



Non-Contact RFID Locking Safety Switches

MGL-P, MGL-M, MGL-SS Operating Instructions



IMPORTANT NOTE:

Read and understand these instructions before installing, operating, or maintaining this equipment.

The product is designed to be a component of a customised safety orientated control system. It is the responsibility of each manufacturer 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.

DESCRIPTION:

The MGL range of Non Contact RFID Coded switches has been developed to provide and maintain a high level of functional safety whilst providing a reliable magnetic door interlock. Coding is achieved by using magnetic and RFID techniques and both of these principles need to be satisfied for the switch to operate safely.

The MGL range will connect to the majority of popular standard safety relays to achieve up to PLe/Category 4 to ISO13849-1.

Offered in Stainless Steel 316, high specification robust Plastic or in Die Cast Metal housings the MGL switches can be used in almost any environments including high pressure cleaning following contact with foreign particles.

The Stainless Steel 316 version of the MGL incorporates a Stainless Steel magnet and has an IP69K ingress protection rating making it suitable for CIP and SIP processes.

APPLICATION:

MGL RFID Coded Non-Contact Safety Switches with integral holding magnet have been designed to interlock hinged or sliding guard doors. They are specifically advantageous when:

- high level anti-tamper is required
- high hygiene requirements exist e.g. food industry hose down
- long mechanical life is required (no moving parts)
- there is a requirement to hold a guard closed

When used in combination with a Dual Channel Safety Relay they can be used to provide protection up to Category 4 and PLe to ISO13849-1.

OPERATION:

All RFID Coded Non-Contact Safety Switches are designed to conform to EN60947-5-3 and be used as directed by EN1088, EN ISO12100 and EN60204-1. They have coded RFID sensing 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. The switches are provided factory coded either uniquely or by series master code.

IMPORTANT:

They are not suitable for machines with a running down time.

Record any codes as required by factory rules or with reference to any risk assessment for the particular guard application.

INSTALLATION:

Installation of all RFID Coded Non-Contact Safety Switches must be in accordance with a risk assessment for the individual application.

The use of a Safety Relay is required for monitoring RFID Coded switches. These relays monitor 2 redundant circuits as per ISO13849-1 for up to PLe/Category 4 protection.

RFID Coded Non-Contact Safety Switches are designed to operate with most Dual Channel Safety Relays to satisfy EN60947-5-3 PDF-S.

M5 mounting bolts must be used to fix the switches. Tightening torque for mounting bolts to ensure reliable fixing is 1.0 Nm. Always mount on to Non Ferrous materials.

Do not mount adjacent switches or actuators closer than 30mm.

Typical misalignment tolerance for non contact after setting is 4mm. To achieve nominal holding force ensure face to face alignment of magnetic parts.

After installation always check each switch function by opening and closing each guard individually in turn and ensuring that the Green LED on the switch and the LEDs 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.

Note: The safety outputs will only close when the actuator is in place and the lock magnet is energised.

Forcing open of the lock will cause the safety outputs to open.

FEATURES:

HEAVY DUTY: 1100N S/Steel, 1500N Plastic and Die Cast Metal

MEDIUM DUTY: 600N S/Steel, 1000N Plastic and Die Cast Metal

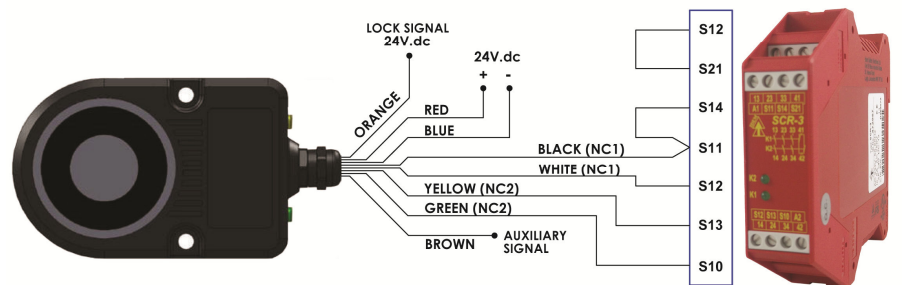
2NC Safety Outputs (Door closed – Lock energised)

1NO Auxiliary Output for indication of door open

No moving parts – high switch life and provides resistance to shock and vibration.

Remanence magnetization holding technique acts as a light magnetic latch before and after unlocking.

CONNECTION EXAMPLE:



MAINTENANCE:

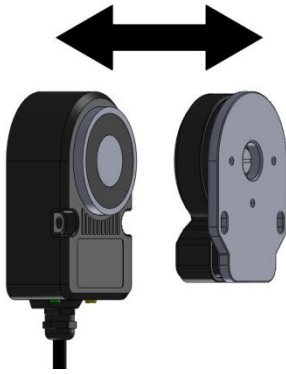
Monthly: Check alignment of actuator and look for signs of mechanical damage to the switch casing.
Check wiring for signs of damage.

