

# Safety Switches with Metal Housing



**EUCHNER**  
More than safety.

# EUCHNER

More than safety.



Headquarters in Leinfelden-Echterdingen



Logistics center in Leinfelden-Echterdingen



Production location in Unterböhringen

## Internationally successful – the EUCHNER company

EUCHNER GmbH + Co. KG is a world-leading company in the area of industrial safety technology. EUCHNER has been developing and producing high-quality switching systems for mechanical and systems engineering for more than 60 years.

The medium-sized family-operated company based in Leinfelden, Germany, employs more than 600 people around the world.

In addition to the production locations in Unterböhringen and Shanghai/China, 15 subsidiaries and other sales partners in Germany and abroad work for our international success on the market.

## Quality and innovation – the EUCHNER products

A look into the past shows EUCHNER to be a company with a great inventive spirit. We take the technological and ecological challenges of the future as an incentive for extraordinary product developments.

EUCHNER safety switches monitor safety doors on machines and installations, help to minimize dangers and risks and thereby reliably protect people and processes. Today, our products range from electromechanical and electronic components to intelligent integrated safety solutions. Safety for people, machines and products is one of our dominant themes.

We define future safety technology with the highest quality standards and reliable technology. Extraordinary solutions ensure the great satisfaction of our customers. The product ranges are subdivided as follows:

- ▶ Transponder-coded Safety Switches (CES)
- ▶ Transponder-coded Safety Switches with guard locking (CET)
- ▶ Interlocking and guard locking systems (Multifunctional Gate Box MGB)
- ▶ Access management systems (Electronic-Key-System EKS)
- ▶ Electromechanical Safety Switches
- ▶ Magnetically coded Safety Switches (CMS)
- ▶ Enabling Switches
- ▶ Safety Relays
- ▶ Emergency Stop Devices
- ▶ Hand-Held Pendant Stations and Handwheels
- ▶ Safety Switches with AS-Interface
- ▶ Joystick Switches
- ▶ Position Switches



## Safety Switches with Metal Housing

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<b>General</b>	<b>4</b>
About this catalog	4
How can I find the right switch?	4
Standards and approvals	5
Function and technology used in safety switches	5
Attaching safety switches	10
Overview of the switching elements	13
<b>Safety Switches with Safety Function, Metal Housing</b>	<b>15</b>
Single limit switches N1A and NB01	15
Safety switches NZ	23
<b>Safety Switches with Separate Actuator, Metal Housing</b>	<b>47</b>
Safety switches NZ.VZ without guard locking	47
Safety switches NZ.VZ.VS with guard locking	53
Safety switches TZ with guard locking and guard lock monitoring	59
Safety switches NX without guard locking	85
Safety switches TX with guard locking and guard lock monitoring	87
Safety switches SGA without guard locking	95
Safety switches STA with guard locking and guard lock monitoring	99
<b>Safety Hinges, Metal Housing</b>	<b>105</b>
Hinges ESH	105
<b>Accessories for Safety Switches</b>	<b>109</b>
Actuators	110
Plug connectors	119
Cable glands	124
Mounting plates	125
Miscellaneous accessories	129
Bolts for safety guards	135
<b>Technical Data</b>	<b>153</b>
<b>Appendix</b>	<b>187</b>
Safety and mounting instructions	187
Overview of the most important standards on machinery safety	188
Glossary	191
<b>Item Index</b>	<b>197</b>
Index by item designation	197
Index by order numbers	204

## About this catalog

The catalog Safety switches with metal housings provides an overview of our safety switches with metal housings in the series N1A, NB01, NZ, TZ, NX, TX, STA and the safety hinge ESH. For numerous applications these switches are the right choice due to their robustness and long service life. You will find the technical data after the product overview. There is a reference to the page with the related technical data on the pages listing the products.

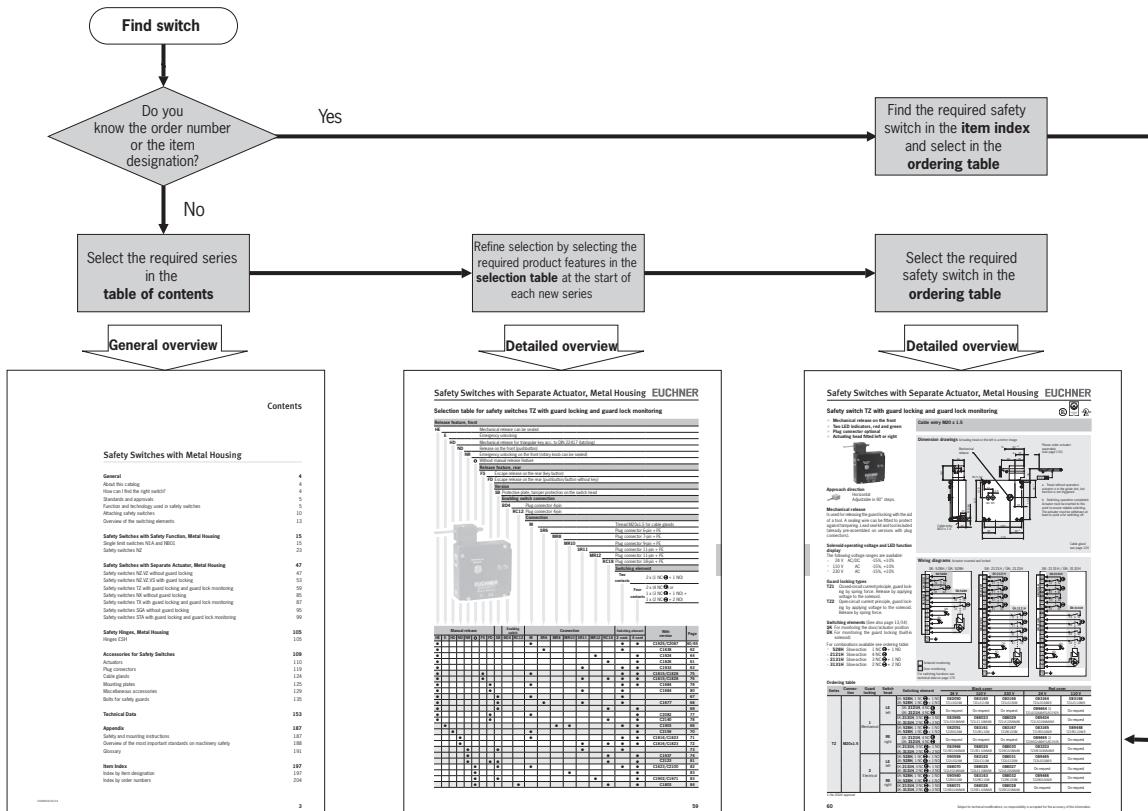
You will find the following series and accessories in this catalog:

Safety switches in metal housing												
With safety function			With separate actuator								Safety hinge ESH	Accessories
Single hole fixing limit switches		Safety switches	Without guard locking			With guard locking		With guard locking and guard lock monitoring				
N1A	NB01	NZ	NZ.VZ	NX	SGA	NZ.VZ.VS	TZ	TX	STA			
												
see page 15	see page 15	see page 23	see page 47	see page 85	see page 95	see page 53	see page 59	see page 87	see page 99	see page 105	see page 105	see page 109

## How can I find the right switch?

There are two ways you can find the right switch:

- If you know the order number or the product designation, look for the switch directly in the item index (see page 197 or page 204).
- If you have specific requirements, refine the selection step-by-step with the aid of the table of contents and the selection tables.



## Standards and approvals

### Standards

Safety switches must meet the requirements for safety components as per the Machinery Directive. The Machinery Directive has been implemented in national law in the EU member states and, as a result, is binding for all manufacturers.

Detailed requirements for the switches are defined in EN 60947 Part 5-1 (Specification for low-voltage switchgear and controlgear. Part 5-1: Control circuit devices and switching elements. Electromechanical control circuit devices).

If the requirements of this standard are met, conformity with the applicable laws and therefore with the Machinery Directive is assumed. EUCHNER safety switches comply with the relevant standards for safety switchgear and therefore help you to comply with safety requirements during the design of your machinery.

### Approvals

To demonstrate conformity, the Machinery Directive also includes the possibility of type examination. Although all relevant standards are taken into account during development, we have all our safety switches subjected to additional type examinations by a notified body.

Many of the safety switches listed in this catalog have been tested by the German Social Accident Insurance association (DGUV), formerly the employers' liability insurance association (BG), and are given in the lists from the DGUV.

Furthermore, numerous switches are listed by Underwriters Laboratories (UL). These switches can be used in countries in which this listing is required. The approval symbols on the individual pages of the catalog indicate which body tested the switches.

With the aid of the approval symbols listed below you can quickly see which approvals are available for the related switches:



Switches with this symbol have the approval of the German Social Accident Insurance association (DGUV) – formerly the employers' liability insurance association (BG)



Switches with this symbol are approved by Underwriters Laboratories (UL, Canada and USA)

### Special approvals:



Switches with this symbol are approved by the Germanischer Lloyd (GL)



Switches with this symbol are compliant with the official Russian standard FOCT (GOST)

## Function and technology used in safety switches

### The task of safety switches

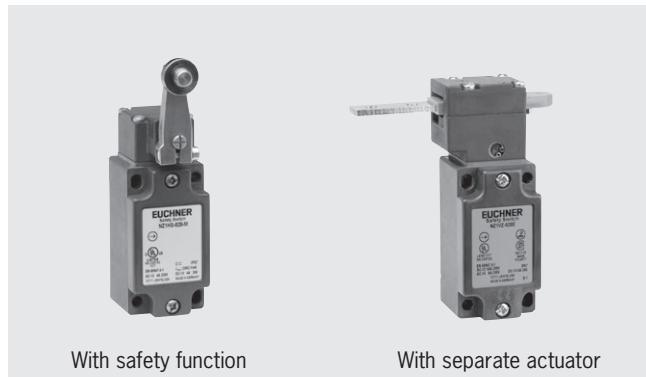
Safety switches have the task of preventing the operation of a machine in the case of a potential hazard. This task is defined in EN 1088 (Safety of machinery. Interlocking devices associated with guards. Principles for design and selection). For this purpose the safety circuit must be opened by the safety switch. Safety switches are therefore key elements of an interlocking device.

In this context an interlocking device is, for example, the interruption of machine operation if the safety door is open – the stop state of the machine is "interlocked" so to speak and unintentional starting is therefore prevented. In relation to movable safety guards this means that if safety doors or safety flaps are open, the machine or system cannot be operated if the machine or system can produce a hazard. For this reason the safety switch for a safety guard must be attached such that a malfunction is excluded. Safety switches must also not be tampered with or bypassed.

The most important feature of a safety switch is at least one NC contact which is operated positively. The switching contacts are separated by a positively driven mechanism when the safety guard is opened.

### Safety switch types

In general, a differentiation is made between safety switches with safety function and safety switches with separate actuator.



With safety function

With separate actuator

EUCHNER has safety switches with safety function and safety switches with separate actuator in its range.

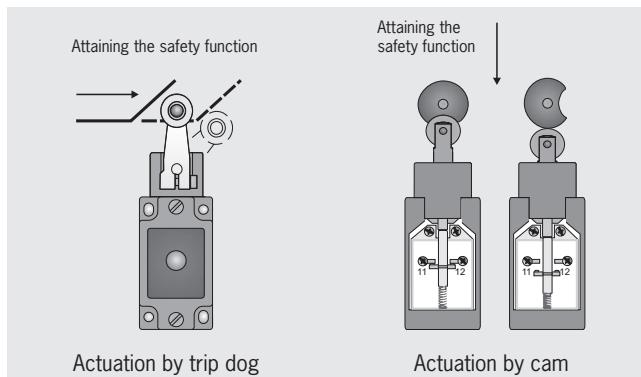
### Safety switches with safety function

Safety switches with safety function are safety switches in which the actuating element and the switch are fitted in one housing. The actuating elements are available in various versions (e.g. in the form of a plunger or a lever arm). The switches N1A, NB01 and NZ listed in this catalog are safety switches with safety function.

To actuate a switch with safety function, trip dogs or cams are often used (see figure on the next page).

The switch must be attached such that the switch is actuated if the safety guard is opened. The positively driven contact in the switching element is opened and the machine is shut down. A built-in spring returns the switch to the free position when the safety guard is closed and the positively driven contact is closed. In this way the safety circuit is enabled again. A safety trip dog with a defined slope should be used to approach the switch. Linear trip dogs are generally used for travel limiting or for shutting down in final positions. A cam with cut-out (negative dog) is particularly suitable for protecting safety guards. An alternative is the safety hinge ESH.

On the safety hinge ESH the cam is already integrated into the switch in a very small space envelope. It is therefore possible to protect movable safety guards with very little mounting effort.



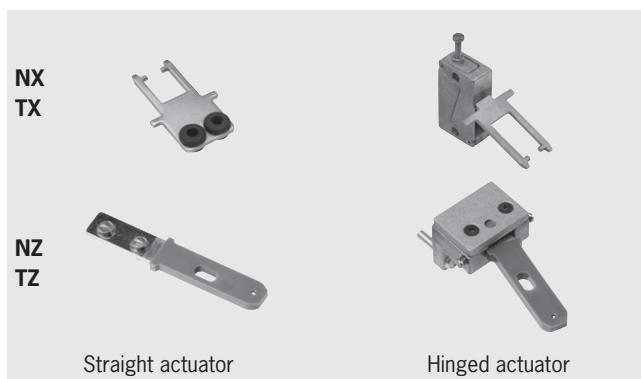
## Safety switches with separate actuator

On safety switches with separate actuator, the actuating element is separate to the switch and is attached to the moving part of the safety guard to be monitored. When the safety guard is closed, the actuating element is inserted in the switch. The actuating elements are available in various versions to suit the safety guard that is to be monitored.

This catalog contains series NZ.VZ, NZ.VZ.VS, TZ, NX, TX and STA switches that are used in combination with separate actuating elements.

## Actuating elements for switches with separate actuator

The safety switches NZ.VZ, NZ.VZ.VS, TZ, NX and TX can only be actuated using a special actuating element with multiple coding. The coding is a type of lock and key principle. The safety switch can only be actuated using an actuating element of a specific shape. Unlike a conventional key, the actuating elements for a switch series are always the same shape.



The switching element is closed by inserting the actuating element in the switch head. The positively driven contact is reliably opened by the positive application of force when the actuating element is removed – even if the contacts are welded together. In the open state, the machinery or systems are then safely interlocked against starting.

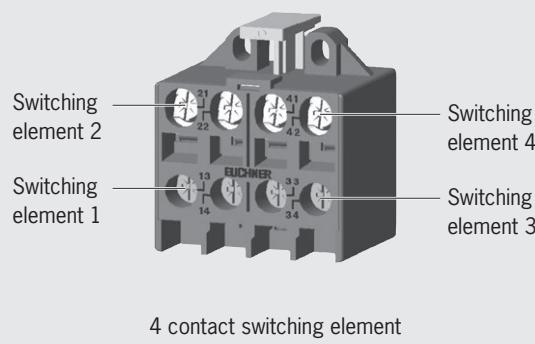
The actuators for the series NZ.VZ and TZ comprise a laminated spring steel core encapsulated in an abrasion-resistant plastic. As the spring steel core comprises three layers, complete fracture on overloading is unlikely. Straight actuators and hinged actuators are available for a wide range of applications in which, e.g. hinged and sliding doors are used. Hinged actuators are spring-mounted actuators that adjust to the inner contours of the switch on insertion in the actuating head. They are suitable for small hinged doors with a radius from 165 mm. For sliding doors and hinged doors with an adequately large pivoting radius (> 1000 mm) a straight actuator can be used.

If increased play is required when the door is closed, an actuator with overtravel is available. With this actuator the door can move slightly in the actuating direction when closed. This is important, for example, if safety doors have a rubber end stop. Using an actuator with overtravel, the continuous pressure from the compressed rubber can be reduced. In this way the load is reduced on the switch head and the door mechanism.

## Switching elements

Different switching elements are available for the switches offered in the catalog:

- ▶ 1 contact switching element
- ▶ 2 contact switching elements with two independent switching contacts
- ▶ 4 contact switching elements with four independent switching contacts



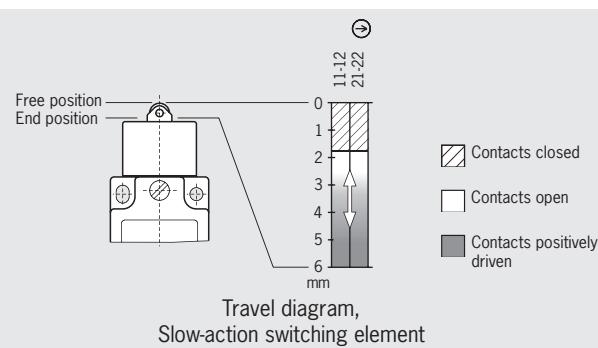
4 contact switching element

Only one switching element is fitted in each case in switches of the series N1A, NB, NZ, NX, TX and STA. Two switching elements are fitted to all series TZ safety switches. In this case one of the switching elements is used to monitor the door position (SK) and the other is used to monitor the position of the guard locking solenoid (ÜK). Switching elements are divided into two types as a function of their switching behavior:

- ▶ Slow-action switching elements and
- ▶ Snap-action switching elements

## Slow-action switching element

Slow-action switching elements are mostly used in safety switches. The opening of the switching element is directly dependent on the position of the actuator. The further the actuator is moved, the further the switching element is opened.

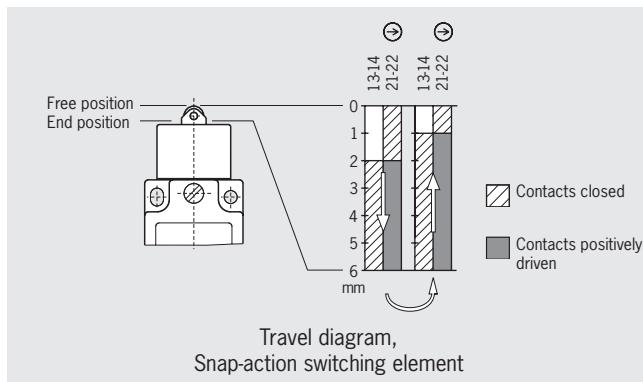


Travel diagram,  
Slow-action switching element

The actuator travel is therefore directly proportional to the travel covered by the switching contact in the switching element. From the travel diagrams it can be seen at which point the switching element changes from the closed state to the open state.

## Snap-action switching element

On snap-action switching elements, the change from the completely closed state to the completely open state is made at a defined point. As a result the switching point is at a defined position unlike on slow-action contact elements. Snap-action switching elements typically have a switching hysteresis.



## Positively driven contacts →

Positively driven contacts are used in the switching elements. These are special switching contacts that are designed to ensure the switching contacts are always reliably separated. Even if contacts are welded together, the connection is opened by the actuating force.

It is a common feature of all switching elements that at least one switching contact is designed as a positively driven contact. Often two positively driven contacts are employed to increase safety using the principle of duplicated design (redundancy). This dual-channel design ensures that on the failure of one channel or on a fault in the control circuit (e. g. in the machine wiring), the interlocking can still be provided with the aid of the second channel.

## Explanation of symbols and notation

Symbols and specific notation related to the switches or the switching contact are used time and again in the catalog.

The following example is intended to explain these aspects:

### Notation

1 NC ⊖ + 1 NO

### Explanation

Normally closed contacts are represented by NC, normally open contacts by NO. The number defines how many contacts are available. The symbol after the NC defines that the NC contact is a positively driven contact. This switch therefore has one normally closed contact and one normally open contact; the normally closed contact is a positively driven contact.

