

## Description

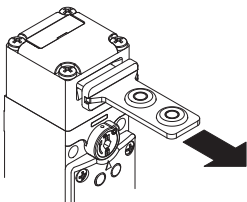


These switches are used on machines where the hazardous conditions remain for a while, even after the machines have been switched off, for example because of mechanical inertia of pulleys, saw disks, parts under pressure or with high temperatures. Thus, the switches can also be used if individual guards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

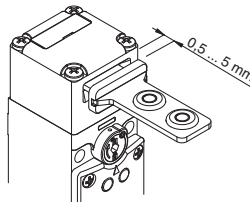


### Holding force of the locked actuator



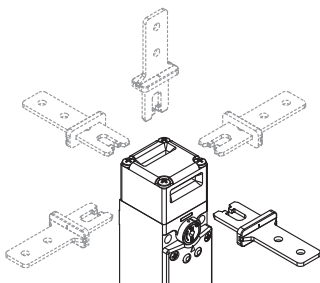
The strong interlocking system guarantees a maximum actuator holding force of  $F_{1max} = 2800 \text{ N}$ .

### 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 steps of 90°. The device can thus assume 32 different configurations.

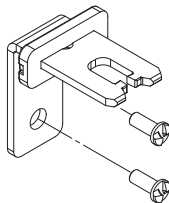
### Contact blocks with 4 contacts



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.

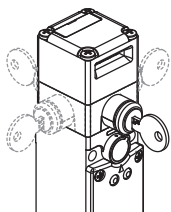
High-reliability electrical contacts with 4 contact points and double interruption

### Safety screws for actuators



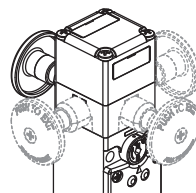
As required by EN ISO 14119, the actuator must be fixed immovably to the guard frame. Pan head safety screws with one-way fitting are available for this purpose. With this screw type, the actuators cannot be removed or tampered by using common tools. See accessories on page 332.

### Turnable key release with lock



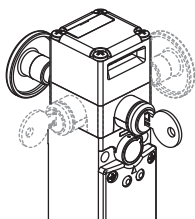
The auxiliary key release device is used to allow the maintenance or the entry into the machinery to authorized personnel only. Turning the key corresponds to actuating the solenoid: the actuator is released. The device can be turned, thereby enabling installation of the safety switch in the machine while the release device remains accessible on the outside of the guard.

### Escape release button



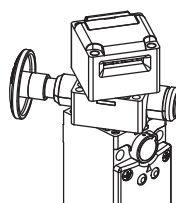
This device is used to safeguard a hazardous area that an operator may enter with his entire body. The release button, which is oriented towards the inside of the danger zone, allows the operator to escape even in the event of a power failure. Pushing the button results in the same function as the auxiliary release device. To reset the switch, simply return the button to its initial position. The escape release 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 escape release button



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

### 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

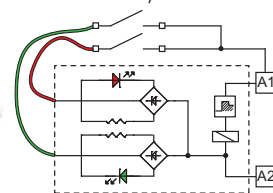


In the version with LED display unit of type A, two green LEDs are switched-on directly by the power supply of the solenoid. Wiring is not necessary.

### 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.



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

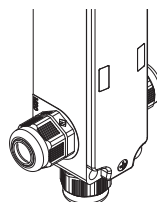
### Protection degree IP67

**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



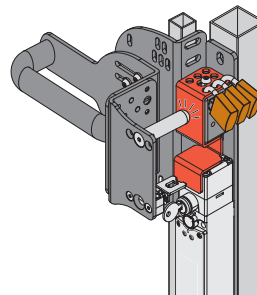
Switches with locked actuator with deactivated solenoid (function principle D) are equipped with an auxiliary release device for the solenoid to simplify installation of the switch and to facilitate entry into the danger zone in the event of a power failure. The auxiliary release device acts on the switch 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



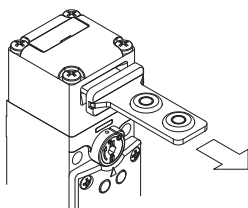
All FG series switches are permanently marked with a special laser system. As a result, the marking remains legible even under extreme operating conditions. Thanks to this system that does not use labels, the loss of plate data is prevented and a greater resistance of the marking is achieved over time.

### 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 locking VF KB2 (page 118) or a safety handle, such as a P-KUBE 1 (page 159).

### 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 guards are unlocked simultaneously, but only one is actually opened. The device keeps all the unlocked guards in their position with a retaining force of approx. 30 N, stopping any vibrations or gusts of wind from opening them.

