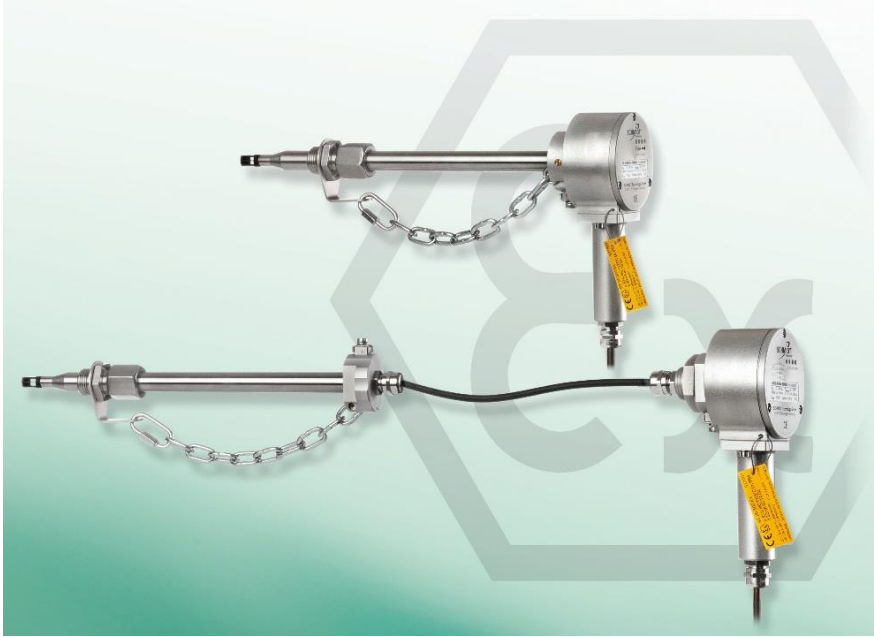


Simply a question of
better measurement



SCHMIDT[®] Flow Sensor SS 20.600 Ex

- Supplementary instructions for use
in explosive atmospheres ATEX

SCHMIDT® Flow Sensor

SS 20.600 Ex – ATEX version

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Imprint:

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Version: 535698.02C

Subject to modifications

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 SS 20.600 Ex** suitable for ATEX:

- Please also read the "**Instructions for Use SS 20.600**" (material no.: 535084.02), because 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 (refer to chapter 4). 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.

Other instructions for assembly, commissioning, maintenance and disassembly can be found in the general instructions for use (material no.: 535084.02) of the **SCHMIDT® Flow Sensor SS 20.600**.

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 Storage and transport

Packaging

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

- Cardboard box
- Polyethylene foam or polyethylene film

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

Conditions for storage and transport

The following points must be observed to avoid damage:

- Do not expose the device to excessive mechanical load, such as throwing, stacking, falling etc..
- Do not use the device in areas with high humidity or rain.
- Do not expose the device to direct sun radiation 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 -20 °C or higher than +85 °C.

3 Safety instructions for explosive atmospheres

- The ATEX version of **SCHMIDT® Flow Sensor SS 20.600 Ex** is suitable for the following applications:
 - o In *explosive gas* atmospheres: Zone 2
 - o In *explosive dust* atmospheres: Zone 22
- The compliance with the important explosion protection data of your application must be ensured by appropriate labeling.
 - o G = Gas, D = Dust
 - o Device categories 1, 2, 3 in 3 zones
 - o Gas specific values: Temperature class (T1 ... T6)
 - o Dust specific values:
 - Conductive and not conductive
 - Surface temperature with regard to smoldering temperature (minus 75 °C) and ignition temperature (2/3); the lower value applies



- Prior to carry out operations such as assembly or electrical connection, make sure that:
 - o the operation approval of the owner is available
 - o there is no explosive atmosphere
 - o the device is disconnected from the mains
 - o the device cannot be switched on inadvertently
- Avoid dust deposits (by installation position, protection, cleaning measures ...) in order to prevent dangerous increasing 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 the risk of explosion (ignition).
- Only original accessories from the manufacturer may be used.

