# **FG** series safety switches with separate actuator with lock

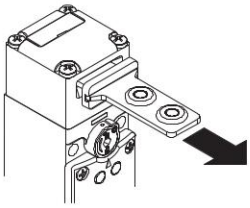
## Description



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.

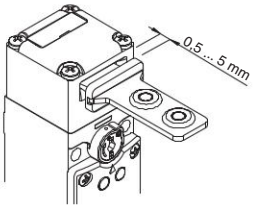


## Holding force of the locked actuator



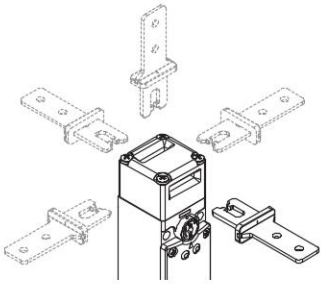
The strong interlocking system guarantees a maximum actuator holding force of $F_{TEST}$ = 3000 N.

## 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



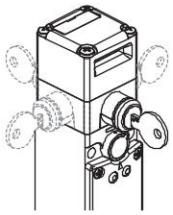
The system can be variably configured by loosening the 4 screws on the head.
The key release device and the release button can also be rotated and secured independently of one another in steps of 90°. The device can thus assume 32 different configurations.

## Contact blocks with 4 contacts



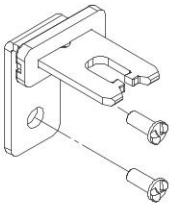
Innovative contact block with 4 contacts, available in various contact configurations for monitoring the actuator or the solenoid (patented). The unit is supplied with captive screws and self-lifting clamping plates. Removable finger protection for eyelet terminal.
High-reliability electrical contacts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

## Turnable key release with lock



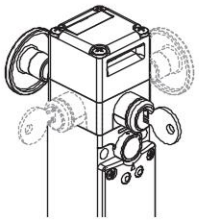
The auxiliary key release device is used to allow the maintenance or the entry into the machinery to authorized personnel only. Turning the key corresponds to actuating the solenoid: the actuator is released. The device can be turned, thereby enabling installation of the safety switch in the machine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

## Safety screws for actuators



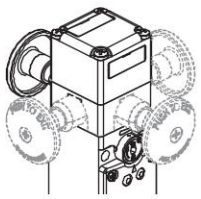
As required by EN ISO 14119, the actuator must be fixed immovably to the guard frame. Pan head safety screws with one-way fitting are available for this purpose. With this screw type, the actuators cannot be removed or tampered by using common tools. See accessories on page 357.

## 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.

## Escape release button



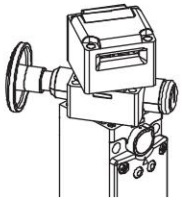
This device is used to safeguard a hazardous area that an operator may enter with his entire body. The release button, which is oriented towards the inside of the danger zone, allows the operator to escape even in the event of a power failure. Pushing the button results in the same function as the auxiliary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



The auxiliary key release is also available with option V73, a variant with triangular key acc. to DIN 22417. This option can be used with installations in which the auxiliary release is to be actuated with a triangular key that is not normally available.
On request, option V70 is also available, with which the auxiliary release returns to the initial position with the aid of a spring.

## 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

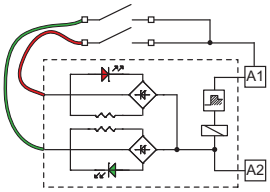


In the version with LED display unit of type A, two green LEDs are switched-on directly by the power supply of the solenoid. Wiring is not necessary.

## 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

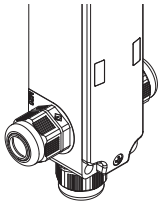
**IP67** These devices are designed to be used under the toughest environmental conditions, and they pass the IP67 immersion test acc. to EN 60529. They can therefore be used in all environments where the maximum degree of protection is required for the housing.

## 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 +60°C.

They can therefore be used for applications in cold stores, sterilisers, and other equipment operated in very 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.

## 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.

## 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.

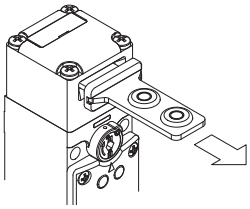
## Access monitoring

P-KUBE 1 P-KUBE Fast P-KUBE Lite



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. the padlockable device for actuator entry locking VF KB2 (page 135) or a safety handle, such as P-KUBE 1 (page 229), P-KUBE Fast (page 241) or P-KUBE Lite (page 245).

## 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 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 357.

## Selection diagram

**SAFETY HANDLES**



**P-KUBE 1**
See page 229

**P-KUBE Fast**
See page 241

**P-KUBE Lite**
See page 245

**ACTUATORS**

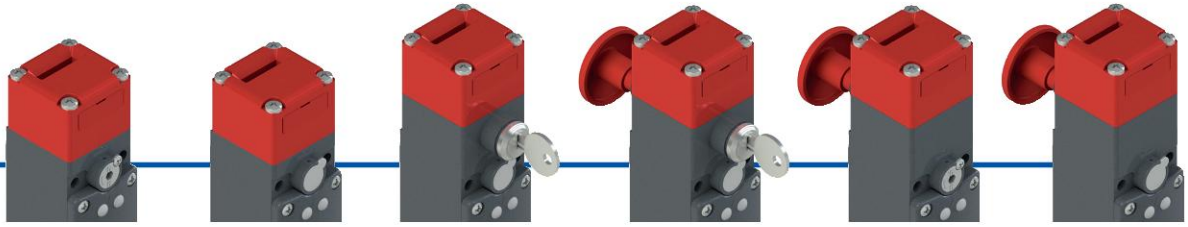


**VF KEYF20**

**VF KEYF21**

**VF KEYF22**

**VF KEYF28**



**D1D**
locked actuator with **de-energised** solenoid with sealable auxiliary release device

**D1E**
locked actuator with **energised** solenoid

**D5D**
locked actuator with **de-energised** solenoid with auxiliary key release

**D6D**
locked actuator with **de-energised** solenoid with auxiliary key release and escape release button

**D7D**
locked actuator with **de-energised** solenoid with sealable auxiliary release device and escape release button

**D7E**
locked actuator with **energised** solenoid with escape release button

**HEAD TYPE AND OPERATING PRINCIPLE**



**SIGNALLING LEDS**



**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

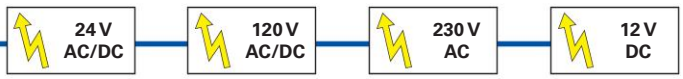
**CONTACT BLOCKS**



For other available contact blocks, see page 129

| | 60A | 60B | 60C | 60D |
|---|---|---|---|---|
| | 1NO+1NC | 2NC | 3NC | 1NO+1NC |
| | 1NO+1NC | 1NO+1NC | 1NC | 2NC |

**SOLENOID SUPPLY VOLTAGE**



| 24 V AC/DC | 120 V AC/DC | 230 V AC | 12 V DC |
|---|---|---|---|
| 0 | 1 | 2 | 3 |

**CONDUIT ENTRIES**



**Threaded conduit entry M20**

**With M23 metal connector clockwise numbering**

| | |
|---|---|
| **K900** | 12-pole, bottom |
| **K901** | 12-pole, right |
| **K902** | 12-pole, left |

