



Tongue Switch with Guard Locking & RFID Coding

KLTM-RFID & KLT-SS-RFID Operating Instructions

Application:

The KLTM-RFID and KLT-SS-RFID Safety Interlock switches are designed to fit to the leading edge of machine guard doors to provide robust guard locking and provide a double tamper resistant interlock mechanism. They are designed to provide robust position interlock detection for moving guards and will remain locked until the solenoid voltage is applied to the switch. They can be used in conjunction with delay timers to provide the solenoid energise signal only after a pre-determined time has run down.

Operation:

The switch is rigidly mounted to the fixed frame of the guard or machine. The actuator is fitted to the moving part (frame) of the guard and is aligned to the switch entry aperture. The mechanical tongue actuator profile is designed to match a cam mechanism within the switch head and provides a not easily defeatable mechanical interlock. There is also an RFID coded actuator which aligns with a programmed receiver inside the switch housing during closing of the guard. Only when both actuators are correctly aligned and the RFID coding is verified correctly can the safety contacts close and allow the machine start circuit to be enabled. When the solenoid is energised the safety contacts are positively opened and the machine circuit is broken.



IMPORTANT:

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

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.

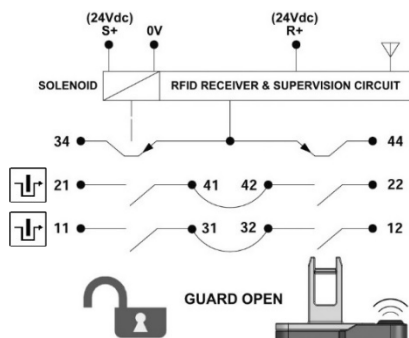
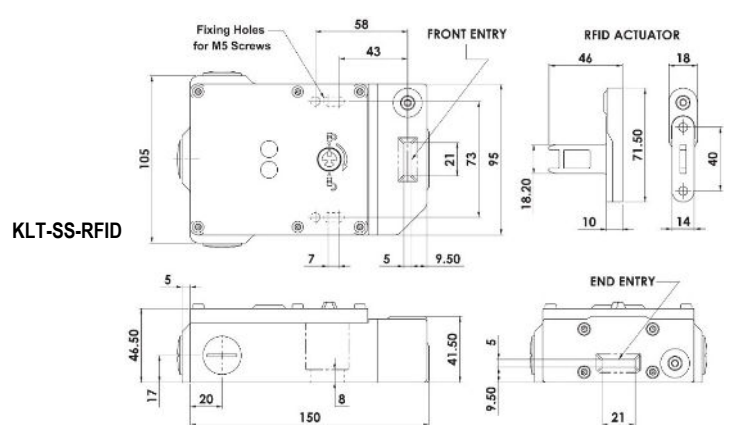
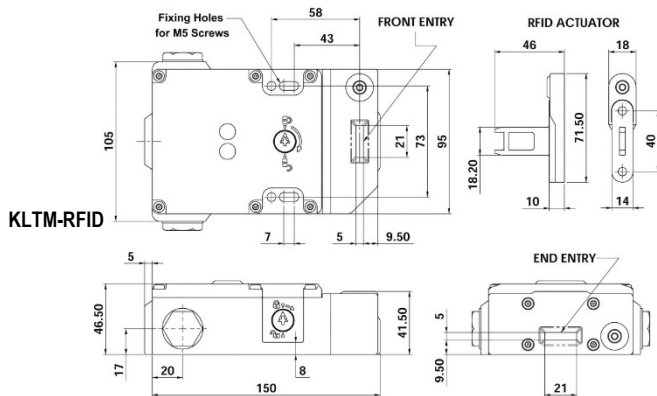
The safety functions and mechanics must be tested regularly. For application where infrequent guard access is foreseeable, the system must have a manual function test to detect a possible accumulation of faults. At least once per month for PLe Cat 3/4 or once per year for PLd Cat 3 (ISO13849-1). Where possible it is recommended that the control system of the machine demands and monitors these tests, and stop 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.