The following standards and rules are useful:

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

- o Standards for explosive gas atmospheres ("G"):
 - EN 60079-10-1: Classification of explosive gas atmospheres
- o Standards for explosive dust atmospheres ("D"):
 - EN 60079-10-2: Classification of explosive dust atmospheres

4 Application range

The ATEX version of the **SCHMIDT® Flow Sensor SS 20.600 Ex** (category 3) is designed for stationary measurement of both the flow velocity as well as the temperature of air and gases in potentially explosive atmospheres featuring the following types of protection:

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



The sensor is only suitable for use in combustible, conductive dusts with a smoldering temperature higher than 210 °C.

Special conditions for use ("X"):

- o The internal intrinsically safe circuit is isolated¹ from the enclosure only up to 30 V.
- o A power supply according protection class III is required (PELV).
- o The permissible pulling force at the connecting cable of the remote version is limited to 20 N (25 % of the nominal value of the standard according to Annex A, chapter A.2.3.2).

The permissible operating temperatures are:

- o Electronics: -20 ... +70 °C
- o Sensor probe (medium): -40 ... +120 °C

Electrical datas:

- o Rated voltage: 24 V_{DC} ± 20 %
- o Rated current: 250 mA
- o Measurement outputs: 0 ... 10 V / 4 ... 20 mA
- o Impulse output:
 - f = 0 ... 100 Hz
 - U_{max} = 28,8 V_{DC}
 - I_{max} = 100 mA
- o Relais output:
 - f = 0 ... 100 Hz
 - U_{max} = 30 V_{DC}
 - I_{max} = 50 mA

Enclosure:

- o Degree of protection: IP65 (main enclosure), IP67 (sensor probe)

¹ Limitation by varistor inside the sensor between GND and enclosure (ESD-protection).

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 of the operator 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 enclosure



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

Remote version



The connecting cable between sensor probe and main enclosure comprises intrinsically safe circuits. It is connected by the factory and must not be disconnected or modified in any way.

Mounting of earth or equipotential bonding conductor

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

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

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 earth potential must be $\leq 30 V_{Peak}^2$.

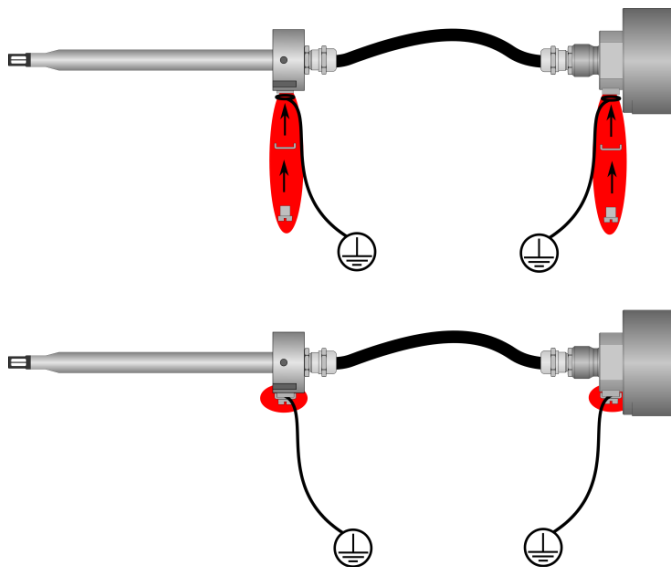


Figure 5-1 Grounding contacts (red), remote version

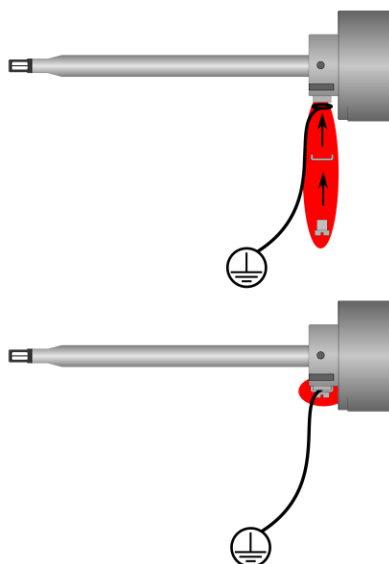


Figure 5-2 Grounding contacts (red), compact sensor

² Limitation by varistor inside the sensor between GND and enclosure (ESD-protection).

6 Electrical connection and protective sleeve assembly

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

Material numbers : 524921 or 524942

Connecting cable



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

Otherwise, the ATEX compliance is null and void.

Connecting the sensor is done via a plug-in connection which has to be protected against impact and UV radiation using a protective sleeve³. This sleeve has an ATEX-certified cable entry (M12) and has to be subsequently mounted (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 ATEX operation.

