GENERAL SPECIFICATIONS

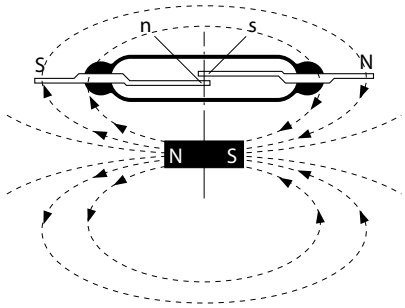
Reed contact magnetic sensors

Proximity magnetic sensors are made of Reed contact whose magnetic material shells, held in a glass bulb containing inert glass, are sensitive to magnetic fields influence which are generated by permanent magnets or by coils supplied with current.
Thanks to the inductive phenomenon, on these same shells magnetic polarities, whose directions are opposite, are generated which cause a change in the contacts status.
Shells contact surfaces are covered with excellent materials (gold, rhodium, tungsten) which enable them to guide, according to the chosen covering, low current circuits or strong inductive loads.
Shells magnetic sensors, in comparison with the traditional contacts provided with mechanical driving gear, have the following advantages:

- hermetic sealing in glass bulb containing inert gas, which protects the contacts against oxidization and against corrosion;
- simplicity in contacts operating by mean of a magnetic field;
- high velocity in functionning and long life contacts ($10^7/10^8$ operations);
- unnecessary maintenance and small overall dimensions.

Switching distance (D)

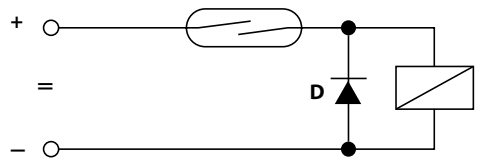
The switching distance depends on the magnet which is used.
Non magnetic and non ferrous materials, placed between the sensor and the magnet, do not interfere with the functionning.
If the sensor is installed on ferrous surfaces dispersing the magnetic flux, it is necessary to interpose adequate non-magnetic spacers during the fixing.



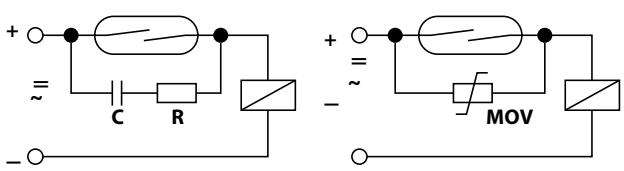
Contacts electric protection

Voltage or current values superior at the specified limits for the contacts cause a decrease of the contacts electric life.
When it is necessary to lead inductive loads, AC electromagnets, incandescent lamps, the peak current at the insertion can be 10÷15 times more than the nominal one, while at the interruption a overshoot that could reach the value of thousands of volts.
Therefore in order to protect the contacts it is necessary to use adequate protection electric circuits as specified in the following exemples:

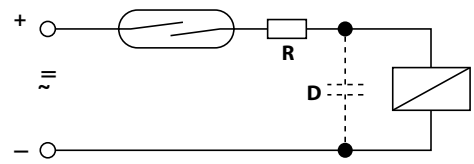
Protection against overshoots in DC



Protection against overshoots in AC-DC



Protection against overloads

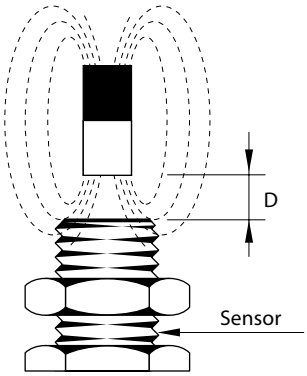


Hall effect magnetic sensors

Hall effect magnetic sensors contain an electric chip which is sensitive to magnetic fields influence generated by permanent magnets or by coils supplied with current.
On the sensitive element a voltage is generated. This voltage is proportional to the magnetic field and it crosses the trigger threshold causing a change in the final stage condition and the consequent control of an external load.

Switching distance (D)

The switching distance depends on the magnet which is used.
Non magnetic and non ferrous materials, placed between the sensor and the magnet, do not interfere with the functionning.
If the sensor is installed on ferrous surfaces dispersing the magnetic flux, it is necessary to interpose adequate non-magnetic spacers during the fixing.