### LED signalling lights

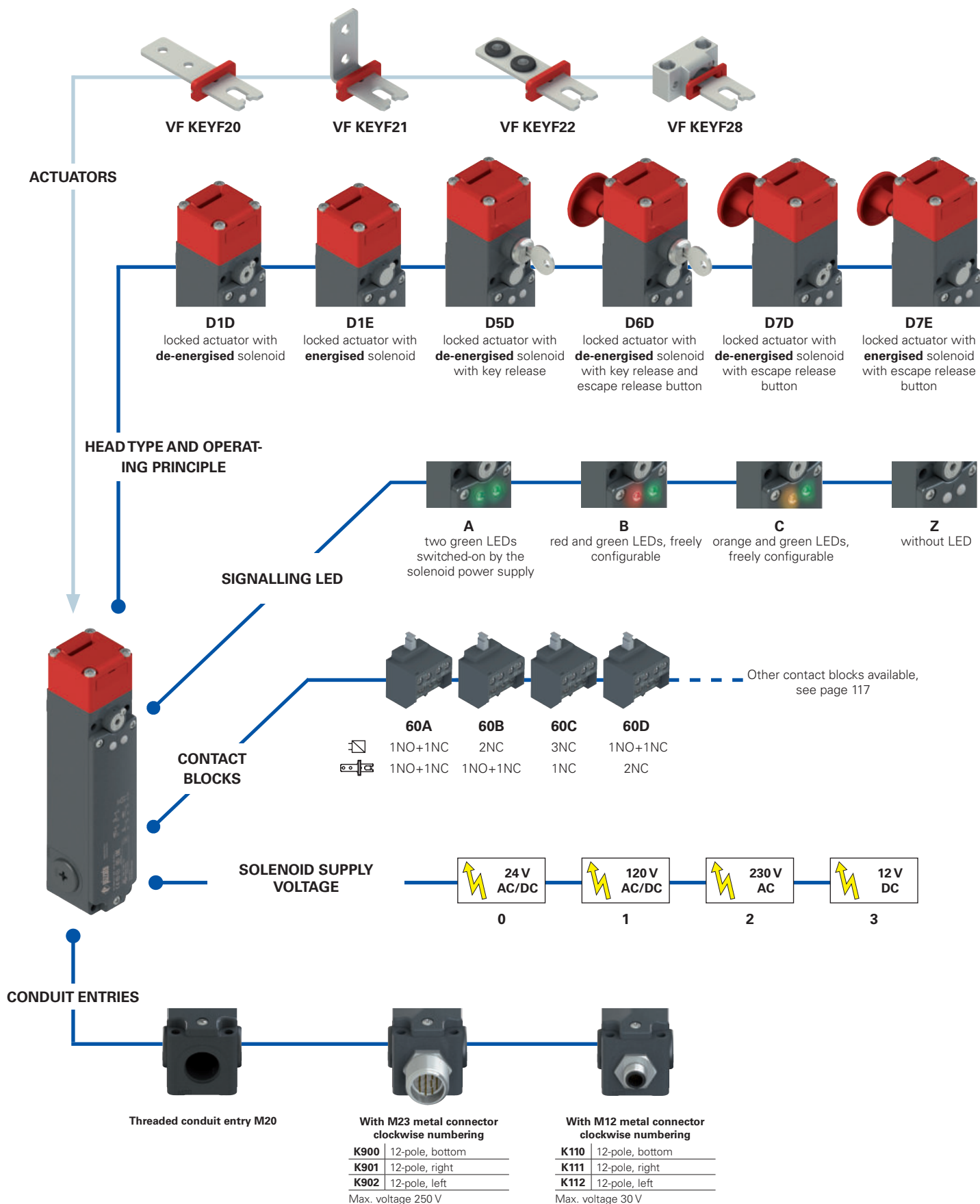


Thanks to the three threaded cable entries, the high luminosity LED signalling lights of the VF SL series can be installed on the switch.

The LED signalling lights can be easily installed by screwing them on one of the conduit entries not used for electric cables. They can be used for many different purposes: for example, to signal, from a distance, whether the switch has been actuated; whether the guard has closed correctly; or whether the guard is locked or unlocked.

For more information see chapter Accessories, page 321.

Selection diagram



● product option  
 → sold separately as accessory



## 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-LP30F20GK900T6V34

Contact blocks		
	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	/	1NO+3NC
61B	/	2NO+2NC
61C	/	3NO+1NC
61D	1NC	3NO
61E	1NO	2NO+1NC
61G	2NO	1NO+1NC
61H	2NO	2NC
61M	3NO	1NC
61R	1NO+3NC	/
61S	3NO+1NC	/

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 escape release button
D7D	locked actuator with de-energised solenoid. With escape release button
D7E	locked actuator with energised solenoid. With escape release button

## Removing the release key

The key can be removed in locked and unlocked actuator position (standard)

**V34** The key can be removed only in the locked position of the actuator

## Ambient temperature

-25°C ... +60°C (standard)

**T6** -40°C ... +60°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

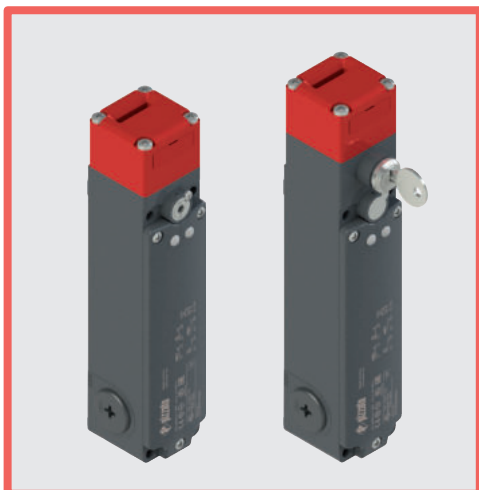
**A** two green LEDs switched-on by the solenoid power supply

**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 escape 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:	CA02.03808
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

SIL (SIL CL) up to:	SIL 3 acc. to EN 62061
Performance Level (PL) up to:	PL e acc. to EN ISO 13849-1
Interlock with mechanical lock, coded:	type 2 acc. to EN ISO 14119
Coding level:	low acc. to EN ISO 14119
Safety parameters:	
$B_{100}$ :	5,000,000 for NC contacts
Mission time:	20 years
Ambient temperature:	-25°C ... +60°C (standard) -40°C ... +60°C (T6 option)
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 339
Wire cross-sections and wire stripping lengths:	see page 357

#### 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

#### In compliance with standards:

IEC 60947-5-1, IEC 60947-1, IEC 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, IEC 61000-6-2, IEC 61000-6-3, EN 50581, BG-GS-ET-15, UL 508, CSA 22.2 N. 14.

