

# ASSURIX Intrinsically Safe Photoelectronic Sensors

## NAMUR types

### Operating Manual and Control Drawing No. OM-AX-02



- 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 2G Ex ia IIC T6 Gb.
- CLASSIFIED BY UNDERWRITER'S LABORATORIES INC. ASSIGNED CONTROL No. 24VL.
- ATEX Certification DMT 03 ATEX E003

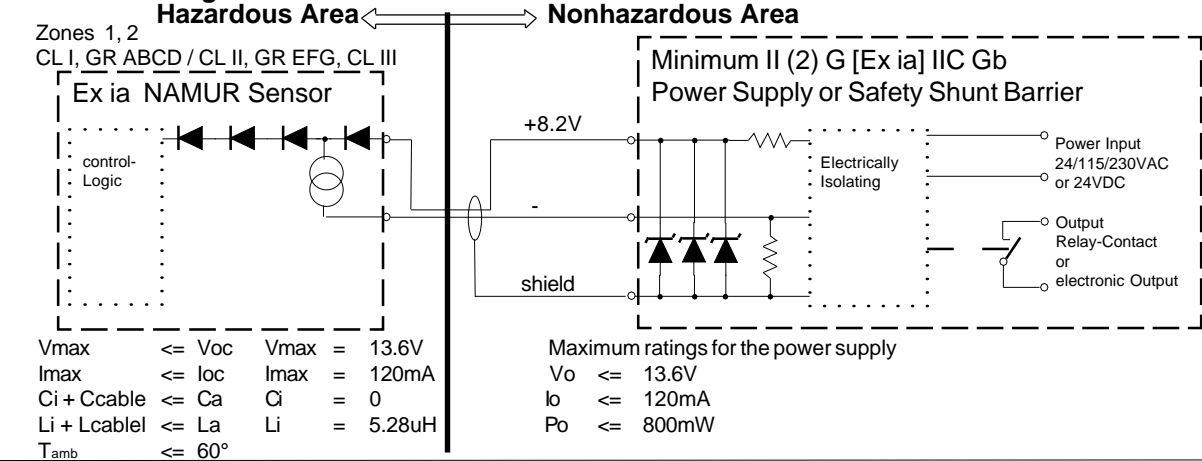
Types	Light Barriers	Proximity Switch	Retroreflective Barriers
<b>Technical Data</b>			
Type of Ex protection	II 2 G Ex ia IIC T6 Gb		
Designation	AX-SE-10N-N18	AX-SE-10P-N18	AX-T-3N-N18   AX-T-3P-N18 AX-T-3N-N30   AX-T-3P-N30
Type	S: Emitter / E: Receiver		T: Proximity switch R: Retroreflective barrier
Range	10m	10m	0.3m <sup>Note1</sup>   0.3m <sup>Note1</sup>   1m <sup>Note2</sup>   1m <sup>Note2</sup>
Housing (Yellow brass, nickel plated)	M18	M18	...-N18=M18   ...-P18=M18 ...-N30=M30   ...-P30=M30
Light source, wave length	870nm		623nm
Nominal supply voltage	8.2VDC (intrinsically safe)		
Current consumption	3.5mA	3.5mA	2.5mA   2.5mA   2.5mA   2.5mA
Safety ratings	U <sub>i</sub> <= 13.6VDC / I <sub>i</sub> <= 120mA / P <sub>i</sub> <= 800mW (in accordance with the power supply)		
Effective capacity / inductance	C <sub>i</sub> = 0pF / L <sub>i</sub> = 5.28uH		
Response time	25Hz	25Hz	100Hz   100Hz   100Hz   100Hz
Output	no output, status indication by current consumption (NAMUR specification)		
Operating temperature T <sub>amb</sub>	-20°C < T <sub>amb</sub> < +60°C		
Enclosure rating, at EN 60529	IP65		
Cable, Length: 2m, shielded, blue covered	Emitter: 2 x AWG24 Receiver: 2 x AWG24	2 x AWG24   2 x AWG24	
Fibre optics connection	--	only types M30 and *-S205 	
Accessories, included	4 nuts M18 (2 clamps M18, optional)	2 nuts M18/M30 (1 clamp M18/M30, optional)   2 nuts M18 (1 clamp M18, optional)	
