

Original Operating Manual:

Light barriers series LBS/LBN/LBD-100-SIR/SDI/EFP/EVP(-OP)

LBD-100-SIR/SDI/EFP/EVP-OP

IECEx BVS 14.0108X



1258



IECEx designation

IECEx designation
Ex d [op. is Ga] IIC T6 Gb

Ex d [op is Ga] IIIC T6 Gb
Ex tb [op is Da] IIIB T100°C Db IP67

ATEX designation:

II 2(1)G Ex d [op is Ga] IIC T6 GB

II 2(1)D Ex tb [op is Da] |||B T100°C Db |P67

Housing M18

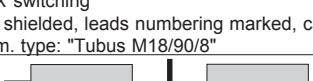
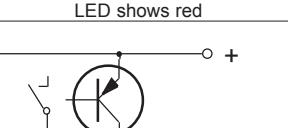
- Range 100m
- Series LBD: ATEX and IECEx certified
- LBD: For use in Ex zones (0), 1, 2, (20), 21, 22
optical radiation can operate into Ex Zones 0, 20
- LBN: For use in Ex zones 2, 22
- Optimal alignment by status visualization by 3-color
- With optional pollution indication output VA
- With optional emitter disable input (Test input)

LBN-100-SIR/SDI/EFP/EVA-OP



II 3G Ex nA op is IIIB T4 Gc

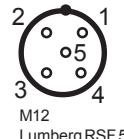
II 3D Ex tc op is IIIA T135°C Dc IP67

Type designation emitter	LBS-100-S**-S***	LBN-100-SIR/SDI-OP-S***	LBD-100-SIR/SDI-OP-S***		
Type designation receiver	LBS-100-E**-S***	LBN-100-EFP/EVP-OP-S***	LBD-100-EFP/EVP-OP-S***		
Technical data (S***: Designation for different options)					
Type of Ex protection Gas, according to 2014/34/EU	None	II 3G Ex nA op is IIB T4 Gc	II 2(1)G Ex d [op is Ga] IIC T6 Gb		
Type of Ex protection Dust, according to 2014/34/EU	none	II 3D Ex tc op is IIIA T135°C Dc IP67	II 2(1)D Ex tb [op is Da] IIIB T100°C Db IP67		
For use in Ex Zones	None	Zones 2, 22	Zones (0), 1, 2, (20), 21, 22		
Optical range		100m			
Minimum detectable object size		12mm (Avoid mirror effects)			
Light source		Infrared 870nm			
Maximum radiant intensity	not limited	<=5mWm ²	<=5mWm ²		
Maximum radiant power	not limited	< 35mW	< 15mW		
Optical angle of aperture (at a distance of 10m)		Emitter: appr.17° / Receiver: appr.15°			
Response time		5ms			
Power up delay time		500ms			
Supply voltage		24VDC +/-10%			
Absolute maximum supply voltage Um		30VDC			
Current consumption, emitter	50mA	55mA	55mA		
Current consumption, receiver		50mA			
Power dissipation		Emitter: max. 1.52W / Receiver: 1.38W			
Output		PNP type, 100mA, short circuit protected			
Pollution indication output VA, optional, only LB*-100-EVP		PNP type, 100mA, short circuit protected			
Housing		M18, brass Ms 58, nickel plated			
Enclosure rating, according to EN 60529	IP 65	IP 67	IP67		
Working temperature range Tamb		-20°C < Tamb < +50°C			
Storage temperature range		-20°C ... +70°C			
Relative humidity		15% ... 90%, noncondensing			
Vibration and shock resistance		Vibration: 30g over 20Hz to 2kHz. Shock: 100g for 3ms			
Pollution degree, in accordance with EN 60664-1:2007		4			
Device designation, in accordance with EN 60947-5-2	LB*-100-SIR/EFP/EVA(-OP); T3A18BP1 / LB*-100-SIR/SDI-OP-S099; T3A18BP2				
Connection cable, type	2/3/4 + PE x AWG24/0.25mm ² , Special-PVC/PVC, shielded				
Connection cable, length	5m	10m	10m		
Male connector M12, only LBS/LBN-100-***-(OP)-S099	Male connector M12, Lumberg RSF 5, 5-pin				
Cable with connector M12, LBS/LBN-100-(OP)-S096/S170	Cable 10cm with male connector M12 type RSTS 5-298, 5-pin				
Accessories, all types, included	- 4x nuts M18 (or 2x clamps, on request)				
Accessories, only LBN-100-***-OP-S099, included	- 2x Safety lock device, mount at the cable connection, for locking the connection. - 2x Warning plate "Do not open/close when supply voltage connected", self-sealing, for gluing on the cable connector. - 2x Protection cap for the sensor socket.				
Accessories, LBS/LBN-100-***-(OP)-S096/S099/S170, not included	- Cord set M12, types Lumberg RKTS 5-298/xx (straight or RKWTH 5-298/xx (right angle)				
Options	Cable length, up to 100m, on request Response time 1ms, on request				
- LB*-100-EVP:	Receiver with pollution indication output VA				
- LB*-100-SDI:	Emitter with disable input DI				
- LBS/LBN-100-***-(OP)-S096:	Cable length 10cm, with male connector M12 / 5-pin, Lumberg type RSTS 5-298				
- LBS/LBN-100-***-(OP)-S099:	Male connector M12: Lumberg type RSF 5, 5-pin				
- LB*-100-***-(OP)-S112:	Cable: TPU, 3/4/5 x 0.5mm ² , shielded, leads numbering marked, cable for trailing, halogen-free, length: 10m				
- LB*-100-***-(OP)-S116:	Cable: TPU, 3/4/5 x 0.5mm ² , shielded, leads numbering marked, cable for trailing, halogen-free				
- LBS/LBN-100-***-(OP)-S170:	Cable length 10cm, with male connector M12 / 5-pin, Lumberg type RSTS 5-298. With potentiometer at the emitter for fine adjustment				
- LB*-100-EFP/EVA(-OP)-S179:	Inverted output function, dark switching				
- LB*-100-S**/E**-(OP)-S183:	Cable: TPU, 3/4/5 x 0.5mm ² , shielded, leads numbering marked, cable for trailing, halogen-free, length: 3m				
- Additional "Tubus M18/90/8":	Aperture tube, open by 8mm. type: "Tubus M18/90/8"				
LED indication and function					
Output function (Wiring see next page)					
LB*-100-EVP with pollution indication output VA	PNP = OFF		PNP=ON, if LED=yellow		
Alignment and controlling by LED display (Status visualization by LED at the rear side of the receiver)	LED red: Light beam interrupted	/ not aligned			
	LED yellow: Polluted lenses	/ bad aligned			
	LED green: Light beam free	/ well aligned			

