ISO 9001:2015 / ATEX

ASSURIX Intrinsically Safe Photoelectronic Sensors

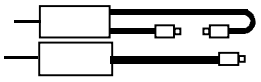
3-wire construction

Operating Manual and Control Drawing No. OM-AX-01

CE 1258 CLASSIFIED UL 24VL

Ex II 2 G Ex ia IIC T6 Gb

- For use in CL I, CL II, CL III, Division 1, GR ABCDEFG, HAZARDOUS LOCATIONS.
- For use in ATEX Ex Zones 1, 2
- Type of Ex protection: Intrinsically safe II 2 G Ex ia IIC T6 Gb.
- CLASSIFIED BY UNDERWRITER'S LABORATORIES INC. ASSIGNED CONTROL No. 24VL.
- ATEX Certification no. DMT 03 ATEX E003

Types / Technical Data	Light Barriers		Proximity Switch		Retroreflective Barriers	
Type of Ex protection	II 2 G Ex ia IIC T6 Gb, according to the ATEX directive 2014/34/EU					
Designation	AX-SE-25-P18 AX-SE-25-P30	AX-SE-50-P30	AX-T-5-P18 AX-T-5-P30	AX-T-10-P18 AX-T-10-P30	AX-R-1-P18	AX-R-4-P30
Type	S:Emitter / E: Receiver		T: Proximity switch		R: Retroreflective barrier	
Range	25m	50m	0.5m Note1	1m Note1	1m Note2	4m Note2
Housing (Yellow brass, nickel plated)	...-P18 = M18 ...-P30=M30	M30	...-P18=M18 ...-P30=M30	...-P18=M18 ...-P30=M30	M18	M30
Light source, wave length	870nm				623nm	
Optical aperture angle	appr. 17° (emitter)		appr. 30°		appr. 17°	
Nominal supply voltage	12VDC (intrinsically safe)					
Current consumption	13mA	13mA	15mA	15mA	15mA	15mA
Safety ratings	Vi <=13.6VDC / Ii <= 120mA /Pi <= 800mW (in accordance with the power supply)					
Effective capacity / inductance	Ci = 150pF / Li = 7.92uH					
Response	50Hz	50Hz	100Hz	100Hz	100Hz	100Hz
Output	PNP, short circuit protected					
Operating temperature range T_{amb}	-20°C < T_{amb} < +60°C					
Enclosure rating	IP 66, NEMA 4 & NEMA 4X					
Mean Time to Failure MTTF	407 Years					
Cable, Length: 3m, shielded, blue covered	Emitter: 2 x AWG24 Receiver: 3 x AWG24		3 x AWG24		3 x AWG24	
Fibre optics connection	--				--	
Accessories	M18: 4 nuts M18 M30: 4 nuts M30		M18: 2 nuts M18 M30: 2 nuts M30		2 nuts M18	2 nuts M30

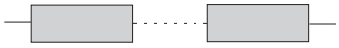
Accessories, not included Options

- Reflector (triple mirror for retroreflective barriers), D=40mm, 50mm or 83mm

- AX-..-.. / **1kHz**:	Sensors with a switching frequency of 1kHz
- AX-SE-**10**-P18:	Light barrier with 10kHz switching frequency
- AX-SE-**100**-P30:	Light barrier with a range of 100m
- AX-SE-56-P30-**GF**:	Light barriers for fibre optics, high density
- AX-SE-25/50-P30-**GF**:	Light barriers for fibre optics
- AX-R-1-P18/90°:	Device with 90° viewing angle
- AX-T-5/10-P30-**NPN**:	With NPN output
- AX-S/E-..-P30-**S017:**	Light barriers with socket M18. Binder series 714, 4 terminals, housing M30, LED inside the socket for receiver and emitter (I=13mA)
- AX-.-P18-**S096:**	Housing M18, socket M12 /5P at cable, length 10cm, with LED
- AX-.-P30-**S099**:	Housing M30, socket M12/ 5P, with LED
- AX-R-..-**S171**:	Retroreflective barriers with potentiometer for fine adjustement
- AX-R-4-P30-**S172**:	Retroreflective barriers M30, socket M12 and potentiometer
- AX-SE-25-P18-**S199**:	Range: 100m, housing M18
- AX-T-5/10-P18-**S201**:	For applications with fibre optics
- AX-.-..-P..-**S224**:	Stainless steel housing 1.4404 / 316L

