructions for use in explosive atmospheres.
- These instructions for use must be read completely and observed carefully, before putting the unit into operation.
- 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 (see *chapter 4*). In particular, it is not designed for direct or indirect protection of personal and 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.

Other instructions for assembly, commissioning, maintenance and disassembly can be found in the general instructions for use (material no.: 523375.02) of the **SCHMIDT® Flow sensor SS 20.500**.

Symbols used in this manual

The symbols used in this manual are explained in the following section.



Danger warnings and safety instructions - Read carefully!

Non-observance of these instructions may lead to injury of the personnel or malfunction of the device.



Risk of explosion - Read carefully!

Important instructions for use in areas subject to explosion hazards.

2 Transport and storage

Packaging

The device is protected by its packaging. The packaging is environmentally safe and recyclable. Basically, the following materials are used:

- Cardboard box
- Polyethylene film

Dispose available packaging parts by submitting it to a recycling company.

Conditions for transport and storage

The following points must be observed in order to prevent damage:

- Do not expose the device to excessive mechanical load, such as throwing, stacking, falling etc.
- Do not use the device in environments where humidity and rain is possible.
- Do not expose the device to direct sunlight for a long time.
- Before transport or shipment of the sensor, the delivered protective cap must be placed onto the sensor tip.
- The storage temperature must not be lower than $-40\text{ }^{\circ}\text{C}$ or higher than $+85\text{ }^{\circ}\text{C}$.

3 Safety instructions for explosive atmospheres

- The ATEX version **SCHMIDT Flow Sensor SS 20.500 Ex** is only suitable for the following applications:
 - In *explosive dust* atmospheres: Zone 22
 - In *explosive gas* atmospheres: Zone 2
- The important explosion protection data indicated on the label of the product must be observed:
 - G = Gas, D = Dust
 - Device categories 1, 2, 3 in the 3 zones
 - Gas specific values: Temperature class (T1 ... T6)
 - Dust specific values:
 - Conductive and not conductive
 - Surface temperature with regard to smoldering temperature (less 75 °C) and ignition temperature (2/3); the smaller value applies
- Prior to carry out operations such as assembly or electrical connection, make sure that:
 - *the operation approval* of the owner is available
 - there is *no explosive atmosphere*
 - the device is *disconnected from the mains*
 - the device cannot be *switched on inadvertently*
- Avoid dust deposits (installation position, protection, cleaning measures...) in order to prevent dangerous increase of the surface temperature.
- Installation, commissioning and periodic checks must be carried out by qualified personnel only ("qualified person" according to TRBS, Technical Rules for Operational Safety, 1203).
- Repair work must be carried out by the manufacturer only.
- Changes to the device are not allowed and can cause risk of explosion (ignition).
- Only original accessories from the manufacturer may be used.



The following standards and rules are useful:

- EN 1127-1: Explosion prevention and protection - Basic concepts and methodology
- TRBS series
- Standards for explosive gas ("G") and dust atmospheres ("D"):
 - EN 60079-14: Electrical apparatus for explosive atmospheres
 - EN 60079-17: Inspection and maintenance
- Standards for explosive gas atmospheres ("G"):
 - EN 60079-10-1: Classification of explosive gas atmospheres
- Standards for explosive dust atmospheres ("D"):
 - EN 60079-10-2: Classification of explosive dust atmospheres

4 Application range

The ATEX version of the category 3 **SCHMIDT® Flow sensor SS 20.500 Ex** is designed for stationary measurement of the flow velocity as well as the temperature of air or gas in potentially explosive atmospheres featuring the following types of protection for:

- Gases (Zone 2): **II 3G Ex ec ic IIC T4 Gc**
- Dusts (Zone 22): **II 3D Ex tc ic IIIC T135°C Dc**



The sensor is suitable for use in atmospheres with combustible, conductive dust with a smoldering temperature higher than 210 °C. Special condition for use ("X"):

- The main housing of the sensor may only be operated in an area with a minimum degree of contamination 2, as defined in IEC 60991-1.
- This does not apply to the tube-shaped sensor probe (including the connecting cable for the remote version).

The permissible operating temperatures are:

- Electronics : -20 ... +70 °C
- Sensor probe: -40 ... +85 °C

Electrical datas:

- Rated voltage : 24 V_{DC/AC} ± 20 %
- Rated current: 170 mA
- Measurement outputs: 0 ... 10 V / 4 ... 20 mA

Enclosure:

- Degree of protection: IP64

5 Mounting instructions

Prior to the assembly in explosive atmospheres, the following safety measures must be observed:



- Check if the device category corresponds to the specified zones.
- Check if the operation approval from the owner is available.
- Check if there is no explosive atmosphere during assembly, maintenance or other activities.
- Compliance with the applicable regulations and the entire relevant documentation for this device.

