

Safety Interlock Switch

MKey8



Switch operational description

MKey8 interlock safety switches are designed to provide position interlock detection and locking for moving guards. They are designed to fit the leading edge of sliding, hinged or lift off machine guards. The actuator is fitted to the moving part of the guard and is aligned to the switch entry aperture. The possibility to lock the switch in the protective position prevents unwanted access to machinery until dangerous operations have ceased.

The locking is useful when applications include:

- processes which cannot be interrupted, such as welding.
- machinery with a long stopping procedure, such as paper machinery that requires a long braking operation.
- prevention of unauthorised access to a particular area.

The head can be set in four positions, thus providing the safety device with eight different operating positions. The leading edges of the actuator key are reinforced and beveled in order to guide it properly into the hole. The MKey8 series have been developed with a high holding force of 2000N. MKey8 has several types of actuators as an option. A standard actuator key is always delivered with interlock switches.

Material

Depending on the environment where the switch will be used, different material can be chosen for the MKey8. The basic version has a rugged die cast housing with a rating of IP67. In harsh applications as for food processing and chemical industry there is a MKey8 Interlock switch with a total rugged stainless steel 316 body. This version has IP69K enclosure

Approvals:



Application:

Gates
Hatches

Features:

Robust design
8 actuating positions
High holding force
Up to PL e, Cat.4
Painted metal or stainless steel
LED status indication

protection (maintained by a double seal lid gasket and seals) and can be high pressure hosed with detergent at high temperature.

Two ways to interlock

The MKey8 is available in two basic versions, either with a spring lock or an electro-magnetic lock.

In the spring lock version, the locking mechanism moves into the locked position directly when the door is closed and the actuator key is pushed into the switch. The actuator key can only be released and the gate opened by supplying operational voltage to the solenoid (A1-A2).

The MKey8 also has an emergency rear release 'unlocking' facility to enable the actuator key to be released without the energisation of the solenoid (A1-A2). This version is called MKey8ER.

MKey8M is the electro-magnetic lock version, the locking mechanism is only in the locked position when the solenoid (A1-A2) is supplied with operating voltage. Release of the actuator key is only possible when the operating voltage is removed from the solenoid (A1-A2). The solenoid voltage can be 24VDC or 230VAC depending on choice.

Safety level

The MKey8 has double forced disconnection contacts connected to the actuator key and the locking mechanism. The actuator key is designed to protect against unauthorised access; no tools, magnets or similar allow that the MKey8 can be tampered with. To achieve highest safety level in connection with the machine control system, it is recommended that the MKey8 is monitored by an appropriate ABB Jokab Safety safety relay, Pluto safety-PLC or Vital system. To obtain the highest level of safety, two switches per gate are required.

MKey8, MKey8M and MKey8Z

MKey8 - Standard version with spring lock

The version of MKey8 with die cast housing and spring lock. The switch has a contact block configuration of 2NC + 2NC with positive force disconnection contacts. One pair closes when the actuator key is pushed into the head (2NC). The other pair closes when the locking mechanism is in the locked position (2NC). There are two NO auxiliary circuits, 1NO circuit with indication of guard open and on another 1NO circuit indication of lock status.



MKey8

MKey8Z



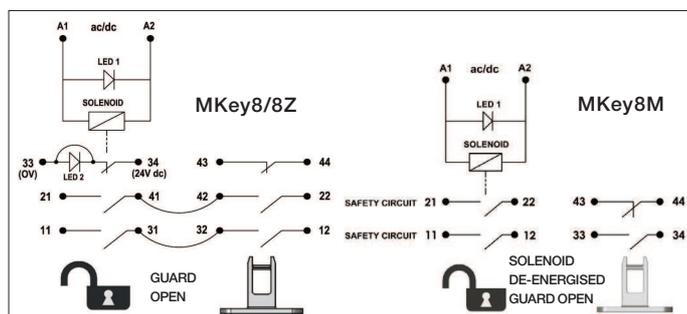
MKey8M

MKey8Z - Stainless Steel version with spring lock

The version of MKey8 with rugged stainless steel housing and spring lock. The switch has a contact block configuration of 2NC + 2NC with positive force disconnection contacts. One pair closes when the actuator key is pushed into the head (2NC). The other pair closes when the locking mechanism is in the locked position (2NC). There are two NO auxiliary circuits, 1NO circuit with indication of guard open and on another 1NO circuit indication of lock status.