**With M12 metal connector clockwise numbering**

| | |
|---|---|
| **K110** | 12-pole, bottom |
| **K111** | 12-pole, right |
| **K112** | 12-pole, left |

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: **FG 60AD1D0A** — options: **-LP30F20GK900T6V34**

### 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** | / | 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. With sealable auxiliary release device. |
| **D1E** | locked actuator with energised solenoid |
| **D5D** | locked actuator with de-energised solenoid. With auxiliary key release. |
| **D6D** | locked actuator with de-energised solenoid. With auxiliary key release and escape release button. |
| **D7D** | locked actuator with de-energised solenoid. With sealable auxiliary release device and escape release button. |
| **D7E** | locked actuator with energised solenoid. With escape release button |

### 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%) |

### 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 |

### 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 |

### 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 |

### Contact type

| | |
|---|---|
| | silver contacts (standard) |
| **G** | silver contacts with 1 µm gold coating |

### 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.

### Ambient temperature

| | |
|---|---|
| | -25°C … +60°C (standard) |
| **T6** | -40°C … +60°C |

### Auxiliary release options
(for articles FG •••D5D••, FG •••D6D•• only)

| | |
|---|---|
| | 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 |
| **V70** | Key release with triangular key with spring return |
| **V73** | Key release with triangular key, no spring return |

# FG series safety switches with separate actuator with lock



**Main features**

- Actuator holding force $F_{TEST}$: 3000 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 LEDs
- Operation with energised or de-energised solenoid

**Quality marks:**

| | |
|---|---|
| IMQ approval: | CA02.03808 |
| UL approval: | E131787 |
| CCC approval: | 2024010305656751 |
| EAC approval: | RU Д-IT.PA07.B.37848/24 |

## 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**

| | |
|---|---|
| "Maximum SIL" up to: | SIL 3 acc. to EN IEC 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: | |
| $B_{10D}$: | 5,000,000 for NC contacts |
| Mission time: | 20 years |
| Ambient temperature: | -25°C … +60°C (standard)<br>-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 $F_{TEST}$: | 3000 N acc. to EN ISO 14119 |
| Max. holding force $F_{ZH}$: | 2300 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 387 |
| Wire cross-sections and wire stripping lengths: | see page 410 |

**Solenoid**

| | |
|---|---|
| Duty cycle: | 100% ED (continuous operation) |
| 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 IEC 63000, BG-GS-ET-15, BG-GS-ET-19, UL 508, CSA C22.2 No. 14.

**Approvals:**
EN 60947-5-1, UL 508, CSA C22.2 No. 14, GB/T14048.5

**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 chapter Utilization requirements from page 385 to page 400.**

| | Electrical data | | Utilization category |
|---|---|---|---|
| without connector | Thermal current ($I_{th}$): | 10 A | Alternating current: AC15 (50÷60 Hz)<br>$U_e$ (V) 120 250 400<br>$I_e$ (A) 6 5 3<br>Direct current: DC13<br>$U_e$ (V) 24 125 250<br>$I_e$ (A) 3 0.7 0.4 |
| | 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 | |
| with M23 connector, 12-pole | Thermal current ($I_{th}$): | 8 A | Alternating current: AC15 (50÷60 Hz)<br>$U_e$ (V) 120 250<br>$I_e$ (A) 6 5<br>Direct current: DC13<br>$U_e$ (V) 24 125 250<br>$I_e$ (A) 3 0.7 0.4 |
| | Rated insulation voltage ($U_i$): | 250 Vac 300 Vdc | |
| | Protection against short circuits: | type gG fuse 8 A 500 V | |
| | Pollution degree: | 3 | |
| with M12 connector, 12-pole | Thermal current ($I_{th}$): | 1.5 A | Alternating current: AC15 (50÷60 Hz)<br>$U_e$ (V) 24<br>$I_e$ (A) 1.5<br>Direct current: DC13<br>$U_e$ (V) 24<br>$I_e$ (A) 1.5 |
| | Rated insulation voltage ($U_i$): | 30 Vac 36 Vdc | |
| | Protection against short circuits: | type gG fuse 1.5 A | |
| | Pollution degree: | 3 | |

## Features approved by IMQ

Rated insulation voltage ($U_i$): 400 Vac
Conventional free air thermal current ($I_{th}$): 10 A
Rated impulse withstand voltage ($U_{imp}$): 6 kV
Protection degree of the housing: IP67
MV terminals (screw terminals)
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, 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

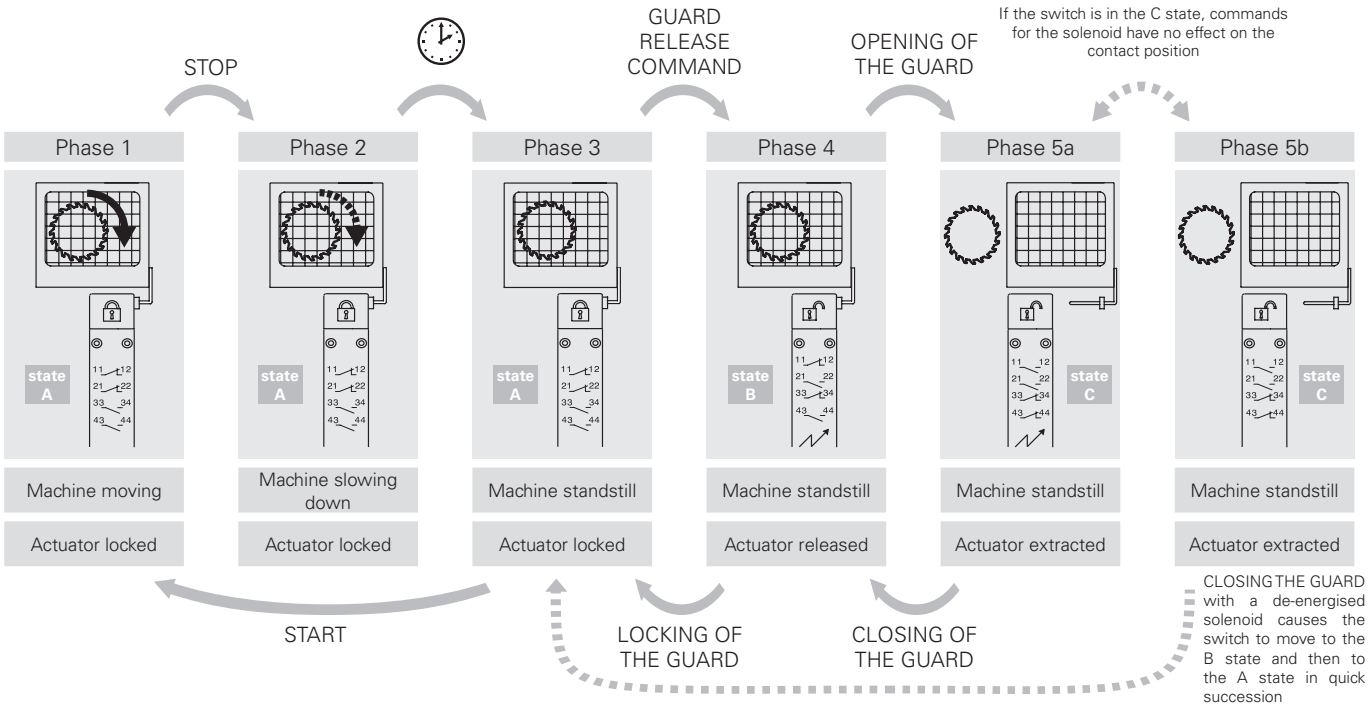
The operating principle of these safety switches allows three different operating states:
state A: with inserted and locked actuator
state B: with inserted but not locked actuator
state C: with extracted actuator
All or some of these states can be monitored by means of electrical NO contacts or NC contacts 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:

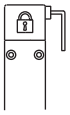
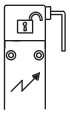
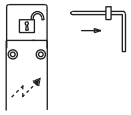
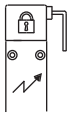
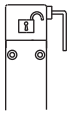
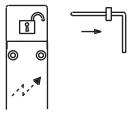
- **Operating principle D**: locked actuator with de-energised solenoid. The actuator is released by energising the solenoid (see example of the operating phases).
- **Operating principle E**: locked actuator with energised solenoid. The actuator is released by switching off the power supply to the solenoid. 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.

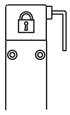
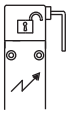
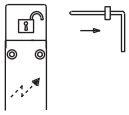
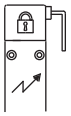
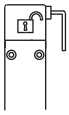
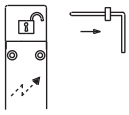
## Example: operating phases with FG 60AD1D0A-F21 (switch with operating principle D)



# FG series safety switches with separate actuator with lock

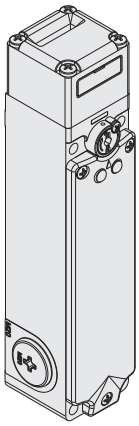
## Contact positions related to switch states

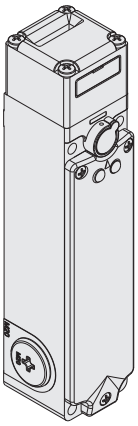
| Operating state | Operating principle D<br>locked actuator with de-energised solenoid | | | Operating principle E<br>locked actuator with energised solenoid | | |
|---|---|---|---|---|---|---|
| | state A | state B | state C | state A | state B | state C |
| Actuator | Inserted and locked | Inserted and released | Extracted | Inserted and locked | Inserted and released | Extracted |
| Solenoid | De-energised | Energised | - | Energised | De-energised | - |
| |  |  |  |  |  |  |
| **FG 60A•••••**<br>1NO+1NC controlled by the solenoid<br>1NO+1NC controlled by the actuator | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 |
| **FG 60B•••••**<br>2NC controlled by the solenoid<br>1NO+1NC controlled by the actuator | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 |
| **FG 60C•••••**<br>3NC controlled by the solenoid<br>1NC controlled by the actuator | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 |
| **FG 60D•••••**<br>1NO+1NC controlled by the solenoid<br>2NC controlled by the actuator | 13-14<br>21-22<br>31-32<br>41-42 | 13-14<br>21-22<br>31-32<br>41-42 | 13-14<br>21-22<br>31-32<br>41-42 | 13-14<br>21-22<br>31-32<br>41-42 | 13-14<br>21-22<br>31-32<br>41-42 | 13-14<br>21-22<br>31-32<br>41-42 |
| **FG 60E•••••**<br>1NO+2NC controlled by the solenoid<br>1NC controlled by the actuator | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 |
| **FG 60F•••••**<br>1NO+2NC controlled by the solenoid<br>1NO controlled by the actuator | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 |
| **FG 60G•••••**<br>2NC controlled by the solenoid<br>2NC controlled by the actuator | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 |
| **FG 60H•••••**<br>4NC controlled by the solenoid | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 |
| **FG 60I•••••**<br>3NC controlled by the solenoid<br>1NO controlled by the actuator | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 | 11-12<br>21-22<br>31-32<br>43-44 |
| **FG 60L•••••**<br>2NO+1NC controlled by the solenoid<br>1NC controlled by the actuator | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 |
| **FG 60M•••••**<br>2NO+1NC controlled by the solenoid<br>1NO controlled by the actuator | 13-14<br>21-22<br>33-34<br>43-44 | 13-14<br>21-22<br>33-34<br>43-44 | 13-14<br>21-22<br>33-34<br>43-44 | 13-14<br>21-22<br>33-34<br>43-44 | 13-14<br>21-22<br>33-34<br>43-44 | 13-14<br>21-22<br>33-34<br>43-44 |
| **FG 60N•••••**<br>1NO+1NC controlled by the solenoid<br>2NO controlled by the actuator | 13-14<br>21-22<br>33-34<br>43-44 | 13-14<br>21-22<br>33-34<br>43-44 | 13-14<br>21-22<br>33-34<br>43-44 | 13-14<br>21-22<br>33-34<br>43-44 | 13-14<br>21-22<br>33-34<br>43-44 | 13-14<br>21-22<br>33-34<br>43-44 |
| **FG 60P•••••**<br>1NC controlled by the solenoid<br>3NC controlled by the actuator | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 | 11-12<br>21-22<br>31-32<br>41-42 |
| **FG 60R•••••**<br>2NO+2NC controlled by the solenoid | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 |
| **FG 60S•••••**<br>1NC controlled by the solenoid<br>2NO+1NC controlled by the actuator | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 | 11-12<br>21-22<br>33-34<br>43-44 |

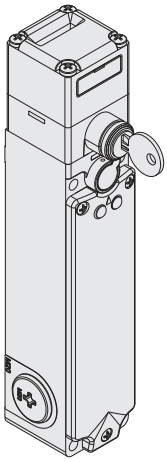
| Operating state | Operating principle D<br>locked actuator with de-energised solenoid<br>state A | | state B | | state C | | Operating principle E<br>locked actuator with energised solenoid<br>state A | | state B | | state C | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Actuator | Inserted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