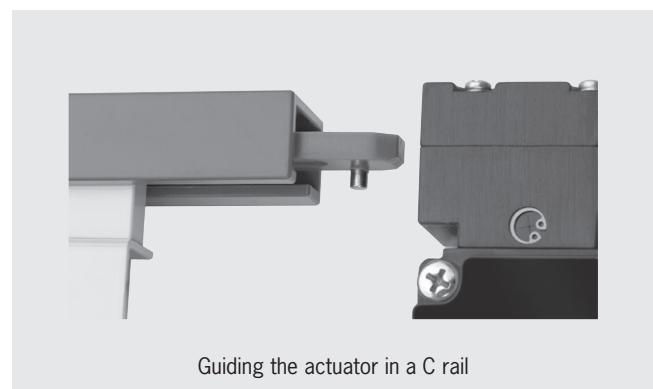
## Auxiliary contacts

### Door monitoring contact

In addition to the safety contacts, auxiliary contacts are also required to indicate to the control system that the safety guard is open. As these switching contacts do not have any safety function, either NC or NO contacts can be used.

## Protection against tampering

A safety switch can only ensure that operation is free of hazards if it is not bypassed. To prevent tampering on switches with separate actuator, the actuator should be positively mounted on the safety guard. All actuating elements are supplied with safety screws that can be fastened using commonly available tools, but that can only be undone with extreme difficulty. It should be ensured that the screws cannot be undone with simple tools. Increased protection against bypassing can be achieved by using a covered installation. In this way it can be made more difficult to insert replacement actuators, or this action can be prevented. Suitable for this purpose, for instance, are rear wall mounting or guiding the actuator in a C rail. Switches with safety function can be installed covered so that the actuating element cannot be reached.



Guiding the actuator in a C rail

## Protective plate

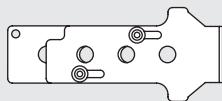
On the switches NZ.VZ, increased protection against bypassing can be achieved by using a protective plate over the switch head. The switch head's rearward opening is then rendered almost inaccessible.



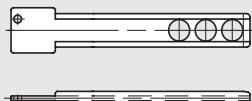
Safety switch with separate actuator with protective plate

## Lockout bar

To prevent the unintentional closing of a safety guard, lockout bars are available for switches with separate actuator. The lockout bar is inserted in the safety switch instead of the actuator when the safety guard is open. The lockout bar can then be secured with commercially available padlocks (up to five locks) to protect against removal.



Lockout bar for three padlocks (here for NX/TX)



Lockout bar for three padlocks (here for NZ/TZ)

This feature guarantees protection for anyone (e.g. maintenance or service personnel, or cleaning staff) who needs to enter potentially hazardous areas. The switches cannot signal a safe (closed) state with a lockout bar fitted. As a result unintentional starting of the machine is not possible.

## Guard locking

Safety switches with separate actuator are available both with and without guard locking. Guard locking is a feature that prevents the unintentional opening of a door as long as there is a hazard. The door is locked by preventing the removal of the actuator from the safety switch. The series N1A, NB, NZ, NX, TX and STA listed in this catalog are safety switches with separate actuator with guard locking.



## Protection of personnel

Guard locking is required if a hazard cannot be removed immediately by shutting down a machine (e.g. a movement with overtravel). In this case fail-safe control of the locking solenoid for the guard locking is required. This requirement can, for instance, be achieved by a standstill monitor or a safe time-delay. The safety switch must also provide a facility for monitoring the position of the solenoid.

The series TZ, TX and STA feature the guard lock monitoring required for this function and can therefore be used for protection of personnel.

## Process protection

Often a safety guard is only to be locked to prevent interruption to the process due to unintentional opening of the safety guard. In this case the position of the guard locking solenoid does not need to be integrated in the safety circuit. In this situation the series NZ.VZ.VS, TZ, TX and STA safety switches are suitable.

## Housing material

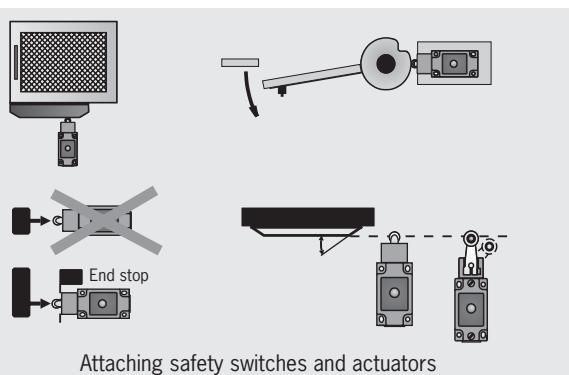
The series N1A, NB, NZ and TZ safety switches have a die-cast alloy housing with an anodized surface. Due to the durable housing material and the high degree of protection (up to IP 67), these switches can be used even under the harshest conditions. The degree of protection only applies to the space for the electrical wiring and not to the actuating head.

## Attaching safety switches with safety function, with separate actuator and the actuators

Certain requirements must be met with respect to attaching the safety switches (e.g. EN 1088 Safety of machinery. Interlocking devices associated with guards. Principles for design and selection).

Any installation position can be used, however, the switches must be attached such that their position cannot be changed in operation. On the other hand, if necessary it must be possible to replace the switches at any time without renewed adjustment.

These requirements are achieved by using reliable fixings that can only be undone using tools. To prevent a change to the position, there must also be no movement in the joint (e.g. by using dowel pins).



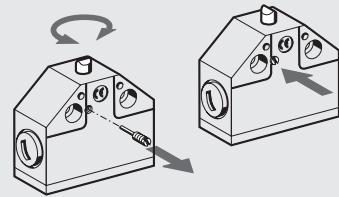
The same applies to the actuators for switches with separate actuator and trip dogs for switches with safety function. A joint without movement is also required here. Above all else, loosening must be prevented. In addition, it must be ensured that cams and trip dogs can only be mounted in the correct position.

To prevent tampering, safety screws can also be used for the attachment of safety switches and trip dogs.

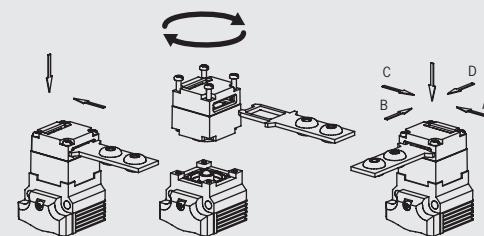
Mounting plates are available to ease the attachment of switches with separate actuator and also actuators. Bolts attached to the safety door are extremely helpful. All requirements, e.g. the mechanical end stop for the door and the exact guidance of the actuator, are optimally met by using bolts.

## Changing the approach direction

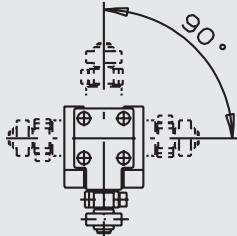
Often the actuator approach direction does not match the standard alignment of the actuating head as delivered. For this reason, the actuating heads on the safety switches NZ, TZ, NX, TX and STA can be very straightforwardly adjusted to the required direction.



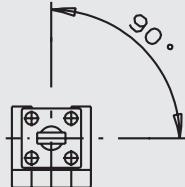
Changing the approach direction  
single hole fixing limit switch N1A/NB01



Changing the approach direction safety switch STA

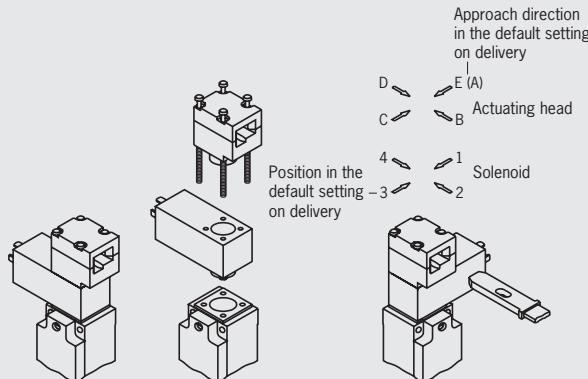


Lever arm

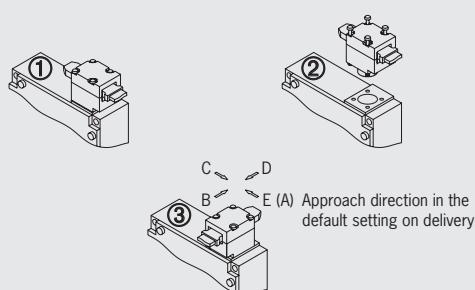


Plunger

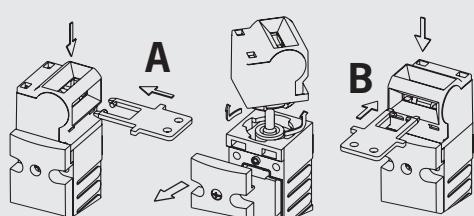
Changing the approach direction safety switch NZ (4 x 90°)



Changing the approach direction safety switch NZ.VZ.VS (4 x 90°)



Changing the approach direction safety switch TZ



Changing the approach direction safety switch NX/TX

After undoing the four fastening screws, the actuating head can be rotated in 90° steps. If for reasons of protection against tampering, renewed removal of the actuating head is to be prevented, the actuating head can be fastened to the basic housing using safety screws. You will find appropriate fixings in the accessories section of this catalog.

## Changing the switching direction

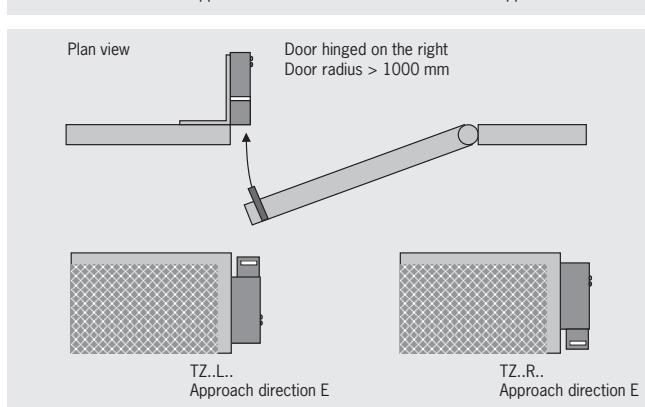
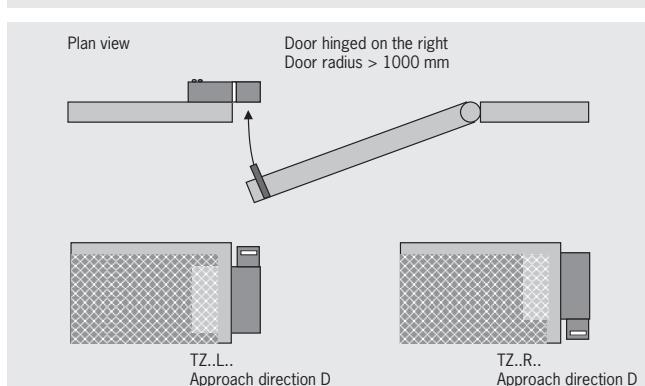
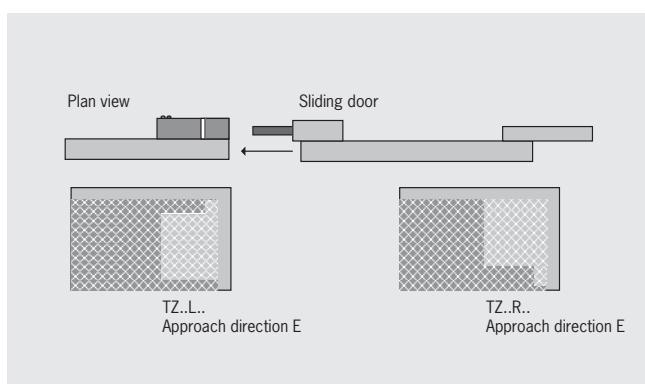
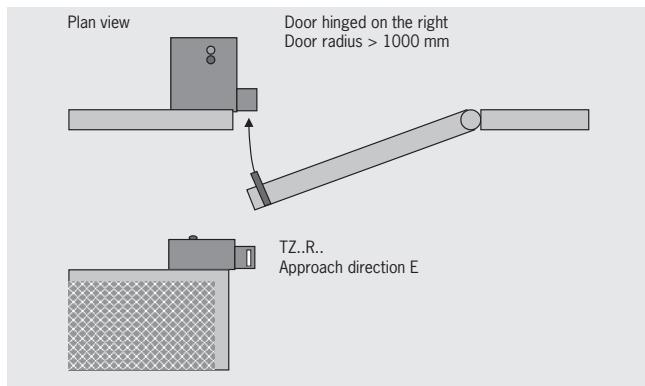
In addition, the actuating direction can be adjusted such that the actuator only switches in one direction.

Position Use	Actuation	Left			Not activated			Right		
		→	↔	↔	↔	↔	↔	→	↔	↔
white	Active									
white red	Both sides left + right									
red white	State									
white red	Pos.driven contacts NO contacts									
white red	One side left									
white red	State									
white red	Pos.driven contacts NO contacts									
red white	One side right									
red white	State									
red white	Pos.driven contacts NO contacts									

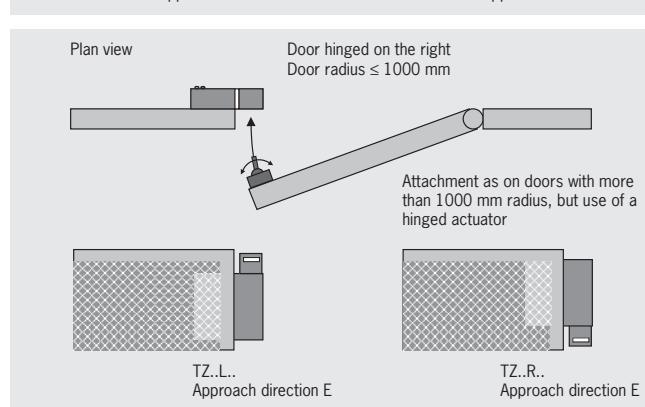
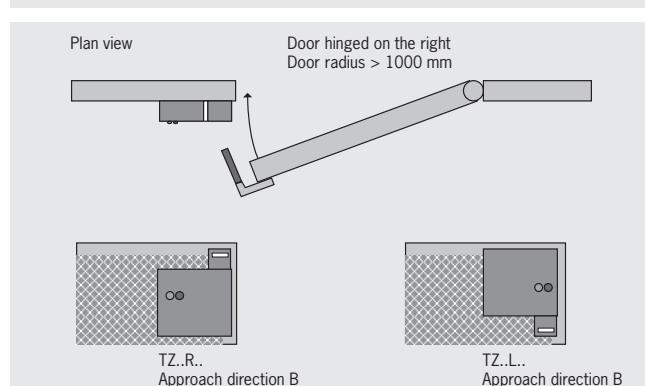
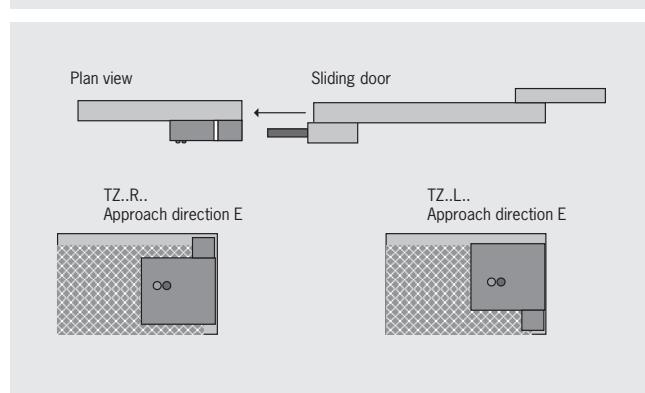
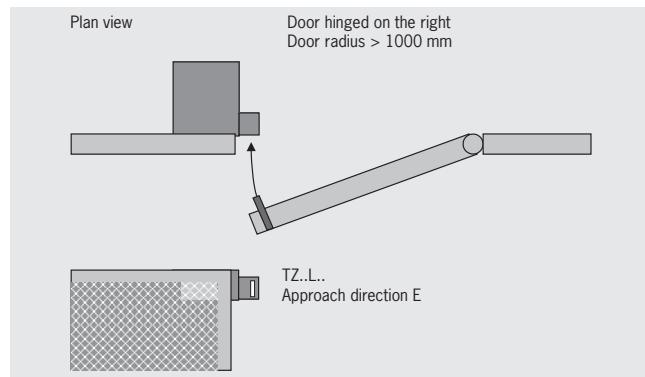
Changing the switching direction position switch NZ.H...

## Attaching the safety switch TZ with actuating head fitted on left or right

The safety switch TZ can be mounted in a large number of different installation positions. Often the switch is mounted horizontally on the roof of a machine or with a suspended actuating head. The method of attachment depends on whether the switch is to be attached in a protected installation position, for instance to make tampering more difficult, or whether the switch is to be mounted so that it is easily accessible as the escape release must be within reach from inside the system.



The drawings show that the attachment of the actuating head is very heavily dependent on how the switch is mounted. It is not possible to list all methods of attachment here, as the actuator head can be rotated in 90° steps. As a result there are a very large number of different methods of attachment. There is a suitable way of mounting the switch for every application.



## Electrical connection

On switches with cable entry there is a large space envelope for making the electrical connection.

Modern wiring concepts increasingly utilize plug-in connections. A switch with plug connectors can be easily replaced during servicing work. This configuration results in short downtimes.

The safety switches NZ and TZ are available with various plug connectors. In addition to the appropriate mating connectors, these connectors are available with pre-assembled cables as accessories.

## Switch layout for design TZ

### ▶ Locking arm

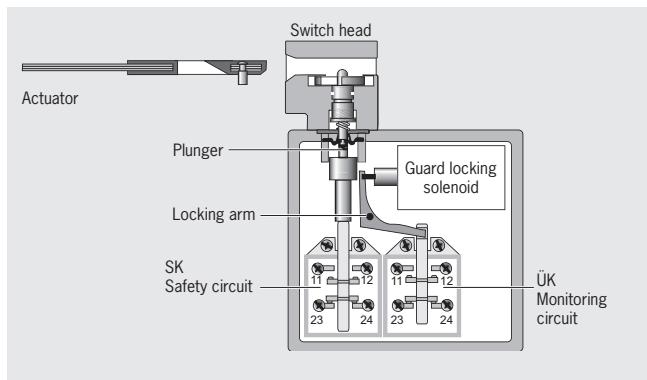
The locking arm ensures that the switch is guard locked by the solenoid. It acts directly on the switching element ÜK; the positively driven contact can only be closed in the locked state (see *Protection against unintentional closing*).

### ▶ SK

The position of the SK switching element is dependent on the position of the actuator or the safety guard. This situation means that the positively driven contacts on the SK switching element are only closed if the actuator is in the switch head.

### ▶ ÜK

The position of the ÜK switching element is dependent on the position of the actuator or the safety guard and the position of the solenoid or the guard locking. I.e., both guard locking and positively driven contact on the ÜK switching element can only be closed if the actuator is in the switch head and the guard locking solenoid is controlled correspondingly.



## LED indicator TZ

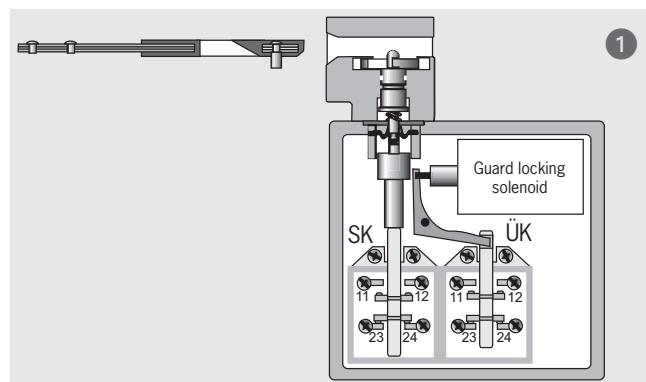
As standard the TZ series is equipped with a red and a green LED. Depending on the switch design, the assignment is pre-wired or can be chosen as required (see also Page 169).

