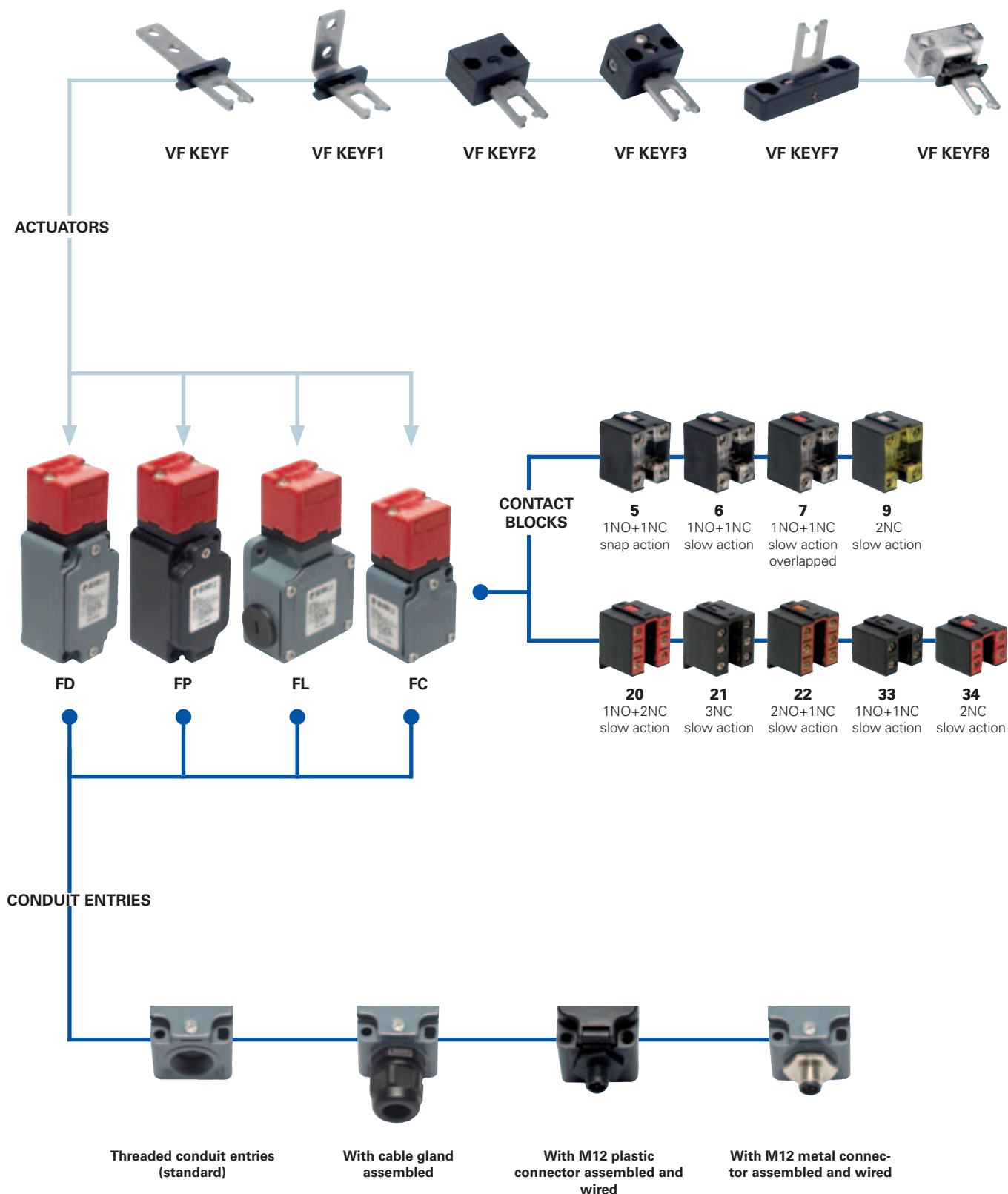


Selection diagram



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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	
FD 693		F1GM2K50	
Housing FD metal housing, one conduit entry FL metal housing, three conduit entries FP polymer housing, one conduit entry		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 ... K50 with 5 poles M12 metal connector ... For the complete list of all combinations, please contact our technical office.	
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		Threaded conduit entry PG 13,5 (standard) M2 M20x1,5	
Actuators without actuator (standard) F with straight actuator F1 with right-angled actuator F2 with jointed actuator F3 with jointed actuator adjustable in two directions F7 with jointed actuator adjustable in one direction F8 with universal actuator		Contacts type silver contacts (standard) G silver contacts gold plated 1 µm	

article		options	
FC 3393		F1GM1K22	
Housing FC metal housing, one conduit entry		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	
Contact blocks 33 1NO+1NC, slow action 34 2NC, slow action		Threaded conduit entry PG 11 (standard) M1 M16x1,5	
Actuators without actuator (standard) F with straight actuator F1 with right-angled actuator F2 with jointed actuator F3 with jointed actuator adjustable in two directions F7 with jointed actuator adjustable in one direction F8 with universal actuator		Contacts type silver contacts (standard) G silver contacts gold plated 1 µm	



