

## 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.

Versions with mode 1 and 3 (safety outputs active when guard closed and locked) are interlocks with guard locking acc. to ISO 14119; the product is labelled with the symbol shown.



## Maximum safety with a single device

# PL e + SIL 3

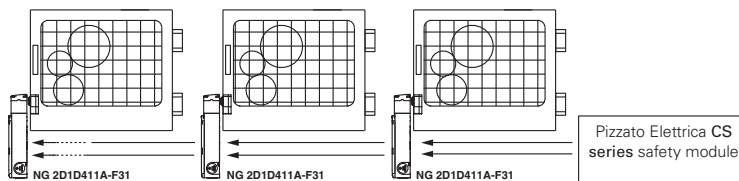
The NG series switches are constructed with redundant electronics. As a result, the maximum PL e and SIL 3 safety levels can still be achieved through the use of a single device on a guard. This avoids expensive wiring in the field and allows faster installation. Inside the control cabinet, the two electronic safety outputs must be connected to a module suitable for managing devices with solid state outputs, or to a safety PLC.

## Series connection of several switches

One of the most important features of the NG series is the possibility of connecting up to 32 sensors in series, while still maintaining the maximum safety levels PL e laid down in EN 13849-1 and SIL 3 acc. to EN IEC 62061:2021.

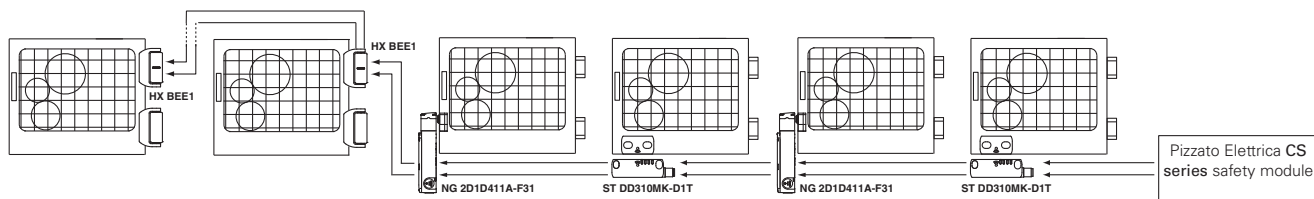
This connection type is permissible in safety systems which have a safety module at the end of the chain that monitors the outputs of the last NG switch.

The fact that the PL e safety level can be maintained even with 32 sensors connected in series demonstrates the extremely secure structure of each single device.



## Series connection with other devices

The NG series features two safety inputs and two safety outputs, which can be connected in series with other Pizzato Elettrica safety devices. This option allows the creation of safety chains containing various devices. For example, stainless steel safety hinges (HX BEE1 series), transponder sensors (ST series) and door lock sensors (NG series) can be connected in series while still maintaining the maximum PL e and SIL 3 safety levels.



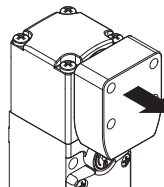
## RFID actuators with high coding level



actuators, according to EN ISO 14119.

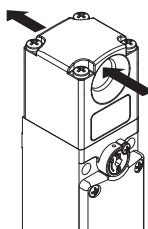
The NG series is provided with an electronic system based on RFID technology to detect the actuator. This allows to provide each actuator with different coding and makes it impossible to tamper with a device by using another actuator of the same series. Millions of different coding combinations are possible for the actuators. They are therefore classified as high level coded

## Holding force of the locked actuator



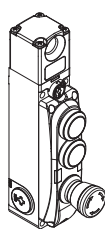
**9750 N** The strong interlocking system guarantees a maximum actuator holding force of  $F_{1max} = 9750 \text{ N}$ . This is one of the highest values currently available on the market today, making this device suitable for heavy-duty applications.

## Dustproof



The switch is provided with a through hole for inserting the actuator. Thanks to this unique feature, any dust that enters the actuator hole can always come out on the opposite side instead of remaining inside. Moreover, the lock pin is provided with a diaphragm seal, making the system suitable for critical environments with a high level of dust.

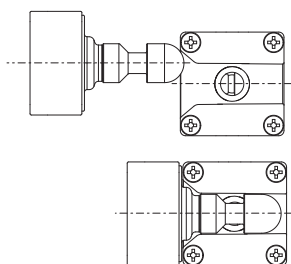
## Integrated control devices



The switch is also available with elevated cover. Control devices such as buttons, emergency stop buttons, indicator lights or selectors can thereby be attached directly to the switch together with corresponding contact blocks.

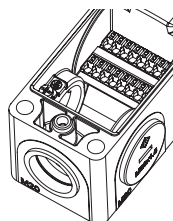
The result is a compact solution with direct access to control devices without needing to install them separately on the switch panel or in their own housing. The devices can be illuminated and, thanks to the PUSH-IN spring-operated connections, wiring is quick and intuitive.

## Centring



The switch is provided with a wide centring inlet for the actuator pin. This solution makes it easier to align the actuator and the opening hole on the head during installation. Moreover, this solution drastically reduces the probability of a collision between the switch and the actuator, making it possible to install the device even on inaccurately closing doors.

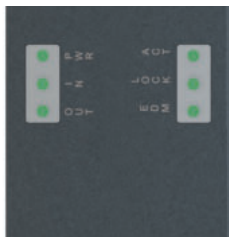
## Push-in spring-operated connections



The switch is provided with a PUSH-IN type spring-operated connection system on the inside. This technology allows wiring to be performed quickly and easily, as the wire just needs to be inserted into the appropriate hole in order to establish the electrical connection and automatically secure the wire. This operation can be performed with rigid or flexible wires with a crimped wire-end sleeve and requires no tools. Release is obtained by pressing the appropriate wire-releasing button.

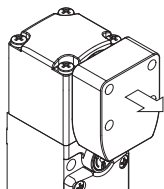


### Six LEDs for immediate diagnosis



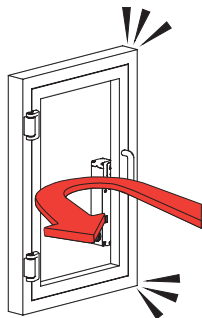
As the LEDs have been designed for quick immediate diagnosis, the status of each input and output is highlighted by one specific LED. This makes it possible to quickly identify the interruption points in the safety chain, which device is released, which door is opened and any errors inside the device. All of this at a glance, without needing to decode complex flashing sequences.

### Holding force of the unlocked actuator



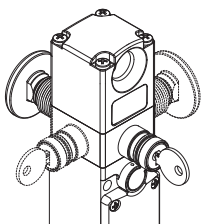
The inside of each switch features a device which holds the actuator in its closed position. Ideal for all those applications where several guards are unlocked simultaneously, but only one is actually opened. The device keeps all the unlocked guards in their position with a retaining force of approx.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

### Function for protecting against recoil forces



If a guard is closed too quickly or with so much force that the recoil would cause it to open again, a special function in the NG switch prevents locking. This function prevents the immediate locking of the guard if the lock signal is applied. This protects the switch against recoil forces that occur during instantaneous locking. This serves to protect the switch from damage and forces the operator to close the guard more gently.

### Key release device and escape release button



The key release device (auxiliary release) is used to permit unlocking of the actuator only by personnel in possession of the key. The device also functions with no power supply and, once actuated, prevents the guard from being locked.

The escape release button allows actuator release and immediate opening of the guard. Generally used in machines

within which an operator could inadvertently become trapped, it faces towards the machine interior, to allow the operator to exit even in the event of a power failure. The button has two stable states and can be freely extended in length with suitable extensions (see accessories). Both devices can be positioned on the four sides of the switch. As a result, it can be installed both towards the interior and towards the exterior of the machine.

### Three safety output actuation modes

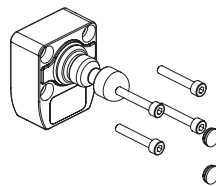
**MODE 1**  
**MODE 2**  
**MODE 3**

The device is available with 3 different actuation modes for safety outputs:

- mode 1: safety outputs active with inserted and locked actuator, for machines with inertia;
- mode 2: safety outputs active with inserted actuator, for machines without inertia;
- mode 3: a first safety output active with actuator inserted and locked and a second safety output active with actuator inserted, for special applications.

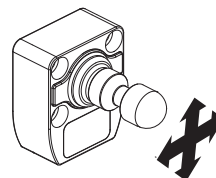
actuator inserted and locked and a second safety output active with actuator inserted, for special applications.

### Protection against tampering



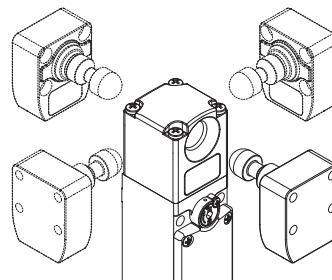
Each actuator of the NG series is supplied with four snap-on protection caps. Not only do the caps prevent dirt from accumulating and simplify cleaning, they also block access to the fastening screws of the actuator. As a result, standard screws can be used instead of tamper-proof screws.

### Jointed actuator for inaccurately closing guards



All NG series actuators are articulated, thereby allowing the actuator pin to be safely guided into the switch through the centring hole. As a result, the actuator and switch do not need to be precisely aligned during installation. In addition, the device can thereby be used on guards with a minimum actuation radius of 150 mm without the actuation pin needing to be angled.

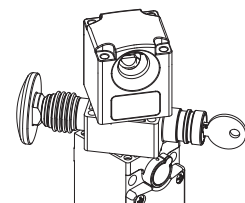
### Head and devices with variable orientation



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

The key release device and the escape release button can also be rotated and secured independently of one another in steps of 90°. The device can thus assume 16 different configurations.

