

Non Contact Magnetic Safety Switches from IDEM

Magnetic Series (with integral LED) Operating Instructions



LPR
(Plastic)



LMR
(Stainless Steel)

Application:

IDEM Magnetic Non Contact switches are designed to interlock hinge, sliding or removal guard doors. They are specifically advantageous when:

- a) poor guard alignment exists
- b) high hygiene requirements exist e.g. food industry hose down
- c) a long mechanical life is required (no moving or touching parts).

When used in combination with approved Dual Channel Safety Modules, the switches can be used to provide up to PLe/Category 4 to ISO13849-1.

Operation:

All IDEM Magnetic Non Contact Safety Switches are designed to conform to IEN60947-5-3 and be used as directed by ISO14119, EN ISO12100 and EN 60204-1. They have a magnetic sensing system which provides a wide (>10mm) sensing distance and provides a high tolerance to misalignment after sensing. They can operate in extreme environments of temperature and moisture.

Installation:

Installation of all IDEM Non Contact Switches must be in accordance with a risk assessment for the individual application.

The use of a Safety Relay is recommended for monitoring IDEM Magnetic switches. These relays monitor 2 redundant circuits as per ISO13849-1 for up to Category 4 protection. IDEM Magnetic switches are designed to operate with most Dual Channel Safety Modules to satisfy EN60947-5-3. The maximum switching current and external fusing should be observed for each type of switch.

M4 mounting bolts must be used to fix the switches. Tightening torque for mounting bolts to ensure reliable fixing is 1.5 Nm. Always mount on to Non Ferrous materials. The recommended setting gap is 5mm. The Safety switch must not be used as a mechanical stop or be adjusted by striking with a hammer. The actuator must not be allowed to strike the switch. Do not mount adjacent switches or actuators closer than 30mm.

Typical misalignment tolerance after setting is 5mm.

After installation always check each switch function by opening and closing each guard individually in turn and ensuring that the LED's on the Safety Modules are illuminated when the switch is closed and are extinguished when the switch is open. Check that the machine stops and cannot be re-started when each switch is open.

The NC switch contacts are potential free and are internally fused. To protect the internal fuse, all switches must be externally fused at a lower rating (see Technical data).

If the LED is used, this is for indication only.

If RED it will be illuminated when the guard is open.

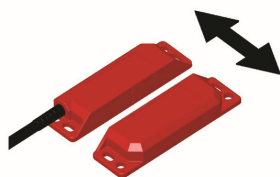
If GREEN it will be illuminated when the guard is closed. (Note: It does not represent the NC contacts).

IMPORTANT:

The Risk Assessment for the particular application should include the risk of spare actuators. Spare actuators should not be readily available and must be securely controlled.

The safety functions and mechanics must be tested regularly. For applications where infrequent guard access is foreseeable, the system must have a manual function test to detect a possible accumulation of faults. At least once per month for PLe Cat3/4 or once per year for PLd Cat3 (ISO13849-1). Where possible it is recommended that the control system of the machine demands and monitors these tests, and stops or prevents the machine from starting if the test is not done. (See ISO14119). It is the responsibility of the user to ensure the correct overall functionality of its systems and machines. IDEM, its subsidiaries and affiliates, are not in a position to guarantee all of the characteristics of a given system or product not designed by IDEM.

Actuator Operating Direction:



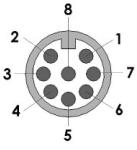
MAINTENANCE:

Monthly: Check alignment of actuator and look for signs of mechanical damage to the switch casing. Check wiring for signs of damage.

Check each switch function by opening and closing each guard individually in turn and ensuring that the appropriate LED's on the Safety Relay are illuminated when the switch is closed and are extinguished when the switch is open. Check that the machine stops and cannot be re-started when each switch is open.

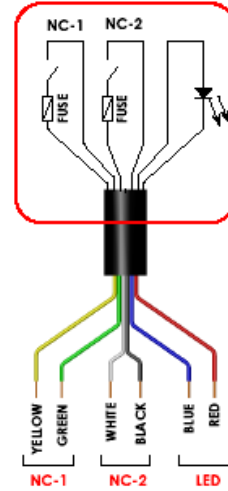
Never repair any switch, actuator or integral cables. Replace any switch displaying signs of mechanical damage to the casing or cables.