ATEX relevant operating conditions



Pressure-tight accessories

Only use suitable, pressure-tight accessories if media separation is required.

Observe pressure safety measures.



Opening of housing

It is not allowed to open the housing (sealed housing screws). Unauthorized opening of the housing renders the explosion protection null and void!



Remote version

The connecting cable between sensor probe and main housing includes intrinsically safe circuits. It is already connected ex works and must not be disconnected or modified in any way.

Mounting ground or equipotential bonding conductor

The metallic enclosure of the sensor must be connected electrically to grounding or equipotential bonding according to EN IEC 60079-0.

The cable required for this must be fastened at the terminal screw of the enclosure, for the remote version also at the sensor probe.

In general the following applies to grounding:



- The external ground connections of the enclosure must be connected to the equipotential bonding of the hazardous area with low ohmic resistance.
- No equipotential current must flow between the hazardous area and non-hazardous area.
- Minimum cable cross-section: 1 x 4 mm²

- The screw must be tightened firmly at the terminal so that the conductor cannot be loosened or twisted.
- The potential difference between the GND of the operating voltage and the grounding potential must be $\leq 30 V_{Peak}^1$.

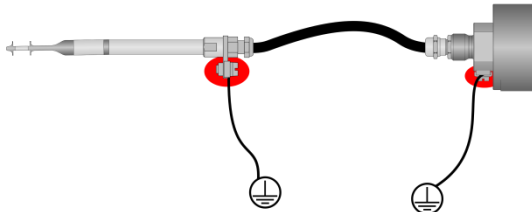
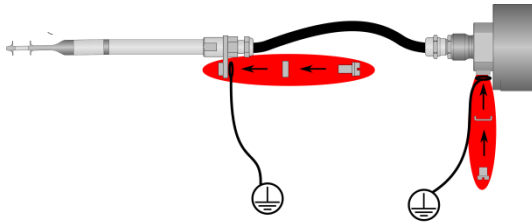


Figure 5-1 Grounding contacts (red), remote version

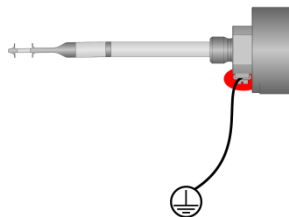
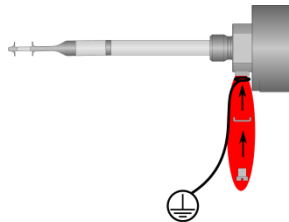


Figure 5-2 Grounding contact (red), compact sensor

¹ ESD protection via in-house varistor installed between GND and housing.

6 Electrical connection and protective sleeve assembly

Electrical connection is realized via a special connecting cable only available at **SCHMIDT Technology** that can be purchased as additional optional accessory:

Material nos.: 523565 or 523566

Connecting cable



The sensor must be operated only with a original connecting cable by **SCHMIDT Technology** (optional accessory).

Otherwise, the ATEX suitability is null and void.

Connection on the sensor side is realized by means of a plug-in connector which has to be protected against impacts and UV radiation by means of a protective sleeve². Latter features an ATEX-certified cable entry (1x M12) and must be installed afterwards (see Figure 6-1).

Protective sleeve for plug-in connector



Must absolutely be mounted!

If the protective sleeve is not mounted professionally, the explosion protection becomes null and void!

It is recommended to connect, first, the connecting cable on the field side (before, fit protective sleeve on cable, see Figure 6-1).

Other electrical accessories, such as Zener barriers or intrinsically safe power supplies, are not required for the ATEX operation.

In general the followings apply:



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

This applies in particular when disassembling the sensor.

WARNING!



DO NOT DISCONNECT THE CONNECTING CABLE AND SENSOR WHEN THEY ARE UNDER VOLTAGE!

WARNING!



DO NOT OPEN PROTECTIVE SLEEVE UNDER VOLTAGE!