Wiring LB*-100-SIR/SDI/EFP/EVP(-OP):

Standard cable:	Special cable:	Receiver:	Emitter:
brown	1	+24VDC	+24VDC
black	2	0V	0V
red	3	Output	DI (optional)
orange	4	Output VA	--
Housing	green-yellow	PE/PA	PE/PA
white	white	Cable shield	Cable shield

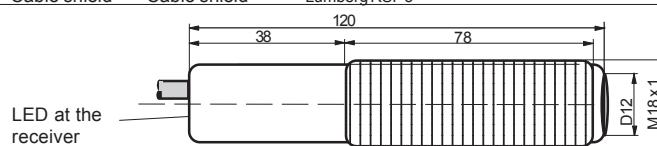
Wiring LBS/LBN-100-SIR/SDI/EFP/EVP(-OP)-S099:



Receiver:	Emitter:
1 +24VDC	+24V
2 Pollution indication output VA	DI (Disable)
3 0V	0V
4 Output	NC
5 PE	PE

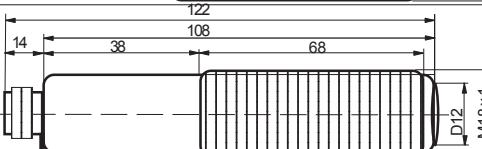
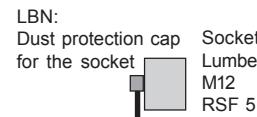
Dimensions: LB*-100-**(-OP):

Same dimensions for emitter and receiver



Dimensions: LBS/LBN-100-**(-OP)-S099:

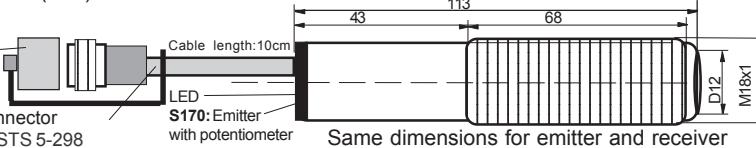
Same dimensions for emitter and receiver



Dimensions: LBS/LBN-100-**(-OP)-S096/S170:

LBN:
Dust protection cap for the socket

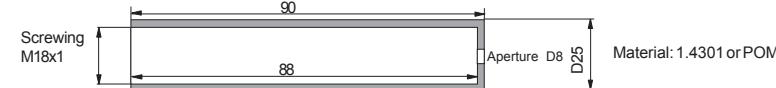
Cord set with connector M12, Lumberg RSTS 5-298



Same dimensions for emitter and receiver

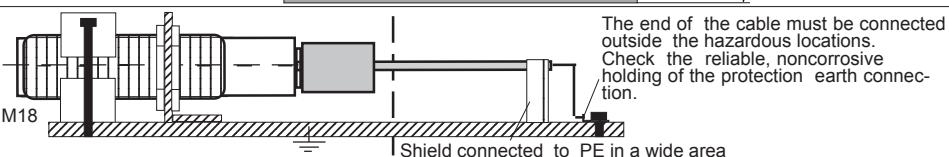
Dimensions: Tubus M18/90/8:

(Optional accessory for reduction the directional angle)



Safe equipotential Bonding for Ex Devices:

The local equipotential bonding have to be done with conductive corrosion-resistant clamps or nuts M18



EX related markings

CE 1258

Type LBD: II 2(1)G Ex d [op is Ga] IIC T6 Gb,

Type LBN: II 3G Ex nA op is IIB T4 Gc,

Type LBD: ATEX Certification

Type LBD: IECEx Certification

Type LBN: ATEX declaration by manufacturer

T_{amb}: -20°C < T_{amb} < +50°C

Date of production: Numerals 5 to 8 of the serial number (year/calendar week)

Manufacturer with address

II 2(1)D Ex tb [op is Da] IIIB T100°C Db IP67

II 3D Ex tc op is IIIA T135°C Dc IP67

No: BVS 10 ATEX E130 X DEKRA

IECEx BVS 14.0108X

According to the ATEX directive 2014/34/EU

Electrical data according to the table "Technical data"

(X designation of the certification number: Fibre optics must only be used with sensors with certified limited optical power)

Operating Manual, EU - Declaration of Conformity:

General regulations for all types of Ex devices:

It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). The maximum rated supply voltage U_m = 30VDC must not be exceeded. The local equipotential bonding have to be done. The protective earth (PE) is solid connected with the housing. At devices without PE terminal, the local equipotential bonding have to be done with conductive corrosion-resistant clamps or nuts M18 over the housing. The cable have to be installed and protected against damages. The cable with termination fittings, or in cable tray systems and installed in a manner to avoid tensile stress at the termination fittings. To connect cables inside hazardous locations only use certified Ex housings. All cable terminals must be connected outside hazardous locations. Other then original manufacturer, additional optical lenses are not allowed in hazardous locations.

Emitter: LBD-100-SIR/SID-OP-S*, Receiver: LBD-100-EFP/EVP-OP-S***:** For use in Ex zones 1, 2, 21, 22. The limited optical radiation can operate into hazardous locations 0 or 20 over through a viewing glass.

Emitter: LBN-100-SIR/SID-OP-S*, Receiver: LBN-100-EFP/EVP-OP-S***:** For use only in Ex zones 2, 22.

Emitter: LBN-100-SIR/SID-OP-S096/S170, Receiver: LBN-100-EFP/EVP-OP-S096/S170: For use only in Ex zones 2, 22. **WARNING!** Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RCTS 5-298/xx (Straight type) or RWKTH 5-298/xx (Right angle type) are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the socket protection cap must be fitted, when the connection cable is not connected.

General mounting prescriptions:

Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to high voltage cables.

Function

If the light beam between emitter and receiver is free, the output switches ON (+24V). If the light beam is interrupted the output switches OFF. The load (Relay or other loads) must be connected at 0V" (minus).