Warning: The activation is obtained when, during the approach, one and only one of the poles is turned to the sensor.

ELECTRICAL PARAMETERS

NOMINAL VOLTAGE
Is indicates the maximum and minimum voltage values within which sensors work correctly.

RESIDUAL RIPPLE
Maximum admissible ripple of the DC supply voltage shown as percentage to its medium value.

MAXIMUM OUTPUT CURRENT
It shows maximum output current a sensor can cope with when working steadly.

MAXIMUM LEAKAGE CURRENT
Existing load current when output stage is stopped and supply voltage is at maximum nominal value.

ABSORPTION
This in the consumption of the photocell referred to the maximum limits of the nominal voltage and without load.

VOLTAGE DROP
Voltage drop on switching circuit when output transistor is conducing.

SHORT CIRCUIT PROTECTION
A protection in case of short circuits or overload to avoid inner circuit damage. Once the short circuit is eliminated the photocell resets.

PROTECTION AGAINST REVERSAL OF POLARITY
Available in DC supplied type, it prevents the sensor from being damage when supply cables are incorrectly connected.

INDUCTIVE LOAD PROTECTION
It protects sensor output in presence of high inductive loads. This protection is performed by a diode or zenner diode.

PROTECTION DEGREE
It shows degree of protection of housing conform to IEC 529 regulation.

START UP DELAY
Time interval between sensor supply connection and active output. This time interval is to avoid the switch output beinginan undefined state when the system is switched on.

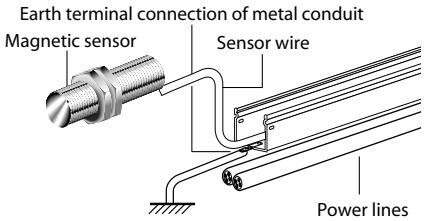
GENERAL SPECIFICATIONS

INSTRUCTIONS FOR CORRECT INSTALLATION

THESE SENSORS ARE NOT SAFETY DEVICES, THEREFORE THEY CANNOT BE USED TO PREVENT INJURIES TO PERSONS, DAMAGES, INDUSTRIAL DAMAGES, ACCIDENTS.

Connections

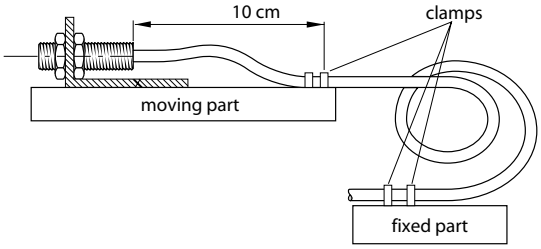
1) Do not exceed the voltage limits printed on the product label. For DC magnetic sensors use stable tension.
2) Do not connect the magnetic sensors power supply cables down-steam from other devices and make sure that they are directly connected to the mains.
3) If the power supply source is a switching voltage regulator, connect the FG (Frame Ground) terminal to the ground.
4) Connect to ground the FG (Frame Ground) terminal and all metallic parts of every industrial machinery or not if a magnetic sensor is used in it.
5) Do not use the magnetic sensors near electromagnetic or high frequency fields.



6) The cables of magnetic sensors must be separate from the power supply cables, from the engines cables, from the inverters cables, or from any other electromagnetic device because induction noise could cause malfunction or damage to the magnetic sensors. Separate the wires of the magnetic sensors from the above indicated cables and then insert the wires into an earthed metal conduit.
7) After making all operations mentioned in the above point 6, if inductive interference exists, an adequate transient suppression filter must be used on the power supply line in proximity to the magnetic sensors.
8) When a large distance by the connection wires to the sensor has to be covered, use conductors with a cross-section of a least 0.50 mm^2 and do not exceed the maximum distance of 100 m.
9) The output signal of a magnetic sensor cannot be used during the "start up delay stage" (not more than 300 mS).
10) Several sensors should not be connected in series, whereas several sensors can be connected in parallel.

