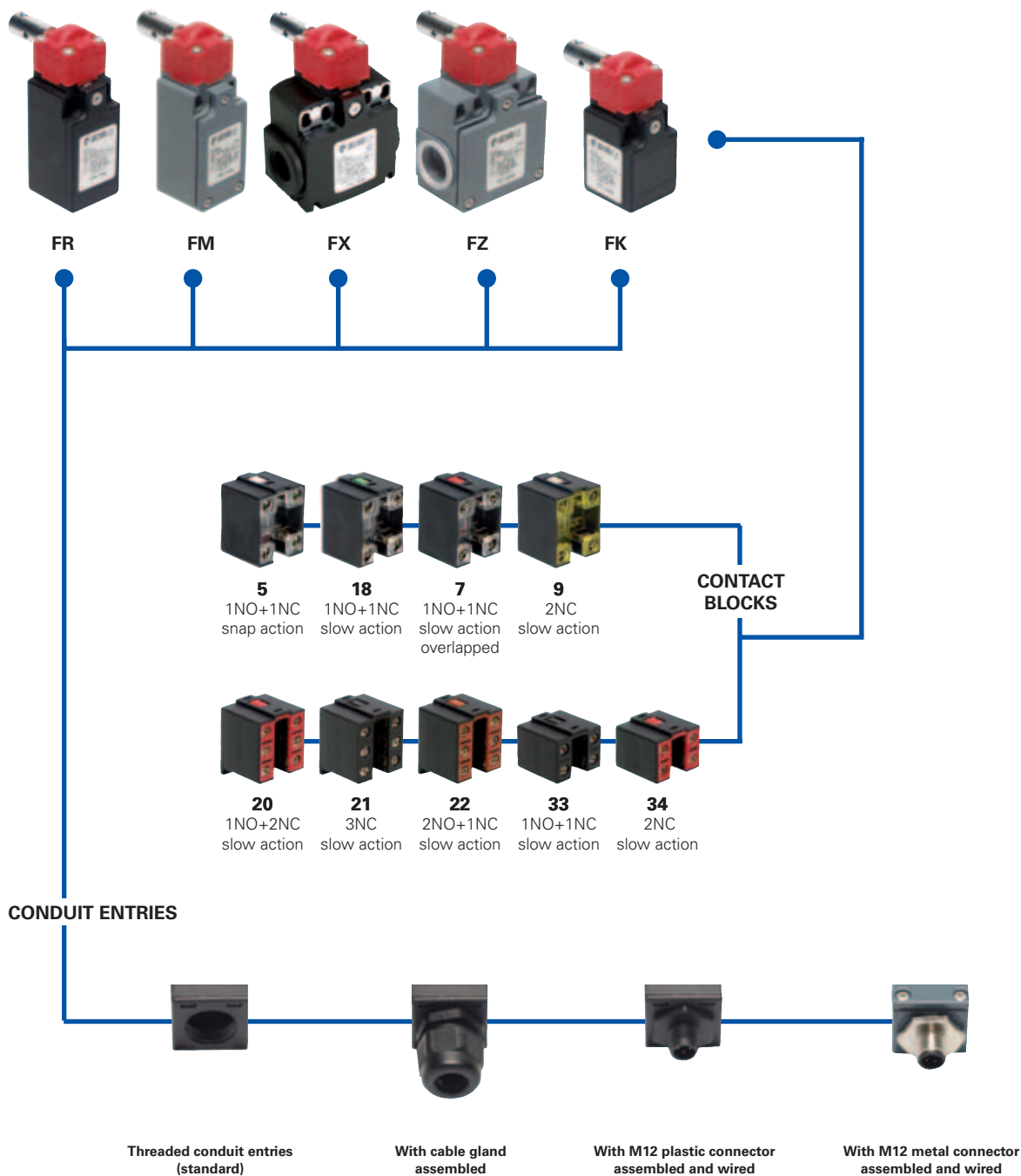


Selection diagram



● 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	
18	1NO+1NC, slow action
5	1NO+1NC, snap action
7	1NO+1NC, slow action overlapped
9	2NC, slow action
20	1NO+2NC, slow action
21	3NC, slow action
22	2NO+1NC, slow action
33	1NO+1NC, slow action
34	2NC, slow action

External metallic parts	
	zinc-plated steel (standard)
X	stainless steel

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 4 poles M12 plastic connector
...

