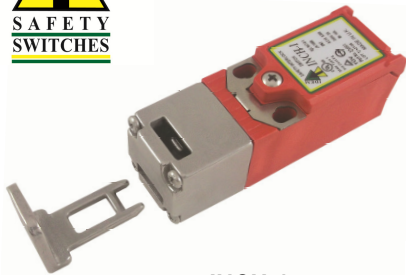




# Safety Interlock Switch Operating Instructions

## INCH-1, INCH-3, MK1-SS



INCH-1



INCH-3



MK1-SS

### IMPORTANT NOTE:

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

These products are designed to be a component of a customised safety orientated control system. 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.

### Application:

INCH-1, INCH-3 and MK1-SS Interlock Switches are designed to be mounted for interlock position sensing of hinged moving guards.

They can be fitted to the leading edge of sliding, hinged or lift off guards.

They have positive opening contacts in accordance with IEC 60947-5-1 and the switch design offers a tamper resistant actuator key. They are available with either an angled or flat actuator fixing to cover most fixing positions and contact blocks are available in slow make/break 1NC 1NO, 2NC or 2NC 1NO (dependant on model).

Enclosures are protected to IP67 (MK1-SS is rated IP69K).

### Operation:

Operation of the switches is achieved by withdrawing the actuator key from the switch to cause deflection of the switch plunger.

Positive actuation of the contacts is achieved at 5mm withdrawal of the actuator.

### 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.

Application consideration must be given to the fixing of the actuator which has to be in a way that prevents disassembly by easy means.

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).

### Installation guide:

**Correct Mounting of Interlock Switches is critical to obtain optimum performance and ensure safety reliability.**

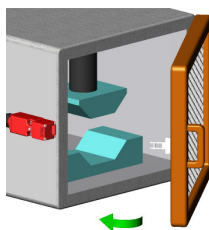
Installation of all switches must be in accordance with a risk assessment for the individual application.

Installation must only be carried out by competent personnel and in accordance with these instructions.

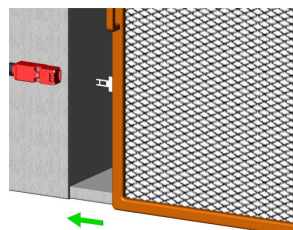
Warning: Do not defeat, bypass or tamper with this switch, severe injury may result.

1. Never use the switch as a mechanical stop.
2. To ensure that the actuator and switch are protected from mechanical shock, guides and stops must be used to prevent mechanical damage.
3. The heads of the switch can be rotated to obtain the best switch orientation by removing the 4 head screws and rotating the head through 90 degrees. Always ensure the 4 head screws are tightened to 1Nm to ensure switch robustness. Always fit the blanking plug (supplied) to the unused actuator entry aperture.
4. When mounting to the guard door align and fix the switch body and actuator using 2 x M4 mounting bolts tightened at 1.5Nm.
5. Typical applications:

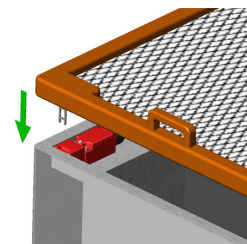
Hinged guard



Sliding guard



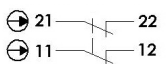
Lift off guard



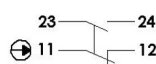
### Contact Blocks/Connections:

#### INCH-1

Slow Make Break 2NC

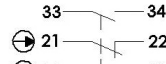


Slow Make Break 1NC 1NO

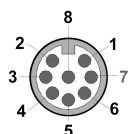


#### INCH-3 and MK1-SS

Slow Make Break 2NC 1NO



Switch Circuit	Quick Connect (QC) M12 8 Way Male (on Flying Lead 250mm) Pin view from switch
11/12	1 7
21/22	6 5
33/34	4 3
Earth	8



Switch Circuit	Quick Connect (QC) M12 4 Way Male (on Flying Lead 250mm) Pin view from switch
11/12	1 3
21/22 or 23/24	4 2



**WARNING: DO NOT DEFEAT, TAMPER, OR BYPASS THE SAFETY FUNCTION. FAILURE TO DO SO CAN RESULT IN DEATH OR SERIOUS INJURY.**