Installation:

- Installation of all IDEM interlock 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.
- M5 (or appropriate) mounting bolts must be used to fix the switch and actuator mounting plates. The tightening torque to ensure reliable fixing is 4.0 Nm. Tightening torque for the lid screws and cable glands must be 1.5 Nm to ensure the IP seal. The actuator entry position (Front or End) can be selected by using the internal slide switch inside the switch cover (See Fig.1 on page 2). Do not mount adjacent switches or actuators closer than 100mm.
- Always fit a mechanical stop to the guard to prevent damage to the front of the switch. Always ensure correct alignment of actuator and handle with front apertures of the switch and guide. Use alignment guides to ensure that the actuator enters the switch without interfering with the sides of the aperture. If fitted, ensure access to at least one of the auxiliary release points. The switch can be positioned / shielded to prevent unintended actuation of the auxiliary release. The release function is achieved by use of a tool and is to be used in exceptional circumstances. If used the release can be protected by use of a tamper coating to protect against unintended operation. If operated this tamper protection must be restored. Always fit the aperture plug to the unused entry aperture to prevent debris entering the switch mechanism.
- The RFID code is factory set. For instances where replacement of the RFID actuator is required please contact IDEM via e-mail: technical@idemsafety.com.
- The switch is supplied with removable conductor links fitted 41/42 and 31/32. If required by the control circuit these may be removed to offer independent monitoring of the solenoid locking function or the actuator position.
- After installation check operation of all control circuits and the locking function. For applications with a run down time after removing power, ensure that the correct timing allowance has been made before the solenoid is energised.

Maintenance:

Every month: Check correct operation of all circuits and the Lock function. If the actuator shows signs of bending or the switch head housing displays mechanical damage then remove and replace. IDEM will not accept responsibility for failure of the switch functions if the installation and maintenance requirements shown in this sheet are not implemented. Every 6 months: Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress. Never attempt to repair any switch. **THESE INSTRUCTIONS FORM PART OF THE PRODUCT WARRANTY.**



| Quick Connect (QC) M23 12 way Male Plug (Pin view from Switch) | Switch Circuit | |
|--|----------------|--|
| 1 | 0V | Supply 0V.dc |
| 2 | R+ 24V.dc | Supply 24V.dc |
| 3 | S+ 24V.dc | Unlock signal (solenoid) apply +24V.dc |
| 4 6 | 11/12 | Safety output circuit |
| 7 8 | 21/22 | Safety output circuit |
| 5 | 44 | Guard open signal +24V.dc out |
| 9 | 34 | Unlocked signal +24V.dc out |
| 12 | | Earth bonding connection |

Tongue Switch with Guard Locking & RFID Coding



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 datasheet 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 Francais, veuillez contacter info@idemsafety.com
 Para solicitar esta hoja de datos en Espanol, por contacto con info@idemsafety.com

LED Diagnostics

| Switch State | LED 1 (Green/Yellow) | Comment |
|--|---------------------------------|---------------------|
| Guard Open | Off | |
| Guard Closed + Locked | Steady Green | Safety outputs ON |
| Guard Closed + Unlocked | Flashing Green | |
| Guard Closed + Misaligned / Wrong Actuator | Alternate Flashing Green/Yellow | |
| Fault | Steady Yellow | See reset procedure |

| Solenoid State | LED 2 (Red) |
|----------------|-------------|
| Energised | ON |
| De-energised | OFF |

Special Instruction: RFID actuator – RESET.

In the event that a Fault condition requires reset, follow the reset instructions:

- 1) Turn off all power to the switch and open the guard.
- 2) Remove the switch cover.
- 3) Using a 2mm terminal screwdriver hold down the RESET button inside the switch housing and turn on the switch power (see Fig.2).
- 4) Release the RESET button, the yellow LED will flash, close the guard and the yellow LED will turn off. (If yellow LED continues to flash check for mechanical fault (e.g. damaged actuator or switch head)).
- 5) Turn power off and then on, the green LED will illuminate.
- 6) Re-fit the switch cover.
- 7) Open and close the guard ensuring all safety functions are correct –refer to any risk assessment for the particular guard application.

