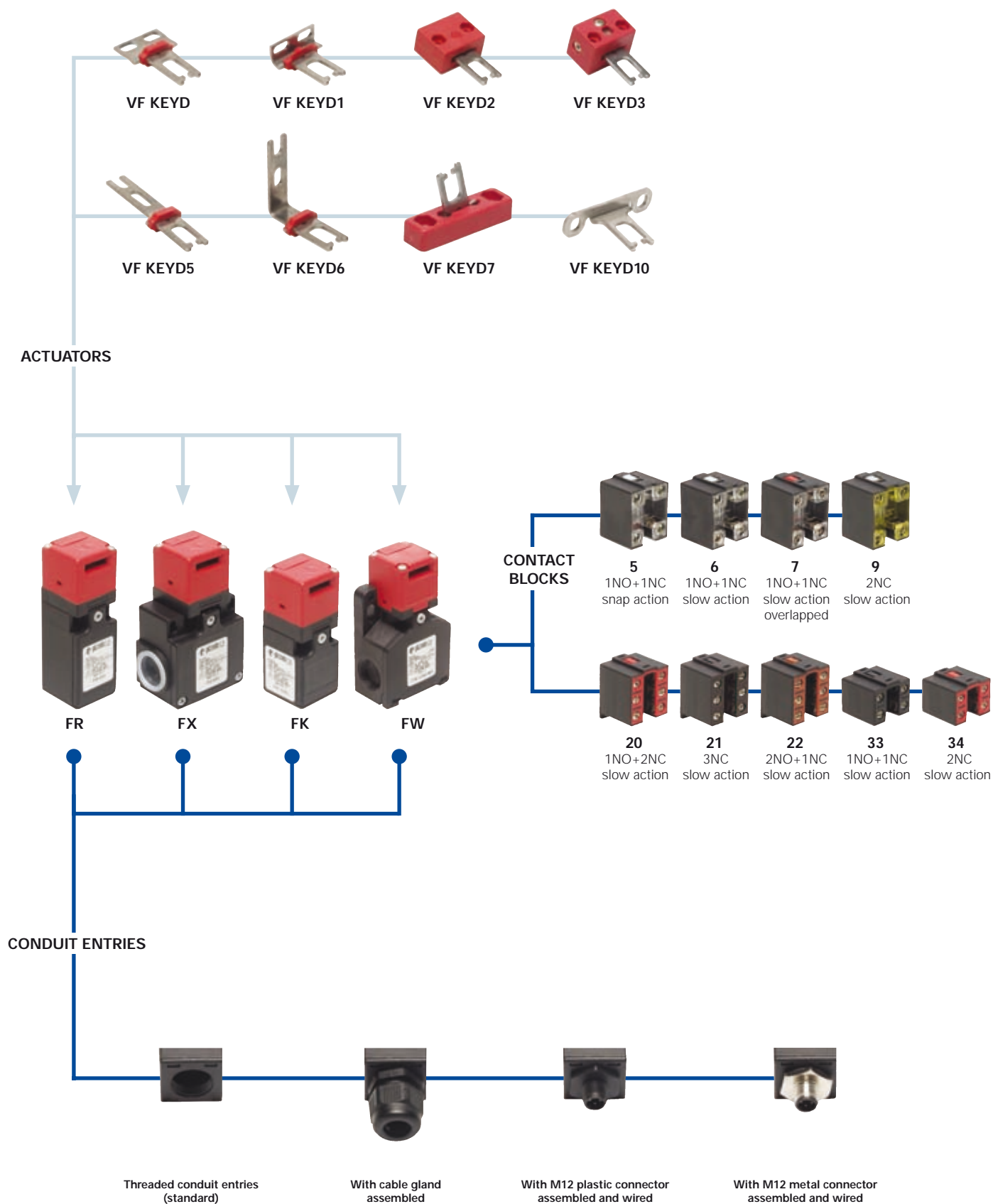


## Selection diagram



## Code structure

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

article		options	
<b>FR 693-</b>		<b>E3D1XGM2K70</b>	
Housing		Preinstalled cable gland or connectors	
<b>FR</b>	polymer housing, one conduit entry		no cable gland or connector (standard)
<b>FX</b>	polymer housing, two conduit entries	<b>K21</b>	with assembled cable gland suitable for Ø 6 to Ø 12 mm cables range
<b>FW</b>	polymer housing, three conduit entries	<b>K40</b>	with M12 metal connector assembled and wired, 8 poles (only for contact blocks 20, 21, 22)
Contact blocks		...	.....
<b>5</b>	1NO+1NC, snap action	For the complete list of all combinations, please contact our technical office.	
<b>6</b>	1NO+1NC, slow action		
<b>7</b>	1NO+1NC, slow action overlapped		
<b>9</b>	2NC, slow action		
<b>20</b>	1NO+2NC, slow action		
<b>21</b>	3NC, slow action		
<b>22</b>	2NO+1NC, slow action		
<b>33</b>	1NO+1NC, slow action		
<b>34</b>	2NC, slow action		
Head type		Threaded conduit entry	
<b>92</b>	detachable head (only for FW housing)		PG 13,5 (standard) (only for FR-FX housing)
<b>93</b>	not detachable head (only for FR-FX-FK housing)	<b>A</b>	PG 11 (only for FR-FX housing)
Actuator extraction force		<b>M1</b>	M16x1,5
	10 N (standard)	<b>M2</b>	M20x1,5
<b>E3</b>	30 N	<b>M3</b>	1/2 NPT (only for FR housing)
Actuators		Contacts type	
	without actuator (standard)		silver contacts (standard)
<b>D</b>	with straight actuator	<b>G</b>	silver contacts gold plated 1 µm
<b>D1</b>	with right-angled actuator	External metallic parts	
<b>D2</b>	with jointed actuator		zinc-plated steel (standard)
<b>D3</b>	with adjustable jointed actuator in two directions	<b>X</b>	stainless steel
<b>D5</b>	with long actuator		
<b>D6</b>	with right-angled long actuator		
<b>D7</b>	with adjustable jointed actuator in one direction		
<b>D10</b>	with shaped actuator		

article		options	
<b>FK 3393-</b>		<b>E3D1XGM1K22</b>	
Housing		Preinstalled cable gland	
<b>FK</b>	polymer housing, one conduit entry		no cable gland (standard)
Contact blocks		<b>K22</b>	with assembled cable gland suitable for Ø 5 to Ø 10 mm cables range
<b>33</b>	1NO+1NC, slow action	<b>K26</b>	with assembled cable gland suitable for Ø 3 to Ø 7 mm cables range
