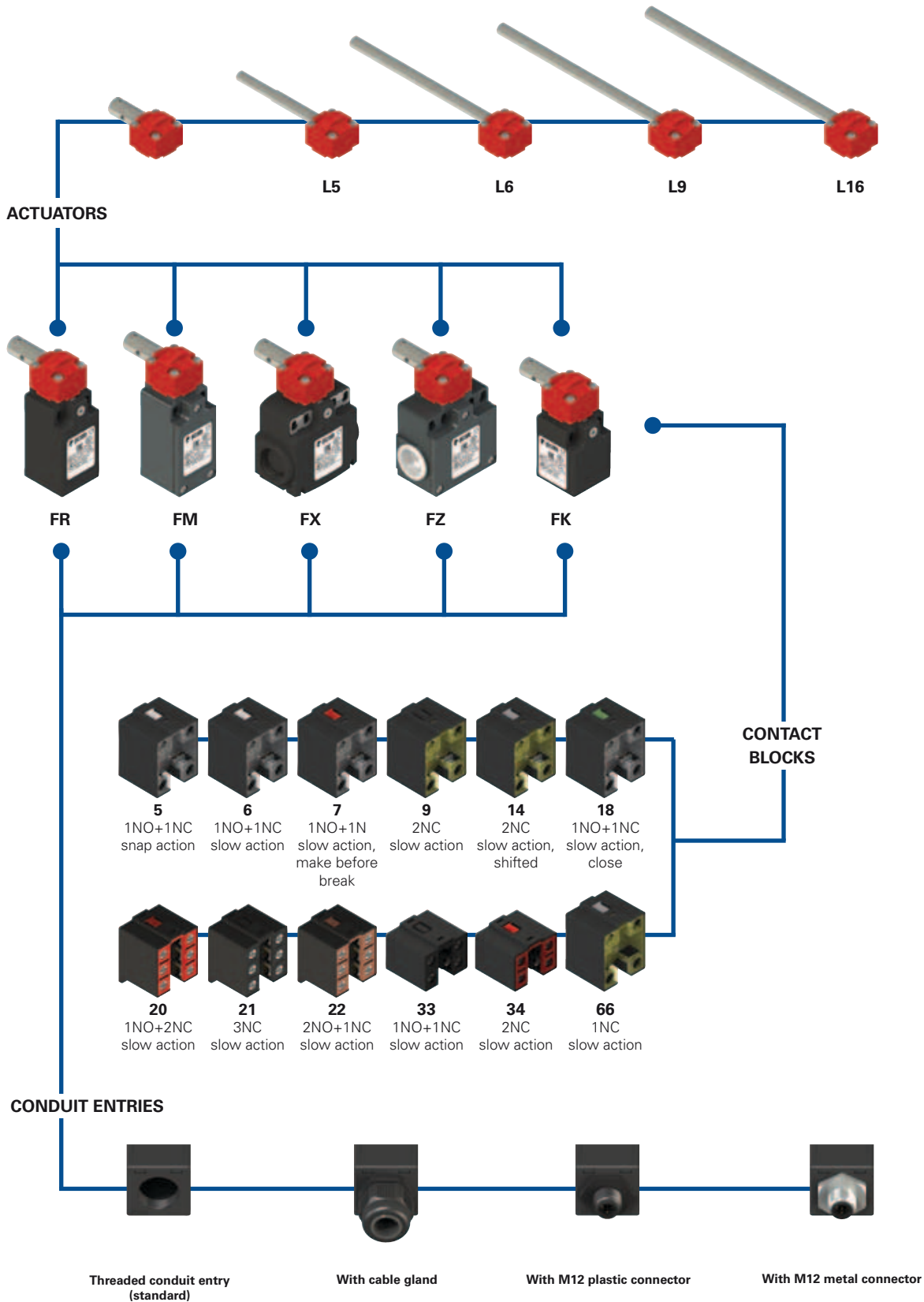


Selection diagram



—●— product option



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 options
FR 1896-XGL16M2K70T6

Housing	
FR	technopolymer, one conduit entry
FM	metal, one conduit entry
FX	technopolymer, two conduit entries
FZ	metal, two conduit entries

Contact block	
5	1NO+1NC, snap action
6	1NO+1NC, slow action
7	1NO+1NC, slow action, make before break
9	2NC, slow action
14	2NC, slow action, shifted
18	1NO+1NC, slow action, close
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

Contact type	
	silver contacts (standard)
G	silver contacts with 1 µm gold coating
G1	silver contacts, 2.5 µm gold coating (not for contact blocks 20, 21, 22, 33, 34)

Ambient temperature	
	-25°C ... +80°C (standard)
T6	-40°C ... +80°C

Pre-installed cable glands or connectors	
	no cable gland or connector (standard)
K23	cable gland for cables Ø 6 ... 12 mm
...
K70	M12 plastic connector, 4-pole
...

