

SAFETY MAGNETIC SENSORS SMP1 series



1. TECHNICAL CHARACTERISTICS

a. Mechanical characteristics

Operating temperature	-25 ... +80 °C
IP Rating	IP67
Pollution degree	3
Shock resistance	30 gn; 11 ms according to EN 60068-2-27
Vibrations resistance	10 gn; (10...150 Hz) EN 60068-2-6
Type of connection	PVC cable 4 x 0,25 mm ² or 6 x 0,25mm ² M8 or M12 connector.
Housing material	PBT+PV

b. Electrical characteristics

Rated operational voltage U_e	24 Vac/dc
Rated operational current I_e	0,25 A (resistive load)
Max switching load	6 W (resistive load)
Thermal current I_{th}	0,25 A
Rated insulation voltage U_i	120 Vac (with cable) 60 Vac / 75 Vdc (with M8 connector) 120 Vac (with 4 poles M12 connector) 30 Vac / 36 Vdc (with 8 poles M12 conn.)

Rated impulse withstand voltage U_{imp}	6 KV / 1,5 KV (with connector)
Electrical endurance	1 million operation cycles
Protection fuse	0,25 A tipo F

c. Actuating characteristics

Assured operating distance Sao	5 mm with actuator SMP1AMG
Assured release distance Sar	15 mm with actuator SMP1AMG
Repeat accuracy	≤ 10%
Frequency of operating cycles	200 Hz
Response time	< 10 ms
Distance between two sensors	Min. 50 mm

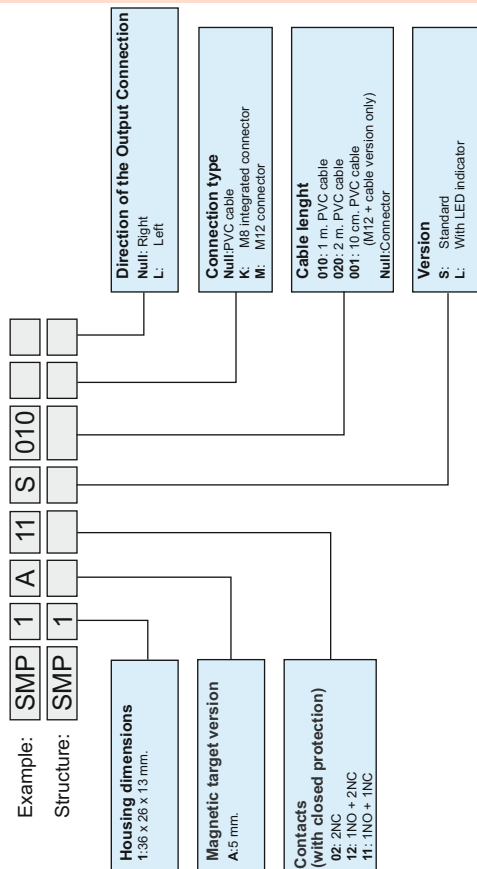
d. Safety characteristics and approvals

SIL level (SIL CL)	Up to according to EN 62061 ⁽¹⁾
Performance Level (PL)	PL e according to EN ISO 13849-1 ⁽¹⁾
Safety category	Up to 4 according to EN ISO 13849-1 ⁽¹⁾
B10d for each channel	400.000 operations (full load) Mechanical endurance 20 millions operations
Conforms to the standards	EN 60947-1, EN 60947-5-1, EN 60947-5-2, EN 60947-5-3 ⁽¹⁾ , EN 60529, EN ISO 14119, EN ISO 12100-1, EN ISO 12100-2, EN ISO 13849-1, EN ISO 13849-2, EN 60204-1

