DESIGNED & MANUFACTURED
IN GREAT BRITAIN

MECHAN CONTROLS

Installation Instruction for

MK-Safe SW Key Controlled Switch

Machine Safety for People and Productivity

Operating Instructions: MK-Safe SW-Range

Description	SW-Range
MK-Safe is the easy-to-configure trapped key interlocking system. It is suitable for various industrial safety applications. The casing of MK-Safe is stainless steel 316 which is designed and built to withstand harsh operating environment. The coding system has 15,000+ different key codes avaible. The master coding system can be provided as an option. SW key controlled switch is designed to work for the control isolation. The 2NO2NC contacts can be monitored by the safety relays. SW1 is the single lock barrel option. SW2-SW5 are the multiple lock barrel option.	

The information is designed to help suitably qualified personnel install and operate Mechan Controls safety equipment. Before using this product, read this guide thoroughly along with any relevant European and/or National Standards E.g. Machinery Directive 2006/42/EC and its Amendments, Provision and Use of Work Equipment Regulations. Further information can be obtained from Mechan Controls Ltd.

Mechan Controls Ltd accepts no responsibility of managing key codes for the customers. It is customer's responsibility implement proper key code management system and means to prevent unintentional duplication of key codes. If an organization decides to keep spare or master keys then they shall be under management control and this shall be taken account of in the risk assessment. For further information, please refer to ISO/TS 19837.

Max. Permissible Wire Gage - Use copper wire only --- For the SW switch

Wire Type	Max. Cross section
Single-core or stranded wire	2 x 2.5 mm²
Single-core or stranded wire	2 x 12 AWG
Flexible wire	2 x 2.5 mm²
Flexible wire sleeving in accordance with DIN 46228	2 x 2.5 mm²
Flexible AWG wires (without sleeve)	2 x 14 AWG
** Tightening torque of screws terminals is 0.6 Nm	
*** Please contact Mechan Controls for further information.	

Technical Specification: SW-Range

Lock Housing Material	316 Stainless Steel
Locking Mechanism Material	Full Stainless Steel
Mounting Plate Material	Full Stainless Steel
Operating Temperature	0ºC - 40ºC
Mechanical Lifetime of Lock Barrels	400,000 Operations
Electrical Lifetime of switch	200,000 Operations DC-13, 50ms @ 0,5A 24VDC

Safety Standards	
Standards	EN ISO 14119:2013 EN ISO 13849-1:2015 EN ISO 13849-2:2012 EN IEC 62061:2021
Certifications	CE Complies with all relevant sections of the CE Marking Directive

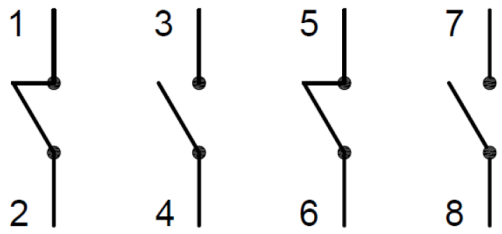
Safety Related Data	
B10d	2,000,000 Note**
Diagnostic Coverage (DC)	High, 99% with correct monitoring Note**
SIL up to	SIL 3 acc. to EN 62061 Note**
Performance Level (PL) up to	PL-e acc. to EN ISO 13849-1 Note**
Safety Category up to	CAT4 acc. to EN ISO 13849-1 Note**

Note**:
The highest safety performance rating can ONLY be achieved by using dual safety inputs monitored by proper safety PLC or safety relay with correct safety circuits.
Using SW key control switch in other applications, the safety performance rating will be subject to design of the circuit and safety control system. The safety performance rating will be much lower than using the proper safety relay to monitor. Please contact Mechan controls for more information.
The trapped key interlocking product is part of the machine safety control system.
To achieve the desired safety performance, the correct system structure shall be implemented.
The proper safety controller shall be used to provide the correct monitoring function and diagnostic coverage.