## Principle of operation of TZ

The sectional drawings show the safety switch TZ in its three switch states:

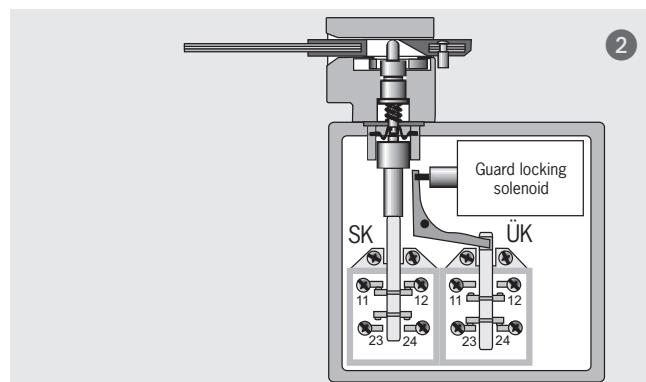
### ① Door open and not locked

In the initial state (actuator removed/safety guard open) all positively driven contacts (SK and ÜK) are open. The related NO contacts 23-24 are closed and signal the state *open and unlocked*. Unintentional closing of the contacts on switching element ÜK is impossible due to the switch mechanism (see *Protection against unintentional closing*).



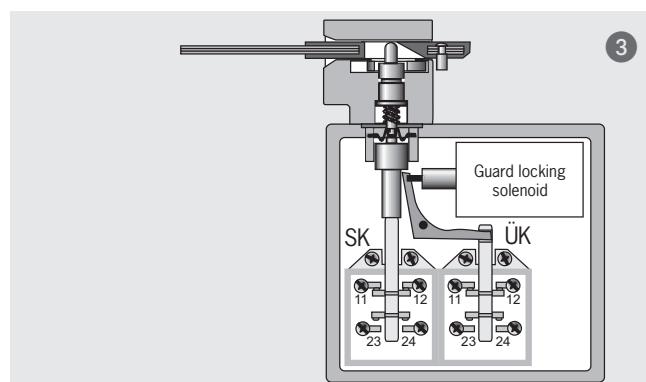
### ② Door closed and not locked

The plunger is released by inserting the actuator into the switch head. The contacts 11-12 on switching element SK are closed, the contacts 23-24 are opened. The contacts 11-12 on the switching element ÜK remain open as before, the door auxiliary contacts 23-24 for switching element ÜK remain closed.



### ③ Door closed and locked

After the actuator has been inserted, it is possible to activate the switch's guard locking. If the guard locking solenoid is activated, the locking arm locks the plunger and actuates the switching element ÜK. The contacts 11-12 are closed on this switching element. The contacts 11-12 on the switching element SK continue to remain closed. In this position the positively driven contacts 11-12 on the two switching elements SK and ÜK are safely locked, both door auxiliary contacts 23-24 are opened. The actuator and the safety guard are locked. This means that the machine connected to the safety circuit can be started.



## LED indicator TX

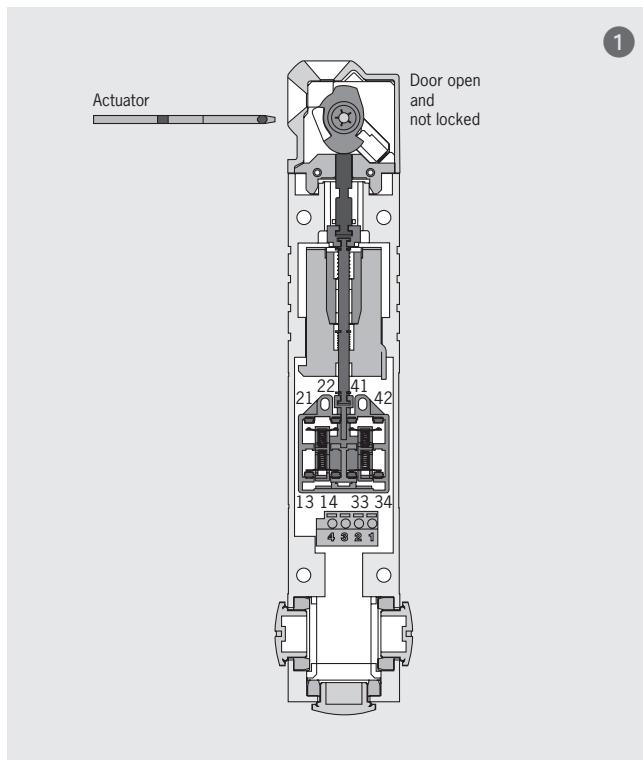
As standard the TX series is equipped with a red and a green LED. Depending on the switch design, the assignment is pre-wired or can be chosen as required.

## Principle of operation of TX/STA

The sectional drawings show the safety switch TX in its three switch states. The same principle of operation applies to the STA.

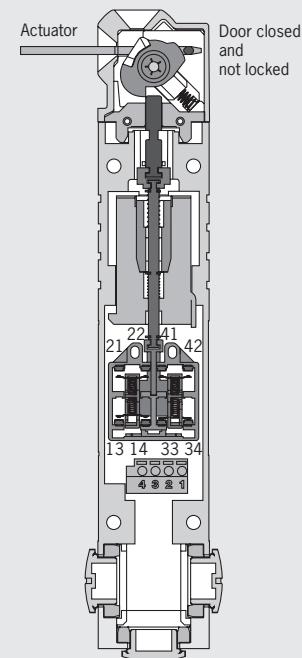
### ① Door open and not locked

In the initial state (actuator removed/safety guard open) all positively driven contacts (here: 21-22 and 41-42) are open. The NO contact 13-14 is closed and signals the condition *Door open*. The NO contact 33-34 is also closed and signals the condition *Not locked*. Unintentional closing of the contacts 21-22 and 41-42 is impossible due to the switch mechanism (see  Protection against unintentional closing).



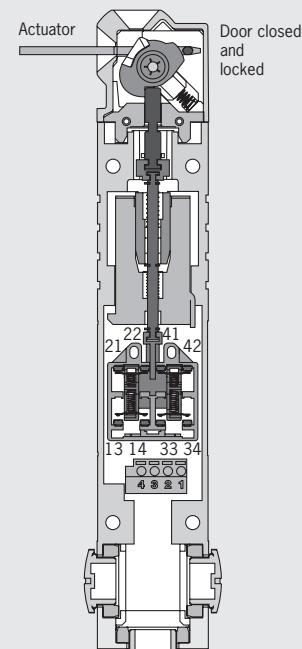
### ② Door closed and not locked

The plunger is released by inserting the actuator into the switch head. The NO contact 13-14 is now open and signals the condition *Door closed*. The NO contact 33-34 remains closed and signals the condition *Not locked*. The positively driven contacts 21-22 and 41-42 remain open as before.



### ③ Door closed and locked

After the actuator has been inserted, it is possible to activate the switch's guard locking. When the guard locking solenoid is activated, NO contact 33-34 is opened and signals the condition *Locked*. The NO contact 13-14 signals as before the condition *Door closed*. The positively driven contacts 21-22 and 41-42 were closed when the guard locking solenoid was activated. The actuator and the safety guard are locked. This means that the machine connected to the safety circuit can be started.



## Protection against unintentional closing

The design feature of a guard locking which ensures that the locking mechanism (solenoid plunger) cannot go into the locking position if the safety guard is open is also referred to in BGI 575 as *Protection against unintentional closing*.

## Switching elements

The switching elements used in our safety switches have a dedicated numbering system. A selection of switching elements is available depending on the switch type. In the following overview you can see which switching element is covered by the related number.

Some switching elements are marked with an H (e. g. 528H). The switching elements have an H-shaped contact bridge. They have a lower contact resistance and can therefore also safely switch small currents from 1 mA.

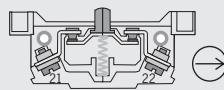
**Please note:** safety switching elements are not available as replacement switching elements.

### Switching elements with 1 switching contact



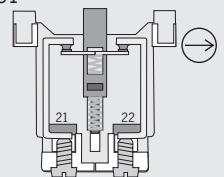
#### Switching element 508

- Slow-action switching contact
- 1 positively driven contact
- for series N1A



#### Switching element 588

- Slow-action switching contact
- 1 positively driven contact
- for series NB01

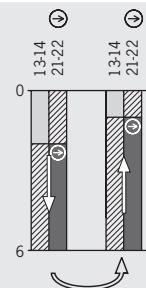
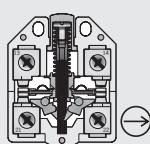


### Switching elements with 2 contacts



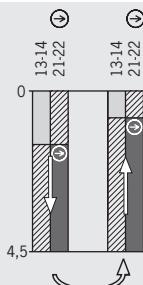
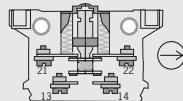
#### Switching element 511

- Snap-action switching element
- 1 positively driven contact + 1 NO contact
- for series NZ



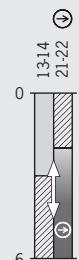
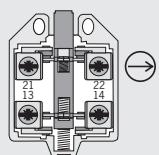
### Switching element 514

- Snap-action switching element
- 1 positively driven contact + 1 NO contact
- for series N1A



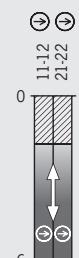
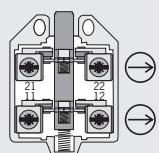
### Switching element 528H

- Slow-action switching element
- 1 positively driven contacts + 1 NO cont.
- for series NZ / TZ



### Switching element 538H

- Slow-action switching element
- 2 positively driven contacts
- for series NZ / TZ

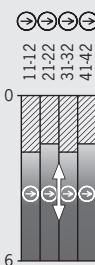
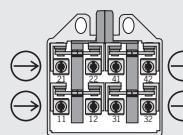


### Switching elements with 4 contacts



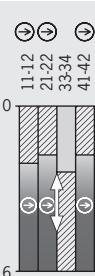
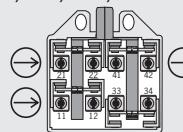
#### Switching element 2121H

- Slow-action switching element
- 4 positively driven contacts
- for series NZ / TZ / NX



#### Switching element 2131H

- Slow-action switching element
- 3 positively driven contacts + 1 NO cont. (door monitoring contact on STA)
- for series NZ / TZ / NX / STA

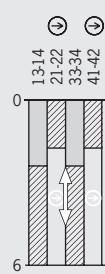
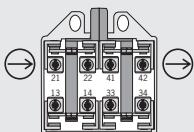


#### Contact

- closed
- open
- positively opened

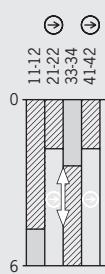
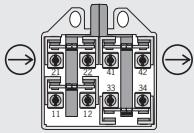
## Switching element 3131H

- ▶ Slow-action switching element
- ▶ 2 positively driven contacts + 2 NO cont.
- ▶ for series NZ / TZ / NX



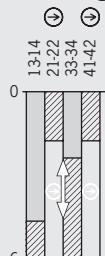
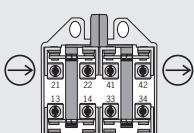
## Switching element 4121

- ▶ Slow-action switching element
- ▶ 2 positively driven contacts + 1 NO cont.
- + 1 NC contact (door monitoring cont.)
- ▶ for series TX



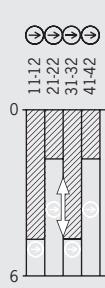
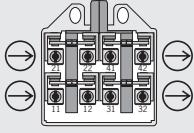
## Switching element 4131 (without door monitoring contact)

- ▶ Slow-action switching element
- ▶ 2 positively driven contacts + 1 NO cont.
- + 1 NO contact
- ▶ for series TX



## Switching element 4141

- ▶ Slow-action switching element
- ▶ 2 positively driven contacts +
- 2 positively driven contacts (door monitoring contacts)
- ▶ for series TX



### Contact

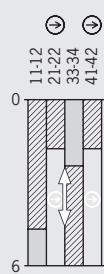
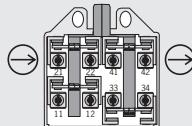
closed

open

positively opened

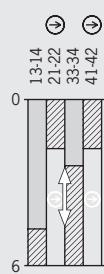
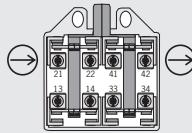
## Switching element ETX B

- ▶ Slow-action switching element
- ▶ 2 positively driven contacts + 1 NO cont.
- + 1 NC contact (door monitoring cont.)
- ▶ for series TX



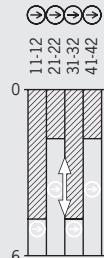
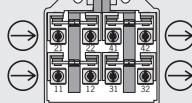
## Switching element ETX C

- ▶ Slow-action switching element
- ▶ 2 positively driven contacts + 1 NO cont.
- + 1 NO contact (door monitoring cont.)
- ▶ for series TX



## Switching element ETX D

- ▶ Slow-action switching element
- ▶ 2 positively driven contacts +
- 2 positively driven contacts (door monitoring contacts)
- ▶ for series TX



## Selection table for single hole fixing limit switches N1A and NB01

**Actuating element**

N1AD	Chisel plunger
N1AR/N1AB	Roller plunger with steel roller Ø 8 mm
N1ARL	Roller plunger with steel roller Ø 18 mm
N1AW	Domed plunger
NB01D	Chisel plunger
NB01R	Roller plunger with steel roller Ø 5 mm

**Connection**

M	Thread M16x1.5 or M12x1.5 for cable glands
SVM5	M12 plug connector 5-pin, male socket adjustable (270°) for elbow connector

**Exterior diaphragm**

AM	Protection against heavy soiling (dust) and aggressive coolants.
----	--

**Switching element**

One contact	1 NC ⊖
Two contacts	1 NC ⊖ + 1 NO

**Actuating element**

N1AD	N1AR/N1AB	N1ARL	N1AW	NB01D	NB01R	M	SVM5	Diaphragm AM	Switching element	with version	Page	
●						●			●	●	C2222	16
●						●		●	●	●		17
●							●		●	●		17
	●					●			●	●	C2222	18
	●					●		●	●	●		19
	●						●		●	●		19
		●				●			●	●		20
		●		●		●	●		●	●	C2222	21
				●		●	●		●			22
					●	●			●			22

## Single hole fixing limit switch N1AD with chisel plunger



- Housing according to DIN 43693
- LED optional
- Plug connector optional
- Exterior diaphragm optional
- Low temperature down to -40 °C optional



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Exterior diaphragm (optional)

Protection against heavy soiling (dust) and aggressive coolants.

### Low temperature

Version C2222 with silicone membrane and low temperature grease.

### LED function display (optional)

A function display is available for the following voltage ranges:

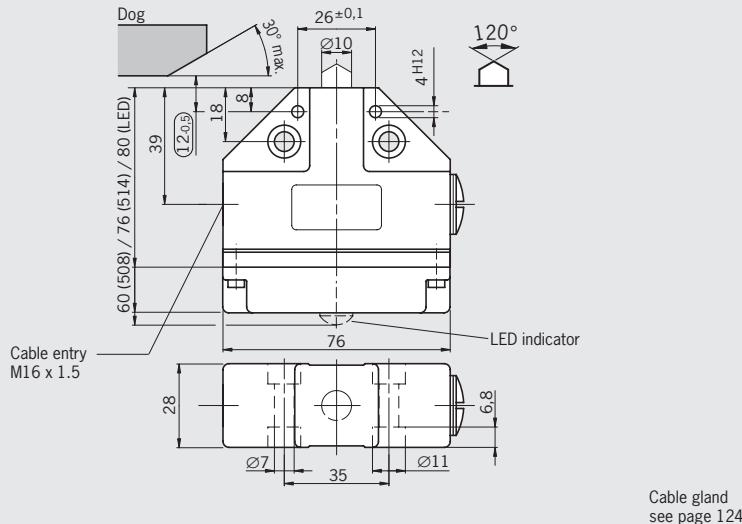
- AC/DC 12-60 V red
- AC 110 V ±15% red
- AC 230 V ±15% red

### Switching elements (See also page 13)

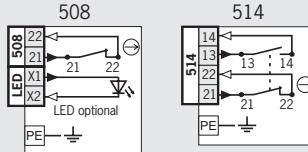
- **514** Snap-action switching contact  
1 NC ⊖ + 1 NO
- **508** Slow-action switching contact  
1 NC ⊖

### Cable entry M16 x 1.5

### Dimension drawings



### Wiring diagrams



### Ordering table

Series	Actuator	Connection	Switching element	Version	Function display			
					Without LED	12-60 V red LED	110 V red LED	230 V red LED
<b>N1A</b>	<b>D</b> Chisel plunger	Cable entry <b>M16 x 1.5</b>	<b>508</b> 1 NC ⊖		<b>083886</b> N1AD508-M	<b>087218</b> N1AD508LE060-M	<b>087221</b> N1AD508LE110-M	<b>087224</b> N1AD508LE220-M
			<b>C2222</b> Low temperature		<b>103237</b> N1AD508-MC2222	-	-	-
			<b>514</b> 1 NC ⊖ + 1 NO		<b>083849</b> N1AD514-M	-	-	-

1) Approval pending

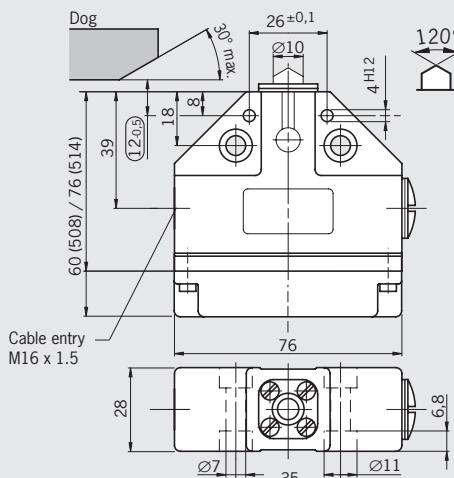
# Safety Switches with Safety Function, Metal Housing

**EUCHNER**



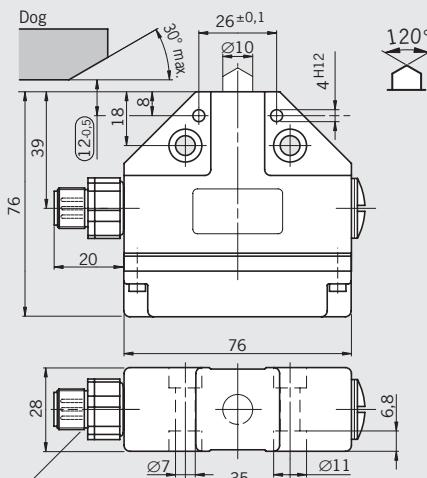
**Cable entry M16 x 1.5**  
Exterior diaphragm

## Dimension drawings



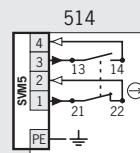
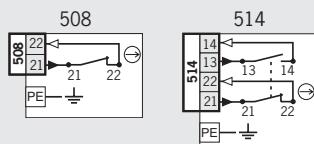
Cable gland  
see page 124

**Plug connector SVM5**  
M12 plug, 5-pin



For mating connector  
see page 124

## Wiring diagrams



## Ordering table

Series	Actuator	Connection	Switching element	Version	Function display
N1A	D Chisel plunger	Cable entry <b>M16 x 1.5</b>	<b>508</b> 1 NC $\ominus$	Exterior diaphragm	<b>Without LED</b> <b>090546</b> N1AD508AM-M
			<b>514</b> 1 NC $\ominus$ + 1 NO	Exterior diaphragm	<b>091261</b> N1AD514AM-M
	Plug connector <b>SVM5</b> (M12 plug)		<b>514</b> 1 NC $\ominus$ + 1 NO		<b>087603</b> N1AD514SVM5-M

1) Approval pending

## Single hole fixing limit switch N1AR/N1AB with roller plunger



- Housing according to DIN 43693
- Steel roller Ø 8 mm
- LED optional
- Plug connector optional
- Exterior diaphragm optional
- Bearing optional
- Low temperature down to -40 °C optional



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Exterior diaphragm (optional)

Protection against heavy soiling (dust) and aggressive coolants.

