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:

HS-SS and HSM Hinge Switches are designed to be mounted for interlock position sensing of hinged moving guards. They have been designed to be fitted to the hinged axis of machine guard doors and provide a robust hinge function in addition to interlock position sensing. They have positive opening contacts in accordance with IEC 60947-5-1 and after fitting the switch offers a very high degree of antitamper. The hinge switch shall be used to mount the machine guard door into the machine guard frame and contact blocks are available in slow make/break 3NC 1NO, or 2NC 2NO. Enclosures are protected to IP67 / IP69K with a low profile, hygienic design for washdown.

## Operation:

Operation of the switches is achieved by the rotating action of a cam and actuator to cause deflection of the switch plunger. Positive actuation of the contacts is achieved at only 6 degrees of opening of the guard and can be adjusted up to 12 degrees if required upon installation.

## 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.

1. Never use the switch as a mechanical stop.
2. The hinge switch can be mounted in any orientation depending upon the opening direction of the guard.
3. The hinge switch can be supplied in left and right-handed variants, and can be mounted with the cable entry either in the top or bottom orientation. Tightening torque for the cable gland to be 2 Nm .
4. All hinge switches are factory set to 6 degrees positive break. This should be sufficient for the majority of applications. However, should the installer require a large switching angle, this can be achieved upon installation via adjustment of the internal cam. See step 5.
5. IMPORTANT: If the hinge switch activation angle is adjusted during installation, the cam locking screw must be re-tightened to a torque of 2 Nm . See Fig. 1 opposite. Ensure rear cover and gasket are refitted correctly using M3 screws provided (tightening torque 1 Nm ).
6. Check that the machine is stopped and cannot be started when the interlocked guard is open.
7. After installation apply tamper resistance paint or compound to the hinge (or bracket) mounting bolts.
8. All mounting hardware is supplied by the user. Fasteners must be of sufficient strength to guard against breakage or loosening of the hinge and guard.
9. The mounting holes on the rear of the switch accept M5 screws, the mounting slots on the front of the optional fixing bracket accept M6 screws


M4 FIXING SCREW AND ADJUST SWITCHING POINT AS NECCESARY
TIGHTENING TORQUE FOR M4 FIXING SCREW IS 2Nm TO ENSURE CORRECT FIXTURE

Fig.1: (If Required) Positive Opening Angle Adjustment during Installation
10. Excessive force must not be exerted by the weight and swing of the guard door (see limits in specification page 2).
11. If hinges are used in pairs for larger guard doors (or with a separately supplied Idem Blank Hinge) the hinges must be mounted co-axially. This can typically be ensured by mounting onto the same flat profile, and using a flat edge to ensure the hinges are parallel and aligned either vertically or horizontally (depending on installation orientation).
12. After mounting of the hinge(s) check the rotation and swing of the guard for misalignment and potential binding.


Maintenance: will rotate freely through 360 degrees. If the operating angle needs to be limited, this must be done so through a separate outer end stop within the guard.

## Every Month:

1. Check the switch body for signs of mechanical damage and wear.
2. Replace any switch showing damage.
3. Check that the machine is stopped and cannot be started when the interlocked guard is open.
4. Check for signs of moisture ingress.
5. Never attempt to repair any switch.

Contact Blocks /
Connections:

| Function | M12 8 way Male <br> (Pin view from switch) |  |
| :--- | :---: | :---: |
| NC3 or NO2 (optional) | 2 | Red |
| NC3 or NO2 (optional) | 3 | Blue |
| NO (auxiliary) | 5 | Brown |
| NO (auxiliary) | 8 | Orange |
| NC 1 | 7 | Black |
| NC 1 | 1 | White |
| NC 2 | 4 | Yellow |
| NC 2 | 6 | Green |

Important: The safety functions and mechanics must be tested regularly. For applications were 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).

## Wiring circuits for pre-wired Explosion Proof Versions:

Important: Specific conditions of use for Ex versions: The integral cable shall be suitably protected from physical damage and abrasion. (See specific Datasheet).



HS-SS / HSM Fixing Bracket


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

AVERTISSMENT: 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
Um dieses Datenblatt in Deutscher Sprache wenden Sie sich bitte anfordern info@idemsafety.com
Pour obtenir cette fiche en Français, veuillez contacter info@idemsafety.com
Para solicitar esta hoja de datos en Español, por favor contacto con info@idemsafety.com

Application Example: Door Interlock - Dual Channel non-monitored. HS-SS / HSM
This system shows interlock switch circuits 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 machine able to start. See Fig 2.


Fig.2: Dual Circuit Interlocking Switch Diagram
Standards: ISO 14119, IEC 60947-5-1, EN60204-1 ISO 13849-1, EN62061.
Safety Classification \& Reliability Data: Mechanical Reliability B10d $1.5 \times 10^{6}$ operations at 100 mA 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
Thermal Current (Ith)
Overload protection fuse (fuse externally)
Rated Insulation/Withstand Voltages
Actuator Rotation for Positive Opening Maximum Approach Withdrawal Speed

Body Material
Enclosure Protection Operating Temperature Vibration
Conduit Entry Excursion: $0.35 \mathrm{~mm}, 1$ octave $/ \mathrm{min}$
Fixing
Tightening Torque (all mounting bolts)
Mounting Position
Pollution Degree
Short Circuit Overload Protection
Altitude
Altitude - use externally 10 A (FF)
Humidity Relative Humidity $90 \%$ at $20^{\circ} \mathrm{C}$ (Non-Condensing)
Information with regards to UL
standards:

Type 1 Enclosures.
Electrical Rating: Pilot Duty 30VAC, 45VA-450VA make / 45 VA break; 2.5 A thermal 36VDC, 55VA make / break
Maximum ambient temperature $50^{\circ} \mathrm{C}$.
Connector versions: 30V. AC/DC 2A. Max.

Warning: Do not exceed recommended working loads. Where medium or large sized guard doors are to be supported using the hinge switch, use of secondary hinge switch, or blank hinges should be considered by the installer (See Fig. 3)

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F_{A}=800 N \quad F_{R}=800 N
$$




Fig.3: Hinge Arrangement and Max Loading Diagram

