# 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

| | | | |
|---|---|---|---|
| Certificate No.: | **IECEx EPS 11.0004X** | Page 1 of 4 | Certificate history: |
| Status: | **Current** | Issue No: 5 | Issue 4 (2019-12-20)<br>Issue 3 (2016-06-30)<br>Issue 2 (2015-07-21)<br>Issue 1 (2013-01-22)<br>Issue 0 (2011-08-25) |
| Date of Issue: | 2021-05-17 | | |
| Applicant: | **Quintex GmbH**<br>i_Park Tauberfranken 13<br>97922 Lauda-Königshofen<br>**Germany** | | |
| Equipment: | **Line Bushing, types LB* * ** * **/...** | | |
| Optional accessory: | | | |
| Type of Protection: | **flameproof enclosure "d", increased safety "e", protection by enclosure "t"** | | |
| Marking: | Ex db IIC T4/T5/T6 Gb<br>Ex eb IIC T4/T5/T6 Gb<br>Ex tb IIIC T135°C/T100°C/T85°C Db IP66<br>Ex db I Mb | | |

Approved for issue on behalf of the IECEx Certification Body: **Holger Schaffer**

Position: **Certification Manager**

Signature: (for printed version)

Date: 2021-05-17

ZERTIFIZIERUNGSSTELLE BUREAU VERITAS 1828 Bureau Veritas CPS Germany GmbH

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**Bureau Veritas Consumer Products Services Germany GmbH**
**Businesspark A96**
**86842 Türkheim**
**Germany**

BUREAU VERITAS

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Date of issue: 2021-05-17 Issue No: 5

Manufacturer: **Quintex GmbH**
i_Park Tauberfranken 13
97922 Lauda-Königshofen
**Germany**

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<br>Edition:7.0 | Explosive atmospheres - Part 0: Equipment - General requirements |
| IEC 60079-1:2014-06<br>Edition:7.0 | Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d" |
| IEC 60079-31:2013<br>Edition:2 | Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t" |
| IEC 60079-7:2017<br>Edition:5.1 | Explosive atmospheres - Part 7: Equipment protection by increased safety "e" |

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 Reports:

DE/EPS/ExTR11.0004/00 DE/EPS/ExTR11.0004/01 DE/EPS/ExTR11.0004/02
DE/EPS/ExTR11.0004/03 DE/EPS/ExTR11.0004/04 DE/EPS/ExTR11.0004/05

Quality Assessment Report:

DE/EPS/QAR11.0001/10

# IECEx Certificate of Conformity



**EQUIPMENT:**
Equipment and systems covered by this Certificate are as follows:

The equipment covered by this certificate are line bushings of type LB* * ** * ** / … and serve as electric connection of equipment in explosion-protected enclosures. This can be a connection between a flameproof enclosure and an enclosure of another type of protection or between two flameproof enclosures. Furthermore, the line bushing with impact protection (U and Z in the type designation code) can be used for an electrical connection from the outside into a flameproof enclosure. The line bushing type LB* * ** * 00/… - line bushing without cores – may be used as sealing element. Additionally, they can be used as enclosure blanking plugs made of solid metal (without casting compound). The blanking plugs are unchanged except for the omission of the drilled hole and the casting compound. For this style, in addition to the type number LB….ooo/… a variant count number (six digit) EP …. (end plug) gets permanently engraved by means of a laser. This variant count number is detailed in the shipping documents. See Annex for details.

**SPECIFIC CONDITIONS OF USE: YES as shown below:**
Line bushings with screw thread: The thread hole of the flameproof enclosure in which the line bushing is integrated has to comply with IEC 60079-1:2014, Clause 5.3.

Pluggable line bushings: The hole of the flameproof enclosure, in which the line bushing is integrated has to comply with IEC 60079-1:2014, Clauses 5.2.1 and 5.2.2 regarding the length and width of the gap. The average surface finish (ISO 468) has to be Ra ≤ 6,3 µm.

Requirements valid for pluggable and screwable line bushings: The line bushing with impact protection (U and Z in the type designation key) may be used for direct connection of flameproof enclosures. In this case, the mounting has to be from the outside into the d-space, so that the impact proof is guaranteed. On the outside, only a hose line, which is safely enclosed, may be used.

