

Description

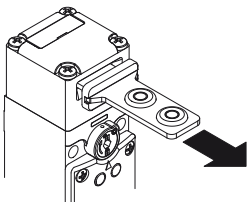


These switches are used on machines where the hazardous conditions remain for a while, even after the machines have been switched off, for example because of mechanical inertia of pulleys, saw disks, parts under pressure or with high temperatures. Thus, the switches can also be used if individual guards are only to be opened under certain conditions.

The versions with solenoid actuated NC contacts are considered interlocks with locking in accordance with ISO 14119, and the product's label is marked with the symbol shown.

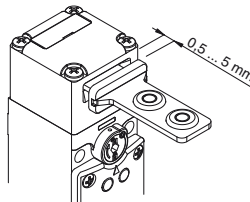


Holding force of the locked actuator



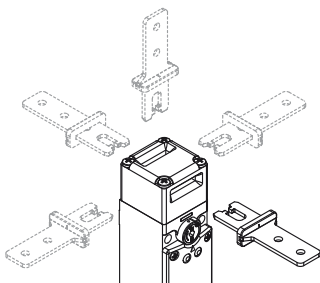
The strong interlocking system guarantees a maximum actuator holding force of $F_{1max} = 2800 \text{ N}$.

Wide-ranging actuator travel



The actuation head of this switch features a wide range of travel. In this way the guard can oscillate along the direction of insertion (4.5 mm) without causing unwanted machine shutdowns. This wide range of travel is available in all actuators in order to ensure maximum device reliability.

Heads and devices with variable orientation



The system can be variably configured by loosening the 4 screws on the head.

The key release device and the release button can also be rotated and secured independently of one another in 4 steps of 90°. The device can thus assume 32 different configurations.

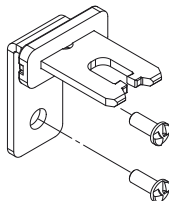
Contact blocks with 4 contacts



Innovative contact block with 4 contacts, available in various contact configurations for monitoring the actuator or the solenoid (patented). The unit is supplied with captive screws and self-lifting clamping plates. Removable finger protection for eyelet terminal.

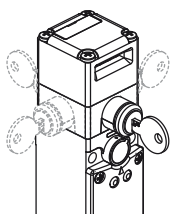
High-reliability electrical contacts with 4 contact points and double interruption

Safety screws for actuators



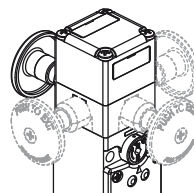
As required by EN ISO 14119, the actuator must be fixed immovably to the door frame. Pan head safety screws with one-way fitting are available for this purpose. With this screw type, the actuators cannot be removed or tampered by using common tools. See accessories on page 295.

Turnable key release with lock



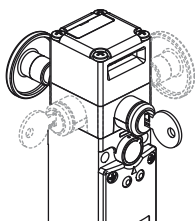
The auxiliary key release device is used to allow the maintenance or the entry into the machinery to authorized personnel only. Turning the key corresponds to actuating the solenoid: the actuator is released. The device can be turned, thereby enabling installation of the safety switch in the machine while the release device remains accessible on the outside of the guard. In this way, the switch is better protected against possible tampering and the external side/surface of the machinery remains smooth.

Emergency release button



This device is used to safeguard a hazardous area that an operator may enter with his entire body. The release button, which is oriented towards the inside of the danger zone, allows the operator to escape even in the event of a power failure. Pushing the button results in the same function as the auxiliary release device. To reset the switch, simply return the button to its initial position. The emergency button can be rotated and is available with different lengths. It is fixed to the switch by means of a screw allowing the installation of the switch both inside and outside the guards.

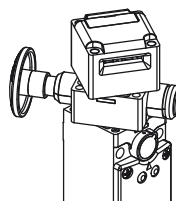
Key release device and emergency release button



the lock and the button must be returned to their initial position.

This device performs simultaneously the two functions mentioned above. The lock and button can be rotated in this case as well; the release button can be ordered with various lengths. The release button has priority over the lock, i.e., the emergency escape can be actuated to unlock the switch even if the lock is locked. To reset the switch,

Non-detachable heads and release devices



The head and the release device can be rotated but cannot be detached from each other. This makes the switch more secure since the problem of incorrect assembly by the installer cannot occur; in addition, the risk of damage is lower (loss of small parts, penetration of dirt, etc.).



LED display unit, type A

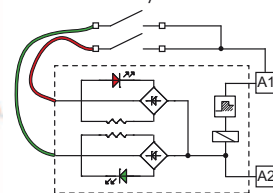


In the version with LED display unit of type A, two green LEDs are switched-on directly by the power supply of the solenoid. Wiring is not necessary.

LED display unit, types B and C



In the version with LED display unit of type B, connection wires from two LEDs are available, one green and one red. By means of suitable connections on the



contact block, various operating states of the switch can be displayed externally.

Protection degree IP67

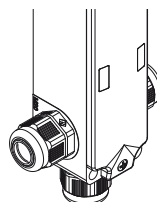
IP67 These devices are designed to be used in the toughest environmental conditions and they pass the IP67 immersion test acc. to EN 60529. They can therefore be used in all environments where maximum protection degree of the housing is required.

Extended temperature range

-40°C These devices are also available in a special version suitable for an ambient operating temperature range from -40°C up to +80°C.

They can therefore be used for applications in cold stores, sterilisers and other equipment with low temperature environments. The special materials used to produce these versions retain their characteristics even under these conditions, thereby expanding the installation possibilities.

Three conduit entries



The switch is provided with three conduit entries in different directions. This allows its application in series connections or in narrow places.

Sealable auxiliary release device



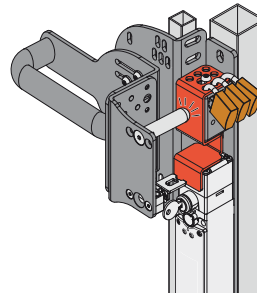
Switches with locked actuator with deactivated solenoid (function principle D) are equipped with an auxiliary release device for the solenoid to simplify installation of the switch and to facilitate entry into the danger zone in the event of a power failure. The auxiliary release device acts on the switch exactly as if the solenoid was energised. As a result, it also actuates the electrical contacts. Can only be actuated with the use of two tools; this ensures adequate protection against tampering. If necessary, it can be sealed using the appropriate hole.