Main data

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

Markings and quality marks:



Approval IMQ:	EG605 (FD-FLFC series) EG606 (FP series)
Approval UL:	E131787
Approval CCC:	2007010305230000 (FD-FLFC series) 2007010305230014 (FP series)
Approval ECU:	1010151

Technical data

Housing

Housing type FP made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin and with double insulation □

Housing type FD, FL and FC made of metal, coated with baked epoxy powder.

FD, FP and FC series one conduit entry

FL series three conduit entries

Protection degree: IP67 according to EN 60529
(electrical contacts)

General data

Safety parameters: see page 6/32
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 operations cycles¹

Max actuating speed: 0,5 m/s

Min. actuating speed: 1 mm/s

Driving torque for installation: see pages 6/1-6/10

(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:	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, 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, 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 6/10.

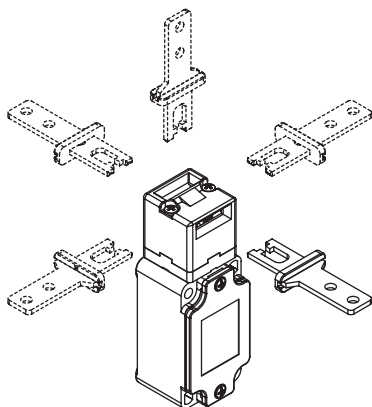
Electrical data			Utilization categories			
without connector	Thermal current (I _{th}):	10 A	Alternate current: AC15 (50...60 Hz)			
	Rated insulation voltage (U _i):	500 Vac 600 Vdc	U _e (V)	250	400	500
		400 Vac 500 Vdc	I _e (A)	6	4	1
		for contact blocks 20, 21, 22, 33, 34	Direct current: DC13			
	Conditional shot circuit current:	1000 A according to EN 60947-5-1	U _e (V)	24	125	250
with 4 or 5 poles M12 connector	Protection against short circuits:	fuse 10 A 500 V type aM	I _e (A)	6	1,1	0,4
	Pollution degree:	3	Alternate current: AC15 (50...60 Hz)			
	Thermal current (I _{th}):	4 A	U _e (V)	24	120	250
		250 Vac 300 Vdc	I _e (A)	4	4	4
		Protection against short circuits:	fuse 4 A 500 V type gG	Direct current: DC13		
with 8 poles M12 connector	Pollution degree:	3	U _e (V)	24	125	250
	Thermal current (I _{th}):	2 A	I _e (A)	4	1,1	0,4
		30 Vac 36 Vdc	Alternate current: AC15 (50...60 Hz)			
		Protection against short circuits:	fuse 2 A 500 V type gG	U _e (V)	24	120
	with 8 poles M12 connector	Pollution degree:	3	I _e (A)	2	4



Description

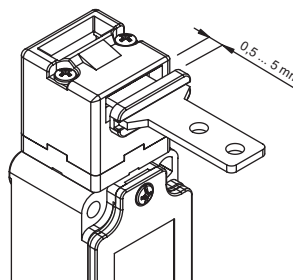
These safety switches are ideal to control gates, sliding doors and other guards protecting dangerous parts of machine. The stainless steel actuator is fastened to the moving part of the guard, so it is removed from the switch on every opening of the guard. The switch mechanism guarantees that removing 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. Made of rugged materials and with oversized thickness, these switches are designed for the use on heavy guards.

Rotating heads



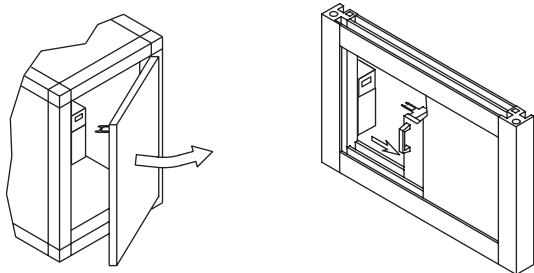
Removing the two fastening screws, in all switches, the head can be rotated in 90° steps.

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)

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.