Regardless of the type of mounting it has to be ensured, that the line bushing is secured against twisting or loosening.

The cable specific minimum ambient temperature $T_{a,min}$ is marked on the line bushing and it is detailed in the shipping documents.

The specifically correct maximum ambient temperature $T_{a,max}$ shall be determined. see Annex.

For Ex-e and Ex-t applications the line bushings and plugs can be fitted with an O-ring or flange gasket. When correctly installed an IP protection of IP66 can be achived. The operating temperature range of the seal is -55 °C to +70 °C. For use with flange gasket it must be assured that the gasket does not flip off due to high torque.

The wires of the line bushing must be connected in enclosures meeting a type of protection to IEC 60079-0, section 2. The cores must be suitably connected in accordance with their rated cross sections and the type of protection selected.

The line bushing type LB* * ** * **/… can also be used in mines susceptible to firedamp. For the heating of the Line bushing due to current load, it must be respected that temperatures exceeding 150°C on space with possible deposition of dust are not present.

When the end termination of fiber optic cables is inside hazardous location, the optical power must be in compliance with type of protection “op is” according to IEC 60079-28.

# IECEx Certificate of Conformity



**DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)**
Addition of high temperature variant and special cable versions + Addition of higher pressure value

**Annex:**

IECEx EPS 11.0004X Annex.pdf

Description of equipment:

The line bushing type LB* * ** * **/... serves for the electric connection of equipment in explosion protected enclosures. This can be a connection between a flameproof enclosure and an enclosure of another type of protection or between two flameproof enclosures. Furthermore, the line bushing with impact protection (U and Z in the type designation code) can be used for an electrical connection from the outside into a flameproof enclosure.

The line bushing type LB* * ** * 00/... - line bushing without cores – may be used as sealing element. Line bushings with impact protection (U and Z in the type designation code) may be used as sealing elements on the outside. Additionally, they can be used as enclosure blanking plugs made of solid metal (without casting compound).

The Series LB* * ** * ** / ... includes a pluggable version with an associated thread adapter. This version is only allowed for use with enclosures where bushings are allowed for use with both pluggable and threaded type of cable glands.

By use of gasket the requirements for explosive dust environment and sealing of enclosures type of protection "increased safety" can be achieved with IP66.

The type LBSM42124/SETZ-Sopat is used as a passage for optical waveguides. Here, a sleeve having a soldered sapphire glass is potted in the cable entry. This allows a light transmission without introducing the optical waveguides into the housing.

Electrical data:

| | |
|---|---|
| Rated voltage: | max 440V, 690V, 1000V, 3000V, 6600V depending on the type |
| Rated current: | The rated current has to comply with the following requirement: To prevent damage to the core, the respective core-specific limiting temperature $T_G$ may not be exceeded under maximum current load, maximum enclosure warming and maximum ambient temperature. The core-specific limiting temperature $T_G$ is marked on the line bushings and it is detailed in the shipping documents. |

The determination of the maximum permissible ambient temperature as well as of the temperature class takes place under consideration of the following table, if need be on the basis of temperature measurements as well as of the core specific limiting temperature $T_G$.

If there has to be considered practically no warming due to current load in the case of control circuits, the core specific limiting temperature can be used as the maximum ambient temperature in the best case.

The following table gives a clue regarding the warming of the line bushing due to current load with the maximum possible number of cores. For the values stated in the table, a warming of $\Delta T = 40$ K has to be taken as a basis.

| Core diameter in mm² | Rated current in A | Core diameter in mm² | Rated current in A |
|---|---|---|---|
| 0,08 | 1,0 | 10,0 | 50,0 |
| 0,25 | 3,0 | 16,0 | 67,0 |
| 0,35 | 5,5 | 25,0 | 90,0 |
| 0,5 | 7,5 | 35,0 | 110,0 |
| 0,75 | 10,0 | 50,0 | 140,0 |
| 1,0 | 12,0 | 70,0 | 170,0 |
| 1,5 | 15,0 | 95,0 | 205,0 |
| 2,5 | 21,0 | 120,0 | 240,0 |
| 4,0 | 28,0 | 150,0 | 270,0 |
| 6,0 | 36,0 | 185,0 | 310,0 |