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

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

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

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

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

Threaded conduit entry	
	PG 11 (standard)
M1	M16x1,5

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

1
1A
1B
2
2A
2B
2C
2D
2E
3
3A
3B
3C
4
4A
4B
4C
4D
4E
4F
4G
4H
5
6



Main data

- Metal housing or polymer housing, from one to two conduit entries
- Protection degree IP67
- 9 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 ECU: 1010151

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

General data

Safety parameters: see page 6/32
 Ambient temperature: from -25°C to +80°C
 Version for operation in ambient temperature from -40°C to +80° C on request
 Max operating frequency: 3600 operations cycles¹/hour
 Mechanical endurance: 1 million of operations cycles¹
 Max actuating speed: 180°/s
 Min. actuating speed: 2°/s
 Driving torque for installation: see pages 6/1-6/10

(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 mm ²	(1 x AWG 22)
	max.	2 x 1,5 mm ²	(2 x AWG 16)
Contact blocks 5, 7, 9, 18:	min.	1 x 0,5 mm ²	(1 x AWG 20)
	max.	2 x 2,5 mm ²	(2 x AWG 14)

In conformity with standards:

IEC 60947-5-1, EN 60947-5-1, 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, CENELEC EN 50013.

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 6/1 to page 6/10.

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

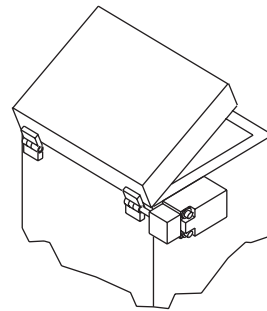
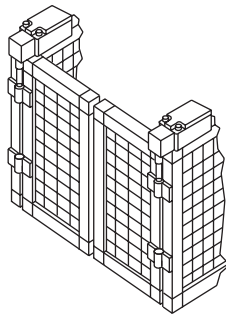
Its special shape allows to use this type of switches also in those areas where dust and dirt could block working of normal safety switches with separate actuator.

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

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, 7, 9, 18, 20, 21, 22, 33, 34

In conformity with standards: EN 60947-1, EN 60947-5-1 and subsequent modifications and completions, fundamental requirements of the Low Voltage Directive 2006/95/CE and subsequent modifications and completions.

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

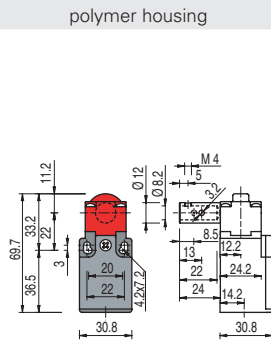
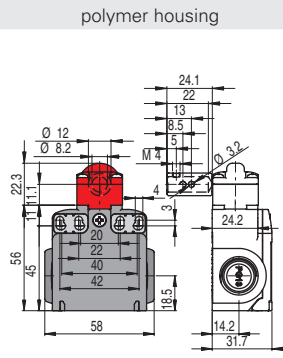
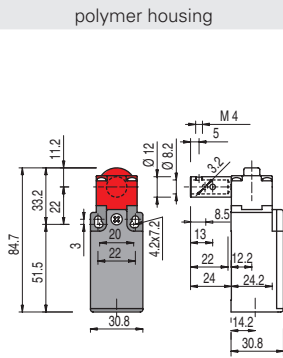
Please contact our technical service for the list of approved products.

1
1A
1B
2
2A
2B
2C
2D
2E
3
3A
3B
3C
4
4A
4B
4C
4D
4E
4F
4G
4H
5
6

Dimensional drawings

Contacts type:

- R** = snap action
- L** = slow action
- LO** = slow action overlapped

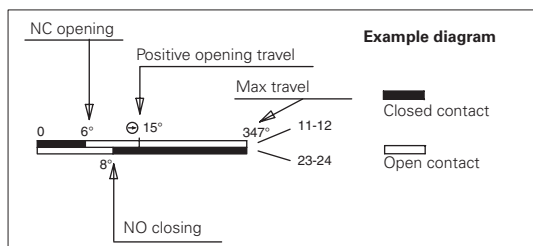


Contact blocks

	FR 1896	FX 1896	FK 3396
18	L FR 1896 1NO+1NC	FX 1896 1NO+1NC	
5	R FR 596 1NO+1NC	FX 596 1NO+1NC	
7	LO FR 796 1NO+1NC	FX 796 1NO+1NC	
9	L FR 996 2NC	FX 996 2NC	
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
Min. force	0,15 Nm (0,4 Nm ⊕)	0,15 Nm (0,4 Nm ⊕)	0,15 Nm (0,4 Nm ⊕)