### Non-detachable head 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.).

### High protection degree

**IP69K**  
**IP67**

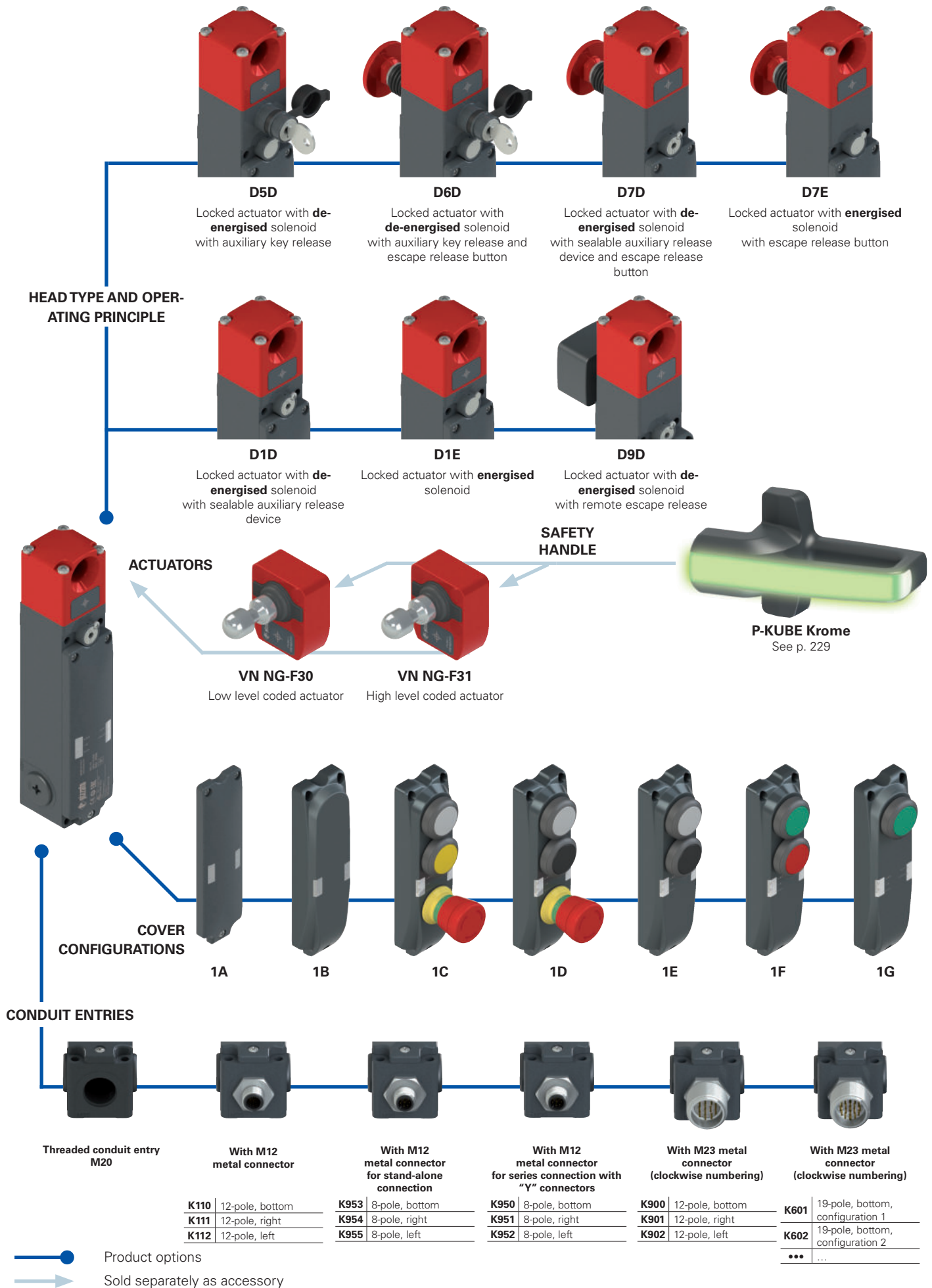
These devices are designed to be used in the toughest environmental conditions and they pass the IP67 immersion test acc. to EN 60529. They can therefore be used in all environments where the maximum degree of protection is required for the housing. Due to their special design, these devices are suitable for use in equipment subjected to cleaning with high pressure hot water jets. These devices meet the IP69K test requirements according to ISO 20653 (water jets with 100 bar and 80°C).

### External device monitoring

**EDM**

On request, the switch can be supplied with EDM function (External Device Monitoring). In this case, the switch itself checks the proper function of the devices connected to the safety outputs. These devices (usually relays or safety contactors) must send a feedback signal to the EDM input, which checks that the received signal is consistent with the state of the safety outputs.

## Selection diagram



**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

**NG 2D1D411A-F31E34K900LP30**

| Operating principle |   |
|---------------------|---|
| <b>D1D</b>          | locked actuator with de-energised solenoid. With sealable auxiliary release device.                           |
| <b>D1E</b>          | locked actuator with energised solenoid   |
| <b>D5D</b>          | locked actuator with de-energised solenoid. With auxiliary key release.                                       |
| <b>D6D</b>          | locked actuator with de-energised solenoid. With auxiliary key release and escape release button.             |
| <b>D7D</b>          | locked actuator with de-energised solenoid. With sealable auxiliary release device and escape release button. |
| <b>D7E</b>          | locked actuator with energised solenoid. With escape release button.  |
| <b>D9D</b>          | locked actuator with de-energised solenoid. With remote escape release. <sup>(1)</sup>                        |

(1) For the remote escape release, see page 203.

| Inputs and outputs |   |
|--------------------|---|
| <b>3</b>           | 2 safety inputs IS1, IS2<br>2 safety outputs OS1, OS2<br>1 signalling output O3: actuator inserted<br>1 signalling output O4: actuator locked<br>I4 or IE1/IE2 inputs for solenoid activation<br>1 reset input I3<br><b>Note:</b> Supplied only together with actuator. |
| <b>4</b>           | 2 safety inputs IS1, IS2<br>2 safety outputs OS1, OS2<br>1 signalling output O3: actuator inserted<br>1 signalling output O4: actuator locked<br>I4 or IE1/IE2 inputs for solenoid activation<br>1 input I3: actuator programming / reset                               |
| <b>5</b>           | 2 safety inputs IS1, IS2<br>2 safety outputs OS1, OS2<br>1 signalling output O3: actuator inserted<br>1 signalling output O4: actuator locked<br>I4 or IE1/IE2 inputs for solenoid activation<br>1 input I3: actuator programming / reset<br>1 feedback input EDM I5    |
| <b>6</b>           | 2 safety inputs IS1, IS2<br>2 safety outputs OS1, OS2<br>1 signalling output O3: actuator inserted<br>1 signalling output FAULT O4<br>I4 or IE1/IE2 inputs for solenoid activation<br>1 input I3: actuator programming / reset  |
| <b>7</b>           | 2 safety inputs IS1, IS2<br>2 safety outputs OS1, OS2<br>1 inverted signalling output O3: actuator inserted<br>1 inverted signalling output O4: actuator locked<br>I4 or IE1/IE2 inputs for solenoid activation<br>1 input I3: actuator programming / reset             |

| Activation of OS outputs |   |
|--------------------------|---|
| <b>1</b>                 | mode 1: safety outputs OS1 and OS2 active with inserted and locked actuator   |
| <b>2</b>                 | mode 2: safety outputs OS1 and OS2 active with inserted actuator  |
| <b>3</b>                 | mode 3: safety output OS1 active with inserted and locked actuator, safety output OS2 active with inserted actuator |

| Release button length |  |
|-----------------------|--|
|                       | for max. 15 mm wall thickness (standard) |
| <b>LP30</b>           | for max. 30 mm wall thickness            |
| <b>LP40</b>           | for max. 40 mm wall thickness            |
| <b>LP50</b>           | for max. 50 mm wall thickness            |
| <b>LP60</b>           | for max. 60 mm wall thickness            |
| ...                   | other wall thicknesses on request        |

| Pre-installed connectors |  |
|--------------------------|--|
|                          | without connector (standard)                               |
| <b>K110</b>              | M12 metal connector, 12-pole, bottom                       |
| <b>K601</b>              | M23 metal connector, 19-pole, bottom, configuration 1      |
| <b>K900</b>              | M23 metal connector, 12-pole, bottom                       |
| <b>K950</b>              | M12 metal connector, 8-pole, bottom, for series connection |
| ...                      | other connectors on request                                |

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

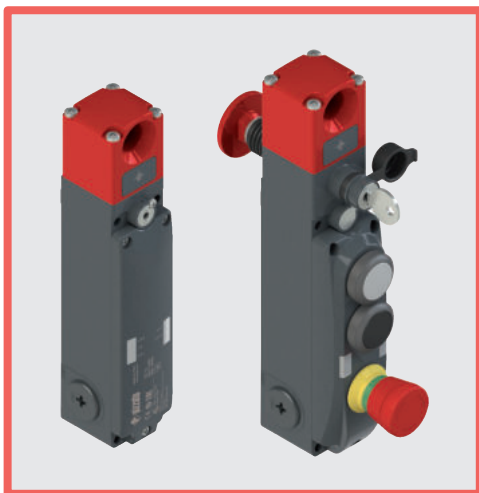
| Actuator extraction force |   |
|---------------------------|---|
|                           | actuator extraction force 30 N (standard) |
| <b>E34</b>                | actuator freely removable                 |

| Actuator   |   |
|------------|---|
| <b>F30</b> | low level coded actuator VN NG-F30<br>the switch recognises any type F30 actuator         |
| <b>F31</b> | high level coded actuator VN NG-F31<br>the switch recognises one single type F31 actuator |

| Cover configurations |   |
|----------------------|---|
| <b>1A</b>            | low cover (standard)  |
| <b>1B</b>            | raised cover without holes  |
| <b>1C</b>            | cover with white button / yellow button / emergency stop button with rotary release |
| <b>1D</b>            | cover with white button / black button / emergency stop button with rotary release  |
| <b>1E</b>            | cover with white button / black button  |
| <b>1F</b>            | cover with green button / red button  |
| <b>1G</b>            | cover with green button   |
| ...                  | other configurations on request   |

**Code structure for actuator****VN NG-F30**

| Actuator   |   |
|------------|---|
| <b>F30</b> | low level coded actuator<br>the switch recognises any type F30 actuator         |
| <b>F31</b> | high level coded actuator<br>the switch recognises one single type F31 actuator |



### Main features

- Actuation without contact, using RFID technology
- Digitally coded actuator
- Actuator holding force: 9750 N
- SIL 3 and PL e with a single device
- Metal housing, three M20 conduit entries
- Protection degree up to IP67 and IP69K
- PL e also with series connection of up to 32 devices
- Signalling LEDs

### Quality marks:



EC type examination certificate: M6A 075157 0023 Rev. 02  
 UL approval: E131787  
 TÜV SÜD approval: Z10 075157 0022 Rev. 02  
 EAC approval: RU C-IT.YT03.B.00035/19

### In compliance with standards:

EN ISO 14119, EN 60947-5-3, EN 60947-1, IEC 60204-1, EN 60204-1, EN ISO 12100, IEC 60529, EN 60529, EN 61000-6-2, EN 61000-6-3, BG-GS-ET-19, IEC 61508-1, IEC 61508-2, IEC 61508-3, IEC 61508-4, SN 29500, EN ISO 13849-1, EN ISO 13849-2, EN IEC 62061, EN 61326-1, EN 61326-3-1, EN 61326-3-2, EN IEC 63000, ETSI 301 489-1, ETSI 301 489-3, ETSI 300 330, UL 508, CSA C22.2 No. 14.

