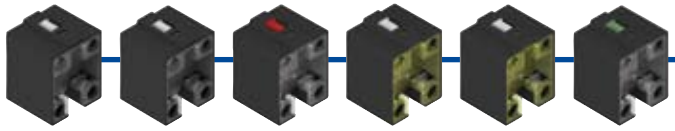
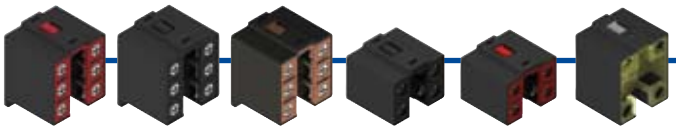
Selection diagram

FR FM FX FZ FK

CONTACT BLOCKS



5 1NO+1NC snap action
6 1NO+1NC slow action
7 1NO+1NC slow action overlapped
9 2NC slow action
14 2NC slow action shifted
18 1NO+1NC slow action closer



20 1NO+2NC slow action
21 3NC slow action
22 2NO+1NC slow action
33 1NO+1NC slow action
34 2NC slow action
66 1NC slow action

CONDUIT ENTRIES

Threaded conduit entries (standard)
With cable gland assembled
With M12 plastic connector assembled and wired
With M12 metal connector assembled and wired

product option
accessory sold separately

Code structure

Attention! The feasibility of a code number does not mean the effective availability of a product. Please contact our sales office.

article | options

FR 1896-XGM2K70

Housing

FR	polymer housing, one conduit entry
FM	metal housing, one conduit entry
FX	polymer housing, two conduit entries
FZ	metal housing, two conduit entries

Contact blocks

5	1NO+1NC, snap action
6	1NO+1NC, slow action
7	1NO+1NC, slow action overlapped
9	2NC, slow action
14	2NC, slow action shifted
18	1NO+1NC, slow action closer
20	1NO+2NC, slow action
21	3NC, slow action
22	2NO+1NC, slow action
33	1NO+1NC, slow action
34	2NC, slow action
66	1NC, slow action

External metallic parts

	zinc-plated steel (standard)
X	stainless steel

Contacts type

	silver contacts (standard)
G	silver contacts gold plated 1 µm

Threaded conduit entry

	PG 13,5 (standard)
A	PG 11 (only for FR-FX housing)
M1	M16x1,5 (only for FR-FX housing)
M2	M20x1,5

Preinstalled cable gland or connectors

	no cable gland or connector (standard)
K21	with assembled cable gland suitable for Ø 6 to Ø 12 mm cables range
...	.....
K70	with assembled 4 poles M12 plastic connector
...	.....

For the complete list of all combinations, please contact our technical office.

article | options

FK 3396-XGM1K22

Housing

FK	polymer housing, one conduit entry

Contact blocks

33	1NO+1NC, slow action
34	2NC, slow action

External metallic parts

	zinc-plated steel (standard)
X	stainless steel

Threaded conduit entry

	PG 11 (standard)
M1	M16x1,5

Contacts type

	silver contacts (standard)
G	silver contacts gold plated 1 µm

Preinstalled cable gland

	no cable gland (standard)
K22	with assembled cable gland suitable for Ø 5 to Ø 10 mm cables range
K26	with assembled cable gland suitable for Ø 3 to Ø 7 mm cables range

Safety switches **for hinged doors**

Main data

- Metal housing or polymer housing, from one to two conduit entries
- Protection degree IP67
- 12 contact blocks available
- Stainless steel actuator
- M12 assembled connector versions
- Silver contacts gold plated versions
- Stainless steel external parts versions

Markings and quality marks:

Approval IMQ:	EG610 (FR-FX-FK series) EG609 (FM-FZ series)
Approval UL:	E131787
Approval CCC:	2007010305230013 (FR-FX-FK series) 2007010305229998 (FM-FZ series)
Approval EZU:	1010151
Approval GOST:	POCC IT.AB24.B04512

Technical data

Housing

Housing type FR, FX and FK made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin ⧈
Housing type FM and FZ made of metal, coated with baked epoxy powder.
FR, FM and FK series one conduit entry
FX and FZ series two conduit entries

Protection degree:	IP67 according to EN 60529 with cable gland having equal or higher protection degree

General data

For safety applications up to SIL 3 / PL e

Safety parameters:	see page 7/34
Ambient temperature:	from -25°C to +80°C

Version for operation in ambient temperature from -40°C to +80° C on request

Max actuation frequency:	3600 operations cycles[1]/hour
Mechanical endurance:	1 million of operations cycles[1]
Max actuating speed:	180°/s
Min. actuating speed:	2°/s
Driving torque for installation:	see pages 7/1-7/12

(1) One operation cycle means two movements, one to close and one to open contacts, as foreseen by EN 60947-5-1 standard..

