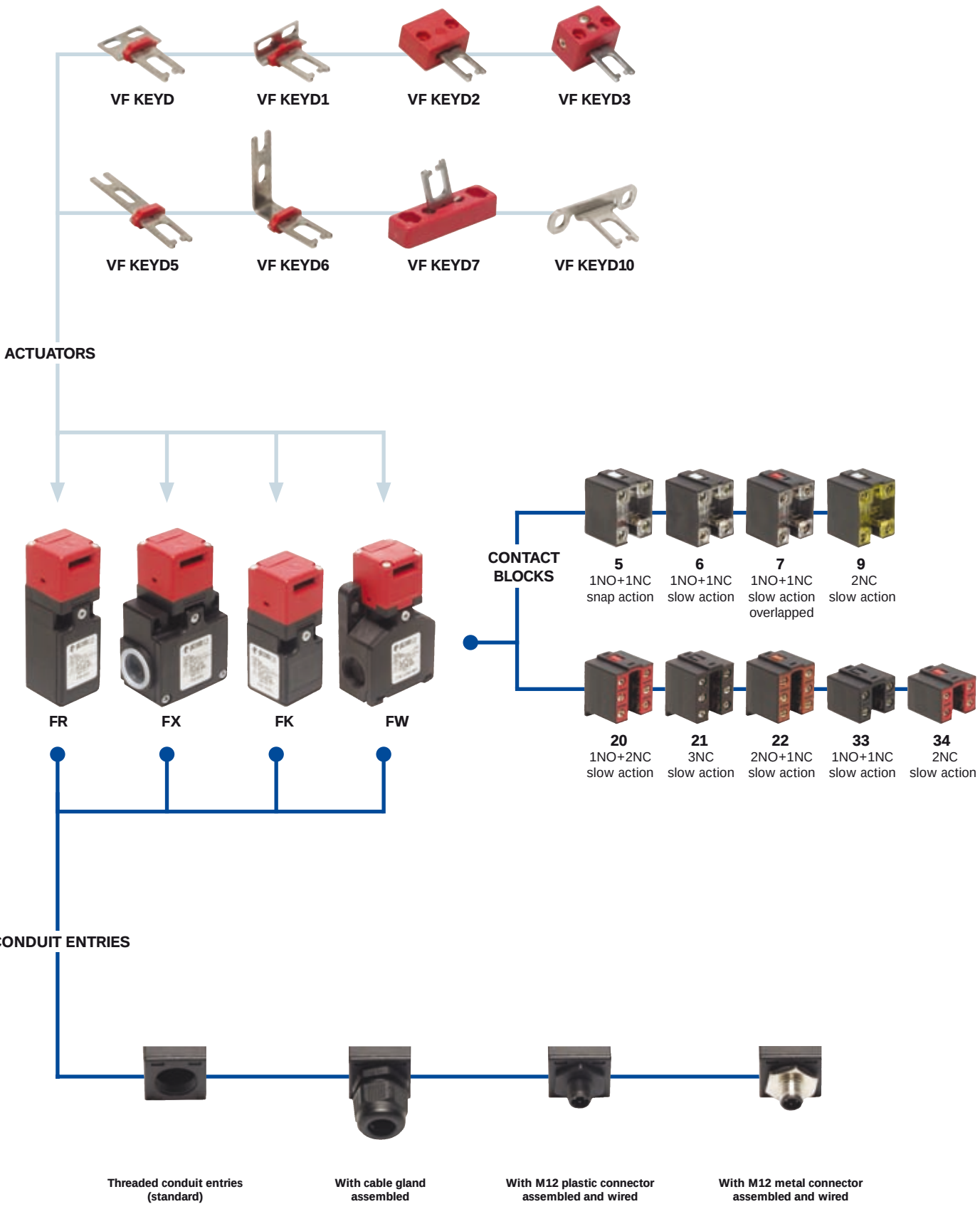
Selection diagram



Code structure

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

article: **FR 693** — options: **-E3D1XGM2K70**

Housing

FR	polymer housing, one conduit entry
FX	polymer housing, two conduit entries
FW	polymer housing, three conduit entries

Contact blocks

5	1NO+1NC, snap action
6	1NO+1NC, slow 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

