

Safety interlock switch

MKey

MKey are mechanical safety switches used for monitoring doors and hatches. The switch is mounted on the frame and the actuator key on the moving part of the guard.

All MKey models have a safe interlocking function. Some MKey models can be locked and depending on the locking signal they can be used either as process locks or safety locks (with a safe unlocking function).

MKey switches are available in different material and sizes in order to meet the requirements of different applications.



Safety and protection

Highest level of safety

PL e/SIL3 can be reached when using two switches on a door.

Safety lock

Models that use power to unlock can be used as safety locks.

Emergency escape button

Using MKey8ER with an integrated emergency escape button, it is always possible to open the door from inside the dangerous zone.



Continuous operation

Strong holding force

A holding force of up to 2000 N prevents unwanted process stops.

Robust design

Models are available with full stainless steel housing with IP69K, suitable for most applications in food processing and chemical industries.

Status information

Auxiliary contacts give status information.



Easy to install

Easy mounting with rotating head

The head of the switch can be mounted in up to 8 actuating positions to allow different mounting positions.

Flexible keys

Flexible keys are available to minimize mechanical wear and allow a smaller movement radius and use in reduced spaces.

Applications

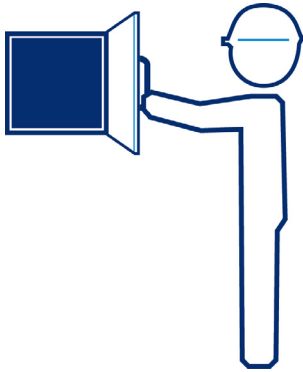
Doors and hatches

MKey is used to monitor the position of doors and hatches.

The models with locking function are usually used for:

- Processes which should not be interrupted, such as welding.
- Machinery with a long stopping procedure, such as paper machinery that requires a long braking operation.
- Prevention of unauthorized access to a particular area.

Please note that all safety key switches (including MKey) normally need two switches per door/hatch in order to reach PL e/SIL3. (See EN ISO 13849 and EN ISO 14119.)



Locking and interlocking

An interlocking function indicates if a door is open or closed and prevents movement when the door is open, but it does not prevent the door from being opened. A locking function makes sure the door is kept closed.

Process lock with safe interlocking

All MKey models offer a safe interlocking function that will stop the process if the door/hatch is opened. All lockable models of MKey can also be used as a process lock to prevent the process from being interrupted.

An example of an application where a process lock could be used is a welding robot where the stopping time is short, but the welding should not be interrupted once it has started.

Safety lock with safe interlocking and safe unlocking

The MKey models that uses power to unlock can be used as safety locks. They have a safe unlocking function, which means that the loss of power for these locks will not result in the release of the locking element, and the door will remain locked even during a power failure.

An example of an application where a safety lock should be used is a circular saw that would have a long stopping time after a power failure.

Features

Different models

MKey5 are simple mechanical interlocks while MKey8 and MKey9 also have locking functions.

- MKey5: plastic body with plastic or stainless steel head, or full stainless steel body and head. Holding force 12 N or 40 N.
- MKey8: robust design in die cast metal or stainless steel body and head. Holding force of 2000 N.
- MKey9: plastic body with stainless steel head. Holding force of 1800 N.

Different materials and protection classes

The housing and head of the key switches are available in different material in order to meet the requirements of different applications. Metal heads are more resistant to mechanical wear. The choice between plastic, die cast or stainless steel depends on the environment and the chemicals used. Models ending with -Z are completely made of stainless steel 316 and offers an IP69K protection class. They can be high pressure hosed with detergent at high temperature and can be used in harsh applications, e.g. the food processing and chemical industries. All other models offer IP67.

Emergency escape button

MKey8ER has a manual release button at the rear of the housing. It is used for emergency exit by a person locked inside the dangerous zone by mistake. It is a non-latching manual escape, and can be used when the risk assessment requires it. The switch must be mounted so that the release button is reachable from inside the dangerous zone, but not reachable from outside. Pressing and holding the button will release the locking mechanism allowing to open the door/guard.