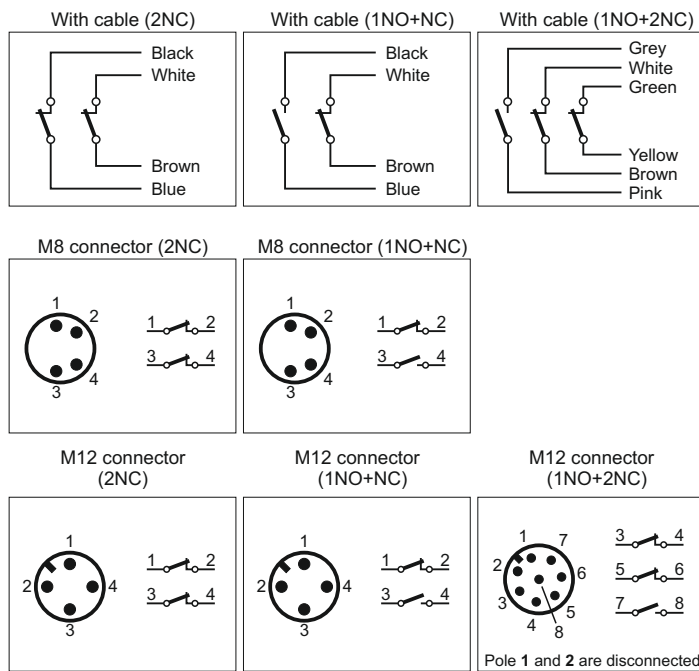
Conforms to the directives	2006 / 42 / CE 2004 / 108 / CE	Machinery directive Electromagnetic compatibility directive
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⁽¹⁾ Connecting a single sensor to the safety module COMEPI MS1A31- * series.

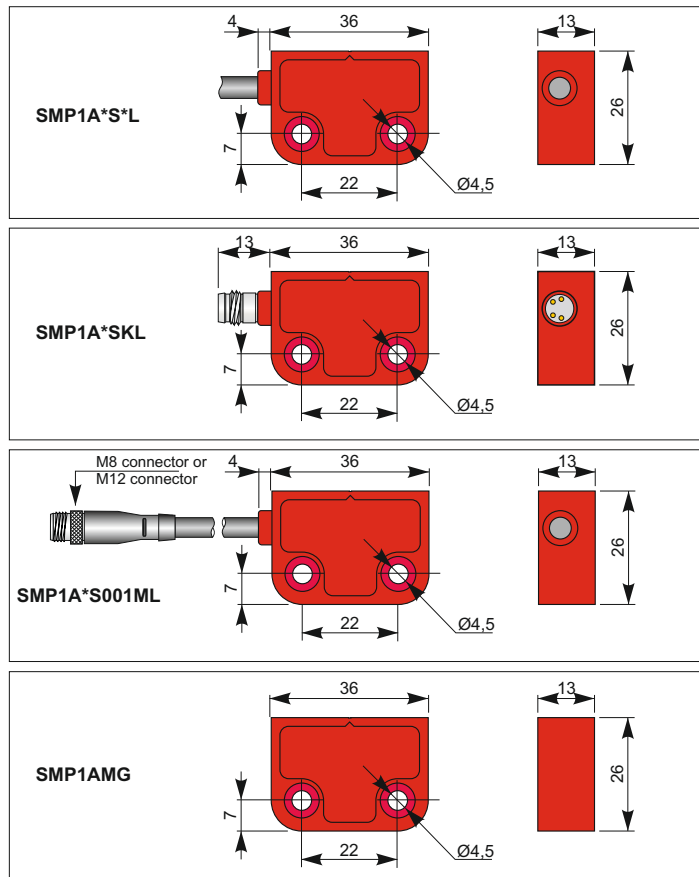
2. DESCRIPTION DIAGRAM



3. WIRING DIAGRAMS



4. MECHANICAL DIMENSIONS



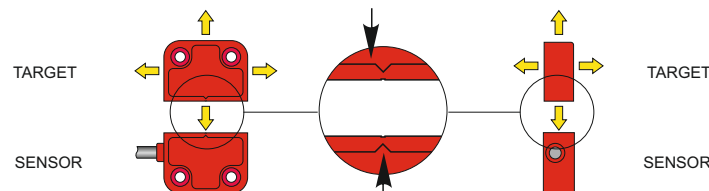
These drawings refer to the sensors with connector or cable exit placed to the left. The models with connection exit placed to the right are mirrored and have the same dimensions..