Accessories, not included	- Reflector (triple mirror for retroreflective barriers), D=40mm, 50mm or 83mm		
Options	- AX-R-1N/1P-N18-90°: Device with 90° viewing angle. - AX-R-0.1N-N18: Retroreflective light barrier, range=3cm .. 10cm, housing M18. - AX-R-4N/4P-N30: Retroreflective light barrier, range=4m, housing M30. - AX-T-1*-N30: Proximity switch, range=10cm, switching frequency= 1kHz. - AX-T-2*-N30: Proximity switch, range=20cm, switching frequency= 700Hz. - AX-S-10-N18-S009: Light barrier emitter with adjustable optical output power. - AX-R-1N/1P-N18-S087: Retroreflective light barrier with potentiometer 90° viewing angle, cable length = 5m. - AX-R-1P-N18-90°-S096: Housing M18, socket M12 (5P) at cable, length 10cm, with LED. - AX-***-S099: Housing M30, socket M12 Lumberg RSF 5 (5P), with LED, proximity switch and *-S171 with potentiometer. - AX-T-3N/P-N18/30S146: Output function determined by polarity of the supply voltage. - AX-R-**-S171: Retroreflective light barrier with adjustable optical output power. - AX-R-4N/4P-N30-S172: Retroreflective light barrier, range=4m, housing M30, with potentiometer, LED and socket M12 (5 pins) - AX-R-1P-N18-90°-S196: Housing M18, socket M12 (5P) at cable, length 25cm, with LED. Minimum working range: 20mm, with deflector 90°. - AX-T-3N/P-N18-S205: For applications with fibre optics. - AX-R-1P-N18-S216: Working range 0mm - 1m, range with deflector U-90-M18-40: 0mm - 0.5m. socket M12 (5P) at cable, length 25cm, with LED, housing length: 138mm. - AX-R-1P-N18-S255: Housing M18, socket M12 (5P) at cable, length 25cm, with LED. - AX-R-1P-N18-S256: Same as AX-R-1P-N18-S255, with extended optical range: 1.8m		
Function and LED indication	Light barriers		
	Proximity switch		
	Retroreflective barriers		
Function and LED indication	Sensors Type "N"		
	Sensors Type "P"		
	Sensors Type "N"		
	Sensors Type "P"		

