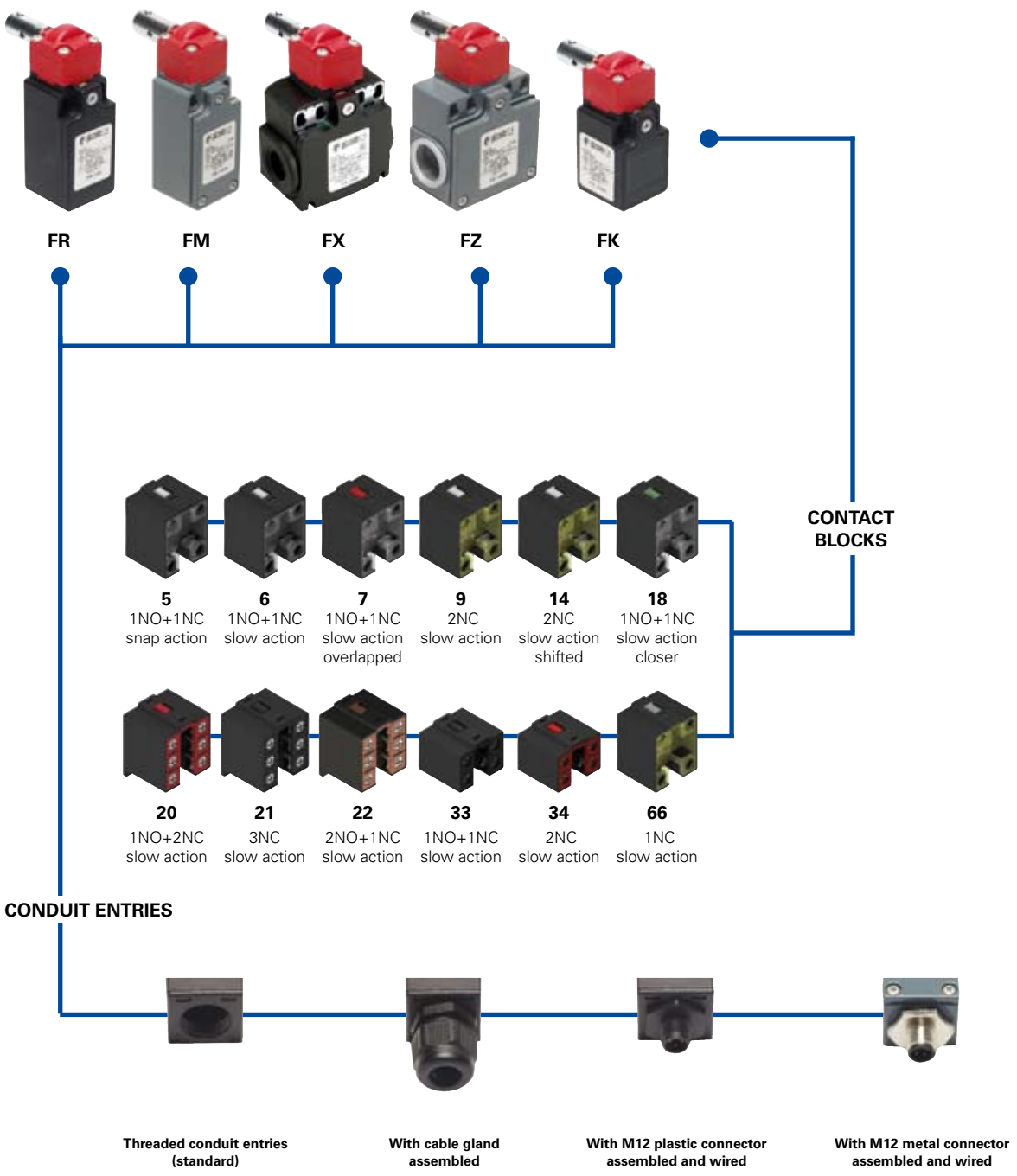


Selection diagram



—●— product option
 —▶— accessory sold separately



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 ECU:	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 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 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 mm ²	(1 x AWG 22)
	max.	2 x 1,5 mm ²	(2 x AWG 16)
Contact blocks 5, 6, 7, 9, 14, 18, 66:	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, 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 (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 500 Vdc (contact blocks 20, 21, 22, 33, 34)	I _e (A)	6	4	1
	Rated impulse withstand voltage (U _{imp}):	6 kV	Direct current: DC13			
		4 kV (contact blocks 20, 21, 22, 33, 34)	U _e (V)	24	125	250
	Conditional short circuit current:	1000 A according to EN 60947-5-1	I _e (A)	6	1,1	0,4
	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	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