#### Approvals:

EN 60947-5-1, UL 508, CSA 22.2 N. 14, GB/T14048.5-2017.

#### Compliance with the requirements of:

Machinery Directive 2006/42/EC, EMC Directive 2014/30/EU, RoHS Directive 2011/65/EU.

#### Positive contact opening in conformity with standards:

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

**⚠ If not expressly indicated in this chapter, for correct installation and utilization of all articles see the instructions given on pages 337 to 350.**

### Electrical data

### Utilization category

	Thermal current ( $I_{th}$ ):	Rated insulation voltage ( $U$ ):	Rated impulse withstand voltage ( $U_{imp}$ ):	Conditional short circuit current:	Protection against short circuits:	Pollution degree:	Utilization category
without connector	10 A	400 Vac 300 Vdc	6 kV	1000 A acc. to EN 60947-5-1	type gG fuse 10 A 500 V	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	8 A	250 Vac 300 Vdc			type gG fuse 8 A 500 V	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	1.5 A	30 Vac 36 Vdc			type gG fuse 1.5 A	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<sub>i</sub>): 400 Vac  
 Conventional free air thermal current (I<sub>m</sub>): 10 A  
 Protection against short circuits: type gG fuse 10 A 500 V  
 Rated impulse withstand voltage (U<sub>imp</sub>): 6 kV  
 Protection degree of the housing: IP67  
 MV terminals (screw terminals)  
 Pollution degree: 3  
 Utilization category: AC15  
 Operating voltage (U<sub>e</sub>): 400 Vac (50 Hz)  
 Operating current (I<sub>e</sub>): 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, 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



Electrical Ratings: A300 pilot duty (720 VA, 120-300 Vac)  
 Q300 pilot duty (69 VA, 125-250 Vdc)  
 Environmental Ratings: Types 1, 4X, 12, 13

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

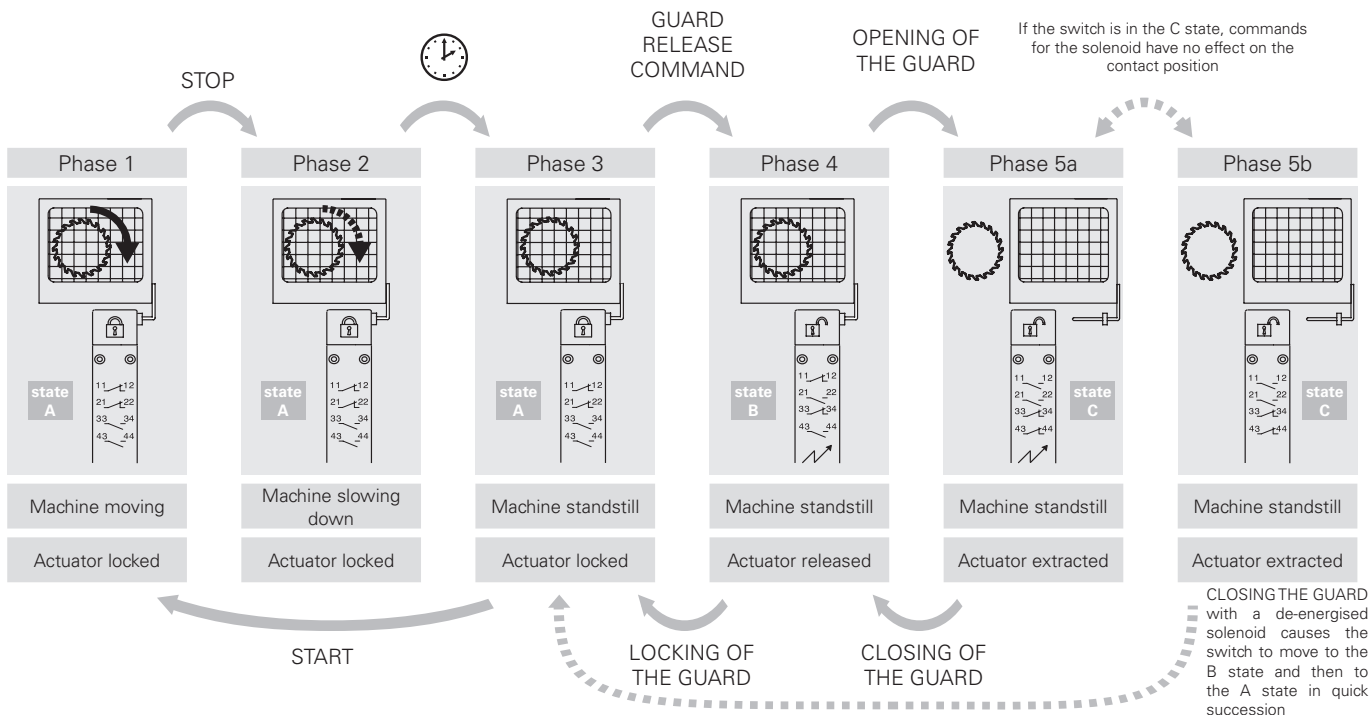
All or some of these states can be monitored by means of electrical NO contacts or NC contacts with positive opening by selecting the appropriate contact blocks. In detail, contact blocks that have electric contacts marked with the symbol of the solenoid (  ) are switched in the transition between the state A and state B, while the electric contacts marked with the symbol of the actuator (  ) are switched between state B and state 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)