**AVERTISSEMENT: NE PAS DESACTIVER, MODIFIER, RETIRER, OU CONTOURNER CETI INTERVERROUILLAGE IL PEUT EN RESULTER DES BLESSURES GRAVES DU PERSONNEL UTILISATEUR.**

### Original Instructions.

To request this data sheet in other languages please contact [info@idemsafety.com](mailto:info@idemsafety.com)  
 Um dieses Datenblatt in Deutscher Sprache wenden Sie sich bitte anfordern [info@idemsafety.com](mailto:info@idemsafety.com)  
 Pour obtenir cette fiche en Français, veuillez contacter [info@idemsafety.com](mailto:info@idemsafety.com)  
 Para solicitar esta hoja de datos en Español, por favor contacto con [info@idemsafety.com](mailto:info@idemsafety.com)

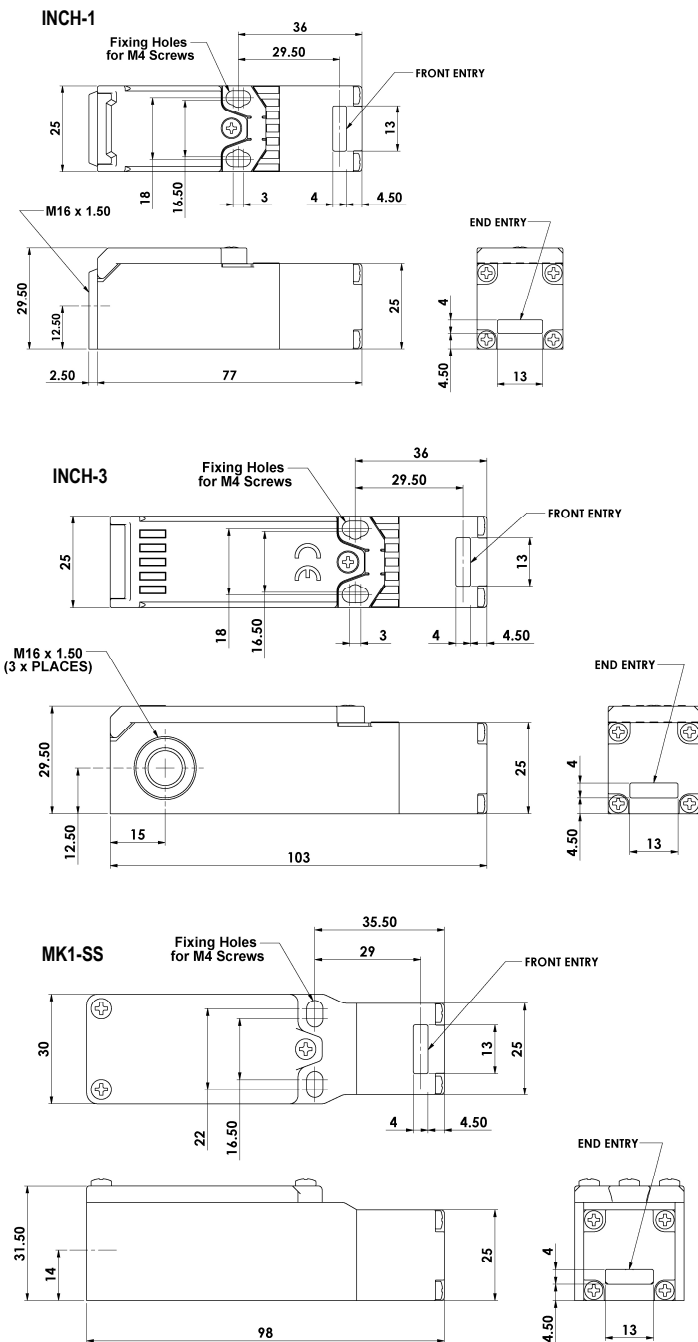
# Safety Interlock Switch

- Always ensure that when fitting electrical conductors that they are routed correctly and do not interfere with the switch cover during fitting. Recommended conductor size is 1.5 – 2.5sq.mm, contact terminal tightening torque is 1Nm.
- Tightening torque for the lid screw and cable glands is 1Nm to maintain IP rating.
- Check that the machine is stopped and cannot be started when the interlocked guard is open.
- After installation apply tamper resistance paint or compound to the actuator and switch mounting bolts.

