



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: **IECEX TUN 21.0011X** Page 1 of 3 [Certificate history:](#)

Status: **Current** Issue No: 0

Date of Issue: 2021-06-29

Applicant: **Baumer A/S**  
Runetofte 19  
8210 Aarhus  
Denmark

Equipment: **Level Switch type: LBFS \*xxxx.x**

Optional accessory:

Type of Protection: **intrinsic safety, protection by enclosure, increased safety**

Marking: Ex ia IIC T5...T4 Ga  
Ex ta IIIC T100°C Da  
Ex ec IIC T5...T4 Gc

Approved for issue on behalf of the IECEx  
Certification Body:

**Andreas Meyer**

Position:

**Deputy Head of the IECEx Certification Body**

Signature:  
(for printed version)

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting [www.iecex.com](http://www.iecex.com) or use of this QR Code.



Certificate issued by:

**TÜV NORD CERT GmbH**  
Hanover Office  
Am TÜV 1, 30519 Hannover  
Germany





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Manufacturer: **Baumer A/S**  
Runetofte 19  
8210 Aarhus  
Denmark

Additional  
manufacturing  
locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

## STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

**IEC 60079-0:2017** Explosive atmospheres - Part 0: Equipment - General requirements  
Edition:7.0

**IEC 60079-11:2011** Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"  
Edition:6.0

**IEC 60079-31:2013** Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"  
Edition:2

**IEC 60079-7:2017** Explosive atmospheres - Part 7: Equipment protection by increased safety "e"  
Edition:5.1

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

## TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

[DE/TUN/ExTR21.0012/00](#)

Quality Assessment Report:

[DE/TUN/QAR13.0001/02](#)



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## **EQUIPMENT:**

Equipment and systems covered by this Certificate are as follows:

The Level Switch LBFS is designed to detect levels in tanks, media separation and provide empty-pipe detection or dry-run protection for pumps. A high frequency sweep signal is radiated from the sensor tip into the tank. The media will act as a virtual capacitor, which together with a coil in the sensor head, will form a circuit creating the switch point signal. The virtual capacitance will depend of the dielectric value of the media.

The Level sensor can be delivered in different mechanical type variants covering e.g , output configuration, process connection thread size, housing material in accordance with the below listed type code list.

Type key:

LBFS-1xxx.x Ex ia - Gas version

LBFS-2xxx.x Ex ta - Dust version

LBFS-3xxx.x Ex ec - Gas version for Zone 2

LBFS-4xxx.x Ex ia & Ex ta – combined Gas and Dust version

For technical data and all other data refer to the attachment

## **SPECIFIC CONDITIONS OF USE: YES as shown below:**

1. The sensor can be delivered with factory mounted M12 plug connector. The sensor can alternatively be delivered without the M12 plug connector. In case delivery is without plug connector a connector meeting ingress protection IP 67 must be chosen.
2. The cabled version of the LBFS switches LBFS-1xxx.x and LBFS-4xxx.x with a cable length above 5 m, have a higher internal inductance and capacitance. The values have to be considered during the installation, see electrical data for details.
3. The certificate numbers incorporates an "X" marking due to reduced force used on the cable pull test for the LBFS-3xxx.x. The sensor cable must be fixed externally to the sensor at a distance max 50 mm from the level sensor.

## **Annex:**

[Attachment IECEX TUN 21.0011 X Issue 00.pdf](#)

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Attachment to IECEx TUN 21.0011 X issue No.: 0

Product:

The product is used for measuring the level of a fluid or powder media.

The measuring principle is based on the DK value of the media. A signal transmitted from the tip of the sensor is swept from approximately 100 to 180 MHz, and is detected by the capacitance measured from sensor tip to the nearest tank or pipe wall.

An internal inductor in series with the measured capacitance forms resonance circuit. The resonance frequency of this circuit is used to determine if a media is present.

The product contains a PCB mounted with electrical components. This contains the electronic circuit necessary for the products functionality.

The PCB is mounted in a stainless steel housing and sealed in top and bottom to achieve an IP protection degree of IP 67. The shape of the steel housing may vary, but will always fully enclose the PCB and sensor. The connection is done via an M12 plug or a permanent cable.

The sensor electrode is encapsulated, and thereby insulated, by the material of PSU or PEEK and has no electrical connection to the media.

Type key:

LBFS-1xxxx.x	Ex ia	-	Gas version
LBFS-2xxxx.x	Ex ta	-	Dust version
LBFS-3xxxx.x	Ex ec	-	Gas version
LBFS-4xxxx.x	Ex ia & Ex ta	-	combined Gas and Dust version

Technical Data:

Permissible ambient temperature range: -40 °C up to 74 °C T5 resp. T100°C  
-40 °C up to 85 °C T4 resp. T100°C

For cable version LBFS-x2xxx.x: -25 °C up to 70 °C T5 resp. T4 resp. T100°C

Electrical Data:

For LBFS-1xxxx.x and LBFS-4xxxx.x version:

Supply and Signal circuit [Brown, Blue, White/Black] only for connection to an intrinsically safe circuit Ex ia with the following maximum values:

$U_i$	=	30	V
$I_i$	=	100	mA
$P_i$	=	750	mW
$C_i$	=	43	nF
$L_i$	=	10	µH

Only for version LBFS-x2xxx.x with cable length above 5 m:

$C_i$	=	43 nF + 0.17 nF/m
$L_i$	=	10 µH + 0.27 µH/m

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**Attachment to IECEx TUN 21.0011 X issue No.: 0**

Only for version LBFS-x\*52x.x with cable length  
above 5 m:

$$\begin{aligned}C_i &= 43 \text{ nF} + 0.20 \text{ nF/m} \\L_i &= 10 \text{ uH} + 1.13 \text{ uH/m} \\* &= \text{A, B, C, D, or E}\end{aligned}$$

LBFS-2xxxx.x and LBFS-3xxxx.x version:

Circuit 1

[Brown, Blue, White/Black]

nominal voltage  $U_n = 30$  V DC  
nominal current  $I_n = 100$  mA  
Prospective short-circuit current: 1500 A

Special Conditions for Safe Use / Notes for Erection:

1. The sensor can be delivered with factory mounted M12 plug connector. The sensor can alternatively be delivered without the M12 plug connector. In case delivery is without plug connector a connector meeting ingress protection IP 67 must be chosen.
2. The cabled version of the LBFS switches LBFS 1xxx x (C) and LBFS 4xxx x (C) with a cable length above 5 m, have a higher internal inductance and capacitance. The values have to be considered during the installation, see electrical data for details.
3. The certificate numbers incorporates an "X" marking due to reduced force used on the cable pull test for the LBFS-3xxx.x. The sensor cable must be fixed externally to the sensor at a distance max 50 mm from the level sensor.