## Contact positions related to switch states

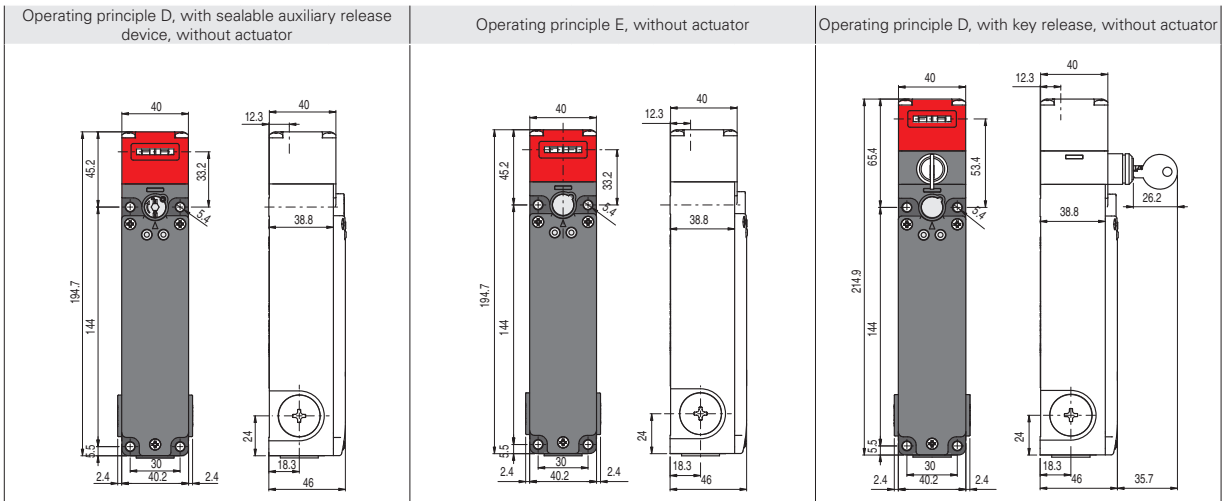
Operating state Actuator Solenoid	Operating principle D locked actuator with de-energised solenoid			Operating principle E locked actuator with energised solenoid		
	state A	state B	state C	state A	state B	state C
	Inserted and locked De-energised	Inserted and released Energised	Extracted -	Inserted and locked Energised	Inserted and released De-energised	Extracted -
<b>FG 60A</b> ..... 1NO+1NC controlled by the solenoid 1NO+1NC controlled by the actuator						
	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	33 / 34	33 / 34	33 / 34	33 / 34	33 / 34	33 / 34
<b>FG 60B</b> ..... 2NC controlled by the solenoid 1NO+1NC controlled by the actuator						
	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32
<b>FG 60C</b> ..... 3NC controlled by the solenoid 1NC controlled by the actuator						
	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32
<b>FG 60D</b> ..... 1NO+1NC controlled by the solenoid 2NC controlled by the actuator						
	13 / 14	13 / 14	13 / 14	13 / 14	13 / 14	13 / 14
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32
<b>FG 60E</b> ..... 1NO+2NC controlled by the solenoid 1NC controlled by the actuator						
	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32
<b>FG 60F</b> ..... 1NO+2NC controlled by the solenoid 1NO controlled by the actuator						
	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	33 / 34	33 / 34	33 / 34	31 / 32	31 / 32	31 / 32
<b>FG 60G</b> ..... 2NC controlled by the solenoid 2NC controlled by the actuator						
	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32
<b>FG 60H</b> ..... 4NC controlled by the solenoid						
	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32
<b>FG 60I</b> ..... 3NC controlled by the solenoid 1NO controlled by the actuator						
	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32
<b>FG 60L</b> ..... 2NO+1NC controlled by the solenoid 1NC controlled by the actuator						
	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	33 / 34	33 / 34	33 / 34	33 / 34	33 / 34	33 / 34
<b>FG 60M</b> ..... 2NO+1NC controlled by the solenoid 1NO controlled by the actuator						
	13 / 14	13 / 14	13 / 14	13 / 14	13 / 14	13 / 14
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	33 / 34	33 / 34	33 / 34	33 / 34	33 / 34	33 / 34
<b>FG 60N</b> ..... 1NO+1NC controlled by the solenoid 2NO controlled by the actuator						
	13 / 14	13 / 14	13 / 14	13 / 14	13 / 14	13 / 14
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	33 / 34	33 / 34	33 / 34	33 / 34	33 / 34	33 / 34
<b>FG 60P</b> ..... 1NC controlled by the solenoid 3NC controlled by the actuator						
	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32	31 / 32
<b>FG 60R</b> ..... 2NO+2NC controlled by the solenoid						
	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	33 / 34	33 / 34	33 / 34	33 / 34	33 / 34	33 / 34
<b>FG 60S</b> ..... 1NC controlled by the solenoid 2NO+1NC controlled by the actuator						
	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12
	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22	21 / 22
	33 / 34	33 / 34	33 / 34	33 / 34	33 / 34	33 / 34



