



# (1) UK - Type Examination Certificate

(2) Equipment and protective systems intended for use in potentially explosive atmospheres – **UKSI 2016:1107 (as amended)**

(3) UK - Type Examination Certificate Number

**EPS 22 UKEX 1 054 X**

**Revision 0**

(4) Equipment: Line bushing LB\* \* \* \* \* /...

(5) Manufacturer: Quintex GmbH

(6) Address: i\_PARK TAUBERFRANKEN 13  
9722 Lauda-Königshofen  
Germany

(7) This equipment and any acceptable variation thereto are specified in the annex to this certificate and the documentation therein referred to.

(8) Bureau Veritas Consumer Products Services United Kingdom Limited, approved body No. 8507 in accordance with UKSI 2016:1107 (as amended) Part 4, certifies that this equipment has been found to comply with the essential health and safety requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Schedule 1 of UKSI 2016:1107 (as amended). The examination and test results are recorded in the confidential documentation under the reference number 11TH0241.

(9) Compliance with the essential health and safety requirements has been assured by compliance with:

**EN IEC 60079-0:2018**

**EN 60079-1:2014**

**EN IEC 60079-7:2015/A1:2018**

**EN 60079-31:2014**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the annex to this certificate.

(11) This UK - Type Examination Certificate relates only to the design and construction of the specified equipment in accordance with UKSI 2016:1107 (as amended). Further requirements apply to the manufacture of this equipment and its placing on the market. Those requirements are not covered by this certificate.

(12) The marking of the equipment shall include the following:

II 2G Ex db IIC T4/T5/T6 Gb

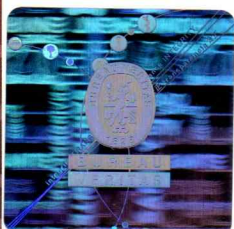
II 2G Ex eb IIC T4/T5/T6 Gb



II 2D Ex tb IIIC T135°C/T100°C/T85°C Db IP66

IM2 Ex db I Mb

IM2 Ex eb I Mb



Certification department of explosion protection

Warrington, 2022-05-02

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Natalie Wilkinson

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(13)

## Annex

(14) **UK - Type Examination Certificate EPS 22 UKEX 1 054 X**

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(15) 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 self-performed 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.

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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 cross-section in mm <sup>2</sup>	Rated current in A	Core cross-section in mm <sup>2</sup>	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	240.0
4.0	28.0	150	270.0
6.0	36.0	185	310.0

- Rated cross-section: 0.08 mm<sup>2</sup> to 185 mm<sup>2</sup> 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)  $R_a \leq 6.3 \mu\text{m}$
- Length of thread:  $\geq 10$  mm
- Length of ferrule:  $\geq 20$  mm
- Length of ferrule gap:  $\geq 12.5$  mm  $\geq 25$  mm  $\geq 40$  mm
- Service temperature: max. -55 °C to +115 °C
- Optional: max -60 °C bis +150 °C for high temperature variant

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All cable types complying with EN 60079-14 clause 9.3.2 can 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	Cross section
FBL TYP 14 x 0,08mm <sup>2</sup>	single-core	0.08 mm <sup>2</sup>
special cable 2xAWG 28/7	multi-core	0.7 mm <sup>2</sup> (max temp. 105 °C)
RG174U	Coaxial line	-
G50/CWJH D20	fiber optic cable	0.6 mm <sup>2</sup>
G50/CWJH D27	fiber optic cable	0.6 mm <sup>2</sup>
E9/CWJH E30	fiber optic cable	0.9 mm <sup>2</sup>
Flexkabel Kapton	Ribbon cable	-
Sabix A 280	Ribbon cable	0.5 mm <sup>2</sup> - 95 mm <sup>2</sup>
Draka Flex-Flame RFOU	Multi-core	0.75 mm <sup>2</sup> - 185 mm <sup>2</sup>
Fibertech AS600/660UVST	fiber optic cable	-
LBSM42124/SETZ-Sopat	Glass bushing	-
Commscope LDF2RK	Coaxial line	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.

