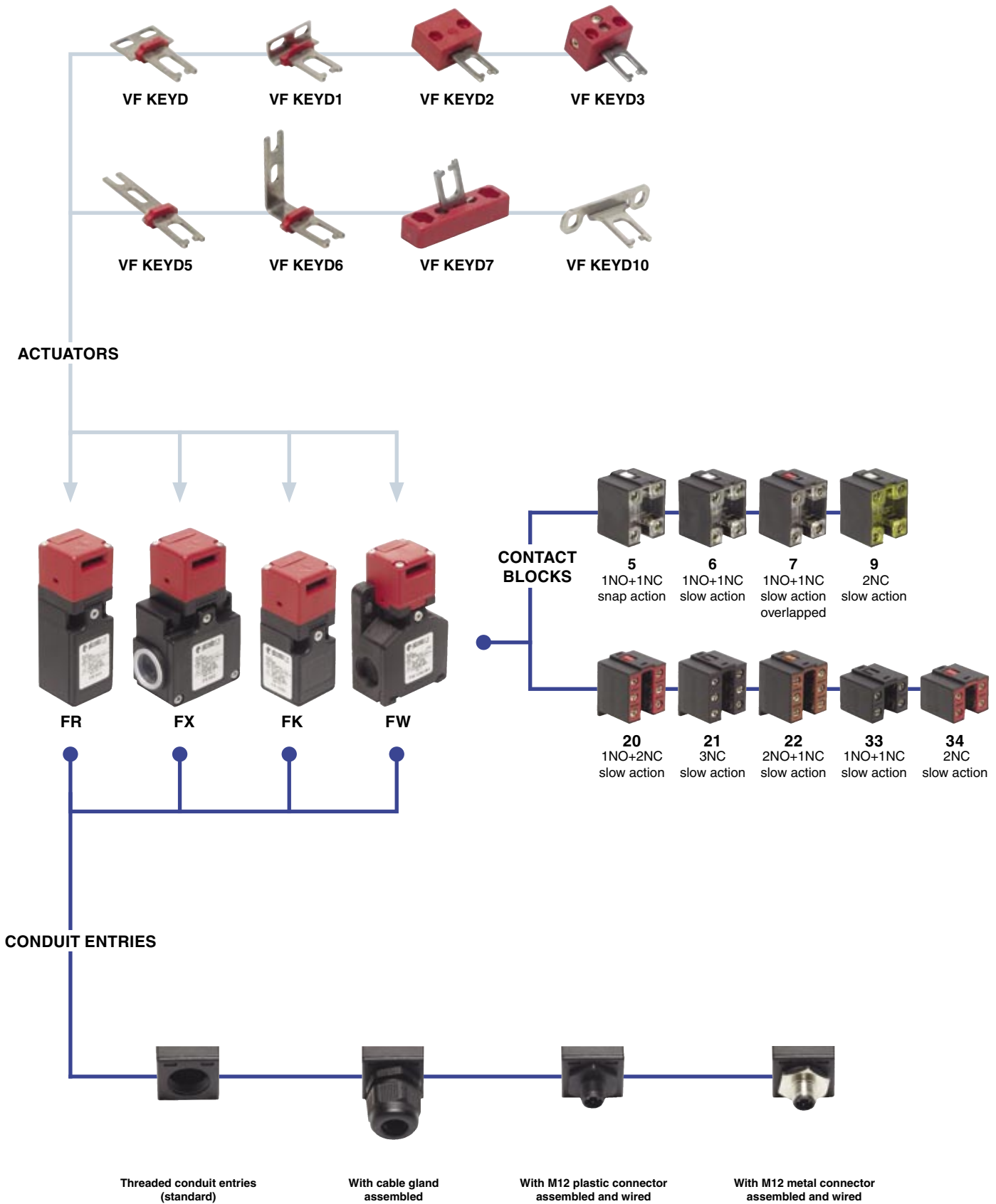


Selection diagram



● 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.