Laser engraving



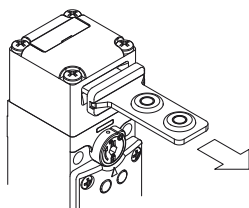
All FG series switches are permanently marked with a special laser system. As a result, the marking remains legible even under extreme operating conditions. Thanks to this system that does not use labels, the loss of plate data is prevented and a greater resistance of the marking is achieved over time.

Access monitoring



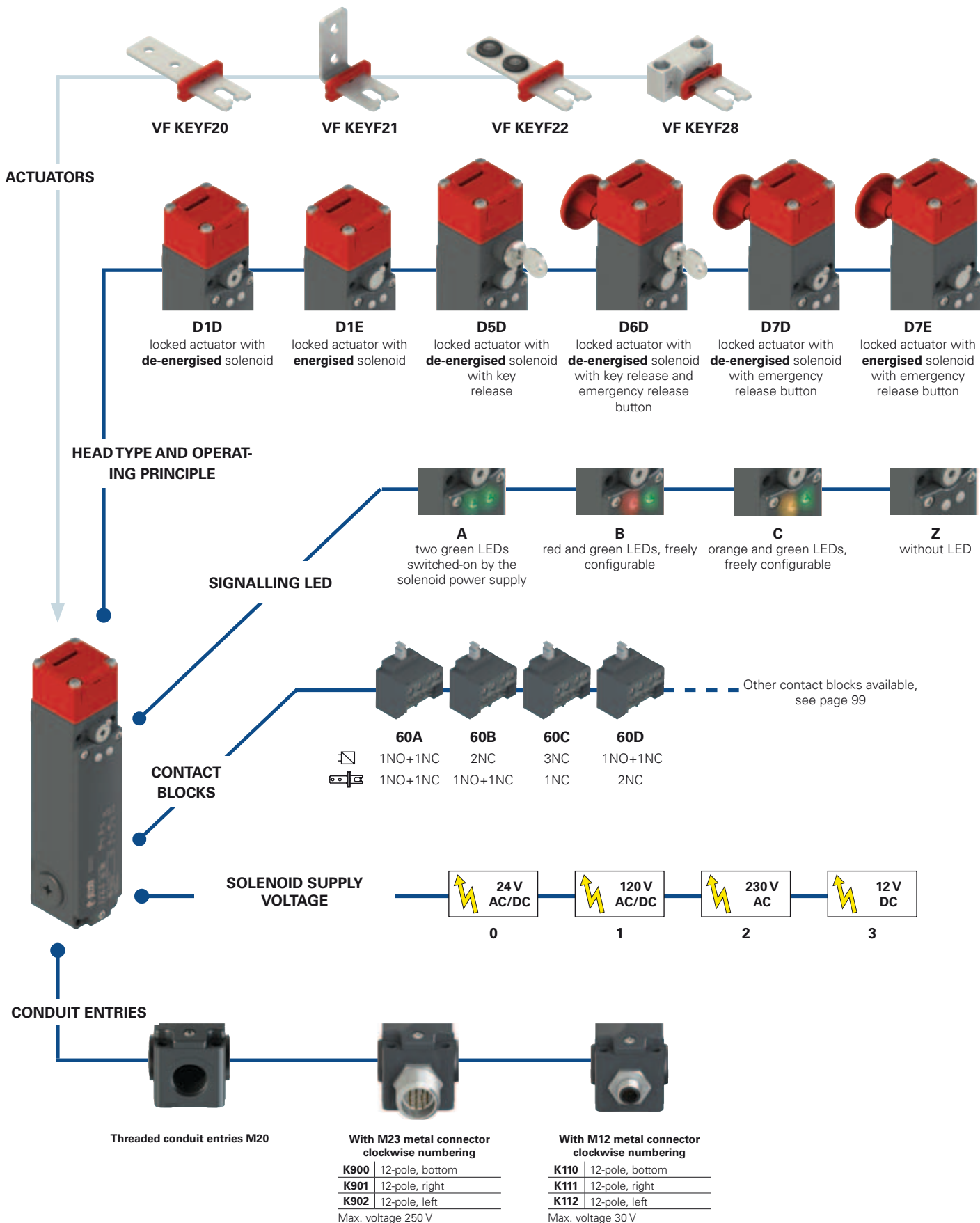
These safety switches alone do not provide sufficient personal protection to the operators or maintenance personnel in situations where they completely enter the danger zone, since unintentional closing of a door after entry could cause the machine to re-start. If the re-start release is completely dependent on these switches, a system for preventing this danger must be provided, e.g. a padlockable device for actuator entry VF KB2 (page 100) or a lockable safety handle, such as a VF AP-P11B-200P (page 153).

Holding force of the unlocked actuator



The inside of each switch features a device which holds the actuator in its closed position. Ideal for all those applications where several doors are unlocked simultaneously, but only one is actually opened. The device keeps all the unlocked doors in their position with a retaining force of 30 N~, stopping any vibrations or gusts of wind from opening them.

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.

article options
FG 60AD1D0A-LP30F20GK900T6

Contact block		
	Contacts activated by the solenoid 	Contacts activated by the actuator 
60A	1NO+1NC	1NO+1NC
60B	2NC	1NO+1NC
60C	3NC	1NC
60D	1NO+1NC	2NC
60E	1NO+2NC	1NC
60F	1NO+2NC	1NO
60G	2NC	2NC
60H	4NC	/
60I	3NC	1NO
60L	2NO+1NC	1NC
60M	2NO+1NC	1NO
60N	1NO+1NC	2NO
60P	1NC	3NC
60R	2NO+2NC	/
60S	1NC	2NO+1NC
60T	1NC	1NO+2NC
60U	/	4NC
60V	2NC	2NO
60X	1NO	3NC
60Y	1NO	1NO+2NC
61A	/	3NC+1NO
61B	/	2NC+2NO
61C	/	1NC+3NO
61D	1NC	3NO
61E	1NO	1NC+2NO
61G	2NO	1NC+1NO
61H	2NO	2NC
61M	3NO	1NC
61R	3NC+1NO	/
61S	1NC+3NO	/

Note: contact blocks 60U, 61A, 61B, 61C cannot be combined with operating principles D6D, D7D, D7E

Operating principle	
D1D	locked actuator with de-energised solenoid
D1E	locked actuator with energised solenoid
D5D	locked actuator with de-energised solenoid. With key release
D6D	locked actuator with de-energised solenoid. With key release and emergency release button
D7D	locked actuator with de-energised solenoid. With emergency release button
D7E	locked actuator with energised solenoid. With emergency release button

Ambient temperature

	-25°C ... +80°C (standard)
T6	-40°C ... +80°C

Pre-installed connectors

	without connector (standard)
K900	M23 metal connector, 12-pole, bottom
...	...
K110	M12 metal connector, 12-pole, bottom
...	...