² Included in delivery

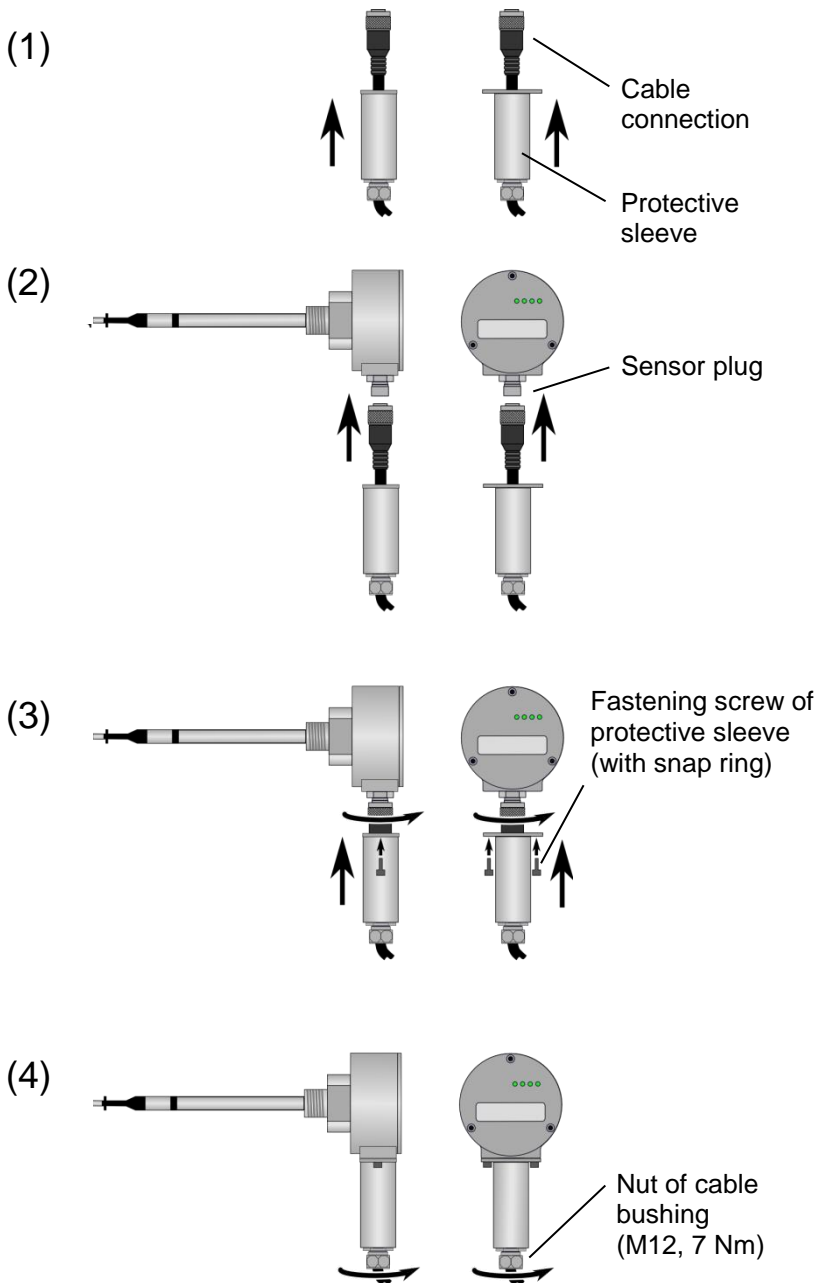


Figure 6-1 Assembly of connecting cable with protective sleeve

Assembly (see Figure 6-1):

- (1) Insert open end of connecting cable into protective sleeve (unscrew the screw of cable bushing) and push latter until almost touching the cable connector.
- (2) Insert cable connector into plug of the sensor housing and tighten spigot nut by hand.
- (3) Push protective sleeve over plug-in connector and fasten it with the included screws (hexagon sockets 2.5 mm; don't forget snap rings) to the housing (tighten by hand).
- (4) Tight nut of cable bushing (M12, 7 Nm).

7 Type plate - Labeling

The rating plate for labeling according to the standards is fixed at the sensor by means of a wire loop.

If required, the customer can attach this plate on or at the sensor on his own responsibility provided that it can be clearly assigned to the sensor and is legible and undetachably. Examples are:

- Mounting it directly at the sensor, e.g. with a machine screw through the loop hole.
- Mounting it undetachably onto a near wall according to EN IEC 60079-0, chapter 29.6.
- The side with the warning note
"Do not disconnect under voltage"
must remain visible.