# FG series safety switches with separate actuator with lock

Contact type
L = slow action







| Operating principle | | Operating principle D, with sealable auxiliary release device, without actuator | | | Operating principle E, without actuator | | | Operating principle D, with key release, without actuator | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Contact block | | | | | | | | | | |
| 60A | L | FG 60AD1D0A | 1NO+1NC | 1NO+1NC | FG 60AD1E0A | 1NO+1NC | 1NO+1NC | FG 60AD5D0A | 1NO+1NC | 1NO+1NC |
| 60B | L | FG 60BD1D0A | 2NC | 1NO+1NC | FG 60BD1E0A | 2NC | 1NO+1NC | FG 60BD5D0A | 2NC | 1NO+1NC |
| 60C | L | FG 60CD1D0A | 3NC | 1NC | FG 60CD1E0A | 3NC | 1NC | FG 60CD5D0A | 3NC | 1NC |
| 60D | L | FG 60DD1D0A | 1NO+1NC | 2NC | FG 60DD1E0A | 1NO+1NC | 2NC | FG 60DD5D0A | 1NO+1NC | 2NC |
| 60E | L | FG 60ED1D0A | 1NO+2NC | 1NC | FG 60ED1E0A | 1NO+2NC | 1NC | FG 60ED5D0A | 1NO+2NC | 1NC |
| 60F | L | FG 60FD1D0A | 1NO+2NC | 1NO | FG 60FD1E0A | 1NO+2NC | 1NO | FG 60FD5D0A | 1NO+2NC | 1NO |
| 60G | L | FG 60GD1D0A | 2NC | 2NC | FG 60GD1E0A | 2NC | 2NC | FG 60GD5D0A | 2NC | 2NC |
| 60H | L | FG 60HD1D0A | 4NC | / | FG 60HD1E0A | 4NC | / | FG 60HD5D0A | 4NC | / |
| 60I | L | FG 60ID1D0A | 3NC | 1NO | FG 60ID1E0A | 3NC | 1NO | FG 60ID5D0A | 3NC | 1NO |
| 60L | L | FG 60LD1D0A | 2NO+1NC | 1NC | FG 60LD1E0A | 2NO+1NC | 1NC | FG 60LD5D0A | 2NO+1NC | 1NC |
| 60M | L | FG 60MD1D0A | 2NO+1NC | 1NO | FG 60MD1E0A | 2NO+1NC | 1NO | FG 60MD5D0A | 2NO+1NC | 1NO |
| 60N | L | FG 60ND1D0A | 1NO+1NC | 2NO | FG 60ND1E0A | 1NO+1NC | 2NO | FG 60ND5D0A | 1NO+1NC | 2NO |
| 60P | L | FG 60PD1D0A | 1NC | 3NC | FG 60PD1E0A | 1NC | 3NC | FG 60PD5D0A | 1NC | 3NC |
| 60R | L | FG 60RD1D0A | 2NO+2NC | / | FG 60RD1E0A | 2NO+2NC | / | FG 60RD5D0A | 2NO+2NC | / |
| 60S | L | FG 60SD1D0A | 1NC | 2NO+1NC | FG 60SD1E0A | 1NC | 2NO+1NC | FG 60SD5D0A | 1NC | 2NO+1NC |
| 60T | L | FG 60TD1D0A | 1NC | 1NO+2NC | FG 60TD1E0A | 1NC | 1NO+2NC | FG 60TD5D0A | 1NC | 1NO+2NC |
| 60U | L | FG 60UD1D0A | / | 4NC | FG 60UD1E0A | / | 4NC | FG 60UD5D0A | / | 4NC |
| 60V | L | FG 60VD1D0A | 2NC | 2NO | FG 60VD1E0A | 2NC | 2NO | FG 60VD5D0A | 2NC | 2NO |
| 60X | L | FG 60XD1D0A | 1NO | 3NC | FG 60XD1E0A | 1NO | 3NC | FG 60XD5D0A | 1NO | 3NC |
| 60Y | L | FG 60YD1D0A | 1NO | 1NO+2NC | FG 60YD1E0A | 1NO | 1NO+2NC | FG 60YD5D0A | 1NO | 1NO+2NC |
| 61A | L | FG 61AD1D0A | / | 1NO+3NC | FG 61AD1E0A | / | 1NO+3NC | FG 61AD5D0A | / | 1NO+3NC |
| 61B | L | FG 61BD1D0A | / | 2NO+2NC | FG 61BD1E0A | / | 2NO+2NC | FG 61BD5D0A | / | 2NO+2NC |
| 61C | L | FG 61CD1D0A | / | 3NO+1NC | FG 61CD1E0A | / | 3NO+1NC | FG 61CD5D0A | / | 3NO+1NC |
| 61D | L | FG 61DD1D0A | 1NC | 3NO | FG 61DD1E0A | 1NC | 3NO | FG 61DD5D0A | 1NC | 3NO |
| 61E | L | FG 61ED1D0A | 1NO | 2NO+1NC | FG 61ED1E0A | 1NO | 2NO+1NC | FG 61ED5D0A | 1NO | 2NO+1NC |
| 61G | L | FG 61GD1D0A | 2NO | 1NO+1NC | FG 61GD1E0A | 2NO | 1NO+1NC | FG 61GD5D0A | 2NO | 1NO+1NC |
| 61H | L | FG 61HD1D0A | 2NO | 2NC | FG 61HD1E0A | 2NO | 2NC | FG 61HD5D0A | 2NO | 2NC |
| 61M | L | FG 61MD1D0A | 3NO | 1NC | FG 61MD1E0A | 3NO | 1NC | FG 61MD5D0A | 3NO | 1NC |
| 61R | L | FG 61RD1D0A | 1NO+3NC | / | FG 61RD1E0A | 1NO+3NC | / | FG 61RD5D0A | 1NO+3NC | / |
| 61S | L | FG 61SD1D0A | 3NO+1NC | / | FG 61SD1E0A | 3NO+1NC | / | FG 61SD5D0A | 3NO+1NC | / |
| Actuating force | | 30 N (60 N ⊖) | | | | | | | | |
| Travel diagrams | | Page 410 | | | | | | | | |