Cross section of the conductors (flexible copper wire)

Contact blocks 20, 21, 22, 33, 34:	min.	1 x 0,34 mm²	(1 x AWG 22)
	max.	2 x 1,5 mm²	(2 x AWG 16)
Contact blocks 5, 6, 7, 9, 14, 18, 66:	min.	1 x 0,5 mm²	(1 x AWG 20)
	max.	2 x 2,5 mm²	(2 x AWG 14)

In conformity with standards:
IEC 60947-5-1, EN 60947-5-1, EN 60947-1, IEC 60204-1, EN 60204-1, EN 1088, EN ISO 12100-1, EN ISO 12100-2, IEC 60529, EN 60529, NFC 63-140, VDE 0660-200, VDE 0113.
Approvals:
IEC 60947-5-1, UL 508, GB14048.5-2001.

In conformity with requirements requested by:
Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC and Electromagnetic Compatibility 2004/108/EC.
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1, VDE 0660-206.

⚠ If not expressly indicated in this chapter, for the right installation and the correct utilization of all articles see requirements indicated from page 7/1 to page 7/12.

	Electrical data		Utilization categories
without connector	Thermal current (Ith):	10 A	Alternate current: AC15 (50...60 Hz)
	Rated insulation voltage (Ui):	500 Vac 600 Vdc 400 Vac 500 Vdc (contact blocks 20, 21, 22, 33, 34)	Ue (V) 250 400 500 Ie (A) 6 4 1
	Rated impulse withstand voltage (U_{imp}):	6 kV 4 kV (contact blocks 20, 21, 22, 33, 34)	Direct current: DC13
	Conditional shot circuit current:	1000 A according to EN 60947-5-1	Ue (V) 24 125 250
	Protection against short circuits:	fuse 10 A 500 V type aM	Ie (A) 6 1,1 0,4
	Pollution degree:	3	
with 4 or 5 poles M12 connector	Thermal current (Ith):	4 A	Alternate current: AC15 (50...60 Hz)
	Rated insulation voltage (Ui):	250 Vac 300 Vdc	Ue (V) 24 120 250
	Protection against short circuits:	fuse 4 A 500 V type gG	Ie (A) 4 4 4
	Pollution degree:	3	Direct current: DC13
			Ue (V) 24 125 250
			Ie (A) 4 1,1 0,4
with 8 poles M12 connector	Thermal current (Ith):	2 A	Alternate current: AC15 (50...60 Hz)
	Rated insulation voltage (Ui):	30 Vac 36 Vdc	Ue (V) 24
	Protection against short circuits:	fuse 2 A 500 V type gG	Ie (A) 2
	Pollution degree:	3	Direct current: DC13
			Ue (V) 24
			Ie (A) 2

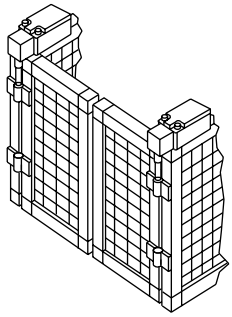
Description

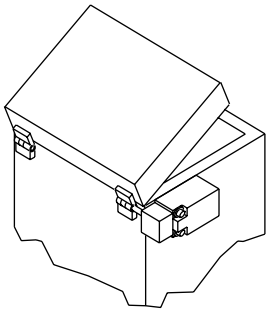
These safety switches have been designed to control gates or guards that protect the hazardous parts of machines. They are very sensitive and positively open the contact block after few rotation degrees, sending the stop signal immediately. The head adjustable in 90° steps allows their installation in four different positions. Available with polymer or metal housing, with protection degree IP67.
Its special shape allows to use this type of switches also in those areas where dust and dirt could block working of normal safety switches with separate actuator.

Rotating heads

Removing the four fastening screws, in all switches, it is possible to rotate the head in 90° steps.

Installation examples





Data type approved by IMQ, CCC and EZU

Rated insulation voltage (Ui): 500 Vac
400 Vac (for contact blocks 20, 21, 22, 33, 34)
Thermal current (Ith): 10 A
Protection against short circuits: fuse 10 A 500 V type aM
Rated impulse withstand voltage (U_{imp}): 6 kV
4 kV (for contact blocks 20, 21, 22, 33, 34)
Protection degree: IP67
MV terminals (screw clamps)
Pollution degree 3
Utilization category: AC15
Operation voltage (Ue): 400 Vac (50 Hz)
Operation current (Ie): 3 A
Forms of the contact element: Zb, Y+Y, Y+Y+X, Y+Y+Y, Y+X+X
Positive opening of contacts on contact block 5, 6, 7, 9, 14, 18, 20, 21, 22, 33, 34

In conformity with standards: EN 60947-1, EN 60947-5-1+ A1:2009, fundamental requirements of the Low Voltage Directive 2006/95/CE.

Please contact our technical service for the list of approved products.

Data type approved by UL

Utilization categories Q300 (69 VA, 125-250 Vdc)
A600 (720 VA, 120-600 Vac)
Data of the housing type 1, 4X "indoor use only", 12, 13
For all contact blocks use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 7,1 lb·in (0.8 Nm).