### Low temperature

Version C2222 with silicone membrane and low temperature grease.

### Ball bearing

For high approach speeds and long travel distances.

### LED function display (optional)

A function display is available for the following voltage ranges:

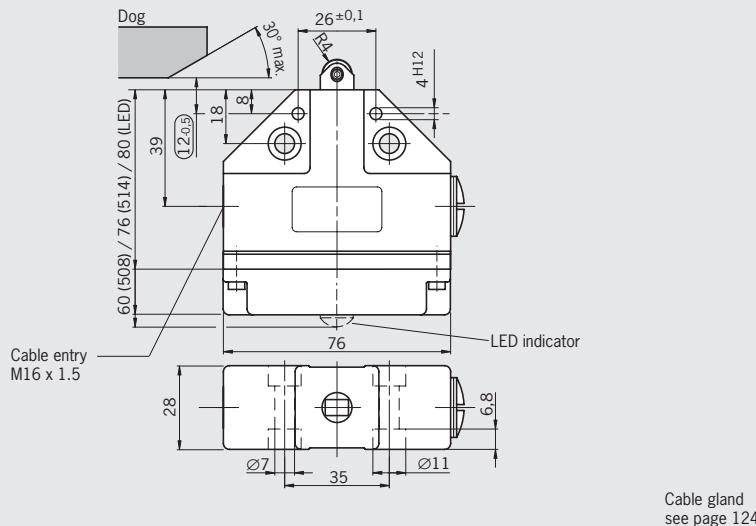
- AC/DC 12-60 V red
- AC 110 V ±15% red
- AC 230 V ±15% red

### Switching elements (See also page 13)

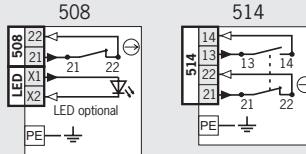
- **514** Snap-action switching contact  
1 NC ⊖ + 1 NO
- **508** Slow-action switching contact  
1 NC ⊖

### Cable entry M16 x 1.5

### Dimension drawings



### Wiring diagrams



### Ordering table

Series	Actuator	Connection	Switching element	Version	Function display			
					Without LED	12-60 V red LED	110 V red LED	230 V red LED
<b>N1A</b>	<b>R</b> Roller plunger Ø 8 mm	Cable entry M16 x 1.5	<b>508</b> 1 NC ⊖	Slide bearing	<b>083887</b> N1AR508-M	<b>087219</b> N1AR508LE060-M	<b>087222</b> N1AR508LE110-M	<b>087225</b> N1AR508LE220-M
				C2222 Low temperature	<b>103221</b> N1AR508-MC2222	-	-	-
	<b>514</b> 1 NC ⊖ + 1 NO	Cable entry M16 x 1.5	<b>514</b> 1 NC ⊖ + 1 NO	Slide bearing	<b>078487</b> N1AR514-M	On request	On request	On request
	<b>B</b> Roller plunger Ø 8 mm			Ball bearing	<b>087245</b> N1AB508-M	-	-	-
			<b>508</b> 1 NC ⊖	Ball bearing	<b>087247</b> N1AB514-M	-	-	-

1) Approval pending

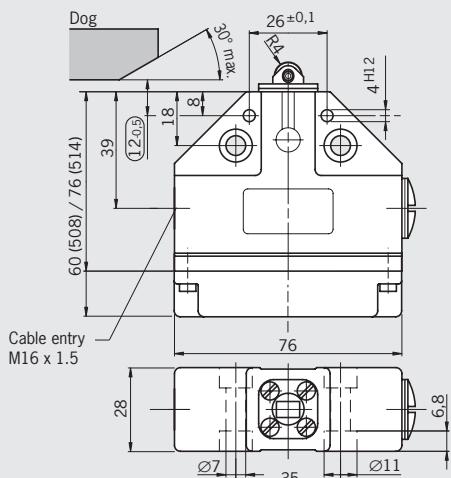
# Safety Switches with Safety Function, Metal Housing

**EUCHNER**



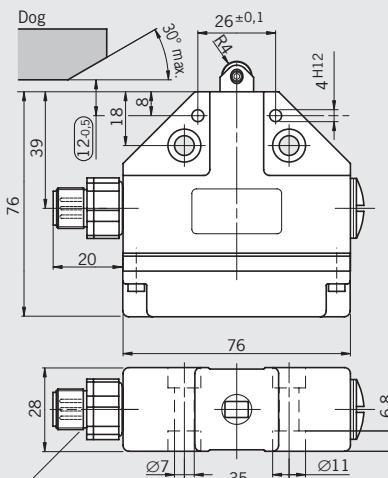
**Cable entry M16 x 1.5**  
Exterior diaphragm

## Dimension drawings



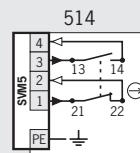
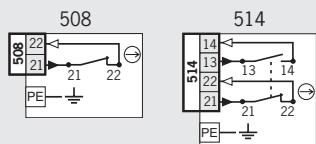
Cable gland  
see page 124

**Plug connector SVM5**  
M12 plug, 5-pin



For mating connector  
see page 124

## Wiring diagrams



## Ordering table

Series	Actuator	Connection	Switching element	Version	Function display
<b>N1A</b>	<b>R</b> Roller plunger Ø 8 mm	Cable entry <b>M16 x 1.5</b>	<b>508</b> 1 NC ⊖	Exterior diaphragm	<b>Without LED</b> <b>090547</b> N1AR508AM-M
			<b>514</b> 1 NC ⊖ + 1 NO	Exterior diaphragm	<b>087158</b> N1AR514AM-M
	Plug connector <b>SVM5</b> (M12 plug)		<b>514</b> 1 NC ⊖ + 1 NO		<b>087604</b> N1AR514SVM5-M

1) Approval pending

## Single hole fixing limit switch N1ARL with extended roller plunger

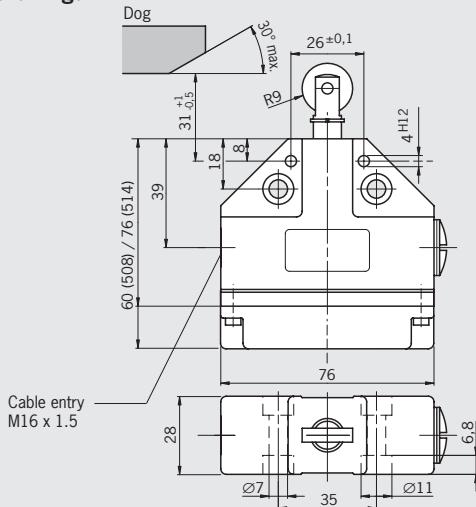


- Housing according to DIN 43693
- Steel roller Ø 18 mm

Cable entry M16 x 1.5



### Dimension drawings



Cable gland  
see page 124

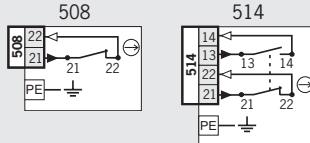
### Approach direction

Horizontal  
Adjustable in 90° steps.

### Switching elements (See also page 13)

- **514** Snap-action switching contact  
1 NC ⊖ + 1 NO
- **508** Slow-action switching contact  
1 NC ⊖

### Wiring diagrams



### Ordering table

Series	Actuator	Connection	Switching element	Function display	
				Without LED	
<b>N1A</b>	<b>RL</b> Roller plunger Ø 18 mm	Cable entry <b>M16 x 1.5</b>	<b>508</b> 1 NC ⊖	<b>087147</b> N1ARL508-M	
			<b>514</b> 1 NC ⊖ + 1 NO	<b>087204</b> N1ARL514-M	

1) Approval pending

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**

**Single hole fixing limit switch N1AW with domed plunger** (GL) 1) c UL us

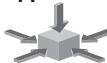


The logo consists of the letters 'UL' inside a circle, with the word 'LISTED' below it, and the number '1)' in the top right corner.

- Housing according to DIN 43693
  - LED optional
  - Plug connector optional
  - Low temperature down to -40 °C optional



## Approach direction



## Horizontal and vertical

### **Low temperature**

Version C2222 with silicone membrane and low temperature grease.

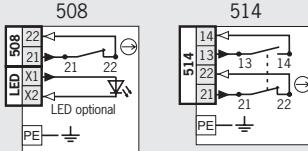
#### **LED function display (optional)**

A function display is available for the following voltage ranges:

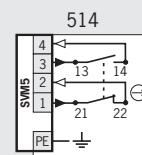
- AC/DC 12-60 V red
  - AC 110 V ±15% red
  - AC 230 V ±15% red

### **Switching elements** (See also page 13)

- **514** Snap-action switching contact  
1 NC  $\ominus$  + 1 NO
  - **508** Slow-action switching contact  
1 NC  $\ominus$



## Wiring diagrams



## Ordering table

Series	Actuator	Connection	Switching element	Version	Function display			
					Without LED	12-60 V red LED	110 V red LED	230 V red LED
N1A	W Domed plunger	Cable entry <b>M16 x 1.5</b>	508 1 NC ⊖		<b>087205</b> N1AW508-M	<b>087220</b> N1AW508LE060-M	<b>087223</b> N1AW508LE110-M	<b>087226</b> N1AW508LE220-M
			C2222 Low temperature		<b>103222</b> N1AW508-MC2222	-	-	-
		Plug connector <b>SVM5</b> (M12 plug)	514 1 NC ⊖ + 1 NO		<b>083850</b> N1AW514-M	-	-	-
			514 1 NC ⊖ + 1 NO		<b>090743</b> N1AW514SVM5-M	-	-	-

1) Approval pending

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**

## Single hole fixing limit switch NB01

- ▶ With chisel plunger
- ▶ With roller plunger, steel roller Ø 5 mm



## Cable entry M12 x 1.5 Chisel plunger



### Approach direction

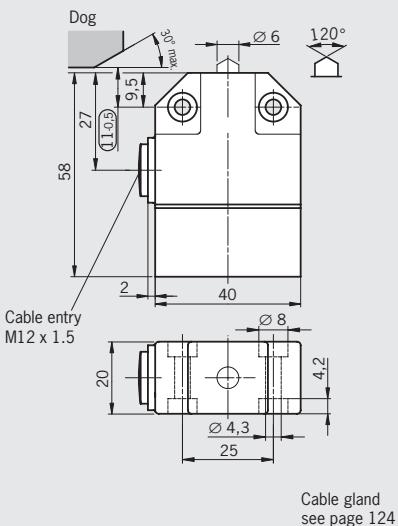
Horizontal  
Adjustable in 90° steps.

### Switching elements (See also page 13)

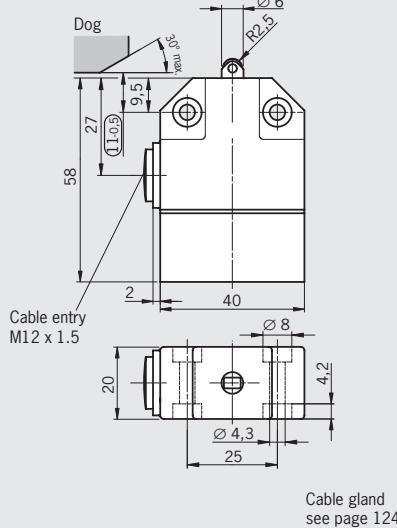
- ▶ **588** Slow-action switching contact  
1 NC ⊖

## Cable entry M12 x 1.5 Chisel plunger

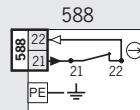
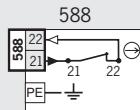
### Dimension drawings



## Cable entry M12 x 1.5 Roller plunger



### Wiring diagrams



### Ordering table

Series	Actuator	Connection	Switching element	Function display	
				Without LED	
<b>NB01</b>	<b>D</b> Chisel plunger	Cable entry <b>M12 x 1.5</b>	<b>588</b> 1 NC ⊖		<b>088584</b> NB01D588-M
	<b>R</b> Roller plunger Ø 5 mm	Cable entry <b>M12 x 1.5</b>	<b>588</b> 1 NC ⊖		<b>088583</b> NB01R588-M

1) Approval pending

## Selection table for safety switches NZ

Actuating element									
WO	Domed plunger								
RK	Roller plunger with steel roller Ø 8 mm								
RS	Roller plunger with steel roller Ø 12 mm								
RG	Roller plunger with plastic roller Ø 12 mm								
RL	Extended roller plunger with steel roller Ø 18 mm								
HS	Lever arm with steel roller Ø 18 mm; 19 mm for grooved ball bearing (C1833)								
HB	Lever arm with plastic roller Ø 18 mm; 30 mm (version C569); roller on inside of lever (C1779)								
PS	Adjustable lever arm with steel roller Ø 18 mm								
PB	Adjustable lever arm with plastic roller Ø 18 mm								
Connection									
M	Thread M20x1.5 for cable glands								
SVM5	M12 plug connector 5-pin, male socket adjustable (270°) for elbow connector								
SR6	Plug connector 6-pin + PE								
MR8	Plug connector 7-pin + PE								
MR9	Plug connector 8-pin + PE								
MR10	Plug connector 9-pin + PE								
SR11	Plug connector 11-pin + PE								
Switching element									
Two contacts	1 NC ⊕ + 1 NO or 2 NC ⊖								
Four contacts	2 NC ⊕ + 2 NO, 3 NC ⊖ + 1 NO or 4 NC ⊖								

Actuating element										Connection					Switching element		With version	Page	
WO	RK	RS	RG	RL	HS	HB	PS	PB	M	SVM5	SR6	MR8	MR9	MR10	SR11	Two contacts	Four contacts		
●									●	●						●	●		24
●											●							C1630/C1631	25
●																			25
	●								●	●								C1912	26
	●										●								27
		●							●									C1588	43
		●							●										28
		●								●								C1630/C1631	29
		●										●							29
		●								●									30
		●								●								C1631	31
		●									●								31
			●						●	●									32
			●								●								33
			●								●							C1831	33
				●					●	●									34
				●							●							C1630	35
				●							●								35
				●								●	●	●					36
				●								●	●	●				C1779	45
				●								●	●	●				C1833	46
					●							●	●	●				C569	44
					●							●	●	●					37
					●							●						C1630/C1631	38
					●								●						38
					●								●	●					39
						●							●	●					40
						●								●					41
						●								●					41
						●									●				42

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**

## Safety switch NZ.WO with domed plunger

- ▶ Version B according to EN 50041  
(Hardened)
- ▶ LED optional
- ▶ Plug connector optional



### Approach direction

Horizontal and vertical

### LED function display (optional)

A function display is available for the following voltage ranges:

- ▶ AC/DC 12-60 V red or yellow
- ▶ AC 110 V ±15% red

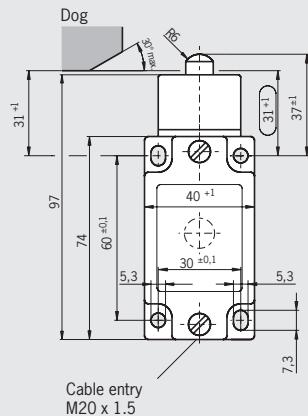
### Switching elements (See also page 13/14)

- ▶ **511** Snap-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **538H** Slow-action switching contact  
2 NC ⊖
- ▶ **2121H** Slow-action switching contact  
4 NC ⊖
- ▶ **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO
- ▶ **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO



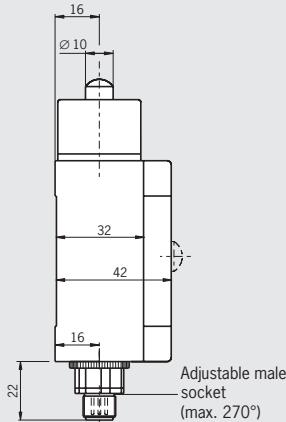
### Cable entry M20 x 1.5

### Dimension drawings



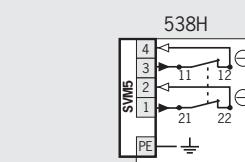
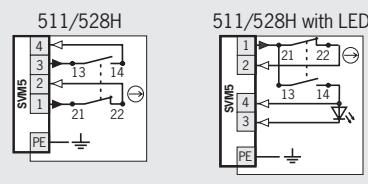
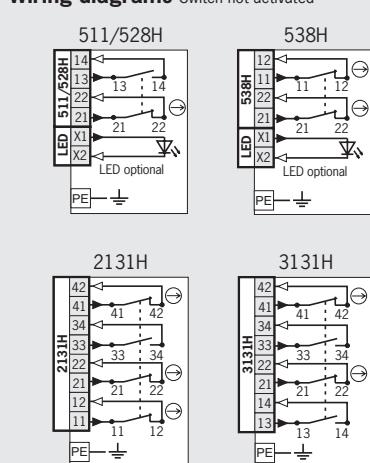
Cable gland  
see page 124

### Plug connector SVM5 M12 plug, 5-pin



For mating connector  
see page 124

### Wiring diagrams



### Ordering table

Series	Actuator	Connec-tion	Switching element	Function display			
				Without LED	12-60 V red LED	110 V red LED	12-60 V yellow LED
NZ	WO Domed plunger	1 Cable entry M20 x 1.5	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO	<b>088611</b> <sup>1)</sup> NZ1WO-511-M	<b>089057</b> <sup>1)</sup> NZ1WO-511L060-M	<b>089059</b> <sup>1)</sup> NZ1WO-511L110-M	<b>089058</b> <sup>1)</sup> NZ1WO-511L060GE-M
			<b>528H</b> 1 NC ⊖ + 1 NO	<b>089624</b> NZ1WO-528-M	<b>089078</b> NZ1WO-528L060-M	On request	On request
			<b>538H</b> 2 NC ⊖	<b>090878</b> NZ1WO-538-M	<b>089076</b> NZ1WO-538L060-M	On request	On request
			<b>2131H</b> 3 NC ⊖ + 1 NO	<b>089629</b> NZ1WO-2131-M	-	-	-
			<b>3131H</b> 2 NC ⊖ + 2 NO	<b>089626</b> NZ1WO-3131-M	-	-	-
		2 Plug connector SVM5 (M12 plug)	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO	<b>089014</b> <sup>1)</sup> NZ2WO-511SVM5	On request	-	<b>098652</b> <sup>1)</sup> NZ2WO-511SVM5L060GE
			<b>528H</b> 1 NC ⊖ + 1 NO	<b>090923</b> NZ2WO-528SVM5	On request	-	On request
			<b>538H</b> 2 NC ⊖	<b>090924</b> NZ2WO-538SVM5	On request	-	On request

1) No DGUV approval for switching element 511

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**

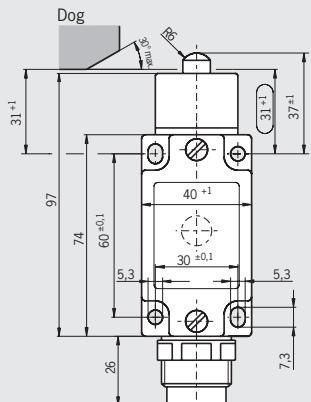


**Plug connector SR6**  
6-pin + PE

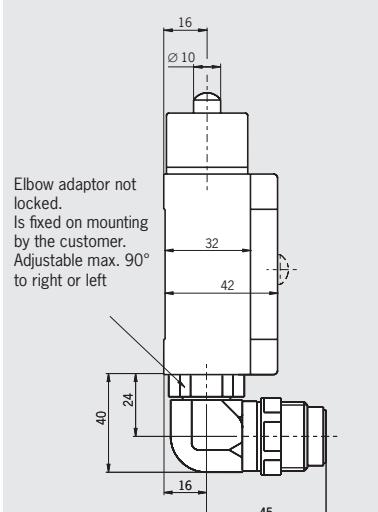
**Plug connector SR6 angled**  
6-pin + PE