<b>34</b>	2NC, slow action	Threaded conduit entry	
Actuator extraction force			PG 11 (standard)
	10 N (standard)	<b>M1</b>	M16x1,5
<b>E3</b>	30 N	Contacts type	
Actuators			silver contacts (standard)
	without actuator (standard)	<b>G</b>	silver contacts gold plated 1 µm
<b>D</b>	with straight actuator	External metallic parts	
<b>D1</b>	with right-angled actuator		zinc-plated steel (standard)
<b>D2</b>	with jointed actuator	<b>X</b>	stainless steel
<b>D3</b>	with jointed actuator adjustable in two directions		
<b>D5</b>	with long actuator		
<b>D6</b>	with right-angled long actuator		
<b>D7</b>	with jointed actuator adjustable in one direction		
<b>D10</b>	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 CCC: 2007010305230013  
 (FR-FX-FK series)  
 Approval ECU: 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<sup>1</sup>/hour

Mechanical endurance: 1 million of operations cycles<sup>1</sup>

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 mm<sup>2</sup> (1 x AWG 22)

max. 2 x 1,5 mm<sup>2</sup> (2 x AWG 16)

Contact blocks 5, 6, 7, 9:

min. 1 x 0,5 mm<sup>2</sup> (1 x AWG 20)

max. 2 x 2,5 mm<sup>2</sup> (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 (I<sub>th</sub>): 10 A  
 Rated insulation voltage (U<sub>i</sub>): 500 VAC 600 VDC  
 400 VAC for contact blocks 20, 21, 22, 33, 34  
 Protection against short circuits: fuse 10 A 500 V type aM  
 Pollution degree: 3

Alternate current: AC15 (50...60 Hz)  
 U<sub>e</sub> (V) 250 400 500  
 I<sub>e</sub> (A) 6 4 1  
 Direct current: DC13  
 U<sub>e</sub> (V) 24 125 250  
 I<sub>e</sub> (A) 6 1,1 0,4

with 4 poles M12 connector

Thermal current (I<sub>th</sub>): 4 A  
 Rated insulation voltage (U<sub>i</sub>): 250 VAC 300 VDC  
 Protection against short circuits: fuse 4 A 500 V type gG  
 Pollution degree: 3

Alternate current: AC15 (50...60 Hz)  
 U<sub>e</sub> (V) 24 120 250  
 I<sub>e</sub> (A) 4 4 4  
 Direct current: DC13  
 U<sub>e</sub> (V) 24 125 250  
 I<sub>e</sub> (A) 4 1,1 0,4

with 8 poles M12 connector

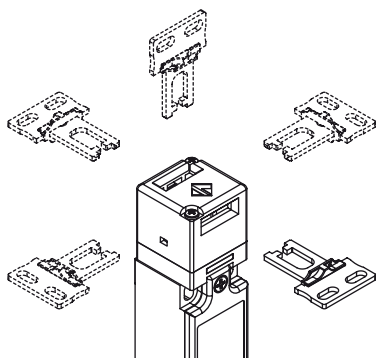
Thermal current (I<sub>th</sub>): 2 A  
 Rated insulation voltage (U<sub>i</sub>): 30 VAC 36 VDC  
 Protection against short circuits: fuse 2 A 500 V type gG  
 Pollution degree: 3