8 Declarations of conformity

SCHMIDT Technology GmbH herewith declares in its sole responsibility, that the product

SCHMIDT® Flow Sensor SS 20.500 Ex

Part-No. **521 501** (configuration code: X Y Z P 2)

is in compliance with the appropriate



European guidelines and standards

and



UK statutory requirements and designated standards.

The corresponding declarations of conformity can be download from **SCHMIDT®** homepage:

www.schmidt-sensors.com

www.schmidttechnology.de

9 Type-examination certificate



Translation


Type Examination Certificate Supplement 1

Change to Directive 2014/34/EU

- 2 Equipment intended for use in potentially explosive atmospheres
Directive 2014/34/EU
- 3 Type Examination Certificate Number: **BVS 11 ATEX E 130 X**
- 4 Product: **Flow sensor type SS 20.500 Ex**
- 5 Manufacturer: **SCHMIDT Technology GmbH**
- 6 Address: **Feldbergstraße 1, 78112 St. Georgen/Schwarzwald, Germany**
- 7 This supplementary certificate extends Type Examination Certificate No. BVS 11 ATEX E 130 X to apply to products designed and constructed in accordance with the specification set out in the appendix of the said certificate but having any variations specified in the appendix attached to this certificate and the documents referred to therein.
- 8 DEKRA Testing and Certification GmbH certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in the confidential Report No. BVS PP 11.2193 EU/N1.
- 9 The Essential Health and Safety Requirements are assured in consideration of:

EN IEC 60079-0:2018	General requirements
EN IEC 60079-7:2015+A1:2018	Increased Safety "e"
EN 60079-11:2012	Intrinsic Safety "i"
EN 60079-31:2014	Protection by Enclosure "t"

- 10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Special Conditions for Use specified in the appendix to this certificate.
- 11 This Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.
- 12 The marking of the product shall include the following:

 II 3G Ex ec ic IIC T4 Gc
II 3D Ex tc ic IIIC T135°C Dc

DEKRA Testing and Certification GmbH
Bochum, 2014-04-14

Signed: Jörg-Timm Kiilsch

Managing Director



Page 1 of 3 of BVS 11 ATEX E 130 X / N1 – Jobnumber 341440400
This certificate may only be reproduced in its entirety and without any change.
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Certification body, DIN-recognised, D-44809 Bochum, Germany
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13 **Appendix**

14 **Type Examination Certificate**

**BVS 11 ATEX E 130 X
Supplement 1**

15 **Product description**

15.1 **Subject and type**

Flow sensor type SS 20.500 Ex

15.2 **Description**

With this supplement the certificate is changed to Directive 2014/34/EU.
(Annotation: In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.)

Description of the apparatus:

The flow sensor type SS 20.500 Ex is used to measure the flow velocity and the temperature of air and gases; the sensor is intended for use in Zones 2 and 22.

The flow sensor consists of a main-enclosure and a pipe-shaped measuring probe. The flow sensor is available either with its probe directly fixed to the main-enclosure (compact variant) or the measuring probe is connected by an unremovable cable (remote variant).

The main-enclosure is manufactured in type of protection Increased Safety "ec" and Protection by Enclosures "tc". The measuring probe (incl. connection cable for the remote variant) is made in type of protection Intrinsic Safety "ic".

Reasons for this supplement:

- Change to Directive 2014/34/EU
- Update to current standard versions
- Addition of type of protection "ic"
- Update of marking
- The maximum surface temperature for Group III is changed to T135°C

15.3 **Parameters (unchanged)**

Thermal data:

Medium temperature (measuring probe)	-40 °C ... +85 °C
Ambient temperature (main-enclosure)	-20 °C ... +70 °C

Electrical data:

Power supply		
Rated voltage	DC /AC	24 V ± 20 %
Rated current		< 170 mA
Output of measuring signal		0 ... 10 V / 4 ... 20 mA

Degree of protection:

IP 64



15.3.2

16 Report Number

BVS PP 11.2193 EU / N1, as of 29.03.2021

17 Special Conditions for Use

For use in gas-explosive areas:
The main-enclosure may only be used in areas with at least pollution degree 2 as defined in IEC 60664-1.
This does not affect the pipe-shaped measuring probe (including measuring cable for the remote variant).

18 Essential Health and Safety Requirements

The Essential Health and Safety Requirements are covered by the standards listed under item 9.

19 Drawings and Documents

Drawings and documents are listed in the confidential report.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA Testing and Certification GmbH
Bochum, 2021-04-14
BVS-Pz/Su/MGR A20190761



Managing Director



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