**Plug connector SR11**  
11-pin + PE

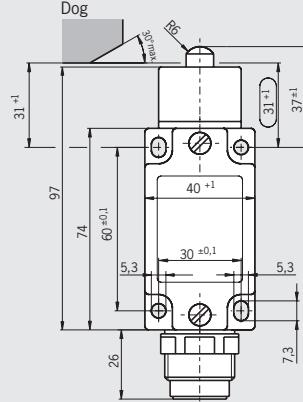
## Dimension drawings



For mating connector  
see page 120



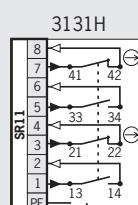
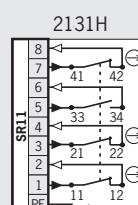
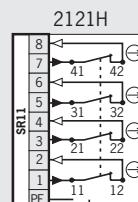
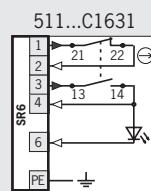
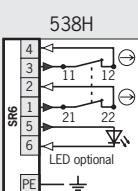
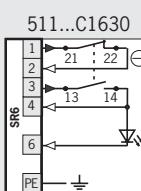
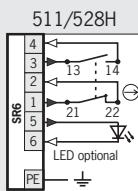
For mating connector  
see page 120



For mating connector  
see page 120

## Wiring diagrams

Switch not activated



## Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display		
					Without LED	12-60 V red LED	12-60 V yellow LED
NZ	WO Domed plunger	2 Plug connector <b>SR6</b>	511 <sup>1)</sup> 1 NC $\ominus$ + 1 NO		090909 <sup>1)</sup> NZ2WO-511	091280 <sup>1)</sup> NZ2WO-511L060	On request
			511 <sup>1)</sup> 1 NC $\ominus$ + 1 NO	C1630 Alternative wiring	On request	On request	059481 <sup>1)</sup> NZ2WO-511L060C1630
			528H 1 NC $\ominus$ + 1 NO		090910 NZ2WO-528	091279 NZ2WO-528L060	On request
			538H 2 NC $\ominus$		090911 NZ2WO-538	087558 NZ2WO-538L060	On request
	2 Plug connector <b>SR6</b> Angled	511 <sup>1)</sup> 1 NC $\ominus$ + 1 NO	C1631 Alternative wiring		On request	On request	059482 <sup>1)</sup> NZ2WO-511L060C1631
		2121H 4 NC $\ominus$			090976 NZ2WO-2121	-	-
		2131H 3 NC $\ominus$ + 1 NO			090912 NZ2WO-2131	-	-
		3131H 2 NC $\ominus$ + 2 NO			090913 NZ2WO-3131	-	-

1) No DGUV approval for switching element 511

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**

## Safety switch NZ.RK with roller plunger

- ▶ Steel roller Ø 8 mm
- ▶ LED optional
- ▶ Plug connector optional
- ▶ Bearing optional



### Approach direction

Horizontal  
Adjustable in 90° steps.

### LED function display (optional)

A function display is available for the following voltage ranges:

- ▶ AC/DC 12-60 V red or yellow
- ▶ AC 110 V ±15% red
- ▶ AC 230 V ±15% red

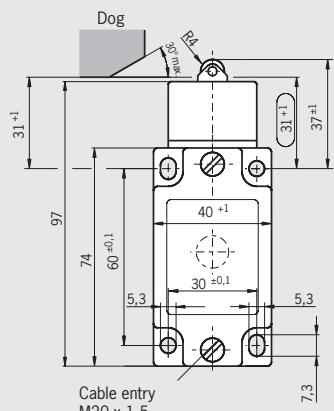
### Switching elements (See also page 13/14)

- ▶ **511** Snap-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **538H** Slow-action switching contact  
2 NC ⊖
- ▶ **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO
- ▶ **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO



### Cable entry M20 x 1.5

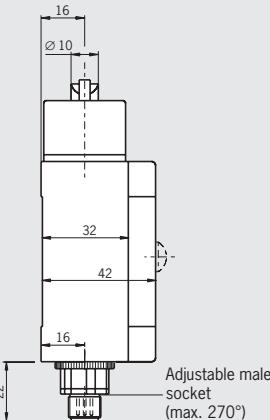
### Dimension drawings



Cable gland  
see page 124

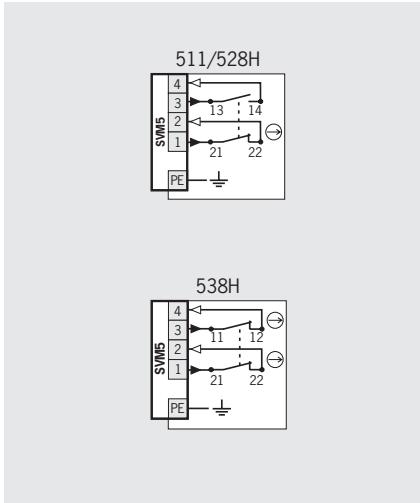
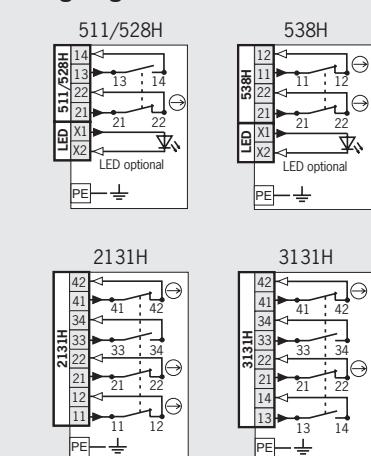
### Plug connector SVM5

M12 plug, 5-pin



For mating connector  
see page 124

### Wiring diagrams



### Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display			
					Without LED	12-60 V red LED	110 V red LED	12-60 V yellow LED
NZ	RK Roller plunger	1 Cable entry M20 x 1.5	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO		<b>088608</b> <sup>1)</sup> NZ1RK-511-M	<b>090354</b> <sup>1)</sup> NZ1RK-511L060-M	<b>090355</b> <sup>1)</sup> NZ1RK-511L220-M	On request
			<b>528H</b> 1 NC ⊖ + 1 NO		<b>090905</b> NZ1RK-528-M	<b>090358</b> NZ1RK-528L060-M	On request	On request
			<b>528H</b> 1 NC ⊖ + 1 NO With bearing	<b>C1912</b>	<b>090572</b> NZ1RK-528-MC1912	On request	On request	<b>086408</b> NZ1RK-528L060GE-MC1912
			<b>538H</b> 2 NC ⊖		<b>090906</b> NZ1RK-538-M	On request	On request	On request
			<b>2131H</b> 3 NC ⊖ + 1 NO		<b>090907</b> NZ1RK-2131-M	-	-	-
		2 Plug connector <b>SVM5</b> (M12 plug)	<b>3131H</b> 2 NC ⊖ + 2 NO		<b>090908</b> NZ1RK-3131-M	-	-	-
			<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO		<b>089007</b> <sup>1)</sup> NZ2RK-511SVM5	On request	-	On request
			<b>528H</b> 1 NC ⊖ + 1 NO		<b>090930</b> NZ2RK-528SVM5	On request	-	On request
			<b>538H</b> 2 NC ⊖		<b>089018</b> NZ2RK-538SVM5	On request	-	On request

1) No DGUV approval for switching element 511

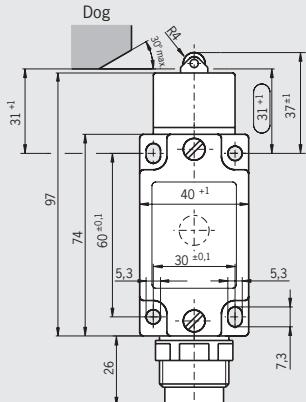
# Safety Switches with Safety Function, Metal Housing

**EUCHNER**

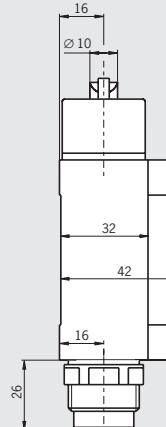


**Plug connector SR6**  
6-pin + PE

## Dimension drawings



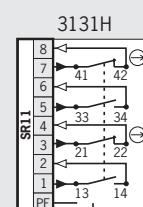
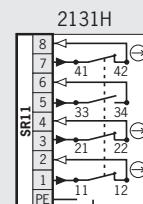
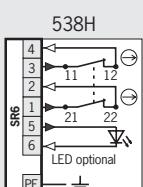
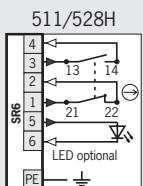
For mating connector  
see page 120



For mating connector  
see page 120

## Wiring diagrams

Switch not activated



## Ordering table

Series	Actuator	Connec-tion	Switching element	Function display		
				Without LED	12-60 V red LED	110 V red LED
NZ	RK Roller plunger	2 Plug connector <b>SR6</b>	<b>511</b> <sup>1)</sup> 1 NC $\ominus$ + 1 NO	<b>090016</b> <sup>1)</sup> NZ2RK-511	On request	<b>088180</b> <sup>1)</sup> NZ2RK-511L110
			<b>528H</b> 1 NC $\ominus$ + 1 NO	<b>090919</b> NZ2RK-528	<b>091292</b> NZ2RK-528L060	On request
			<b>538H</b> 2 NC $\ominus$	<b>090920</b> NZ2RK-538	On request	On request
	2 Plug connector <b>SR11</b>	<b>2131H</b> 3 NC $\ominus$ + 1 NO	<b>090921</b> NZ2RK-2131	-	-	-
			<b>3131H</b> 2 NC $\ominus$ + 2 NO	<b>090922</b> NZ2RK-3131	-	-

1) No DGUV approval for switching element 511

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**

## Safety switch NZ.RS with roller plunger

- Version C according to EN 50041  
(steel roller Ø 12 mm)
- LED optional
- Plug connector optional



### Approach direction

Horizontal  
Adjustable in 90° steps.

### LED function display (optional)

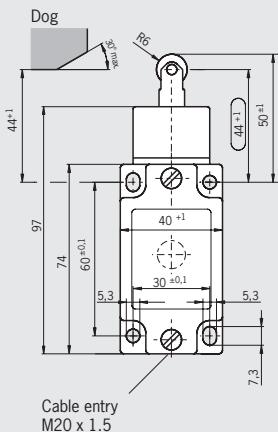
A function display is available for the following voltage ranges:

- AC/DC 12-60 V red or yellow
- AC 110 V ±15% red
- AC 230 V ±15% red

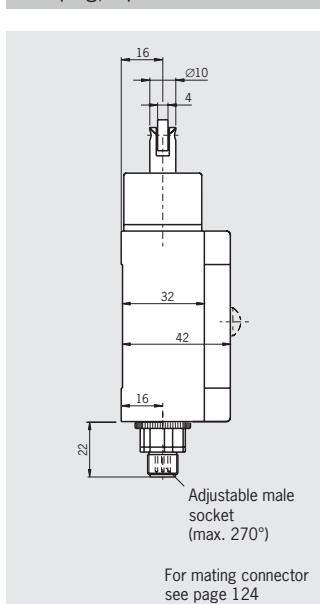
### Switching elements (See also page 13/14)

- **511** Snap-action switching contact  
1 NC ⊖ + 1 NO
- **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
- **538H** Slow-action switching contact  
2 NC ⊖
- **2121H** Slow-action switching contact  
4 NC ⊖
- **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO
- **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO

### Cable entry M20 x 1.5

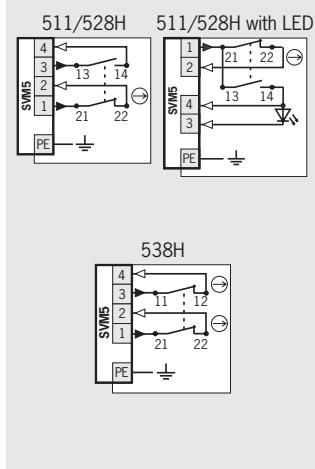
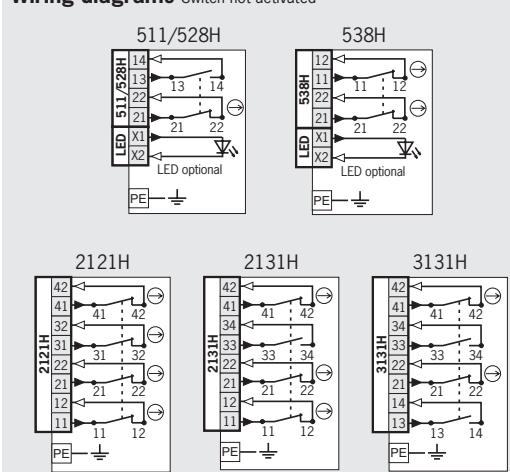


### Plug connector SVM5



For mating connector see page 124

### Wiring diagrams



### Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display			
					Without LED	12-60 V red LED	110 V red LED	12-60 V yellow LED
NZ	RS Roller plunger	1 Cable entry M20 x 1.5	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO		<b>079960</b> <sup>1)</sup> NZ1RS-511-M	<b>089053</b> <sup>1)</sup> NZ1RS-511L060-M	<b>089055</b> <sup>1)</sup> NZ1RS-511L220-M	<b>086528</b> <sup>1)</sup> NZ1RS-511L060GE-M
			<b>528H</b> 1 NC ⊖ + 1 NO		<b>089627</b> NZ1RS-528-M	<b>086413</b> NZ1RS-528L060-M	<b>091291</b> NZ1RS-528L220-M	On request
			<b>538H</b> 2 NC ⊖		<b>090936</b> NZ1RS-538-M	<b>090555</b> NZ1RS-538L060-M	On request	<b>090424</b> NZ1RS-538L060GE-M
			<b>2121H</b> 4 NC ⊖		<b>087595</b> NZ1RS-2121-M	-	-	-
			<b>2131H</b> 3 NC ⊖ + 1 NO		<b>089633</b> NZ1RS-2131-M	-	-	-
			<b>3131H</b> 2 NC ⊖ + 2 NO		<b>089631</b> NZ1RS-3131-M	-	-	-
		2 Plug connector <b>SVM5</b> (M12 plug)	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO		<b>090027</b> <sup>1)</sup> NZ2RS-511SVM5	On request	-	<b>098651</b> <sup>1)</sup> NZ2RS-511SVM5L060GE
			<b>528H</b> 1 NC ⊖ + 1 NO		<b>090963</b> NZ2RS-528SVM5	On request	-	On request
			<b>538H</b> 2 NC ⊖		<b>090964</b> NZ2RS-538SVM5	On request	-	On request

1) No DGUV approval for switching element 511

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**



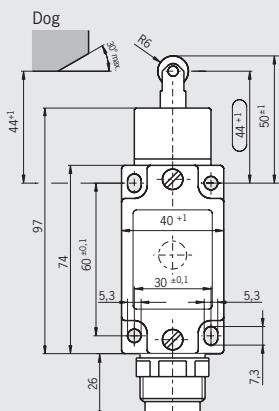
**Plug connector SR6**  
6-pin + PE

**Plug connector SR6**  
Angled 6-pin + PE

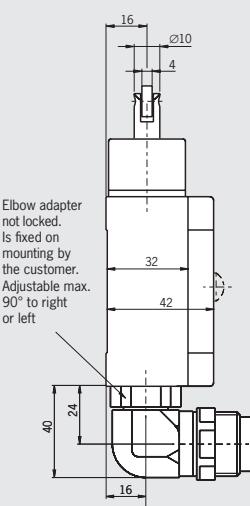
**Plug connector MR9**  
8-pin + PE

**Plug connector SR11**  
11-pin + PE

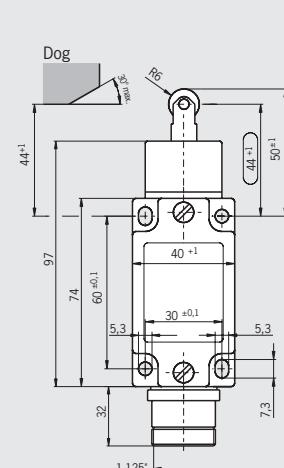
## Dimension drawings



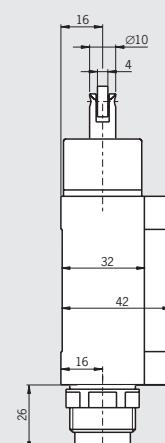
For mating connector  
see page 120



For mating connector  
see page 120



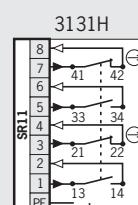
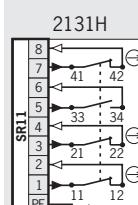
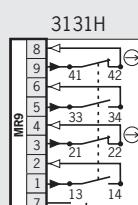
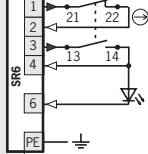
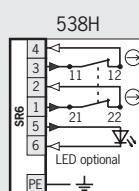
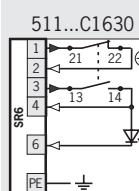
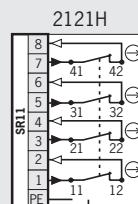
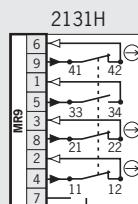
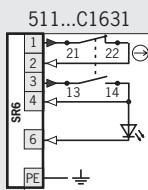
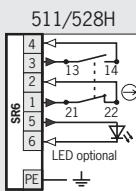
For mating connector  
see page 123



For mating connector  
see page 120

## Wiring diagrams

Switch not activated



## Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display		
					Without LED	12-60 V red LED	12-60 V yellow LED
NZ	RS Roller plunger	2 Plug connector SR6	511 <sup>1)</sup> 1 NC ⊖ + 1 NO		090024 <sup>1)</sup> NZ2RS-511	090147 <sup>1)</sup> NZ2RS-511L060	089622 <sup>1)</sup> NZ2RS-511L060GE
			511 <sup>1)</sup> 1 NC ⊖ + 1 NO	C1630 Alternative wiring	On request	On request	082400 <sup>1)</sup> NZ2RS-511L060C1630
			528H 1 NC ⊖ + 1 NO		090950 NZ2RS-528	088197 NZ2RS-528L060	On request
			538H 2 NC ⊖		090951 NZ2RS-538	090952 NZ2RS-538L060	On request
	2 Plug connector SR6 Angled	511 <sup>1)</sup> 1 NC ⊖ + 1 NO	C1631 Alternative wiring				079350 <sup>1)</sup> NZ2RS-511L060C1631
				On request		On request	
	1...9C Plug connector MR9	2131H 3 NC ⊖ + 1 NO			077362 <sup>3)</sup> NZ1RS-2131-9C-GMMF		
		3131H 2 NC ⊖ + 2 NO			087074 NZ1RS-3131-9C-GMMF		
	2 Plug connector SR11	2121H 4 NC ⊖			090974 NZ2RS-2121		
		2131H 3 NC ⊖ + 1 NO			090149 NZ2RS-2131		
		3131H 2 NC ⊖ + 2 NO			090954 NZ2RS-3131		

1) No DGUV approval for switching element 511

3) UL approval only for safety switch 077362

## Safety switch NZ.RG with roller plunger

- ▶ Version C according to EN 50041  
(plastic roller Ø 12 mm)
- ▶ LED optional
- ▶ Plug connector optional



### Approach direction

Horizontal  
Adjustable in 90° steps.