Alternate current: AC15 (50...60 Hz)  
 U<sub>e</sub> (V) 24  
 I<sub>e</sub> (A) 2  
 Direct current: DC13  
 U<sub>e</sub> (V) 24  
 I<sub>e</sub> (A) 2

## Description

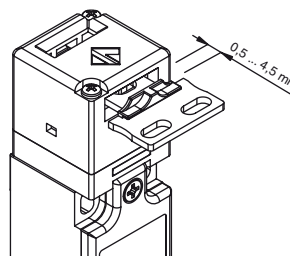
These safety switches are ideal to control gates, sliding doors and other guards protecting dangerous parts of machine. The stainless steel actuator is fastened to the moving part of the guard, so it is removed from the switch on every opening of the guard. The switch mechanism guarantees that removing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



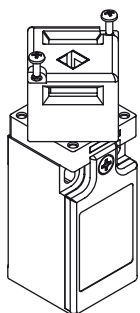
Removing the two fastening screws, in all switches, the head can be rotated in 90° steps.

## Actuator regulation zone



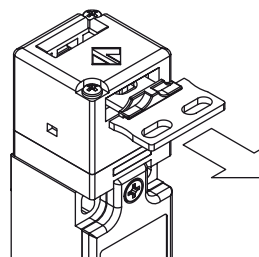
This switch has a wide backlash of the actuator into the head (4 mm) for an easier installation. With closed door, check that the actuator doesn't knock straight against the head of the switch; it must be in the adjustment zone (0,5...4,5 mm)

## Not detachable head



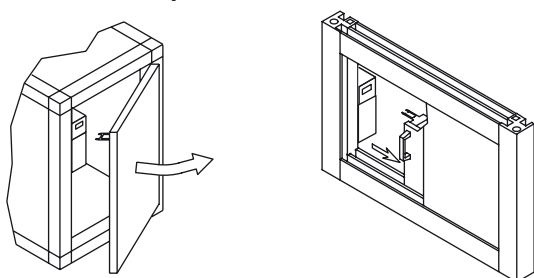
The action head type "93" is completely interchangeable and compatible with previous head type "92", but it has the advantage to be not detachable from the switch body even if it is always adjustable in 90° steps (Pizzato Elettrica patent). The new head is safer because it cannot be ruined during installation.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

## 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

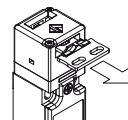
Contacts type:

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

Contact blocks

	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 <b>R</b>	FR 593 $\rightarrow$ 1NO+1NC	FX 593 $\rightarrow$ 1NO+1NC	FW 592-M2 $\rightarrow$ 1NO+1NC	
6 <b>L</b>	FR 693 $\rightarrow$ 1NO+1NC	FX 693 $\rightarrow$ 1NO+1NC	FW 692-M2 $\rightarrow$ 1NO+1NC	
7 <b>LO</b>	FR 793 $\rightarrow$ 1NO+1NC	FX 793 $\rightarrow$ 1NO+1NC	FW 792-M2 $\rightarrow$ 1NO+1NC	
9 <b>L</b>	FR 993 $\rightarrow$ 2NC	FX 993 $\rightarrow$ 2NC	FW 992-M2 $\rightarrow$ 2NC	
20 <b>L</b>	FR 2093 $\rightarrow$ 1NO+2NC	FX 2093 $\rightarrow$ 1NO+2NC	FW 2092-M2 $\rightarrow$ 1NO+2NC	
21 <b>L</b>	FR 2193 $\rightarrow$ 3NC	FX 2193 $\rightarrow$ 3NC	FW 2192-M2 $\rightarrow$ 3NC	
22 <b>L</b>	FR 2293 $\rightarrow$ 2NO+1NC	FX 2293 $\rightarrow$ 2NO+1NC	FW 2292-M2 $\rightarrow$ 2NO+1NC	
33 <b>L</b>	FR 3393 $\rightarrow$ 1NO+1NC	FX 3393 $\rightarrow$ 1NO+1NC	FW 3392-M2 $\rightarrow$ 1NO+1NC	FK 3393 $\rightarrow$ 1NO+1NC
34 <b>L</b>	FR 3493 $\rightarrow$ 2NC	FX 3493 $\rightarrow$ 2NC	FW 3492-M2 $\rightarrow$ 2NC	FK 3493 $\rightarrow$ 2NC
Min. force	10 N (18 N $\rightarrow$ )	10 N (18 N $\rightarrow$ )	10 N (18 N $\rightarrow$ )	10 N (18 N $\rightarrow$ )