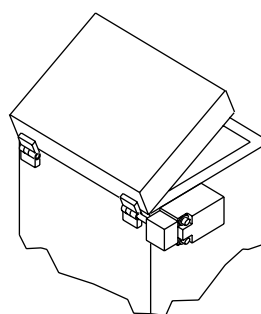
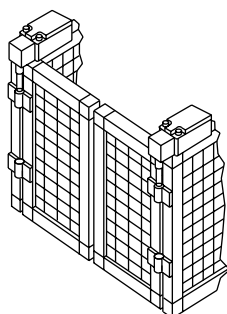
These safety switches have been designed to control gates or guards that protect the hazardous parts of machines. They are very sensitive and positively open the contact block after few rotation degrees, sending the stop signal immediately. The head adjustable in 90° steps allows their installation in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

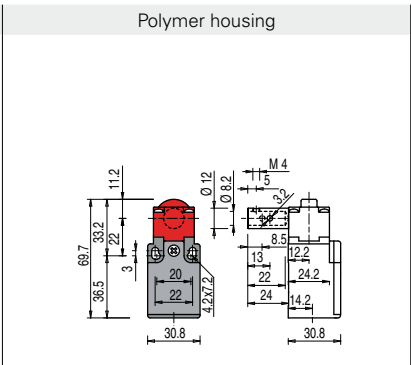
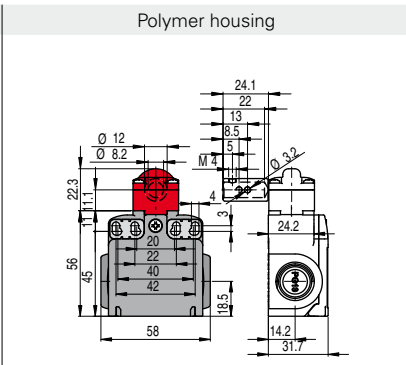
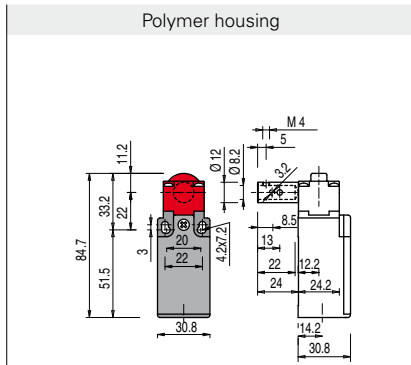
In conformity with standard: UL 508

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

Dimensional drawings

Contacts type:

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



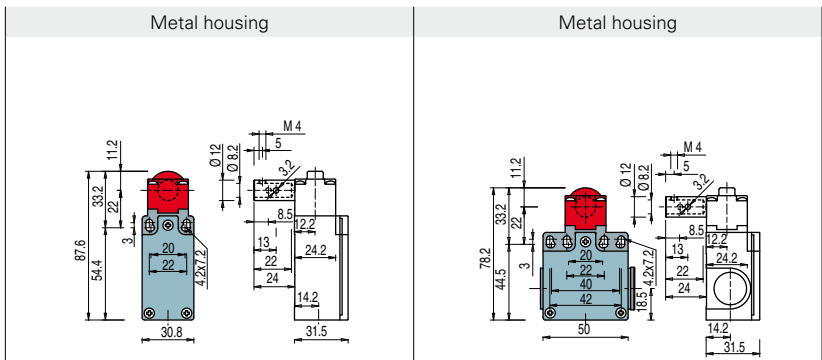
Contact blocks

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		



Contacts type:

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



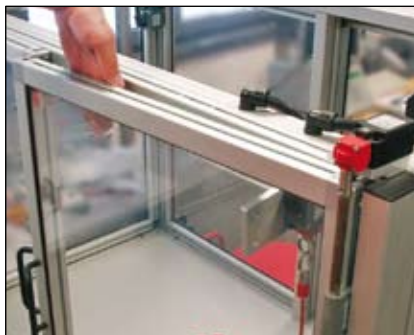
Contact blocks

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