### LED function display (optional)

A function display is available for the following voltage ranges:

- ▶ AC/DC 12-60 V red or yellow
- ▶ AC 230 V ±15% red

### Switching elements (See also page 13/14)

- ▶ **511** Snap-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **538H** Slow-action switching contact  
2 NC ⊖
- ▶ **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO
- ▶ **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO

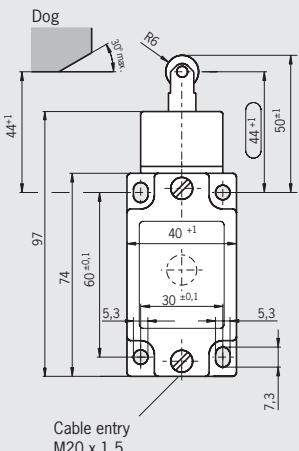
### Cable entry M20 x 1.5



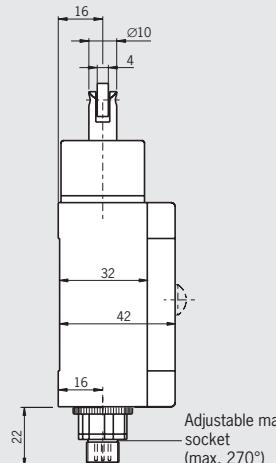
### Plug connector SVM5 M12 plug, 5-pin



### Dimension drawings

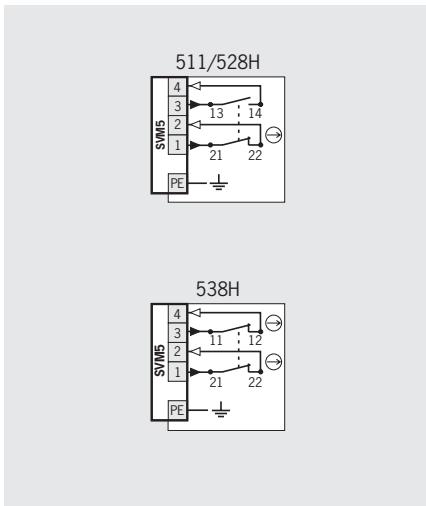
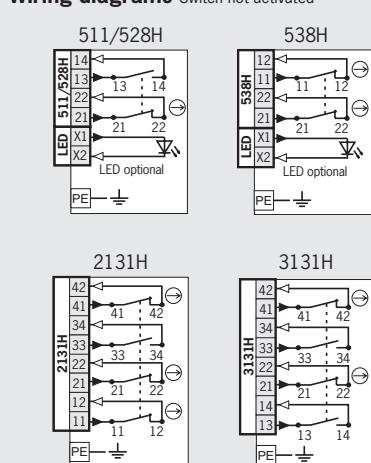


Cable gland  
see page 124



For mating connector  
see page 124

### Wiring diagrams



### Ordering table

Series	Actuator	Connec-tion	Switching element	Function display		
				Without LED	12-60 V red LED	230 V red LED
NZ	RG Roller plunger	1 Cable entry M20 x 1.5	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO	<b>088605</b> <sup>1)</sup> NZ1RG-511-M	<b>089052</b> <sup>1)</sup> NZ1RG-511L060-M	<b>089054</b> <sup>1)</sup> NZ1RG-511L220-M
			<b>528H</b> 1 NC ⊖ + 1 NO	<b>090932</b> NZ1RG-528-M	<b>090008</b> NZ1RG-528L060-M	On request
			<b>538H</b> 2 NC ⊖	<b>090933</b> NZ1RG-538-M	<b>090009</b> NZ1RG-538L060-M	On request
			<b>2131H</b> 3 NC ⊖ + 1 NO	<b>090934</b> NZ1RG-2131-M	-	-
			<b>3131H</b> 2 NC ⊖ + 2 NO	<b>090935</b> NZ1RG-3131-M	-	-
		2 Plug connector SVM5 (M12 plug)	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO	<b>090026</b> <sup>1)</sup> NZ2RG-511SVM5	On request	-
			<b>528H</b> 1 NC ⊖ + 1 NO	<b>090961</b> NZ2RG-528SVM5	On request	-
			<b>538H</b> 2 NC ⊖	<b>090962</b> NZ2RG-538SVM5	On request	-

1) No DGUV approval for switching element 511

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**

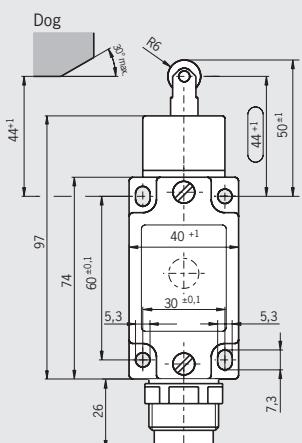


**Plug connector SR6**  
6-pin + PE

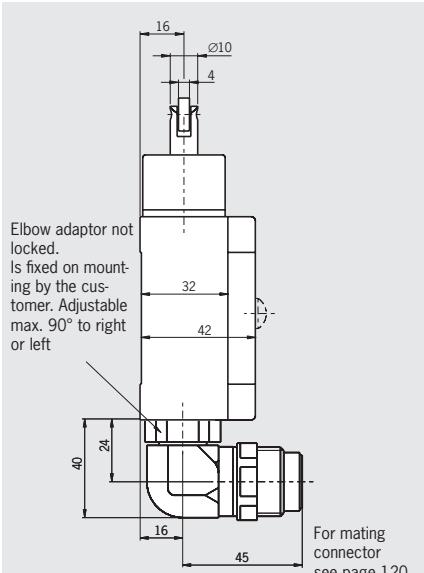
**Plug connector SR6 angled**  
6-pin + PE

**Plug connector SR11**  
11-pin + PE

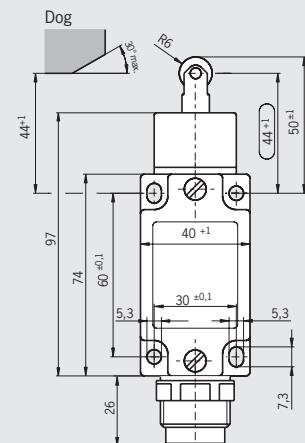
## Dimension drawings



For mating connector  
see page 120



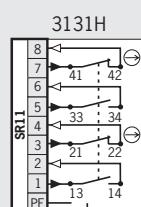
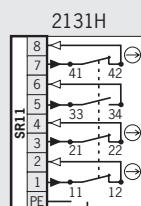
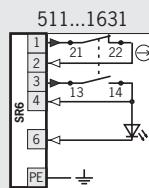
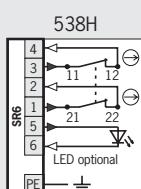
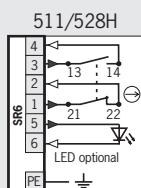
For mating connector  
see page 120



For mating connector  
see page 120

## Wiring diagrams

Switch not activated



## Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display	
					Without LED	12-60 V red LED
NZ	RG Roller plunger	2 Plug connector <b>SR6</b>	511 <sup>1)</sup> 1 NC ⊖ + 1 NO		090032 <sup>1)</sup> NZ2RG-511	091284 <sup>1)</sup> NZ2RG-511L060
			528H 1 NC ⊖ + 1 NO		090943 NZ2RG-528	-
			538H 2 NC ⊖		090945 NZ2RG-538	090946 NZ2RG-538L060
		2 Plug connector <b>SR6</b> Angled	511 <sup>1)</sup> 1 NC ⊖ + 1 NO	C1631 Alternative wiring	On request	On request
			2131H 3 NC ⊖ + 1 NO		090947 NZ2RG-2131	-
		3131H 2 NC ⊖ + 2 NO			090948 NZ2RG-3131	-

1) No DGUV approval for switching element 511

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**

## Safety switch NZ.RL with roller plunger

- ▶ Steel roller Ø 18 mm
- ▶ With grooved ball bearing Ø 16 mm optional
- ▶ LED optional
- ▶ Plug connector optional



### Approach direction

Horizontal  
Adjustable in 90° steps.

### LED function display (optional)

A function display is available for the following voltage ranges:

- ▶ AC/DC 12-60 V red
- ▶ AC 110 V ±15% red
- ▶ AC 230 V ±15% red

### Switching elements (See also page 13/14)

- ▶ **511** Snap-action switching contact 1 NC ⊖ + 1 NO
- ▶ **528H** Slow-action switching contact 1 NC ⊖ + 1 NO
- ▶ **538H** Slow-action switching contact 2 NC ⊖
- ▶ **2121H** Slow-action switching contact 4 NC ⊖
- ▶ **2131H** Slow-action switching contact 3 NC ⊖ + 1 NO
- ▶ **3131H** Slow-action switching contact 2 NC ⊖ + 2 NO

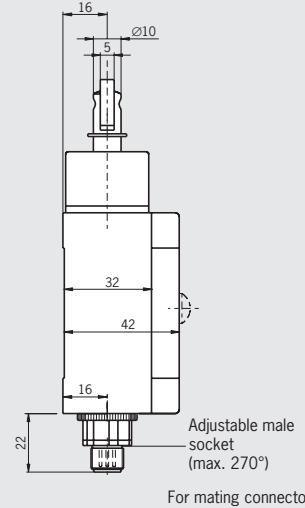
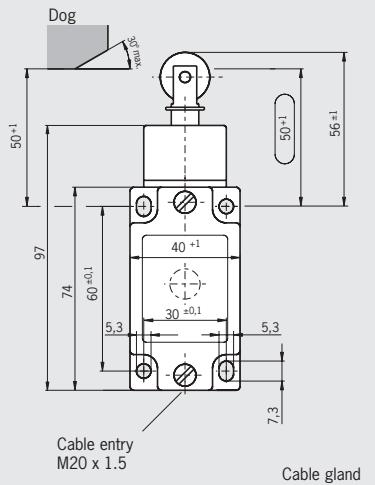
## Cable entry M20 x 1.5



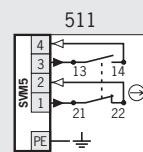
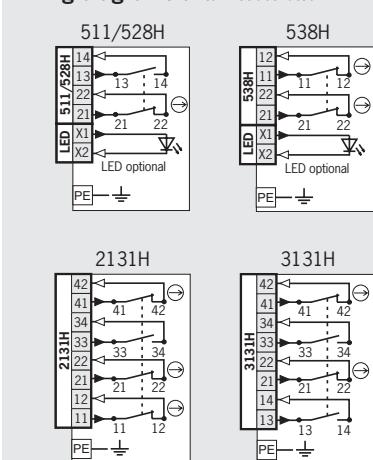
## Plug connector SVM5 M12 plug, 5-pin



## Dimension drawings



## Wiring diagrams



## Ordering table

Series	Actuator	Connec-tion	Switching element	Function display			
				Without LED	12-60 V red LED	110 V red LED	230 V red LED
NZ	RL Roller plunger	1 Cable entry M20 x 1.5	511 <sup>1)</sup> 1 NC ⊖ + 1 NO	088614 <sup>1)</sup> NZ1RL-511-M	088996 <sup>1)</sup> NZ1RL-511L060-M	089080 <sup>1)</sup> NZ1RL-511L110-M	089079 <sup>1)</sup> NZ1RL-511L220-M
			528H 1 NC ⊖ + 1 NO	090937 NZ1RL-528-M	090938 NZ1RL-528L060-M	On request	-
		538H 2 NC ⊖	090939 NZ1RL-538-M	090940 NZ1RL-538L060-M	On request	On request	-
		2131H 3 NC ⊖ + 1 NO	090941 NZ1RL-2131-M	-	-	-	-
		3131H 2 NC ⊖ + 2 NO	090942 NZ1RL-3131-M	-	-	-	-
	2 Plug connector SVM5 (M12 plug)	511 <sup>1)</sup> 1 NC ⊖ + 1 NO	090028 <sup>1)</sup> NZ2RL-511SVM5	On request	-	-	-

1) No DGUV approval for switching element 511

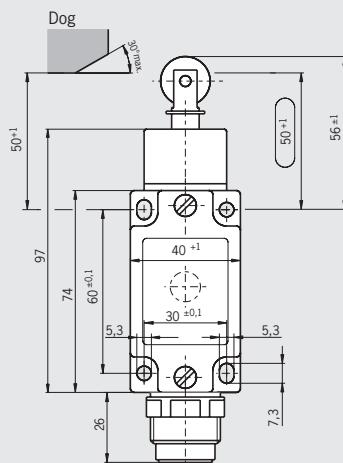
# Safety Switches with Safety Function, Metal Housing

**EUCHNER**



**Plug connector SR6**  
6-pin + PE

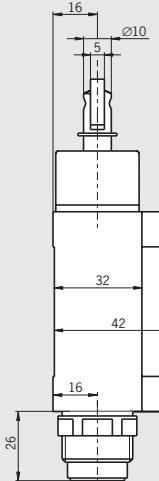
## Dimension drawings



For mating connector  
see page 120

**Plug connector SR11**  
11-pin + PE

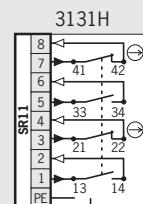
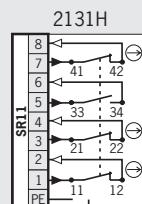
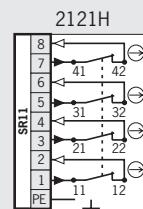
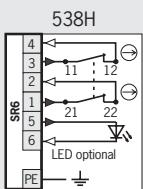
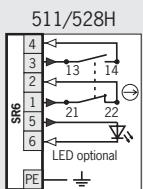
**Note:**  
Roller diameter 16 mm on  
version with grooved ball bearing  
(C1831)



For mating connector  
see page 120

## Wiring diagrams

Switch not activated



## Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display	
					Without LED	12-60 V red LED
NZ	RL Roller plunger	2 Plug connector <b>SR6</b>	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO		<b>090025</b> <sup>1)</sup> NZ2RL-511	
			<b>528H</b> 1 NC ⊖ + 1 NO		-	<b>091282</b> NZ2RL-528L060
			<b>538H</b> 2 NC ⊖		-	<b>091278</b> NZ2RL-538L060
	2 Plug connector <b>SR11</b>	<b>2121H</b> 4 NC ⊖			<b>090975</b> NZ2RL-2121	-
		<b>2121H</b> 4 NC ⊖	<b>C1831</b> Grooved ball bearing		<b>095806</b> NZ2RL-2121C1831	-
		<b>2131H</b> 3 NC ⊖ + 1 NO			<b>090958</b> NZ2RL-2131	-
		<b>3131H</b> 2 NC ⊖ + 2 NO			<b>090959</b> NZ2RL-3131	-

1) No DGUV approval for switching element 511

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**

## Safety switch NZ.HS with roller lever arm

- ▶ Version A according to EN 50041 (steel roller Ø 18)
- ▶ LED optional
- ▶ Plug connector optional



### Approach direction



Switch head and lever arm can be adjusted in 90° steps.

### Switching direction

Right, left or both sides (see page 9).

### LED function display (optional)

A function display is available for the following voltage ranges:

- ▶ AC/DC 12-60 V red or yellow
- ▶ AC 110 V ±15% red
- ▶ AC 230 V ±15% red

### Switching elements (See also page 13/14)

- ▶ **511** Snap-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **538H** Slow-action switching contact  
2 NC ⊖
- ▶ **2121H** Slow-action switching contact  
4 NC ⊖
- ▶ **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO
- ▶ **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO

### Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display				
					Without LED	12-60 V red LED	110 V red LED	230 V red LED	12-60 V yellow LED
NZ	HS Lever arm	1 Cable entry M20 x 1.5	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO		<b>079953</b> <sup>1)</sup> NZ1HS-511-M	<b>090035</b> <sup>1)</sup> NZ1HS-511L060-M	<b>090036</b> <sup>1)</sup> NZ1HS-511L110-M	<b>090037</b> <sup>1)</sup> NZ1HS-511L220-M	<b>090038</b> <sup>1)</sup> NZ1HS-511L060GE-M
			<b>528H</b> 1 NC ⊖ + 1 NO		<b>090970</b> NZ1HS-528-M	<b>090971</b> NZ1HS-528L060-M	<b>090050</b> NZ1HS-528L110-M	<b>090052</b> NZ1HS-528L220-M	<b>090049</b> NZ1HS-528L060GE-M
			<b>538H</b> 2 NC ⊖		<b>090972</b> NZ1HS-538-M	<b>090760</b> NZ1HS-538L060-M	On request	On request	On request
			<b>2121H</b> 4 NC ⊖		<b>090254</b> NZ1HS-2121-M	-	-	-	-
			<b>2131H</b> 3 NC ⊖ + 1 NO		<b>090973</b> NZ1HS-2131-M	-	-	-	-
			<b>3131H</b> 2 NC ⊖ + 2 NO		<b>090747</b> NZ1HS-3131-M	-	-	-	-
		<b>2</b> Plug connector <b>SVM5</b> (M12 plug)	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO		<b>090867</b> <sup>1)</sup> NZ2HS-511SVM5	On request	-	-	<b>098648</b> <sup>1)</sup> NZ2HS-511SVM5L060GE
			<b>528H</b> 1 NC ⊖ + 1 NO		<b>090868</b> NZ2HS-528SVM5	On request	-	-	On request
			<b>538H</b> 2 NC ⊖		<b>090869</b> NZ2HS-538SVM5	On request	-	-	On request

1) No DGUV approval for switching element 511

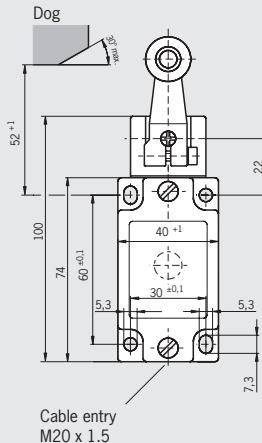
### Cable entry M20 x 1.5



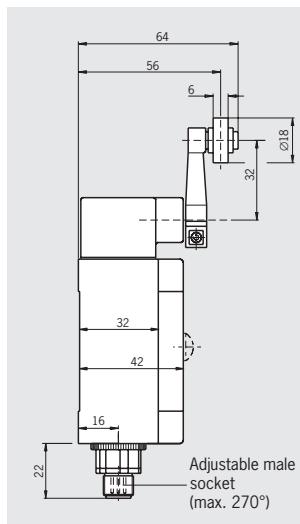
### Plug connector SVM5



### Dimension drawings



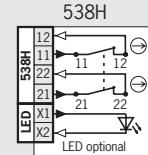
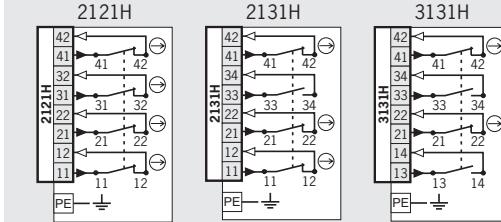
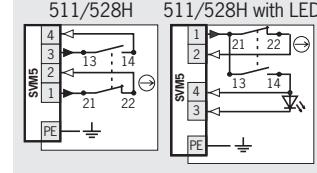
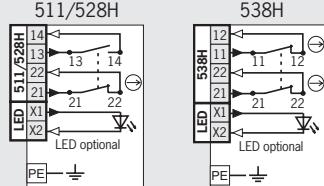
Cable gland  
see page 124