For the complete list of possible combinations please contact our technical department.

Contact type

	silver contacts (standard)
G	silver contacts with 1 µm gold coating

Actuators

	without actuator (standard)
F20	straight actuator VF KEYF20
F21	angled actuator VF KEYF21
F22	actuator with rubber pads VF KEYF22
F28	universal actuator VF KEYF28

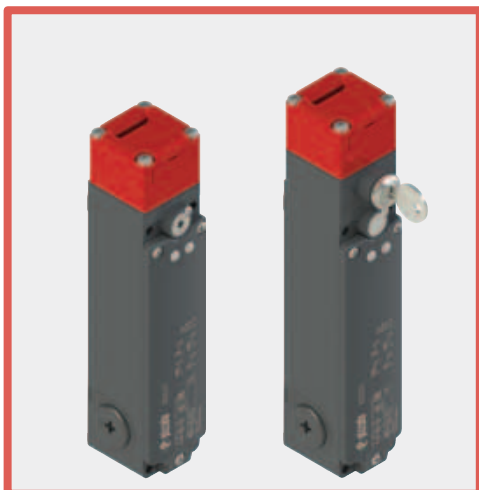
Release button length

	for max. 15 mm wall thickness (standard)
LP30	for max. 30 mm wall thickness
LP40	for max. 40 mm wall thickness
LP60	for max. 60 mm wall thickness
LPRG	adjustable, for wall thickness from 60 mm to 500 mm

Signalling LED

A	two green LEDs switched-on by the solenoid power supply
B	red and green LEDs, freely configurable
C	orange and green LEDs, freely configurable
Z	without LED

Solenoid	supply	voltage
0	24 Vac/dc (-10% ... +10%)	
1	120 Vac/dc (-15% ... +10%)	
2	230 Vac (-15% ... +10%)	
3	12 Vdc (-15% ... +20%)	



Main features

- Actuator holding force F_{1max} : 2800 N
- 30 contact blocks with 4 contacts
- Metal housing, three M20 conduit entries
- Protection degree IP67
- Versions with key release and emergency release button
- 4 stainless steel actuators
- Head and release devices, individually turnable and non-detachable
- Signalling LED
- Operation with energised or de-energised solenoid

Quality marks:



IMQ approval:	CA02.03848
UL approval:	E131787
CCC approval:	2013010305602309
EAC approval:	RU C-IT.A135.B.00454

Technical data

Housing

Metal head and housing, baked powder coating.	
Three threaded conduit entries:	M20x1.5 (standard)
Protection degree:	IP67 acc. to EN 60529 with cable gland of equal or higher protection degree

General data

For safety applications up to:	SIL 3 acc. to EN 62061 PL e acc. to EN ISO 13849-1 type 2 acc. to EN ISO 14119 low acc. to EN ISO 14119
Interlock with mechanical lock, coded:	
Coding level:	
Safety parameters:	
B_{100} :	5,000,000 for NC contacts
Service life:	20 years
Ambient temperature:	-25°C ... +60°C
Max. actuation frequency:	600 operating cycles/hour
Mechanical endurance:	1 million operating cycles
Max. actuation speed:	0.5 m/s
Min. actuation speed:	1 mm/s
Maximum force before breakage F_{1max} :	2800 N acc. to EN ISO 14119
Max. holding force F_{zh} :	2150 N acc. to EN ISO 14119
Maximum clearance of locked actuator:	4.5 mm
Released actuator extraction force:	30 N
Tightening torques for installation:	see page 313-324

Cable cross section (flexible copper strands)

Contact block:	min. 1 x 0.34 mm ² (1 x AWG 22) max. 2 x 1.5 mm ² (2 x AWG 16)
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In compliance with standards:

IEC 60947-5-1, EN 60947-5-1, EN 60947-1, IEC 60204-1, EN 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, EN 60529, EN 61000-6-2, EN 61000-6-3, BG-GS-ET-15, UL 508, CSA 22.2 N. 14.

Approvals:

IEC 60947-5-1, UL 508, CSA 22.2 N. 14.

Compliance with the requirements of:

Machinery Directive 2006/42/EC and EMC Directive 2014/30/EU.

Positive contact opening in conformity with standards:

IEC 60947-5-1, EN 60947-5-1.

Solenoid

Duty cycle:	100% ED (continuous operation)
Solenoid protection 12 V:	type gG fuse 1 A
Solenoid protection 24 V:	type gG fuse 0.5 A
Solenoid protection 120 V:	fuse 315 mA, delayed
Solenoid protection 230 V:	fuse 315 mA, delayed
Solenoid consumption:	9 VA

⚠ If not expressly indicated in this chapter, for correct installation and utilization of all articles see chapter utilization requirements from page 313 to page 324.

	Electrical data	Utilization category
without connector	Thermal current (I_{th}): 10 A Rated insulation voltage (U_i): 400 Vac 300 Vdc Rated impulse withstand voltage (U_{imp}): 6 kV Conditional short circuit current: 1000 A acc. to EN 60947-5-1 Protection against short circuits: type gG fuse 10 A 500 V Pollution degree: 3	Alternating current: AC15 (50÷60 Hz) U_e (V) 120 250 400 I_e (A) 6 5 3 Direct current: DC13 U_e (V) 24 125 250 I_e (A) 3 0.7 0.4
with M23 connector 12-pole	Thermal current (I_{th}): 8 A Rated insulation voltage (U_i): 250 Vac 300 Vdc Protection against short circuits: type gG fuse 8 A 500 V Pollution degree: 3	Alternating current: AC15 (50÷60 Hz) U_e (V) 120 250 I_e (A) 6 5 Direct current: DC13 U_e (V) 24 125 250 I_e (A) 3 0.7 0.4
with M12 connector 12-pole	Thermal current (I_{th}): 1.5 A Rated insulation voltage (U_i): 30 Vac 36 Vdc Protection against short circuits: type gG fuse 1.5 A Pollution degree: 3	Alternating current: AC15 (50÷60 Hz) U_e (V) 24 I_e (A) 1.5 Direct current: DC13 U_e (V) 24 I_e (A) 1.5

