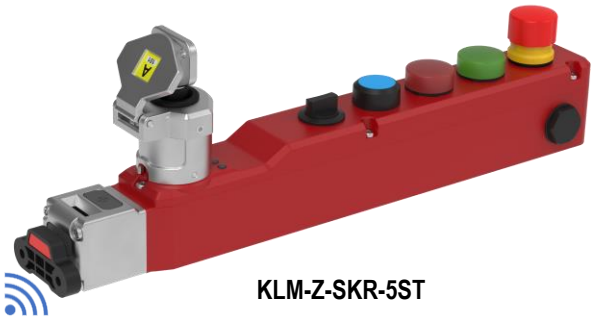
Tongue Interlock Switch with Guard Locking, RFID Coding & Release Key
KLM-Z-SKR-5ST with Release Key, E-Stop and Push Buttons
Operating Instructions



KLM-Z-SKR-5ST

With Release Key & RFID Coded Actuator.

KLM-Z-SKR-5ST-RR

With Release Key, RFID Coded Actuator & Rear Release Button.

Application:

KLM-Z-SKR-5ST (incorporating an RFID interlock switch) is designed to fit to the leading edge of machine guard doors to provide robust guard locking and provide a robust, double tamper resistant interlock mechanism with solenoid-controlled personnel release key. They are designed to provide position interlock detection for moving guards and will keep the guard locked until a voltage is applied to the switch solenoid. The mechanical cam system inside the switch housing will hold guards closed up to 3000N.
They can be used in conjunction with delay timers to provide the solenoid energise signal only after a pre-determined the time has run down. The KLM-Z-SKR-5ST housing will incorporate standard 22mm pushbuttons, switches, or lamps to facilitate machine request functions and diagnostics all in one device. They can be used in conjunction with delay timers to provide the solenoid energise signal only after a pre-determined the time has run down.

Operation:

The KLM-Z-SKR-5ST 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 positively operated, 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 the guard is closed, can the key be turned to the trapped position, the safety contacts will then close, and the actuator is locked. The machine start circuit can then be enabled when the RFID actuator is verified.
When the solenoid is energized, the safety contacts are opened, and the machine circuit is broken. The key can then be released, and the guard door can be opened. The key can be removed and used as a personnel key to prevent unwanted locking of the guard and machine re-start or, can be integrated into a part of another section of trapped key interlocking if required.

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 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 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).
Ensure that the switch holding force (Fzh) is sufficient to withstand the static forces applied during normal use and dynamic effects caused by bouncing of the guard shall not create an impact reaction force which exceeds the holding force. If the expected impact reaction forces are higher than the specified holding force for the switch, then design measures must be applied to avoid the force.
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:

1. 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.
2. M5 mounting bolts must be used to fix the switch and actuator mounting. 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. Do not mount adjacent switches or actuators closer than 100mm.
3. Always fit a mechanical stop to the guard to prevent damage to the front of the switch.
   Always ensure correct alignment of actuator 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 manual 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.
4. 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
5. Always check the electrical ratings of any 22mm devices fitted. Never exceed these ratings.
6. After installation check operation of all control circuits, the locking function and rear escape functions.
   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 any part of the KLM-Z-SKR-5ST(-RR) 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. Re-check Installation conditions above. Never attempt to repair any switch. **THESE INSTRUCTIONS FORM PART OF THE PRODUCT WARRANTY.**

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
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Pour obtenir cette fiche en Francais, veuillez contacter info@idemsafety.com
Para solicitor esta hoja de datos en Espanol, por contacto con info@idemsafety.com

Tongue Interlock Switch with Guard Locking, RFID Coding & Release Key

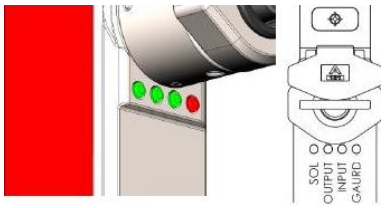
LED DIAGNOSTICS (Interlock switch)

GUARD	
Guard Closed and Locked	Green (Steady)
Guard Closed and Unlocked	Green (Flash)
Code Incorrect	Red (Flash)
Guard Open	Red

INPUT	
Safety Inputs On	Green (Steady)
Safety Input Missing	Green (Flash)
Safety Inputs Off	Off
Internal fault	Red (Steady)

OUTPUT	
Safety Outputs On	Green (Steady)
Safety Outputs Off	Off
External Fault	Red (Flashing)