MKey8M - Power to lock version with magnetic lock

The version of MKey8 with die cast housing and magnetic lock. The switch has a contact block configuration of 2NC + 1 (NC + NO) with positive force disconnection contacts. One pair closes when the actuator key is pushed into the head (1NC + 1NO). The other pair closes when the locking mechanism is in the locked position (2NC). A 1NO/1NC circuit gives an indication of actuator status.



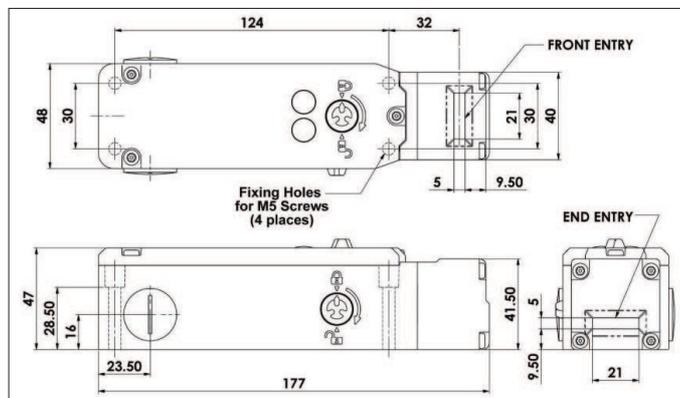
Schematic circuit: LED1 status of solenoid, LED2 status of lock (Terminals 33 - 34 are selectable to be used either as power feed to LED2 or as a voltage free auxiliary circuit to indicate lock status).

	6.0	5.0	0 mm
11/12	Open		
21/22	Open		
33/44			Open
43/44			Open

MKey8/8Z, Contacts at withdrawal of actuator.

	6.0	5.0	0 mm
11/12	Open		Solenoid energised
21/22	Open		Solenoid energised
33/34	Open		Tongue Inserted
43/44		Open	Tongue Inserted

MKey8M, Contacts at withdrawal of actuator.



Dimensions MKey8, MKey8M and MKey8Z

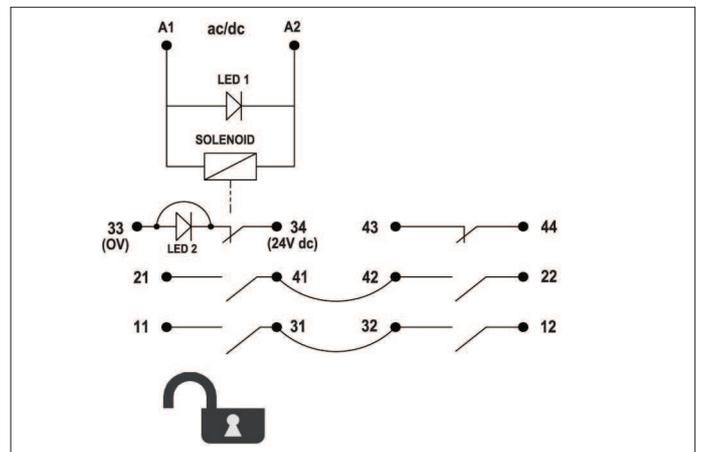
MKey8ER

MKey8ER - Standard version with emergency release

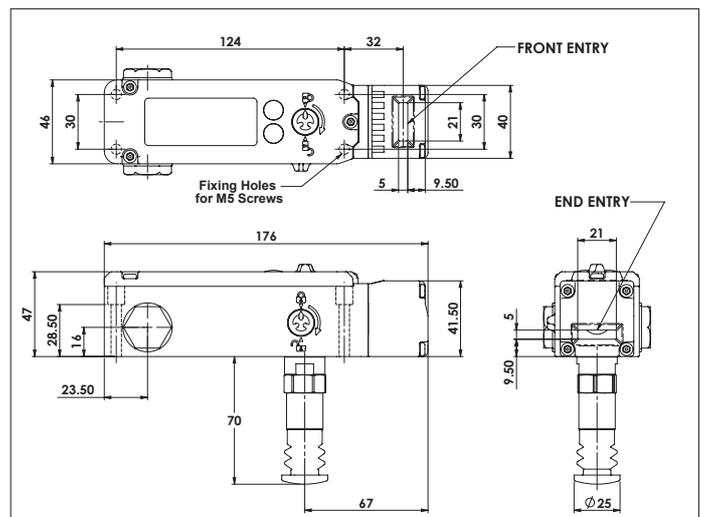
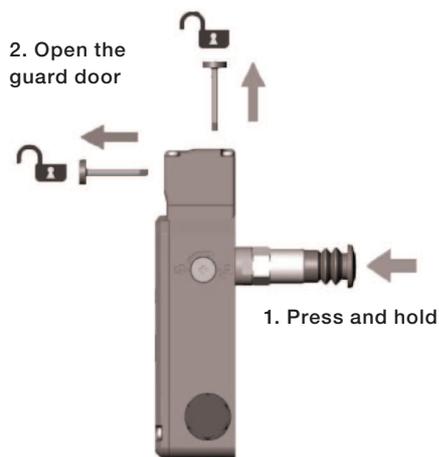
The version of MKey8 with die cast housing and spring lock with Emergency release. The switch has a contact block configuration of 2NC + 2NC with positive force disconnection contacts. One pair closes when the actuator key is pushed into the head (2NC). The other pair closes when the locking mechanism is in the locked position (2NC). There are two NO auxiliary circuits, 1NO circuit that indicates guard open and 1NO circuit that indicates lock status.