Head type

92	detachable head (only for FW housing)
93	not detachable head (only for FR-FX-FK housing)

Actuator extraction force

	10 N (standard)
E3	30 N

Actuators

	without actuator (standard)
D	with straight actuator
D1	with right-angled actuator
D2	with jointed actuator
D3	with adjustable jointed actuator in two directions
D5	with long actuator
D6	with right-angled long actuator
D7	with adjustable jointed actuator in one direction
D10	with shaped actuator

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) (only for FR-FX housing)
A	PG 11 (only for FR-FX housing)
M1	M16x1,5
M2	M20x1,5
M3	1/2 NPT (only for FR housing)

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
K40	with M12 metal connector assembled and wired, 8 poles (only for contact blocks 20, 21, 22)
...	.....

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

article: **FK 3393** — options: **-E3D1XGM1K22**

Housing

FK	polymer housing, one conduit entry

Contact blocks

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

Actuator extraction force

	10 N (standard)
E3	30 N

Actuators

	without actuator (standard)
D	with straight actuator
D1	with right-angled actuator
D2	with jointed actuator
D3	with jointed actuator adjustable in two directions
D5	with long actuator
D6	with right-angled long actuator
D7	with jointed actuator adjustable in one direction
D10	with shaped actuator

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 11 (standard)
M1	M16x1,5

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



Patent pending

Main data

- Housing polymer housing, from one to three conduit entries
- Protection degree IP67
- 9 contact blocks available
- 8 stainless steel actuators available
- M12 assembled connector versions
- Silver contacts gold plated versions

Markings and quality marks:

Approval IMQ:	EG610 (FR-FX-FK series)
Approval UL:	E131787
Approval CCC:	2007010305230013 (FR-FX-FK series)
Approval EZU:	1010151

Technical data

Housing

Made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin and with double insulation ⧈
FR and FK series one conduit entry
FX series two conduit entries
FW series three knock out conduit entries

Protection degree:	IP67 (electrical contacts)

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 cycles[1]/hour
Mechanical endurance:	1 million of operations cycles[1]
Max actuating speed:	0,5 m/s
Min. actuating speed:	1 mm/s
Actuator extraction force	10 N (30 N -E3 version)

(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 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:	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, IEC 60204-1, EN 60204-1, EN 1088, EN ISO 12100-1, EN ISO 12100-2, IEC 529, EN 60529, NFC 63-140, VDE 0660-200, VDE 0113, CENELEC EN 50013, BG-GS-ET-15.
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.

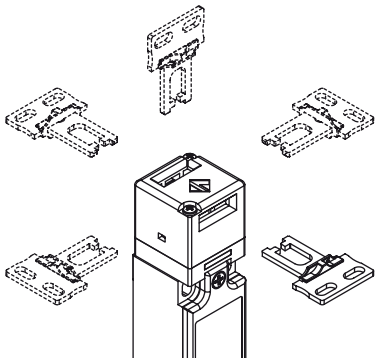
⚠ **If not expressly indicated in this chapter, for the right installation and the correct utilization of all articles see requirements indicated from page 6/1 to page 6/8.**

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	Ue (V) 250 400 500
		400 VAC for contact blocks 20, 21, 22, 33, 34	Ie (A) 6 4 1
	Protection against short circuits:	fuse 10 A 500 V type aM	Direct current: DC13
	Pollution degree:	3	Ue (V) 24 125 250
			Ie (A) 6 1,1 0,4
with 4 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

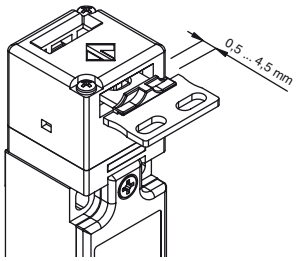
These safety switches are ideal to control gates, sliding doors and other guards protecting dangerous parts of machine. The stainless steel actuator is fastened to the moving part of the guard, so it is removed from the switch on every opening of the guard. The switch mechanism guarantees that removing the actuator forces the positive opening of the electrical contacts. Easy to install, these switches can be applied to any kind of protection (with hinge, sliding and removable ones). Besides, the possibility to actuate the switch only with its actuator guarantees that the machine can be restarted only when the guard has been closed. All products (except FW series) are equipped with a particular mechanical hooking that does not allow the separation of the head from the body during its positioning.