Power to lock or power to unlock

Two different types of locking function are available:

- Spring lock (power to unlock) models are automatically locked when closing the door. An active signal (+24 VDC) must be supplied to unlock the switch, which makes these models suitable as safe locks.
- Electro-magnetic lock (power to lock) models are locked when an active signal (+24 VDC) is supplied, which makes these models suitable only as process locks.

Rotatable head

Depending on model, the head of MKey can be set in two or four directions with two entrance holes each, thus providing four or eight different mounting positions. The leading edges of the actuator key are reinforced and beveled in order to guide it properly into the hole.



Constructed for safety

All MKey switches have double positively operated forced-guided contacts controlled by the actuator key. This means that the contacts that are closed when the actuator key is in the switch will be forced to open, and the ones that are opened will be forced to close, when the actuator key is removed. It also means that it is not possible to have, e.g. NO and NC contacts opened at the same time due to a fault like one welded contact.

The actuator key is designed to prevent tampering with the safety switch using a tool, a magnet or any similar object.

The lockable models also have forced-guided contacts controlled by the locking mechanism.

MKey8 and MKey9 have auxiliary contacts giving status information (not MKey5, MKey8M or MKey9M).

Ordering information

MKey



2TLC172409F0201

MKey5



2TLC172409F0201

MKey5 SSH



2TLC172503F0201

MKey5Z



2TLC172421F0201

MKey9



2TLC172417F0201

MKey8ER



2TLC172415F0201

MKey8Z

MKey ordering information

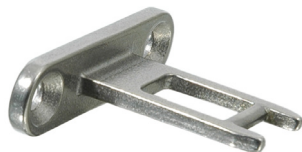
Locking function	Material housing	Material head	Holding force	Special feature	Type	Order code
—	Plastic	Plastic	12 N		MKey5	2TLA050003R0100
		Plastic	40 N		MKey5+	2TLA050003R0101
	Stainless steel	Stainless steel	12 N		MKey5 SSH	2TLA050003R0110
		Stainless steel	40 N		MKey5+ SSH	2TLA050003R0111
	Stainless steel	Stainless steel	12 N	IP69K	MKey5Z	2TLA050003R0120
			40 N	IP69K	MKey5+Z	2TLA050003R0121
Process lock (power to lock)	Plastic	Stainless steel	1800 N		MKey9M 24VDC	2TLA050009R0112
	Die cast	Die cast	2000 N		MKey8M 24VDC	2TLA050013R0132
Safety lock (power to unlock)	Plastic	Stainless steel	1800 N		MKey9 24VDC	2TLA050007R0112
				No key supplied	MKey9 24VDC, No Key	2TLA050007R0012
	Die cast	Die cast	2000 N		MKey8 24VDC	2TLA050011R0132
				With escape release button	MKey8ER 24VDC	2TLA050015R0132
Stainless steel	Stainless steel	2000 N	IP69K	MKey8Z 24VDC	2TLA050011R0122	

Ordering information

Accessories

Actuator keys

All MKey safety switches are supplied with the appropriate standard key, except MKey9 24VDC, No key. Choose standard key or flat key depending on suitable mounting direction, e.g. standard door or sliding door. Flexible keys are suitable for doors/hatches with a smaller opening radius (i.e. 100-175 mm).



