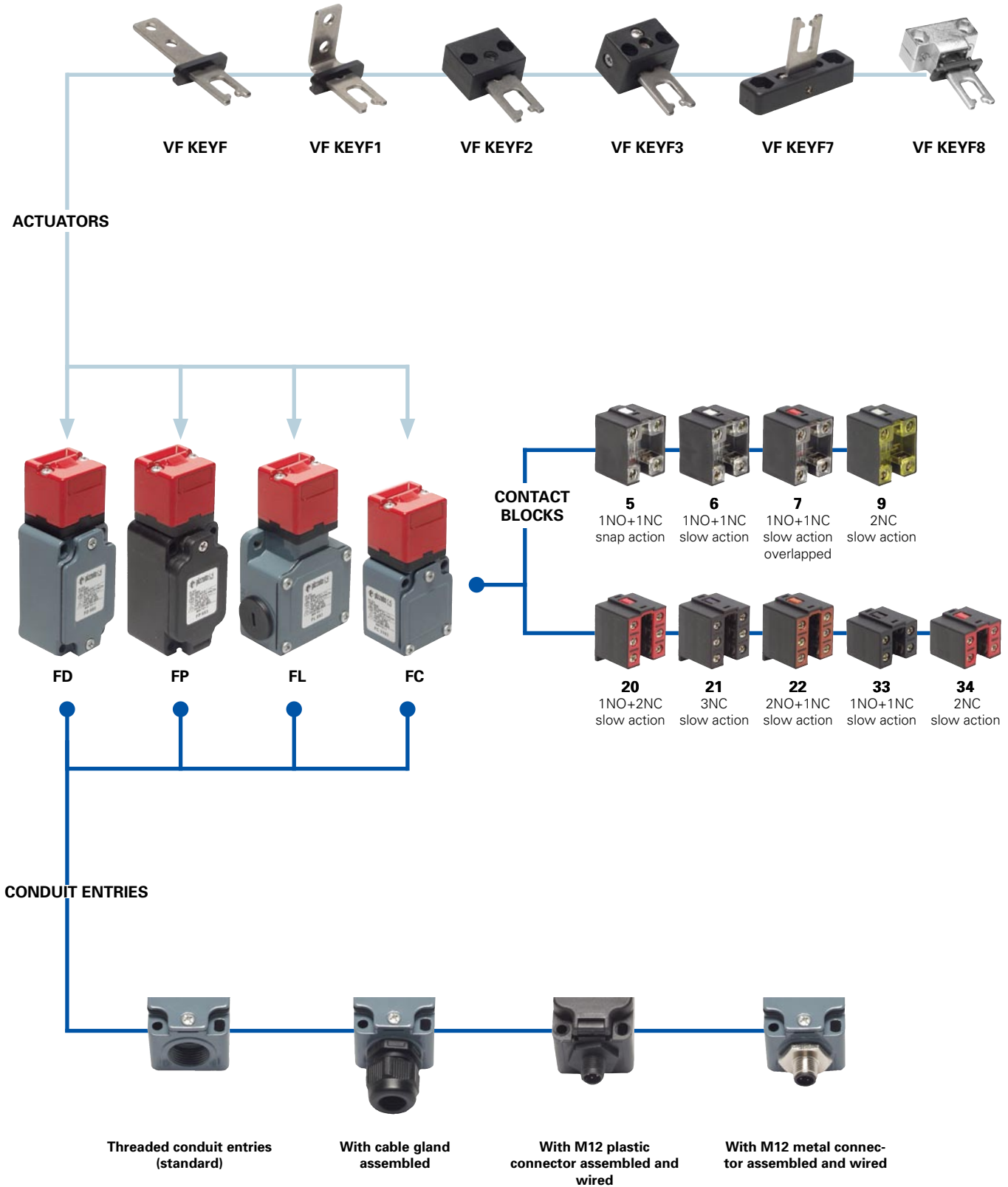


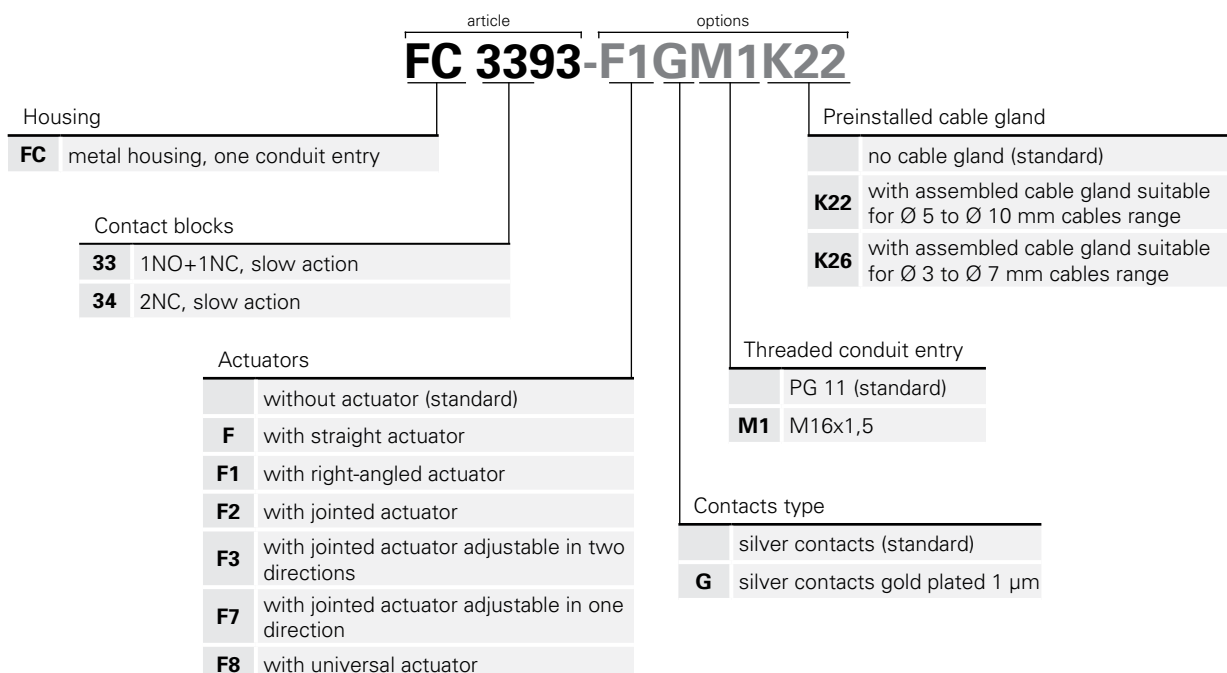
