

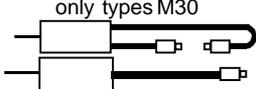
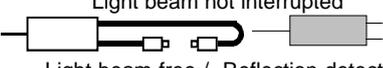
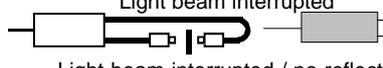
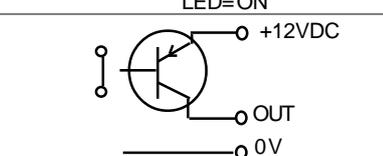
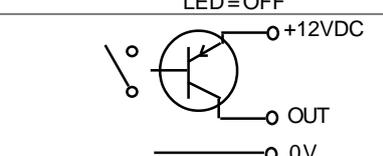
ASSURIX Intrinsically Safe Photoelectronic Sensors

3-wire construction

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



- Applicable in CL I, CL II, CL III, Division 1, GR ABCDEFG, HAZARDOUS LOCATIONS.
- Applicable 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 DMT 03 ATEX E003

Types	Light Barriers	Proximity Switch	Retroreflective Barriers
Technical Data			
Type of Ex protection	II 2 G Ex ia IIC T6 Gb		
Designation	AX-SE-25-P18 AX-SE-25-P30	AX-SE-50-P30	AX-T-5-P18 AX-T-10-P18 AX-T-10-P30
Type	S: Emitter / E: Receiver		R: Retroreflective barrier
Range	25m	50m	1m Note1 4m Note2
Housing (Yellow brass, nickel plated)	...-P18 = M18 ...-P30 = M30	M30	...-P18 = M18 ...-P30 = M30
Light source, wave length	870nm		623nm
Nominal supply voltage	12VDC (intrinsically safe)		
Current consumption	13mA	13mA	15mA
Safety ratings	$V_i \leq 13.6VDC / I_i \leq 120mA / P_i \leq 800mW$ (in accordance with the power supply)		
Effective capacity / inductance	$C_i = 150pF / L_i = 7.92uH$		
Response	50Hz	50Hz	100Hz
Output	PNP, short circuit protected		
Operating temperature range T_{Amb}	$-20^\circ C < T_{Amb} < +60^\circ C$		
Enclosure rating	IP 66, NEMA 4 & NEMA 4X		
Cable, Length: 3m, shielded, blue covered	Emitter: 2 x AWG24 Receiver: 3 x AWG24	3 x AWG24	3 x AWG24
Fibre optics connection	--	only types M30 	--
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	- Reflector (triple mirror for retroreflective barriers), $D=40mm, 50mm$ or $83mm$		
Options	- 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 - AX-...-P30- S099 : Retroreflective barriers with potentiometer for fine adjustment - 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	Proximity switch	Retroreflective barriers
			
			
	LED=ON	LED=OFF	LED=OFF
Output function: Inverted output function by changing the polarity of the supply voltage.			
Connection diagram:	Devices with cable connection:	Socket S017:	Socket 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:

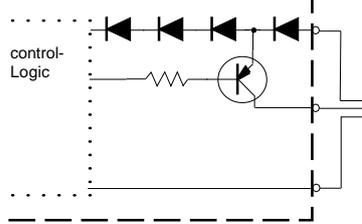
Hazardous Area

Nonhazardous Area

Zones 1, 2

CL I, GR ABCD / CL II, GR EFG, CL III

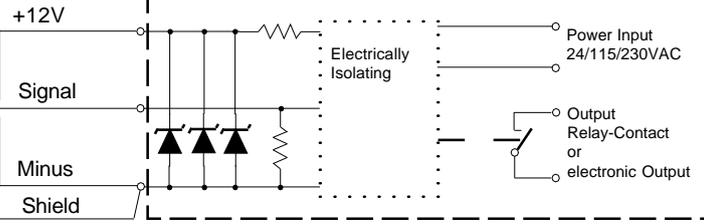
Ex ia Sensor



$V_{max} \geq V_{oc}$ $V_{max} = 13.6V$
 $I_{max} \geq I_{oc}$ $I_{max} = 120mA$
 $C_i + C_{cable} \leq C_a$ $C_i = 150pF$
 $L_i + L_{cable} \leq L_a$ $L = 7.92uH$
 $T_{Amb} \leq 60^\circ$

Minimum II (2) G [Ex ia] IIC Gb

Power Supply or Safety Shunt Barrier

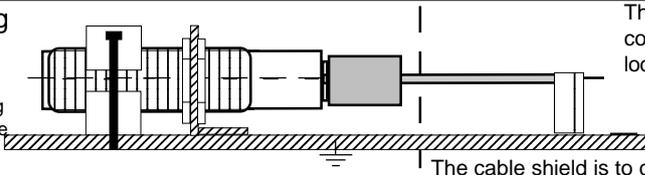


Maximum ratings for the power supply

$V_o \leq 13.6V$
 $I_o \leq 120mA$
 $P_o \leq 800mW$

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 0158

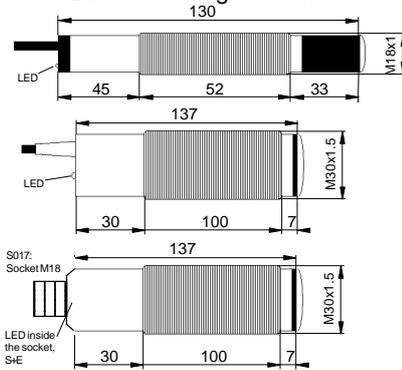
Ex II 2 G Ex ia IIC T6 Gb

EC-Certification number: DMT 03 ATEX E 003 DEKRA

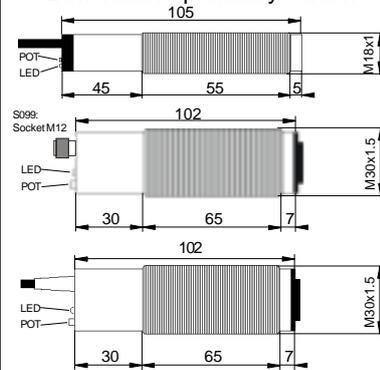
Manufacturer with address $T_{amb}: -20^\circ C < T_{amb} < +60^\circ C$ Electrical data according to the chart

Date of production: Numeral 5 to 8 of the serial number (Year/Week)

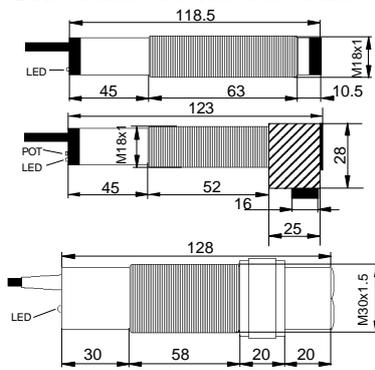
Dimensions light barriers



Dimensions proximity switch



Dimensions retroreflective barriers



Operating Manual / EC - 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

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, ATEX 118a, 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/EC-Declaration of Conformity / Approvals:

ATEX: DMT 03 ATEX E 003, DEKRA.

UL-Classified, Assigned Control No. 24VL / E185916.

The sensors are conform to the following standards:

UL 913, UL 508, EN 60079-0:2009, EN 60079-11:2007

EN 60825-1:2007; N 60529:2000, EN 60950-1:2006;

EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4.

Ex protection: 94/9/EC, UL 913. EMC: 2004/108/EC. Machine

directive: 2006/42/EC. RoHS: 2011/65/EU

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/UL standards and

directives and the EC/UL-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

OM_AX_01_e30/2014-03-06/HB

Tippkemper - Matrix GmbH
 Meegerer 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