Function and LED indication

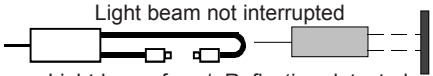
Light barriers



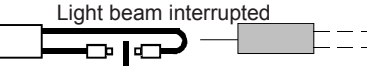
Light beam not interrupted

Light beam interrupted

Proximity switch

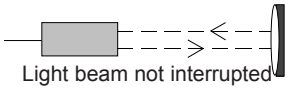


Light beam free / Reflection detected

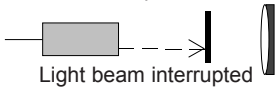


Light beam interrupted / no reflection

Retroreflective barriers

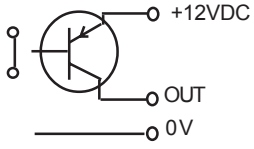


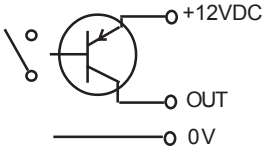
Light beam not interrupted
LED = ON



Light beam interrupted
LED = OFF

Output function:
Inverted output function by changing the polarity of the supply voltage.

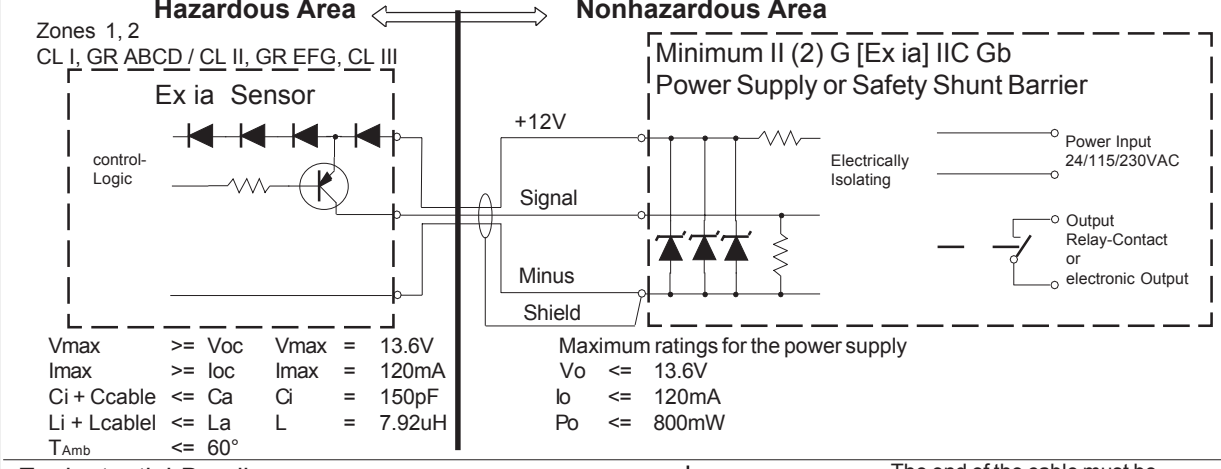




Connection diagram:	Devices with	Socket S017: cable connection:	Socket S096/S099: (Pin 2: Not connected)
+12VDC	Brown	Pin 1	Pin 1 / brown
0V:	Black	Pin 3	Pin 3 / blue
Output:	Red	Pin 2	Pin 4 / black
Protection earth PA/PE	At the housing	Pin 4	Pin 5 / grey
Cable shield	Blank or white	--	--

Note 1: Range on white paper 30cm x 20cm. Note 2: Range on reflector (triple mirror), D=83mm

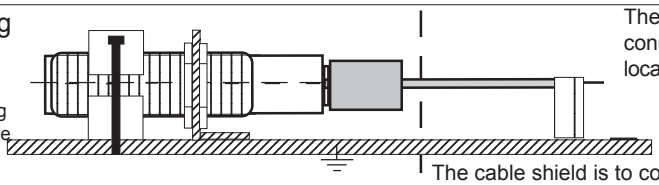
Control Drawing for Hazardous Areas:



Vmax	>=	Voc	Vmax	=	13.6V	Maximum ratings for the power supply	
Imax	>=	Ioc	Imax	=	120mA	Vo	<= 13.6V
Ci + Ccable	<=	Ca	Ci	=	150pF	Io	<= 120mA
Li + Lcablel	<=	La	L	=	7.92uH	Po	<= 800mW
T_{Amb}	<=	60°					

Equipotential Bonding prescription:

The local equipotential bonding have to be done with conductive corrosion-resistant clamps or nuts M18/M30



The end of the cable must be connected outside the hazardous location.

The cable shield is to connect at PE.

