



# 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.

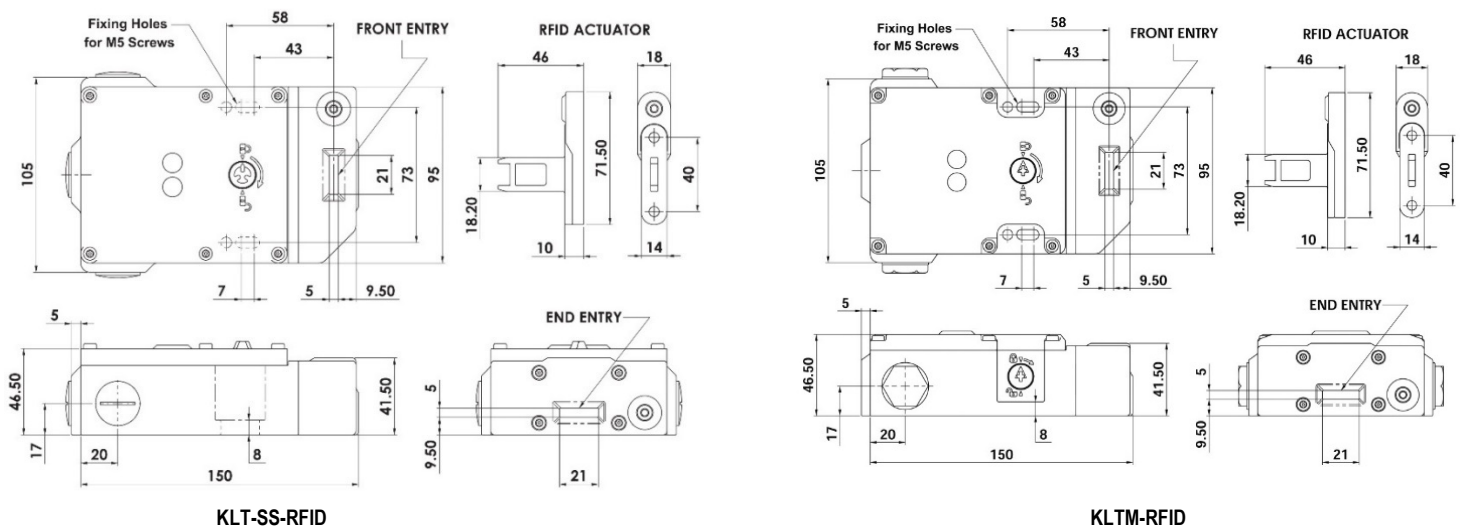
### Installation:

- 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](mailto: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.**



## LED DIAGNOSTICS (Interlock switch)

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 PROCEDURES' below

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

RESET PROCEDURES - EITHER RESET PROCEDURE BELOW CAN BE USED TO RESET THE SWITCH (INTERNAL RESET BUTTON OR EXTERNAL RESET TERMINAL).

**WARNING: AFTER COMPLETING THE RESET PROCEDURE NORMAL OPERATION OF THE SWITCH WILL RESUME, THIS INCLUDES ENABLING THE OUTPUTS IF INTERLOCKING AND LOCKING CONDITIONS ARE SATISFIED.**



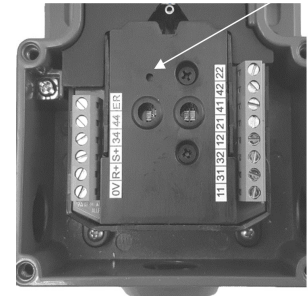
**AVERTISSEMENT: APRÈS LE FAIT D'ACCOMPLIR LA PROCÉDURE L'OPÉRATION NORMALE DU CHANGEMENT REPRENDRA, CELA INCLUT LA PERMISSION DES PRODUCTIONS EN EMBOÏTANT ET EN FERMANT DES CONDITIONS SONT SATISFAITS.**

### If using INTERNAL RESET BUTTON (see Figure 1.)

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 Figure.1).
- 4) Release the RESET button, the yellow LED will flash, close the guard and the yellow LED will turn steady yellow. 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 and normal operation is resumed.
- 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.