Features approved by IMQ

Rated insulation voltage (U_i): 400 Vac
 Conventional free air thermal current (I_{th}): 10 A
 Protection against short circuits: type gG fuse 10 A 500 V
 Rated impulse withstand voltage (U_{imp}): 6 kV
 Protection degree of the housing: IP67
 MV terminals (screw terminals)
 Pollution degree: 3
 Utilization category: AC15
 Operating voltage (U_e): 400 Vac (50 Hz)
 Operating current (I_e): 3 A

Forms of the contact element: X+X+X+X, Y+Y+Y+Y, X+Y+Y+Y, X+X+Y+Y, X+X+X+Y
 Positive opening of contacts on all contact blocks: 60A, 60B, 60C, 60D, 60E, 60F, 60G, 60H, 60I, 60L, 60M, 60N, 60P, 60R, 60S, 60T, 60U, 60V, 60X, 60Y, 61A, 61B, 61C, 61D, 61E, 61G, 61H, 61M, 61R, 61S

In compliance with standards: EN 60947-1, EN 60947-5-1+ A1:2009, fundamental requirements of the Low Voltage Directive 2014/35/EU.

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

Features approved by UL

Utilization categories: A300 (720 VA, 120-300 Vac)
 Q300 (69 VA, 125-250 Vdc)

Housing features type 1, 4X "indoor use only"; 12, 13

In compliance with standard: UL508, CSA 22.2 N. 14



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

Operating principle

The operating principle of these safety switches allows three different operating states:

- state A**: with inserted and locked actuator
- state B**: with inserted but not locked actuator
- state C**: with extracted actuator

All or some of these states can be monitored by means of electrical NO contacts or NC contacts with positive opening by selecting the appropriate contact

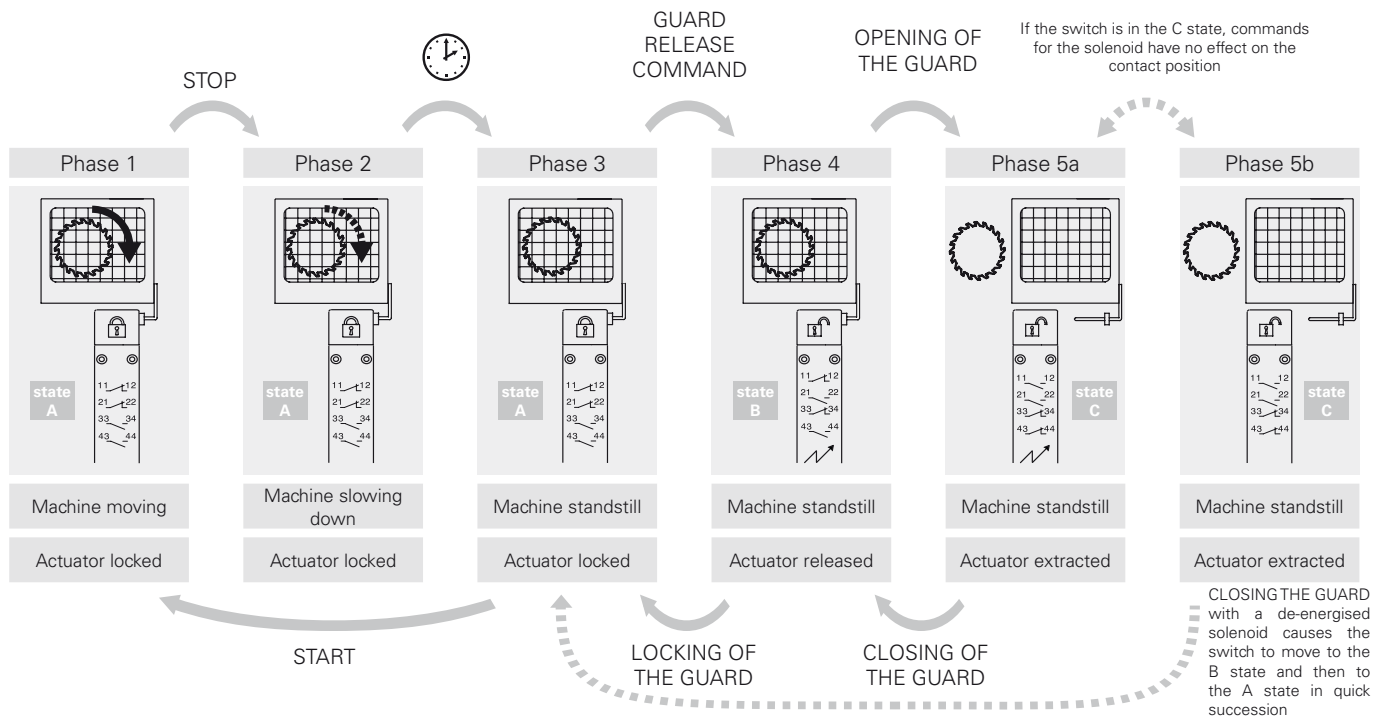
blocks. Contact blocks whose electrical contacts are marked with the solenoid symbol () are actuated upon changing from state A to B, while contacts marked with the actuator symbol () are actuated upon changing from state B to C.

Operating principle

Select from two operating principles for actuator locking:

- **Operating principle D**: locked actuator with de-energised solenoid. The actuator is released by applying the power supply to the solenoid (see example of the operating phases).
- **Operating principle E**: locked actuator with energised solenoid. The actuator is released by switching off the power supply to the solenoid. This version should only be used under certain conditions, since a power failure at the system will result in the immediate opening of the guard.

Example: operating phases with FG 60AD1D0A-F21 (switch with operating principle D)