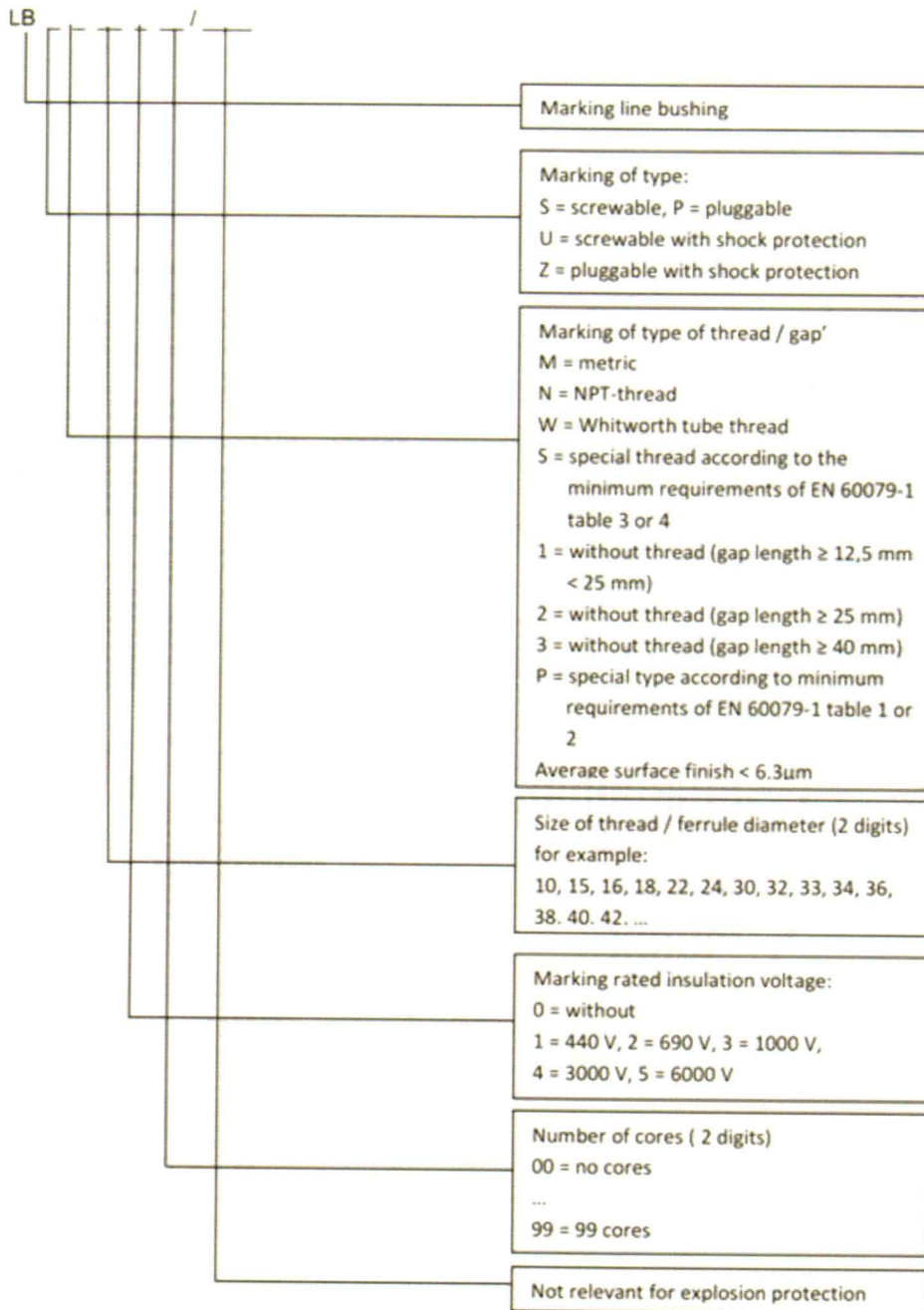
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Type designation key:



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.

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**Revision 0**

(16) Reference number: 11TH0241

(17) Special conditions for safe use:

Line bushings with screw thread: The thread hole of the flameproof enclosure in which the line bushing is integrated has to comply with EN 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 EN 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  $R_a \leq 6.3 \mu\text{m}$ . See manual for details. If the cable bushing is used as a replacement for another bushing previously used, the resulting tolerance range for the gap width of the cylindrical gap must be the same or smaller than the permissible tolerance range for the gap width in connection with the previously used cable bushing.

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  $T_{a, \text{min}}$  is marked on the line bushings and it is detailed in the shipping documents.

The specifically correct maximum ambient temperature  $T_{a, \text{max}}$  is determined as described in (15).

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  $-55 \text{ }^\circ\text{C}$  to  $+70 \text{ }^\circ\text{C}$ . 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 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  $150 \text{ }^\circ\text{C}$  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 EN 60079-28.

(18) Essential health and safety requirements:

Met by compliance with standards.

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