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



Contact type  
 = slow action



Contact blocks

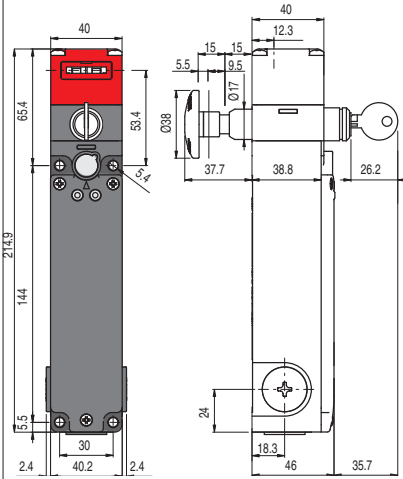
	Operating principle D, with sealable auxiliary release device, without actuator	Operating principle E, without actuator	Operating principle D, with key release, without actuator
60A	FG 60AD1D0A   1NO+1NC 1NO+1NC	FG 60AD1E0A  1NO+1NC 1NO+1NC	FG 60AD5D0A  1NO+1NC 1NO+1NC
60B	FG 60BD1D0A   2NC 1NO+1NC	FG 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   / 1NO+3NC	FG 61AD1E0A  / 1NO+3NC	FG 61AD5D0A  / 1NO+3NC
61B	FG 61BD1D0A   / 2NO+2NC	FG 61BD1E0A  / 2NO+2NC	FG 61BD5D0A  / 2NO+2NC
61C	FG 61CD1D0A   / 3NO+1NC	FG 61CD1E0A  / 3NO+1NC	FG 61CD5D0A  / 3NO+1NC
61D	FG 61DD1D0A   1NC 3NO	FG 61DD1E0A  1NC 3NO	FG 61DD5D0A  1NC 3NO
61E	FG 61ED1D0A   1NO 2NO+1NC	FG 61ED1E0A  1NO 2NO+1NC	FG 61ED5D0A  1NO 2NO+1NC
61G	FG 61GD1D0A   2NO 1NO+1NC	FG 61GD1E0A  2NO 1NO+1NC	FG 61GD5D0A  2NO 1NO+1NC
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   1NO+3NC /	FG 61RD1E0A  1NO+3NC /	FG 61RD5D0A  1NO+3NC /
61S	FG 61SD1D0A   3NO+1NC /	FG 61SD1E0A  3NO+1NC /	FG 61SD5D0A  3NO+1NC /
Actuating force	30 N (60 N )	30 N (60 N )	30 N (60 N )
Travel diagrams	Page 117	Page 117	Page 117

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

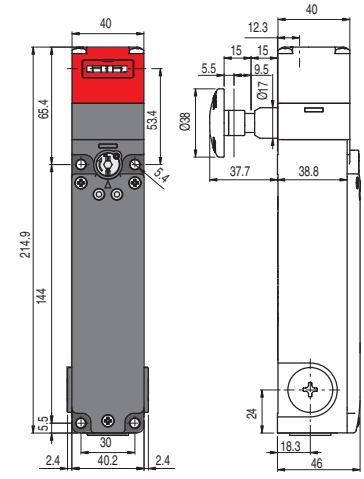


Contact type  
L = slow action

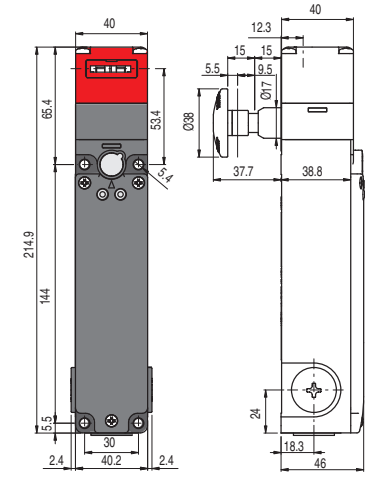
Operating principle D, with key release, escape release button, without actuator