Operation Instructions: MK-Safe SW Key Control Switch

The operating logic of the SW1 key control switch

When the key is released from the lock, the status of the switch contacts is as following:



	Contact 1-2	Contact 3-4	Contact 5-6	Contact 7-8
Status	Closed	Open	Closed	Open

When the key is inserted in the lock barrel and turned to the trapped position, the status of the switch contacts is as following:

	Contact 1-2	Contact 3-4	Contact 5-6	Contact 7-8
Status	Open	Closed	Open	Closed

The operating logic of the SWn n=2-5 key control switch with multiple lock barrels

The operation of releasing keys:

1. The key for the first lock barrel which drives the switch is always turned to released position first.
2. When the first key is released or turned to release position, the rest of the keys can be released sequentially.

When one or more keys are released from SWn (n=2-5)Unit, the status of the switch contacts are as following:

	Contact 1-2	Contact 3-4	Contact 5-6	Contact 7-8
Status	Closed	Open	Closed	Open

The operation of trapping keys:

1.Return all the keys back to the unit, the keys now can be turned to trapped position sequentially
2. The first key which drives the switch can be turned to trapped position when all the rest of the keys are trapped.

When all the keys are trapped in SWn (n=2-5)Unit, the status of the switch contacts are as following:

	Contact 1-2	Contact 3-4	Contact 5-6	Contact 7-8
Status	Open	Closed	Open	Closed

Operation Instructions: MK-Safe SW Key Control Switch

AC Current Rating for each switch contact

Please refer to the following table for AC rated operational current Ie of the switch contact. If further information or clarification is required, please contact Mechan Controls

Table of AC Rated Operational Current Ie		
Utilization category	Voltage (V)	Current (A)
AC-15	220 - 240	5
AC-21A	220 - 240	20
AC-22A	220 - 240	20

DC Current Rating for each switch contact

Please refer to the following table for DC rated operational current Ie of the switch contact. If further information or clarification is required, please contact Mechan Controls

Table of DC Rated Operational Current Ie		
Utilization category	Voltage (V)	Current (A)
DC-21A	24	16
DC-22A	24	14
DC-23A	24	13
DC-13	24	3

Mounting of the key controlled switch

1. The unit should be mounted in its correct assembly condition.
2. The user must comply with the relevant safety standards.
3. After mounting the unit, it must be commissioned and tested by a qualified person to ensure the correct operation and safety function of the unit.
4. The user must comply with the relevant electrical standards.

The unit should be mounted in the position with no vibration. Otherwise, anti-vibration mounting measurement should be used to ensure the correct operation of the unit.

Recommended Fixing Required:
SW1, SW2 and SW3 key controlled switch:
4 x M6 Hex socket head cap screws / minimum screw length = 16mm + panel thickness
4 x M6 Spring washer, 4 x M6 Flat washer, 4 x M6 Nut

SW4 and SW5 key controlled switch:
6 x M6 Hex socket head cap screws / minimum screw length = 16mm + panel thickness
6 x M6 Spring washer, 6 x M6 Flat washer, 4 x M6 Nut

The recommended torque to tighten the above M6 fixing screws is 8 to 10Nm.
Ensure that all the fixing screws can not be removed due to the vibration.
The temper-proof security screws are recommended so that the personnel on site can not remove the unit using standard tools.
All fixing positions must be used.

The user should consider the weight of the SW unit which requires the proper support of the unit.
The user should ensure the SW unit is mounted securely.