FR 693-E3D1XGM2K70

Housing		Preinstalled cable gland or connectors	
FR	polymer housing, one conduit entry		no cable gland or connector (standard)
FX	polymer housing, two conduit entries	K21	with assembled cable gland suitable for Ø 6 to Ø 12 mm cables range
FW	polymer housing, three conduit entries	K40	with M12 metal connector assembled and wired, 8 poles (only for contact blocks 20, 21, 22)
	
Contact blocks		For the complete list of all combinations, please contact our technical office.	
5	1NO+1NC, snap action	Threaded conduit entry	
6	1NO+1NC, slow action		PG 13,5 (standard) (only for FR-FX housing)
7	1NO+1NC, slow action overlapped	A	PG 11 (only for FR-FX housing)
9	2NC, slow action	M1	M16x1,5
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
Head type		External metallic parts	
92	detachable head (only for FW housing)		zinc-plated steel (standard)
93	not detachable head (only for FR-FX-FK housing)	X	stainless steel
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		

FK 3393-E3D1XGM1K22

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	
Actuator extraction force			PG 11 (standard)
	10 N (standard)	M1	M16x1,5
E3	30 N	Contacts type	
Actuators			silver contacts (standard)
	without actuator (standard)	G	silver contacts gold plated 1 µm
D	with straight actuator	External metallic parts	
D1	with right-angled actuator		zinc-plated steel (standard)
D2	with jointed actuator	X	stainless steel
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		



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 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 cycles¹/hour

Mechanical endurance: 1 million of operations cycles¹

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 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
Protection against short circuits:	Pollution degree:	400 VAC for contact blocks 20, 21, 22, 33, 34	I _e (A)	6	4	1
		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

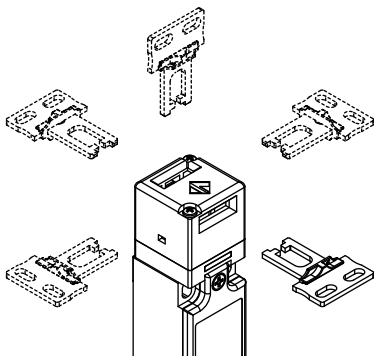
with 4 poles M12 connector	Thermal current (I _{th}):	4 A	Alternate current: AC15 (50...60 Hz)			
	Rated insulation voltage (U _i):	250 VAC 300 VDC	U _e (V)	24	120	250
Protection against short circuits:	Pollution degree:	fuse 4 A 500 V type gG	I _e (A)	4	4	4
		3	Direct current: DC13			
			U _e (V)	24	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:	Pollution degree:	fuse 2 A 500 V type gG	I _e (A)	2		
		3	Direct current: DC13			
			U _e (V)	24		
			I _e (A)	2		

Description

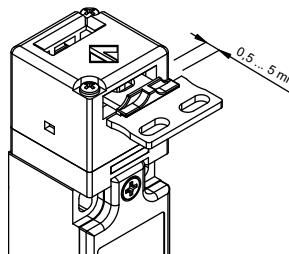
These safety switches are ideal to control gates, sliding doors and other guards protecting dangerous parts of machine. The stainless steel actuator is fastened to the moving part of the guard, so it is removed from the switch on every opening of the guard. The switch mechanism guarantees that removing 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.

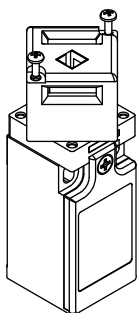
Actuator regulation zone



This switch has a wide backlash of the actuator into the head (4,5 mm) for an easier installation.

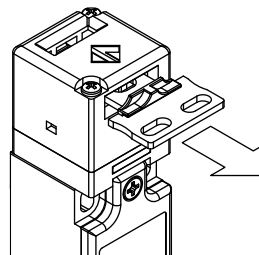
With closed door, check that the actuator doesn't knock straight against the head of the switch; it must be in the adjustment zone (0,5...5 mm)

Not detachable head



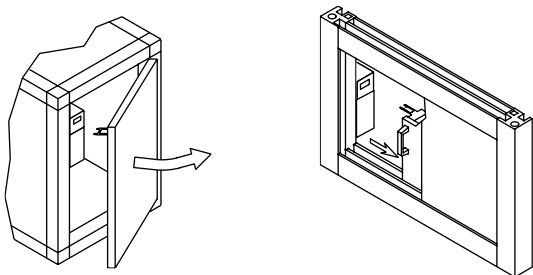
The action head type "93" is completely interchangeable and compatible with previous head type "92", but it has the advantage to be not detachable from the switch body even if it is always adjustable in 90° steps (Pizzato Elettrica patent). The new head is safer because it cannot be ruined during installation. 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 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.