Operating principle D, with escape release button, without actuator



Operating principle E, with escape release button, without actuator



Contact blocks

60A	L	FG 60AD6D0A						1NO+1NC	1NO+1NC		
60B	L	FG 60BD6D0A						2NC	1NO+1NC		
60C	L	FG 60CD6D0A						3NC	1NC		
60D	L	FG 60DD6D0A						1NO+1NC	2NC		
60E	L	FG 60ED6D0A						1NO+2NC	1NC		
60F	L	FG 60FD6D0A						1NO+2NC	1NO		
60G	L	FG 60GD6D0A						2NC	2NC		
60H	L	FG 60HD6D0A						4NC	/		
60I	L	FG 60ID6D0A						3NC	1NO		
60L	L	FG 60LD6D0A						2NO+1NC	1NC		
60M	L	FG 60MD6D0A						2NO+1NC	1NO		
60N	L	FG 60ND6D0A						1NO+1NC	2NO		
60P	L	FG 60PD6D0A						1NC	3NC		
60R	L	FG 60RD6D0A						2NO+2NC	/		
60S	L	FG 60SD6D0A						1NC	2NO+1NC		
60T	L	FG 60TD6D0A						1NC	1NO+2NC		
60V	L	FG 60VD6D0A						2NC	2NO		
60X	L	FG 60XD6D0A						1NO	3NC		
60Y	L	FG 60YD6D0A						1NO	1NO+2NC		
61D	L	FG 61DD6D0A						1NC	3NO		
61E	L	FG 61ED6D0A						1NO	2NO+1NC		
61G	L	FG 61GD6D0A						2NO	1NO+1NC		
61H	L	FG 61HD6D0A						2NO	2NC		
61M	L	FG 61MD6D0A						3NO	1NC		
61R	L	FG 61RD6D0A						1NO+3NC	/		
61S	L	FG 61SD6D0A						3NO+1NC	/		
Actuating force								30 N (60 N			
Travel diagrams								Page 117			

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

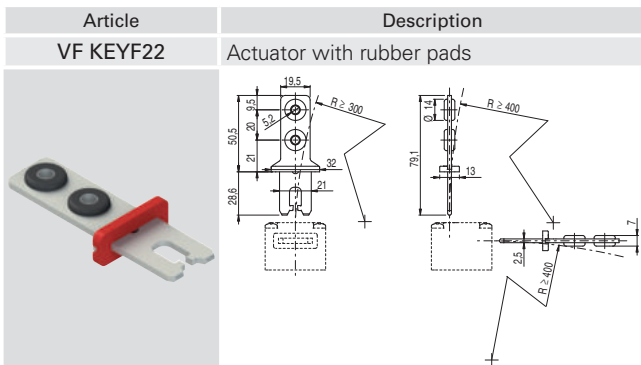
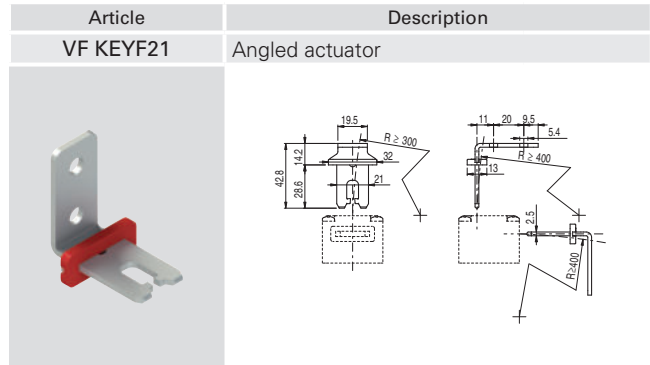
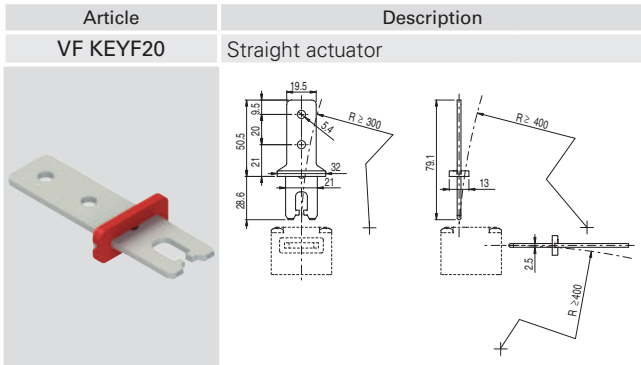
Travel diagrams

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

**Legend:**  
 Closed contact  
 Open contact  
 Contacts activated by the actuator  
 Contacts activated by the solenoid  
 Positive opening travel

Stainless steel actuators

**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.



All values in the drawings are in mm

Accessories See page 321

→ The 2D and 3D files are available at [www.pizzato.com](http://www.pizzato.com)

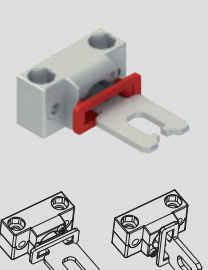
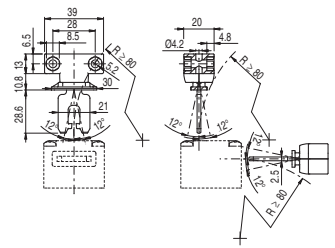