### Compliance with the requirements of:

Machinery Directive 2006/42/EC, EMC Directive 2014/30/EC, RED Directive 2014/53/EU, RoHS directive 2011/65/EU, FCC Part 15.

### Features approved by UL

Electrical Ratings: 24 Vdc, 0.25 A.  
 Input supplied by Class 2 source or limited voltage limited energy.  
 Environmental Ratings: Types 1, 4X, 12, 13 (versions without control devices), Type 1 (versions with control devices).

### Features approved by TÜV SÜD

Protection degree: IP67, IP69K  
 Ambient temperature: -20°C...+50°C  
 Storage temperature: -40°C...+75°C  
 PL, category: PL e, cat. 4  
 SIL: SIL 3 / SIL CL 3

Tested according to: 2006/42/EC, EN IEC 60947-5-2:2020/A11:2022, EN 60947-5-3:2013, EN 61508-1:2010 (SIL 3), EN 61508-2:2010 (SIL 3), EN 61508-3:2010 (SIL 3), EN IEC 62061:2021 (maximum SIL 3), EN ISO 13489-1:2015 (PL e, Cat 4).

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

### Technical data

Metal head and housing, baked powder coating.  
 Three threaded conduit entries:  
 Protection degree:

M20x1.5  
 IP67 acc. to EN 60529,  
 IP69K acc. to ISO 20653  
 IP65 acc. to EN 60529 with cable gland of equal or higher protection degree

Protection degree with control devices:

### General data

| Safety parameters   | SIL | PL | Cat. | DC   | PFH <sub>0</sub> | MTTF <sub>0</sub> |
|---|-----|----|------|------|------------------|-------------------|
| Monitoring function: actuator locked - Mode 1               | 3   | e  | 4    | High | 1.15E-09         | 2968              |
| Monitoring function: actuator present - Mode 2              | 3   | e  | 4    | High | 1.15E-09         | 3946              |
| Monitoring function: actuator locked - Mode 3               | 2   | d  | 2    | High | 1.48E-09         | 2957              |
| Monitoring function: actuator present - Mode 3              | 2   | d  | 2    | High | 1.48E-09         | 3927              |
| Dual-channel control for locking function of the actuator   | 3   | e  | 4    | High | 1.51E-10         | 4011              |
| Single-channel control for locking function of the actuator | 2   | d  | 2    | High | 1.51E-10         | 4011              |

Interlock with lock, no contact, coded: type 4 acc. to EN ISO 14119  
 Level of coding acc. to EN ISO 14119: low with F30 actuator  
 High with F31 actuator

Mission time: 20 years  
 Ambient temperature: -20°C ... +50°C

Max. actuation frequency with actuator lock and release: 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  $F_{1max}$ : 9750 N acc. to EN ISO 14119  
 Max. holding force  $F_{2h}$ : 7500 N acc. to EN ISO 14119  
 Maximum clearance of locked actuator: 4 mm  
 Released actuator extraction force: ~ 30 N

### Power supply electrical data

Rated operating voltage  $U_0$ : 24 Vdc ±10% SELV/PELV  
 Operating current at  $U_0$  voltage: 40 mA min.; 0.4 A with activated solenoid;  
 1.2 A with activated solenoid and all outputs at maximum power

Rated insulation voltage  $U_i$ : 32 Vdc  
 Rated impulse withstand voltage  $U_{imp}$ : 1.5 kV  
 External protection fuse: 2 A type gG or equivalent device  
 Overvoltage category: III  
 Solenoid duty cycle: 100% ED (continuous operation)  
 Solenoid consumption: 9 W max.  
 Pollution degree: 3 acc. to EN 60947-1

### Electrical data of IS1/IS2/I3/I4/I5/IE1/IE2/EDM inputs

Rated operating voltage  $U_{01}$ : 24 Vdc  
 Rated current consumption  $I_{01}$ : 5 mA

### Electrical data of OS1/OS2 safety outputs

Rated operating voltage  $U_{02}$ : 24 Vdc  
 Output type: PNP type OSSD  
 Maximum current per output  $I_{02}$ : 0.25 A  
 Minimum current per output  $I_{m2}$ : 0.5 mA  
 Thermal current  $I_{m2}$ : 0.25 A  
 Utilization category: DC13;  $U_{02}=24$  Vdc,  $I_{02}=0.25$  A  
 Short circuit detection: Yes  
 Overcurrent protection: Yes  
 Internal self-resettable protection fuse: 1.1 A  
 Duration of the deactivation impulses at the safety outputs: < 300 μs  
 Permissible maximum capacitance between outputs: < 200 nF  
 Permissible maximum capacitance between output and ground: < 200 nF  
 Activation time of safety outputs OS1 and OS2 after deactivation of inputs IS1, IS2: typically 7 ms, max. 15 ms  
 Activation time upon unlocking the guard: typically 7 ms, max. 12 ms  
 Maximum delay of EDM status change: 500 ms

### Electrical data of O3/O4 signalling output

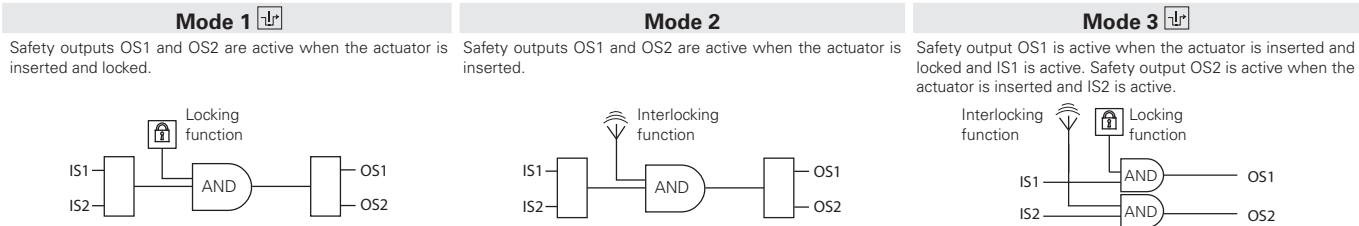
Rated operating voltage  $U_{03}$ : 24 Vdc  
 Output type: PNP  
 Maximum current per output  $I_{03}$ : 0.1 A  
 Utilization category: DC13;  $U_{03}=24$  Vdc,  $I_{03}=0.1$  A  
 Short circuit detection: No  
 Overcurrent protection: Yes  
 Internal self-resettable protection fuse: 1.1 A

### RFID sensor data

Assured operating distance  $S_{ao}$ : 2 mm  
 Assured release distance  $S_{ar}$ : 4 mm (actuator not locked)  
 10 mm (actuator locked)  
 Rated operating distance  $S_n$ : 2.5 mm  
 Repeat accuracy: ≤ 10 %  $s_n$   
 Differential travel: ≤ 20 %  $s_n$   
 RFID transponder frequency: 125 kHz  
 Max. switching frequency: 1 Hz

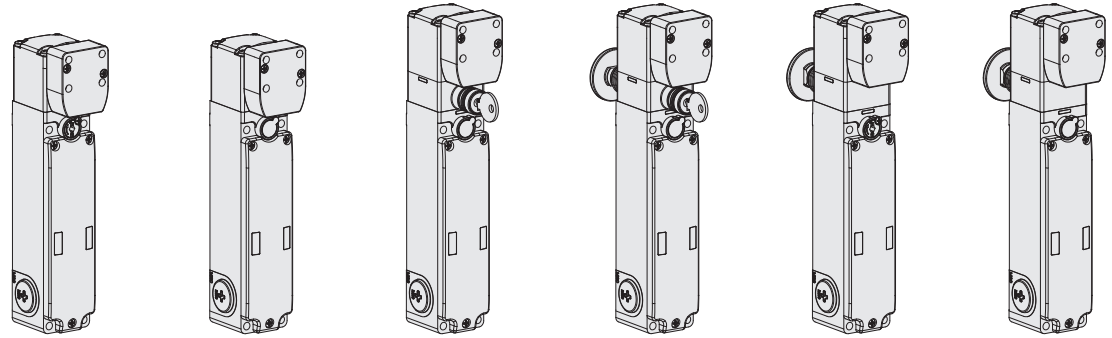


## Actuation mode of the OS1 and OS2 safety outputs



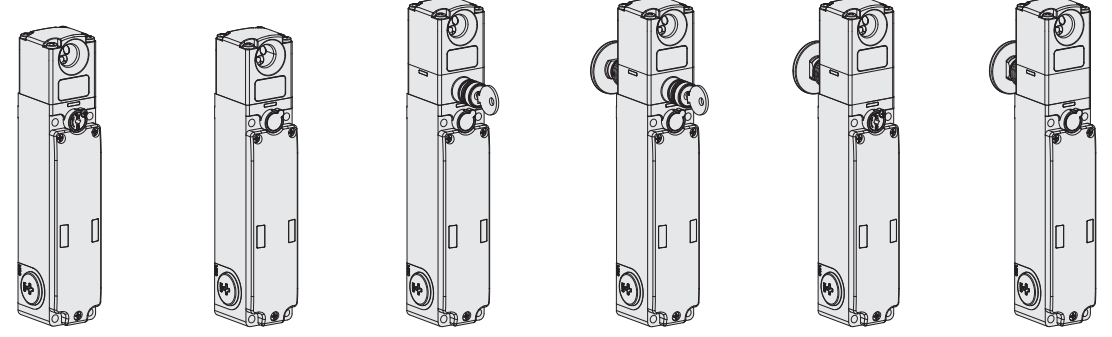
In case of machines with or without inertia of the dangerous elements. Safety category of the safety outputs: PL e, SIL 3. In case of machines without inertia of the dangerous elements. Safety category of the safety outputs: PL e, SIL 3. In case of machines with or without inertia of the dangerous elements. Safety category of the safety outputs: PL d, SIL 2.