Adjustable male  
socket  
(max. 270°)  
For mating connector  
see page 124

### Wiring diagrams

Switch not activated



# Safety Switches with Safety Function, Metal Housing

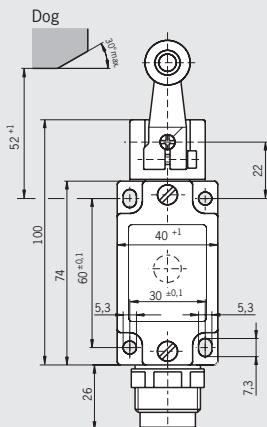
**EUCHNER**



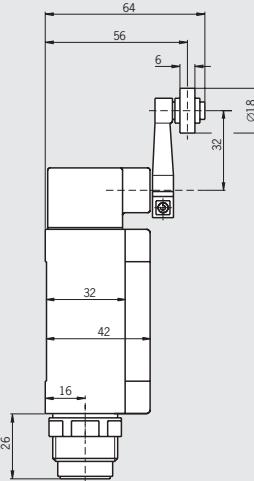
**Plug connector SR6**  
6-pin + PE

**Plug connector SR11**  
11-pin + PE

## Dimension drawings



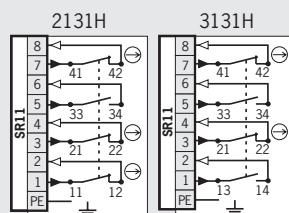
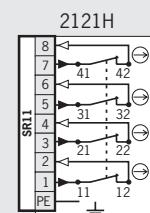
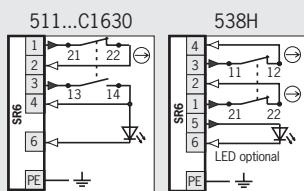
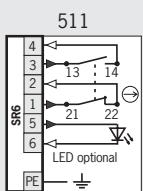
For mating connector  
see page 120



For mating connector  
see page 120

## Wiring diagrams

Switch not activated



## Ordering table

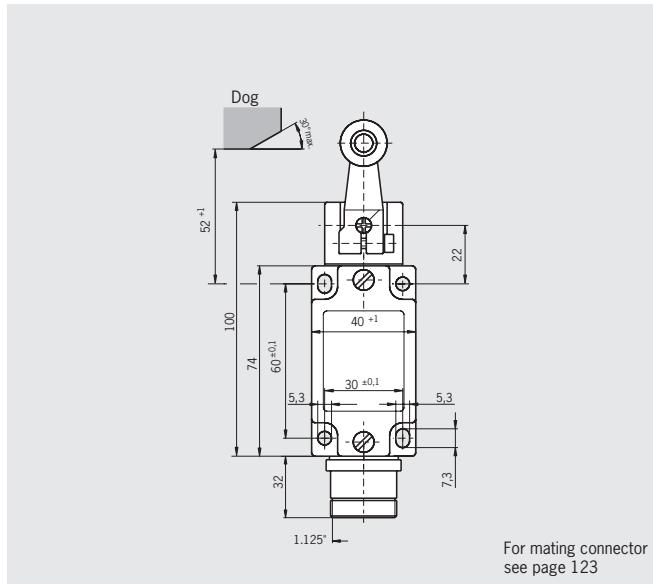
Series	Actuator	Connec-tion	Switching element	Version	Function display		
					Without LED	12-60 V red LED	12-60 V yellow LED
NZ	HS Lever arm	2 Plug connector SR6	511 <sup>1)</sup> 1 NC ⊖ + 1 NO		089093 <sup>1)</sup> NZ2HS-511	089094 <sup>1)</sup> NZ2HS-511L060	090697 <sup>1)</sup> NZ2HS-511L060GE
			511 <sup>1)</sup> 1 NC ⊖ + 1 NO	C1631 Alternative wiring	On request	On request	078473 <sup>1)</sup> NZ2HS-511L060C1630
			528H 1 NC ⊖ + 1 NO		090852 NZ2HS-528	088196 NZ2HS-528L060	On request
			538H 2 NC ⊖		090853 NZ2HS-538	090854 NZ2HS-538L060	On request
	2 Plug connector SR11	2121H 4 NC ⊖			091264 NZ2HS-2121	-	-
		2131H 3 NC ⊖ + 1 NO			090146 NZ2HS-2131	-	-
		3131H 2 NC ⊖ + 2 NO			090856 NZ2HS-3131	-	-

1) No DGSV approval for switching element 511

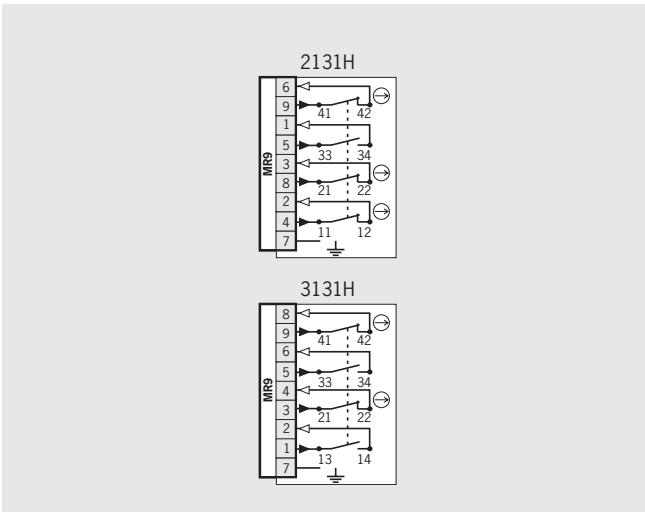
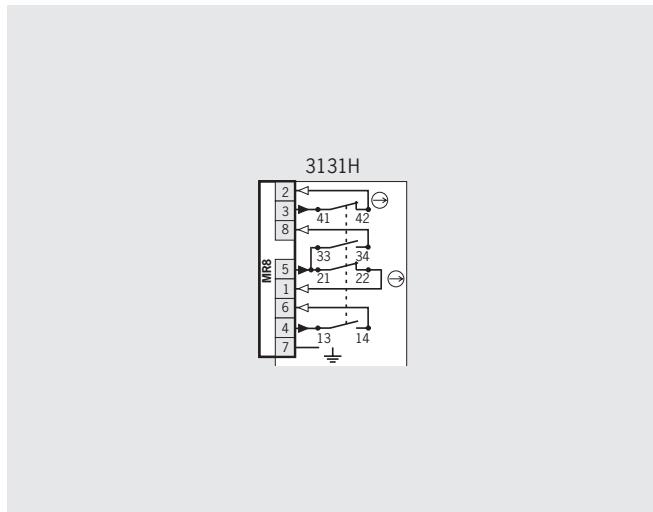
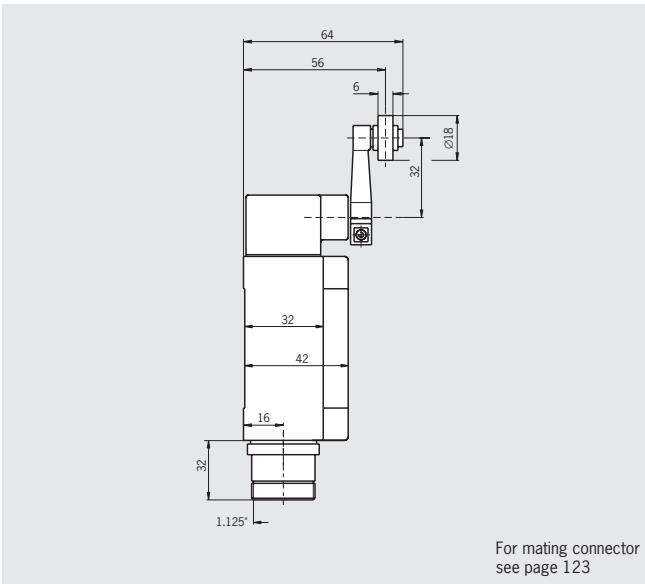
Please turn over



**Plug connector MR8**  
7-pin + PE



**Plug connector MR9**  
8-pin + PE



## Ordering table

Series	Actuator	Connec-tion	Switching element	Function display		
				Without LED	12-60 V red LED	12-60 V yellow LED
NZ	HS Lever arm	1...8C Plug connector <b>MR8</b>	<b>3131H</b> 2 NC $\ominus$ + 2 NO	<b>086574</b> NZ1HS-3131-8C-Ford / PT60577-101K01	-	-
		1...9C Plug connector <b>MR9</b>	<b>2131H</b> 3 NC $\ominus$ + 1 NO	<b>077391</b> <sup>3)</sup> NZ1HS-2131-9C-GMMF	-	-
			<b>3131H</b> 2 NC $\ominus$ + 2 NO	<b>073508</b> NZ1HS-3131-9C-GMMF	-	-

3) UL approval only for safety switch 077391

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**

## Safety switch NZ.HB with roller lever arm

- ▶ Version A according to EN 50041  
(plastic roller Ø 18)
- ▶ LED optional
- ▶ Plug connector optional



### Approach direction



Switch head and lever arm can be adjusted in 90° steps.

### Switching direction

Right, left or both sides (see page 9).

### LED function display (optional)

A function display is available for the following voltage ranges:

- ▶ AC/DC 12-60 V red or yellow
- ▶ AC 230 V ±15% red

### Switching elements (See also page 13/14)

- ▶ **511** Snap-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **538H** Slow-action switching contact  
2 NC ⊖
- ▶ **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO
- ▶ **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO

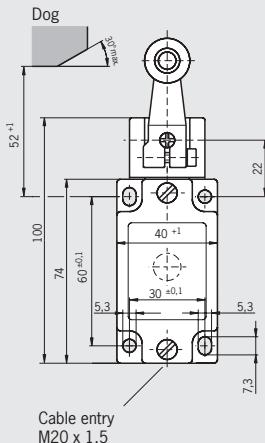
### Cable entry M20 x 1.5



### Plug connector SVM5

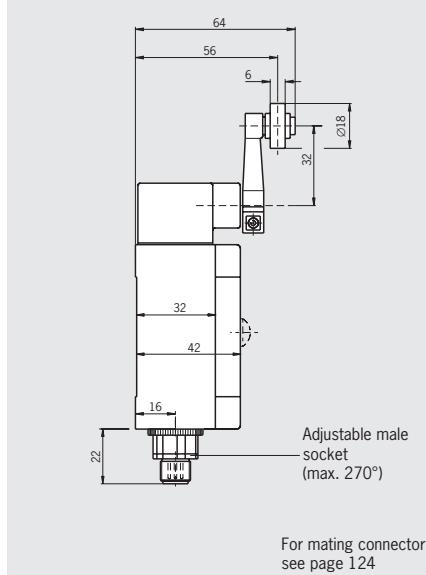


### Dimension drawings



Cable entry  
M20 x 1.5

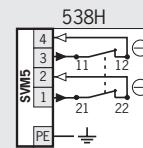
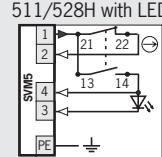
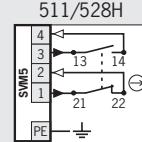
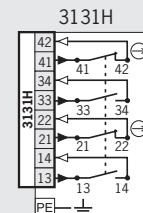
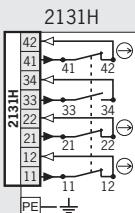
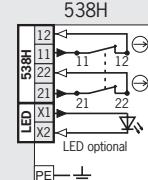
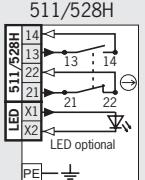
Cable gland  
see page 124



For mating connector  
see page 124

### Wiring diagrams

Switch not activated



### Ordering table

Series	Actuator	Connec-tion	Switching element	Function display			
				Without LED	12-60 V red LED	230 V red LED	12-60 V yellow LED
NZ	HB Lever arm	1 Cable entry M20 x 1.5	511 <sup>1)</sup> 1 NC ⊖ + 1 NO	079952 <sup>1)</sup> NZ1HB-511-M	090039 <sup>1)</sup> NZ1HB-511L060-M	090040 <sup>1)</sup> NZ1HB-511L220-M	086525 <sup>1)</sup> NZ1HB-511L060GE-M
			528H 1 NC ⊖ + 1 NO	088199 NZ1HB-528-M	090965 NZ1HB-528L060-M	090051 NZ1HB-528L220-M	086527 NZ1HB-528L060GE-M
			538H 2 NC ⊖	090966 NZ1HB-538-M	090967 NZ1HB-538L060-M	On request	On request
		2 Plug connector SVM5 (M12 plug)	2131H 3 NC ⊖ + 1 NO	090968 NZ1HB-2131-M	-	-	-
			3131H 2 NC ⊖ + 2 NO	090969 NZ1HB-3131-M	-	-	-
	HB Lever arm	511 <sup>1)</sup> 1 NC ⊖ + 1 NO	090861 <sup>1)</sup> NZ2HB-511SVM5	On request	-	-	098649 <sup>1)</sup> NZ2HB-511SVM5L060GE
		528H 1 NC ⊖ + 1 NO	090864 NZ2HB-528SVM5	On request	-	-	On request
		538H 2 NC ⊖	090862 NZ2HB-538SVM5	On request	-	-	On request

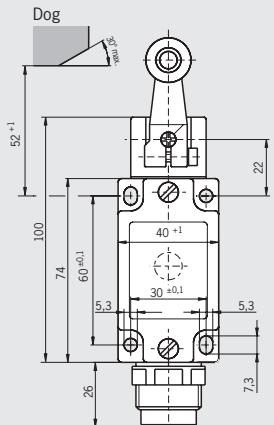
1) No DGUV approval for switching element 511

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**

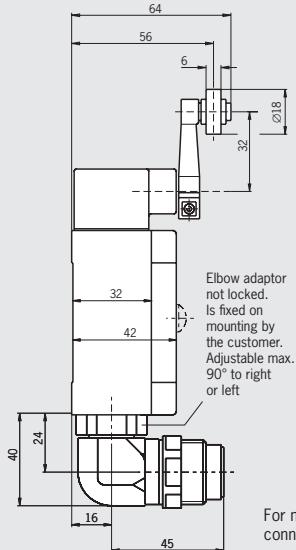


**Plug connector SR6**  
6-pin + PE



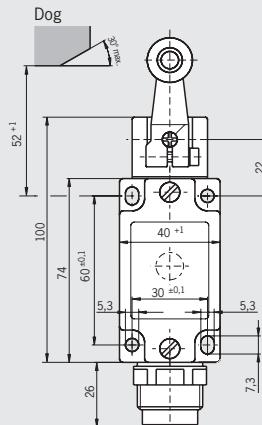
For mating connector  
see page 120

**Plug connector SR6 angled**  
6-pin + PE



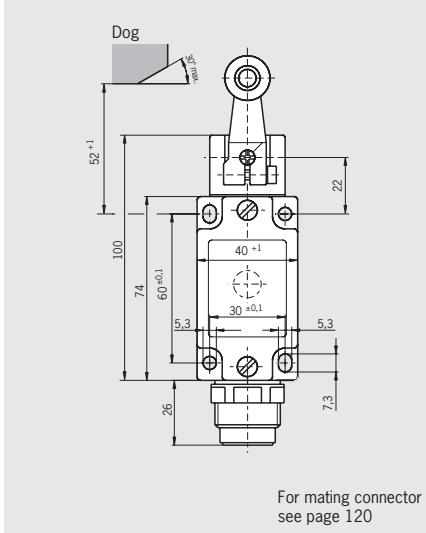
For mating connector  
see page 120

**Plug connector SR11**  
11-pin + PE



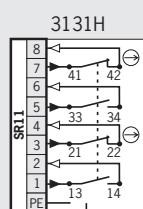
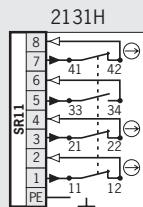
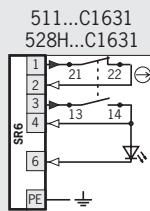
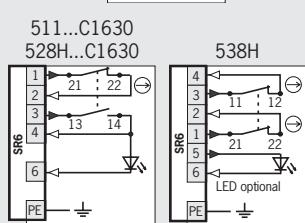
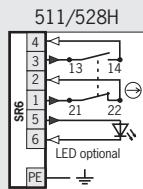
For mating connector  
see page 120

## Dimension drawings



## Wiring diagrams

Switch not activated



## Ordering table

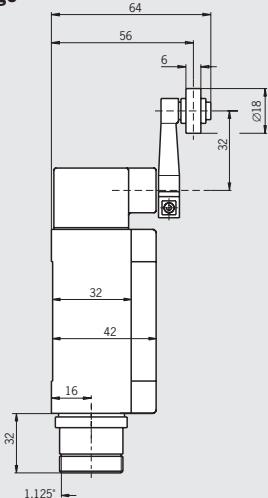
Series	Actuator	Connec-tion	Switching element	Version	Function display			
					Without LED	12-60 V red LED	230 V red LED	12-60 V yellow LED
NZ	HB Lever arm	2 Plug connector <b>SR6</b>	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO		<b>089091</b> <sup>1)</sup> NZ2HB-511	<b>089092</b> <sup>1)</sup> NZ2HB-511L060	On request	<b>090719</b> <sup>1)</sup> NZ2HB-511L060GE
			<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO	C1630 Alternative wiring	On request	On request	On request	<b>054121</b> <sup>1)</sup> NZ2HB-511L060C1630
		2 Plug connector <b>SR6</b> Angled	<b>528H</b> 1 NC ⊖ + 1 NO		<b>090845</b> NZ2HB-528	<b>090846</b> <sup>1)</sup> NZ2HB-528L060	<b>091281</b> NZ2HB-528L220	-
			<b>528H</b> 1 NC ⊖ + 1 NO	C1630 Alternative wiring	On request	On request	On request	<b>091346</b> NZ2HB-528L060C1630
		538H 2 NC ⊖			<b>090847</b> NZ2HB-538	<b>090848</b> NZ2HB-538L060	On request	On request
	2 Plug connector <b>SR6</b> Angled	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO	C1631 Alternative wiring		On request	On request	On request	<b>054122</b> <sup>1)</sup> NZ2HB-511L060C1631
		<b>528H</b> 1 NC ⊖ + 1 NO	C1631 Alternative wiring		On request	On request	On request	<b>091347</b> NZ2HB-528L060C1631
	2 Plug connector <b>SR11</b>	<b>2131H</b> 3 NC ⊖ + 1 NO			<b>090136</b> NZ2HB-2131	-	-	-
		<b>3131H</b> 2 NC ⊖ + 2 NO			<b>090137</b> NZ2HB-3131	-	-	-

1) No DGUV approval for switching element 511



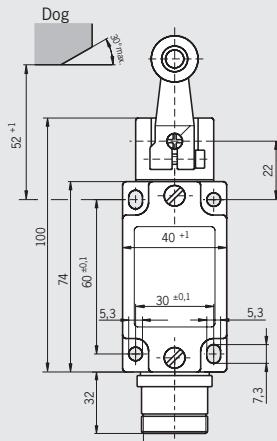
**Plug connector MR9**  
8-pin + PE

### Dimension drawings



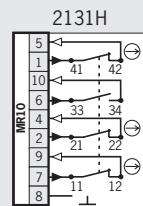
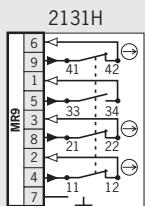
For mating connector  
see page 123

**Plug connector MR10**  
9-pin + PE



For mating connector  
see page 123

**Wiring diagrams** Switch not activated



### Ordering table

Series	Actuator	Connec-tion	Switching element	Function display			
				Without LED	12-60 V red LED	230 V red LED	12-60 V yellow LED
NZ	HB Lever arm	1...9C Plug connector MR9	2131H 3 NC ⊖ + 1 NO	077390 NZ1HB-2131-9C-GMMF	-	-	-
		1...10C Plug connector MR10	2131H 3 NC ⊖ + 1 NO	095898 NZ1HB-2131-10C-FW	-	-	-

# Safety Switches with Safety Function, Metal Housing

**EUCHNER**



## Safety switch NZ.PS with adjustable lever arm

- Steel roller Ø 18
- LED optional
- Plug connector optional

Cable entry M20 x 1.5



### Approach direction



Switch head and lever arm can be adjusted in 90° steps.

### Switching direction

Right, left or both sides (see page 9).

### Lever arm adjustment

Lever arm length can be adjusted from 28 mm to 78 mm in steps of 12.5 mm.