Use Atex products in environments with explosion hazard (see page 2/137)

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: EN 60947-1, EN 60947-5-1 and subsequent modifications and completions, fundamental requirements of the Low Voltage Directive 2006/95/CE 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

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.

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

Dimensional drawings

Contacts type:

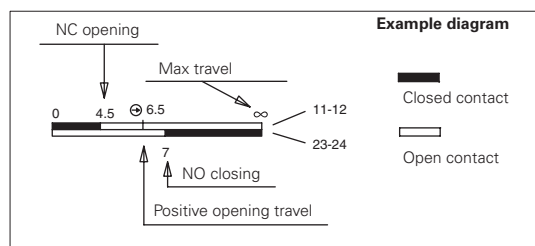
R = snap action
L = slow action
LO = slow action overlapped

Contact blocks

	polymer housing Switch without actuator	metal housing Switch without actuator	metal housing Switch without actuator	metal housing Switch without actuator
5	R FP 593 \rightarrow 1NO+1NC 	FD 593 \rightarrow 1NO+1NC 	FL 593 \rightarrow 1NO+1NC 	
6	L FP 693 \rightarrow 1NO+1NC 	FD 693 \rightarrow 1NO+1NC 	FL 693 \rightarrow 1NO+1NC 	
7	LO FP 793 \rightarrow 1NO+1NC 	FD 793 \rightarrow 1NO+1NC 	FL 793 \rightarrow 1NO+1NC 	
9	L FP 993 \rightarrow 2NC 	FD 993 \rightarrow 2NC 	FL 993 \rightarrow 2NC 	
20	L FP 2093 \rightarrow 1NO+2NC 	FD 2093 \rightarrow 1NO+2NC 	FL 2093 \rightarrow 1NO+2NC 	
21	L FP 2193 \rightarrow 3NC 	FD 2193 \rightarrow 3NC 	FL 2193 \rightarrow 3NC 	
22	L FP 2293 \rightarrow 2NO+1NC 	FD 2293 \rightarrow 2NO+1NC 	FL 2293 \rightarrow 2NO+1NC 	
33	L FP 3393 \rightarrow 1NO+1NC 	FD 3393 \rightarrow 1NO+1NC 	FL 3393 \rightarrow 1NO+1NC 	FC 3393 \rightarrow 1NO+1NC
34	L FP 3493 \rightarrow 2NC 	FD 3493 \rightarrow 2NC 	FL 3493 \rightarrow 2NC 	FC 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)

How to read travel diagrams

All measures in the diagrams are in mm.

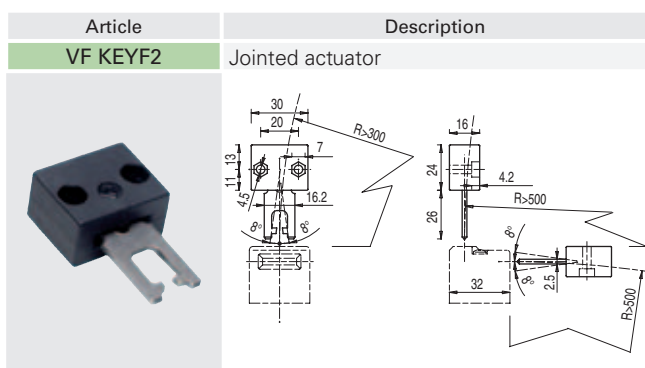
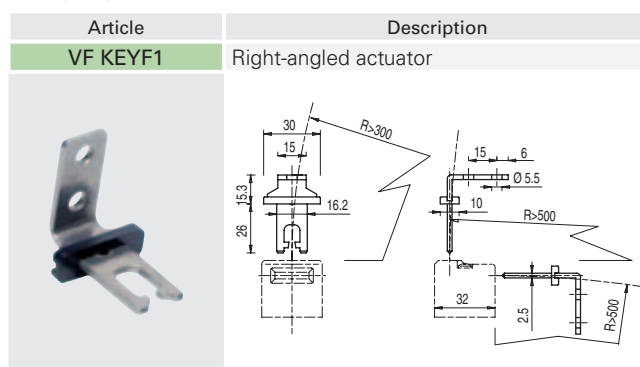
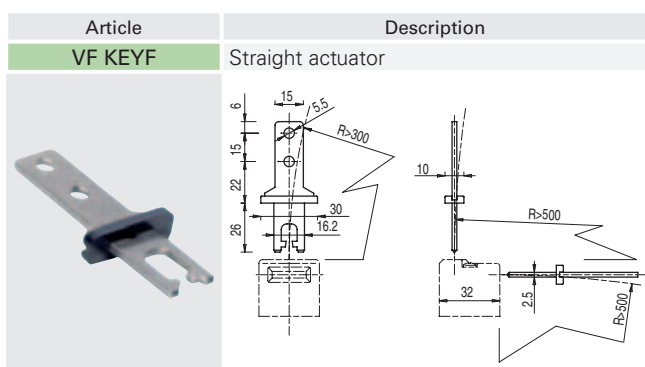
**IMPORTANT:**

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.