### Selection table for switches with high level coded actuators



| Operating principle | Locked actuator with de-energised solenoid. With sealable auxiliary release device. | Locked actuator with energised solenoid. | Locked actuator with de-energised solenoid. With key release. | Locked actuator with de-energised solenoid. With key release and escape release button. | Locked actuator with de-energised solenoid. With escape release button and sealable auxiliary release device. | Locked actuator with energised solenoid. With escape release button. |
|---------------------|---|--|---|---|---|--|
| Mode 1              | NG 2D1D411A-F31   | NG 2D1E411A-F31                          | NG 2D5D411A-F31   | NG 2D6D411A-F31   | NG 2D7D411A-F31   | NG 2D7E411A-F31  |
| Mode 2              | NG 2D1D421A-F31   | NG 2D1E421A-F31                          | NG 2D5D421A-F31   | NG 2D6D421A-F31   | NG 2D7D421A-F31   | NG 2D7E421A-F31  |
| Mode 3              | NG 2D1D431A-F31   | NG 2D1E431A-F31                          | NG 2D5D431A-F31   | NG 2D6D431A-F31   | NG 2D7D431A-F31   | NG 2D7E431A-F31  |

### Selection table for switches

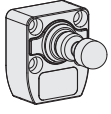


| Operating principle | Locked actuator with de-energised solenoid. With sealable auxiliary release device. | Locked actuator with energised solenoid. | Locked actuator with de-energised solenoid. With key release. | Locked actuator with de-energised solenoid. With key release and escape release button. | Locked actuator with de-energised solenoid. With escape release button and sealable auxiliary release device. | Locked actuator with energised solenoid. With escape release button. |
|---------------------|---|--|---|---|---|--|
| Mode 1              | NG 2D1D411A   | NG 2D1E411A                              | NG 2D5D411A   | NG 2D6D411A   | NG 2D7D411A   | NG 2D7E411A  |
| Mode 2              | NG 2D1D421A   | NG 2D1E421A                              | NG 2D5D421A   | NG 2D6D421A   | NG 2D7D421A   | NG 2D7E421A  |
| Mode 3              | NG 2D1D431A   | NG 2D1E431A                              | NG 2D5D431A   | NG 2D6D431A   | NG 2D7D431A   | NG 2D7E431A  |

**To order a product with EDM input** replace number 4 with number 5 in the codes shown above. Example: NG 2D1D411A → NG 2D1D511A

**Legend:** interlock with lock monitoring acc. to EN ISO 14119

### Selection table for actuators

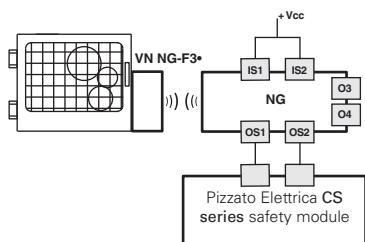


| Level of coding acc. to EN ISO 14119 | Article   |
|--------------------------------------|-----------|
| low                                  | VN NG-F30 |
| high                                 | VN NG-F31 |

The use of RFID technology in NG series devices makes them suitable for several applications. Pizzato Elettrica offers two different versions of actuators, in order to best suit customers' specific needs. Type F30 actuators are all encoded with the same code. This implies that a device associated with an actuator type F30 can be activated by other actuators type F30. Type F31 actuators are always encoded with different codes. This implies that a device associated with an actuator type F31 can be activated only by a specific actuator. Another F31 type actuator will not be recognised by the device until a new association procedure is carried out (reprogramming). After reprogramming, the old actuator F31 will no longer be recognized. Reprogramming of the actuator can be performed repeatedly.

## Complete safety system

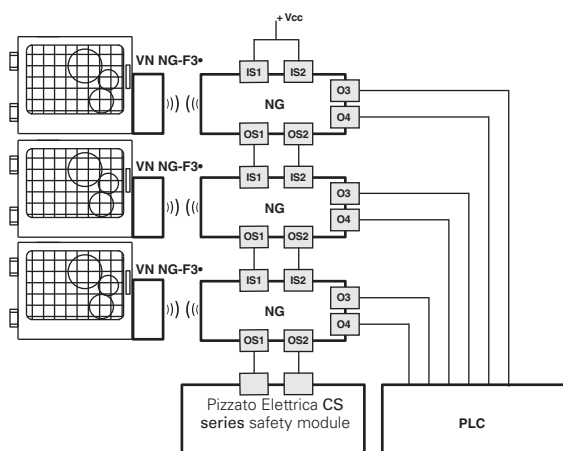
The use of complete and tested solutions guarantees the electrical compatibility between the NG series switches and the safety modules from Pizzato Elettrica, as well as high reliability. The switches have been tested with the modules listed in the adjacent table.



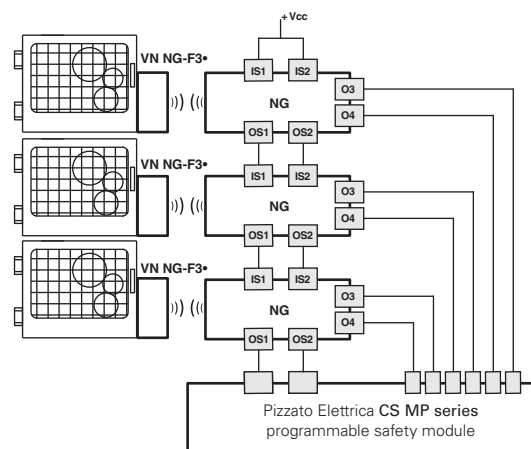
NG series switches can be used as individual devices provided that the safety outputs be evaluated by a Pizzato Elettrica safety module (see table for combinable safety modules).

| Switches   | Compatible safety modules | Safety module output contacts |                         |                     |
|------------|---------------------------|-------------------------------|-------------------------|---------------------|
|            |                           | Instantaneous safety contacts | Delayed safety contacts | Signalling contacts |
| NG 2●●●●●● | CS AR-01●●●●●             | 2NO                           | /                       | 1NC                 |
|            | CS AR-02●●●●●             | 3NO                           | /                       | /                   |
|            | CS AR-05●●●●●             | 3NO                           | /                       | 1NC                 |
|            | CS AR-06●●●●●             | 3NO                           | /                       | 1NC                 |
|            | CS AR-08●●●●●             | 2NO                           | /                       | /                   |
|            | CS AT-0●●●●●              | 2NO                           | 2NO                     | 1NC                 |
|            | CS AT-1●●●●●              | 3NO                           | 2NO                     | /                   |
|            | CS MP●●●●●                |                               | See p. 369              |                     |
|            | CS MF●●●●●                |                               | See p. 401              |                     |

All NG series switches can be connected to safety modules or safety PLCs with OSSD inputs provided compatibility is ensured in advance.

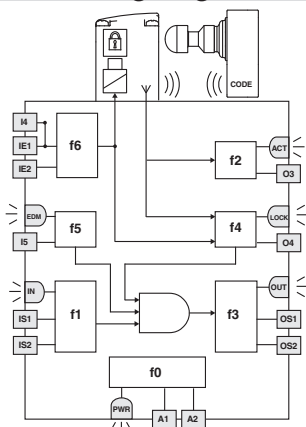


Possibility of series connection of multiple switches for simplifying the wiring of the safety system, whereby only the outputs of the last switch are evaluated by a Pizzato Elettrica safety module (see table with compatible safety modules). Each NG series switch is provided with two signalling outputs which are activated when the guard is closed (O3) or locked (O4). Depending on the specific requirements of the system that has been realised, the signals of the signalling outputs can be evaluated by a PLC.



Possibility of series connection of multiple switches for simplifying the wiring of the safety system, whereby only the outputs of the last switch are evaluated by a Pizzato Elettrica safety module of the CS MP series. Both the safety-relevant evaluation and the evaluation of the signalling outputs are performed by the CS MP series. The examples listed above refer to applications with NG 2●●●●●●.

## Internal wiring diagram



| LED  | Function                         |
|------|----------------------------------|
| PWR  | Power supply / self-diagnosis    |
| IN   | status of safety inputs          |
| OUT  | status of safety outputs         |
| ACT  | actuator state                   |
| LOCK | actuator locked                  |
| EDM  | state of EDM input (NG 2D●●5●●●) |

The diagram on the side represents the 6 logic functions which interact inside the device. Function f0 is a basic function and includes the monitoring of the power supply as well as internal, cyclical tests.

Function f1 monitors the status of the device inputs, whereas function f2 monitors the presence of the actuator within the detection areas of the switch.

Function f4 checks the actuator lock condition.

Function f3 is intended to activate or deactivate the safety outputs and check for any faults or short circuits in the outputs.

In the EDM versions, the f5 function verifies the consistency of the EDM signal during safety output state changes.