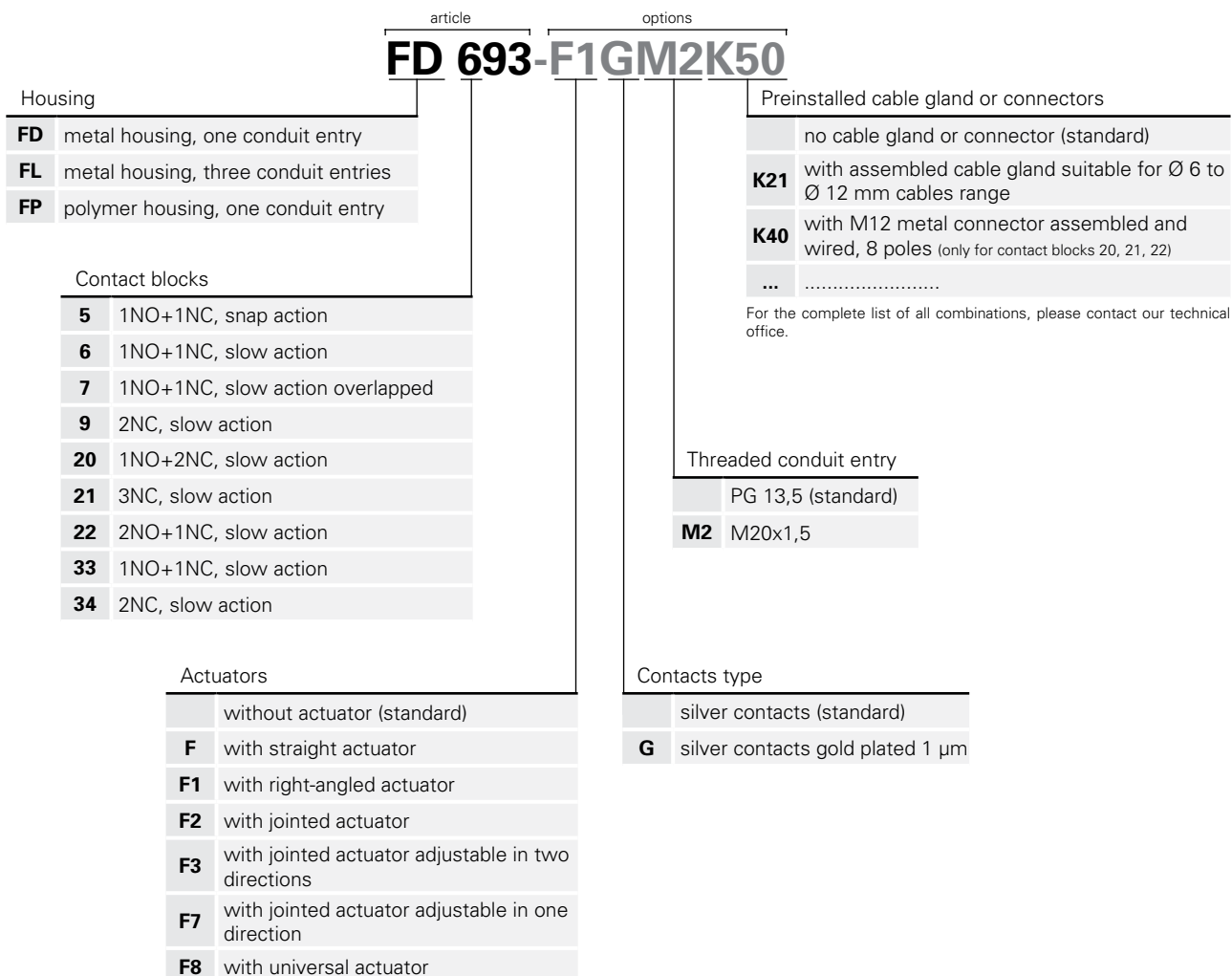
Selection diagram