How to read travel diagrams

All measures in the diagrams are in degrees



IMPORTANT:

In safety applications it is necessary to activate the switch **at least up to the positive opening point** indicated in the diagrams with the symbol ⊕. Operate the switch **at least with the positive opening force**, indicated between brackets, below each article, next the value of minimum force.

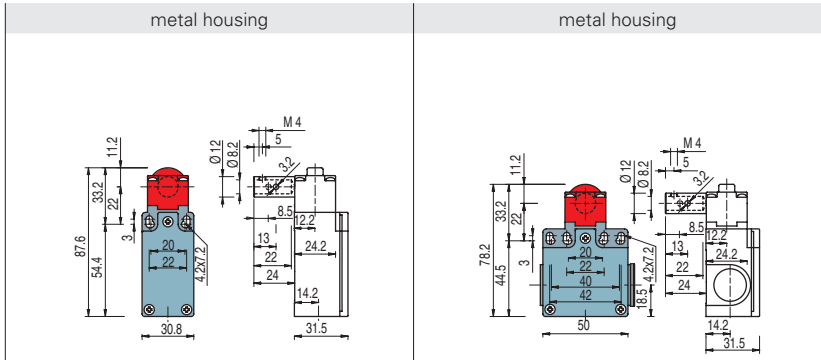
Accessories See page 5/1

All measures in the drawings are in mm



1
1A
1B
2
2A
2B
2C
2D
2E
3
3A
3B
3C
4
4A
4B
4C
4D
4E
4F
4G
4H
5
6

Contacts type:
R = snap action
L = slow action
LO = slow action overlapped



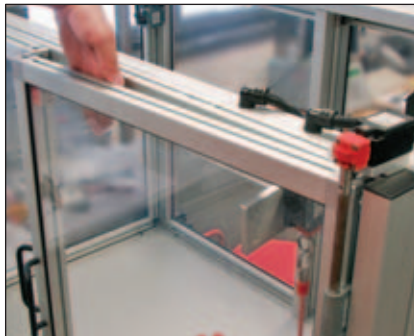
Contact blocks

	metal housing	metal housing
18	L FM 1896 \rightarrow 1NO+1NC 0° 6° 16° 347° 8°	FZ 1896 \rightarrow 1NO+1NC 0° 6° 16° 347° 8°
5	R FM 596 \rightarrow 1NO+1NC 0° 11° 31° 347° 4°	FZ 596 \rightarrow 1NO+1NC 0° 11° 31° 347° 4°
7	LO FM 796 \rightarrow 1NO+1NC 0° 15° 25° 347° 7°	FZ 796 \rightarrow 1NO+1NC 0° 15° 25° 347° 7°
9	L FM 996 \rightarrow 2NC 0° 6° 16° 347°	FZ 996 \rightarrow 2NC 0° 6° 16° 347°
20	L FM 2096 \rightarrow 1NO+2NC 0° 6° 16° 347° 9°	FZ 2096 \rightarrow 1NO+2NC 0° 6° 16° 347° 9°
21	L FM 2196 \rightarrow 3NC 0° 6° 16° 347°	FZ 2196 \rightarrow 3NC 0° 6° 16° 347°
22	L FM 2296 \rightarrow 2NO+1NC 0° 6° 16° 347° 9°	FZ 2296 \rightarrow 2NO+1NC 0° 6° 16° 347° 9°
33	L FM 3396 \rightarrow 1NO+1NC 0° 6° 16° 347° 9°	FZ 3396 \rightarrow 1NO+1NC 0° 6° 16° 347° 9°
34	L FM 3496 \rightarrow 2NC 0° 6° 16° 347°	FZ 3496 \rightarrow 2NC 0° 6° 16° 347°
Min. force	0,15 Nm (0,4 Nm \rightarrow)	0,15 Nm (0,4 Nm \rightarrow)

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