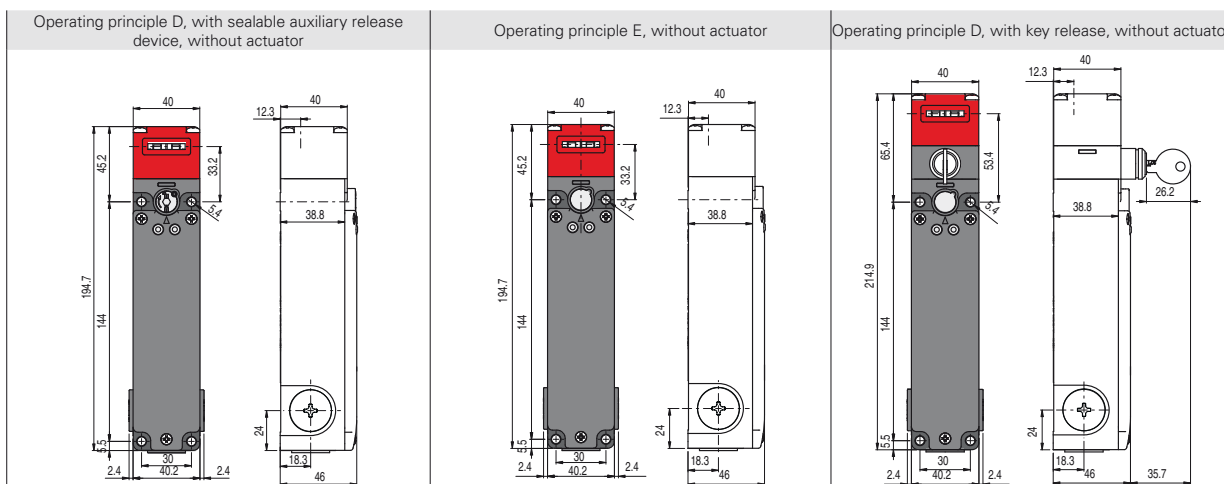


Operating state Actuator Solenoid	Operating principle D locked actuator with de-energised solenoid			Operating principle E locked actuator with energised solenoid		
	state A	state B	state C	state A	state B	state C
	Inserted and locked De-energised	Inserted and released Energised	Extracted -	Inserted and locked Energised	Inserted and released De-energised	Extracted -
FG 60T••••• 1NC controlled by the solenoid 1NO+2NC controlled by the actuator	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44
FG 60U••••• 4NC controlled by the actuator	11 / 12 21 / 22 31 / 32 41 / 42	11 / 12 21 / 22 31 / 32 41 / 42	11 / 12 21 / 22 31 / 32 41 / 42	11 / 12 21 / 22 31 / 32 41 / 42	11 / 12 21 / 22 31 / 32 41 / 42	11 / 12 21 / 22 31 / 32 41 / 42
FG 60V••••• 2NC controlled by the solenoid 2NO controlled by the actuator	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44
FG 60X••••• 1NO controlled by the solenoid 3NC controlled by the actuator	13 / 14 21 / 22 31 / 32 41 / 42	13 / 14 21 / 22 31 / 32 41 / 42	13 / 14 21 / 22 31 / 32 41 / 42	13 / 14 21 / 22 31 / 32 41 / 42	13 / 14 21 / 22 31 / 32 41 / 42	13 / 14 21 / 22 31 / 32 41 / 42
FG 60Y••••• 1NO controlled by the solenoid 1NO+2NC controlled by the actuator	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44
FG 61A••••• 1NO+3NC controlled by the actuator	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44
FG 61B••••• 2NO+2NC controlled by the actuator	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44
FG 61C••••• 3NO+1NC controlled by the actuator	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44
FG 61D••••• 1NC controlled by the solenoid 3NO controlled by the actuator	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44
FG 61E••••• 1NO controlled by the solenoid 2NO+1NC controlled by the actuator	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44
FG 61G••••• 2NO controlled by the solenoid 1NO+1NC controlled by the actuator	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44
FG 61H••••• 2NO controlled by the solenoid 2NC controlled by the actuator	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44	11 / 12 21 / 22 33 / 34 43 / 44
FG 61M••••• 3NO controlled by the solenoid 1NC controlled by the actuator	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44
FG 61R••••• 1NO+3NC controlled by the solenoid	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44	11 / 12 21 / 22 31 / 32 43 / 44
FG 61S••••• 3NO+1NC controlled by the solenoid	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44	13 / 14 21 / 22 33 / 34 43 / 44

Dimensional drawings

All values in the drawings are in mm

Contact type:
 = slow action



Contact block

	Operating principle D, with sealable auxiliary release device, without actuator	Operating principle E, without actuator	Operating principle D, with key release, without actuator
60A	FG 60AD1D0A 1NO+1NC 1NO+1NC	FG 60AD1E0A 1NO+1NC 1NO+1NC	FG 60AD5D0A 1NO+1NC 1NO+1NC
60B	FG 60BD1D0A 2NC 1NO+1NC	FG 60BD1E0A 2NC 1NO+1NC	FG 60BD5D0A 2NC 1NO+1NC
60C	FG 60CD1D0A 3NC 1NC	FG 60CD1E0A 3NC 1NC	FG 60CD5D0A 3NC 1NC
60D	FG 60DD1D0A 1NO+1NC 2NC	FG 60DD1E0A 1NO+1NC 2NC	FG 60DD5D0A 1NO+1NC 2NC
60E	FG 60ED1D0A 1NO+2NC 1NC	FG 60ED1E0A 1NO+2NC 1NC	FG 60ED5D0A 1NO+2NC 1NC
60F	FG 60FD1D0A 1NO+2NC 1NO	FG 60FD1E0A 1NO+2NC 1NO	FG 60FD5D0A 1NO+2NC 1NO
60G	FG 60GD1D0A 2NC 2NC	FG 60GD1E0A 2NC 2NC	FG 60GD5D0A 2NC 2NC
60H	FG 60HD1D0A 4NC /	FG 60HD1E0A 4NC /	FG 60HD5D0A 4NC /
60I	FG 60ID1D0A 3NC 1NO	FG 60ID1E0A 3NC 1NO	FG 60ID5D0A 3NC 1NO
60L	FG 60LD1D0A 2NO+1NC 1NC	FG 60LD1E0A 2NO+1NC 1NC	FG 60LD5D0A 2NO+1NC 1NC
60M	FG 60MD1D0A 2NO+1NC 1NO	FG 60MD1E0A 2NO+1NC 1NO	FG 60MD5D0A 2NO+1NC 1NO
60N	FG 60ND1D0A 1NO+1NC 2NO	FG 60ND1E0A 1NO+1NC 2NO	FG 60ND5D0A 1NO+1NC 2NO
60P	FG 60PD1D0A 1NC 3NC	FG 60PD1E0A 1NC 3NC	FG 60PD5D0A 1NC 3NC
60R	FG 60RD1D0A 2NO+2NC /	FG 60RD1E0A 2NO+2NC /	FG 60RD5D0A 2NO+2NC /
60S	FG 60SD1D0A 1NC 2NO+1NC	FG 60SD1E0A 1NC 2NO+1NC	FG 60SD5D0A 1NC 2NO+1NC
60T	FG 60TD1D0A 1NC 1NO+2NC	FG 60TD1E0A 1NC 1NO+2NC	FG 60TD5D0A 1NC 1NO+2NC
60U	FG 60UD1D0A 4NC	FG 60UD1E0A 4NC	FG 60UD5D0A 4NC
60V	FG 60VD1D0A 2NC 2NO	FG 60VD1E0A 2NC 2NO	FG 60VD5D0A 2NC 2NO
60X	FG 60XD1D0A 1NO 3NC	FG 60XD1E0A 1NO 3NC	FG 60XD5D0A 1NO 3NC
60Y	FG 60YD1D0A 1NO 1NO+2NC	FG 60YD1E0A 1NO 1NO+2NC	FG 60YD5D0A 1NO 1NO+2NC
61A	FG 61AD1D0A 3NC+1NO	FG 61AD1E0A 3NC+1NO	FG 61AD5D0A 3NC+1NO
61B	FG 61BD1D0A 2NC+2NO	FG 61BD1E0A 2NC+2NO	FG 61BD5D0A 2NC+2NO
61C	FG 61CD1D0A 1NC+3NO	FG 61CD1E0A 1NC+3NO	FG 61CD5D0A 1NC+3NO
61D	FG 61DD1D0A 1NC 3NO	FG 61DD1E0A 1NC 3NO	FG 61DD5D0A 1NC 3NO
61E	FG 61ED1D0A 1NO 1NC+2NO	FG 61ED1E0A 1NO 1NC+2NO	FG 61ED5D0A 1NO 1NC+2NO
61G	FG 61GD1D0A 2NO 1NC+1NO	FG 61GD1E0A 2NO 1NC+1NO	FG 61GD5D0A 2NO 1NC+1NO
61H	FG 61HD1D0A 2NO 2NC	FG 61HD1E0A 2NO 2NC	FG 61HD5D0A 2NO 2NC
61M	FG 61MD1D0A 3NO 1NC	FG 61MD1E0A 3NO 1NC	FG 61MD5D0A 3NO 1NC
61R	FG 61RD1D0A 3NC+1NO	FG 61RD1E0A 3NC+1NO	FG 61RD5D0A 3NC+1NO
61S	FG 61SD1D0A 1NC+3NO	FG 61SD1E0A 1NC+3NO	FG 61SD5D0A 1NC+3NO
Actuating force	30 N (60 N)	30 N (60 N)	30 N (60 N)
Travel diagrams	page 99 - group 1	page 99 - group 1	page 99 - group 1