OM-AX-02\_e27/2015-06-29/HB

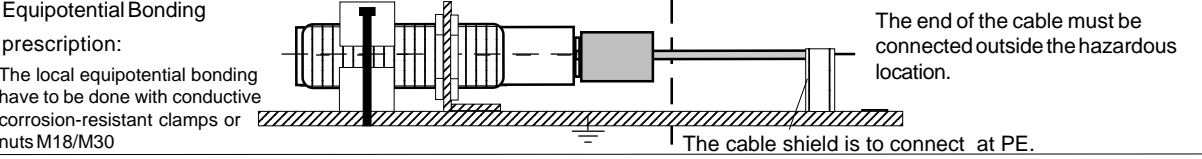
Note 1: Range on white paper 30cm x 20cm.

Note 2: Range on reflector (Triple mirror) D=83mm

# Control Drawing for Hazardous Areas:



Wiring:	Function	Cable type 1	Cable type 2	*-S096/S196/S255: socket M12 at cable 10/25cm	*-S099: socket M12
(cable shield , connect to PE)	+8.2V	brown	brown	Pin 1 (br)	Pin 1 (br)
		black	blue	Pin 3 (bl)	Pin 2,4 = NC
	PE	at the housing	at the housing	Pin 5 (gr)	Pin 3 (bl)
					Pin 5 (gr)

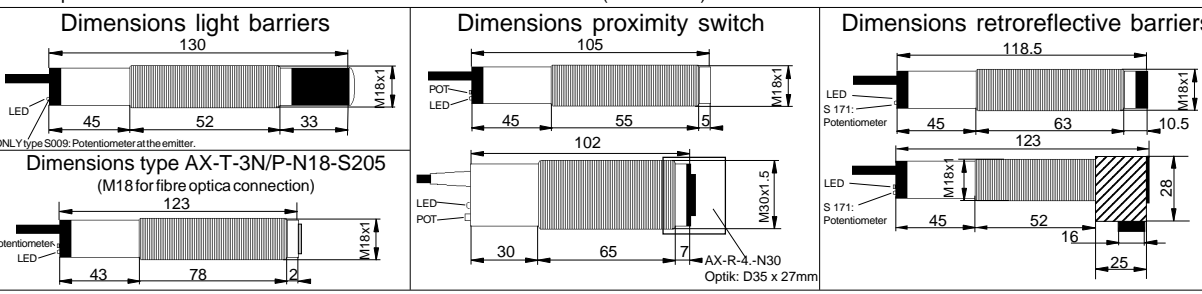


**ATEX related designations**

CE 0158 II 2G Ex ia IIC T6 Gb 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: Numerals 5 to 8 of the serial number (Year/Week)



## 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 e 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 and retroreflective light barriers "N" types:** When the light beam is not interrupted the current consumption will be  $\geq 2mA$  and the LED lights up. When the light beam is interrupted the current consumption is reduced to  $\leq 1mA$  and the LED switches OFF.

**Light barriers and retroreflective light barriers "P" types:** If the light beam is not interrupted the current consumption will be  $\leq 1mA$  and the LED switches OFF. When the light beam is interrupted the current consumption is increased to  $\geq 2mA$  and the LED lights up.

**Proximity Switches "N" types:** When the sensor detects diffused reflected light, the current consumption will be  $\geq 2mA$  and the LED lights up. When no light will be detected the current consumption is reduced to  $\leq 1mA$  and the LED switches OFF.

**Proximity Switches "P" types:** When the sensor detects diffused reflected light, the current consumption will be  $\leq 1mA$  and the LED switches OFF. When no light will be detected the current consumption is increased to  $\geq 2mA$  and the LED lights up.

**Proximity Switches types "-S146":**

With selectable output mode (X-Function). By changing the polarity of the supply voltage, the output mode will be reversed. On standard connection the current consumption will be  $\geq 2mA$ , when the sensor

detects diffuse reflected light. The supply voltage must be minimum 11VDC to maximum 13.6VDC.

**Maintenance, General Notes, Disposal**

No special maintenance is required. Cleaning only with a non-aggressive cleaning liquid. 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 aeries 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, ATEX118a, 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). Equipment must only be repaired or serviced by the manufacturer.

**UL/EC-Declaration of Conformity / Approvals:**

ATEX EC-Certification No. DMT 03 ATEX E 003.  
UL-Classified, Assigned Control No. 24VL / E185916.  
The sensors are conform to the following standards:  
UL 913, UL 508, EN 60079-0:2009, EN 60079-11:2012  
EN 60825-1:2007; N 60529:2014, EN 60950-1:2006;  
EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4.  
ATEX directive: 94/9/EC, UL 913. EMC directive: 2004/108/EC.  
Machine directive: 2006/42/EG. RoHS directive: 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:

OM-AX-02\_e27/2015-06-29/HB

Hans Bracher, Matrix Elektronik AG

**Tippekemper - Matrix GmbH**  
Meesener Str. 43 D-51491 Overath  
Tel.: +49 2206 9566-0 Fax -19  
info@tippekemper-matrix.com

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