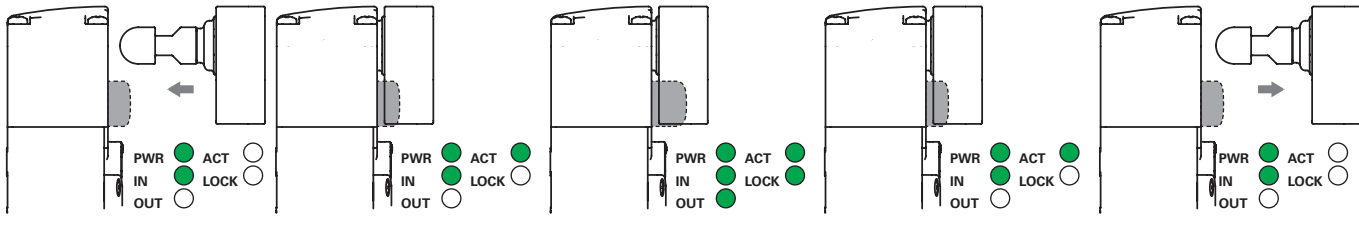
The safety-related function, which combines the sub-functions mentioned above, activates the safety outputs according to the chosen operating mode:

- Both safety outputs OS1/OS2 for switches in mode 1 are activated only if both IS1/IS2 safety inputs are active and the actuator is inserted and locked;
- Both safety outputs OS1/OS2 for switches in mode 2 are activated only if both IS1/IS2 safety inputs are active and the actuator is inserted;
- The safety output OS1 for switches in mode 3 is activated only if the IS1 safety input is active and the actuator is inserted and locked, whereas the safety output OS2 is activated only if the IS2 safety input is active and the actuator is inserted.

The status of each function is displayed by the corresponding LED (PWR, IN, OUT, ACT, LOCK, EDM), in such a way that the general device status becomes immediately obvious to the operator.



### Actuation sequence in mode 1



The switch is supplied with power (PWR LED on, green), the IS1 and IS2 inputs are enabled (IN LED on, green), the OS1 and OS2 safety outputs are disabled (OUT LED off). The actuator is outside of the actuation zone (LED ACT off).

When the actuator is brought inside the safe actuation area (dark grey area), the switch turns on the ACT LED (green). In this position, the O3 signalling output (door-closed) is activated. The actuator is not locked (LOCK LED off).

The I4 input can be used to lock the actuator (LOCK LED on, green). The OS1 and OS2 safety outputs are enabled (OUT LED on, green). The O4 signalling output is activated at the same time. The safe actuation area is extended in order to allow greater play for the actuator.

The I4 input can be used to unlock the actuator (LOCK LED off). The switch disables the OS1 and OS2 safety outputs and turns off the OUT LED. The O4 signalling output is deactivated at the same time. The safe actuation area returns to the initial values.

When the actuator leaves the actuation limit area, the device turns off the ACT LED and the O3 signalling output.

### Actuation sequence in mode 2 and mode 3

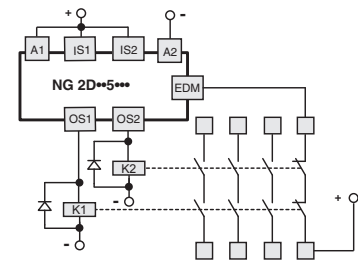
In contrast to the above mode 2 description, the safety outputs OS1 and OS2 are activated when the actuator is detected, and deactivated when the actuator is no longer detectable, in mode 3, the OS1 safety output is active with inserted and locked actuator and IS1 active, the OS2 safety output is active with inserted actuator and IS2 active.

#### Operating states

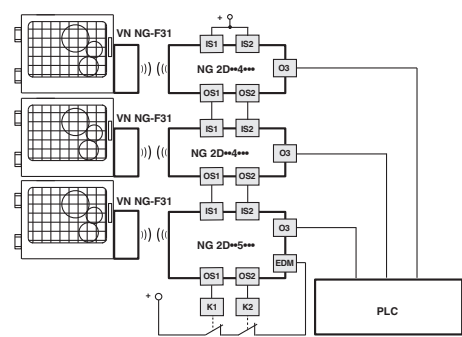
| PWR LED | IN LED | OUT LED | ACT LED | LOCK LED | EDM LED (a) | Device state | Description  |
|---------|--------|---------|---------|----------|-------------|--------------|--|
| ○       | ○      | ○       | ○       | ○        | ○           | OFF          | Device switched off.   |
| ●       | ●      | ●       | ●       | ●        | ●           | POWER ON     | Internal tests upon activation.  |
| ●       | ○      | ○       | *       | *        | ●           | RUN          | Safety inputs of the device not active.  |
| ●       | ●      | *       | *       | *        | *           | RUN          | Activation of safety inputs.   |
| ●       | ●      | ○       | *       | *        | *           | RUN          | Safety inputs incoherence. Recommended action: check for presence and/or wiring of inputs.   |
| ●       | *      | *       | ●       | *        | *           | RUN          | Actuator in safe area. O3 signalling output active.  |
| ●       | *      | *       | ●       | ●        | ○           | RUN          | Actuator in safe area and locked; O3 and O4 outputs active.  |
| ●       | ●      | ●       | ●       | ●        | ○           | RUN          | <b>Mode 1</b><br>Activation of safety inputs IS1, IS2. Actuator in safe area and locked. O3, O4, OS1 and OS2 outputs active.   |
| ●       | ●      | ●       | ●       | *        | ○           | RUN          | <b>Mode 2</b><br>Activation of safety inputs IS1, IS2. Actuator in safe area. O3, OS1 and OS2 outputs active.  |
| ●       | ●      | ●       | ●       | ●        | ○           | RUN          | <b>Mode 3</b><br>Actuator present, guard closed and locked, IS1 enabled, IS2 disabled, OS1 enabled, OS2 disabled.  |
| ●       | ●      | ●       | ●       | ○        | ○           | RUN          | <b>Mode 3</b><br>Actuator present, guard closed and not locked, IS1 and IS2 enabled, OS1 disabled, OS2 enabled.  |
| ●       | *      | ●       | *       | *        | *           | ERROR        | Error on safety outputs. Recommended action: check for any short circuits between the outputs, outputs and ground or outputs and power supply, then restart the device.                                    |
| ●       | ○      | ○       | ●       | ○        | ○           | ERROR        | Actuator detection error. Check the physical integrity of the device and, in case of failure, please replace the entire device. If undamaged, realign the actuator with the switch and restart the device. |
| ●       | ○      | ○       | ○       | ○        | ○           | ERROR        | Internal error. Recommended action: restart the device. If the failure persists, replace the device.   |
| ●       | *      | ○       | *       | *        | ●           | RUN          | EDM signal active (external relay off) <sup>a</sup>  |
| ●       | ●      | ●       | ●       | ●        | ○           | RUN          | EDM signal not active (external relay on) <sup>a</sup>   |
| ●       | ○      | ○       | ○       | ○        | ●           | ERROR        | Error in the EDM <sup>a</sup> function   |

Legend: ○ = off ● = on ● = flashing ● = alternating colours \* = indifferent (a) Available for NG 2D●●5●● versions only

#### External device monitoring (EDM)



The NG 2D●●5●● version, in addition to maintaining the operating and safety characteristics of the NG series, allows control of **forcibly guided NC contacts of contactors or relays** controlled by the safety outputs of the switch itself. As an alternative to the relays or contactors you can use Pizzato Elettrica expansion modules CS ME-03. See page 359 of the General Catalogue Safety 2023-2024. This check is carried out via the EDM input (External Device Monitoring as defined in EN 61496-1) of the switch.



This version, with the IS safety inputs, **can be used at the end of a series of NG switches, up to a maximum number of 32 devices**, while maintaining the maximum PL e safety level and acc. to EN ISO 13849-1 and SIL 3 safety level acc. to EN IEC 62061.

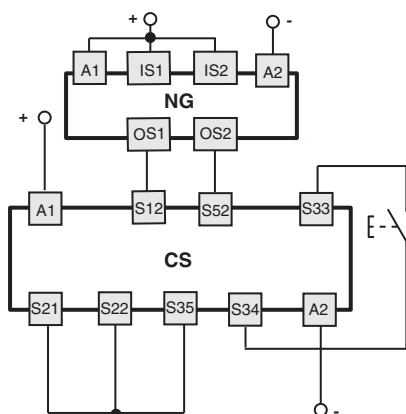
This solution allows you to dispense with the safety module connected to the last device in the chain.



## Connection with safety modules

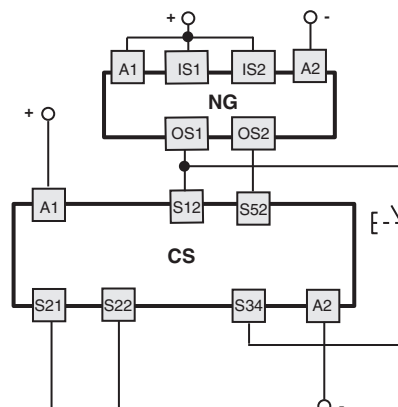
Connections with CS AR-08•••• safety modules

Input configuration with monitored start  
2 channels / Category 4 / up to SIL 3 / PL e



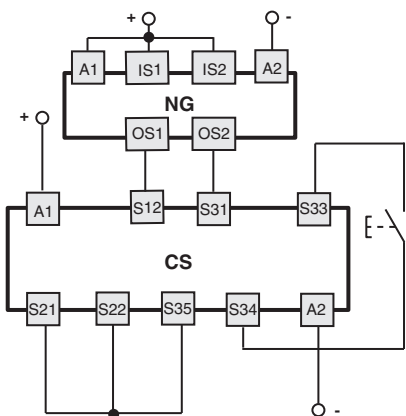
Connections with CS AR-05•••• / CS AR-06•••• safety modules

Input configuration with manual start (CS AR-05••••)  
or monitored start (CS AR-06••••)  
2 channels / Category 4 / up to SIL 3 / PL e



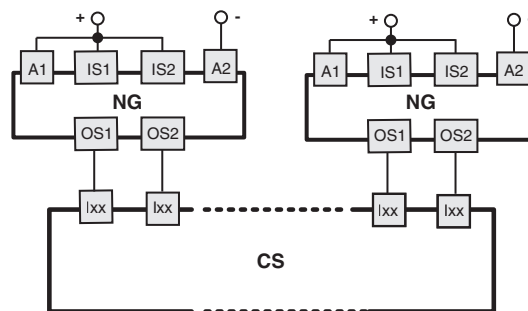
Connections with CS AT-0••••• / CS AT-1••••• safety modules

Input configuration with monitored start  
2 channels / Category 4 / up to SIL 3 / PL e