Assembly

1) For correct assembly and alignment, all the accessories supplied with the sensor must be used.
2) Do not turn too much fixing screws or nuts to avoid electrical or mechanical damages.
3) Mounting magnetic sensors side by side, leave an appropriate place between them to avoid mutual interference.
4) Do not pull the connection cable of the sensor. When the conditions of use result to be too hard (in places not protected from shocks or subjected to movements) use a protective sheath.



5) Avoid continuous movements between the sensor and its cable and follow the instructions given in the drawing.
6) Protect the sensitive surface of the sensor from shocks, mechanical pressures to avoid irreparable damages.
7) Install the sensor being careful that metallic (or of any other material) shavings shall not settle on the sensitive part of the sensor.
8) Do not use the sensors in presence of organic or liquid solvents or of any kind of acid.
9) Do not use the sensors outdoors without an adequate protection.
10) Do not exceed the indicated temperature limits.
11) Do not subject the appliance to strong vibrations or to shocks which can damage the sensor or can harm its impermeability.

Further information

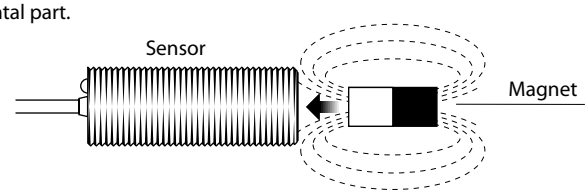
The manufacturer is not liable for the improper use of the product.
Any use and/or application which are not provided for by the instruction manuals must be previously and directly authorized by the same manufacturer.

Information

Although some ranges of INFRA photoelectric sensors are protected to IP67, this does not mean that our devices can be used to detect objects in water or in the rain.

ACTIVATION OF HALL EFFECT SENSORS WITH FRONTAL SENSITIVITY

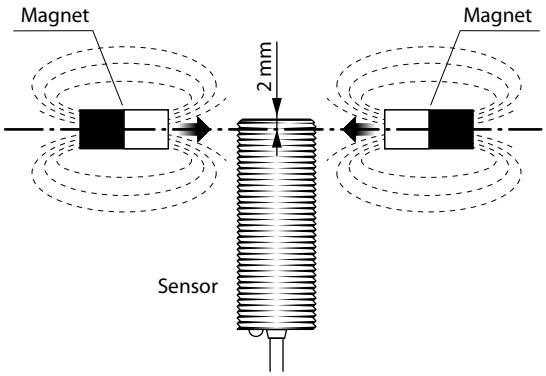
These sensors are sensitive to magnetic fields of every kind of polarity (for this reason they are defined as **OMNIPOLAR**) that concern the sensitive frontal part.



The activation is obtained when, during the approach, one and only one of the poles is turned to the sensor.

ACTIVATION OF HALL EFFECT SENSORS WITH BILATERAL SENSITIVITY

These sensors are sensitive to magnetic fields of every kind of polarity (for this reason they are defined as OMNIPOLAR) that concern each of the two sensitive faces.



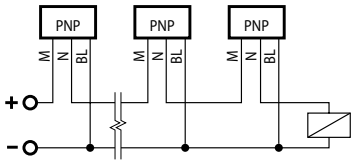
The activation is obtained when, during the approach, one and only one of the poles is turned to the sensor.

SERIES AND PARALLEL CONNECTIONS FOR PNP SENSORS

Series connections (AND)

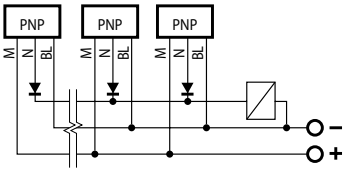
Sensors which are connected in this way can activate only one output when they are simultaneously excited. In order to realise this kind of connection, for DC models, pay attention to the following notes:

1) the voltage drop of each sensor (< 1,5 V);
2) the maximum load voltage of the sensors that are used related to the consumption of each sensor (< 30 mA).



Parallel connection (OR)

Sensors which are connected in this way can activate indipendently the common output when they are excited. If you want to omit the diodes shown in the diagrams, it is necessary to use sensors with open collector (NO) final stage.



POWER SUPPLY FOR DC SENSORS