

# Original Operating Manual: Redlight Light Barriers LBx-22-S/E-VA, M18

## LBD-22-S/E-GD



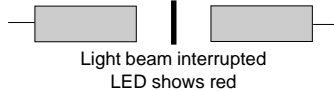
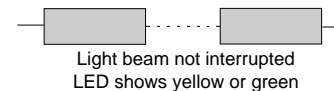
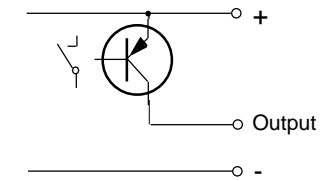
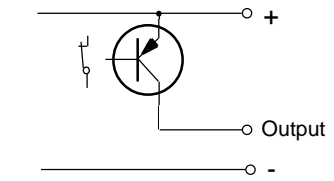
II 2G Ex d IIC T6 Gb  
II 2D Ex tb IIB T90°C Db IP67

- Short response time
- Range 20m.
- Optimal alignment by visualization by LED at the rear side of the receiver
- With optional emitter disable input
- With optional pollution indication output
- Series LBD: Applicable in Ex-Zones 1, 2, 21, 22
- Series LBN: Applicable in Ex-Zones 2, 22
- Series LBN S96/S99: Applicable in Ex-Zone 2

## LBN-22-S/E-GD



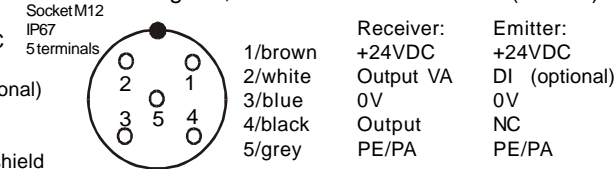
II 3G Ex nA IIB T4 Gc  
II 3D Ex tc IIIA T135°C Dc IP67

Technical data	Series	LBS-22-S/E-VA(-DI)	LBN-22-S/E-VA(-DI)-GD	LBD-22-S/E-VA(-DI)-GD
Designation Emitter + Receiver		LBx-22-S = Emitter / LBx-22-E = Receiver		
Designation, emitter with disable input		LBx-22-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 Gb
Type of ex protection Dust, at 94/9/EC		none	II 3D Ex tc IIIA T135°C Dc IP67	II 2D Ex tb IIB T90°C Db IP67
Applicable in Ex zones		none	2, 22	1, 2, 21, 22
Range		20m		
Minimum detectable object size		12mm (avoid mirror effects)		
Light source		Visible red, 623nm		
Light source, life span		>60'000hours		
Directional angle		Appr. 17°		
Maximum radiant intensity		<=5mW/mm²		
Response time		5ms		
Supply voltage		24 VDC (20 to 28VDC)		
Current consumption, emitter		28mA		
Current consumption, receiver		50mA		
Maximum power dissipation		Emitter = 0.79W / Receiver = 1.4W		
Output		PNP, 100mA, short circuit protected		
Optional Pollution indication output "VA"		PNP, 100mA, short circuit protected		
Optional electrical input DI, only type LBx-22-S-DI		Disable input, PNP compatible		
Housing		M18, brass, nickel plated		
Enclosure rating, at EN 60529 / NEMA		IP 65 / 4X	IP67 / 6P	
Vibration and shock resistance		Vibration: 30g over 20Hz to 2kHz. Shock: 100g for 3ms		
Maximum ambient working temperature <sup>Note 1</sup>		-20°C < T <sub>amb</sub> < +60°C	0°C < T <sub>amb</sub> < +50°C	
Connection cable, shielded		Special PVC/PVC 2/3/4 x AWG24/0.25mm², L=5m	Special PVC/PVC 2/3/4 x AWG24/0.25mm², L=10m	
Socket M12, LBx-22(-G)-S99		RSFM 5, 5 terminals	S99 RSFM 5, 5 terminals	--
Cord set 10cm, M12, LBx-22(-G)-S96		RSTS 5-298, 5 terminals	S96 5-298, 5 terminals	--
Accessories		- 4 nuts M18 or optional 2 clamps		
Accessories, only LBN-22-S/E-G-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-22-...S96/S99		- Single ended cordset, straight type: RKTS 5-299/..M or right angle type: RKWTH 5-299/..M, Lumberg M12/5P		
Options		Cable length up to 100m, on request Response time 1ms, on request - LB.-22-S-DI: Emitter with disable input - LB.-22-E-VA: Receiver with optional pollution indication output - LBS/LBN-..S/E(-G)-S96: Cable length:10cm with connector M12/5 terminals, Cord set Lumberg RSTS 5-298. LBN: ONLY FOR GAS HAZARDOUS LOCATIONS. - LBS/LBN-..S/E(-G)-S99: Socket M12: Lumberg RSF 5, 5 terminals. ONLY FOR GAS HAZARDOUS LOCATIONS. - LB.-(-GD)-S112: Special Cable: Sonderleitung TPU, shielded, oil and solvent resistant, cable for trailing, length=10m - LB.-(-GD)-S116: Special Cable: Sonderleitung TPU, shielded, oil and solvent resistant, cable for trailing, length=3m - LB.-L50-E(-GD)-S179: With inverted output function, Dark=ON - Aperture tube, open by 8mm, type "Tubus M18/90/8"		
LED Indication Function				
Output and connection layout (S96/S99: See next page)				
Cable 1: brown Cable 2: black Cable 3: red Cable 4: grey Receiver: brown Emitter: black = +24VDC = 0V = Output = VA Output <sup>4</sup> = NC = PE/PA PE at the yellow housing Cable shield and housing, connect to PE Note 3: Only Type LBx-22-S-DI Note 4: Only Type LBx-22-E-VA				
Pollution indication output VA		PNP=OFF	PNP=ON, if LED=yellow	
Alignment and Controlling by LED Display (At the rear side 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 0158 Manufacturer with address Date of construction: Numeral 5 to 8 of the serial number (Year/Week) Device type LBD-22-S/E-GD: II 2G Ex d IIC T6 Gb, II 2D Ex tb IIB T90°C Db IP67 EC Type Certification. Number: BVS 10 ATEX E 130 X Device type LBN-22-S/E-GD: II 3G Ex nA IIB T4 Gc, II 3D Ex tc IIIA T135°C Dc IP67 Declaration by manufacturer at 94/9/EC: Device type LBN-22-S/E-G-S96: II 3G Ex nA IIB T4 Gc Declaration by manufacturer at 94/9/EC: Device type LBN-22-S/E-G-S99: II 3G Ex nA IIB T4 Gc Declaration by manufacturer at 94/9/EC: T <sub>amb</sub> : -20°C < T <sub>amb</sub> < +50°C Electrical data according to the chart		
Note 1: On temperatures less the +5°C, the cable must not be agitated				