SOLENOID	
Solenoid Energised	Red
Solenoid De-energised	Off

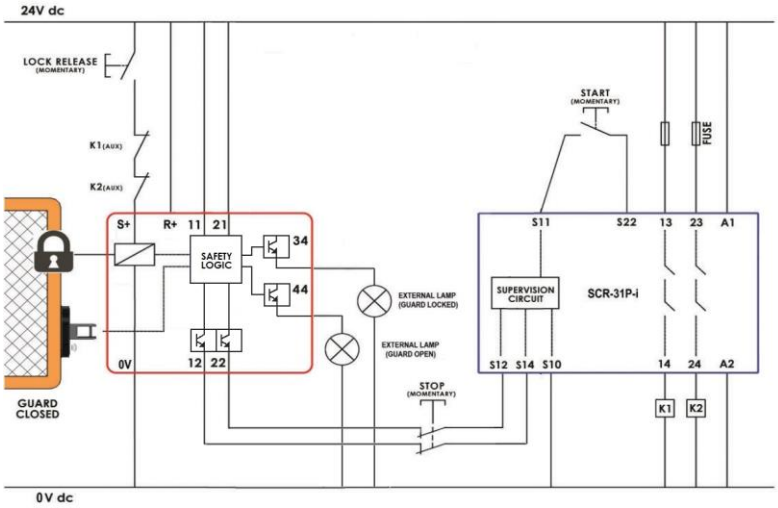


Terminal connections

Terminal	Switch Circuit
R+	Supply +24V.dc
0V	Supply 0V.dc
11	Safety Input 1
12	Safety Output 1
21	Safety Input 2
22	Safety Output 2
44	Guard open signal +24V.dc out
34	Guard unlocked signal +24V.dc out
S+	Unlock signal Apply +24V.dc

Technical Data:	
Standards	IEC60947-5-1, IEC60947-5-3, ISO14119, ISO13849-1 IEC62061, UL60947-5-1
Supply Voltage	24Vdc (+/- 10%) SELV/PELV 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 (ISO14119)	F1Max 3000N Fzh 2307N
Classification and coding level (ISO14119)	Type 4 High
Actuator insertion for locking	5mm
Sao / Sar (RFID)	15mm / 25mm
Max operating frequency	1Hz
Actuator entry minimum radius	175mm
Body & Lid Material	Die cast – Painted red
Key Barrel Material	Stainless Steel 316
Key Material	Stainless Steel 316
Head Material	Stainless Steel 316
Mechanical Actuator Material	Stainless Steel 316
Enclosure Protection	IP67
Operating Temperature	-25°C to +40°C
Mechanical Life Expectancy (B10d)	2.5 x 106 cycles at 100mA load
Vibration	IEC68-2-6, 10-55Hz+1Hz
	Excursion: 0.35mm, 1 octave/min

Schematic example.
Connected to SCR-31P-I relay to give PLe to ISO13849-1.
Stop Button, Lock Release Button, Start Button, External Lamps.



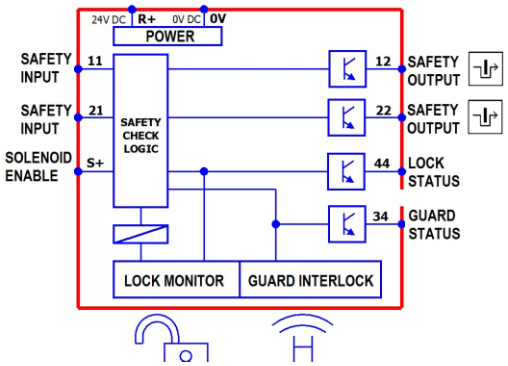
Characteristic data according to IEC62061 (used as a subsystem)

Safety Integrity Level	SIL 3	
PFH (1/h)	1.0 E-09	Corresponds to 1.0% of SIL3
PFD	8.7 E-05	Corresponds to 9.0% of SIL3
Proof Test Interval T_1	20a	