MKey Key 2

2TLA050040R0201



MKey Key 3

2TLA050040R0202

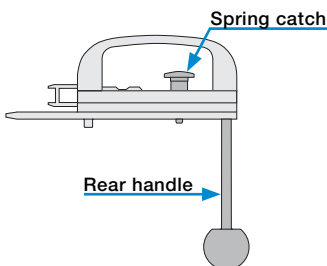


MKey Key 4

2TLA050040R0220



MKey Key 6



Slide lock with rear handle and spring catch



MKey slide lock left




MKey slide lock right

Type of key	Compatible MKey models	Key housing	Description	Type	Order code
Standard key	MKey5 MKey5+	None	Standard key for MKey safety switches with plastic head. Stainless steel key.	MKey Key 1	2TLA050040R0201
	MKey5 SSH MKey5+ SSH MKey5Z MKey5+Z All MKey8 All MKey9	None	Standard key for MKey safety switches with metal head. Stainless steel key.	MKey Key 2	2TLA050040R0202
Flat key	All	Plastic shroud	Flat key for MKey safety switches. Stainless steel key with plastic shroud.	MKey Key 3	2TLA050040R0220
Flexible key	All MKey5	Plastic	Flexible key for MKey5 safety switches. Stainless steel key with plastic housing.	MKey Key 4	2TLA050040R0221
	All	Die cast	Flexible key for MKey safety switches. Stainless steel key with black die cast metal housing.	MKey Key 5	2TLA050040R0203
	All	Stainless steel	Flexible key for MKey safety switches. Stainless steel key with stainless steel housing.	MKey Key 6	2TLA050040R0204

Other accessories

Description	Type	Order code
Bit for manual unlocking of MKey8Z. Stainless steel.	MKey8Z Manual release	2TLA050040R0400
Maintenance lockout actuator key. Compatible with all MKey switches.	MKey Lockout key	2TLA050040R0401
Slide Lock for MKey8 and MKey9, left.	MKey slide lock left	2TLA050040R0500
Slide Lock for MKey8 and MKey9, right.	MKey slide lock right	2TLA050040R0501
Rear handle for MKey Slide Lock. Required to open door from inside.	Slide lock rear handle	2TLA050040R0510
Spring catch for MKey Slide Lock. Prevents accidental movement of the Slide Lock.	Slide lock spring catch	2TLA050040R0511
Spacer in stainless steel for flexible keys. Required when using JSM D29A and JSM D29C.	JSM D29E	2TLA040033R6400

Technical data

	MKey5	MKey8	MKey9
Approvals			
Conformity	CE 2006/42/EC - Machinery 2014/30/EU - EMC 2011/65/EU - RoHS EN ISO 12100:2010, EN ISO 14119:2013, EN 60204-1:2006+A1:2009, EN 60947-1:2007+A1:2011, EN 60947-5-1:2004+A1:2009		
Functional safety data			
B_{10d}	2,500,000 operations at 100 mA load		
EN/IEC 62061	Up to SILCL3 (depending on system architecture) ¹⁾		
EN ISO 13849-1	Up to PL e (depending on system architecture) ¹⁾		
Electrical data			
Contact block configuration with guard open and unlocked			
For actuator key	2 NO + 1 NC	MKey8, MKey8Z, MKey8ER: 2 NO + 1 NC MKey8M: 1 NO + 1 NC	MKey9: 2 NO + 1 NC ²⁾ 1 NO + 1 NC
For solenoid/locking	-	MKey8, MKey8Z, MKey8ER: 2NO + 1NC MKey8M: 2 NO	MKey9: 2 NO + 1 NC ²⁾ MKey9M: 2 NO
Solenoid voltage	-	+24 VDC ± 10%	+24 VDC ± 10%
DC-13	24 VDC / 3 A		
AC-15	230 VAC / 3 A		
Mechanical data			
Travel for positive opening	6 mm	10 mm	10 mm
Actuator key entry minimum radius	175 mm Standard Key, 100 mm Flexible Key		
Material	Body: Polyester or stainless steel 316 Head: Polyester or stainless steel 316	MKey8, MKey8M, MKey8ER: Die cast painted red MKey8Z: Stainless steel 316	Body: Glass filled polyester Head: Stainless steel 316
Conduit entries	3 x M20 x 1.5	3 x M20 x 1.5	1 x M20 x 1.5
Operating temperature	-25...+80°C	-25...+40°C	-25...+40°C
Protection class	MKey5, MKey5+, MKey5 SSH, MKey5+ SSH: IP67 MKey5Z, MKey5+Z: IP67, IP69K	MKey8, MKey8M, MKey8ER: IP67 MKey8Z: IP67, IP69K	IP67

- 1) Please see EN/IEC 62061, EN ISO 13849, EN ISO 14119 and ISO/TR 24119 to see how fault exclusions and serial connection impacts the reliability of the safety related parts of control systems.
- 2) For MKey9, the pair of contacts for the actuator key and the pair of contacts for the locking cannot be used independently of each other. See the manual for more information.