**Connection diagram, cable:**

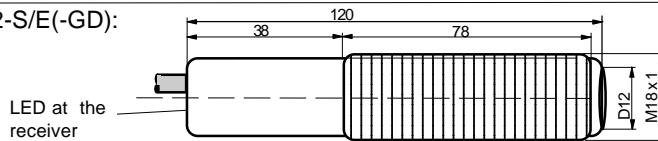
Cable 1:	Cable 2:	Cable 3:	Cable 4:	Receiver:	Emitter:
brown	brown	white	1	+24VDC	+24VDC
blue	black	yellow	2	0V	0V
black	red	grey	3	Output	DI (optional)
grey	orange	yellow-green	4	Output VA	-
PE at the housing	yellow	grey	5	PE/PA	PE/PA
white	white	blank	white	Cable shield	Cable shield

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



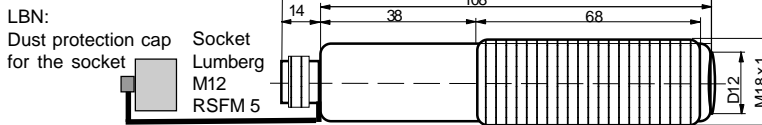
**Dimensions: LBS/LBN/LBD-22-S/E(-GD):**

Same dimensions for emitter end receiver



**Dimensions: LBS/LBN-22-S/E(-G)-S99:**

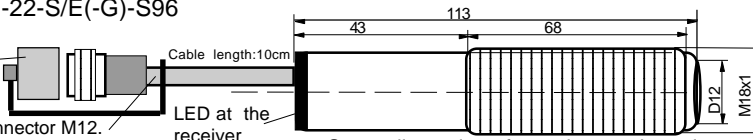
Same dimensions for emitter end receiver



**Dimensions: LBS/LBN-22-S/E(-G)-S96**

LBN: Dust protection cap for the socket

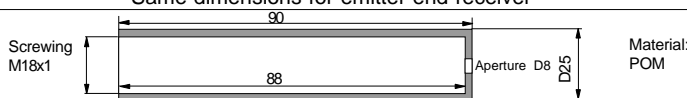
Cord set with connector M12. Lumberg RSTS 5-298



Same dimensions for emitter end receiver

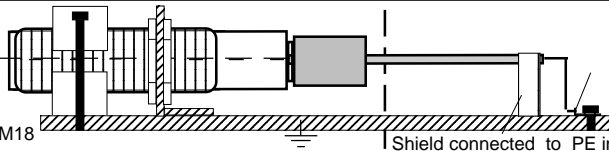
**Dimensions: Tubus M18/90/8:**

(Optional accessory for reduction the directional angle)



**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. Shield connected to PE in a wide area

**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.

**Types: LBD-** are ONLY applicable in Ex zones 1, 2 and 21, 22.

**Types: LBN-** are ONLY applicable in Ex zones 2 and 22.

**Types: LBN--S96/S99** are ONLY applicable in Ex zone 2 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.

**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-22-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.

**Optional 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-22-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.

**Mechanical Mounting Prescriptions**

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 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:**

The dismounting of the connector safety lock device while the supply voltage is connected is hazardous! The mounting of the light barrier in dusty locations without fixed cordset or protection cap results in a high ignition risk. When installing and operating with the light barrier, it is necessary to take into consideration the relevant international and other national regulations. EN 60079-14, single directive 1999/92/EC.

Standards met: EN 60079-0:2009, EN 60079-1:2007, EN 60079-15:2006-05, 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, Machine directive: 2006/46/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:**

Type LBD: EC type certification. No: DMT 99 ATEX E 056  
 Type LBN: Declaration of conformity 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

LBx-22\_e2/2013-09-30/HB

Tippkemper - Matrix GmbH  
 Meegener Str. 43 D-51491 Overath  
 Tel.: +49 2206 9566-0 Fax -19  
 info@tippkemper-matrix.com

Matrix Elektronik AG (Manufacturer)  
 Kirchweg 24 CH-5420 Ehrendingen  
 Tel.: +41 56 20400-20 Fax -29  
 info@matrix-elektronik.com