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

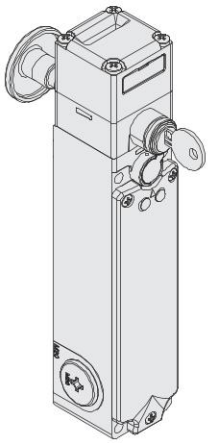
Contacts activated by the actuator

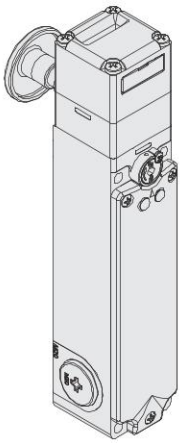
Contacts activated by the solenoid

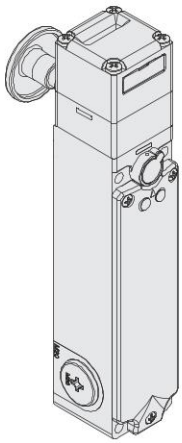
**Accessories** See page 357

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

Contact type
L = slow action







| Operating principle | | 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 block | | | | | | | | | | |
| 60A | L | FG 60AD6D0A | 1NO+1NC | 1NO+1NC | FG 60AD7D0A | 1NO+1NC | 1NO+1NC | FG 60AD7E0A | 1NO+1NC | 1NO+1NC |
| 60B | L | FG 60BD6D0A | 2NC | 1NO+1NC | FG 60BD7D0A | 2NC | 1NO+1NC | FG 60BD7E0A | 2NC | 1NO+1NC |
| 60C | L | FG 60CD6D0A | 3NC | 1NC | FG 60CD7D0A | 3NC | 1NC | FG 60CD7E0A | 3NC | 1NC |
| 60D | L | FG 60DD6D0A | 1NO+1NC | 2NC | FG 60DD7D0A | 1NO+1NC | 2NC | FG 60DD7E0A | 1NO+1NC | 2NC |
| 60E | L | FG 60ED6D0A | 1NO+2NC | 1NC | FG 60ED7D0A | 1NO+2NC | 1NC | FG 60ED7E0A | 1NO+2NC | 1NC |
| 60F | L | FG 60FD6D0A | 1NO+2NC | 1NO | FG 60FD7D0A | 1NO+2NC | 1NO | FG 60FD7E0A | 1NO+2NC | 1NO |
| 60G | L | FG 60GD6D0A | 2NC | 2NC | FG 60GD7D0A | 2NC | 2NC | FG 60GD7E0A | 2NC | 2NC |
| 60H | L | FG 60HD6D0A | 4NC | / | FG 60HD7D0A | 4NC | / | FG 60HD7E0A | 4NC | / |
| 60I | L | FG 60ID6D0A | 3NC | 1NO | FG 60ID7D0A | 3NC | 1NO | FG 60ID7E0A | 3NC | 1NO |
| 60L | L | FG 60LD6D0A | 2NO+1NC | 1NC | FG 60LD7D0A | 2NO+1NC | 1NC | FG 60LD7E0A | 2NO+1NC | 1NC |
| 60M | L | FG 60MD6D0A | 2NO+1NC | 1NO | FG 60MD7D0A | 2NO+1NC | 1NO | FG 60MD7E0A | 2NO+1NC | 1NO |
| 60N | L | FG 60ND6D0A | 1NO+1NC | 2NO | FG 60ND7D0A | 1NO+1NC | 2NO | FG 60ND7E0A | 1NO+1NC | 2NO |
| 60P | L | FG 60PD6D0A | 1NC | 3NC | FG 60PD7D0A | 1NC | 3NC | FG 60PD7E0A | 1NC | 3NC |
| 60R | L | FG 60RD6D0A | 2NO+2NC | / | FG 60RD7D0A | 2NO+2NC | / | FG 60RD7E0A | 2NO+2NC | / |
| 60S | L | FG 60SD6D0A | 1NC | 2NO+1NC | FG 60SD7D0A | 1NC | 2NO+1NC | FG 60SD7E0A | 1NC | 2NO+1NC |
| 60T | L | FG 60TD6D0A | 1NC | 1NO+2NC | FG 60TD7D0A | 1NC | 1NO+2NC | FG 60TD7E0A | 1NC | 1NO+2NC |
| 60V | L | FG 60VD6D0A | 2NC | 2NO | FG 60VD7D0A | 2NC | 2NO | FG 60VD7E0A | 2NC | 2NO |
| 60X | L | FG 60XD6D0A | 1NO | 3NC | FG 60XD7D0A | 1NO | 3NC | FG 60XD7E0A | 1NO | 3NC |
| 60Y | L | FG 60YD6D0A | 1NO | 1NO+2NC | FG 60YD7D0A | 1NO | 1NO+2NC | FG 60YD7E0A | 1NO | 1NO+2NC |
| 61D | L | FG 61DD6D0A | 1NC | 3NO | FG 61DD7D0A | 1NC | 3NO | FG 61DD7E0A | 1NC | 3NO |
| 61E | L | FG 61ED6D0A | 1NO | 2NO+1NC | FG 61ED7D0A | 1NO | 2NO+1NC | FG 61ED7E0A | 1NO | 2NO+1NC |
| 61G | L | FG 61GD6D0A | 2NO | 1NO+1NC | FG 61GD7D0A | 2NO | 1NO+1NC | FG 61GD7E0A | 2NO | 1NO+1NC |
| 61H | L | FG 61HD6D0A | 2NO | 2NC | FG 61HD7D0A | 2NO | 2NC | FG 61HD7E0A | 2NO | 2NC |
| 61M | L | FG 61MD6D0A | 3NO | 1NC | FG 61MD7D0A | 3NO | 1NC | FG 61MD7E0A | 3NO | 1NC |
| 61R | L | FG 61RD6D0A | 1NO+3NC | / | FG 61RD7D0A | 1NO+3NC | / | FG 61RD7E0A | 1NO+3NC | / |
| 61S | L | FG 61SD6D0A | 3NO+1NC | / | FG 61SD7D0A | 3NO+1NC | / | FG 61SD7E0A | 3NO+1NC | / |
| Actuating force | | 30 N (60 N ⊖) | | | | | | | | |
| Travel diagrams | | Page 410 | | | | | | | | |

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

Contacts activated by the actuator

Contacts activated by the solenoid

**Accessories** See page 357

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

## Stainless steel actuators

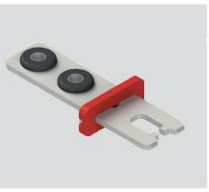
**IMPORTANT:** These actuators can be used only with items of the FG and FY series (e.g. FG 60AD1D0A-F20).
Low coding level acc. to EN ISO 14119.



| Article | Description |
|---|---|
| VF KEYF20 | Straight actuator |



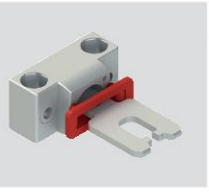
| Article | Description |
|---|---|
| VF KEYF21 | Angled actuator |



| Article | Description |
|---|---|
| VF KEYF22 | Actuator with rubber pads |

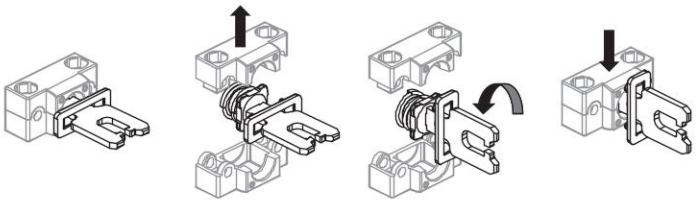
## Universal actuator VF KEYF28

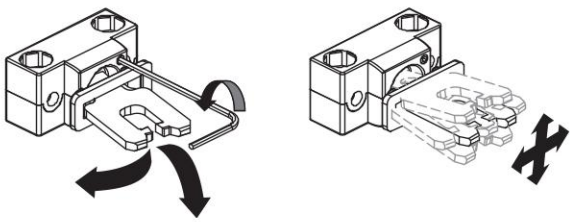
**IMPORTANT:** These actuators can be used only with items of the FG and FY series (e.g. FG 60AD1D0A-F28).
Low coding level acc. to EN ISO 14119.