Legend: With positive opening according to EN 60947-5-1, interlock with lock monitoring acc. to EN ISO 14119



Contact type: L = slow action	Operating principle D, with key release, emergency release button, without actuator		Operating principle D, with emergency release button, without actuator		Operating principle E, with emergency release button, without actuator	
Contact block						
60A	FG 60AD6D0A	1NO+1NC 1NO+1NC	FG 60AD7D0A	1NO+1NC 1NO+1NC	FG 60AD7E0A	1NO+1NC 1NO+1NC
60B	FG 60BD6D0A	2NC 1NO+1NC	FG 60BD7D0A	2NC 1NO+1NC	FG 60BD7E0A	2NC 1NO+1NC
60C	FG 60CD6D0A	3NC 1NC	FG 60CD7D0A	3NC 1NC	FG 60CD7E0A	3NC 1NC
60D	FG 60DD6D0A	1NO+1NC 2NC	FG 60DD7D0A	1NO+1NC 2NC	FG 60DD7E0A	1NO+1NC 2NC
60E	FG 60ED6D0A	1NO+2NC 1NC	FG 60ED7D0A	1NO+2NC 1NC	FG 60ED7E0A	1NO+2NC 1NC
60F	FG 60FD6D0A	1NO+2NC 1NO	FG 60FD7D0A	1NO+2NC 1NO	FG 60FD7E0A	1NO+2NC 1NO
60G	FG 60GD6D0A	2NC 2NC	FG 60GD7D0A	2NC 2NC	FG 60GD7E0A	2NC 2NC
60H	FG 60HD6D0A	4NC /	FG 60HD7D0A	4NC /	FG 60HD7E0A	4NC /
60I	FG 60ID6D0A	3NC 1NO	FG 60ID7D0A	3NC 1NO	FG 60ID7E0A	3NC 1NO
60L	FG 60LD6D0A	2NO+1NC 1NC	FG 60LD7D0A	2NO+1NC 1NC	FG 60LD7E0A	2NO+1NC 1NC
60M	FG 60MD6D0A	2NO+1NC 1NO	FG 60MD7D0A	2NO+1NC 1NO	FG 60MD7E0A	2NO+1NC 1NO
60N	FG 60ND6D0A	1NO+1NC 2NO	FG 60ND7D0A	1NO+1NC 2NO	FG 60ND7E0A	1NO+1NC 2NO
60P	FG 60PD6D0A	1NC 3NC	FG 60PD7D0A	1NC 3NC	FG 60PD7E0A	1NC 3NC
60R	FG 60RD6D0A	2NO+2NC /	FG 60RD7D0A	2NO+2NC /	FG 60RD7E0A	2NO+2NC /
60S	FG 60SD6D0A	1NC 2NO+1NC	FG 60SD7D0A	1NC 2NO+1NC	FG 60SD7E0A	1NC 2NO+1NC
60T	FG 60TD6D0A	1NC 1NO+2NC	FG 60TD7D0A	1NC 1NO+2NC	FG 60TD7E0A	1NC 1NO+2NC
60V	FG 60VD6D0A	2NC 2NO	FG 60VD7D0A	2NC 2NO	FG 60VD7E0A	2NC 2NO
60X	FG 60XD6D0A	1NO 3NC	FG 60XD7D0A	1NO 3NC	FG 60XD7E0A	1NO 3NC
60Y	FG 60YD6D0A	1NO 1NO+2NC	FG 60YD7D0A	1NO 1NO+2NC	FG 60YD7E0A	1NO 1NO+2NC
61D	FG 61DD6D0A	1NC 3NO	FG 61DD7D0A	1NC 3NO	FG 61DD7E0A	1NC 3NO
61E	FG 61ED6D0A	1NO 1NC+2NO	FG 61ED7D0A	1NO 1NC+2NO	FG 61ED7E0A	1NO 1NC+2NO
61G	FG 61GD6D0A	2NO 1NC+1NO	FG 61GD7D0A	2NO 1NC+1NO	FG 61GD7E0A	2NO 1NC+1NO
61H	FG 61HD6D0A	2NO 2NC	FG 61HD7D0A	2NO 2NC	FG 61HD7E0A	2NO 2NC
61M	FG 61MD6D0A	3NO 1NC	FG 61MD7D0A	3NO 1NC	FG 61MD7E0A	3NO 1NC
61R	FG 61RD6D0A	3NC+1NO	FG 61RD7D0A	3NC+1NO	FG 61RD7E0A	3NC+1NO
61S	FG 61SD6D0A	1NC+3NO	FG 61SD7D0A	1NC+3NO	FG 61SD7E0A	1NC+3NO
Actuating force	30 N (60 N		30 N (60 N		30 N (60 N	
Travel diagrams	page 99 - group 1		page 99 - group 1		page 99 - group 1	