Function, LB*-100-**(-OP)-S179

If the light beam between emitter and receiver is free, the output switches OFF. If the light beam is interrupted the output switches ON (+24V). The load (Relay or other loads) must be connected at 0V" (minus).

Optional pollution indication output. Only LB*-100-EVP(-OP)-S***:

The VA output will be activated by polluted lenses or a bad alignment. If the lenses are polluted, the LED shows yellow and the VA output switches to ON (+24V). This function gives the possibility to recognize pollutions in a short time.

Optional Emitter Disable Input DI. Only LB*-100-SDI(-OP)-S***:

If several light barriers are installed close to another, it is necessary to use light barriers with emitters with disable input. By using the disable input DI, each emitter can be controlled in a short reaction time. If only one emitter is activated in the same time, a mutual influence is precluded.

DI= 0V or not connected = emitter enabled
DI= High (24VDC) = emitter disabled

The Disable Input SDI must be activated for >=7ms. The SDI input is PNP compatible. The Emitter-Disable-Input DI can also be used for testing the associated receiver. By a short-time shut-off of the emitter, the switching off of the receiver output and with it the correct function of the receiver will be checked.

Alignment of the Light Barrier

The three color indication at the rear side of the receiver allows an optimal alignment.

1. The emitter beam must hit the receiver lens in an angle near to 90°.
2. The receiver should be moved, until the LED (from the receiver) shows "green". Search the middle of the green range. If the receiver LED shows yellow, the light barrier is bad aligned, or the lenses are polluted.

Maintenance:

No special maintenance is required. If the lenses becomes dirty, they should be cleaned with a non-aggressive solvents. Equipment must only be repaired by the manufacturer.

General safety instructions:

The operating manual provide the machine manufacturer's or machine operator's technical personnel instructions on the safe mounting, configuration, electrical installation, commissioning, and on the operation and maintenance of the light barrier. Please read the operating instructions carefully. Types: Emitter: LBN-100-SIR/SID-OP-S096/S170, Receiver: LBN-100-EFP/EVP-OP-S096/S170: "WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES. DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS". The mounting of the sensor in dusty locations without fixed cordset or protection cap results in a high ignition risk. In worst case of breakdown, the output can change to any state! The light barriers must not be used for fail-safe applications! In worst case the output can change to any state! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations: EN 60079-14, single directive 1999/92/EC. The sensors are conform to the following standards:

The sensors are conform to the following standards:

IEC/EN 60079-0:2012+A11:2013, IEC/EN 60079-1:2007, EN 60079-15:2010, IEC/EN 60079-28:2007, IEC/EN 60079-31:2010, EN 60529:2014, EN 60950-1:2006, EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4, ATEX directive: 2014/34/EU, Machine directive: 2006/42/EG, EMC directive: 2014/30/EU, RoHS directive: 2011/65/EU.

General Notes, disposal:

We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

EU-Declaration of conformity:

IECEx certification, types LBD: Ex d [op is Ga] IIC T6 Gb, Ex tb [op is Da] IIIB T100°C Db IP67.

Certification No. IECEx BVS 14.0108X.

ATEX certification, types LBD: II 2(1)G Ex d [op is Ga] IIC T6 Gb, II 2(1)D Ex tb [op is Da] IIIB T100°C Db IP67. Certification No. BVS 10 ATEX E130 X, DEKRA EXAM GmbH, Zertifizierungsstelle, Carl-Beyling-Haus, Dinendahlstrasse 9, D-44809 Bochum, Kennnummer: 0158.

ATEX certification, types LBN: II 3D Ex tc op is IIIA T135°C Dc IP67. ATEX declaration by manufacturer in accordance to 2014/34/EU.

ATEX certification of quality type production of Ex devices in accordance to the directive 2014/34/EU, CE 1258, Eurofins. Certification No.: SEV 21 ATEX 4580, QAR No.: CH/SEV/QAR21.0009/01. The conformity of the devices with the EC standards and directives and the EC-type examination certificate and the observation of the Quality Safety System ISO 9001:2015 with the ATEX module "Production", declares:

Pablo Ledergerber, Matrix Elektronik AG

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