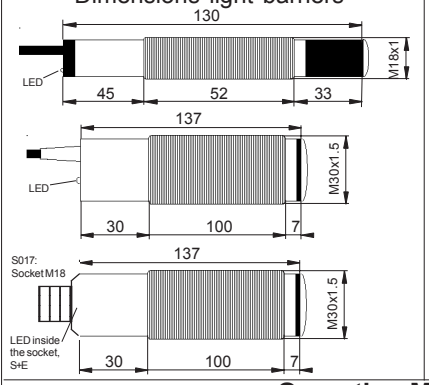
ATEX related designations

CE 1258 | Ⓔx II 2 G Ex ia IIC T6 Gb | EC-Certification number: DMT 03 ATEX E 003 DEKRA

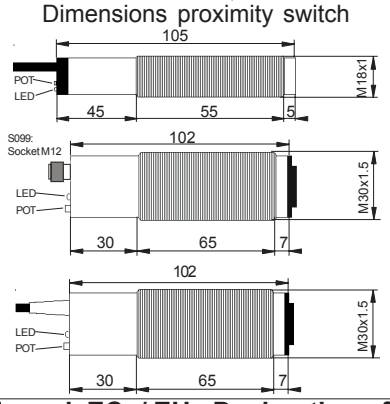
Manufacturer with address | T_{amb}: -20°C < T_{amb} < +60°C | Electrical data according to the chart

Date of production: | Numeral 5 to 8 of the serial number (Year/Calendar week)

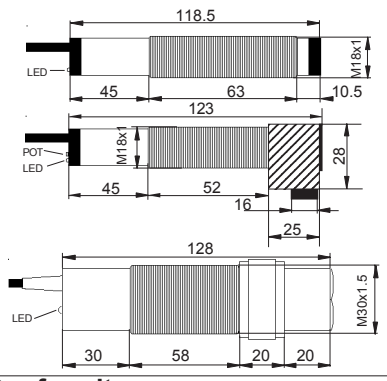
Dimensions light barriers



Dimensions proximity switch



Dimensions retroreflective barriers



Operating Manual, EC- / EU - Declaration of Conformity:

Mounting prescriptions:

Ex-Protection

It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). The electrical connections must be exactly as shown in the control drawing for hazardous areas. The local equipotential bonding have to be done by a reliable, noncorrosive holding of the protection earth connection. The cable must be protected against damages. To connect cables inside the hazardous locations, only use certificated Ex housings. Only original manufacture optical parts must be used . Other additional optical lenses or fibre optics are not allowed in hazardous locations. The sensor must only be supplied by an approved intrinsically safe power supply or safety shunt barrier with the minimum specification II (2) G [Ex ia] IIC Gb, mounted out of the hazardous location. Connector versions: The maximum rates of capacity and inductance of the connection cable must be respected.

Function

Light barriers: If the light beam is not interrupted the output switches to ON (+12V). If the light beam is interrupted the output switches to OFF. The load must be connected between the output and 0V.

Proximity Switches: If the sensor detects reflected light, by any object, the output is switching ON (H-Level). If the sensor detects no reflected light, the output is switched OFF.

Retroreflective light barriers: If the light beam the sensor and the reflector, is not interrupted the output switches to ON (+12V). If the light beam is interrupted the output switches to OFF. The load must be connected between the output and 0V.

Output-Mode (X-Function): By changing the polarity of the supply voltage, the output mode will be reversed. The LED function will remain unchanged.

Maintenance

No special maintenance is required. Cleaning only with a non-aggressive cleaning liquid. Equipment must only be repaired by the manufacturer.

Fibre optics

For efficiently detection solutions look for our multiple program of fibre optics, also for high temperature areas.

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.

Safety Informations

The sensors of the series AX-** must not be used for Accident-Prevention! 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, UL508, UL913 Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, II, III Division 1, Hazardous (Classified) Locations. There is no risk on eye injuries by the diode emitters. The maximum possible exposure is less then the ratings described by the standard EN 60825-1/item 13).

UL/EU-Declaration of Conformity / Approvals:

We, Matrix Elektronik AG, declare under our sole responsability that the product family OM-AX-01 with the certificate DMT 03 ATEX E003(0158) complies with the requirements of Directives 2014/34/EU, UL913, 2014/30/EU, 2006/42/EC and 2011/65/EU and meets the following standards: UL 913, UL 508, EN/IEC 60079-0:2018, EN 60079-11:2012, EN 60825-1:2014, EN 60529:2014, EN 60950-1:2006, EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2 and EN 61000-6-4. One or more of the standards mentioned in the associated EU type-examination certificate DMT 03 ATEX E003 have already been replaced by new editions. The manufacturer also declares that the product family OM-AX-01 complies with the requirements of the new editions of the standards, since the amended requirements of the new editions of the standards are not relevant for this product. The above listed product is produced under a quality schema with certification No: SEV 21 ATEX 4580, Eurofins, NB:1258 in conformity with ISO 9001:2015 requirements.

Pablo Ledergerber, Matrix Elektronik AG

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