Travel diagrams table

All values in the drawings are in mm

60A 2NO+2NC		60M 3NO+1NC		61A 1NO+3NC	
60B 1NO+3NC		60N 3NO+1NC		61B 2NO+2NC	
60C 4NC		60P 4NC		61C 3NO+1NC	
60D 1NO+3NC		60R 2NO+2NC		61D 3NO+1NC	
60E 1NO+3NC		60S 2NO+2NC		61E 3NO+1NC	
60F 2NO+2NC		60T 1NO+3NC		61G 3NO+1NC	
60G 4NC		60U 4NC		61H 2NO+2NC	
60H 4NC		60V 2NO+2NC		61M 3NO+1NC	
60I 1NO+3NC		60X 1NO+3NC		61R 1NO+3NC	
60L 2NO+2NC		60Y 2NO+2NC		61S 3NO+1NC	

Legend:

- Closed contact
- Open contact
- Contacts activated by the actuator
- Contacts activated by the solenoid
- Positive opening travel

Stainless steel actuators

All values in the drawings are in mm

IMPORTANT: These actuators can be used only with items of the FG series (e.g. FG 60AD1D0A).
Low level of coding acc. to EN ISO 14119.

Article	Description
VF KEYF20	Straight actuator

Article	Description
VF KEYF21	Angled actuator

Article	Description
VF KEYF22	Actuator with rubber pads

Items with code on green background are stock items

Accessories See page 299

→ The 2D and 3D files are available at www.pizzato.com



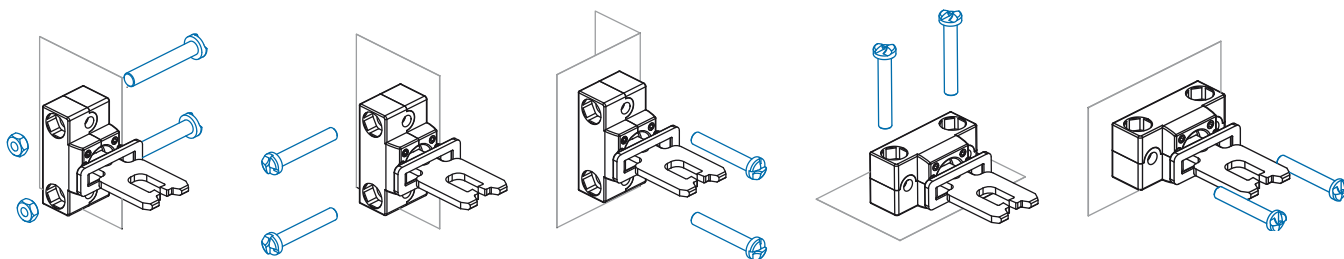
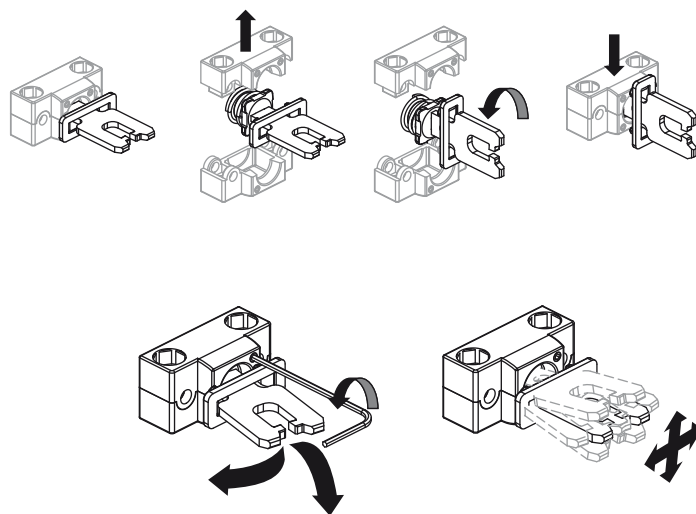
Universal actuator VF KEYF28

All values in the drawings are in mm

IMPORTANT: These actuators can be used only with items of the FG series (e.g. FG 60AD1D0A).
Low level of coding acc. to EN ISO 14119.

Article	Description
VF KEYF28	Universal actuator

Actuator adjustable in two dimensions for small doors; can be mounted in various positions.
The fixing block has two pairs of bore holes; it is provided for rotating the working plane of the actuator by 90°.



Accessories for sealing



Pliers, wire and lead seals are needed for applications in which it is required that the manual release devices be sealed (versions D1D and D7D only).

Article	Description
VF FSPB-200	Pack of 200 lead seals
VF FSPB-10	Pack of 10 lead seals
Article	Description
VF FSFI-400	400 metre wire roll
VF FSFI-10	10 metre wire roll
Article	Description
VF FSPZ	Pliers without logo



Limits of use

Do not use where dust and dirt may penetrate in any way into the head and deposit there. Especially not where powder, shavings, concrete or chemicals are sprayed. Adhere to the EN ISO 14119 requirements regarding low level of coding for interlocks. Do not use in environments with presence of explosive or flammable gas. In these case use ATEX products (see dedicated Pizzato catalogue).

Accessories

Article	Description
VF KB2	Actuator entry locking device Padlockable device for locking the actuator entry (patented) to prevent the accidental closing of the door behind operators while they are in the danger area. To be used only with FG series switches (e.g. FG 60AD1D0A). Hole diameter for padlocks: 9 mm.

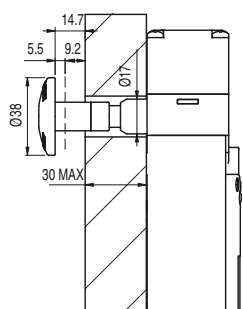
Article	Description
VF KLA371	Set of two locking keys Extra copy of the locking keys to be purchased if further keys are needed (standard supply: 2 units). The keys of all switches have the same code. Other codes on request.