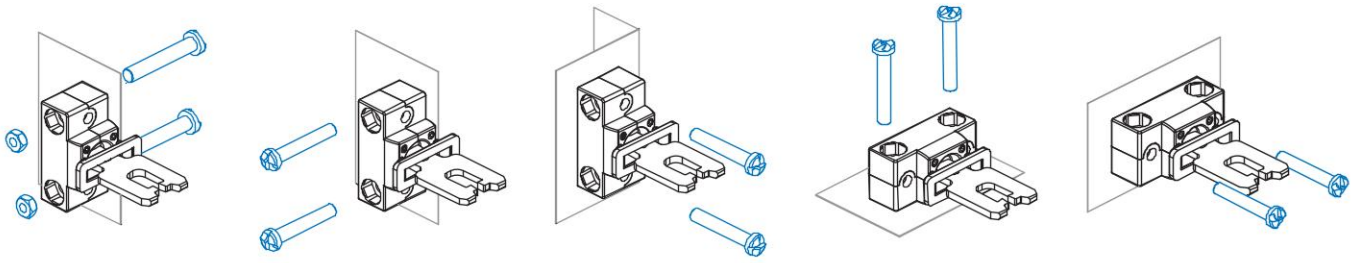


| Article | Description |
|---|---|
| VF KEYF28 | Universal actuator |

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°.



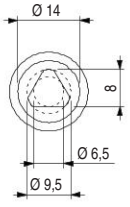




## Auxiliary key release with triangular key



Articles with the V70 and V73 option have an auxiliary key release with a triangular key that meets DIN 22417 standards.
This type of lock can be used in situations where the switch must only be unlocked using the corresponding triangular key, a tool which is not usually available.
There are two versions of the triangular key release: with a spring return (option V70) and without a spring return (option V73).



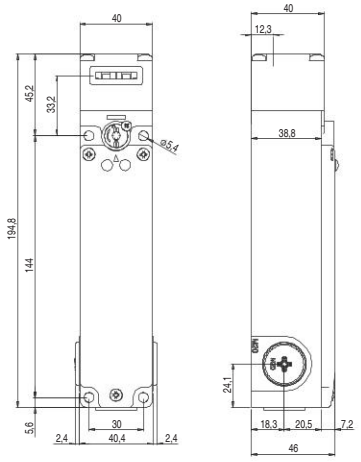

All values in the drawings are in mm

**Accessories** See page 357

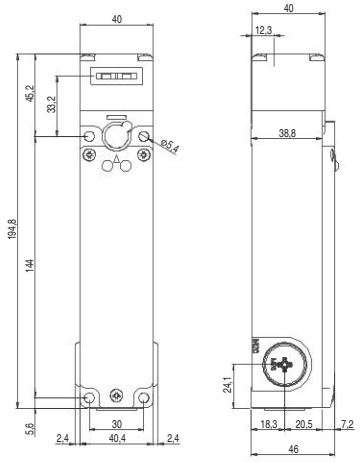
→ The 2D and 3D files are available at **www.pizzato.com**

## Dimensional drawings

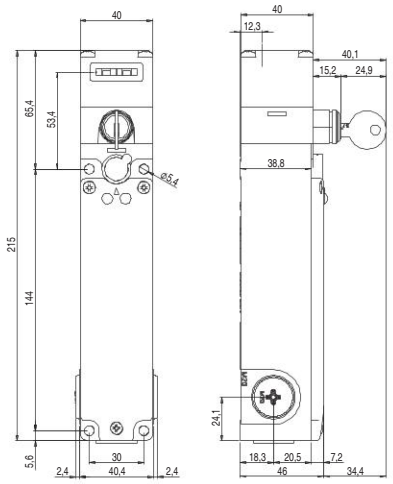
**Switch FG 6••D1D••**
Operating principle D,
with sealable auxiliary release device



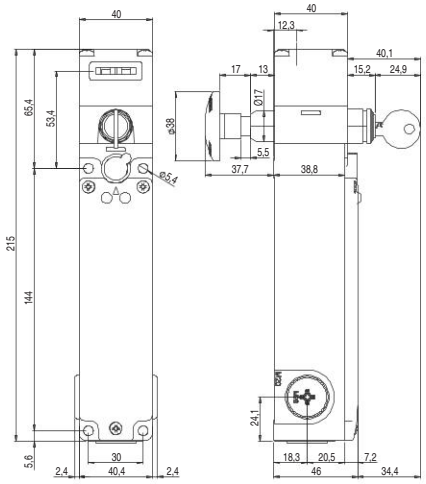
**Switch FG 6••D1E••**
Operating principle E



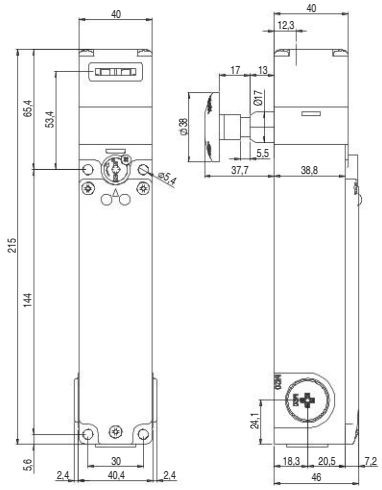
**Switch FG 6••D5D••**
Operating principle D,
with key release



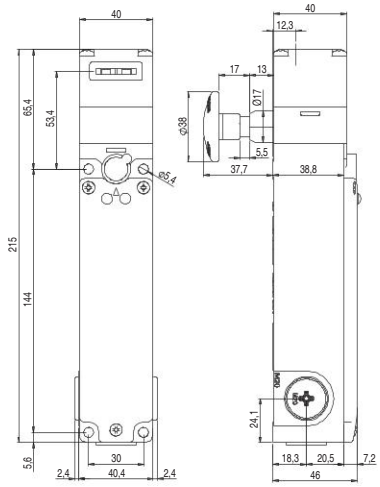
**Switch FG 6••D6D••**
Operating principle D
with auxiliary key release and escape release button



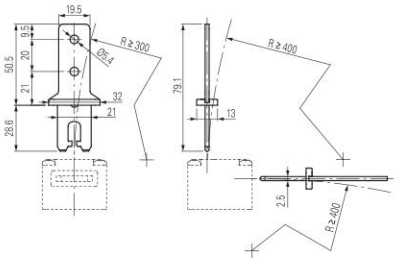
**Switch FG 6••D7D••**
Operating principle D
with sealable auxiliary release device and escape release button



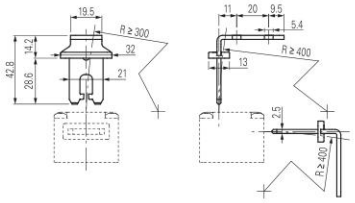
**Switch FG 6••D7E••**
Operating principle E,
with escape release button