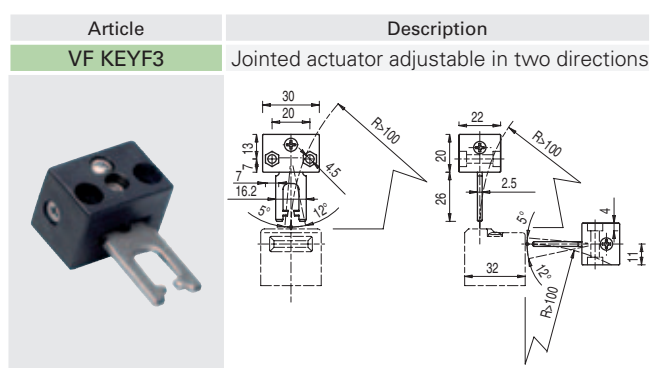


Stainless steel actuators

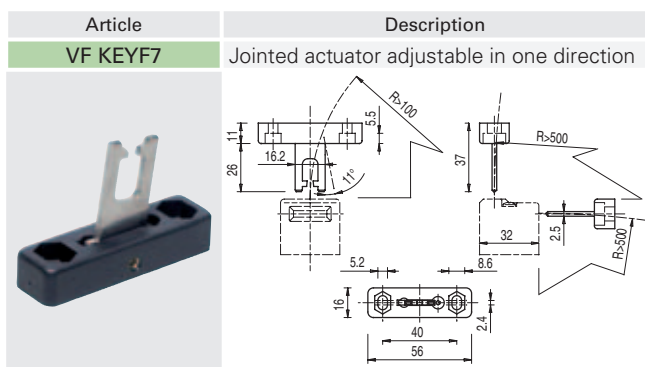
IMPORTANT: These actuators must be used with FD, FP, FL, FC or FS series only (e.g. FD 693)



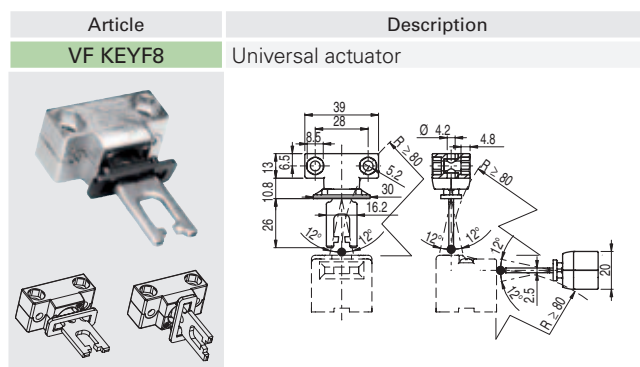
The actuator can flex in four directions for applications where the door alignment is not precise.



Actuator adjustable in two directions for doors with reduced dimensions.

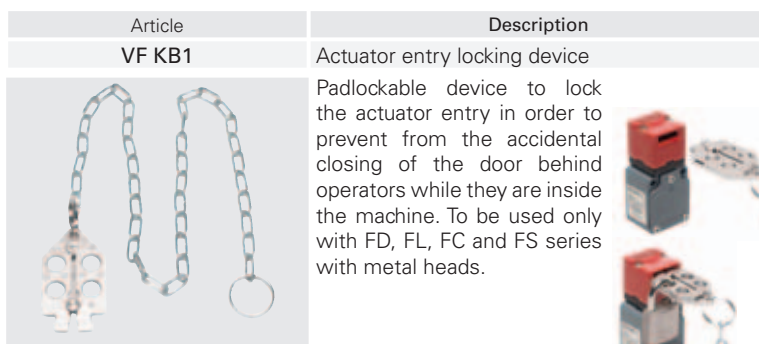


Actuator adjustable in one direction for doors with reduced dimensions.



Joined and two directions adjustable actuator for doors with reduced dimensions. The actuator has two couples of fixing holes and it is possible to rotate the actuator-working plan (see picture).

Accessories



Padlockable device to lock the actuator entry in order to prevent from the accidental closing of the door behind operators while they are inside the machine. To be used only with FD, FL, FC and FS series with metal heads.



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