Rated diameter: 0.08 mm² to 185 mm²
depending on the type

Number of cores: 0 to 99

Type / size of thread: M8 x 0,7 to M72 x 1.5 or other pitch
types and sizes of threads not conform to ISO-Standards are marked

Diameter of ferrule: 8 to 80 mm, average surface finish (ISO 468) $R_a \leq 6.3$ µm

Length of thread: ≥ 10 mm

Length of ferrule: ≥ 20 mm

Length of ferrule joint: ≥ 12.5 mm ≥ 25 mm ≥ 40 mm

Service temperature: max. -55°C to +115°C

Optional temperature: max. -60°C to +150°C for high temperature variant

All cable types complying with EN 60079-14 clause 9.3.2 cab be used in the bushing. The following table lists special cables that can be also used together with the Line Bushing LB* * ** * ** / ...:

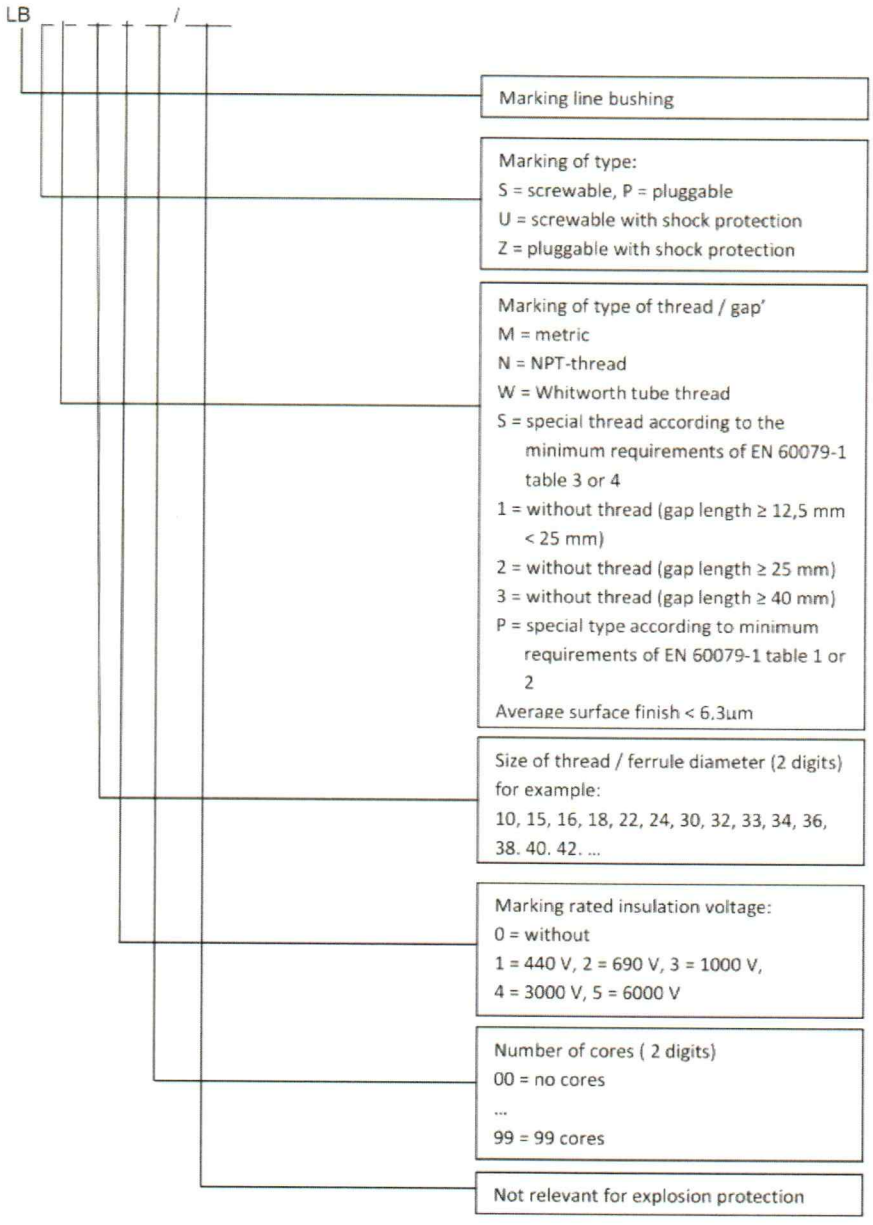
| Cable type | Description | Diameter |
|---|---|---|
| FBL TYP 14 x 0,08mm² | single core | 0,08 mm² |
| specialcable 2xAWG 28/7 | multi-core | 0,7 mm (max temp. 105°C) |
| H07RN-F | multi-core | 0,25 mm² - 6,0 mm² |
| RG174U | Coaxial line | - |
| G50/CWJH D20 | fiber optic cable | 0,6 mm² |
| G50/CWJH D27 | fiber optic cable | 0,6 mm² |
| E9/CWJH E30 | fiber optic cable | 0,9 mm² |
| Flexkabel Kapton | Ribbon cable | - |
| Sabix A 280 | Ribbon cable | 0,5 mm² - 95 mm² |
| Draka Flex-Flame RFOU | multi core | 0,75 mm² - 95 mm² |
| Fibertech AS600/660UVST | fiber optic cable | - |
| LBSM42124/SETZ-Sopat | Glass sleeve | - |
| Commscope LDF2RK-50 | Coax-cable | 3/8 in |