Items with code on **green** background are stock items

Accessories See page 299

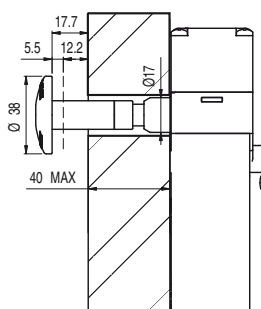
→ The 2D and 3D files are available at www.pizzato.com

Other release button lengths



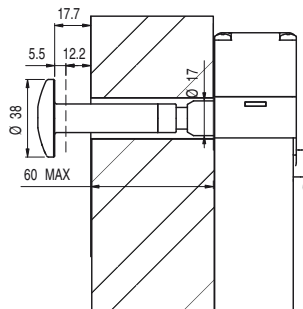
-LP30

For wall thickness
15 ... 30 mm



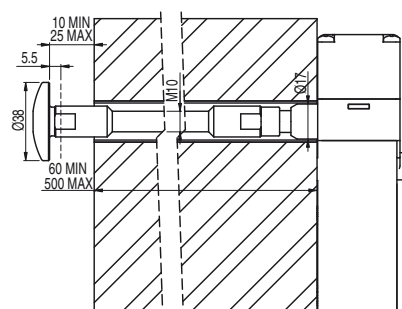
-LP40

For wall thickness
30 ... 40 mm



-LP60

For wall thickness
40 ... 60 mm



-LPRG

For wall thickness
60 ... 500 mm

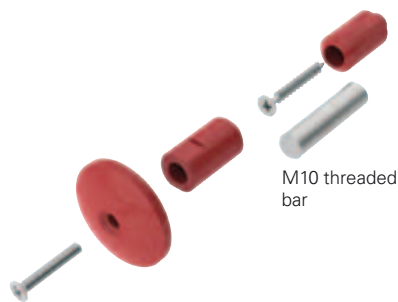
- Avoid bending and twisting the release button.
- To guarantee correct device operation, keep a distance of 10 ... 25 mm between the wall and the release button.
- The actuation path of the release button must always be kept clean. Dirt or chemical products could compromise the device operation.
- Periodically check the device for proper function.

- Avoid bending and twisting the release button.
- On the inside of the wall, use a bushing or a tube with an inner diameter of 18 ± 0.5 mm as a guide.
- Guide in the M10 threaded rod in such a way so as to prevent bending. The M10 threaded rod is not supplied with the device.
- Use medium-strength thread locker to secure the threaded rod.
- Do not exceed an overall length of 500 mm between the release button and the switch.
- To guarantee correct device operation, keep a distance of 10 ... 25 mm between the wall and the release button.
- The actuation path of the release button must always be kept clean. Dirt or chemical products could compromise the device operation.
- Periodically check the device for proper function.

Release button



Article	Description
VF FG-LP15	Technopolymer release button for max. 15 mm wall thickness, supplied with screw
VF FG-LP30	Technopolymer release button for max. 30 mm wall thickness, supplied with screw
VF FG-LP40	Technopolymer release button for max. 40 mm wall thickness, supplied with screw
VF FG-LP60	Metal release button for max. 60 mm wall thickness, supplied with screw



M10 threaded bar

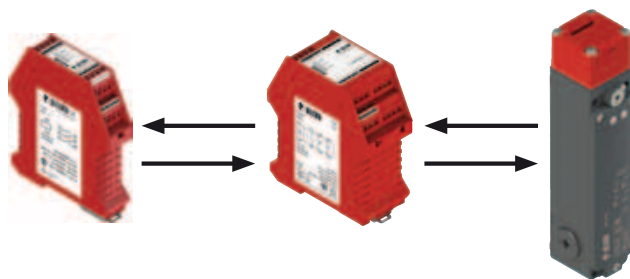
Article	Description
VF FG-LPRG	Metal release button for wall thickness from 60 to 500 mm, supplied with 2 supports and 2 screws, without M10 threaded bar

The M10 bar can be supplied in zinc-plated steel with 1 m length. Article: AC 8512.

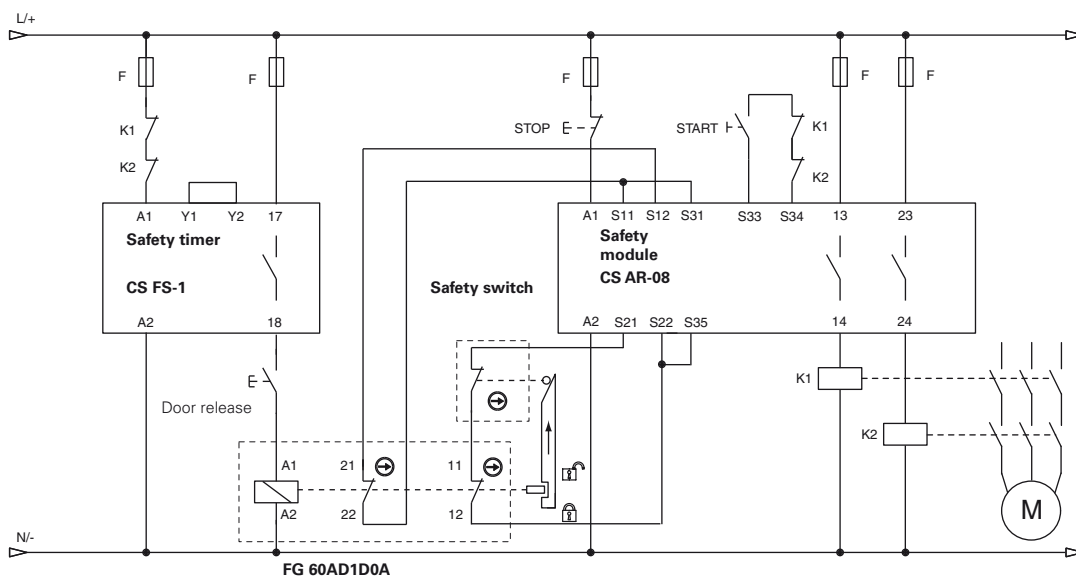
Safety modules

Pizzato Elettrica offers its customers a wide range of safety modules. These were developed taking into consideration typical problems encountered during the monitoring of safety switches under actual operating conditions. Safety modules with instantaneous or delayed contacts for emergency circuits of type 0 (immediate stop) or type 1 (controlled stop).

Safety switches with solenoid of the FG series can be connected to safety modules for the realization of safety circuits up to PL e acc. to EN ISO 13849. For technical information or wiring diagrams, please contact our technical office.



Application example with safety timer



Application example with safety module for standstill monitoring