Product Selection

MK-SWn-STC-N-20A

Product Type	
MK-Safe	Mechan Key Exchange

Product Type	
SWn	Key Operated Switch with n locks, n = 1-5

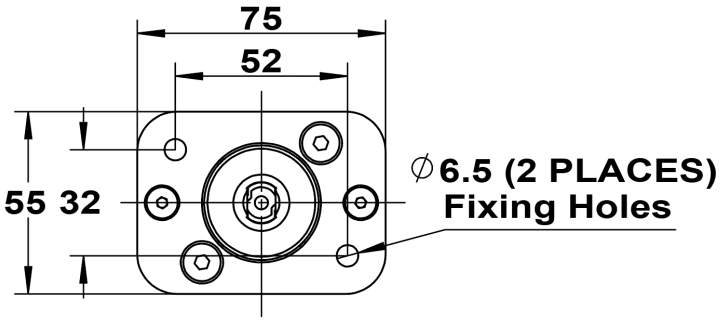
Code Type	
STC	Standard Code System
MAC	Master Code System

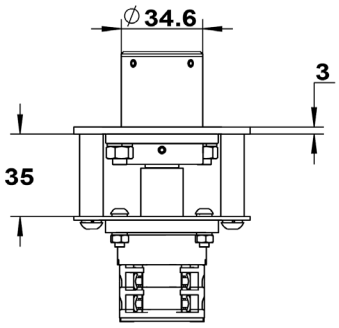
Dust Cover	
N	No Dustcover
DC	With Dustcover

Current	
20A	20A AC see detail electrical specification

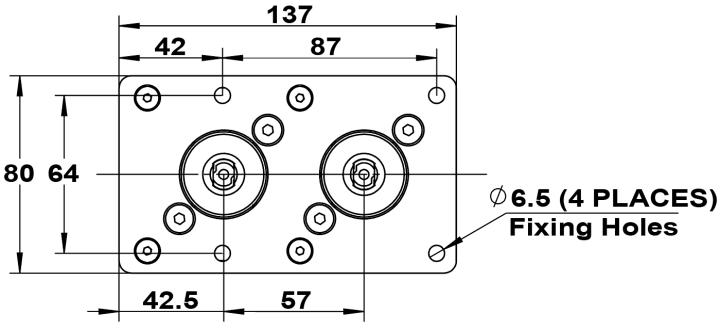
Dimensions

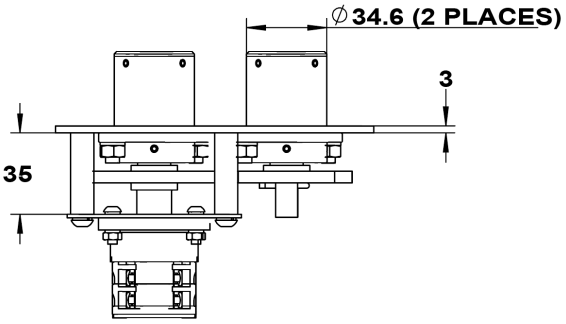
SW1 key controlled switch drawing:



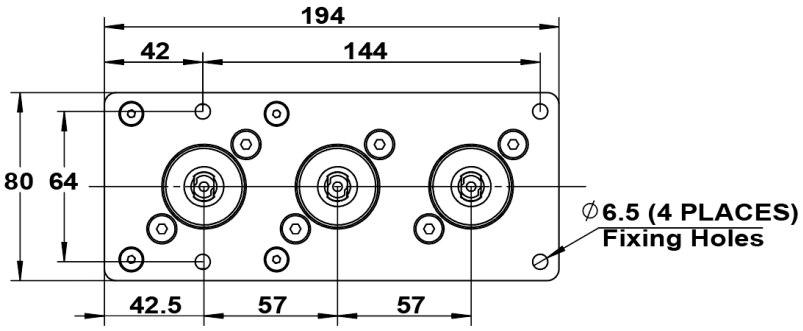


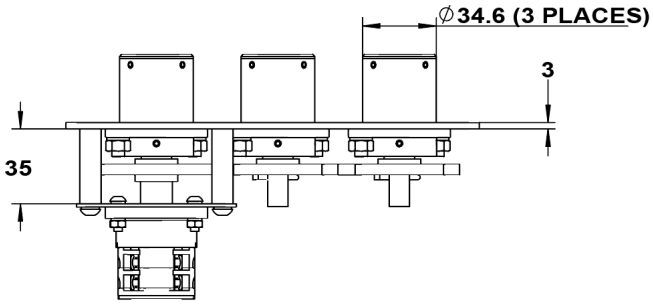
SW2 key controlled switch drawing:



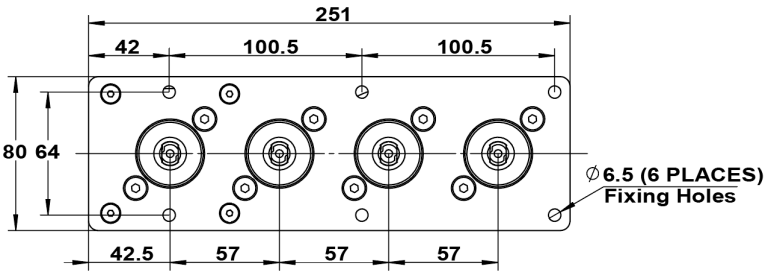


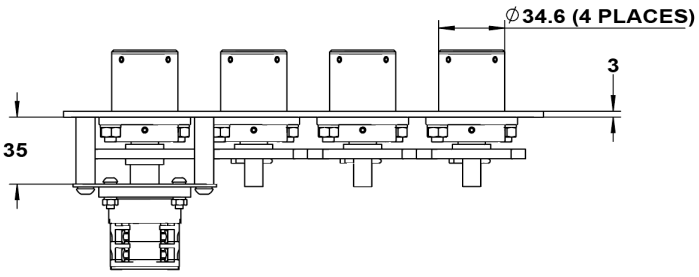
SW3 key controlled switch drawing:



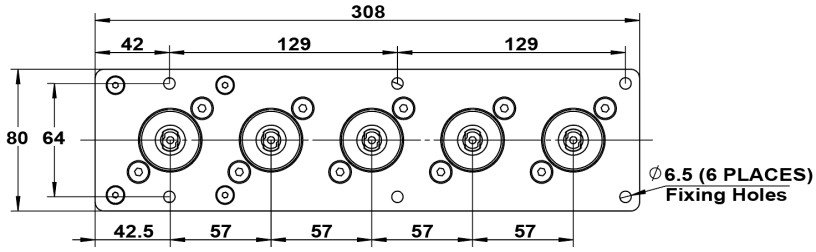


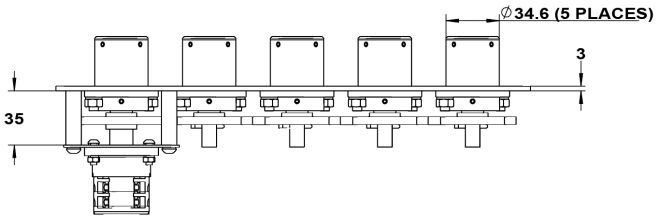
SW4 key controlled switch drawing:





SW5 key controlled switch drawing:





All dimensions are in MM

Safety Assessment

A risk assessment should take place to establish that the specifications of the MK-Safe product are suitable for the application required. See Technical Specifications below or contact Mechan Controls for further information.

The products may only be installed, commissioned, operated, maintained by competent persons.

A competent person is a qualified and knowledgeable person who, because of their training, experience and current professional activity, has the specialist knowledge required. An understanding of European and International laws, directives and standards is recommended.

Maintenance

It is recommended to check the unit on a weekly basis regarding the following aspects:
1. the correct safety function of the unit
2. the correct operation of the unit
3. Look for signs of damage or excessive wear

Damaged units should be replaced or returned to the manufacturer for repair where practical. For the purpose of lubrication or cleaning, use WD40. The unit should be lubricated at a reasonable frequency depending on the operating environment.

Disclaimer

In the interest of product development specifications are subject to change without notice. It is the responsibility of the user to ensure compliance with any acts or by-laws in place. All information regarding Mechan equipment is believed to be accurate at the time of printing. Responsibility cannot be accepted for errors or omissions.