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.

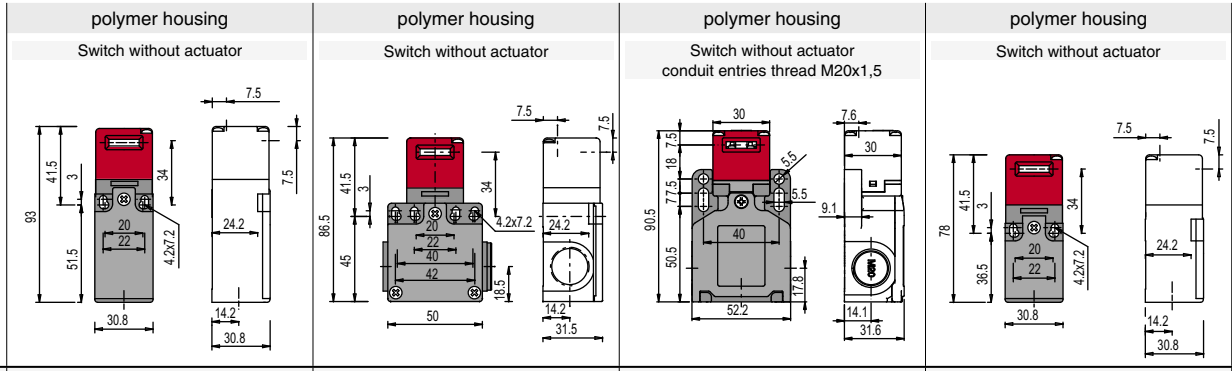
Please contact our technical service for the list of type approved products.

Dimensional drawings

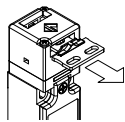
Contacts type:

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

Contact blocks



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.

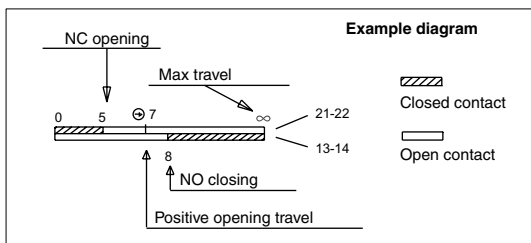
Min. force 30 N version	30 N (38 N ⊕)	30 N (38 N ⊕)	30 N (38 N ⊕)	30 N (38 N ⊕)
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Accessories See page 5/1

Items with code on the green background are available in stock

How to read travel diagrams

All measures in the diagrams are in mm



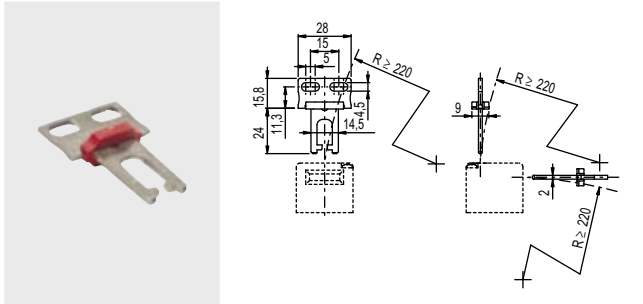
IMPORTANT: NC contact has to be considered with inserted actuator. In safety applications it is necessary to activate the switch at least up to the positive opening point indicated in the diagrams with the symbol ⊕. Operate the switch at least with the positive opening force, indicated between brackets, below each article, next the value of minimum force.