In general the following applies:



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 CONNECTING CABLE AND SENSOR UNDER VOLTAGE!



WARNING!

DO NOT OPEN PROTECTIVE SLEEVE UNDER VOLTAGE!

³ Included in delivery

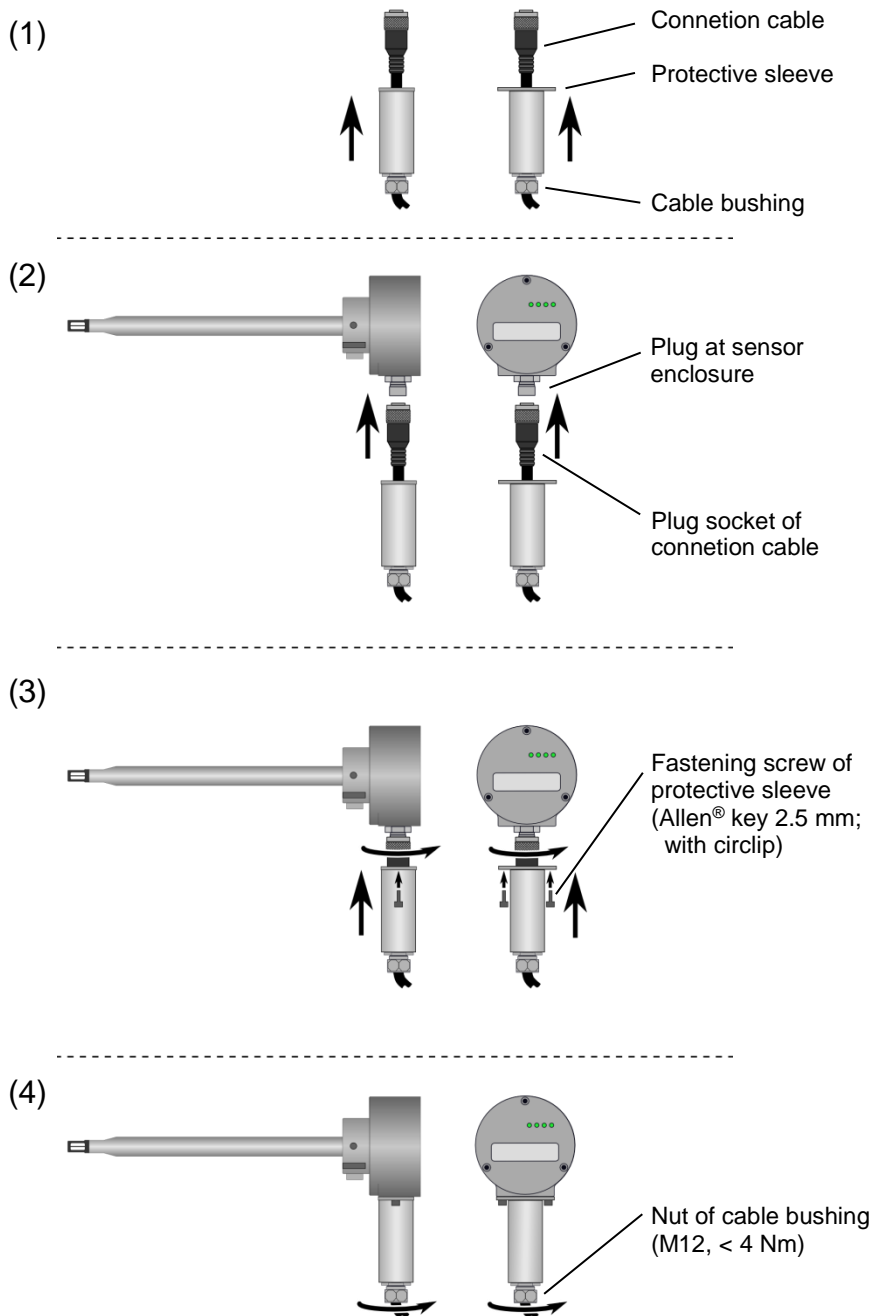


Figure 6-1 Assembly of the connecting cable with protective sleeve

Assembly (see Figure 6-1):

- (1) Insert the open end of the connection cable into the protective sleeve, unscrew the screw of the cable bushing if necessary.
Push sleeve right up to the cable connector.
- (2) Insert the cable socket connector into the plug of the sensor enclosure and tighten the spigot nut hand-tight.
- (3) Put the protective sleeve on the plug-in connector and fasten it to the enclosure (hand-tight) with the enclosed screws (Allen® key 2.5 mm; do not forget the circlips).
- (4) Tighten the nut of the cable bushing (M12, max. 4 Nm).

