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Line bushings

Type: LESM...../.....,LESN...../.....,LESW...../.....,LESS...../.....
Type: LEP1...../.....,LEP2...../.....,LEP3...../.....,LEPP...../.....
Type: LEUM...../.....,LEUN...../.....,LEUW...../.....,LEUS...../.....
Type: LEZ1...../.....,LEZ2...../.....,LEZ3...../.....,LEZP...../.....

1 Security instructions

Line bushings must only be used as intended.

Explosion protection for line bushings and sealing elements is guaranteed only when these elements are used in their original state.

When damaged, line bushings must not be operated.

Explosion protection is not or no longer guaranteed if

casting is damaged, fissured or flaked,
the thread of the installation housing is damaged,
the outer surface of the pluggable housing is damaged,
line bushings are not secured against unfastening,
the insulation of cables is damaged.

2 Technical data

Type examination certificate: EPS 08 ATEX 1105 X

Label:  II 2 G Ex d II C T4

Number of cores: 0 up to 50

Line bushing sizes: M10x1 up to M42x1.5 and d= 10mm up to d=40 mm

Measuring cross section: 0,25 up to 95 mm²

Ambient temperature Ta varying with core:
-55°C ≤ Ta ≤ 115 °C

Measuring voltage/Operating voltage:

Type LE ___ 1 ___	440/500 V
Type LE ___ 2 ___	690/750 V
Type LE ___ 3 ___	1000/1100 V

Operating current per core at 80°C (T6) on a core with an ambient temperature of Ta = 40°C:

0.25mm ²	3.0A	6mm ²	36A
0.35mm ²	5.5A	10mm ²	50A
0.5mm ²	7.5A	16mm ²	67A
0.75mm ²	10A	25mm ²	90A
1.0mm ²	12A	35mm ²	110A
1.5mm ²	15A	50mm ²	140A
2.5mm ²	21A	70mm ²	170A
4.0mm ²	28A	95mm ²	205A

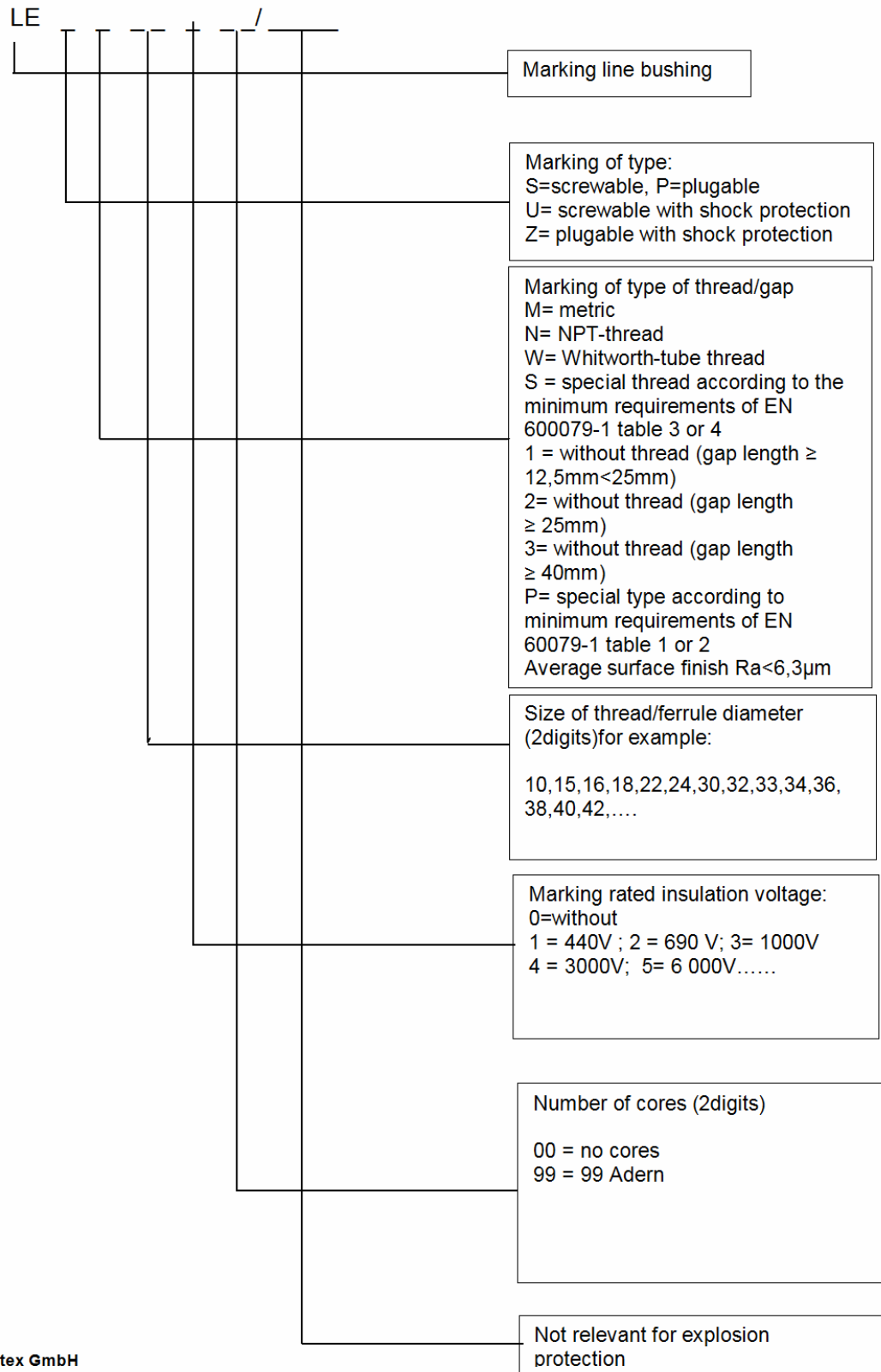
Operating current per core at 115°C (T4) on a core with an ambient temperature of Ta = 80°C:

0.25mm ²	3.0A	6mm ²	36A
0.35mm ²	5.5A	10mm ²	50A
0.5mm ²	7.5A	16mm ²	67A
0.75mm ²	10A	25mm ²	90A
1.0mm ²	12A	35mm ²	110A
1.5mm ²	15A	50mm ²	140A
2.5mm ²	21A	70mm ²	170A
4.0mm ²	28A	95mm ²	205A

A complete overview of technical data is provided in the EC type examination certificate.

3

Type designation key:



4 Installation and operating instructions:

Line bushings of type LE^{*****}/... are used to electrically connect equipment in potentially explosive atmospheres. The connection is established between a flameproof enclosure and an enclosure of another type of protection. Alternatively two flameproof enclosures are connected.

Line bushings of type LEU^{*****}/... (screwable) with impact protection and line bushings of type LEZ^{*****}/... (pluggable) with impact protection can also be used to establish an electrical connection from outside to a flameproof enclosure.

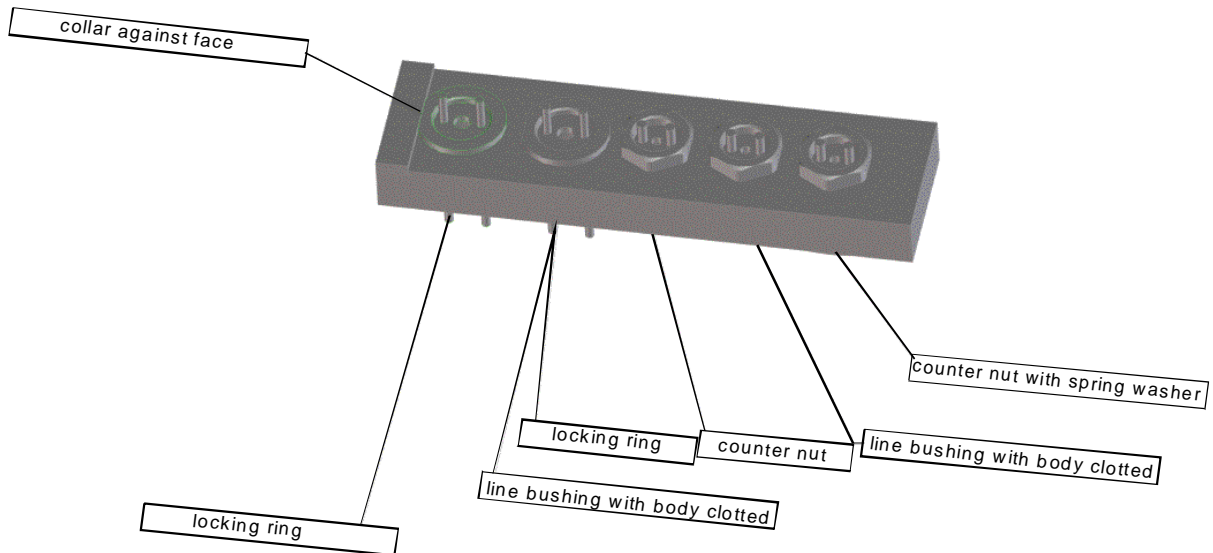
Line bushings of type LE^{****00}/... - line bushings without cables – can be used for internal sealing.

Line bushings of type LEU^{****00}/... and LEZ^{****00}/... - line bushings without cables but with impact protection – can be used to seal an enclosure.

Cables are cast with high temperature and leakage current resistant resin to isolate them from the enclosure. When installing line bushings in electrical equipment, unfastening and twisting of line bushings need to be prevented as illustrated in figures 1 and 2.