Rotating heads



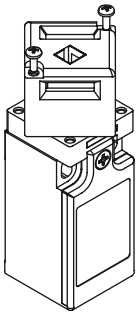
Removing the two fastening screws, in all switches, the head can be rotated in 90° steps.

Actuator regulation zone



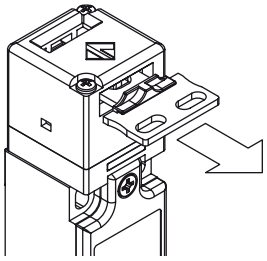
This switch has a wide backlash of the actuator into the head (4 mm) for an easier installation.
With closed door, check that the actuator doesn't knock straight against the head of the switch; it must be in the adjustment zone (0,5…4,5 mm)

Not detachable head



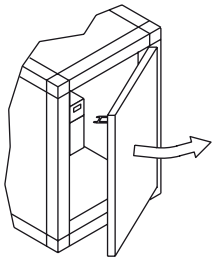
The action head type "93" is completely interchangeable and compatible with previous head type "92", but it has the advantage to be not detachable from the switch body even if it is always adjustable in 90° steps (Pizzato Elettrica patent). The new head is safer because it cannot be ruined during installation. The head fixing screws have been reduced to only two (instead of the previous four) and so the rotation operation will be quicker and cheaper.

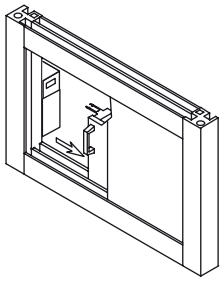
Versions with 30 N actuator extraction force



Versions with 30 N actuator holding force instead of the standard 10 N are available.

Installation examples





Limits of utilization

Do not use where dust and dirt may penetrate in any way into the head and deposit there, in particular where metal dust, concrete or chemicals are spread.
Do not use where explosive or inflammable gas is present.

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, 6, 7, 9, 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.

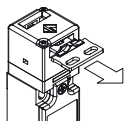
Dimensional drawings

Contacts type:

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

Contact blocks		polymer housing Switch without actuator	polymer housing Switch without actuator	polymer housing Switch without actuator conduit entries thread M20x1,5	polymer housing Switch without actuator
5	R	FR 593 ⊖ 1NO+1NC	FX 593 ⊖ 1NO+1NC	FW 592-M2 ⊖ 1NO+1NC	
6	L	FR 693 ⊖ 1NO+1NC	FX 693 ⊖ 1NO+1NC	FW 692-M2 ⊖ 1NO+1NC	
7	LO	FR 793 ⊖ 1NO+1NC	FX 793 ⊖ 1NO+1NC	FW 792-M2 ⊖ 1NO+1NC	
9	L	FR 993 ⊖ 2NC	FX 993 ⊖ 2NC	FW 992-M2 ⊖ 2NC	
20	L	FR 2093 ⊖ 1NO+2NC	FX 2093 ⊖ 1NO+2NC	FW 2092-M2 ⊖ 1NO+2NC	
21	L	FR 2193 ⊖ 3NC	FX 2193 ⊖ 3NC	FW 2192-M2 ⊖ 3NC	
22	L	FR 2293 ⊖ 2NO+1NC	FX 2293 ⊖ 2NO+1NC	FW 2292-M2 ⊖ 2NO+1NC	
33	L	FR 3393 ⊖ 1NO+1NC	FX 3393 ⊖ 1NO+1NC	FW 3392-M2 ⊖ 1NO+1NC	FK 3393 ⊖ 1NO+1NC
34	L	FR 3493 ⊖ 2NC	FX 3493 ⊖ 2NC	FW 3492-M2 ⊖ 2NC	FK 3493 ⊖ 2NC
Min. force		10 N (18 N ⊖)	10 N (18 N ⊖)	10 N (18 N ⊖)	10 N (18 N ⊖)

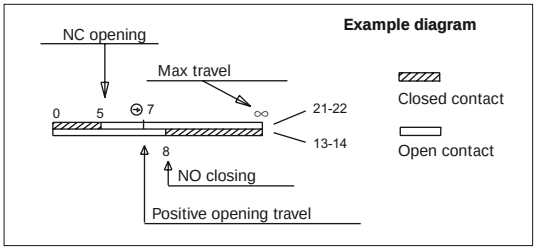
All switches listed above are available in the version with 30N actuator extraction force. To obtain these products, the order code has to be changed adding the extension "-E3", for example FR 693-E3.