RESET button Figure 1 (cover removed).  
(If required press and hold using a 2mm terminal screw driver)



### If using EXTERNAL RESET INPUT (Terminal 'ER')

- 1) Provide a 24V DC signal with a rising edge (0V to 24VDC) to the external reset input terminal ('ER').
- 2) Once the correct reset signal is detected at the 'ER' terminal the yellow LED will flash for 2 seconds before normal operation resumes.

## SPECIFICATION

Standards	IEC60947-5-3 ISO14119 ISO13849-1 IEC62061 UL508	
Supply Voltage	24Vdc (+/- 10%)	
Power Consumption	R+ 1.2W (50mA Max.) S+ 12W (500mA Max.)	
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	
Classification and coding level (ISO14119)	Type 4 High	
Assured locking distance	5mm	
Sao (RFID)	10mm	
Sar (RFID)	20mm	
Max operating frequency	1Hz	
Actuator entry minimum radius	175mm	
Body Material	Stainless Steel 316 or Die-cast (painted red)	
Head Material	Stainless Steel 316	
Mechanical Actuator Material	Stainless Steel 316	
Enclosure Protection	IP65	
Operating Temperature	-25°C to +40°C	
Mechanical Life Expectancy (B10d)	2.5 x 10 <sup>6</sup> cycles at 100mA load	
Vibration	IEC68-2-6, 10-55Hz+1Hz Excursion: 0.35mm, 1 octave/min	

Characteristic data according to IEC62021 (used as a subsystem)

Safety Integrity Level	SIL 3	
PFH (1/h)	4.77E-10	Corresponds to 4.8% of SIL3
PFD	4.18E-05	Corresponds to 4.2% of SIL3
Proof Test Interval T <sub>1</sub>	20a	

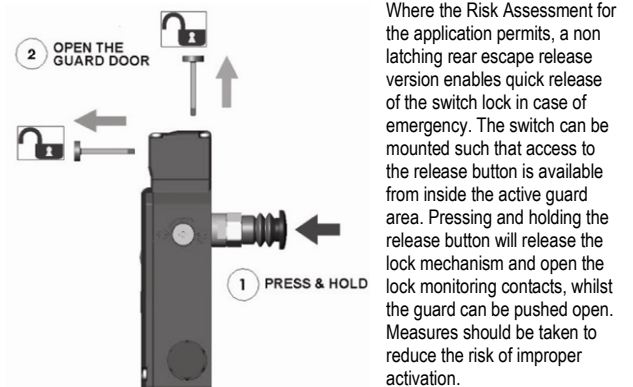
Characteristic data according to EN ISO13849-1

Performance Level	e	If both channels are used in conjunction with a SIL 3 / PL e control device.
Diagnostic Coverage DC	99% (High)	
Category	Cat 4.	
MTTF <sub>d</sub>	1100a	

Number of operating days per year: d<sub>op</sub> = 365d  
Number of operating hours per day: h<sub>op</sub> = 24h

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

**Information with regard to UL standards:** Type 1 enclosure.  
Maximum temperature 40°C.  
Use 16-28AWG copper conductors (rated 90°C). Terminal Torque 6 lb ins. (0.7Nm). Intended for same polarity use.  
Safety Circuits (11-31 & 21-41) A300 Pilot Duty. 240V. 3A.  
(PF 0.38 or greater tested for 6,000 cycles endurance).  
Use one polymeric conduit connection. Not suitable for connection to rigid metal conduit.  
(Earth bonding terminal inside enclosure if required – use 16-12AWG conductors).



Interlock Switch Circuit – Terminal connections.

(Use 16-12AWG copper conductors. Terminal Torque 6 lb ins. (0.7Nm)).

0V	Supply 0V.dc
R+ 24V.dc	Supply 24V.dc
S+ 24V.dc	Unlock signal (solenoid) apply +24V.dc
11/12	Safety interlock and lock monitoring circuit (link wire fitted)
21/22	Safety interlock and lock monitoring circuit (link wire fitted)
44	Guard open signal +24V.dc out
34	Unlocked signal +24V.dc out
ER	External Reset Signal (see 'RESET PROCEDURES')

