

Original Operating Manual: Laser Light Barriers LBx-L50-S/E-VA(-OP)


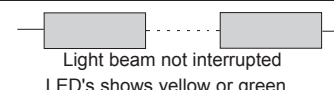
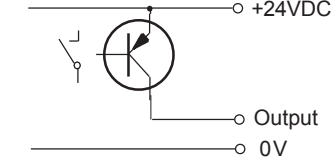
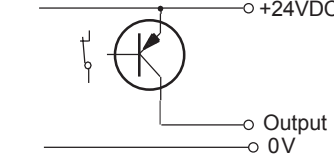
LBD-L50-S/E-OP

- Short response time
- Range 50m.
- Optimal alignment help by status indication through the illuminated receiver lens.
- With optional emitter disable input
- With pollution indication output
- Series LBD: Applicable in Ex-Zones 1(0), 2(0), 21(20), 22(20)
- Series LBN: Applicable in Ex-Zones 2(1), 22(21)
- Series LBN/LBD: With limited optical output power at EN 60079-28

LBN-L50-S/E-OP

 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

 II 3(2)G Ex nA [op is Gb] IIB T4 Gc
 II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67

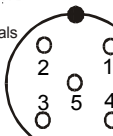
Technical data	Emitters Receivers	LBS-L50-S(-DI) LBS-L50-E-VA	LBN-L50-S(-DI)-OP LBN-L50-E-VA-OP	LBD-L50-S(-DI)-OP LBD-L50-E-VA-OP
Designation, emitter with disable input			LBx-L50-S-DI	
Type of Ex protection Gas, at 94/9/EC		none	II 3(2)G Ex nA [op is Gb] IIB T4 Gc	II 2(1)G Ex d [op is Ga] IIC T6 Gb
Type of Ex protection Dust, at 94/9/EC		none	II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67	II 2(1)D Ex tb [op is Da] IIIB T100°C Db IP67
Applicable in Ex Zones		Not for Ex zones	(1), 2, (21), 22	(0), 1, 2, (20), 21, 22
Sensing range			50m	
Minimum detectable object size			10mm (avoid mirror effects)	
Light source			Laser, visible red, 650nm, class 2	
Maximum radiant power			<=1mW	
Maximum radiant intensity		NOT LIMITED	<=5mW/mm ²	<=5mW/mm ²
Directional angle of the receiver			Appr. 17°. (at a distance of 10m)	
Response time			5ms	
Supply voltage			24 VDC +/-15%	
Current consumption, emitter			40mA	
Current consumption, receiver			50mA	
Maximum power dissipation			Emitter = 1.1W / Receiver = 1.4W	
Output			PNP, 100mA, short circuit protected	
Pollution indication output "VA"			PNP, 100mA, short circuit protected	
Electrical input, only type LBx-L50-S-DI(-OP)			Disable input, PNP compatible	
Maximum ambient working temperature ^{Note 1}		0°C < T _{amb} < +60°C	0°C < T _{amb} < +50°C	
Storage temperature range			-20°C ... +70°C	
Relative humidity			15% ... 90%, noncondensing	
Pollution degree, at EN 60664-1			4	
Utilization category, at EN 60947-5-1/2			DC13	
Housing			M18, brass, nickel plated	
Enclosure rating, at EN 60529		IP 54	IP67	
Vibration and shock resistance			Vibration: 30g over 20Hz to 2kHz. Shock: 100g for 3ms	
Connection cable, shielded		Special PVC/PVC 2/3/4xAWG24/0.25mm ² , L=5m	Special PVC/PVC 2/3/4 x AWG24/0.25mm ² , L=10m	
LBx-L50(-OP) S99: Socket M12, Lumberg		RSF 5, 5 terminals	RSF 5, 5 terminals	--
LBx-L50(-OP) S96: Cord set 10cm, M12, Lumberg		RSTS 5-298, 5 terminals	RSTS 5-298, 5 terminals	--
Accessories		- 4 nuts M18 or optional 2 clamps		
Accessories, only LBN-L50-S/E-OP-S96/99		- 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. - 2x Protection cap for the sensor socket.		
Accessories optional, only LBx-L50-...-S96/S99		- Single ended cordset, straight type: RKTS 5-298/.M or right angle type: RKWTH 5-298/.M, Lumberg M12/5P		
Options				
- Cable length:	Up to 100m, on request			
- Response time 1ms:	On request			
- LB.-L50-S-DI:	Emitter with disable input			
- LBS/LBN-.-S/E(-OP)-S96:	Cable length:10cm with connector M12/5 terminals, Cord set Lumberg RSTS 5-298.			
- LBS/LBN-.-S/E(-OP)-S99:	Socket M12: Lumberg RSF 5, 5 terminals			
- LB.-(-OP)-S112:	Special Cable: Sonderleitung TPU, shielded, oil and solvent resistant, cable for trailing, halogen free, length=10m			
- LB.-(-OP)-S116:	Special Cable: Sonderleitung TPU, shielded, oil and solvent resistant, cable for trailing, halogen free, length=3m			
- LB.-L50-E(-OP)-S179:	With inverted output function, Dark=ON			
- Additional "Tubus M18/90/8":	Aperture tube, open by 8mm			
LED Indication Function				
Output Wiring and and connection layout, see page 2				
Pollution indication output VA		PNP=OFF	PNP=ON, if LED=yellow	
Alignment and Controlling by LED Display (Trough the receiver lens and at the rearside of the receiver)		LED red: Light beam interrupted / not aligned	LED yellow: polluted lenses / badly aligned	
		LED green: Light beam free	/ well aligned	
ATEX related designations				
CE 1258	Manufacturer with address		Electrical data according to the chart	
Device type LBD-L50-S/E-OP:	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		EC Type Certification. Number: BVS 10 ATEX E 130 X	
Device type LBN-L50-S/E-OP:	II 3(2)G Ex nA [op is Gb] IIB T4 Gc, II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67		Declaration by manufacturer at 94/9/EC	
T _{amb} : 0°C < T _{amb} < +50°C	Date of production: Numeral 5 to 8 of the serial number (Year/Week)			
(X designation of the certification number: Fibre optics must only be applied with sensors with certificated limited optical power)				
Note 1: On temperatures less the +5°C, the cable must not be agitated				