7 Type plate - Labelling

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

If required, the customer can attach this label, on his own responsibility, elsewhere on or at the sensor, provided that the assignment to the sensor remains unmistakable, it is easily legible and mounted so that it cannot be lost.

Examples are:



- Mounting it directly at the sensor, e.g. by means of machine screws through the fixing hole.
- Attaching on the adjacent wall next to the sensor or similar according to EN 60079-0, chapter 29.6.
- The side with the warning note
„WARNING - NICHT UNTER SPANNUNG TRENNEN“
(*Meaning: "WARNING - Do not disconnect under voltage"*)
must remain visible.

8 Declarations of conformity



EU-Declaration of conformity



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

SCHMIDT® Flow Sensor SS 20.600

Part-No. **524 600**

is in compliance with the following European guidelines:

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 following designated standards were used for assessment of the product therefore:

- Emission (residence): **EN IEC 61000-6-3:2021**
- Immision (industrial): **EN IEC 61000-6-2:2019**

ATEX version (configuration code: A B C D E F 2 H PP)

No.: 2014/34/EU

Text: Directive 2014/34/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 **equipment and protective systems intended for use in potentially explosive atmospheres (ATEX)**

The following European standards were used for assessment of the product therefore:

- Equipment category „3G, 3D“: **EN IEC 60079-0:2018**
- Equipment category „3G“: **EN IEC 60079-7:2015/A1:2018**
EN 60079-11:2012
- Equipment category „3D“: **EN 60079-31:2014**
EN 60079-11:2012

- Marking:



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

For assessment of the product for compliance with the directive the following notified body was included:

- IBExU Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
09599 Freiberg (Germany)
- Type Examination Certificate: **IBExU12ATEXB027 X | Issue 1**

Further requirements of these directives apply for production and marketing of this device. This product will be produced using a quality assurance system according internal production control (attachment VIII).

This declaration certifies the compliance with the mentioned directives but comprises no confirmation of attributes. The security advices of the included product documentation have to be observed. The above mentioned product was tested in a typical configuration.

St. Georgen, 26.08.2022

Helmar Scholz
Head of R&D Division Sensors

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Internet www.schmidt-sensors.com

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

SCHMIDT[®] Flow Sensor SS 20.600

Part-No. 524 600

is in compliance with the following UK statutory regulations:

Title: Electromagnetic Compatibility Regulations 2016

The following designated standards were used for assessment of the product therefore:

- Emission (residence): **BS EN IEC 61000-6-3:2021-03-30**
- Immision (industrial): **BS EN IEC 61000-6-2:2019-02-05**

ATEX version (configuration code: A B C D E F 2 H PP)

Title: Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016

The following designated standards were used for assessment of the product therefore:

- Equipment category „3G, 3D“: **BS EN IEC 60079-0:2018**
- Equipment category „3G“: **BS EN IEC 60079-7:2015/A1:2018**
BS EN 60079-11:2012
- Equipment category „3D“: **BS EN 60079-31:2014**
BS EN 60079-11:2012

- Marking:



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

For assessment of the product for compliance with the regulation the following notified body was included:

- IBExU Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
09599 Freiberg (Germany)

- Type Examination Certificate: **IBExU12ATEXB027 X | Edition 1**

Further requirements of this regulation apply for production and marketing of this device. This product will be produced using a quality assurance system according internal production control (attachment VIII).

This declaration certifies the compliance with the mentioned regulations but comprises no confirmation of attributes. The security advices of the included product documentation have to be observed. The above mentioned product was tested in a typical configuration.