For the complete list of possible combinations please contact our technical department.

Threaded conduit entry	
M2	M20x1.5 (standard)
M1	M16x1.5 (FR-FX housing only)
	PG 13.5
A	PG 11 (FR-FX housing only)

Actuator design	
	actuator with hole (standard)
L5	Ø8x69 mm, tapered Ø6.9
L6	Ø8x120 mm
L9	Ø8x140 mm
L16	Ø8.7x165 mm, stainless steel

article options options
FK 3396-XGL16M1K24T6

Housing	
FK	technopolymer, one conduit entry

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

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

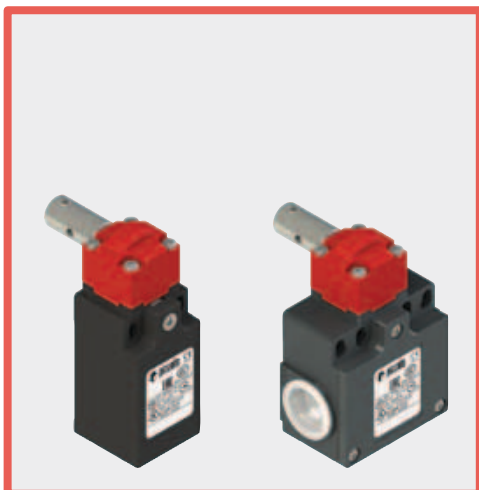
Contact type	
	silver contacts (standard)
G	silver contacts with 1 µm gold coating

Ambient temperature	
	-25°C ... +80°C (standard)
T6	-40°C ... +80°C

Pre-installed cable glands	
	no cable gland (standard)
K24	cable gland for cables Ø 5 ... 10°mm
K28	cable gland for cables Ø 3 ... 7°mm

Threaded conduit entry	
M1	M16x1.5 (standard)
	PG11

Actuator design	
	actuator with hole (standard)
L5	Ø8x69 mm, tapered Ø6.9
L6	Ø8x120 mm
L9	Ø8x140 mm
L16	Ø8.7x165 mm, stainless steel



Main features

- Metal housing or technopolymer housing, from one to two conduit entries
- Protection degree IP67
- 12 contact blocks available
- Versions with M12 connector
- Versions with gold-plated silver contacts
- Versions with stainless steel external metallic parts

Quality marks:



IMQ approval:	EG610 (FR-FX-FK series) EG609 (FM-FZ series)
UL approval:	E131787
CCC approval:	2007010305230013 (FR-FX-FK series) 2007010305229998 (FM-FZ series)
EAC approval:	RU C-IT.A135.B.00454

Technical data

Housing

FR, FX and FK series housing made of glass fibre reinforced technopolymer, self-extinguishing, shock-proof and with double insulation: □

FM and FZ series: metal housing, baked powder coating.

FR, FM series: one threaded conduit entry: M20x1.5 (standard)

FK series: one threaded conduit entry: M16x1.5 (standard)

FX series: two knock-out threaded conduit entries: M20x1.5 (standard)

FZ series: two threaded conduit entries: M20x1.5 (standard)

Protection degree: IP67 acc. to EN 60529 with cable gland of equal or higher protection degree

General data

For safety applications up to: SIL 3 acc. to EN 62061
PL e acc. to EN ISO 13849-1
type 1 acc. to EN ISO 14119

Mechanical interlock, not coded:

Safety parameters:

B_{10D} : 5,000,00 for NC contacts

Service life: 20 years

Ambient temperature: -25°C ... +80°C

Max. actuation frequency: 3600 operating cycles/hour

Mechanical endurance: 1 million operating cycles

Max. actuation speed: 180°/s

Min. actuation speed: 2°/s

Tightening torques for installation: see page 313-324

Cable cross section (flexible copper strands)

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 compliance with standards:

IEC 60947-5-1, EN 60947-5-1, EN 60947-1, IEC 60204-1, EN 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, EN 60529, UL 508, CSA 22.2 No.14.

Approvals:

IEC 60947-5-1, UL 508, CSA 22.2 No.14, GB14048.5-2001.

Compliance with the requirements of:

Machinery Directive 2006/42/EC and EMC Directive 2014/30/EU.