5. INSTALLATION INSTRUCTIONS

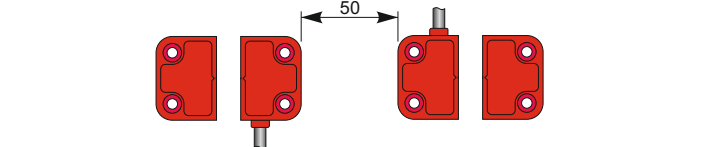
a. Sensor and actuator fixing

- Use non-magnetic screw only.
- Fasten the screws with a max tightening torque between 0,8 ... 2 Nm.
- Fasten steadfastly the sensor and the actuator to the safety device (by means of rivets, tamper-proof screws, etc.).
- Fasten the sensor on plane surfaces only, in order to avoid possible distortions that could damage the sensor or alter switching distances.
- To activate the safety sensors it is necessary to use the proper coded actuator. Conventional magnets cannot be used.
- The sensor and actuator central reference marks must be opposed (see 5.b).

b. Sensor and actuator fixing



c. Multiple sensor-actuator systems assembly



The minimum mounting gap between sensor-actuator systems must be at least 50 mm.

d. Warning during and after the installation

- The installation must be performed by qualified staff only.
- Before installation and at regular intervals, check the right contacts switching and system operation of the sensor and associated safety module.
- Do not use a hammer for adjustment.
- Do not use the sensor as a mechanical stop.
- Verify the assured operating (Sao) and release distances (Sar).
- It is advisable to make adjustments observing the diagram reported in the switching distances section (see 6.b).
- Do not install the sensor and actuator on strong magnetic field.
- Keep away from iron filing.

e. Shock, vibrations and wear

- Do avoid impact with sensor. Excessive shock and vibrations cannot guarantee the proper sensor functioning.
- The actuator must not strike the sensor.
- In case of damages or wear it is necessary to change the whole device, including the actuator.
- The sensor and the actuator must be replaced after 1 million operations.

f. Warning during wiring

- Keep the load under the value given in the utilization category (vedi 1.b).
- When sensor contacts are used without the related safety module, connect in series a protection fuse (see 1.b).
- Turn off the power supply before checking the switch connection contacts, also during wiring.
- If the sensor is the only safety device installed on the protection, then always use at least 2 channels connected to a safety module.
- If you are using a sensor with cable mod. **SMP1A12S****, the two channels used must include the yellow-green cables. If you are using a sensor with connector mod. **SMP1A12S001M***, the two channels used must include pins n° 3-4. If these requirements are not fulfilled, the sensor will not have anti-tamper coding.

6. INSTRUCTIONS FOR PROPER USE

a. Utilization

The safety magnetic sensor **SMP1** with coded magnetic target **SMP1AMG** is used in the safety circuits (EN 60204) as electrical interlock device (EN 1088) associated with a mobile guard and the related automatic control safety module for the signal processing (EN 60947-5-3). These sensors, if correctly installed and connected to the safety modules, allow to obtain control circuits up to the safety category 4 in accordance with EN ISO 13849-1.

b. Switching distances

When the actuator is in the internal space defined by the dark gray area (see fig. 1 and fig. 2), the NC contacts are closed, while the possible NO contact is now open. When the actuator is out of the space defined by the light gray area (see fig. 1 and fig. 2) the NC contacts are open, while the possible NO contact is now closed. The installation of the sensor and the actuator on ferromagnetic materials, will reduce the switching distances.

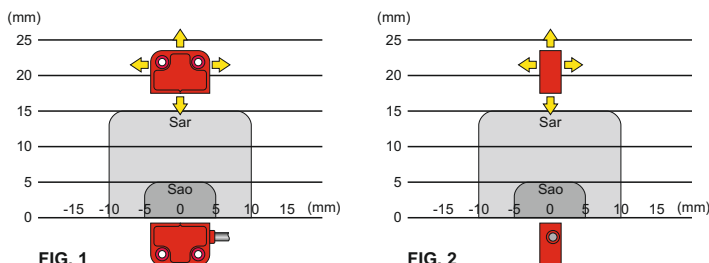


FIG. 1

FIG. 2

Note : The drawing of the activation areas is indicative.

