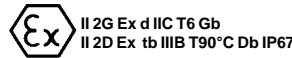


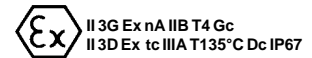
Original Operating Manual: Light Barriers series LBx-11-S/E, Housing M18

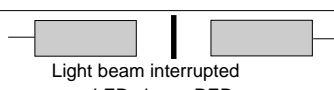
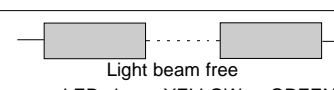
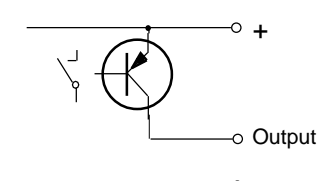
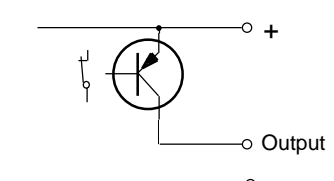
LBD-11-S/E-GD



- Range 10m, short response time
- Optimal alignment by visualization by LED at the rearside of the receiver
- With optional emitter disable input DI
- With optional pollution indication output
- Series LBD-11-S/E-GD: Applicable in Ex-Zones 1, 2, 21, 22
- Series LBN-11-S/E-GD: Applicable in Ex-Zones 2, 22
- Series LBN-11-S/E-G-S109: Applicable in Ex-Zone 2. T_{amb}: +100°C
- Series LBS-11-S/E-S109: Extended temperature range. T_{amb}: +100°C

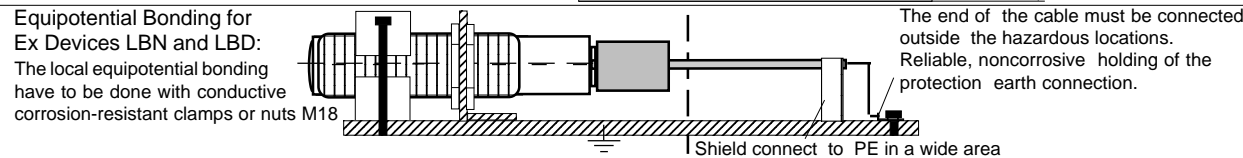
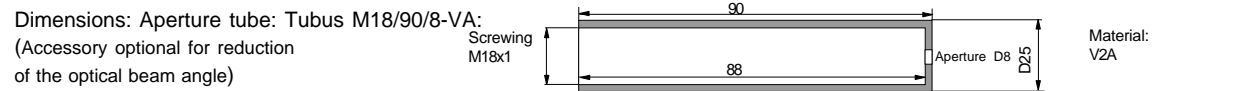
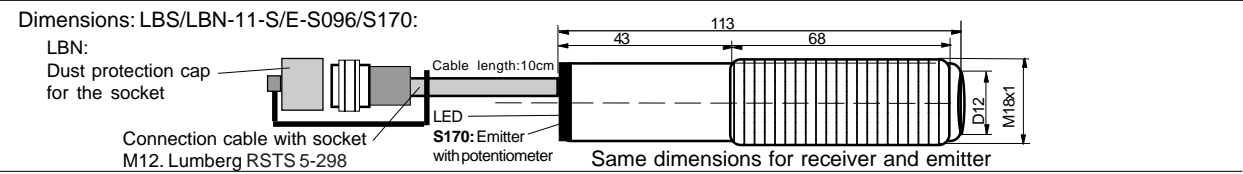
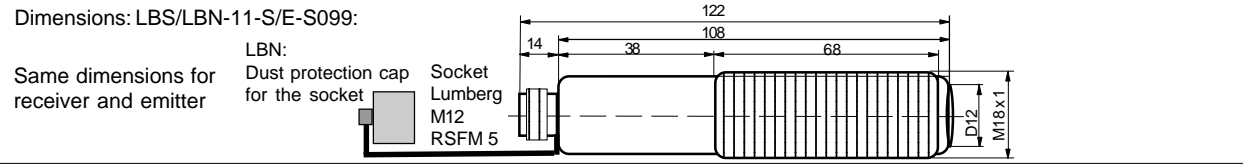
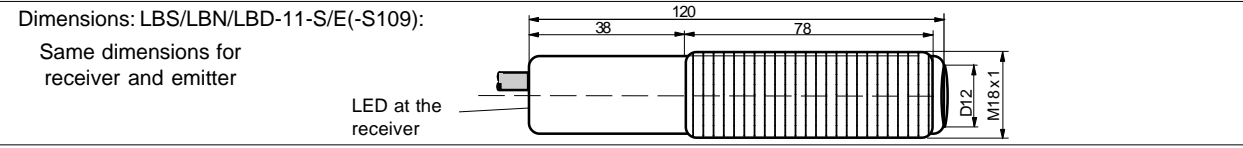
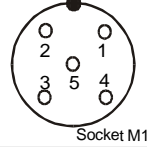
LBN-11-S/E-GD



