

Operating Instructions for ATEX sensors series D121 an D12P

1. INTRODUCTION

ATEX magnetic sensors are a series of devices suitable for monitoring the presence or absence of a permanent magnet within the functioning area of the sensor itself. This permanent magnet is generally fixed to a structure or to a moving object whose presence is determined by the sensor. The sensors described in this manual are suitable for use in areas with a potentially explosive atmosphere and in particular in:

Zone 2 and 22 and Category 3G and 3D in accordance with the directive: 2014/34/UE (94/9/CE) and according to the regulations:

EN 60079-0 - Explosive atmospheres - Part 0: Equipment - General requirements

EN 60079-18 - Explosive atmospheres - Part 18: Equipment protection by encapsulation "m"

All the sensors indicated in this manual are covered by the EU Type Certificate n° IMQ 16 ATEX 023 X issued by the notified body IMQ SpA.

2. INSTALLATION and COMMISSIONING

The manufacturer of the machine, or the installer, is responsible for a correct and safe installation. Electrical connections must be carried out by authorized and qualified personnel trained in compliance with EN60079-14 and EN60079-17.

- The sensor connection cable must not be extended or joined in any way.
- The sensors must be connected to a suitable electrical load which, in any case, exceeds the maximum electrical values allowed (see table 4.3).
- It is necessary to install an external protection fuse in series with the contact; value is indicated in table 4.3.
- The sensors with metal body must be installed so that the housing is equipotential with the earth of the electrical system. For this purpose it is possible to connect to the 6.3x0.8 mm male faston terminal on the ground washer supplied. This connection must be made using a special anti-loosening safety terminal (e.g.: manufacturer INARCA S.p.A. mod. INARSAFETY 6.3 cod.0011364xxx or similar). The minimum section of the earth wire to be used is 2.5 mm² and the wire must be first crimped and then soldered to the safety terminal.
- The Sensors and Magnets must not be used as a mechanical stop and in any case must they come into direct contact with moving parts.
- During installation, care must be taken not to cause impacts or mechanical shocks to the sensor because this could lead to malfunctions. If a sensor is failed or subjected to a strong impact during installation, segregate the switch and abort the installation.
- If the Sensors and Magnets are mounted on a ferromagnetic material, the activation distance is reduced or there may be cases of false activations due to unwanted magnetization of the ferromagnetic metal parts surrounding the sensor.

Warranty coverage is voided in the following conditions:

- If these instructions are not followed.
- Non-compliance with safety regulations.
- Installation and electrical connection not carried out by authorized personnel or do not comply with the requirements of this manual.
- Missed checks and maintenance.

2.1. SERVICE and INSPECTION

In order to assure the correct functioning in time it's necessary to remove iron swarf from the sensors and magnets at regular intervals.

If it's necessary to clean the sensor housing, avoid accumulating electrostatic charges on the plastic, using a damp cloth and solvents-free detergents.

In any way, avoid the rubbing of the plastic housing of the sensor with non-conductive materials.

Regularly check cables and electrical connections and check the Insulation Integrity; carry out these operations in accordance with EN60079-17.

3. MODELS IDENTIFICATION

This manual apply for sensors models codes: D121 and D12P.

For complete code identification, please refer to the codification diagram reported below in this manual.

3.1 CODIFICATION DIAGRAM for SENSORS "D121" and "D12P"

D121 1BUL Z200B0EX

Series and Shape:
Threaded M12x1

Housing Variant:
1 = Housing lenght 35 mm
P = Plastic housing

Reed contact type: 1B/BB = N.O. (SPST)

Cable type:
UL= UL cable 2xAWG20 PVC
UP= UL cable 2xAWG22 PUR

Encapsulation:
Z = Potting IP67

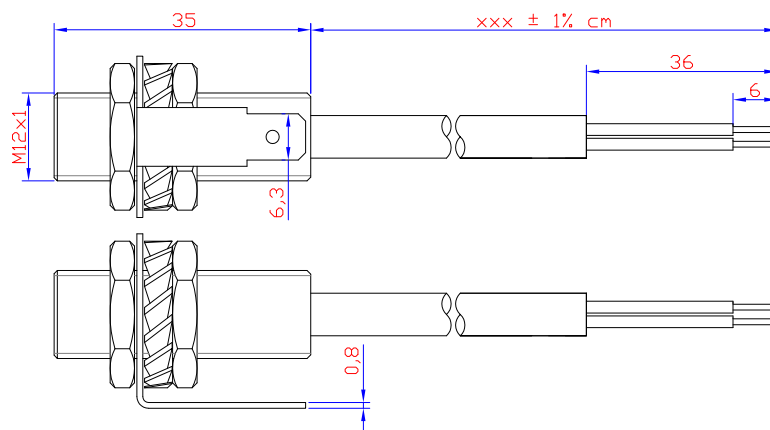
Cable lenght [cm] (three digits) or [m] (two digits followed by "M")

Housing Material Variant: B = Nickel coated brass; X = AISI 316L; P= PA6 30% G.F.