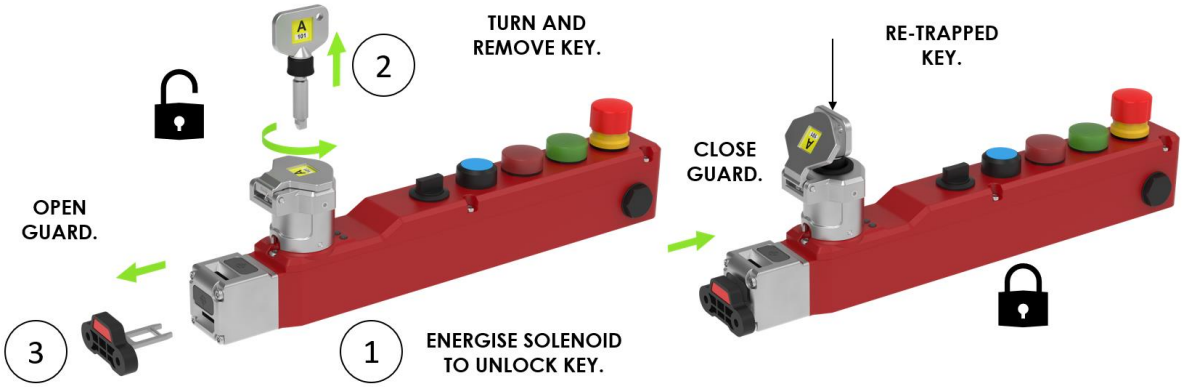
Characteristic data according to EN ISO13849-1

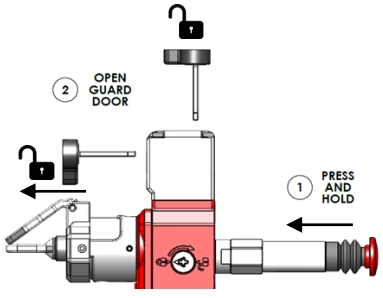
Performance Level	e	
Category	Cat 4.	
$MTTF_d$	771a	
Diagnostic Coverage DC	High	

Internal Schematic:



Information with regard to UL Standards: Type 1 enclosure. Use Class 2 power supply or equivalent.
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 (11-12 & 21-22) 24V.dc 200mA max.
Use one polymeric conduit connection. Not suitable for connection to rigid metal conduit.
(Earth bonding terminal inside metal enclosures (if required). Use 16-12AWG conductors).

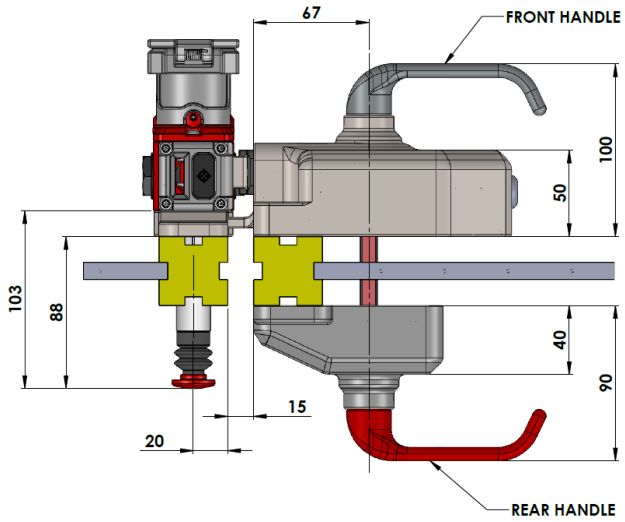




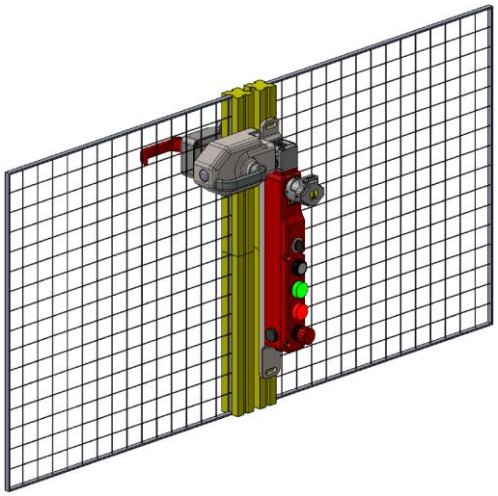
Where the Risk Assessment for the application permits, a non-latching emergency release version enables quick release of the switch lock in case of emergency. The switch can be mounted such that access to the release button is available from inside the active guard area.
Pressing and holding the release 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.

