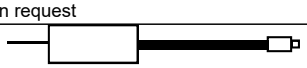
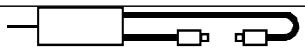
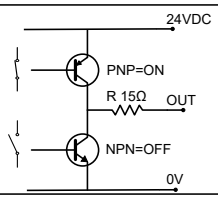
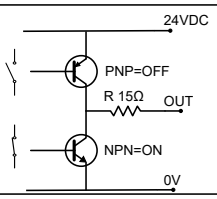
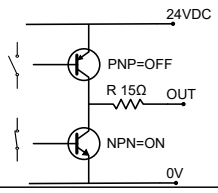
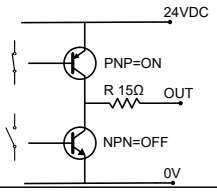
ISO 9001:2015

IDD-150-POT-OP
Optical sensor with TEACH-IN

1258

- With TEACH-IN function, suitable for connecting optical fibres.
- Adjustable sensivity
- Largely independent of contamination conditions

Technical Data	IDD-150-POT-OP
Gas Ex protection designation	II 2(1)G Ex d [op is Ga] IIC T6 Gb
Dust Ex protection designation	II 2(1)D Ex tb [op is Da] IIIB T100°C Db
For use in Ex Zones	(0), 1, 2, (20), 21 and 22
Performance Level (PL)	PL b
Safety integrity level	SIL 1
Safety-related reliability PFHd [1/h]	1.69 x 10^{-6}
MTTFd [Years]	67.47 years
Light Source	red, 623nm
Optical aperture angle	approx. 12°
Response time	7.5ms
Potentiometer for fine adjustment	yes
Minimum pulse duration for TEACH-IN	180ms
Output type	push-pull, max. 100mA, short circuit protected
Output impedance	approx. 15Ω
Pollution degree	4
Device designation according to EN 60947-5-1/2	DC13
Enable Zone	approx. 10 - 400mm (On white paper 80g, 20cm x 30cm)
Supply voltage, Ue	24VDC ±10%
Absolute maximum supply voltage, Um	30VDC
Current consumption	45mA
Power consumption	1 W @ 24V
Input type	TEACH-IN: PNP compatible, Ri 10kΩ
Power up delay time	500ms
Housing	M30 x 135mm
Enclosure rating	IP67
Ambient working temperature range, T_{amb}	–10°C up to +50°C
Storage temperature range	–20°C up to +70°C
Relative humidity	10% ... 90%
EMC, shock and vibration resistance	Vibration: 30g at 20Hz to 2kHz. Shock: 50g in every direction (X, Y, Z)
Connection cable	TPU insulation, AWM 20236, 4+PE x 0.5mm², halogen free, shielded, leads numbering marked, oil resistant cable for trailing, length: 10m
Accessories	**Included** • 1x spare screw with sealing ring for potentiometer sealing. • 2x Nuts M30
	Optional • 1x Clamp clip.
Alternative product variants (datasheets on request)	
Cable length:	Up to 100m, on request
Fibre optics connector	 

Function		**TEACH-IN**	**At measurement**
At Teach-In the sensor measures the quantity of diffuse reflected light and stores this as reference value. During normal running the actual measured value will be compared with the stored reference value. If more or less quantity of light received, the output will be switched OFF. The tolerance of allowable difference can be adjusted by the potentiometer.	**LED shows RED**	With activated TEACH-IN: No valid reference data measured. Output = OFF	Actual measured value is greater or less then the reference value, including the tolerance, determinated by the potentiometer. Output switches off.
	LED shows green	With activated TEACH-IN: Valid reference data measured and stored. Output = ON	Actual measured value equal to the reference value, within the determinated tolerance. Output switches on.
Output function in operation, LED display		LED = GREEN	LED = RED
Output function at standard wiring of the supply voltage			
Output function at reversed wiring of the supply voltage.			

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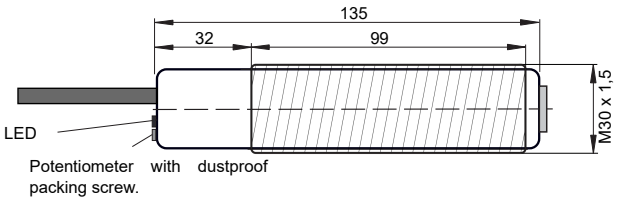
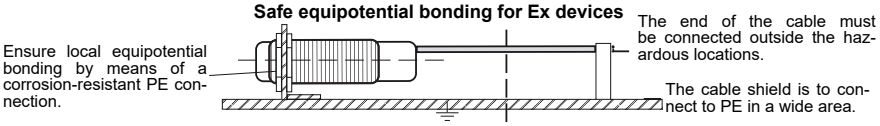
IDD-150-POT-OP_e8/2023-04-20/MP

Wiring and Dimensions

Lead-No	Function	Function, inverted
1	+24VDC	0V
2	0V	+24VDC
3	OUT	OUT
4	TEACH-IN	TEACH-IN
white	Cable shield	Cable shield
yellow-green	PE	PE



