Switch operational description
The MKey9 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 bevelled in order to guide it properly into the hole. The safety switch is designed to have a high holding force of 2000N. MKey9 has several types of actuators as an option. A standard actuator key is always delivered with interlock switches.

Material
The MKey9 is made in a rugged polyester housing with a stainless steel head which gives the switch a rating of IP67.

Two versions
The MKey9 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).

MKey9M is the electro-magnetic lock version, the locking mechanism is 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 is 24VDC.

Safety level
The MKey9 has double forced disconnection contacts to the actuator key and the locking mechanism. The actuator key is designed to protect against unauthorised access; no tools, magnets or similar allow the MKey9 to be tampered with. To achieve maximum safety level in connection with the machine control system, it is recommended that the MKey9 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.

Regulations and Standards
The MKey9 is designed and approved in accordance to relevant standards. Examples of relevant standards are EN 1088, IEC/EN 60947-5-1, EN 60204-1, EN ISO 13849-1, EN 62061 and UL 508.
### Technical data – MKey9 series

<table>
<thead>
<tr>
<th>Article number</th>
<th>MKey9 - 24VDC</th>
<th>MKey9M - 24VDC (power to lock)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2TLA050007R0112</td>
<td>2TLA050009R0112</td>
</tr>
</tbody>
</table>

#### Level of Safety

- **EN ISO 13849-1**: Up to PL e/Cat. 4 depending upon system architecture
- **EN 62061**: Up to SIL3 depending upon system architecture

#### Safety data

- **Mechanical reliability B_{40}**: 2.5 x 10^6 operations at 100mA load
- **Proof test interval (life) MTTF**: 356 years (8 cycles per hour/24 hours per day/365 days)

#### Utilisation category

- **AC15 A300 3A**

#### Solenoid voltage

- 24 VDC or 230 VAC, +/- 10%

#### Solenoid power consumption

- **MKey9**: 12 W
- **MKey9M**: 12 W (Inrush 50W)
- **LED 2 supply voltage**: 24 VDC, +/- 10%

#### Travel for positive opening

- **10 mm**

#### Actuator entry mini. radius

- **175 mm Standard Key**
- **100 mm Flexible Key**

#### 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 (Ith)

- **5A**

#### Conduit entry

- **1 x M20**

#### Enclosure classification

- **IP67**

#### Operating temperature

- **MKey9**: -25°C to +55°C
- **MKey9M**: -25°C to +40°C

#### Head/body material

- Stainless steel 316/polyster

#### Colour

- Red

#### Mounting position

- Any

#### Mounting bolts

- 4 x M5

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**Dimensions MKey9 and MKey9M**

<table>
<thead>
<tr>
<th>Actuator entry positions</th>
<th>Top or side manual release points (not on MKey9M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4</td>
<td>8 actuator entry positions rotatable head</td>
</tr>
</tbody>
</table>

**Schematic circuit MKey9 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).