5 Protecting pluggable and screwable line bushings

Figure 1:
 View from above (collar visible)



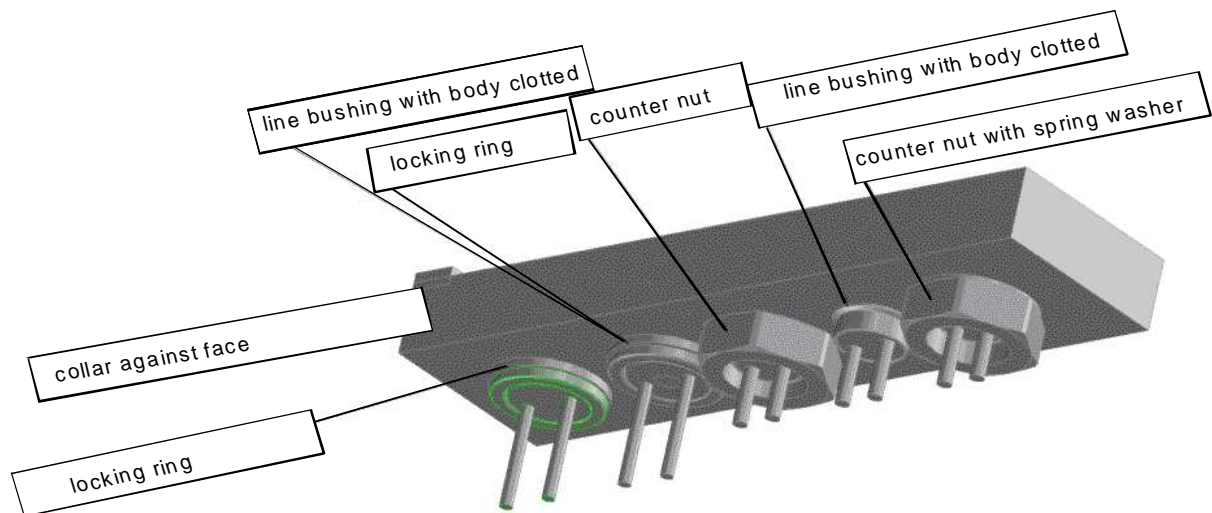
Screwable line bushings:

Thread lead $\geq 0,7\text{mm}$
 Standard ISO 965-1/-3 mittel (m)
 Number of pitches ≥ 6 mm
 Thread depth with enclosures:
 $\leq 100\text{ cm}^3 \geq 5\text{mm}$
 $\geq 100\text{cm}^3 \geq 8\text{mm}$

Pluggable line bushings:

Cylindrical gap varying with the volume (V)
 group and adjustable gap length (L)
 ($L \geq 12,5\text{mm}$, $L \geq 25$ mm or $L \geq 40\text{mm}$), see EN 60079

Figure 2:
View from below



With a wall thickness of 8 to 10 mm of the installation enclosure, using metallic washers ($s = 2$ mm) is required.

Detailed information on thread types (for example, M20 x 1.5) and line bushing types is provided in shipping documents.

Special types of threaded line bushings (type: LESS... and type: LEUS...), special types of pluggable line bushings (type: LEPP... and type: LEZP...) and sealing elements need to be labelled separately.

With special types of threaded line bushings (type: LESS... and type: LEUS...), on the collar of the metallic threaded bushing, complete information on the thread type (for example M19 x 1) is engraved.

With special types of pluggable line bushings (type: LEPP..., i. e. a different type of hexagon, larger bushing or collar is used, and type: LEZP...), on the collar of the bushing, a 4-digit type number (ranging from 0001 to 9999) is engraved.

Cables of line bushings need to be connected in enclosures complying with a type of protection as specified in DIN EN 60079-0.



Enclosures used for connection need to comply with DIN EN 60079-0, sections 14.2 and 14.4. With EEx e enclosures, the IP 54 protection class needs to be complied with.

Information on technical data that is not accessible via the labelling of line bushings and batch numbers are contained in shipping documents. In this documentation, via the specifications on line bushings, detailed line bushing information can be retrieved.

6 Special conditions:

Threaded line bushings:

The threaded hole of a flameproof enclosure in which the threaded line bushing is installed needs to comply with EN 60079-1:2006, section 5.3. Threaded line bushings can be used to electrically connect flameproof enclosures.

Pluggable line bushings:

With regard to gap width and gap length, the hole of a flameproof enclosure in which the pluggable line bushing is installed needs to comply with EN 60079-1:2004, sections 5.2.1 and 5.2.2. Mean deviation of the roughness profile (ISO 468) needs to be $Ra \leq 6,3 \mu\text{m}$. Pluggable line bushings can be used to electrically connect flameproof enclosures.

Line bushings of type LEU... and type LEZ... can also be used to establish a direct electrical connection to flameproof enclosures. In this case, to ensure impact protection, line bushings have to be installed from outside the „d“ area in any case. From outside, only cables are allowed to be inserted into the enclosure. These cables need to be cast into the line bushing as required for flameproof usage.

Irrespective of the installation method, line bushings must be protected from unfastening and twisting.

Determining maximum current carrying capacity:

At maximum current carrying capacity, maximum enclosure temperature and maximum ambient temperature, the temperature limits below must **not** be exceeded to prevent cables from being damaged:

Cable Radox 125	TG = 115°C
Cable Radox 155	TG = 100°C
Cable JZ-500 Helu	TG = 70°C
Cable H05V-K	TG = 70°C

7 Maintenance:

When maintaining the equipment in which line bushings and sealing elements are used, these elements are also checked.

8 **Recommendations for maintenance:**

Regularly checking proper functioning of line bushings and sealing elements is mandatory.

Damaged line bushings and sealing elements must be replaced.