Connections with CS MF•••••, CS MP••••• safety modules

The connections vary according to the program of the module  
Category 4 / up to SIL 3 / PL e

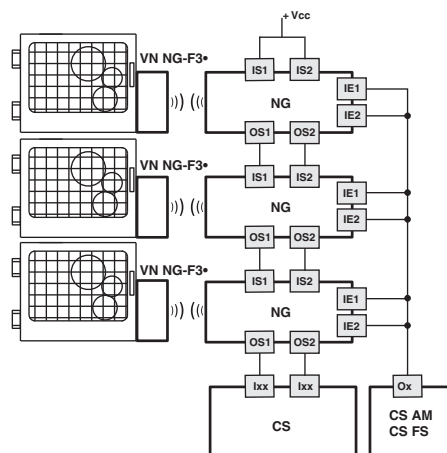


Application example on page 367

## Series connection of several switches

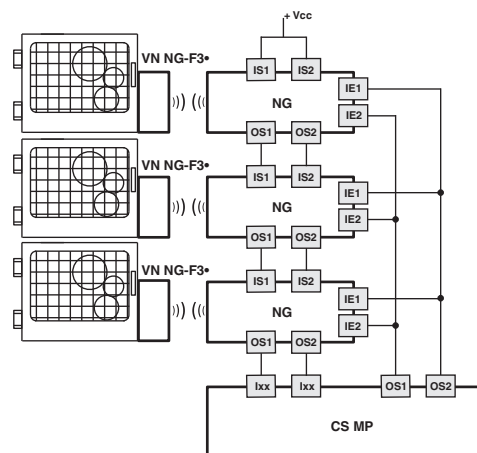
Monitoring function: actuator locked  
2 channels / Category 4 / up to SIL 3 / PL e

Single-channel control for locking function of the actuator  
1 channel / Category 2 / up to SIL 2 / PL d



Monitoring function: actuator locked  
2 channels / Category 4 / up to SIL 3 / PL e

Dual-channel control for locking function of the actuator  
2 channels / Category 4 / up to SIL 3 / PL e



## Connection terminals

PUSH-IN type spring-operated connection system

Cross-section of rigid/flexible wires w. wire-end sleeve:

min. 1 x 0.34 mm<sup>2</sup> (1 x AWG 22)  
max. 1 x 1.5 mm<sup>2</sup> (1 x AWG 16)

Wire cross-section with pre-insulated wire-end sleeve:

min. 1 x 0.25 mm<sup>2</sup> (1 x AWG 23)  
max. 1 x 0.75 mm<sup>2</sup> (1 x AWG 18)

Cable stripping length (x):

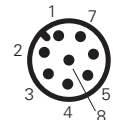
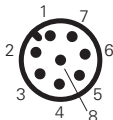
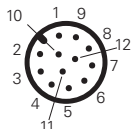
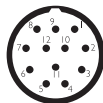
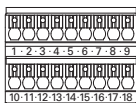
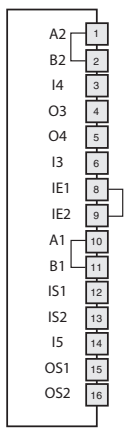
min.: 8 mm  
max.: 12 mm





### Pin assignments (version with standard cover NG 2D••••1A)

| Internal terminal strip | M23 connector 12-pole | M12 connector 12-pole | M12 connector 8-pole stand-alone connection | M12 connector 8-pole series connection with "Y" connectors | Connection  |
|-------------------------|-----------------------|-----------------------|---|--|---|
| A2 1                    | 3                     | 3                     | 3   | 3  | <b>A2</b> Supply input 0 V  |
| B2 2                    | 3                     | 3                     | 3   | 3  | <b>B2</b> 0 V auxiliary supply output                             |
| I4 3                    | 10                    | 10                    | 8   | 8  | <b>I4</b> Solenoid activation input for single channel mode (c)   |
| O4 4                    | 5                     | 5                     | 2   | /  | <b>O3</b> Signalling output, actuator inserted and locked (e)     |
| O4 5                    | 9                     | 9                     | 5   | 5 (f)  | <b>O4</b> Signalling output, actuator inserted and locked (b) (e) |
| I3 6                    | 8                     | 8                     | 6   | /  | <b>I3</b> Actuator programming input / reset                      |
| IE1 8                   | 10                    | 10                    | /   | /  | <b>IE1</b> Solenoid activation input for double channel mode      |
| IE2 9                   | 12 (d)                | 12 (d)                | /   | /  | <b>IE2</b> Solenoid activation input for double channel mode      |
| A1 10                   | 1                     | 1                     | 1   | 1  | <b>A1</b> Supply input +24 Vdc                                    |
| B1 11                   | 1                     | 1                     | 1   | 1  | <b>B1</b> Auxiliary supply output +24 Vdc, 8 A max.               |
| IS1 12                  | 2                     | 2                     | /   | 2  | <b>IS1</b> Safety input   |
| IS2 13                  | 2                     | 2                     | /   | 2  | <b>IS2</b> Safety input   |
| I5 14                   | 6                     | 6                     | /   | 6  | <b>IS2</b> Safety input   |
| OS1 15                  | 11                    | 11                    | /   | /  | <b>I5</b> EDM input (a)   |
| OS2 16                  | 4                     | 4                     | 4   | 4  | <b>OS1</b> Safety output  |
|                         | 7                     | 7                     | 7   | 7  | <b>OS2</b> Safety output  |



**Important:** terminals 7, 17, 18, of the internal terminal strip must not be used.

(a) Available in NG 2D•••5••• version only.  
 (b) For NG 2D•••6•••: the output signals the fault condition of the device.  
 (c) In single-channel actuation mode, inputs IE1 and IE2 must be short-circuited.  
 (d) In dual channel actuation mode, remove the internal bridge between terminals 8-9 and connect the wire from pin 12 to internal terminal 9.  
 (e) For NG 2D•••7••• articles: the signalling outputs O3 and O4 have negative operating logic (low active signal).  
 (f) Available for 8-pole connector, not available for the end of a chain with Y connectors.

Female connectors See page 419

## Switch with integrated field-wireable control devices

| NG 2D••••1C |  |   |                   | NG 2D••••1D                    |   |   |                                | NG 2D••••2V                    |   |   |                                |                                |
|-------------|--|---|-------------------|--------------------------------|---|---|--------------------------------|--------------------------------|---|---|--------------------------------|--------------------------------|
|             | Description                                    | Colour  | Terminals         |                                | Description                               | Colour  | Terminals                      |                                | Description                               | Colour  | Terminals                      |                                |
|             | Device 1                                       | illuminated button, spring-return 1NO+1NC                       | white             | 19 21 31<br>E- 20 22 34<br>LED | Device 1                                  | illuminated button, spring-return 1NO+1NC                       | white                          | 19 21 31<br>E- 20 22 34<br>LED | Device 1                                  | illuminated button, spring-return 1NO+1NC                       | white                          | 19 21 31<br>E- 20 22 34<br>LED |
|             | Device 2                                       | illuminated button, spring-return 1NO+1NC                       | yellow            | 23 25 32<br>E- 24 26 34<br>LED | Device 2                                  | button, not illuminated, spring-return 1NO+1NC                  | black                          | 23 25 32<br>E- 24 26           | Device 2                                  | illuminated button, spring-return 1NO+1NC                       | blue                           | 23 25 32<br>E- 24 26 34<br>LED |
|             | Device 3                                       | emergency stop button, not illuminated, with rotary release 2NC | red               | 27 29<br>E- 28 30              | Device 3                                  | emergency stop button, not illuminated, with rotary release 2NC | red                            | 27 29<br>E- 28 30              | Device 3                                  | emergency stop button, not illuminated, with rotary release 2NC | red                            | 27 29<br>E- 28 30              |
|             | NG 2D••••1E                                    |   |                   |                                | NG 2D••••1F                               |   |                                |                                | NG 2D••••7F                               |   |                                |                                |
|             | Description                                    | Colour  | Terminals         |                                | Description                               | Colour  | Terminals                      |                                | Description                               | Colour  | Terminals                      |                                |
|             | Device 1                                       | illuminated button, spring-return 1NO+1NC                       | white             | 19 21 31<br>E- 20 22 34<br>LED | Device 1                                  | illuminated button, spring-return 1NO+1NC                       | green                          | 19 21 31<br>E- 20 22 34<br>LED | Device 1                                  | illuminated button, spring-return 1NO+1NC                       | white                          | 19 21 31<br>E- 20 22 34<br>LED |
| Device 2    | button, not illuminated, spring-return 1NO+1NC | black   | 23 25<br>E- 24 26 | Device 2                       | illuminated button, spring-return 1NO+1NC | red   | 23 25 32<br>E- 24 26 34<br>LED | Device 2                       | illuminated button, spring-return 1NO+1NC | blue  | 23 25 32<br>E- 24 26 34<br>LED |                                |
|             | NG 2D••••1G                                    |   |                   |                                | NG 2D••••1H                               |   |                                |                                | NG 2D••••3G                               |   |                                |                                |
|             | Description                                    | Colour  | Terminals         |                                | Description                               | Colour  | Terminals                      |                                | Description                               | Colour  | Terminals                      |                                |
|             | Device 1                                       | illuminated button, spring-return 1NO+1NC                       | green             | 19 21 31<br>E- 20 22 34<br>LED | Device 1                                  | illuminated button, spring-return 1NO+1NC                       | white                          | 19 21 31<br>E- 20 22 34<br>LED | Device 1                                  | illuminated button, spring-return 1NO+1NC                       | blue                           | 19 21 31<br>E- 20 22 34<br>LED |