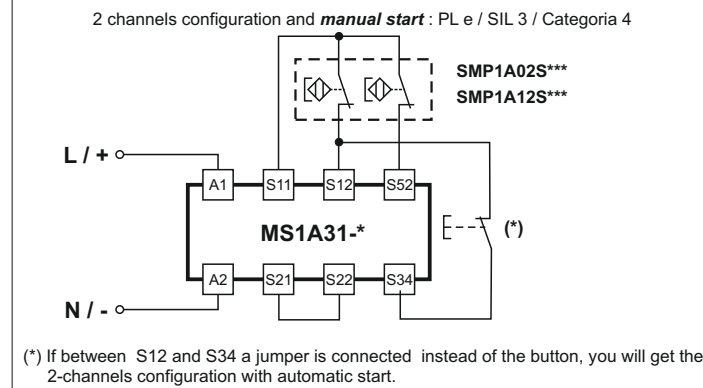
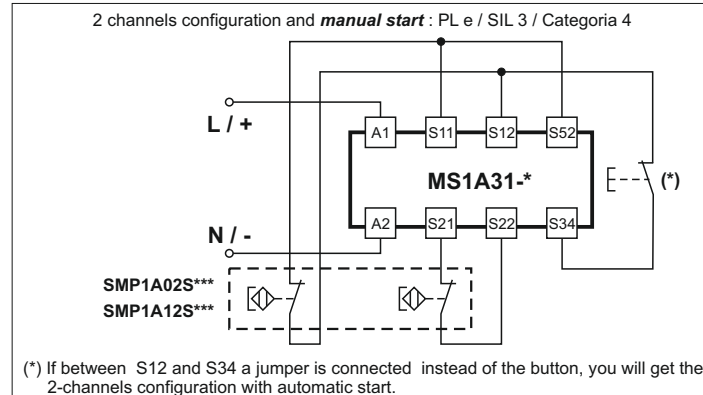
c. Connecting with COMEPI safety modules

Use safety sensor with 2 NC contacts and coded magnet combined with COMEPI safety modules MS1A31-* series. The sensor connected to the safety module could be classified as control circuit device up to PDF-M (EN 60947-5-3).

d. Utilization limits

- Use the device SMP1 series following its instructions, observing its operation limits and using it according to the safety standard in force.
- The utilization conforming to the final use, implies the respect of standard in force regarding the installation and the operation, in detail: EN ISO 13849-1, EN 60204-1, EN 1088, EN ISO 12100-1, EN ISO 12100-2.
- The COMEPI responsibility is excluded in case of:
 - Utilization not according to its final destination.
 - Non observing its safety instructions.
 - Installation and reparations not performed by qualified and authorized staff.
 - Omission of functional tests.
- For additional information please contact COMEPI srl technical dept :
Tel. 039 9906408 fax 039 9906203, e-mail: comepi@comepi.com.

7. CONNECTION WITH SAFETY MODULES MS1A31- *



8. EC DECLARATION OF CONFORMITY

COMEPI

DECLARATION OF CONFORMITY

We, **COMEPI s.r.l.**
Via Novarino 9/L - 23899 Robbiate (LC) - Italy
declare under our sole responsibility that the products:

SAFETY MAGNETIC SENSORS (Product's name)
SMP1A*S*** (Model)

to which this declaration relates are in conformity with the following standards:
EN 60947-1, EN 60947-5-1, EN 60947-5-2, EN 60947-5-3, EN 60529, EN ISO 14119, EN ISO 12100-1, EN ISO 12100-2, EN ISO 13849-1, EN ISO 13849-2 e EN 60204-1
according to the provisions of the European Directives:

2004/108/EC - Electromagnetic directive
2006/42/EC - Machinery directive

Inzago: 2015/11/16 **Mr. Ambrogio Comi**