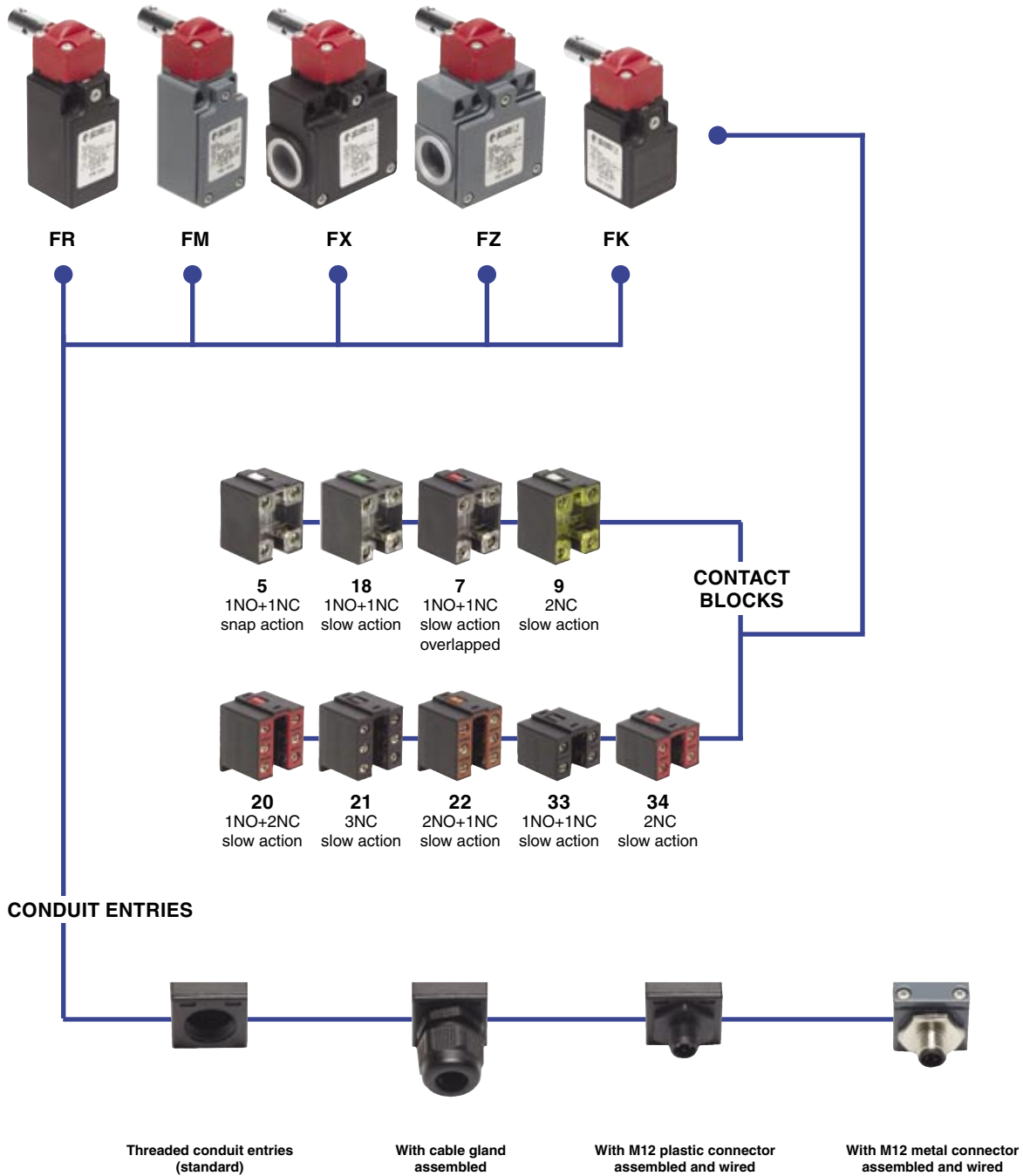


Selection diagram



Code structure

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

FR 1896-XGM2K70

Housing		Preinstalled cable gland or connectors	
FR	polymer housing, one conduit entry		no cable gland or connector (standard)
FM	metal housing, one conduit entry	K21	with assembled cable gland suitable for Ø 6 to Ø 12 mm cables range
FX	polymer housing, two conduit entries	K40	with M12 metal connector assembled and wired, 8 poles (only for contact blocks 20, 21, 22)
FZ	metal housing, two conduit entries
Contact blocks		For the complete list of all combinations, please contact our technical office.	
18	1NO+1NC, slow action	Threaded conduit entry	
5	1NO+1NC, snap action		PG 13,5 (standard)
7	1NO+1NC, slow action overlapped	A	PG 11 (only for FR-FX housing)
9	2NC, slow action	M1	M16x1,5 (only for FR-FX housing)
20	1NO+2NC, slow action	M2	M20x1,5
21	3NC, slow action	M3	1/2 NPT (only for FR housing)
22	2NO+1NC, slow action	Contacts type	
33	1NO+1NC, slow action		silver contacts (standard)
34	2NC, slow action	G	silver contacts gold plated 1 µm
External metallic parts			
	zinc-plated steel (standard)		
X	stainless steel		