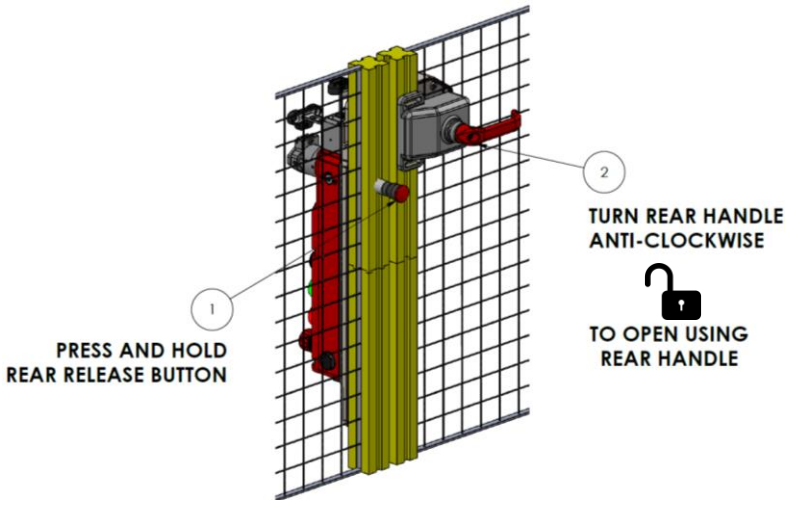
Tongue Interlock Switch with Guard Locking, RFID Coding & Release Key

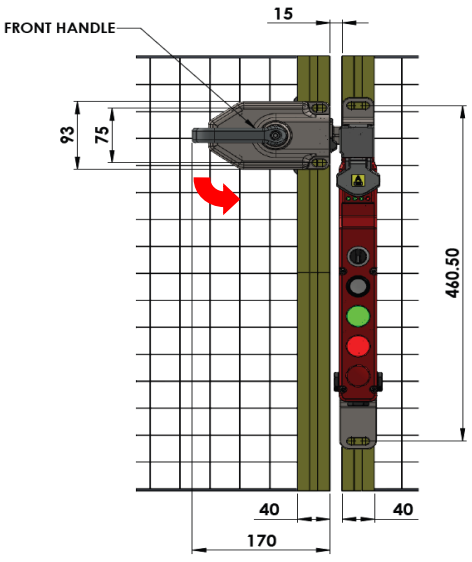
KLM-Z-SKR-5ST with Front Rotary Handle, Rear Escape Button and Rear Escape Rotary Handle.

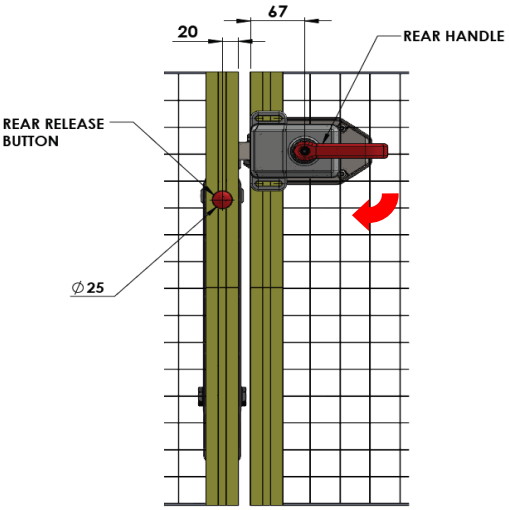


Application Example: Front Rotary Handle, Rear Escape Button and Rear Escape Rotary Handle (Dimensions in mm). **(Handles shown left hand (LH) versions)**