## Universal actuator VF KEYF28

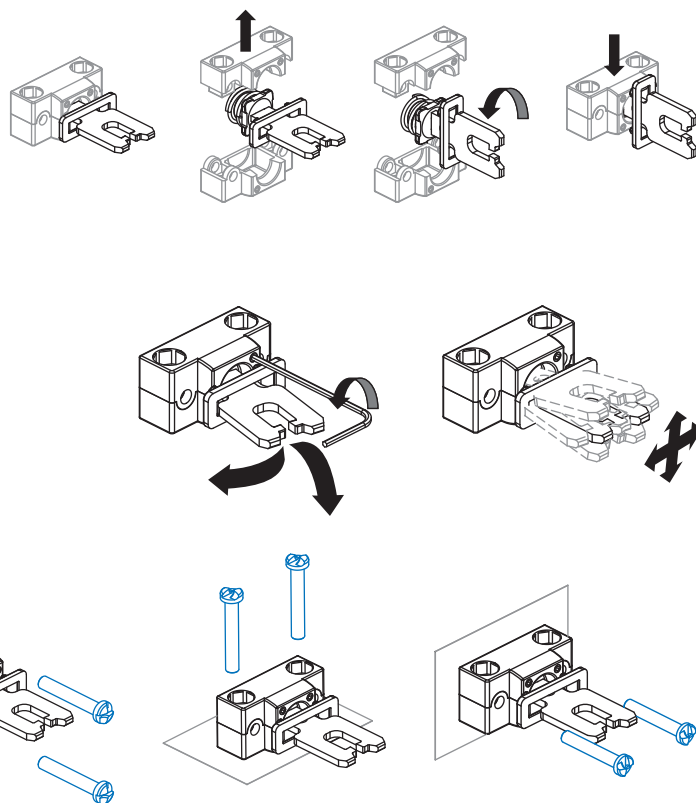
**IMPORTANT:** These actuators can be used only with items of the FG series (e.g. FG 60AD1D0A).

Low level of coding acc. to EN ISO 14119.

Article	Description
VF KEYF28	Universal actuator

Jointed actuator for guards with poor alignment, adjustable in two dimensions for small doors; can be mounted in various positions. The metal fixing body has two pairs of bore holes; it is provided for rotating the working plane of the actuator by 90°.

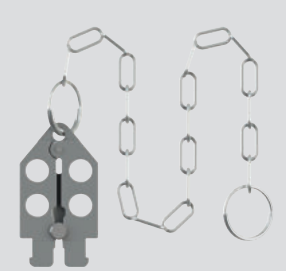


## Limits of use


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

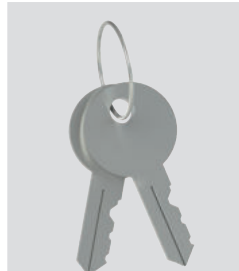
Article	Description
VF KB2	Lock out device



Padlockable lock out device to prevent the actuator entry and 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.

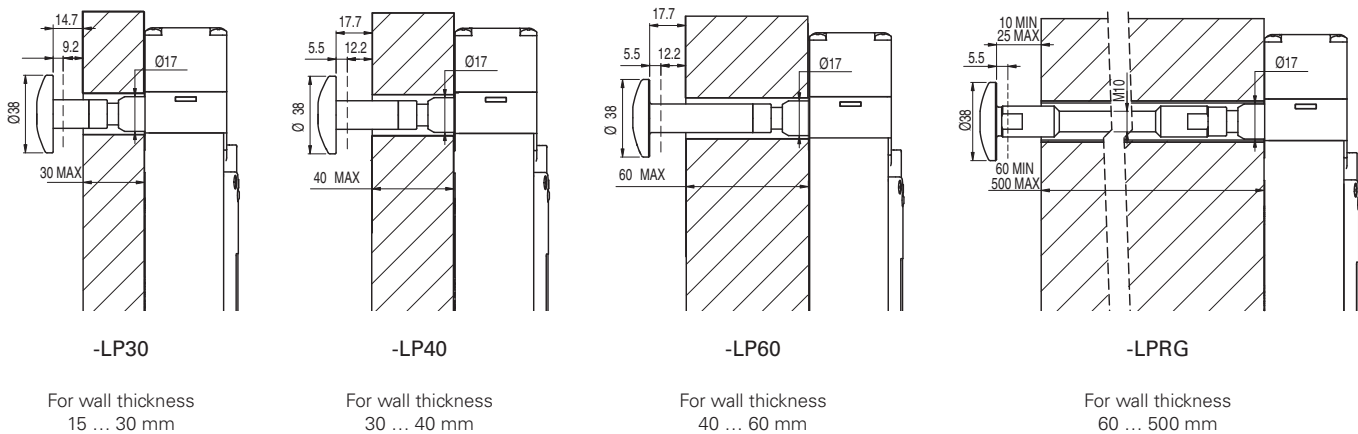


Article	Description
VF KLA371	Set of two locking keys



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.

## Other release button lengths



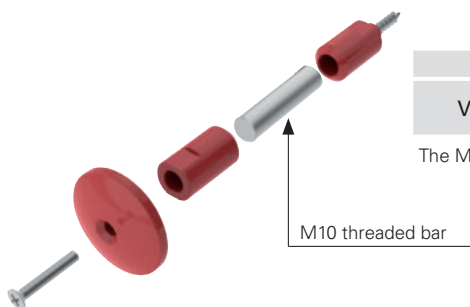
- Avoid bending and twisting the release button.
- To guarantee correct device operation, keep a distance of 10 ... 25 mm between the wall and the release button.
- The actuation path of the release button must always be kept clean. Dirt or chemical products could compromise the device operation.
- Periodically 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  $18 \pm 0.5$  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