—●— 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.





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-FL-FC series) EG606 (FP series)
Approval UL:	E131787
Approval CCC:	2007010305230000 (FD-FL-FC 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 \square

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 (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 operations cycles¹

Max actuating speed: 0,5 m/s

Min. actuating speed: 1 mm/s

(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 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 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 _{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 for contact blocks 20, 21, 22, 33, 34	I _e (A)	6	4	1
	Protection against short circuits:	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	

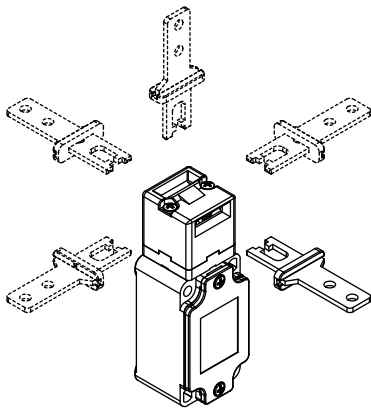
with 4 or 5 poles M12 connector	Thermal current (I _{th}):	4 A	Alternate current: AC15 (50...60 Hz)			
	Rated insulation voltage (U _i):	250 VAC 300 VDC	U _e (V)	24	120	250
	Protection against short circuits:	fuse 4 A 500 V type gG	I _e (A)	4	4	4
	Pollution degree:	3	Direct current: DC13			
		U _e (V)	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:	fuse 2 A 500 V type gG	I _e (A)	2	
	Pollution degree:	3	Direct current: DC13		
		U _e (V)	24		
		I _e (A)	2		

Description

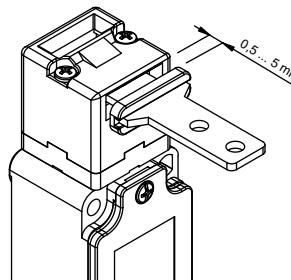
These safety switches are ideal to control gates, sliding doors and other guards protecting dangerous parts of machine. The stainless steel actuator is fastened to the moving part of the guard, so it is removed from the switch on every opening of the guard. The switch mechanism guarantees that removing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

Rotating heads



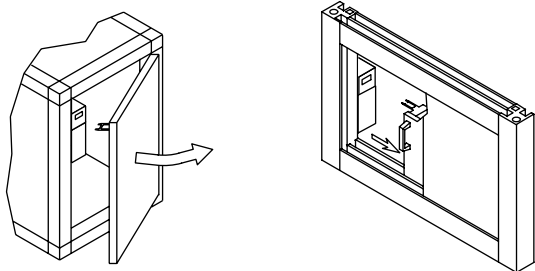
Removing the two fastening screws, in all switches, the head can be rotated in 90° steps.