The fiber optic cables have to be strain relieved by an appropriate method. When use the ribbon cable Kapton the line bushings type LB*-*-**-*-**/...can only be used between two flameproof enclosures.

When a line bushing is built-in a flameproof enclosure with adjacent enclosure protected by type of protection increased safety, single, partly not insulated wires may be encapsulated in the line bushing. The not insulated part of each wire has to be completely enclosed by the casting compound.

The bushing was tested for overpressure test with 50bar. Therefore, it can be used for enclosures with maximum reference pressure up to 33bar.

Type designation key:



The relevant rated voltage can be seen from the marking. The relevant type marking and the individual charge number can be seen in the delivery documents. This is valid also for the whole marking of the thread and for the ferrule diameter including tolerances. With special threads (type LBSS ** * ** / ...) the whole marking of the thread is shown on the surface of the metallic thread ferrule. With special forms (type LBPP ** * ** / ...) a four-digit variant counting number described in the delivery documents is engraved on the surface of the metallic ferrule.

(17) Special conditions for safe use (detail):

Line bushings with screw thread: The thread hole of the flameproof enclosure in which the line bushing is integrated has to comply with IEC 60079-1:2014, Clause 5.3.

Pluggable line bushings: The hole of the flameproof enclosure, in which the line bushing is integrated has to comply with IEC 60079-1:2014, Clauses 5.2.1 and 5.2.2 regarding the length and width of the gap. The average surface finish (ISO 468) has to be $R_a \leq 6.3$ µm. See manual.

Requirements valid for pluggable and screwable line bushings: The line bushing with shock protection (U and Z in the type designation key) may be used for direct connection of flameproof enclosures. In this case, the mounting has to be from the outside into the d-space, so that the impact proof is guaranteed. On the outside, only a hose line, which is safely enclosed, may be used.

Regardless of the type of mounting it has to be ensured, that the line bushing is secured against twisting or loosening.

The cable specific minimum ambient temperature $T_{A, min}$ is marked on the line bushings and it is detailed in the shipping documents.

The specifically correct maximum ambient temperature $T_{A, max}$ is determined as described in above table

For Ex-e and Ex-t applications the line bushings and plugs can be fitted with an O-ring or flange gasket. When correctly installed an IP protection of IP66 can be achieved. The operating temperature range of the seal is -55 °C to +70 °C. For use with flange gasket it must be assured that the gasket does not flip off due to high torque.

The wires of the line bushing must be connected in enclosures meeting a type of protection to EN 60079-0, section 2. The cores must be suitably connected in accordance with their rated cross sections and the type of protection selected.

The line bushing type LB* * ** * **/... can also be used in mines susceptible to firedamp. For the heating of the Line bushing due to current load, it must be respected that temperatures exceeding 150°C on space with possible deposition of dust are not present.

When the end termination of fiber optic cables is inside hazardous location, the optical power must be in compliance with type of protection "op is" according to IEC 60079-28 or installed inside "op pr" enclosure.