Warranty

Warranty will be void if the following points are true:

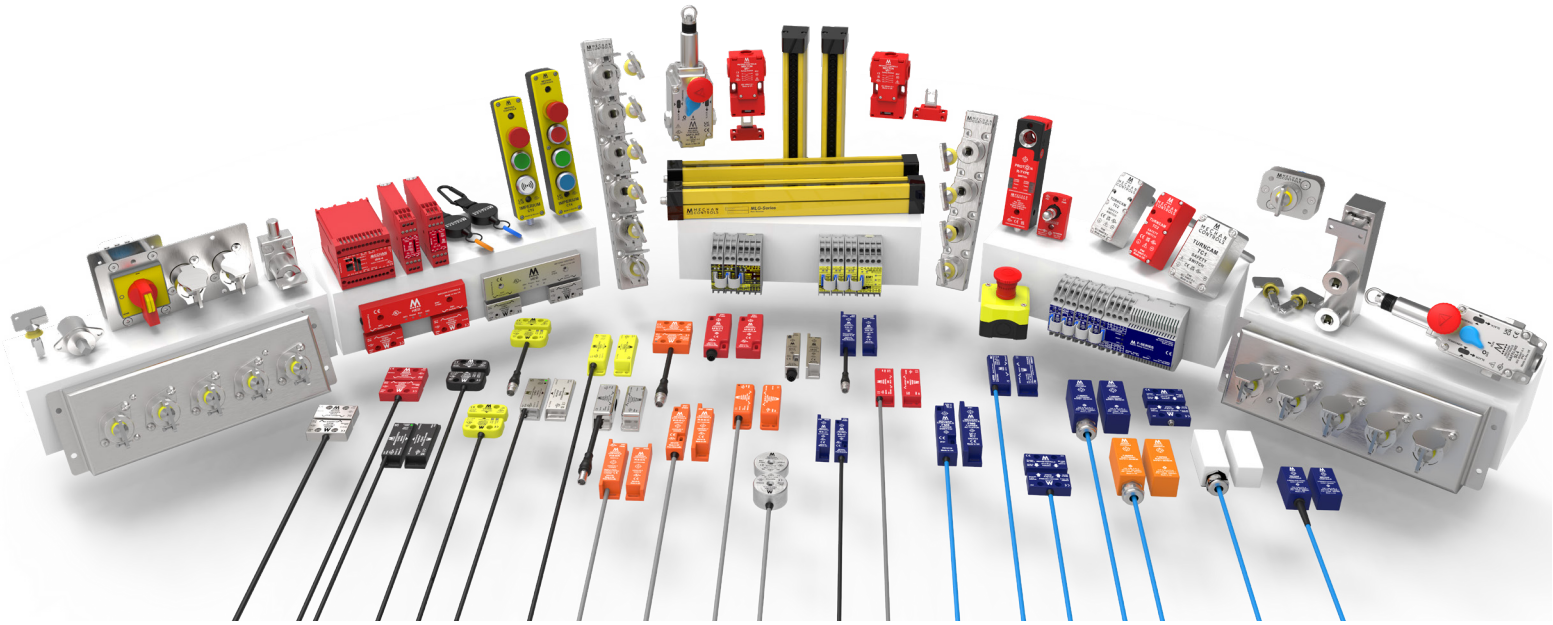
- The product was not used for its intended purpose
- Damaged was caused by usage not stated in the manual
- Modifications have been made to the products (e.g exchanging components)
- Operating personnel are not suitably qualified

Warning!

The MK-Safe trapped key system should not be manipulated or overridden. Removing the actuator from the guard may lead to loss of safety resulting in serious injury or death.

Mechan Controls Safety Products

Mechan Controls designs and manufactures machine guard safety products in the U.K. since 1972. As one of the leading manufacturers in the world, Mechan prides itself on the quality of its products. With over 100 Years of experience in the machine guarding field, Mechan Controls is at the forefront of machine guarding safety.



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