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.

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.

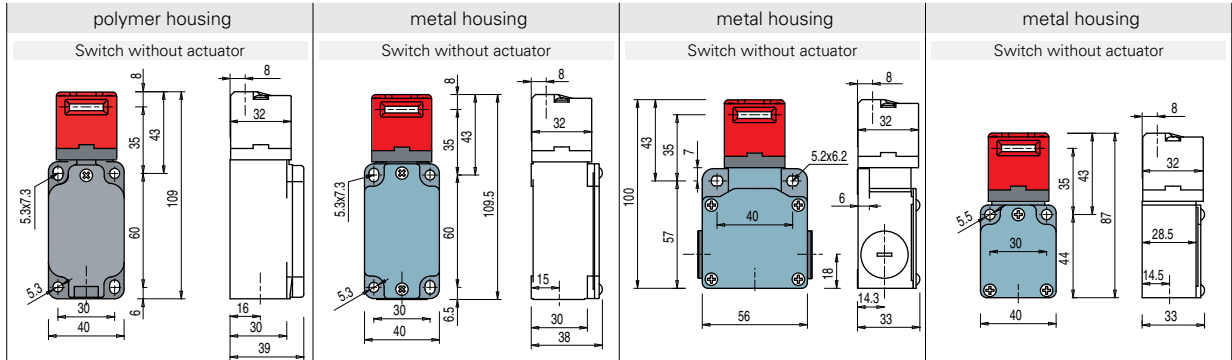
Please contact our technical service for the list of type approved products.

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

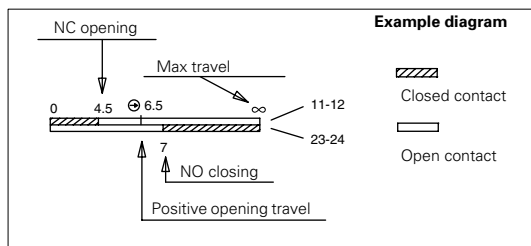


Contact blocks

5	R	FP 593	⊕ 1NO+1NC	FD 593	⊕ 1NO+1NC	FL 593	⊕ 1NO+1NC	
6	L	FP 693	⊕ 1NO+1NC	FD 693	⊕ 1NO+1NC	FL 693	⊕ 1NO+1NC	
7	LO	FP 793	⊕ 1NO+1NC	FD 793	⊕ 1NO+1NC	FL 793	⊕ 1NO+1NC	
9	L	FP 993	⊕ 2NC	FD 993	⊕ 2NC	FL 993	⊕ 2NC	
20	L	FP 2093	⊕ 1NO+2NC	FD 2093	⊕ 1NO+2NC	FL 2093	⊕ 1NO+2NC	
21	L	FP 2193	⊕ 3NC	FD 2193	⊕ 3NC	FL 2193	⊕ 3NC	
22	L	FP 2293	⊕ 2NO+1NC	FD 2293	⊕ 2NO+1NC	FL 2293	⊕ 2NO+1NC	
33	L	FP 3393	⊕ 1NO+1NC	FD 3393	⊕ 1NO+1NC	FL 3393	⊕ 1NO+1NC	FC 3393
34	L	FP 3493	⊕ 2NC	FD 3493	⊕ 2NC	FL 3493	⊕ 2NC	FC 3493
Min. force		10 N (18 N ⊕)		10 N (18 N ⊕)		10 N (18 N ⊕)		10 N (18 N ⊕)

How to read travel diagrams

All measures in the diagrams are in mm



IMPORTANT:

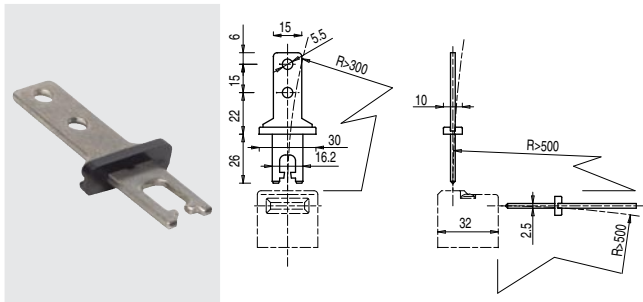
NC contact has to be considered with inserted actuator. In safety applications it is necessary to activate the switch **at least up to the positive opening point** indicated in the diagrams with the symbol ⊕. Operate the switch **at least with the positive opening force**, indicated between brackets,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