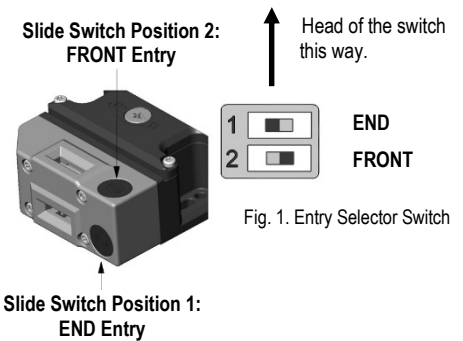


Fig. 1. Entry Selector Switch

| Technical Data: | |
|--|---|
| Standards: IEC60947-5-1 IEC60947-5-3 ISO14119 ISO13849-1 IEC62061 U60947-5-1 | |
| Supply Voltage | 24Vdc (+/- 10%) SELV or Class 2 |
| Power Consumption | R+ (50mA Max.) |
| | S+ (500mA Max.) (Solenoid) |
| Safety Circuits | 24Vdc 200mA max. switching. |
| Auxiliary Circuits (34 & 44) | 24Vdc 200mA max. Output feed. |
| Rated Insulation Voltage | 500VAC |
| Rated Impulse withstand | 1000VAC |
| Holding Force | F1Max 3000N Fzh 2307N (ISO14119) |
| Classification and coding level | Type 4 High (ISO14119) |
| Actuator insertion distance for assured locking | 5mm |
| Sao (RFID) | 10mm |
| Sar (RFID) | 20mm |
| Operating Frequency | 1Hz |
| Actuator entry minimum radius | 175mm |
| Body Material | KLTM-RFID: Die cast – Painted red KLT-SS-RFID: Stainless Steel 316 |
| Head Material | Stainless Steel 316 |
| Mechanical Actuator Material | Stainless Steel 316 |
| Enclosure Protection | IP67 (IP69K S/Steel versions only). |
| Operating Temperature | -25°C to +40°C |
| Mechanical Life Expectancy (B10d) | 2.5 x 10 ⁸ cycles at 100mA load |
| Vibration | IEC68-2-6, 10-55Hz+1Hz |
| | Excursion: 0.35mm, 1 octave/min |

Entry Selector Switch
 Select Front or End sensing. (See Fig 1)

RESET button
 (If required press and hold using a 2mm terminal screw driver)

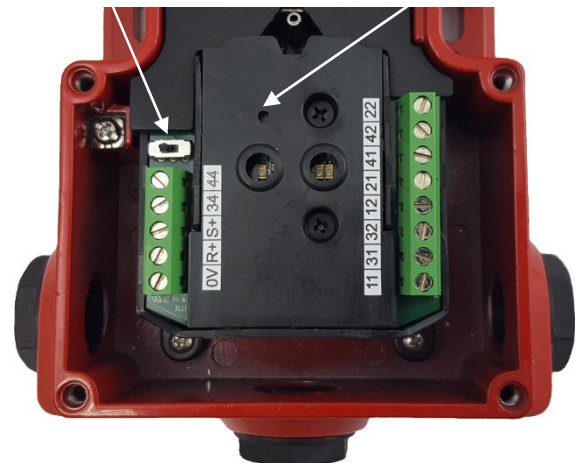


Fig. 2. Cover Removed

Safety Classification for Guard Position monitoring.

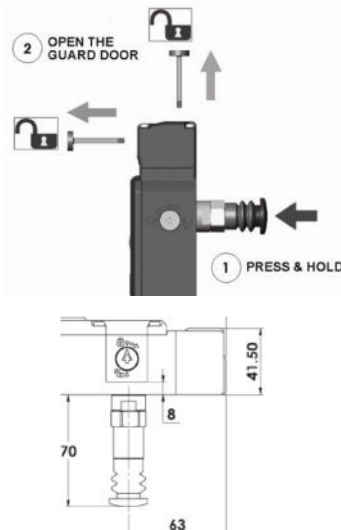
Characteristic data according to IEC62061 (used as a subsystem)

| Safety Integrity Level | SIL 3 | |
|------------------------------------|----------|-----------------------------|
| PFH (1/h) | 4.8 E-10 | Corresponds to 4.8% of SIL3 |
| Proof Test Interval T ₁ | 20a | |

Characteristic data according to EN ISO13849-1

| Performance Level | e | If both channels are used in conjunction with a SIL3/PLe control device. |
|------------------------|------------|--|
| Category | Cat 4. | |
| MTTF _d | 1100a | |
| Diagnostic Coverage DC | 99% (High) | Note: The Diagnostic coverage could be reduced to lower than PL e if multiple interlocking switches are connected in series. |

Information with regard to UL Standards: Type 1 enclosure. Maximum temp. 40°C.
 Use 16-28AWG copper conductors (rated 90°C). Terminal Torque 6 lb ins. (0.7Nm).
 Intended for same polarity use. Safety Circuits (11-12 & 21-22) 24V.dc 200mA max.
 Use one polymer conduit connection. Not suitable for connection to rigid metal conduit.
 (Earth bonding terminal inside enclosure if required – use 16-12AWG conductors).



Where the Risk Assessment for the application permits, a non latching escape rear release versions (-RR) enables quick release of the switch lock in case of emergency. The switch can be mounted such that access to the release button is available from inside the active guard area. Pressing and holding the release button will release the lock mechanism and open the lock monitoring contacts, whilst the guard can be pushed open. Measures should be taken to reduce the risk of improper activation.