Monthly: Check each switch function by opening and closing each guard individually in turn and ensuring that the Green LED on the switch and the appropriate LEDs 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 RFID Locking Safety Switches

Actuator Operating Direction:



LED Operation and Switch Status Indication:

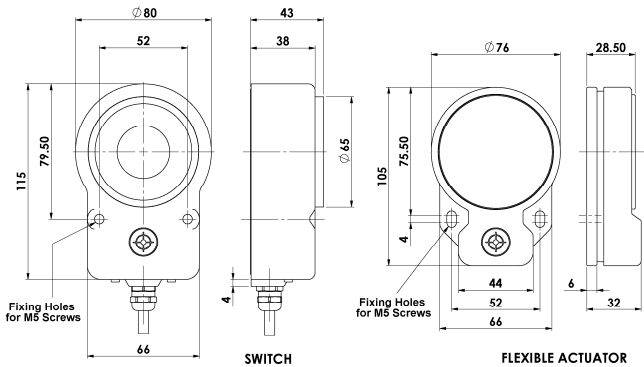
The MGL switch uses 2 LEDs to indicate all the different possible switch states. The LEDs are in a clearly visible location at either side of the cable exit point.

Switch Status	Guard	Green LED	Yellow LED
Locked	Closed	Steady	Off
Solenoid Power OFF (unlocked)	Closed	Flashing	Off
Guard Open	Open	Off	Steady
Door Forced Open	Open	Off	Flashing
Wrong Actuator Code	Closed	Flashing	Flashing

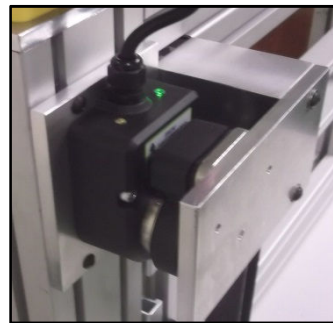
MGL shown in OPEN position.
Steady Yellow LED indication.



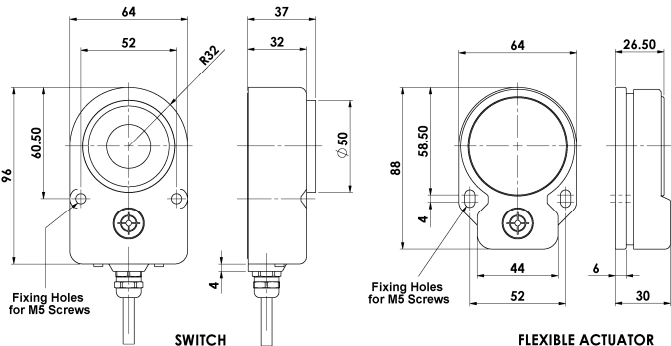
MGL-1 Switch Dimensions (mm) (Heavy Duty)



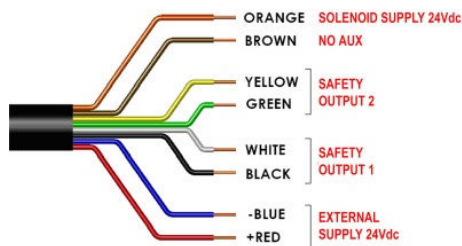
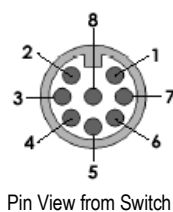
MGL shown in CLOSED position, lock energised.
Steady Green LED indication.



MGL-2 Switch Dimensions (mm) (Medium Duty)



Connection Colours



Quick Connect (QC) 250mm (10") M12 8-Way Male Plug	Conductor Colours	Function	Power Ratings
3	Blue	0Vdc	50mA max.
2	Red	24Vdc	
8	Orange	Lock Applied (24Vdc)	500mA max.
7	Black	Safety Output 1	200mA max.
1	White	Safety Output 1	
4	Yellow	Safety Output 2	200mA max.
6	Green	Safety Output 2	
5	Brown	Auxiliary Signal	+24Vdc

Standards: EN1088 EN60947-5-3 EN60204-1 ISO13849-1 UL508

Safety Classification and Reliability Data:

Dielectric Withstand: 250V.ac
 Insulation Resistance: 100 Mohms
 Switching Distance: Sao 1mm Close Sar 10mm Open
 Tolerance to Misalignment: 5mm in any direction from 5mm setting gap
 Switching frequency: 1.0 Hz maximum
 Approach speed: 200mm/m to 1000mm/s
 Body material: MGL-*P = Plastic MGL-*M = Die-Cast Metal MGL-*SS = Stainless Steel 316
 Temperature Range: -25C to +40C
 Enclosure Protection: IP67/IP69K (Stainless Steel)
 Cable Type: PVC 8 core 6mm OD
 Mounting Bolts: 2 x M5 Tightening torque 1.0 Nm
 Mounting Position: Any
 Power Supply: +24Vdc ± 10%

Characteristic Data according to EN ISO13849-1:

Performance Level e If both channels are used in combination with a SIL3/PLe control device
 Category Cat4
 MTTFd 1100a
 Diagnostic Coverage DC 99% (high)
 Number of operating days per year: d_{op} = 365d
 Number of operating hours per day: h_{op} = 24h
 B10d: Not mechanical parts implemented

When the product is used deviant from these assumptions (different load, operating frequency, etc.) the values have to be adjusted accordingly.