Positive contact opening in conformity with standards:

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

⚠ If not expressly indicated in this chapter, for correct installation and utilization of all articles see chapter utilization requirements from page 313 to page 324.

Electrical data

Utilization category

without connector	with M12 connector 4 and 5-pole	with M12 connector 8-pole	
Thermal current (I_{th}):	10 A	4 A	2 A
Rated insulation voltage (U):	500 Vac 600 Vdc	250 Vac 300 Vdc	30 Vac 36 Vdc
Rated impulse withstand voltage (U_{imp}):	400 Vac 500 Vdc (contact blocks 20, 21, 22, 33, 34)	6 kV	type gG fuse 4 A 500 V
Conditional short circuit current:	4 kV (contact blocks 20, 21, 22, 33, 34)	1000 A acc. to EN 60947-5-1	type gG fuse 2 A 500 V
Protection against short circuits:	1000 A acc. to EN 60947-5-1	type aM fuse 10 A 500 V	3
Pollution degree:	3	3	3
Utilization category: 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			
Utilization category: 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			
Utilization category: AC15 (50±60 Hz)			
U_e (V) 24			
I_e (A) 2			
Direct current: DC13			
U_e (V) 24			
I_e (A) 2			

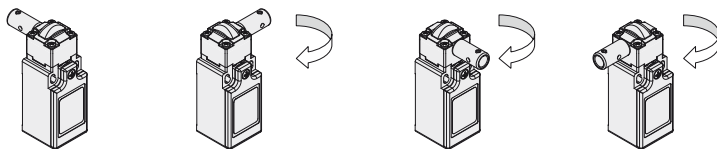


Description



These safety switches are designed to monitor gates or doors that safeguard dangerous parts of machines without inertia. They are very sensitive, open the contacts after few degrees of rotation and immediately send the stop signal. The head, which can be turned in 90° steps, enables installation in multiple positions. Available with technopolymer or metal housings, with protection degree IP67. The special design allows it to be used even under operating conditions in which dust and dirt could inhibit the operation of normal safety switches with separate actuator.

Head with variable orientation



For all switches, the head can be adjusted in 90° steps after removing the four fastening screws. This allows you to use the same switch on both right- and left-facing door fronts.

Protection degree IP67

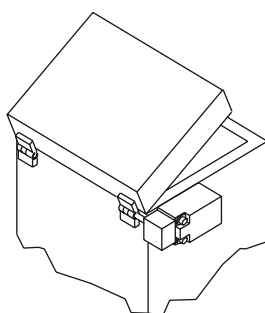
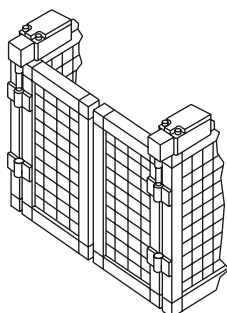
IP67 These devices are designed to be used in the toughest environmental conditions and they pass the IP67 immersion test acc. to EN 60529. They can therefore be used in all environments where maximum protection degree of the housing is required.

Extended temperature range

-40°C These devices are also available in a special version suitable for an ambient operating temperature range from -40°C up to +80°C.

They can therefore be used for applications in cold stores, sterilisers and other equipment with low temperature environments. The special materials used to produce these versions retain their characteristics even under these conditions, thereby expanding the installation possibilities.

Application examples



Adjustable switching point



When installing the device, the contact switching point can be adjusted over the entire 360° range. By fixing the stud screw, it is possible to check the correct setting of the activation angle and quickly and easily adjust it if necessary. Once adjustment is complete, you can render the device tamper-proof against commonly used tools using the supplied lock pin.

Features approved by IMQ

Rated insulation voltage (U _i):	500 Vac
	400 Vac (for contact blocks 20, 21, 22, 33, 34)
Conventional free air thermal current (I _{th}):	10 A
Protection against short circuits:	type aM fuse 10 A 500 V
Rated impulse withstand voltage (U _{imp}):	6 kV
	4 kV (for contact blocks 20, 21, 22, 33, 34)
Protection degree of the housing:	IP67
MV terminals (screw terminals)	
Pollution degree:	3
Utilization category:	AC15
Operating voltage (U _e):	400 Vac (50 Hz)
Operating current (I _e):	3 A

Forms of the contact element: Zb, Y+Y, Y+Y+X, Y+Y+Y, Y+X+X
 Positive opening contacts on contact blocks 5, 6, 7, 9, 14, 18, 20, 21, 22, 33, 34, 66.
 In compliance with standards: EN 60947-1, EN 60947-5-1 + A1:2009, fundamental requirements of the Low Voltage Directive 2014/35/EU.