## Internal connections (version with integrated control devices)

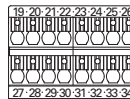
| Terminal no. | Connection   | NG 2D••••1C<br>NG 2D••••1D<br>NG 2D••••2V | NG 2D••••1E<br>NG 2D••••1F<br>NG 2D••••7F | NG 2D••••1G<br>NG 2D••••1H<br>NG 2D••••3G |
|--------------|--|---|---|---|
| 1            | A2 Supply input 0 V  | 1   | 1   | 1   |
| 2            | B2 0 V auxiliary supply output                             | 2   | 2   | 2   |
| 3            | I4 Solenoid activation input for single channel mode (c)   | 3   | 3   | 3   |
| 4            | O3 Signalling output, actuator inserted (d)                | 4   | 4   | 4   |
| 5            | O4 Signalling output, actuator inserted and locked (b) (d) | 5   | 5   | 5   |
| 6            | I3 Actuator programming input / reset                      | 6   | 6   | 6   |
| 8            | IE1 Solenoid activation input for double channel mode      | 8   | 8   | 8   |
| 9            | IE2 Solenoid activation input for double channel mode      | 9   | 9   | 9   |
| 10           | A1 Supply input +24 Vdc                                    | 10  | 10  | 10  |
| 11           | B1 Auxiliary supply output +24 Vdc, 1.5 A max.             | 11  | 11  | 11  |
| 12           | IS1 Safety input   | 12  | 12  | 12  |
| 13           | IS2 Safety input   | 13  | 13  | 13  |
| 14           | I5 EDM input (a)   | 14  | 14  | 14  |
| 15           | OS1 Safety output  | 15  | 15  | 15  |
| 16           | OS2 Safety output  | 16  | 16  | 16  |

| Terminal no. | Connection                          | Diagram |
|--------------|-------------------------------------|---------|
| 19           | Contact 1                           |         |
| 20           | Contact 2                           |         |
| 21           | Contact 3                           |         |
| 22           | Contact 1                           |         |
| 23           | Contact 2                           |         |
| 24           | Contact 3                           |         |
| 25           | Contact 1                           |         |
| 26           | Contact 2                           |         |
| 27           | Contact 3                           |         |
| 28           | Contact 1                           |         |
| 29           | Contact 2                           |         |
| 30           | Contact 3                           |         |
| 31           | Supply input +24 Vdc / LED device 1 |         |
| 32           | Supply input +24 Vdc / LED device 2 |         |
| 33           | Supply input +24 Vdc / LED device 3 |         |
| 34           | Supply input 0 V / LED              |         |

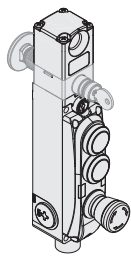
**Important:** terminals 7, 17, 18, of the internal terminal strip must not be used.  
 (a) Available in NG 2D••••5••• version only.  
 (b) For NG 2D••••6•••: the output signals the fault condition of the device.  
 (c) In single-channel actuation mode, inputs IE1 and IE2 must be short-circuited.  
 (d) For NG 2D••••7••• articles: the signalling outputs O3 and O4 have negative operating logic (low active signal).

Internal terminal strip integrated control devices





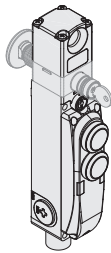
### Switch with integrated control devices and M23 connector, 19-pole



| NG 2D••••1C-K603 |   |        |                |
|------------------|---|--------|----------------|
|                  | Description   | Colour | Terminals      |
| Device 1         | illuminated button, spring-return 1NO                           | white  | 17 18<br>6 19  |
| Device 2         | illuminated button, spring-return 1NO                           | yellow | 15 16<br>6 19  |
| Device 3         | emergency stop button, not illuminated, with rotary release 2NC | red    | 10 13<br>11 14 |

| NG 2D••••1D-K603 |   |        |                |
|------------------|---|--------|----------------|
|                  | Description   | Colour | Terminals      |
| Device 1         | illuminated button, spring-return 1NO                           | white  | 17 18<br>6 19  |
| Device 2         | button, not illuminated, spring-return 1NO                      | black  | 15<br>6        |
| Device 3         | emergency stop button, not illuminated, with rotary release 2NC | red    | 10 13<br>11 14 |

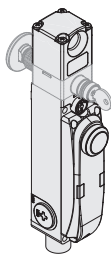
| NG 2D••••2V-K603 |   |        |                |
|------------------|---|--------|----------------|
|                  | Description   | Colour | Terminals      |
| Device 1         | illuminated button, spring-return 1NO                           | white  | 17 18<br>6 19  |
| Device 2         | illuminated button, spring-return 1NO                           | blue   | 15 16<br>6 19  |
| Device 3         | emergency stop button, not illuminated, with rotary release 2NC | red    | 10 13<br>11 14 |



| NG 2D••••1E-K602 |  |        |               |
|------------------|--|--------|---------------|
|                  | Description                                | Colour | Terminals     |
| Device 1         | illuminated button, spring-return 1NO      | white  | 17 18<br>6 19 |
| Device 2         | button, not illuminated, spring-return 1NO | black  | 15<br>6       |

| NG 2D••••1F-K602 |                                       |        |               |
|------------------|---------------------------------------|--------|---------------|
|                  | Description                           | Colour | Terminals     |
| Device 1         | illuminated button, spring-return 1NO | green  | 17 18<br>6 19 |
| Device 2         | illuminated button, spring-return 1NO | red    | 15 16<br>6 19 |

| NG 2D••••7F-K602 |                                       |        |               |
|------------------|---------------------------------------|--------|---------------|
|                  | Description                           | Colour | Terminals     |
| Device 1         | illuminated button, spring-return 1NO | white  | 17 18<br>6 19 |
| Device 2         | illuminated button, spring-return 1NO | blue   | 15 16<br>6 19 |

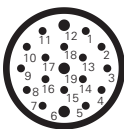


| NG 2D••••1G-K601 |                                       |        |               |
|------------------|---------------------------------------|--------|---------------|
|                  | Description                           | Colour | Terminals     |
| Device 1         | illuminated button, spring-return 1NO | green  | 17 18<br>6 19 |

| NG 2D••••1H-K601 |                                       |        |               |
|------------------|---------------------------------------|--------|---------------|
|                  | Description                           | Colour | Terminals     |
| Device 1         | illuminated button, spring-return 1NO | white  | 17 18<br>6 19 |

| NG 2D••••3G-K601 |                                       |        |               |
|------------------|---------------------------------------|--------|---------------|
|                  | Description                           | Colour | Terminals     |
| Device 1         | illuminated button, spring-return 1NO | blue   | 17 18<br>6 19 |

### Internal connections (version with integrated control devices)



| M23 connector, 19-pole | Connection |   |
|------------------------|------------|---|
| 19                     | A2         | Supply input 0 V  |
| 19                     | B2         | 0 V auxiliary supply output                             |
| 1                      | I4         | Solenoid activation input for single channel mode       |
| 8                      | O3         | Signalling output, actuator inserted (c)                |
| 9                      | O4         | Signalling output, actuator inserted and locked (b) (c) |
| 7                      | I3         | Actuator programming input / reset                      |
| /                      | IE1        | Solenoid activation input for double channel mode (d)   |
| /                      | IE2        | Solenoid activation input for double channel mode (d)   |
| 6                      | A1         | Supply input +24 Vdc                                    |
| 6                      | B1         | Auxiliary supply output +24 Vdc, 1.5 A max.             |
| 2                      | IS1        | Safety input  |
| 3                      | IS2        | Safety input  |
| 12                     | I5         | EDM input (a)   |
| 4                      | OS1        | Safety output   |
| 5                      | OS2        | Safety output   |

**Important:** terminals 7, 17, 18, of the internal terminal strip must not be used.

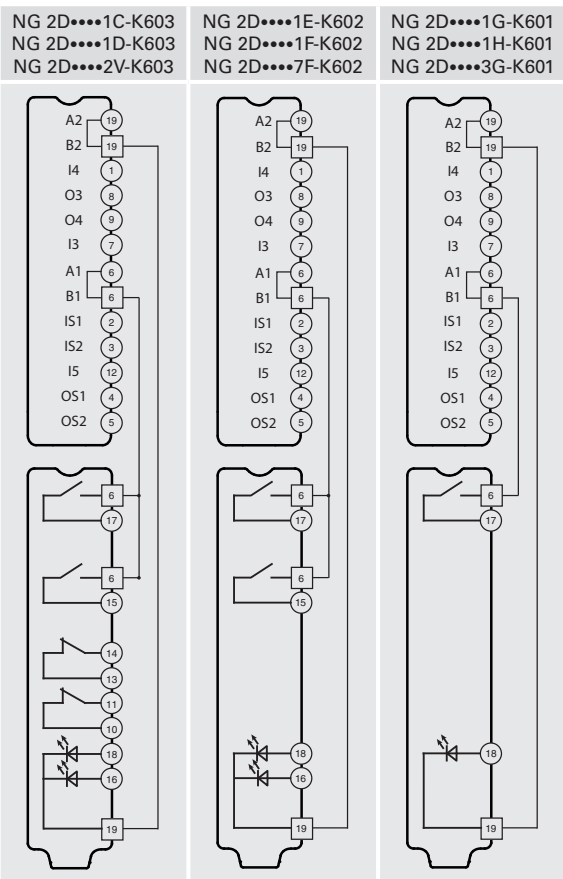
(a) Available in NG 2D••••5 version only.

(b) For NG 2D••••6: the output signals the fault condition of the device.

(c) For NG 2D••••7: the signalling outputs O3 and O4 have negative operating logic (low active signal).