In conformity with standard: UL 508

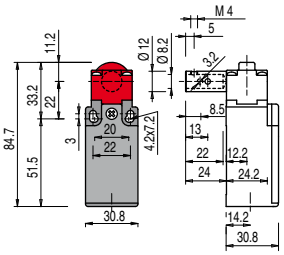
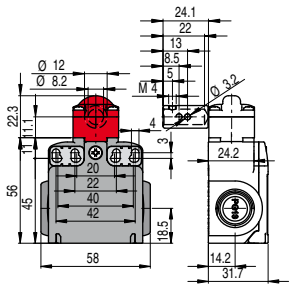
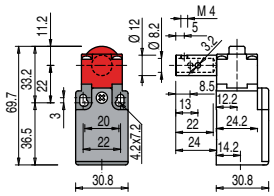
Please contact our technical service for the list of approved products.

Safety switches **for hinged doors**

Dimensional drawings

Contacts type:

R = snap action
L = slow action
LO = slow action overlapped
LS = slow action shifted

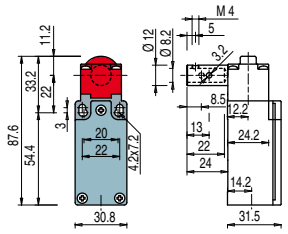
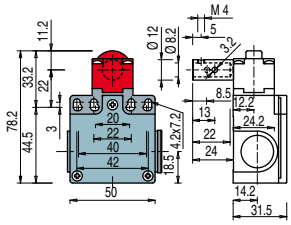
Contact blocks		Polymer housing		Polymer housing		Polymer housing	
							
5	R	FR 596	1NO+1NC	FX 596	1NO+1NC		
6	L	FR 696	1NO+1NC	FX 696	1NO+1NC		
7	LO	FR 796	1NO+1NC	FX 796	1NO+1NC		
9	L	FR 996	2NC	FX 996	2NC		
14	LS	FR 1496	2NC	FX 1496	2NC		
18	L	FR 1896	1NO+1NC	FX 1896	1NO+1NC		
20	L	FR 2096	1NO+2NC	FX 2096	1NO+2NC		
21	L	FR 2196	3NC	FX 2196	3NC		
22	L	FR 2296	2NO+1NC	FX 2296	2NO+1NC		
33	L	FR 3396	1NO+1NC	FX 3396	1NO+1NC	FK 3396	1NO+1NC
34	L	FR 3496	2NC	FX 3496	2NC	FK 3496	2NC
66	L	FR 6696	1NC	FX 6696	1NC		
Min. force		0,15 Nm (0,4 Nm →)		0,15 Nm (0,4 Nm →)		0,15 Nm (0,4 Nm →)	
Travel diagrams		page 7/8 - group 9		page 7/8 - group 9		page 7/8 - group 9	

Accessories See page 6/1

All measures in the drawings are in mm

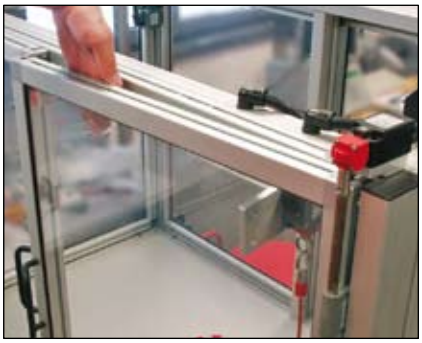
Contacts type:

R = snap action
L = slow action
LO = slow action overlapped
LS = slow action shifted

Contact blocks		Metal housing		Metal housing	
					
5	R	FM 596	1NO+1NC	FZ 596	1NO+1NC
6	L	FM 696	1NO+1NC	FZ 696	1NO+1NC
7	LO	FM 796	1NO+1NC	FZ 796	1NO+1NC
9	L	FM 996	2NC	FZ 996	2NC
14	LS	FM 1496	2NC	FZ 1496	2NC
18	L	FM 1896	1NO+1NC	FZ 1896	1NO+1NC
20	L	FM 2096	1NO+2NC	FZ 2096	1NO+2NC
21	L	FM 2196	3NC	FZ 2196	3NC
22	L	FM 2296	2NO+1NC	FZ 2296	2NO+1NC
33	L	FM 3396	1NO+1NC	FZ 3396	1NO+1NC
34	L	FM 3496	2NC	FZ 3496	2NC
66	L	FM 6696	1NC	FZ 6696	1NC
Min. force		0,15 Nm (0,4 Nm ⊖)		0,15 Nm (0,4 Nm ⊖)	
Travel diagrams		page 7/8 - group 9		page 7/8 - group 9	

Regulation of intervention point

Temporary shaft locking (dowel provided).



Verify the operating point according to EN 294, adjust the operating point again if necessary.

Switch locking (pin provided).

Items with code on the **green** background are available in stock