Connection diagram, cable:

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

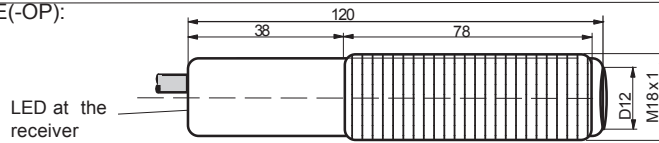
Connection diagram, LBS and LBN S96/S99 (Socket):

Socket M12 IP67 5 terminals	Receiver:	Emitter:
1/brown	+24VDC	+24VDC
2/white	Output VA	DI (optional)
3/blue	0V	0V
4/black	Output	NC
5/grey	PE/PA	PE/PA



Dimensions: LBS/LBN/LBD-L50-S/E(-OP):

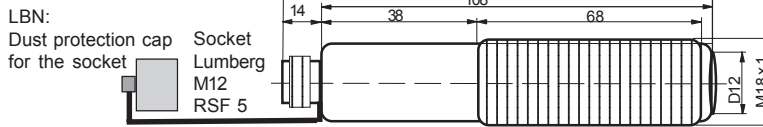
Same dimensions for emitter end receiver



Status indication trough the illuminated receiver lens at the receiver

Dimensions: LBS/LBN-L50-S/E(-OP)-S99:

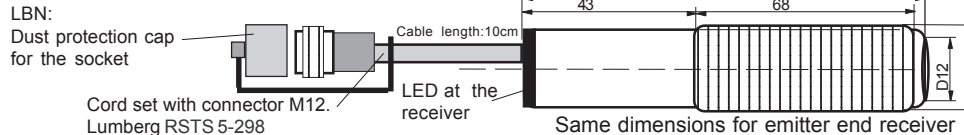
Same dimensions for emitter end receiver



Status indication trough the illuminated receiver lens at the receiver

Dimensions: LBS/LBN-L50-S/E(-OP)-S96

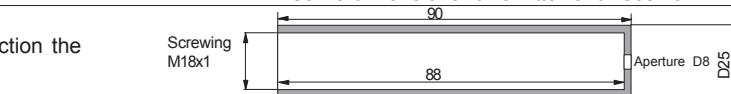
Same dimensions for emitter end receiver



Status indication trough the illuminated receiver lens at the receiver

Dimensions: Tubus M18/90/8:

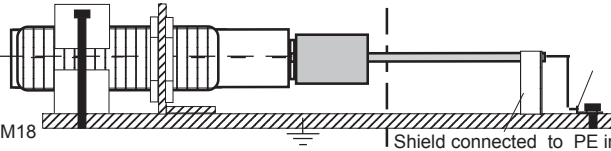
(Optional accessory for reduction the directional angle)



Material: POM

Equipotential Bonding for Ex Devices LBN and LBD:

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



The end of the cable must be connected outside the hazardous locations. Reliable, noncorrosive holding of the protection earth connection.

Operating Manual / EC - Declaration of Conformity:

Operating Manual:

Ex protection:

General prescriptions for all Ex devices:

It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). The maximum input voltage $U_m=30VDC$ must not be exceeded. The local equipotential bonding have to be done. The protective earth (PE) terminal is solid connected with the housing. The cable have to be protected against damages. To connect cables inside hazardous locations only use certificated Ex housings. All cable terminals must be connected outside hazardous locations. Use only original manufactured fibre optics and additional optical lenses, other additional optical lenses are not allowed in hazardous locations.

Type: LBD-L50-S/E-OP: Applicable in Ex zones 1, 2, 21, 22. The limited optical radiation can operate into hazardous locations 0 or 20 through a certificated viewing glass.

Type: LBN-L50-S/E-OP: Only applicable in Ex zones 2, 22. The limited optical radiation can operate into hazardous locations 1 or 21 through a certificated viewing glass.

Type: LBN-L50-S/E-OP-S96/S99: Only applicable in Ex zones 2, 22. The limited optical radiation can operate into hazardous locations 1 or 21 through a certificated viewing glass. 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 RKTS 5-298/xx (Straight type) or 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 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 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-100-E(-OP)-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.

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-L50-S-DI(-OP):

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.

Mechanical Mounting Prescriptions

Because Lasers have a very small aperture angle, mount the light barriers free from vibrations and shocks. If it is practicable, protect the lenses from contamination.

Alignment of the Light Barrier

The three color indication in the receiver optic allows an optimal alignment.

1. The emitter laser 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.

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.

Safety Informations for Laser Installations of Class 2:

The instructions for planning and installation must be followed in accordance with EN 60825-1. Do not stare into Laser Beam

General safety instructions

Series LBN-L50-S/E-OP-S96/S99: "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. The sensors 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 sensors are conform to the following standards: EN 60079-0:2009, EN 60079-1:2007, EN 60079-15:2010, EN 60079-28:2007, 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/EC.

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

ATEX, Model 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 E 130 X, Notified Body: DEKRA EXAM GmbH, Carl-Beyling-Haus, Dinendahlstrasse 9, D-44809 Bochum, CE 0158.

ATEX, Model LBN: II 3(2)G Ex nA [op is Gb] IIB T4 Gc, II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67. ATEX declaration by manufacturer at 94/9/EC. ATEX certification of quality type production of Ex devices at the directive 94/9/EC, CE 1258, Eurofins. Certification No: SEV 21 ATEX 4580. 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

LBx-L50-OP_e15/2022-01-24/MIP

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