All measures in the drawings are in mm

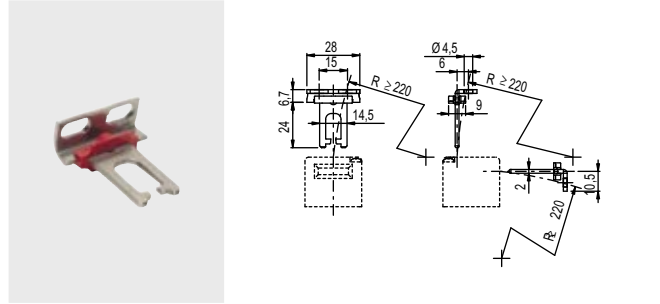
Actuators stainless steel

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

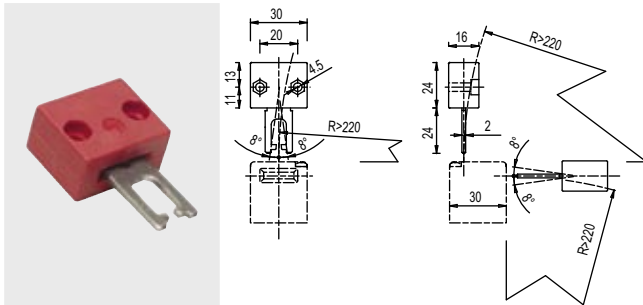
Article	Description	Pack
VF KEYD	Straight actuator	10 pcs



Article	Description	Pack
VF KEYD1	Right-angled actuator	10 pcs

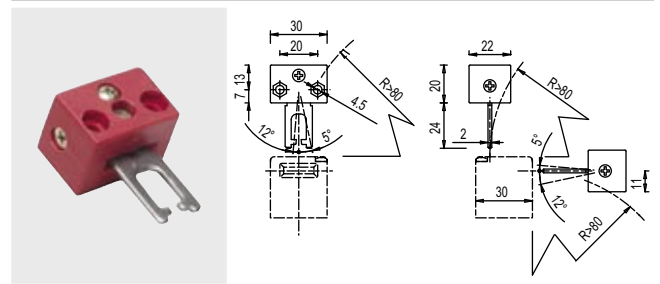


Article	Description	Pack
VF KEYD2	Jointed actuator	10 pcs



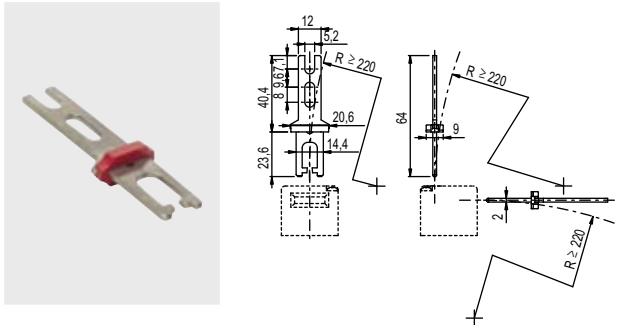
The actuator can flex in four directions for applications where the door alignment is not precise

Article	Description	Pack
VF KEYD3	Jointed actuator adjustable in two directions	10 pcs

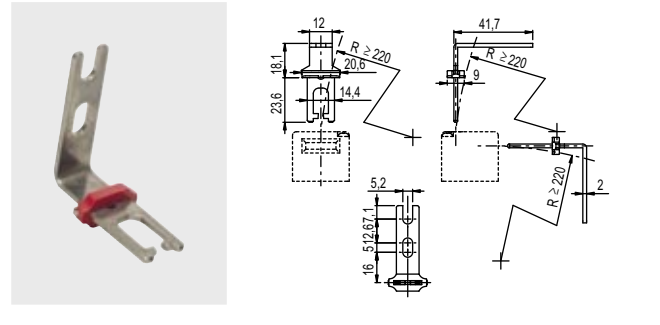


Actuator adjustable in two directions for doors with reduced dimensions.

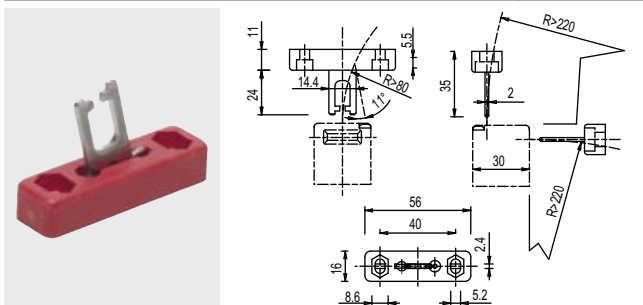
Article	Description	Pack
VF KEYD5	Long actuator	10 pcs



Article	Description	Pack
VF KEYD6	Right-angled long actuator	10 pcs



Article	Description	Pack
VF KEYD7	Jointed actuator adjustable in one direction	10 pcs



Actuator adjustable in one direction for doors with reduced dimensions.

Article	Description	Pack
VF KEYD10	Shaped actuator	10 pcs