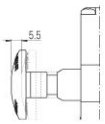
### Actuator VF KEYF20



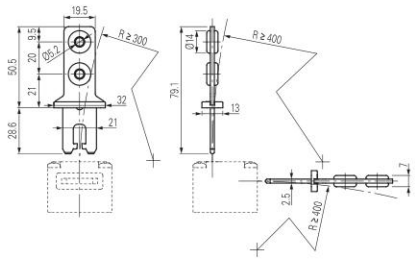
### Actuator VF KEYF21



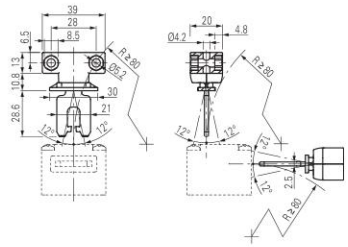
### Release button travel



### Actuator VF KEYF22



### Actuator VF KEYF28



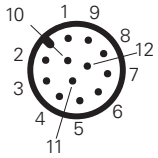
All values in the drawings are in mm

**Accessories** See page 357

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

## Wiring diagram for M12 connectors

M12 connector, 12-pole




| Contact block 60A 2NO+2NC | | Contact block 60B 1NO+3NC | | Contact block 60C 4NC | | Contact block 60D 1NO+3NC | | Contact block 60E 1NO+3NC | | Contact block 60F 2NO+2NC | | Contact block 60G 4NC | | Contact block 60H 4NC | | Contact block 60I 1NO+3NC | | Contact block 60L 2NO+2NC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** |
| A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 |
| NC | 3-4 | NC | 3-4 | NC | 3-4 | NO | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 |
| NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 |
| NO | 7-8 | NC | 7-8 | NC | 7-8 | NC | 7-8 | NC | 7-8 | NO | 7-8 | NC | 7-8 | NC | 7-8 | NC | 7-8 | NO | 7-8 |
| NO | 9-10 | NO | 9-10 | NC | 9-10 | NC | 9-10 | NO | 9-10 | NO | 9-10 | NC | 9-10 | NC | 9-10 | NO | 9-10 | NO | 9-10 |

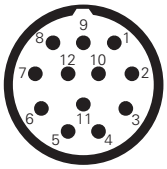
| Contact block 60M 3NO+1NC | | Contact block 60N 3NO+1NC | | Contact block 60P 4NC | | Contact block 60R 2NO+2NC | | Contact block 60S 2NO+2NC | | Contact block 60T 1NO+3NC | | Contact block 60U 4NC | | Contact block 60V 2NO+2NC | | Contact block 60X 1NO+3NC | | Contact block 60Y 2NO+2NC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** |
| A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 |
| NO | 3-4 | NO | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NO | 3-4 | NC | 3-4 |
| NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 |
| NO | 7-8 | NO | 7-8 | NC | 7-8 | NO | 7-8 | NO | 7-8 | NC | 7-8 | NC | 7-8 | NO | 7-8 | NC | 7-8 | NO | 7-8 |
| NO | 9-10 | NO | 9-10 | NC | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NC | 9-10 | NO | 9-10 | NC | 9-10 | NO | 9-10 |

| Contact block 61A 1NO+3NC | | Contact block 61B 2NO+2NC | | Contact block 61C 3NO+1NC | | Contact block 61D 3NO+1NC | | Contact block 61E 3NO+1NC | | Contact block 61G 3NO+1NC | | Contact block 61H 2NO+2NC | | Contact block 61M 3NO+1NC | | Contact block 61R 1NO+3NC | | Contact block 61S 3NO+1NC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** |
| A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 |
| NC | 3-4 | NC | 3-4 | NO | 3-4 | NO | 3-4 | NO | 3-4 | NO | 3-4 | NC | 3-4 | NO | 3-4 | NC | 3-4 | NO | 3-4 |
| NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 |
| NC | 7-8 | NO | 7-8 | NO | 7-8 | NO | 7-8 | NO | 7-8 | NO | 7-8 | NO | 7-8 | NO | 7-8 | NC | 7-8 | NO | 7-8 |
| NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 |

**Note:** the wires connected to pins 11 and 12 of the M12 connector can be used to activate the LEDs in FG series configurations with freely connectable LEDs.

## Wiring diagram for M23 connectors

### M23 connector, 12-pole




| Contact block 60A 2NO+2NC | | Contact block 60B 1NO+3NC | | Contact block 60C 4NC | | Contact block 60D 1NO+3NC | | Contact block 60E 1NO+3NC | | Contact block 60F 2NO+2NC | | Contact block 60G 4NC | | Contact block 60H 4NC | | Contact block 60I 1NO+3NC | | Contact block 60L 2NO+2NC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** |
| A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 |
| NC | 3-4 | NC | 3-4 | NC | 3-4 | NO | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 |
| NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 |
| NO | 7-8 | NC | 7-8 | NC | 7-8 | NC | 7-8 | NC | 7-8 | NO | 7-8 | NC | 7-8 | NC | 7-8 | NC | 7-8 | NO | 7-8 |
| NO | 9-10 | NO | 9-10 | NC | 9-10 | NC | 9-10 | NO | 9-10 | NO | 9-10 | NC | 9-10 | NC | 9-10 | NO | 9-10 | NO | 9-10 |
| ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 |

| Contact block 60M 3NO+1NC | | Contact block 60N 3NO+1NC | | Contact block 60P 4NC | | Contact block 60R 2NO+2NC | | Contact block 60S 2NO+2NC | | Contact block 60T 1NO+3NC | | Contact block 60U 4NC | | Contact block 60V 2NO+2NC | | Contact block 60X 1NO+3NC | | Contact block 60Y 2NO+2NC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** |
| A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 |
| NO | 3-4 | NO | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NC | 3-4 | NO | 3-4 | NC | 3-4 |
| NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 |
| NO | 7-8 | NO | 7-8 | NC | 7-8 | NO | 7-8 | NO | 7-8 | NC | 7-8 | NC | 7-8 | NO | 7-8 | NC | 7-8 | NO | 7-8 |
| NO | 9-10 | NO | 9-10 | NC | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NC | 9-10 | NO | 9-10 | NC | 9-10 | NO | 9-10 |
| ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 |

| Contact block 61A 1NO+3NC | | Contact block 61B 2NO+2NC | | Contact block 61C 3NO+1NC | | Contact block 61D 3NO+1NC | | Contact block 61E 3NO+1NC | | Contact block 61G 3NO+1NC | | Contact block 61H 2NO+2NC | | Contact block 61M 3NO+1NC | | Contact block 61R 1NO+3NC | | Contact block 61S 3NO+1NC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** | **Contacts** | **Pin no.** |
| A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 | A1-A2 | 1-2 |
| NC | 3-4 | NC | 3-4 | NO | 3-4 | NO | 3-4 | NO | 3-4 | NO | 3-4 | NC | 3-4 | NO | 3-4 | NC | 3-4 | NO | 3-4 |
| NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 | NC | 5-6 |
| NC | 7-8 | NO | 7-8 | NO | 7-8 | NO | 7-8 | NO | 7-8 | NO | 7-8 | NO | 7-8 | NO | 7-8 | NC | 7-8 | NO | 7-8 |
| NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 | NO | 9-10 |
| ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 | ground | 11 |

## Release button



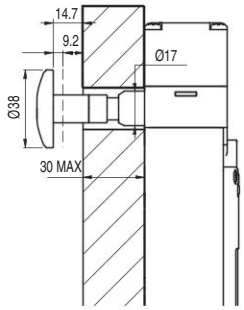
| Article | Description |
|---|---|
| VF FG-LP15 | Technopolymer release button for max. 15 mm wall thickness, supplied with screw |
| VF FG-LP30 | Technopolymer release button for max. 30 mm wall thickness, supplied with screw |
| VF FG-LP40 | Technopolymer release button for max. 40 mm wall thickness,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

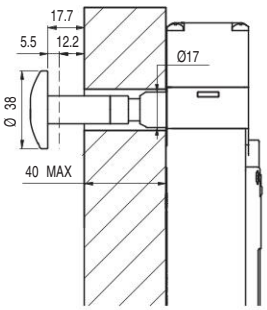
The M10 bar can be supplied in zinc-plated steel with 1 m length. Article: AC 8512.

