Operating manual: LBD-GLC-ESD-OP
Photoelectric Light Barrier

CE 1258

Ex

II 2(1)G
II 2(1)D

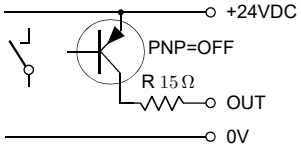
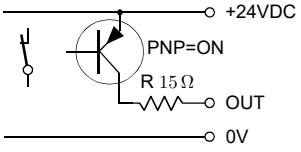
IECEx BVS 14.0108X

Ex db [op is Ga] IIC T6 Gb
Ex tb [op is Da] IIIC T100°C Db

- Robust light barrier for industrial applications
- (Receiver Only) State visualization by LED inside front optic
- (Receiver Only) Alignment aid by 3-color LED at the rearside.

Type designation code

LBD-	Distance		Type		Output Type		-	Signal Frequency		Connection Cable		Options		-OP
	C	10m	**A**	Emitter (Laser, DI)	**C**	PNP		**A**	Channel A	**A**	TPU, 3m	**D**	State visualization by LED inside front optic	
	D	20m	**B**	Emitter (Infrared)	**Z**	None		**B**	Channel B	**B**	TPU, 5m	**E**	Visible red light inside front optic	
	E	50m	**E**	Emitter (Laser)				**C**	Channel C	**C**	TPU, 10m	**Z**	None	
	F	100m	**F**	Emitter (Infrared, DI)				**D**	Channel D	**P**	PVC, 3m			
	G	120m	**L**	Receiver				**E**	HS (High Speed)	**Q**	PVC, 5m			
	H	200m	**M**	Receiver (VA)				**F**	100Hz	**R**	PVC, 10m			
			N	Receiver (Inverted Output)						**S**	PVC, 20m			

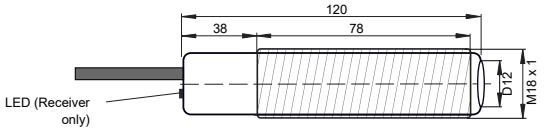
Technical Data \ Type	LBD-GLC-ESD-OP
Gas Ex protection designation	II 2(1)G Ex db [op is Ga] IIC T6 Gb
Dust Ex protection designation	II 2(1)D Ex tb [op is Da] IIIC T100°C Db
For use in Ex Zones	Zones (0), 1, 2, (20), 21, 22
Light Source	Infrared 870nm
Measuring range	120m
Min. recognizable object size	12mm (Avoid deflections on reflective surfaces)
Optical aperture angle	approx. 15°
Response time	5ms
Output type	PNP, max. 100mA, short-circuit protected
Pollution degree	4, according to EN 60664-1:2007
Supply voltage, Ue	24VDC ± 10%
Absolute maximum supply voltage, Um	30VDC
Current consumption	40mA
Maximum power dissipation	1.12W
Power up delay time	500ms
Housing	M18
Enclosure rating	IP67
Ambient working temperature range, T_{amb}	–20°C up to +50°C
Storage temperature range	–20°C up to +70°C
Relative humidity	15% ... 90%, noncondensing
Connection cable	PVC cable shielded black 3xAWG24, Length: 20m
Accessories	**Included**: • 4x Nuts M18 (or 2x Clamps on request) — **Optional**:
Options	LBx-***N***-***-OP Inverted output function, dark switching LBx-***M***-***-OP With pollution indication output "VA" LBx-***-**D**-OP (Receiver Only) State visualization by LED inside front optic LBx-***-**E**-OP (Emitter Only) Visible red light inside front optic
Function and LED Indication	 Light beam interrupted LED shows red —  Light beam not interrupted LED shows yellow or green
Output circuitry	 
Alignment and Controlling by LED Display (At the rearside of the receiver).	**LED color** / **Meaning**: red — light beam interrupted or not aligned; yellow — polluted lenses or badly aligned; green — light beam free and well aligned

EX related markings	CE 1258 Typ: LBD-GLC-ESD-OP Gas: ⬡ II 2(1)G Ex db [op is Ga] IIC T6 Gb ATEX: IECEx: Tamb: Manufacturing date:	Manufacturer with Address Electrical data according to table Dust: ⬡ II 2(1)D Ex tb [op is Da] IIIC T100°C Db BVS 10 ATEX E 130 X IECEx BVS 14.0108X –20°C up to +50°C Number 5 to 8 of the Serial Number (Year / CW)