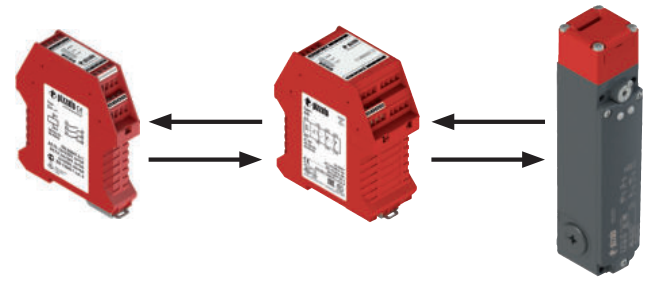
Article	Description
VF FG-LPRG	Metal release button for wall thickness from 60 to 500 mm, supplied with 2 supports and 2 screws, without M10 threaded bar

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



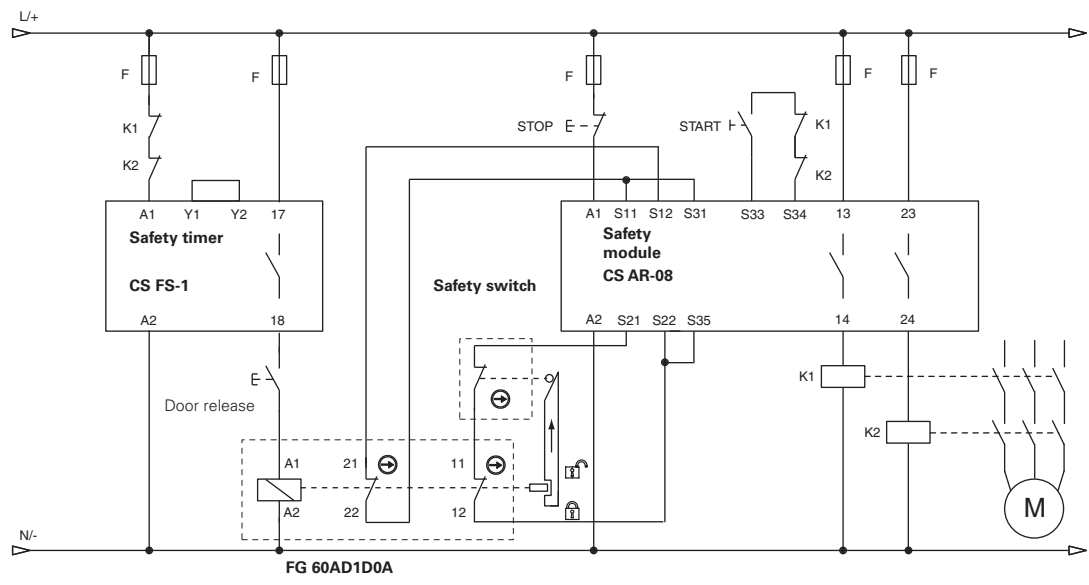
### Safety modules

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).

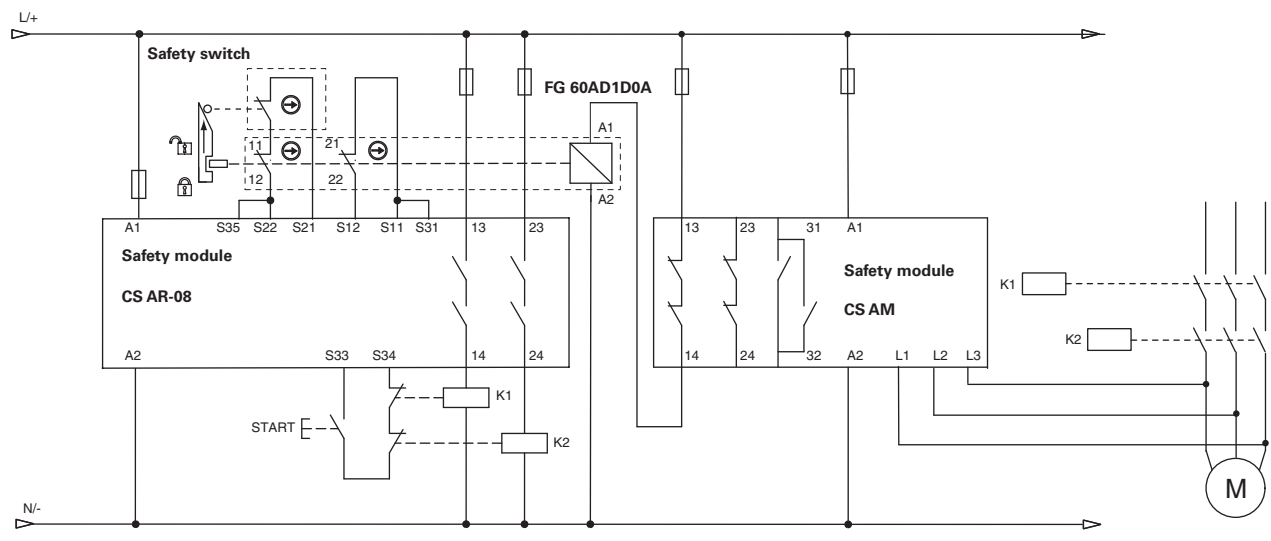


Safety switches with solenoid of the FG series can be connected to safety modules for the realization of safety circuits up to PL e acc. to EN ISO 13849. For technical information or wiring diagrams, please contact our technical office.

### Application example with safety timer



### Application example with safety module for standstill monitoring



NOTE: The NC contacts of K1 and K2 are mechanically guided (EN 60947-4-1, Annex F)