More information

For more information, e.g. the complete technical information, see product manual:

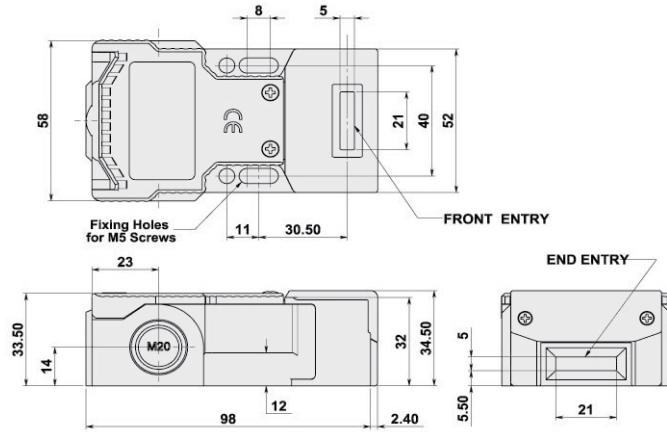
MKey5 [2TLC172244M0201](#)

MKey8 [2TLC172245M0201](#)

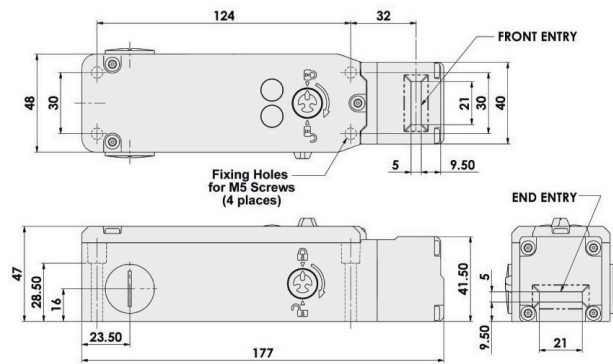
MKey9 [2TLC172246M0201](#)

Dimension drawings MKey

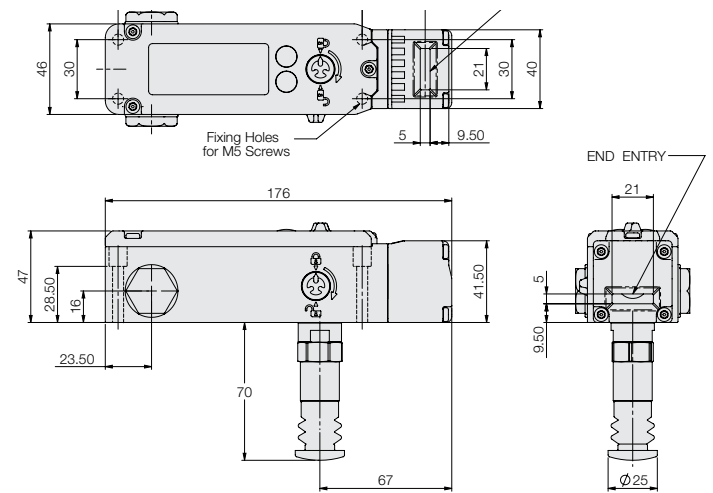
MKey5



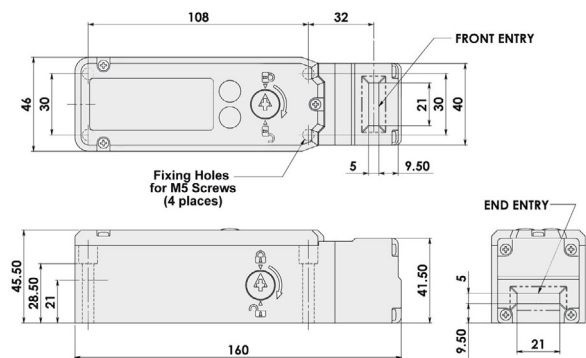
MKey8 and MKey8M



MKey8ER



MKey9 and MKey9M



All dimensions in mm

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