## Other release button lengths



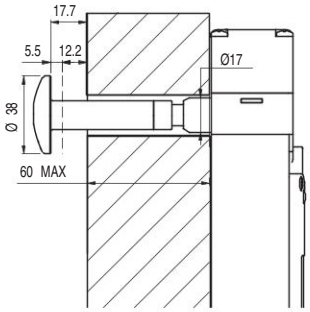

-LP30

For wall thickness
15 … 30 mm



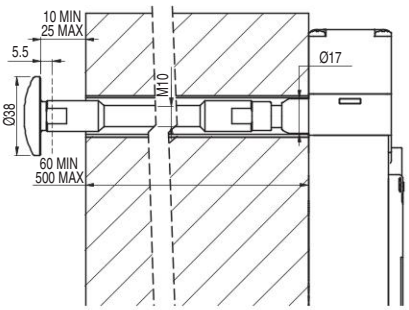

-LP40

For wall thickness
30 … 40 mm




-LP60

For wall thickness
40 … 60 mm




-LPRG

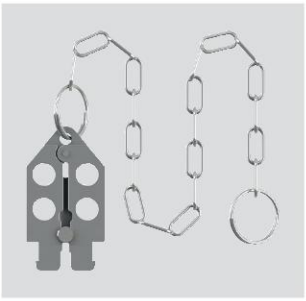
For wall thickness
60 … 500 mm

**-LP30, -LP40, -LP60:**
- 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.

**-LPRG:**
- 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 as 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.

## 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 and FY 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.

All values in the drawings are in mm

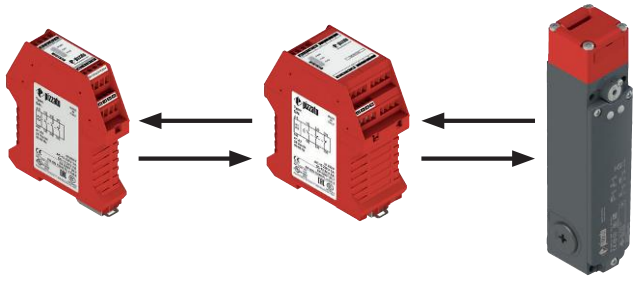
**Accessories** See page 357

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

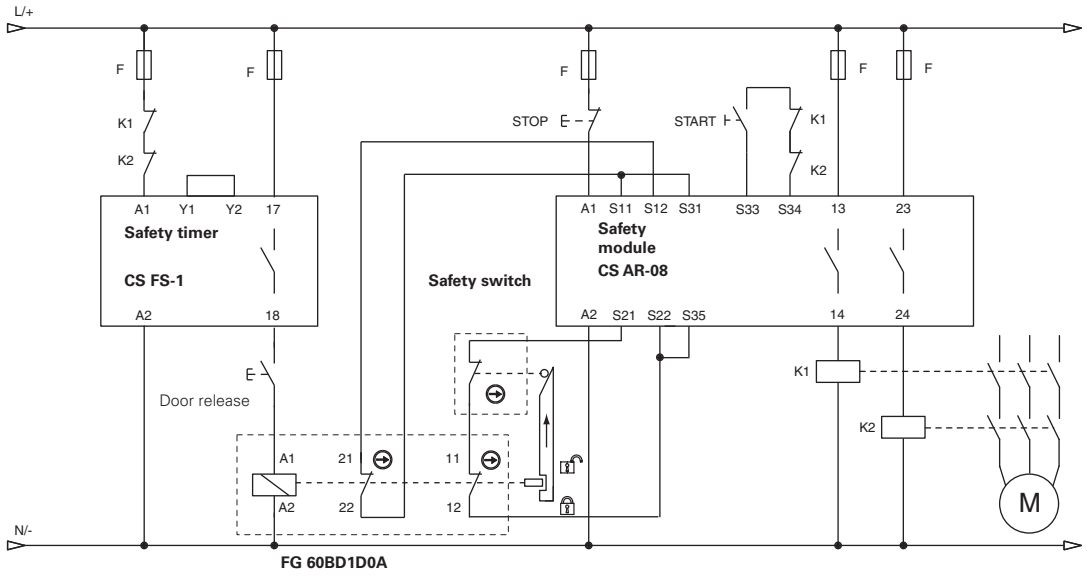
## Safety modules

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).

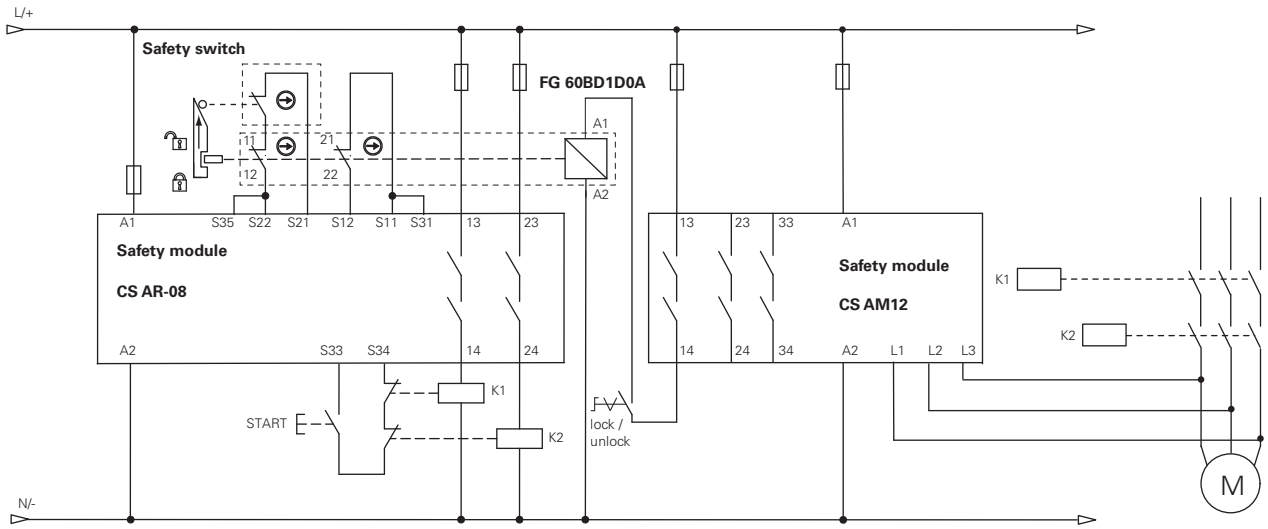
Safety switches with solenoid of the FG series can be connected to safety modules for the realization of safety circuits up to PL e acc. to EN ISO 13849. For technical information or wiring diagrams, please contact our technical office.



## 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)