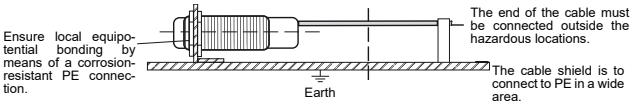
Wiring Diagram

	LB*-***L/N***-***-OP	LB*-***M***-***-OP	LB*-***B/E***-***-OP	LB*-***A/F***-***-OP
brown	24VDC	24VDC	24VDC	24VDC
black	0V	0V	0V	0V
red	OUT	OUT	–	DI
orange	–	VA	–	–
white	Cable shield	Cable shield	Cable shield	Cable shield

Dimensions



Safe equipotential bonding for Ex devices



Operating Manual / EC-/EU-declaration of conformity

Installation prescriptions for Ex hazardous locations
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 Um = 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. 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. Use only original manufactured fibre optics and additional optical lenses, other additional optical lenses are not allowed in hazardous locations.
LBD-GLC-ESD-OP: Applicable in Ex zones 1, 2, 21 and 22. The limited optical radiation can operate into hazardous locations (0) and (20) through a certificated viewing glass.

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. During electrical installation, the power must be disconnected from the device.

General function
The light barriers can be used e.g. for the detection of objects (bottles, cans, etc.) on a conveyor belt. This light barrier consists of a transmitter and a receiver. When both the transmitter and the receiver are correctly positioned and the light beam from the transmitter is not interrupted by an object, the receiver will show green on the indicator LED and the output is switched on. If the light beam is interrupted by an object, then the indicator LED shows red and the output is switched off.

Arrangement of light barriers, types LB*-*-A/B/C/D**-OP**
If several light barriers are installed close to another, it is necessary to use light barriers with different emitter frequencies (A to D). Light barriers with different emitter frequencies have no influence on each other. Precaution: If a receiver is influenced by other emitters of another type, TOFF may increase from 30ms up to 400ms. High speed light barriers and high temperature light barriers cannot be combined with frequency light barriers A to D. To avoid interference effects, all emitters should be installed at the same side and all receivers at the other side. For indoor applications the background should be protected against clutters, by using light absorbing materials.

Arrangement of light barriers, types LB*-*-E**-OP**
If several light barriers are installed close to another, it is necessary to use light barrier emitters with the optional 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 >= 15ms. The DI 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
1. Align transmitter with receiver.
2. The 3-color status display at the back of the receiver enables optimum alignment of the receiver. Align receiver so that the receiver LED shows “green”. Look for the center of the green area. If the LED lights up yellow, the light barrier is not optimally aligned or the lenses are dirty.

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 LBD-GLC-ESD-OP light barriers must not be used for accident protection. In the case of a malfunction, the output can have any state. During installation, operation and maintenance, it is mandatory to meet the relevant EU and national regulations and directives, especially with regard to explosion protection: EN 60079-14, Directives 1999/92/EC and 2014/34/EU.

General notes, disposal
We reserve the right to modify our products. Our products are designed in such a way, that it has the least possible adverse effect on the environment. It neither emits or contains 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.

Special usage conditions
The widths and gaps of the flameproof joints of this apparatus are not identical with the respective minimum or maximum values required by Table 2 and 3 of IEC 60079-1:2014. Information on the dimensions are to be obtained from the manufacturer. Access to the enclosure is prevented by adhesion. Repair works of the enclosure and thus of the parts forming the flameproof joint can only be carried out by the manufacturer. The instructions contain relevant hints.

EU-Declaration of Conformity
The product meets the requirements of the following standards and directives: EN IEC 60079-0:2018, IEC 60079-1:2014, IEC 60079-15:2010, IEC 60079-28:2015, IEC 60079-31:2013, EN 60529:2014, 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/EC, EMC directive 2014/30/EU, RoHS directive 2011/65/EU
ATEX/IECEx-Designation:
Gas: II 2(1)G Ex db [op is Ga] IIC T6 Gb
Dust: II 2(1)D Ex tb [op is Da] IIIC T100°C Db
ATEX EU-type examination certificate No.: BVS 10 ATEX E 130 X
IECEx CoC No.: IECEx BVS 14.0108X
Ex CB IECEx: DEKRA Testing and Certification GmbH, Carl-Beyling-Haus, Dinendahlstrasse 9, D-44809 Bochum, Ident number: 0158.
ATEX certification of quality management system, type production of Ex devices, in accordance to the directive 2014/34/EU:
Certification No.: SEV 21 ATEX 4580, QAR No.: CH/SEV/QAR21.0009/01, CB: Eurofins Electric & Electronic Product Testing AG, Luppmenstrasse 3, CH-8320 Fehraltorf CE 1258.
Pablo Ledergerber, Matrix Elektronik AG, is authorized to generation of documentation.
The conformity of the devices with all used standards and directives and the EC-type examination certificate and the observation of the Quality Management System ISO 9001:2015, declares:

Ehrendingen, 25.7.2024

Pablo Ledergerber, Matrix Elektronik AG

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