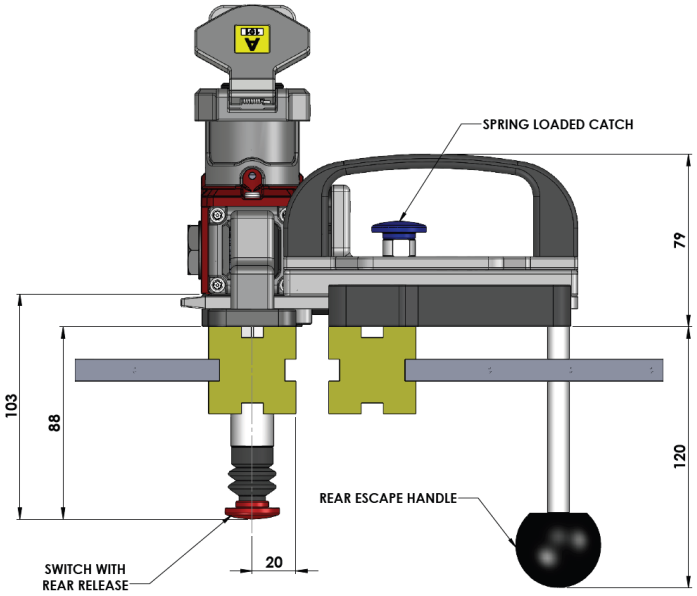




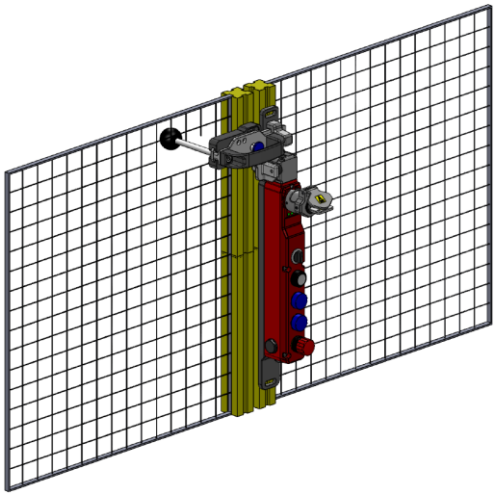


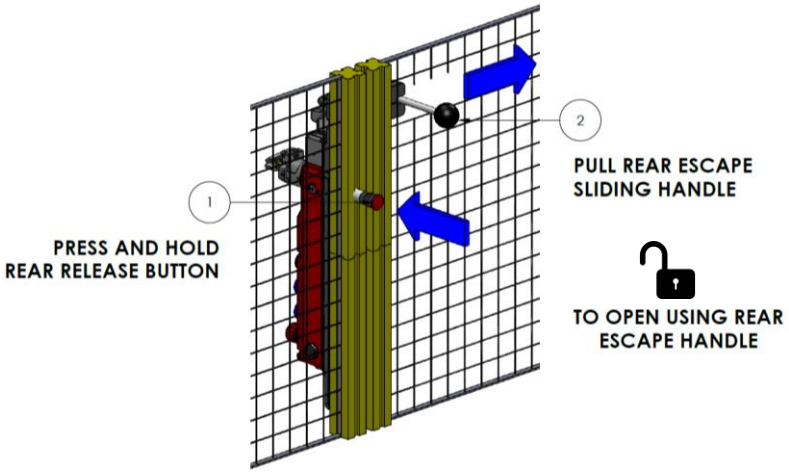
Tongue Interlock Switch with Guard Locking, RFID Coding & Release Key

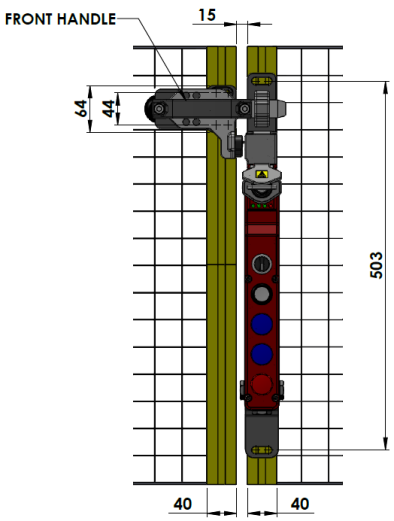
KLM-Z-SKR-5ST with Sliding Front Handle, Rear Escape Button and Rear Escape Sliding Handle.

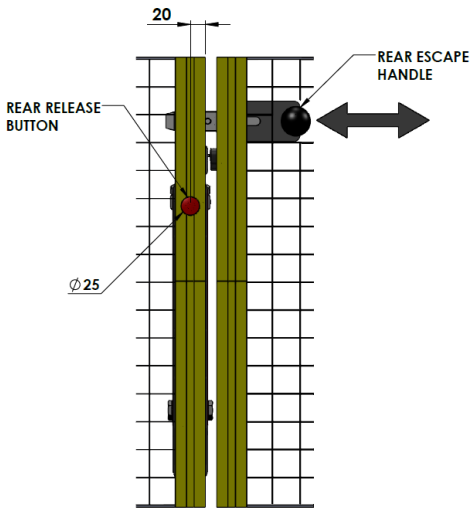


Application Example: Sliding Front Handle, Rear Escape Button and Rear Escape Sliding Handle (Dimensions in mm). **(Handles shown left hand (LH) versions)**