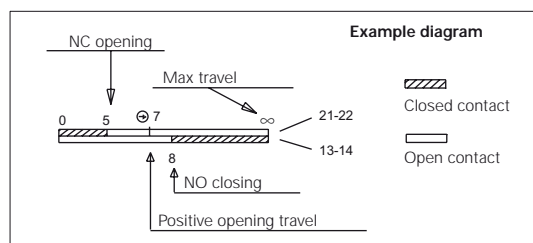
All switches listed above are available in the version with 30N actuator extraction force. To obtain these products, the order code has to be changed adding the extension "-E3"; for example FR 693-E3.



Min. force 30 N version	30 N (38 N $\rightarrow$ )	30 N (38 N $\rightarrow$ )	30 N (38 N $\rightarrow$ )	30 N (38 N $\rightarrow$ )
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## 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  $\rightarrow$ . Operate the switch **at least with the positive opening force**, indicated between brackets, below each article, next the value of minimum force.

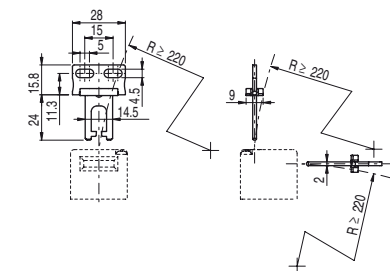
## Actuators stainless steel

10 pcs packs

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

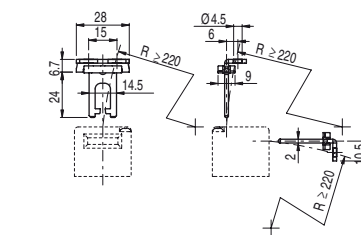
Article	Description
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**VF KEYD** Straight actuator



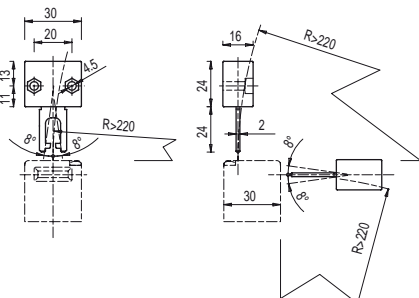
Article	Description
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**VF KEYD1** Right-angled actuator



Article	Description
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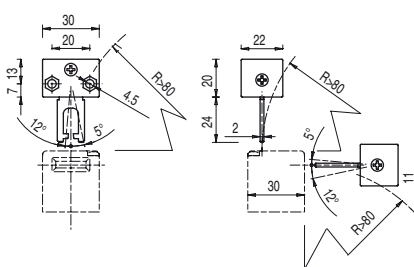
**VF KEYD2** Jointed actuator



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

Article	Description
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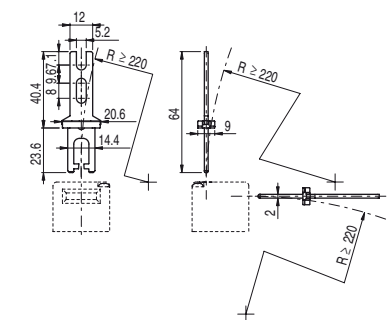
**VF KEYD3** Jointed actuator adjustable in two directions



Actuator adjustable in two directions for doors with reduced dimensions.

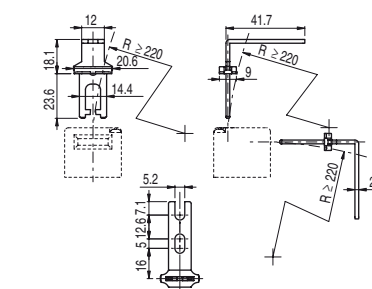
Article	Description
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**VF KEYD5** Long actuator



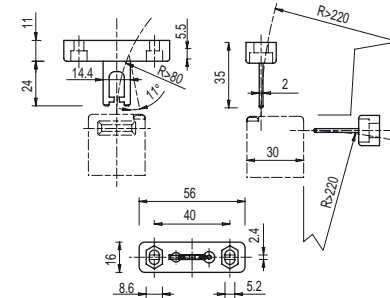
Article	Description
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**VF KEYD6** Right-angled long actuator



Article	Description
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**VF KEYD7** Jointed actuator adjustable in one direction



Actuator adjustable in one direction for doors with reduced dimensions.

Article	Description
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**VF KEYD10** Shaped actuator