Features

The MKey8ER has manual release button at the rear of the housing. This can be used where the risk assessment for the application permit, a non latching manual escape of the switch lock in case of emergency. The switch must be mounted so that the release button is reachable from inside the active guard area. Press and holding the red button will release the lock mechanism and lock monitoring contacts while the guard can be pushed open.



LED1 status of solenoid LED2 status of lock (terminals 33-34 are selectable to be used either as power feed to LED2 or as a voltage free auxiliary circuit to indicate lock status).



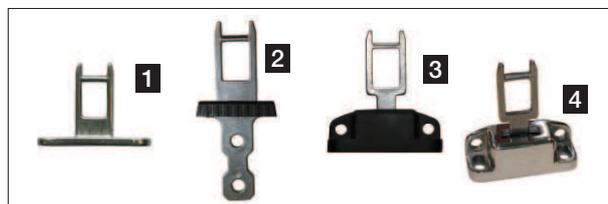
Dimensions MKey8ER

Technical data – MKey8 series	
Supplier	ABB AB Jokab Safety, Sweden
Article number/ Ordering data MKey8 - Standard MKey8 - 24VDC MKey8 - 230VAC	2TLA050011R0132 2TLA050011R0134
MKey8M - Power to Lock MKey8M - 24VDC MKey8M - 230VAC	2TLA050013R0132 2TLA050013R0134
MKey8ER - Emergency release MKey8ER - 24VDC MKey8ER - 230VAC	2TLA050015R0132 2TLA050015R0134
MKey8Z - Stainless Steel MKey8Z - 24VDC MKey8Z - 230VAC	2TLA050011R0122 2TLA050011R0124
EN ISO13849-1	Up to PL e, Cat. 4 depending upon system architecture
EN62061	Up to SIL3 depending upon system architecture
Safety data	
Mechanical reliability B_{10d}	2.5 x 10 ⁶ operations at 100mA load
Proof test interval (life)	35 years
MTTF_d	356 years (8 cycles per hour/24 hours per day/365 days)
Utilisation category	AC15 A300 3A
Solenoid voltage (by part number)	24VDC or 230VAC
Solenoid power consumption	12 W (MKey8M inrush 50 W)
LED 2 supply voltage	24VDC (MKey8, MKey8ER, MKey8Z)
Travel for positive opening	10 mm
Actuator entry mini. radius	175 mm standard actuator 100 mm heavy duty actuator
Max. approached/ withdrawal speed	600 mm/s
Rated insulation/ withstand voltages	600VAC / 2500VAC
Vibration resistance	IEC 68-2-6, 10-55 Hz+ 1 Hz excursion: 0.35 mm 1 octave/min.
Thermal current (I_{th})	5A

Regulations and Standards

The MKey8 is designed and approved in accordance to relevant standards. Examples of relevant standards are EN1088, IEC/EN60947-5-1, EN60204-1, EN ISO13849-1, EN62061 and UL508.

Enclosure protection MKey8/M/ER MKey8Z	IP67 IP69K, IP67
Operating temperature MKey8 MKey8M MKey8ER MKey8Z	-25°C to +55°C -25°C to +40°C -25°C to +55°C -25°C to +55°C
Conduit entries	3 x M20
Material MKey8/M/ER MKey8Z	Die cast painted red Stainless steel 316
Colour	Red or stainless steel
Mounting position	Any
Mounting bolts	4 x M5



Actuator

- | | |
|------------------------------------|-----------------|
| 1. Standard Key for SS head | 2TLA050040R0202 |
| 2. Flat Key | 2TLA050040R0220 |
| 3. Flexible Key with metal housing | 2TLA050040R0203 |
| 4. Flexible Key with SS housing | 2TLA050040R0204 |
- (Key always in Stainless steel)



Manual release key for MKey8Z
2TLA050040R0400



8 actuators entry positions rotatable head