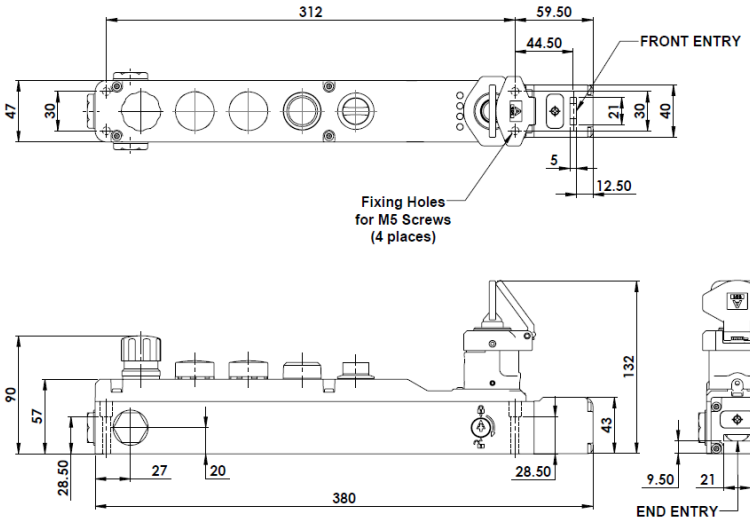




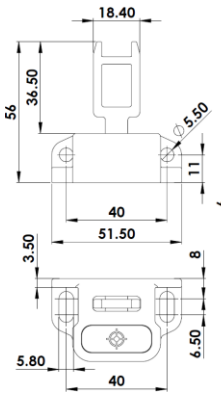


Tongue Interlock Switch with Guard Locking, RFID Coding & Release Key

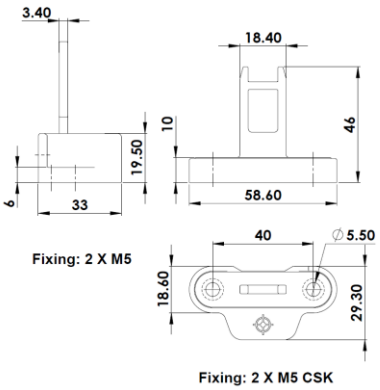
Product Dimensions (mm)