Stainless steel actuators

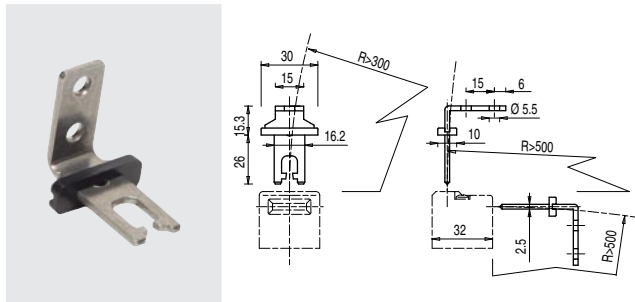
10 pcs packs

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

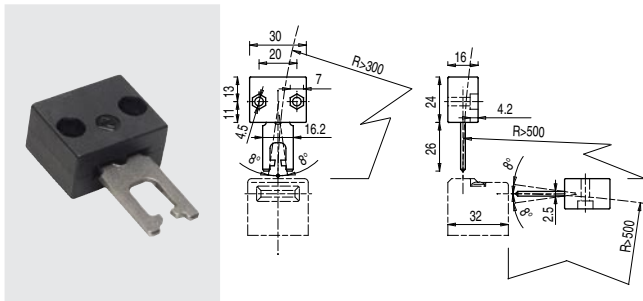
Article	Description
VF KEYF	Straight actuator



Article	Description
VF KEYF1	Right-angled actuator

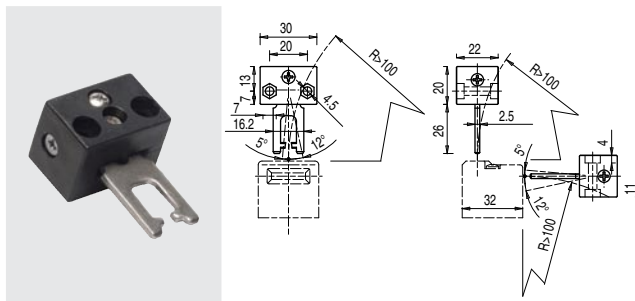


Article	Description
VF KEYF2	Jointed actuator



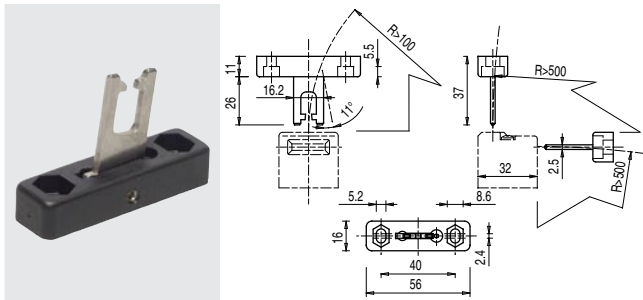
The actuator can flex in four directions for applications where the door alignment is not precise

Article	Description
VF KEYF3	Jointed actuator adjustable in two directions



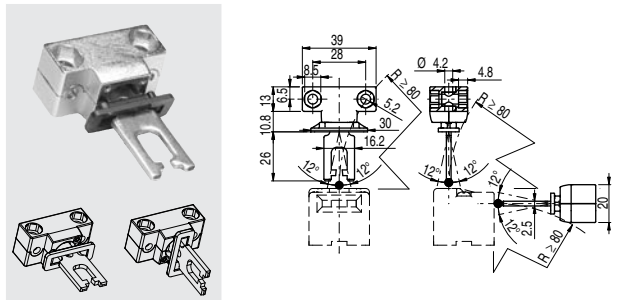
Actuator adjustable in two directions for doors with reduced dimensions.

Article	Description
VF KEYF7	Jointed actuator adjustable in one direction



Actuator adjustable in one direction for doors with reduced dimensions.

Article	Description
VF KEYF8	Universal actuator



Jointed 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

Article	Description
VF KB1	Actuator entry locking device



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.