(d) Input not connected.

|    |                                     |          |  |
|----|-------------------------------------|----------|--|
| 17 | Contact 1                           | Device 1 |  |
| 6  | Contact 2                           |          |  |
| /  | Contact 1                           | Device 2 |  |
| 15 | Contact 2                           |          |  |
| 6  | Contact 1                           | Device 3 |  |
| 10 | Contact 2                           |          |  |
| 11 | Contact 1                           |          |  |
| 13 | Contact 2                           |          |  |
| 14 | Contact 2                           |          |  |
| 18 | Supply input +24 Vdc / LED device 1 |          |  |
| 16 | Supply input +24 Vdc / LED device 2 |          |  |
| /  | Supply input +24 Vdc / LED device 3 |          |  |
| 19 | Supply input 0 V / LED              |          |  |



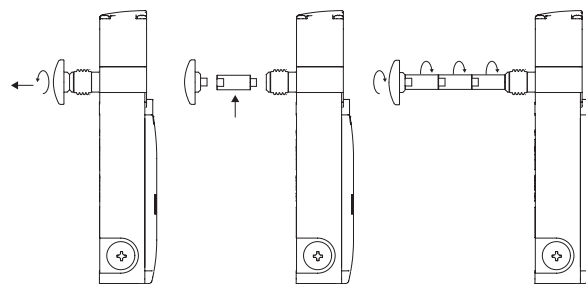
**Female connectors** see page 419





## Extensions for release button

| Article    | Description  | Drawing |
|------------|--|---------|
| VN NG-LP30 | Metal extension for release button. For max. wall thickness of 30 mm |         |
| VN NG-LP40 | Metal extension for release button. For max. wall thickness of 40 mm |         |
| VN NG-LP50 | Metal extension for release button. For max. wall thickness of 50 mm |         |
| VN NG-LP60 | Metal extension for release button. For max. wall thickness of 60 mm |         |
| VN NG-ERB  | Red metal release button   |         |



- Metal extensions can be combined with one another to achieve the desired length.
- Do not exceed an overall length of 500 mm between the release button and the switch.
- Use medium-strength thread locker to secure the extensions.

## Adhesive labels for escape release button



Polycarbonate yellow adhesive, rectangular, 300x32 mm, red inscription. It has to be fixed on the internal part of the jamb and helps finding the escape release button.

| Article       | Description          |
|---------------|----------------------|
| VF AP-A1AGR01 | PREMERE PER USCIRE   |
| VF AP-A1AGR02 | PUSH TO EXIT         |
| VF AP-A1AGR04 | ZUM ÖFFNEN DRÜCKEN   |
| VF AP-A1AGR05 | POUSSER POUR SORTIR  |
| VF AP-A1AGR06 | PULSAR PARA SALIR    |
| VF AP-A1AGR07 | НАЖАТЬ ДЛЯ ВЫХОДА    |
| VF AP-A1AGR08 | NACISNAĆ ABY WYJŚĆ   |
| VF AP-A1AGR09 | PRESSIONAR PARA SAIR |

## Accessories

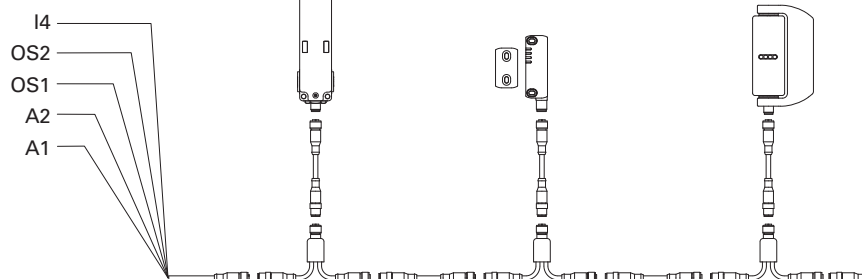
| Article   | Description   |
|-----------|---|
| VF KLB300 | Set of two locking keys   |
|           | Extra copy of the locking keys to be purchased if further keys are needed (standard supply: 2 units).<br>The keys of all switches have the same code. Other codes on request. |
| Article   | Description   |
| VN NG-ERX | AISI 316 stainless steel release button   |
|           | AISI 316 stainless steel release button, unpainted. Guarantees a high resistance against corrosion and aggressive cleaning.   |

## Series connection



















To simplify series connections of the devices, various M12 connectors are available that allow complete wiring.




This solution significantly reduces installation times while at the same time maintaining the maximum safety levels PL e and SIL 3.

For more information see page 426 of the General Catalogue Safety 2023-2024.



## Available control devices

|   | Description   | Colour  | Spare part number   | Combinable with contacts <sup>(1)</sup> | Protrusion (x) mm |
|---|---|---|---|---|-------------------|
|     | Illuminated button, spring-return   | <ul style="list-style-type: none"> <li>● White</li> <li>● Red</li> <li>● Green</li> <li>● Yellow</li> <li>● Blue</li> </ul> | VN NG-AC27121<br>VN NG-AC27123<br>VN NG-AC27124<br>VN NG-AC27125<br>VN NG-AC27126 | 1NO<br>(1NC)<br>(2NO)<br>(1NO+1NC)      | 3                 |
|     | Non-illuminated button, spring-return   | ● Black   | VN NG-AC27122   | 1NO<br>(1NC)<br>(2NO)<br>(1NO+1NC)      | 3                 |
|     | Non-laser-markable, illuminated, projecting spring-return push button                           | ● Red   | VN NG-AC26018   | 1NO<br>(1NC)<br>(2NO)<br>(1NO+1NC)      | 6,1               |
|     | Indicator light   | <ul style="list-style-type: none"> <li>● Red</li> <li>● Yellow</li> <li>● Green</li> <li>● Blue</li> <li>● White</li> </ul> | VN NG-AC26060<br>VN NG-AC26061<br>VN NG-AC26062<br>VN NG-AC26063<br>VN NG-AC26064 | /                                       | 2,7               |
|     | Emergency stop button acc. to EN ISO 13850  |   |   | 2NC                                     | 26,4              |
|    | Rotary release<br>Push-pull release   | <ul style="list-style-type: none"> <li>● Red</li> <li>● Red</li> </ul>  | VN NG-AC26052<br>VN NG-AC26055  |   |                   |
|   | Emergency stop button acc. to EN ISO 13850 for 2NC + 1NO contacts, spring-return <sup>(2)</sup> |   |   | 2NC + 1NO, spring-return                | 26,4              |
|   | Rotary release  | ● Red   | VN NG-AC26056   |   |                   |
|   | Illuminated emergency stop button acc. to EN ISO 13850  |   |   | 2NC                                     | 26,4              |
|   | Rotary release<br>Push-pull release   | <ul style="list-style-type: none"> <li>● Red</li> <li>● Red</li> </ul>  | VN NG-AC26051<br>VN NG-AC26054  |   |                   |
|   | Simple stop button  |   |   | 2NC                                     | 26,4              |
|   | Rotary release<br>Push-pull release   | <ul style="list-style-type: none"> <li>● Black</li> <li>● Black</li> </ul>  | VN NG-AC26053<br>VN NG-AC26057  |   |                   |
|   | Illuminated selector switch with handle, with transparent lens for LED                          |   |   |   |                   |
|  | <ul style="list-style-type: none"> <li>∨</li> <li>▷</li> <li>∨</li> <li>∨</li> </ul>            | <ul style="list-style-type: none"> <li>● Black</li> <li>● Black</li> <li>● Black</li> <li>● Black</li> </ul>                | VN NG-AC26033<br>VN NG-AC26030<br>VN NG-AC26034<br>VN NG-AC26031                  | 1NO<br>1NC<br>(2NO)<br>(1NO+1NC)        | 16,8              |
|   | Key selector switch, 2 positions  |   |   |   |                   |
|  | <ul style="list-style-type: none"> <li>∨</li> <li>▷</li> <li>∨</li> </ul>                       | <ul style="list-style-type: none"> <li>● Black</li> <li>● Black</li> <li>● Black</li> </ul>                                 | VN NG-AC26043<br>VN NG-AC26040<br>VN NG-AC26041                                   | 1NO<br>(1NC)<br>(2NO)<br>(1NO+1NC)      | 39 (a)<br>14 (b)  |
|   | Closing cap   | ● Black   | VN NG-AC26020   | /                                       | 2,7               |
|   | Fixing key  | ● Black   | VN NG-AC26080   | /                                       | /                 |

**Legend:**  Maintained  Spring-return  Key extraction position (a) with key (b) without key

<sup>(1)</sup> The contacts in brackets are on request. Contact our technical department to verify the effective feasibility of the control device unit with the chosen combination of control devices.

<sup>(2)</sup> The NO contact with spring-return is only activated if the emergency stop button reaches the stop. The signal of the NO contact is captured by analysing the rising edge.

**To order buttons with marking:**

add the marking code indicated in the tables on pp. 165-168 to the article codes of the General Catalogue HMI 2023-2024.

Example: Black spring-return button with "O" engraving.

VN NG-AC27122 → VN NG-AC27122-L1



## Technical data of the control devices

### General data

|                              |  |
|------------------------------|--|
| Protection degree:           | IP65 acc. to EN 60529                                |
| Mechanical endurance:        |  |
| Spring-return button:        | 1 million operating cycles                           |
| Emergency stop button:       | 50,000 operating cycles                              |
| Selector switch:             | 300,000 operating cycles                             |
| Key selector switch:         | 50,000 operating cycles                              |
|                              | 30,000 operating cycles including removal of the key |
| Safety parameter $B_{10D}$ : | 100,000 (emergency stop button)                      |

### Actuating force

|                        |            |             |
|------------------------|------------|-------------|
| Spring-return button:  | 4 N min    | 100 N max.  |
| Emergency stop button: | 20 N min   | 100 N max.  |
| Selector switch:       | 0.1 Nm min | 1.5 Nm max. |
| Key selector switch:   | 0.1 Nm min | 1.3 Nm max. |

### Contact blocks of the control devices

|                           |   |
|---------------------------|---|
| Material of the contacts: | silver contacts                                 |
| Contact type:             | Self-cleaning contacts with double interruption |

### Electrical data:

|   |                  |
|---|------------------|
| Thermal current $I_{th}$ :                  | 1 A              |
| Rated insulation voltage $U_i$ :            | 32 Vac/dc        |
| Rated impulse withstand voltage $U_{imp}$ : | 1.5 kV           |
| LED supply voltage:                         | 24 Vdc $\pm$ 15% |
| LED supply current:                         | 10 mA per LED    |

### Utilization category of the contact block:

|                      |
|----------------------|
| Direct current: DC13 |
| $U_e$ (V) 24         |
| $I_e$ (A) 0.55       |

### Signalling contact with spring return:

|                      |
|----------------------|
| Direct current: DC13 |
| $U_e$ (V) 24         |
| $I_e$ (mA) 10        |

### In compliance with standards:

IEC 60947-5-1, IEC 60947-5-5, EN ISO 13850

### Installation for safety applications:

Always connect the safety circuit to the **NC contacts** (normally closed contacts) as stated in standard EN 60947-5-1.