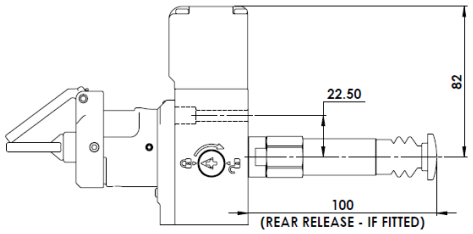


FLEXIBLE RFID ACTUATOR

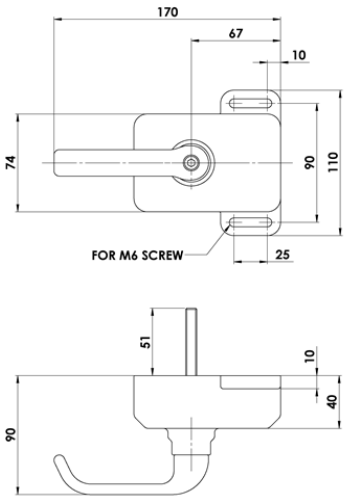


STANDARD RFID ACTUATOR

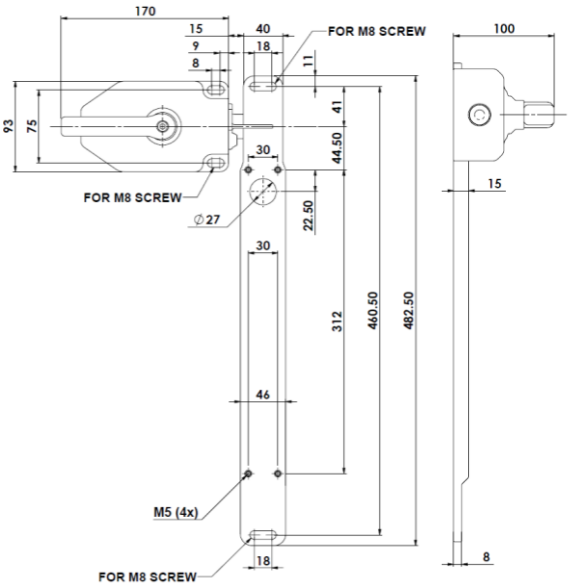


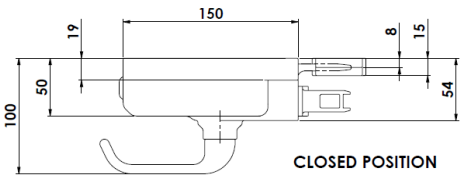


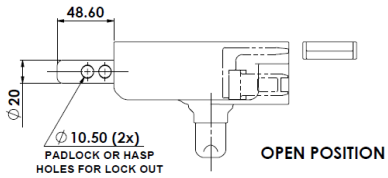
REAR ROTARY HANDLE



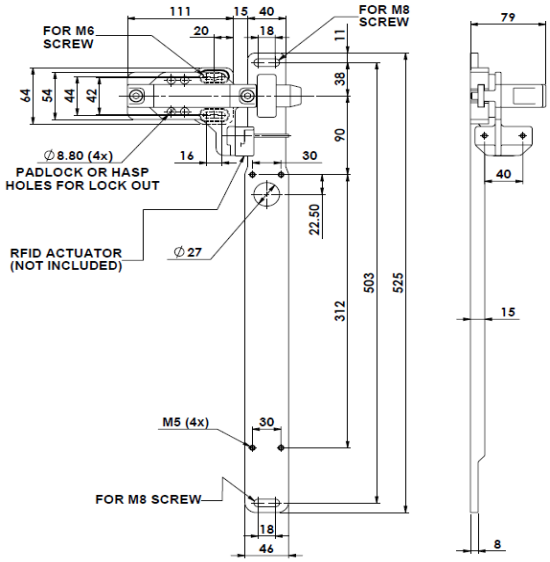
FRONT ROTARY HANDLE

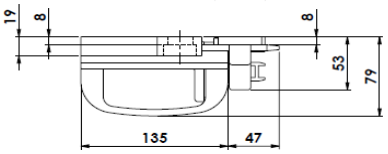


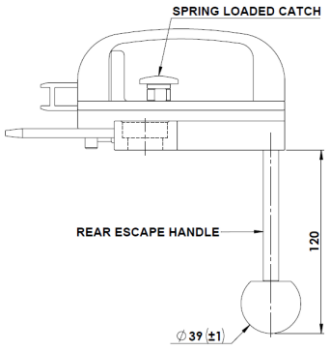




SLIDING HANDLE



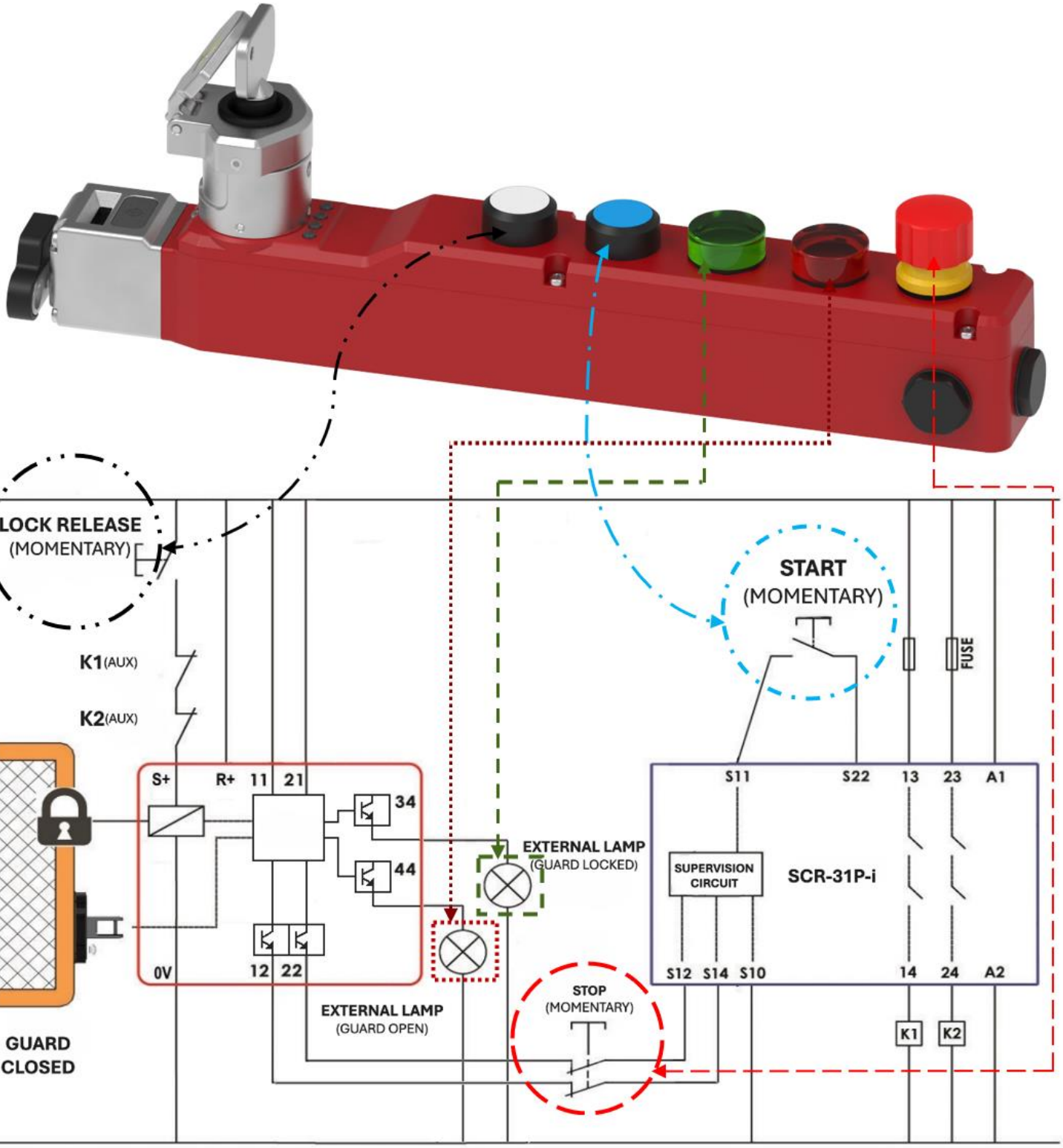




Tongue Interlock Switch with Guard Locking, RFID Coding & Release Key

Connection Example:

Connected to IDEM VIPER SCR-31-I Safety Relay (internal wire links not removed).
KLM-ZSKR-5ST(-RR)



Tongue Interlock Switch with Guard Locking, RFID Coding & Release Key

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Switch Sales Numbers:

	With Side Manual Release			Without Side Manual Release		
KLM-Z-SKR-5ST	M20	½" NPT	M12 QC	M20	½" NPT	M12 QC
Standard	457004	457005	457006	457304	457305	457306
Rear Release	457014	457015	457016	457314	457315	457316

Accessory Sales Numbers	Description	
458003	GBZ-4ST/5ST Sliding Gate Bolt Lock Left Hand (KLM-Z-4ST/5ST)	
458004	GBZ-4ST/5ST Sliding Gate Bolt Lock Right Hand (KLM-Z-4ST/5ST)	
458005	GBZ-4ST/5ST Rotary Gate Bolt Lock Left Hand	
458006	GBZ-4ST/5ST Rotary Gate Bolt Lock Right Hand	
522451	Legend Holder for use with 22mm Devices	
522452	Blanking Plug for sealing unused 22mm holes	