Non Contact Magnetic Safety Switches from IDEM



| Quick Connect (QC) M12 8 Way Male Plug Pin view from Switch | Standard Lead Colour | Circuit (Actuator Present) |
|---|-------------------------|-------------------------------|
| 4 | Yellow | NC 2 |
| 6 | Green | NC 2 |
| 7 | Black | NC 1 |
| 1 | White | NC 1 |
| 2 | Red | Supply +24Vdc |
| 3 | Blue | Supply 0Vdc |

Note: The LED does not indicate the status of the NC Safety Contacts, but indicated that the actuator is aligned to give optimum performance.



Technical Data:
Safety Channels NC1 and NC2: Voltage free: 250Vac 1.0A Max.

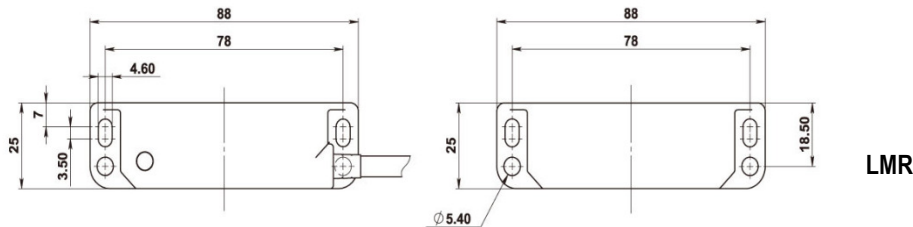
Fuses (NC Circuits): Fuse externally 0.8(F)
 Contact release time: <2ms
 Initial Contact resistance: <500 milliohm
 Minimum switched current: 10Vdc 1mA
 Dielectric withstand: 250Vac
 Insulation resistance: 100 Mohms
 Recommended setting gap: 5mm
 LED supply voltage: 24Vdc +/-10%
 NC switching distance:
 (Target to target): Sao 10mm Close
 Sar 22mm Open
 LED (Green): Typical: 8mm ON 15mm OFF
 LED (Red): Typical: 8mm OFF 15mm OFF
 Tolerance to misalignment: 5mm in any direction from 5mm setting gap
 Switching frequency: 1.0Hz maximum
 Approach speed: 200mm/m to 1000mm/s
 Temperature range: -25/80C LPR
 -25/105C LMR
 Enclosure protection: IP67 LPR
 IP69K LMR
 Shock resistance: IEC 68-2-27 11ms 30g
 Vibration resistance: IEC 68-2-6 10-55Hz 1mm
 Mechanical life expectancy: 10,000,000 switchings
 Electrical life expectancy: 1,000,000 switchings
 De-rating Safety Factor 2
 Tested to 2,000,000 cycles at 24V 0.2A
 Cable type: PVC 6 core 6mm OD Max
 Mounting bolts: 2xM4 Tightening torque 1.0Nm

Safety Classification and Reliability Data:

ISO 13849-1 Up to PLe Category 4
 (if both channels are used with a PLe control device)
 B10d 3,300,000 cycles at 100mA load
 Usage 8 cycles/hour 24 hours/365 days per year
 MTTFd is 470 years

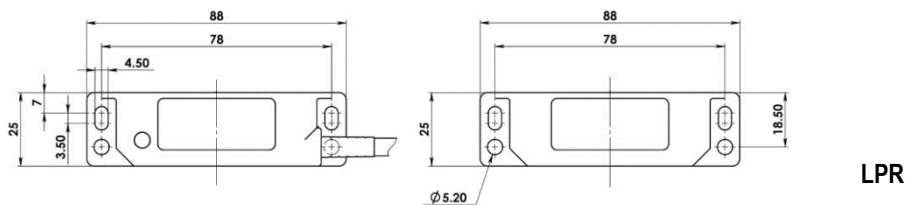
Technical Data:

Standards: ISO14119 EN60947-5-3 EN60204-1 ISO13849-1 UL508



SWITCH

ACTUATOR



SWITCH

ACTUATOR