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

Features approved by UL

Utilization categories	Q300 (69 VA, 125-250 Vdc) A600 (720 VA, 120-600 Vac)
Housing features type 1, 4X "indoor use only"; 12, 13	
For all contact blocks use 60 or 75 °C copper (Cu) conductor, rigid or flexible, wire size 12, 14 AWG. Tightening torque for terminal screws of 7.1 lb in (0.8 Nm).	
In compliance with standard:	UL 508, CSA 22.2 No.14

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

Dimensional drawings

All values in the drawings are in mm

Contact type:	Technopolymer housing		Technopolymer housing
R = snap action L = slow action LO = slow action make before break LS = slow action shifted			
Contact block	5 R FR 596-M2 → 1NO+1NC 6 L FR 696-M2 → 1NO+1NC 7 LO FR 796-M2 → 1NO+1NC 9 L FR 996-M2 → 2NC 14 LS FR 1496-M2 → 2NC 18 L FR 1896-M2 → 1NO+1NC 20 L FR 2096-M2 → 1NO+2NC 21 L FR 2196-M2 → 3NC 22 L FR 2296-M2 → 2NO+1NC 33 L FR 3396-M2 → 1NO+1NC 34 L FR 3496-M2 → 2NC 66 L FR 6696-M2 → 1NC	FX 596-M2 → 1NO+1NC FX 696-M2 → 1NO+1NC FX 796-M2 → 1NO+1NC FX 996-M2 → 2NC FX 1496-M2 → 2NC FX 1896-M2 → 1NO+1NC FX 2096-M2 → 1NO+2NC FX 2196-M2 → 3NC FX 2296-M2 → 2NO+1NC FX 3396-M2 → 1NO+1NC FX 3496-M2 → 2NC FX 6696-M2 → 1NC	FK 3396-M1 → 1NO+1NC FK 3496-M1 → 2NC
Actuating force	0.15 Nm (0.4 Nm →)		0.15 Nm (0.4 Nm →)
Travel diagrams	page 318 - group 9		page 318 - group 9

Contact type:	Metal housing		Metal housing
R = snap action L = slow action LO = slow action make before break LS = slow action shifted			
Contact block	5 R FM 596-M2 → 1NO+1NC 6 L FM 696-M2 → 1NO+1NC 7 LO FM 796-M2 → 1NO+1NC 9 L FM 996-M2 → 2NC 14 LS FM 1496-M2 → 2NC 18 L FM 1896-M2 → 1NO+1NC 20 L FM 2096-M2 → 1NO+2NC 21 L FM 2196-M2 → 3NC 22 L FM 2296-M2 → 2NO+1NC 33 L FM 3396-M2 → 1NO+1NC 34 L FM 3496-M2 → 2NC 66 L FM 6696-M2 → 1NC	FZ 596-M2 → 1NO+1NC FZ 696-M2 → 1NO+1NC FZ 796-M2 → 1NO+1NC FZ 996-M2 → 2NC FZ 1496-M2 → 2NC FZ 1896-M2 → 1NO+1NC FZ 2096-M2 → 1NO+2NC FZ 2196-M2 → 3NC FZ 2296-M2 → 2NO+1NC FZ 3396-M2 → 1NO+1NC FZ 3496-M2 → 2NC FZ 6696-M2 → 1NC	
Actuating force	0.15 Nm (0.4 Nm →)		0.15 Nm (0.4 Nm →)
Travel diagrams	page 318 - group 9		page 318 - group 9

Items with code on green background are stock items

Accessories See page 299

→ The 2D and 3D files are available at www.pizzato.com

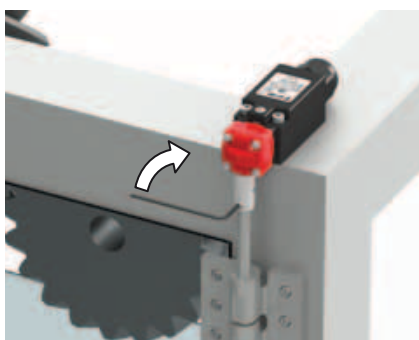


Dimensional drawings for actuators

All values in the drawings are in mm

Option	Drawing
L5	
L6	
L9	
L19	

Adjustment of the switching point



Temporary locking of the actuator (stud screw provided).



Verify the switching point according to EN ISO 13857 and recalibrate if necessary.



Pin the switch (pin is provided).