210005	Rear sliding handle (for use with Sliding front handles and RR switches).	
210006	Spring catch (prevents accidental re-closing, requires deliberate action)	
522341	Compact Push Button Momentary (Green) 2NC	Contacts: AC15: 240V. 0.75A. / 120V. 1.5A.
522332	Compact Push Button Momentary (Green) 1NC 1NO	
522331	Compact Push Button Momentary (Red) 1NC 1NO	
522334	Compact Push Button Momentary (Blue) 1NC 1NO	
522335	Compact Push Button Momentary (Black) 1NC 1NO	
522352	Compact Illuminated Push Button Momentary (Green) 1NC	24V.ac/dc lamp. Contacts: AC15: 240V. 0.75A. / 120V. 1.5A.
522351	Compact Illuminated Push Button Momentary (Red) 1NC	
522433	Pilot light Green 24V. ac/dc	24V.ac/dc lamp
522432	Pilot light Red 24V. ac/dc	
522431	Pilot light Yellow 24V. ac/dc	
522434	Pilot light Blue 24V. ac/dc	
522435	Pilot light Clear 24V. ac/dc	
522235	Compact Stop, Twist to reset, Red, 30mm Mushroom Head 2NC	Contacts: AC15: 240V. 0.75A. / 120V. 1.5A.
522236	Compact Stop, Twist to reset, Red, 30mm Mushroom Head 1NC 1NO	

Tongue Interlock Switch with Guard Locking, RFID Coding & Release Key

ORIGINAL INSTRUCTIONS. To request this data sheet in other languages please contact info@idemsafety.com
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IDEM SAFETY SWITCHES USA, Inc. 2574 S.Beverley St., Suite 104, Boise, ID 83709 Tel: 510-445-0751 Fax: 866-431-7064 email: salesusa@idemsafety.com Web: www.idemsafety.com