St. Georgen, 26.08.2022

Helmar Scholz
Head of R&D Division Sensors

9 Type Examination Certificate

IBExU Institut für Sicherheitstechnik GmbH
An-Institut der TU Bergakademie Freiberg

- [1] **TYPE EXAMINATION CERTIFICATE - Translation**
- [2] Equipment
of equipment-groups I and II, equipment-categories M2 and 2 plus 3
- [3] Type examination certificate number **IBExU12ATEXB027 X** | Issue 1
- [4] Product: **Flow Sensor**
Type: SS 20.600 Ex
- [5] Manufacturer: SCHMIDT Technology GmbH
- [6] Address: **Feldbergstraße 1**
78112 St. Georgen / Schwarzwald
GERMANY
- [7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- [8] IBExU Institut für Sicherheitstechnik 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 Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014.
- The examination and test results are recorded in the confidential test report IB-22-3-0046.
- [9] Compliance with the essential health and safety requirements has been assured by compliance with: EN IEC 60079-0:2018, EN IEC 60079-7:2015 + A1:2018, EN 60079-11:2012 and EN 60079-31:2014 except in respect of those requirements listed at item [18] of the schedule.
- [10] If the sign "X" is placed after the certificate number, it indicates that the product is subject to the specific conditions of use specified in the schedule to this certificate.
- [11] This type examination certificate relates only to the design of the specified equipment and not to specific items of equipment subsequently manufactured or supplied.
- [12] The marking of the product shall include the following:



Ⓔ II 3G Ex ec ic IIC T4 Gc X
Ⓔ II 3D Ex ic tc IIIC T135°C Dc X
-20 °C ≤ T_{amb} ≤ +70 °C

IBExU Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
09599 Freiberg, GERMANY

Tel: + 49 (0) 37 31 / 38 05 0
Fax: + 49 (0) 37 31 / 38 05 10

By order

IBExU
Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
09599 Freiberg/Sachsen
Telefon (03731) 3805-0
Telefax (03731) 38 05 10

Certificates without signature and stamp are not valid. Certificates may only be duplicated completely and unchanged. In case of dispute, the German text shall prevail.

Dipl.-Ing. Willamowski

- Stamp -

Freiberg, 2022-08-26

[13] **Schedule**

[14] **Certificate number IBExU12ATEXB027 X | Issue 1**

[15] **Description of product**

The flow sensor is used for stationary measurement of flow velocity and temperature of gaseous media. The device is intended for use in potentially explosive atmospheres where equipment of category 3G or 3D is required. The sensor probe which is in contact with the medium is operated in an intrinsically safe circuit.

Technical data:

Ambient temperature of enclosure:	-20 °C up to +70 °C
Medium temperature of sensor probe:	-40 °C up to +120 °C
Degree of protection of enclosure:	IP65 in accordance with EN 60529
Degree of protection of sensor:	IP67 in accordance with EN 60529

Electrical data

Rated voltage of sensor:	$U_N = 24 \text{ V DC} \pm 20 \%$
Current consumption of sensor:	$I_N \leq 250 \text{ mW}$
Signal interface - current:	$I_{Out} = 4 \dots 20 \text{ mA}$
Signal interface - voltage:	$U_{Out} = 0 \dots 10 \text{ V}$
Signal interface - pulse:	$f_{Out} = 0 \dots 100 \text{ Hz}$ $U_{max} = 28,8 \text{ V}$ $I_{max} = 100 \text{ mA}$
Signal interface - relay (galvanically isolated):	$f_{Out} = 0 \dots 100 \text{ Hz}$ $U_{max} = 30 \text{ V}_{DC} / 21,8 \text{ V}_{AC}$ $I_{max} = 50 \text{ mA}$

Changes compared to type examination certificate IBExU12ATEXB027 X:

Modification 1

Minor design changes at sensor enclosure.

Modification 2

The current edition of the standard EN IEC 60079-0:2018 is applied.

Modification 3

The product is also suitable for dust Ex.

Modification 4

The standard EN IEC 60079-7:2015/A1:2018 is applied instead of EN 60079-15.

[16] **Test report**

The test results are recorded in the confidential test report IB-22-3-0046 of 2022-08-25. The test documents are part of the test report and they are listed there.

Summary of the test results

The flow sensor SS 20.600 Ex fulfills the requirements of explosion protection for electrical equipment of Equipment Group II and Category 3G in type of protection increased safety "ec" with an internal circuit according to type of protection intrinsic safety "ic" for explosion group IIC an temperature class T4 as well as equipment category 3D in type of protection by enclosure "tc" with an internal circuit according to type of protection intrinsic safety "ic" for explosion group IIIC with maximum surface temperature of 135 °C.

[17] **Specific conditions of use**

- The internal intrinsically safe circuit is isolated up to 30 V from the sensor enclosure.
- There is a power supply for protection class III (PELV).



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