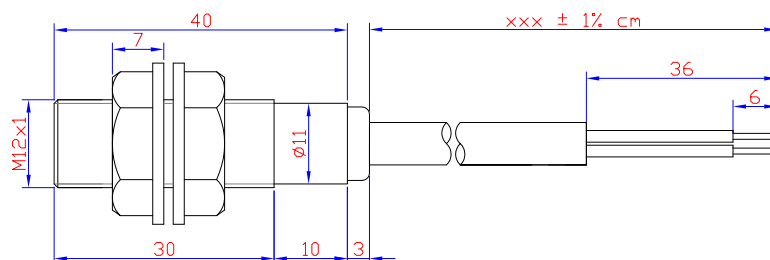
Cable end:
0 = Unsheathed cable and stripped conductors; P=Ferrule; A...Y = Others Terminations

EX = ATEX construction

4.1. MECHANICAL FEATURES of MAGNETIC SENSOR code: D121



4.2. MECHANICAL FEATURES of MAGNETIC SENSOR code: D12P



4.3. D121 and D12P SENSOR TECHNICAL DATA

Parameter	Value
Housing Material	D121: OT58 CW614N (EN 12164) or AISI316L 1.4404 (EN 10088) D12P: PA6 30% glass fiber
Accessory Material	NUTS D121: OT58 CW614N (EN 12164) or AISI316L 1.4404 (EN 10088) NUTS D12P: PA6 30% glass fiber WASHERS and GROUND TERMINAL: AISI 304 1.4301 (EN 10088)
Ambient Temperature (Ta)	-20°C ... +70 °C
Protection Degree	IP 67 (EN 60529)
Maximum Switching Voltage	200V DC / 250V AC
Maximum Switching Current	0,5A
Minimum operational current	5 mA (suggested)
OFF-state current	0,0 A
Maximum resistance at closed contact	1,5 Ω
Rated imp. withstand voltage	2,5 kV AC
External Fuse	800 mA minimum breaking capacity: 80A
Max. switching frequency	50 Hz
Repeatability accuracy	0,2 mm
Mechanical Life	100x10 ⁶ cycles
Vibration resistance	Displacement: 0,35 mm / Frequency: 10÷55 Hz
Shock resistance	Amplitude: 30 g (peak) / Duration: 11 ms


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5.0 ATEX MARKING of SENSORS D121 and D12P


ATEX magnetic Sensors series "D121" and "D12P" are marked as follow:

CE  II 3G Ex mc IIC T6 Gc X
II 3D Ex mc IIIC T75°C Dc

5.1 ATEX MARKING MEANING for USE with GAS (G)

CE		II	3G	Ex	mc	IIC	T6	Gc	X
Mark for use In a potentially explosive atmosphere									
Equipment GROUP: II: Equipment for Surface Installation									
Equipment CATEGORY: 3: Normal Protection (zone 2) G: Gas Vapours									
LEVEL of PROTECTION : mc: Encapsulation									
GAS GROUP: IIC: Hydrogen, Acetylene									
TEMPERATURE Classification: T6: Maximum Surface Temperature=85°C									
LEVEL of PROTECTION (EPL): Gc: Increased									
ADDITIONAL CONDITIONS: X: Special conditions of use must be observed									

5.2 ATEX MARKING MEANING for USE with DUST (D)

CE		II	3D	Ex	mc	IIIC	T75°C	Dc
Mark for use in a potentially explosive atmosphere								
Equipment GROUP: II: Equipment for Surface Installation								
Equipment CATEGORY: 3: Normal Protection (zone 2) D: Dusts								
LEVEL of PROTECTION : mc: Encapsulation								
DUSTS GROUPS: IIIC: Conductive Dust								
MAXIMUM SURFACE TEMPERATURE [°C]: 75°C								
LEVEL of PROTECTION (EPL): Dc: Increased								

6.0 CONDITIONS of USE In POTENTIALLY EXPLOSIVE AREA

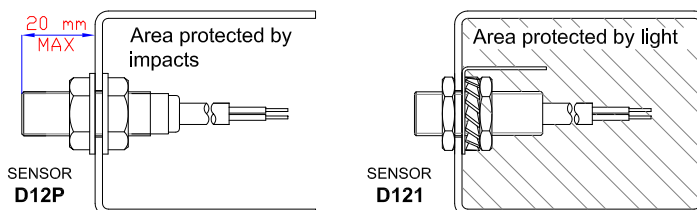
ATEX magnetic sensors must be used in a potentially explosive area in an ambient temperature range between: $-20^{\circ}\text{C} < T_a < +70^{\circ}\text{C}$

6.1 SPECIAL CONDITIONS of USE (X)

The D121 series magnetic sensors must be mounted so that the area where the cable exits the metal body is not exposed to UV radiation from visible light (see example drawing).

The D12P series magnetic sensors must be mounted in such a way as to protect the body from direct impacts if the installation leaves an exposed portion of the housing greater than 20 mm (see example drawing).

Devices used to provide protection against impact and/or light must be removable only by the use of a tool and must remain in place during normal operation.



In case of doubts or doubts about the installation of the sensors object of this manual, contact the technical office STEM S.r.l.