Technical data	Type	LBS-11-S/E-(VA)(-DI)	LBN-11-S/E-(VA)(-DI)-GD	LBD-11-S/E-(VA)(-DI)-GD
Designation for emitter and receiver		LBx-11-S = Emitter / LBx-11-E = Receiver		
Receiver with pollution indication output VA		LBx-11-E-VA		
Emitter with disable input DI		LBx-11-S-DI		
Type of Ex protection Gas, at 94/9/EC		NONE	II 3G Ex nA IIB T4 Gc	II 2G Ex d IIC T6 Gc
Type of Ex protection Dust, at 94/9/EC		NONE	II 3D Ex tc IIIA T135°C Dc IP67	II 2D Ex tb IIIB T90°C Dc IP67
Applicable in Ex zones		NONE	2, 22	1, 2, 21, 22
Range		10m		
Minimum detectable object size		12mm (avoid mirror effects)		
Light source		Infrared 870nm		
Light source, life span		>60'000hours		
Directional angle (Distance 10m)		Emitter: appr. 17° / Receiver: a. 15°		
Response time		5ms		
Power up delay time		500ms		
Supply voltage		24 VDC +-10%		
Absolute maximum voltage Um		30VDC		
Current consumption, emitter		18mA		
Current consumption, receiver (without load current)		40mA		
Maximum power dissipation		Emitter: 0.5W / Receiver: 1.4W		
Output		PNP, 100mA, short circuit protected		
Optional pollution indication output VA		PNP, 100mA, short circuit protected		
Input, only types LBx-11-S-DI		Emitter disable input DI, PNP compatible		
Status indication		3-color LED, at the rearside of the receiver		
Housing		M18, brass Ms58, nickel plated		
Enclosure rating, at EN 60529		IP 65	IP67	
Vibration and shock resistance		Vibration: 30g over 20Hz to 2kHz. Shock: 100g for 3ms		
Working temperature range T _{amb} ^{Note 1}		-20°C < T _{amb} < +60°C	-20°C < T _{amb} < +50°C	
Storage temperature range		-30°C +80°C		
Connection cable, shielded		Special PVC/PVC 3/4 x AWG24/0.25mm ² , L=5m	Special PVC/PVC 3/4 x AWG24/0.25mm ² , L=10m	
Socket M12, only LBx-11(-GD)-S099		RFSM 5, 5 pins	RFSM 5, 5 pins	--
Cord set 10cm, M12, only LBx-11(-GD)-S096/S170		RSTS 5-298, 5 pins	RSTS 5-298, 5 pins	--
Accessories		- 4 nuts M18 or optional 2 clamps		
Accessories, only LBN-11-S/E-GD-S096/099/S170		- 2x Safety lock device, mount at the cable connection, for locking the connection. (black synthetic device) - 2x Warning plate "WARNING - Explosion Hazard - Do Not Disconnect While Circuit Is Live Unless Area Is Known To Be Non-Hazardous", self-sealing, for gluing on the cable connector.		
Accessories, optional, only LBx-11 S096/S099/S170		- 2x Protection cap for the sensor socket. - Cord set with connector M12. Straight type: RKTS 5-186/xx, 5-298/..M or right angle type: RKWTH 5-186/xx, 5-298/..M, Lumberg M12/5P		
Options		Cable length up to 100m, on request. Response time 1ms, on request.		
- LB.-11-E-VA:		Receiver with pollution indication output "VA".		
- LB.-11-S-DI:		Emitter with disable input "DI".		
- LBS/LBN.-S/E(-GD)-S096:		Cable length 10cm, with socket M12/5 Pins, Lumberg type RSTS 5-298.		
- LBS/LBN.-S/E(-GD)-S099:		Socket M12: Lumberg RSF 5, 5 Pins.		
- LBS/LBN.-S/E(-G)-S109:		Maximum ambient working temperature +100°C. Cable TPU. Only for Ex Zone 2. II 3G Ex nA II T3 Gc.		
- LB.-(-GD)-S112:		Cable: TPU, 3/4/5 x 0.5mm ² , shielded, leads numbering marked, resistant to solvents, for drag chain use, length: 10m.		
- LB.-(-GD)-S116:		Cable: TPU, 3/4/5 x 0.5mm ² , shielded, leads numbering marked, resistant to solvents, for drag chain use.		
- LBS/LBN.-S/E(-GD)-S170:		Cable length 10cm, with socket M12/5 Pins, Lumberg type RSTS 5-298. With potentiometer at the emitter for power adjustment.		
- LB.-11-E(-GD)-S179:		Reversed switching function, dark switching.		
- LB.-(-GD)-S183:		Cable: TPU, 3/4/5 x 0.5mm ² , shielded, leads numbering marked, resistant to solvents, for drag chain use, length: 3m.		
- Aperture tube 8mm.		Type: "Tubus M18/90/8"		
LED indication and function				
Output		Wiring diagram at the rearside of this data sheet		
				