## Maintenance:

- Every Month: Check the switch actuator and body for signs of mechanical damage and wear. Replace any switch showing damage. Check that the machine is stopped and cannot be started when the interlocked guard is open.
- Every 6 Months: Check for mechanical damage to switch body or actuator. Replace any switch showing damage. Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress. Never attempt to repair any switch.

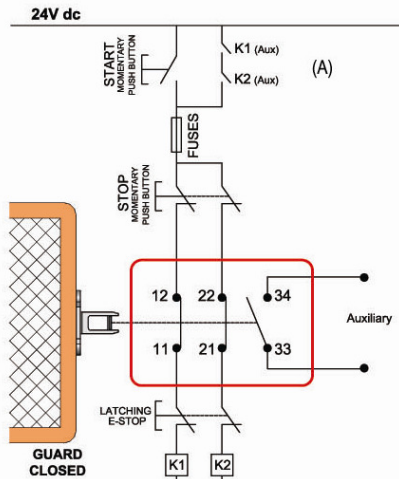
## Dimensions (outline fixing dimensions shown in mm)



## Information with regard to UL Standards:

Type 1 Enclosures.  
 Use 16 - 12AWG stranded copper insulated conductors rated 90°C minimum. (75C. ampacity).  
 Terminal tightening torque 7lbs ins (0.8Nm).  
 Intended for same polarity use and one polymeric conduit connection.  
 Not suitable for connection to a rigid metal conduit system.  
 Electrical Rating: Pilot Duty A300 240V.ac 3A. 6,000 cycles.  
 Maximum ambient temperature 80°C.  
 MK1-SS (Earth bonding terminal inside enclosure if required, use 16-12AWG conductors).

## Application Example: Door Interlock - Dual Channel non-monitored. INCH-3 or MK1-SS



This system shows interlock switch circuits 11-12 and 21-22 configured to allow dual circuit direct feeds to contactor coils K1 and K2. When the start button is pressed and then released, the auxiliary contacts (A) of contactors K1 and K2 maintain the feed to the contactor coils. Opening of the Interlock Switch or depressing the E Stop will isolate power to the contactor coils. Re-start can only occur providing the Guard is closed and the E Stop is reset.

System is shown with the guards closed and the machine able to start.

## Contact operation at withdrawal of actuator

2NC 1NO	4.5	4.0	0 mm	2NC	4.0	0 mm
11/12	Open			11/12	Open	
21/22	Open			21/22	Open	
33/34		Open				

1NC 1NO (SNAP)	4.5	4.0	0 mm
11/12	Open		
23/24		Open	

**Standards:** ISO 14119, IEC 60947-5-1, EN60204-1  
 ISO 13849-1, EN62061, UL60947-5-1

## Safety Classification & Reliability Data:

Mechanical Reliability B10d 2.5 x 10<sup>6</sup> operations at 100mA load  
 ISO 13849-1 Up to PLe depending upon system architecture  
 EN62061 Up to SIL3 depending upon system architecture  
 Safety Data – Annual Usage 8 cycles per hour/24 hours per day/365 days  
 MTTFd 356 years

Utilization Category AC15 A300 3A  
 Thermal Current (Ith) 10A  
 Overload protection fuse (fuse externally) 10A. (FF)  
 Rated Insulation/Withstand Voltages 600VAC/2500VAC  
 Actuator Travel/Force for Positive Opening 6mm/12N  
 Actuator Entry Minimum Radius 150mm Standard 100mm Flexible  
 Maximum Approach Withdrawal Speed 600mm/s  
 Body Material Polyester/Stainless Steel 316  
 Enclosure Protection IP67 Plastic or IP69K Stainless Steel 316  
 Operating Temperature -25C +80C  
 Vibration IEC 68-2-6 10-55Hz+1Hz  
 Excursion: 0.35mm, 1 octave/min  
 Conduit Entry Various (see sales part numbers)  
 Fixing 2 x M4  
 Mounting Position Any  
 Pollution Degree 3  
 Short Circuit Overload Protection Fuse externally 10A (FF)