Safe equipotential bonding for Ex devices



EX related markings

CE 1258	Manufacturer with Address
Typ: IDD-150-POT-OP	Electrical data according table
Gas: Ex II 2(1)G Ex d [op is Ga] IIC T6 Gb	Dust: Ex II 2(1)D Ex tb [op is Da] IIIB T100°C Db
ATEX:	BVS 10 ATEX E130 X
IECEx:	IECEx BVS 14.0108X
Tamb:	–10°C up to +50°C
Manufacturing date:	Number 5 to 8 of the Serial Number (Year / CW)

Operating Manual / EU-declaration of conformity

General installation prescriptions
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 protection earth, large-surfaced. Do not exceed the maximum ratings. Connection cables must not be installed parallel to high voltage cables.

Ex installation prescriptions
It is necessary to take into consideration the valid international and national rules and regulations (IEC 60079-14). The maximum ratings must not be exceeded. The electrical connections must be done according to the wiring diagram. The local equipotential bonding must be connected corrosion resistant and permanentely. The protective earth (PE) is solidly connected with the housing.
The cable shield must be solidly connected to protection earth. 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 then original manufacturer, additional optical lenses are not allowed in hazardous locations.
After adjusting the potentiometer, the dustproof sealing screw with undamaged packing ring, must be screwed down. Inside zones 21 and 22 the sensor must not be operated without fixed dustproof sealing crew. Damaged or lost screws or packing rings must be replaced.
The product IDD-150-POT-OP may only be installed and operated within Ex zones 1, 2, 21 and 22. The limited optical radiation may operate inside Ex zones 0 and 20.

Startup
Because the IDENTIX sensor compares a memorized reference value with a actual measure value, first a reference value must be memorized. The reference value will be picked-up by the TEACH-IN function and memorized in an EEPROM (Data holding >= 5 years). TEACH-IN is activated by a +24VDC pulse from at least 180ms. With the potentiometer, the tolerance range for the permitted deviation can be adjusted (Left turn = small tolerance; right turn = great tolerance). The potentiometer has no influence to the range of the sensor.

TEACH-IN Procedure
Turn the potentiometer to the right side (great tolerance). Place the measuring object in front of the sensor with enabled TEACH-IN until the LED turns green. In TEACH-IN mode the output is switched on for a valid measuring range and switched off for an invalid measuring range.

LED Red	No valid reference value picked-up. Optimize the measure set-up. The output is off.

Optimizing of the measure set-up: Change the distance from the sensor to the measure object and repeat TEACH-IN.

LED Green	Valid measurement value picked-up and memorized. The output is on.

Behaviour in operation: The sensor continously compares the reference value with the actual measurement value.

LED Green	Measurement value matches reference value. Output is on.
LED Red	Measurement value is higher or lower than the reference value. Output is off.

The permissible tolerance before turning the output off can be adjusted by using the potentiometer. If the Identix does not detect any differences (LED Red), optimize the measurements according to chapter "Optimizing of the measure set-up".

Adjustment of sensitivity
Position and measure the reference and actual object. Narrow the measuring range by tuning the potentiometer to the left until the optimal measurement accuracy has been achieved.

Output-Function
By reversal connection of the supply voltage (2: +24V, 1: 0V), the output function can be inverted. The LED function does not change. The TEACH-IN switching mode does not change. Measurements by the Identix will persist even if the power supply is disconnected.

Fibre optics
The device can be used for multiple fields of application when used in conjunction with fibre optics from our diverse selection, including light barrier applications.

General safety
The sensor must not be used for Accident-Prevention! In worst case the output can change to any state! When installing and operating the product, it is necessary to take into consideration all relevant international and other national regulations, especially those regarding explosion protection.

Maintenance
The TEACH-IN adjustment must be repeated at regular intervals, depending on use, after several hours, days or at the latest approximative six months.
Protect the product and any optical ports (if applicable) from pollution. Clean with **non-aggressive** solvents only. Strong solvents may damage certain fibre optics. The equipment must only be repaired or serviced by the manufacturer.

General notes and 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.

EU-Declaration of Conformity
The product meets the requirements of the following standards and directives:
EN IEC 60079-0:2018, IEC 60079-14:2013, IEC 60079-28:2015, IEC 60079-31:2013, EN 60529:2014, EN 60950-1:2006, E 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 d [op is Ga] IIC T6 Gb
Dust: II 2(1)D Ex tb [op is Da] IIIB T100°C Db
ATEX EU-type examination certificate No.: BVS 10 ATEX E130 X
IECEx CoC No.: IECEx BVS 14.0108X
Ex CB IECEx: DEKRA Testing and Certification GmbH, Carl-Beyling-Haus, Dinendahlstrasse 9, D-44809 Bochum.
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/QAR21.0009/00, CB: Eurofins Electric & Electronic Product Testing AG, Luppmenstrasse 3, CH-8320 Fehraltorf CE 1258 Ident. Number: 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, 20.4.2023

Pablo Ledergerber, Matrix Elektronik AG