FK 3396-XGM1K22

Housing		Preinstalled cable gland	
FK	polymer housing, one conduit entry		no cable gland (standard)
Contact blocks		K22	with assembled cable gland suitable for Ø 5 to Ø 10 mm cables range
33	1NO+1NC, slow action	K26	with assembled cable gland suitable for Ø 3 to Ø 7 mm cables range
34	2NC, slow action	Threaded conduit entry	
External metallic parts			PG 11 (standard)
	zinc-plated steel (standard)	M1	M16x1,5
X	stainless steel	Contacts type	
			silver contacts (standard)
		G	silver contacts gold plated 1 µm



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 EZU: 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



General data

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

(1) One operation cycle means two movements, one to close and one to open contacts, as foreseen by IEC 947-5-1 standard.

Cross section of the conductors (flexible copper wire)

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

In conformity with standards:

IEC 947-5-1, IEC 337-1, EN 60947-5-1, CEI EN 60947-5-1, CEI 17-45, IEC 204-1, EN 60204-1, CEI 44-5, EN 1088, EN ISO 12100-1, EN ISO 12100-2, IEC 529, EN 60529, CEI 70-1, NFC 63-140, VDE 0660-200, VDE 0113, CENELEC EN 50013, BG-GS-ET-15.

Approvals:

IEC 947-5-1, UL 508.

In conformity with requirements requested by:

Low Voltage Directive 73/23/EEC and subsequent modifications and completions. Machinery Directive 98/37/EEC.

Electromagnetic Compatibility 89/336/EEC and subsequent modifications and completions.

Positive contact opening in conformity with standards:

IEC 947-5-1, EN 60947-5-1, CEI EN 60947-5-1, VDE 0660-206.

For the correct installation of all articles, please see "Utilization requirements" chapter, from page 6/1 to page 6/4.

Electrical data

Utilization categories

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

Description

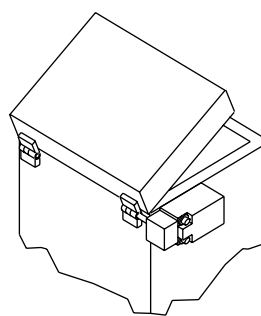
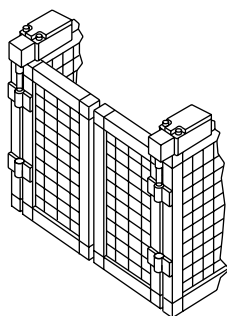
These safety switches have been designed to control gates or guards that protect the hazardous parts of machines. They are very sensitive and positively open the contact block after few rotation degrees, sending the stop signal immediately. The head adjustable in 90° steps allows their installation in 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 and EZU

Rated insulation voltage (Ui): 500 VAC
400 VAC for contact blocks 20, 21, 22, 33, 34

Thermal current (I_{th}): 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 (U_e): 400 VAC (50 Hz)

Operation current (I_e): 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: EN60947-1, EN 60947-5-1 and subsequent modifications and completions, fundamental requirements of the Low Voltage Directive 73/23 EEC and subsequent modifications and completions.

Please contact our technical service for the list of type 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

In conformity with standard: UL 508

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.

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

Dimensional drawings

Contacts type:

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

Contact blocks

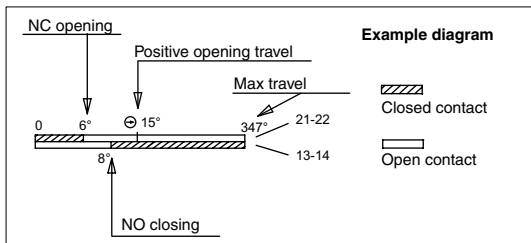
	polymer housing	polymer housing	polymer housing
18	FR 1896 \ominus 1NO+1NC	FX 1896 \ominus 1NO+1NC	
5	FR 596 \ominus 1NO+1NC	FX 596 \ominus 1NO+1NC	
7	FR 796 \ominus 1NO+1NC	FX 796 \ominus 1NO+1NC	
9	FR 996 \ominus 2NC	FX 996 \ominus 2NC	
20	FR 2096 \ominus 1NO+2NC	FX 2096 \ominus 1NO+2NC	
21	FR 2196 \ominus 3NC	FX 2196 \ominus 3NC	
22	FR 2296 \ominus 2NO+1NC	FX 2296 \ominus 2NO+1NC	
33	FR 3396 \ominus 1NO+1NC	FX 3396 \ominus 1NO+1NC	FK 3396 \ominus 1NO+1NC
34	FR 3496 \ominus 2NC	FX 3496 \ominus 2NC	FK 3496 \ominus 2NC
Min. force	0,15 Nm (0,4 Nm \ominus)	0,15 Nm (0,4 Nm \ominus)	0,15 Nm (0,4 Nm \ominus)

Accessories
See page 5/1

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

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 \ominus . Operate the switch **at least with the positive opening force**, indicated between brackets, below each article, next the value of minimum force.

All measures in the drawings are in mm

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

Contact blocks

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