Min. force 30 N version	30 N (38 N ⊖)	30 N (38 N ⊖)	30 N (38 N ⊖)	30 N (38 N ⊖)

How to read travel diagrams

All measures in the diagrams are in mm



IMPORTANT:
NC contact has to be considered with inserted actuator. **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

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

All measures in the drawings are in mm

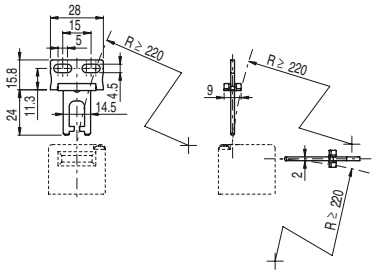
Actuators stainless steel

10 pcs packs

IMPORTANT: These actuators must be used with FR, FX, FK e FW (e.g. FR 693)

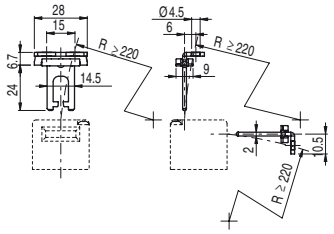
Article	Description
VF KEYD	Straight actuator





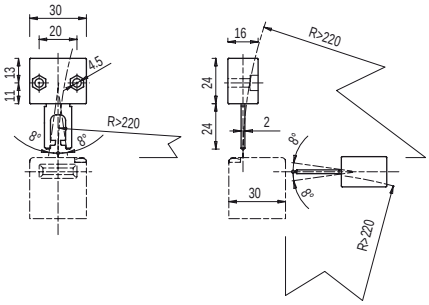
Article	Description
VF KEYD1	Right-angled actuator





Article	Description
VF KEYD2	Jointed actuator

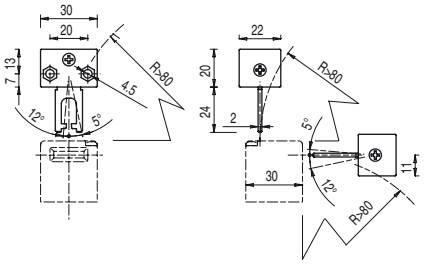




The actuator can flex in four directions for applications where the door alignment is not precise

Article	Description
VF KEYD3	Jointed actuator adjustable in two directions

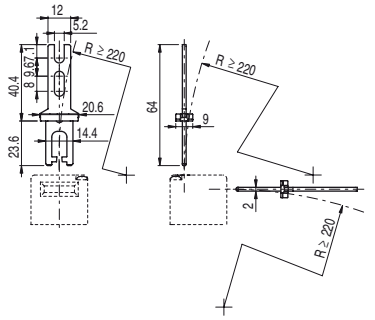




Actuator adjustable in two directions for doors with reduced dimensions.

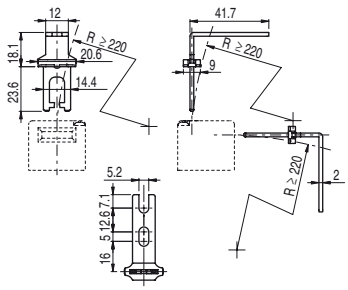
Article	Description
VF KEYD5	Long actuator





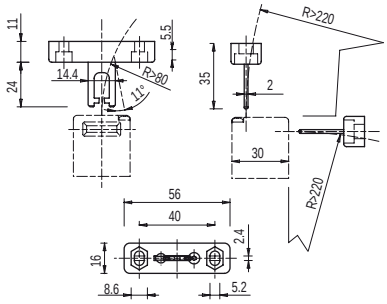
Article	Description
VF KEYD6	Right-angled long actuator





Article	Description
VF KEYD7	Jointed actuator adjustable in one direction





Actuator adjustable in one direction for doors with reduced dimensions.

Article	Description
VF KEYD10	Shaped actuator