Pollution indication output, LBx.-E-VA		PNP=OFF		
Alignment and LED indication (LED at the rearside of the receiver)		LED RED: Light beam interrupted or light barrier bad aligned. LED YELLOW: Lenses polluted or light barrier bad aligned. LED GREEN: Light beam free, light barrier well aligned.		
ATEX related designations		CE 0158 Manufacturer with address Electrical data, according to the charts		
Types LBD-11-GD:		II 2G Ex d IIC T6 Gb, II 2D Ex tb IIIB T90°C Db IP67 EC-Type Examination Certificate: BVS 10 ATEX E130 X		
Types LBN-11-GD(-S096/099/170):		II 3G Ex nA IIB T4 Gc, II 3D Ex tc IIIA T135°C Dc IP67 Declaration by manufacturer at 94/9/EC		
Types LBN-11-G-S109:		II 3G Ex nA II T3 Gc Declaration by manufacturer at 94/9/EC		
T _{amb} : -20°C < T _{amb} < +50°C (S109: +100°C)		Date of production: Numerals 5 to 8 of the serial number (Year/Week)		
Note 1: At ambient temperatures less then -5°C, the cable must not be agitated.				

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Wiring, cable:			Socket, only LBS and LBN S096/S099/S170:		
Standard cable:	Special cable:	Receiver:	Emitter:	Receiver:	Emitter:
brown	1	+24VDC	+24VDC	+24VDC	+24VDC
black	2	0V	0V	Output VA	DI (optional)
red	3	Output	DI (optional)	0V	0V
orange	4	Output VA (optional)	--	Output	NC
at the housing	green-yellow	PE/PA	PE/PA	PE/PA	PE/PA
white	white	Cable shield	Cable shield		



Operating Manual, EC - Declaration of Conformity:

Ex protection:
 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 certificated Ex housings. All cable terminals must be connected outside hazardous locations. Other than original manufacturer, additional optical lenses are not allowed in hazardous locations.
 Type LBD-11-S/E-GD: ONLY applicable in Ex zones 1, 2 and 21, 22.
 Type LBD-11-S/E-GD: ONLY applicable in Ex zones 2 and 22.
 Type LBN-11-S/E-GD-S096/S099/S170: ONLY applicable in Ex zone 2 and 22 hazardous locations. 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 RKT5 5-298/xx (Straight type), RKWTH 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 protection cap for the socket must be fitted, when the connection cable is NOT connected.
 Type LBN-11-S/E-G-S109: ONLY applicable in Ex zone 2.
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 is not interrupted the output switches to ON (+24V). If the light beam is interrupted the output switches OFF. The load must be connected between the output and 0V.
Function, devices LBx-11-E-S179:
 If the light beam is not interrupted the output switches to OFF. If the light beam is interrupted the output switches to ON (+24VDC). The load must be connected between the output and 0V.
Optical pollution indication output "VA":
 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.
Arrangement of light barriers, only types LBx-11-S-DI(-GD):
 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 DI must be activated for $\geq 7ms$.
 The DI input is PNP compatible.
Alignment of the Light Barrier
 The three color indication at 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
 Types LBN-11-S/E-GD-S096/S099/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 emitter and receiver in dusty locations without fixed cordsets or protection caps results in a high ignition risk. The light barriers must not be used for Accident-Prevention! 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, ATEX 118a, single directive 1999/92/EC.
 The sensor and the fibre optic are conform to the following standards:
 EN 60079-0:2009, EN 60079-1:2007, EN 60079-15:2010, EN 60079-31:2010, EN 60825-1:2006, EN 60825-2:2004; EN 60529; EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4. Ex protection: 94/9/EC (ATEX 100a), Machine directive: 2006/42/EC, EMC: 2004/108/EC, RoHS: 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.
EC-Declaration of conformity
 Models LBD:
 EC-Type Examination Certificate No. BVS 10 ATEX E 130 X. DEKRA.
 Models LBN:
 ATEX declaration by manufacturer at 94/9/EC.
 ATEX certification of quality type production of Ex devices at the directive 94/9/EC, CE 0158. Certification No: BVS 12 ATEX ZQS / E118. 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 9001:2008 with the ATEX module "Production", declares:
 Hans Bracher, Matrix Elektronik AG

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