### LED function display (optional)

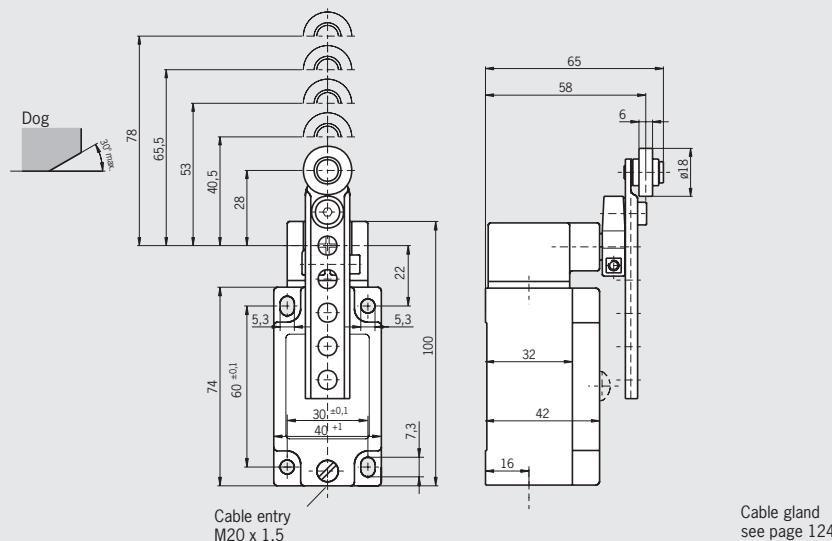
A function display is available for the following voltage ranges:

- AC/DC 12-60 V red or yellow
- AC 230 V ±15% red

### Switching elements (See also page 13/14)

- **511** Snap-action switching contact  
1 NC ⊖ + 1 NO
- **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
- **538H** Slow-action switching contact  
2 NC ⊖
- **2121H** Slow-action switching contact  
4 NC ⊖
- **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO
- **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO

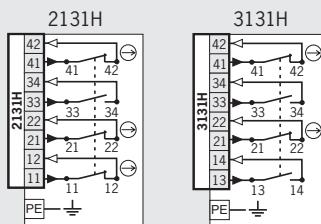
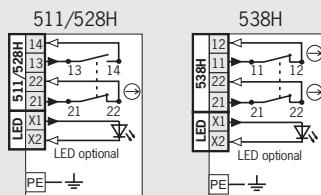
### Dimension drawings



Cable gland  
see page 124

### Wiring diagrams

Switch not activated



### Ordering table

Series	Actuator	Connec-tion	Switching element	Function display			
				Without LED	12-60 V red LED	230 V red LED	12-60 V yellow LED
NZ	PS Adjustable lever arm	1 Cable entry M20 x 1.5	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO	<b>088613</b> <sup>1)</sup> NZ1PS-511-M	On request	On request	On request
			<b>528H</b> 1 NC ⊖ + 1 NO	<b>090874</b> NZ1PS-528-M	<b>090430</b> NZ1PS-528L060-M	<b>093521</b> NZ1PS-528L220-M	<b>093523</b> NZ1PS-528L220GE-M
			<b>538H</b> 2 NC ⊖	<b>090875</b> NZ1PS-538-M	On request	On request	On request
			<b>2131H</b> 3 NC ⊖ + 1 NO	<b>090876</b> NZ1PS-2131-M	-	-	-
			<b>3131H</b> 2 NC ⊖ + 2 NO	<b>090877</b> NZ1PS-3131-M	-	-	-

1) No DGUV approval for switching element 511

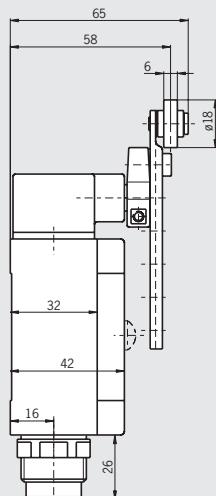
# Safety Switches with Safety Function, Metal Housing

**EUCHNER**



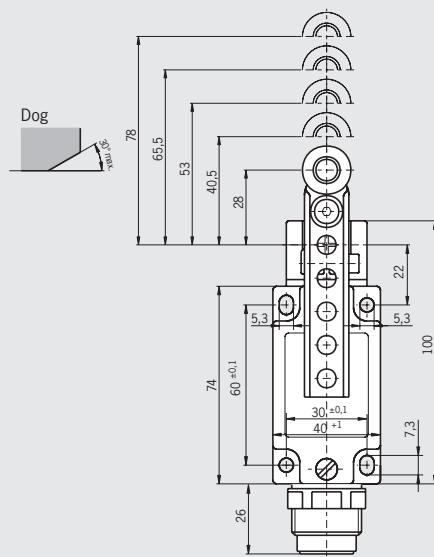
**Plug connector SR6**  
6-pin + PE

## Dimension drawings



For mating connector  
see page 120

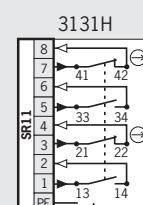
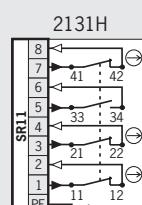
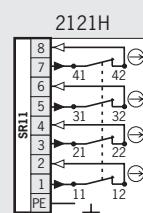
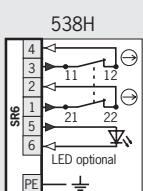
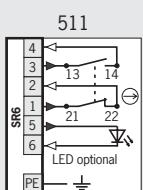
**Plug connector SR11**  
11-pin + PE



For mating connectors  
see page 120

## Wiring diagrams

Switch not activated



## Ordering table

Series	Actuator	Connec-tion	Switching element	Function display	
				Without LED	12-60 V red LED
NZ	PS Adjustable lever arm	2 Plug connector <b>SR6</b>	<b>511</b> 1 NC ⊖ + 1 NO	<b>093112</b> <sup>1)</sup> NZ2PS-511	<b>090152</b> <sup>1)</sup> NZ2PS-511L060
			<b>538H</b> 2 NC ⊖	On request	<b>091632</b> NZ2PS-538L060
		2 Plug connector <b>SR11</b>	<b>2121H</b> 4 NC ⊖	<b>091268</b> NZ2PS-2121	-
			<b>2131H</b> 3 NC ⊖ + 1 NO	<b>090151</b> NZ2PS-2131	-
			<b>3131H</b> 2 NC ⊖ + 2 NO	<b>090150</b> NZ2PS-3131	-

1) No DGUV approval for switching element 511

## Safety switch NZ.PB with adjustable lever arm

► Plastic roller Ø 18

Cable entry M20 x 1.5



### Approach direction



Switch head and lever arm can be adjusted in 90° steps.

### Switching direction

Right, left or both sides (see page 9).

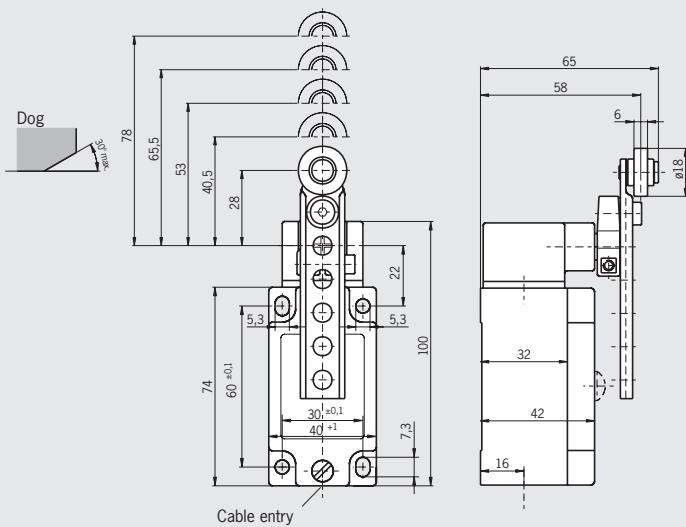
### Lever arm adjustment

Lever arm length can be adjusted from 28 mm to 78 mm in steps of 12.5 mm.

### Switching elements (See also page 13/14)

- **511** Snap-action switching contact  
1 NC ⊖ + 1 NO
- **538H** Slow-action switching contact  
2 NC ⊖
- **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO
- **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO

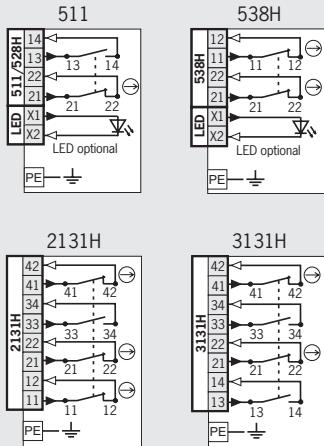
### Dimension drawings



Cable gland  
see page 124

### Wiring diagrams

Switch not activated



### Ordering table

Series	Actuator	Connec-tion	Switching element	Function display	
				Without LED	
NZ	PB Adjustable lever arm	1 Cable entry M20 x 1.5	511 <sup>1)</sup> 1 NC ⊖ + 1 NO	088618 <sup>1)</sup> NZ1PB-511-M	
			538H 2 NC ⊖	090871 NZ1PB-538-M	
			2131H 3 NC ⊖ + 1 NO	090872 NZ1PB-2131-M	
			3131H 2 NC ⊖ + 2 NO	090873 NZ1PB-3131-M	

1) No DGUV approval for switching element 511

## Safety switch NZ.RS.C1588 with roller plunger

- ▶ Version C according to EN 50041  
(steel roller Ø 12 mm)
- ▶ Exterior bellows  
(Material CR rubber)



### Approach direction



Horizontal

Switch head and lever arm can be adjusted in 90° steps.

### Exterior bellows

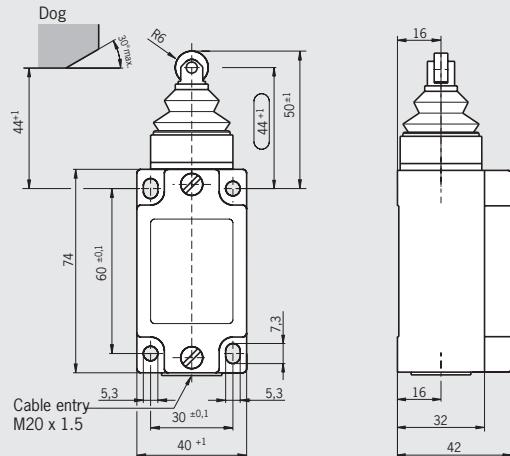
Protection against heavy soiling (dust) and aggressive coolants.

### Switching elements (See also page 13)

- ▶ **511** Snap-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO

### Cable entry M20 x 1.5

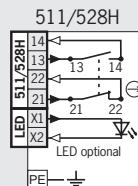
### Dimension drawings



Cable gland  
see page 124

### Wiring diagrams

Switch not activated



### Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display
NZ	RS	1 Cable entry M20 x 1.5	511 <sup>1)</sup> 1 NC ⊖ + 1 NO	C1588 Exterior bellows, red cover	Without LED 091352 <sup>1)</sup> NZ1RS-511-MC1588
			528H 1 NC ⊖ + 1 NO	C1588 Exterior bellows, red cover	091339 NZ1RS-528-MC1588

1) No DGUV approval for switching element 511

## Safety switch NZ.HB.C569 with roller lever arm

- ▶ Large plastic roller Ø 30 mm
- ▶ LED optional

Cable entry M20 x 1.5



### Approach direction



Switch head and lever arm can be adjusted in 90° steps.

### Switching direction

Right, left or both sides (see page 9).

### LED function display (optional)

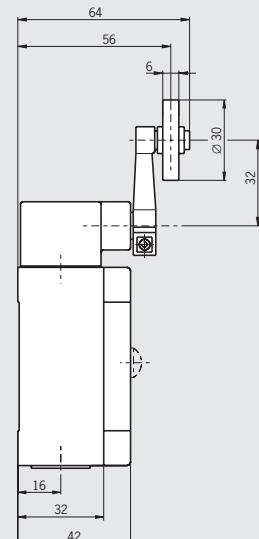
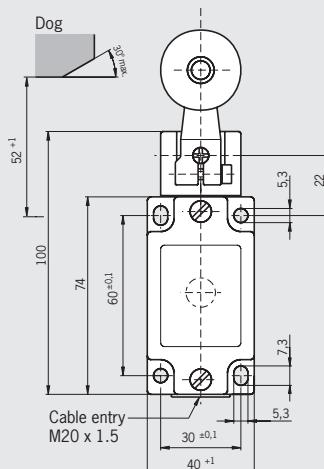
A function display is available for the following voltage ranges:

- ▶ AC/DC 12-60 V red

### Switching elements (See also page 13)

- ▶ **511** Snap-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **538H** Slow-action switching contact  
2 NC ⊖

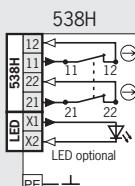
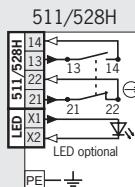
### Dimension drawings



Cable gland  
see page 124

### Wiring diagrams

Switch not activated



### Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display	
					Without LED	12-60 V red LED
NZ	HB Lever arm	1 Cable entry M20 x 1.5	511 <sup>1)</sup> 1 NC ⊖ + 1 NO	C569 Large plastic roller Ø 30 mm	079965 <sup>1)</sup> NZ1HB-511-MC569	091091 <sup>1)</sup> NZ1HB-511L060-MC569
			528H 1 NC ⊖ + 1 NO	C569 Large plastic roller Ø 30 mm	079946 NZ1HB-528-MC569	091330 NZ1HB-528L060-MC569
			538H 2 NC ⊖	C569 Large plastic roller Ø 30 mm	079999 NZ1HB-538-MC569	On request

1) No DGUV approval for switching element 511

## Safety switch NZ.HS.C1779 with roller lever arm



- ▶ Steel roller Ø 18 mm
- ▶ Roller mounted on inside of lever

Cable entry M20 x 1.5



### Approach direction



Switch head and lever arm can be adjusted in 90° steps.

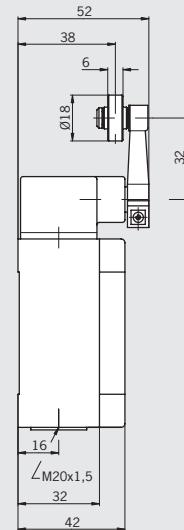
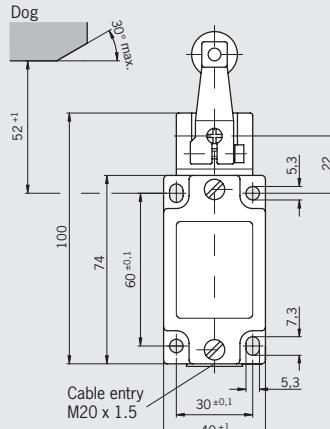
### Switching direction

Right, left or both sides (see page 9).

### Switching elements

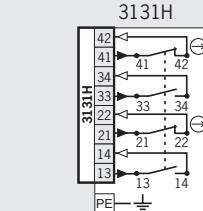
(See also page 14)  
▶ **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO

### Dimension drawings



Cable gland  
see page 124

### Wiring diagrams



### Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display
					Without LED
<b>NZ</b>	<b>HS</b> Lever arm	<b>1</b> Cable entry <b>M20 x 1.5</b>	<b>3131H</b> 2 NC ⊖ + 2 NO	<b>C1779</b> Roller mounted on inside of lever	<b>079996</b> NZ1HS-3131-MC1779

## Safety switch NZ.HS.C1833 with roller lever arm

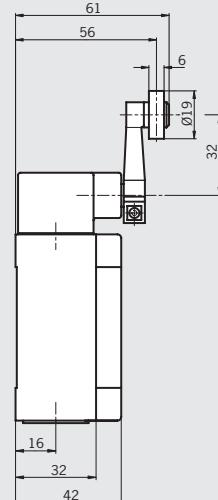
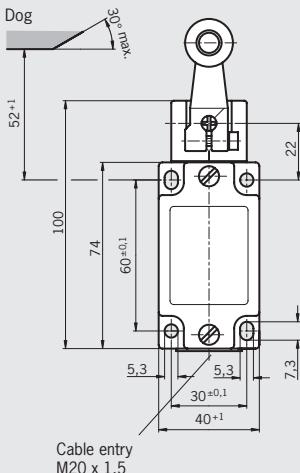


- Steel roller Ø 19 mm
- With grooved ball bearing
- LED on request

Cable entry M20 x 1.5



### Dimension drawings



Cable gland  
see page 124

### Approach direction



Switch head and lever arm can be adjusted in 90° steps.

### Switching direction

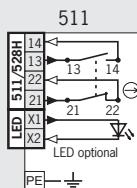
Right, left or both sides (see page 9).

### Switching elements (See also page 13)

- **511** Snap-action switching contact  
1 NC ⊖ + 1 NO

### Wiring diagrams

Switch not activated



### Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display
					Without LED
<b>NZ</b>	<b>HS</b> Lever arm	<b>1</b> Cable entry <b>M20 x 1.5</b>	<b>511</b> 1 NC ⊖ + 1 NO	<b>C1833</b> With grooved ball bearing	<b>091312</b> NZ1HS-511-MC1833

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Selection table for safety switches NZ.VZ

### Version

**SB** Protective plate, tamper protection on the switch head

### Connection

**M**

**SVM5**

**C16-1**

**SR6**

**MR8**

**MR9**

**MR10**

**SR11**

Thread M20x1.5 for cable glands

M12 plug connector 5-pin

Plug connector 6-pin + PE

Plug connector 6-pin + PE

Plug connector 7-pin + PE

Plug connector 8-pin + PE

Plug connector 9-pin + PE

Plug connector 11-pin + PE

### Switching element

Two contacts

1 NC ⊖ + 1 NO or 2 NC ⊖

Four contacts

2 NC ⊖ + 2 NO, 3 NC ⊖ + 1 NO or 4 NC ⊖



SB	Connection								Switching element Two contacts	With version	Page
	M	SVM5	C16-1	SR6	MR8	MR9	MR10	SR11			
●	●								●	●	48
		●		●					●		49
					●	●	●		●	●	49
●	●								●		50
●			●	●					●	C1233	51
●									●	C1420/C1701/C1233	52
●								●	●	C1233	52

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch NZ.VZ

- Housing according to EN 50041
- Various cable entries
- Plug connector optional
- LED optional



### Approach direction

 Horizontal  
Adjustable in 90° steps.

### LED function display (optional)

A function display is available for the following voltage ranges:

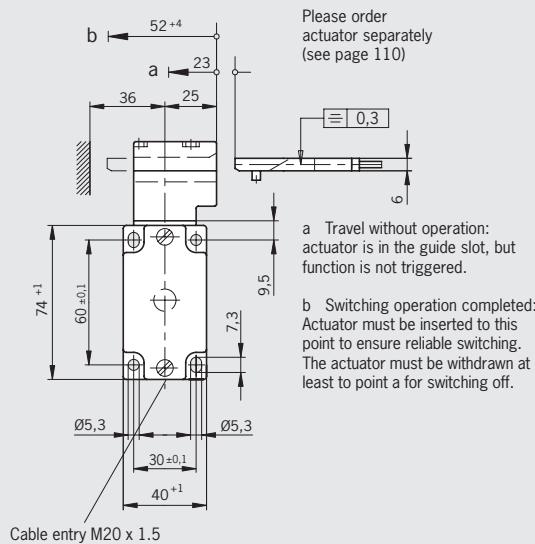
- AC/DC 12-60 V red
- AC 110 V ±15% red
- AC 230 V ±15% red

### Switching elements (See also page 13/14)

- **511** Snap-action switching contact 1 NC ⊖ + 1 NO
- **528H** Slow-action switching contact 1 NC ⊖ + 1 NO
- **538H** Slow-action switching contact 2 NC ⊖
- **2121H** Slow-action switching contact 4 NC ⊖
- **2131H** Slow-action switching contact 3 NC ⊖ + 1 NO
- **3131H** Slow-action switching contact 2 NC ⊖ + 2 NO

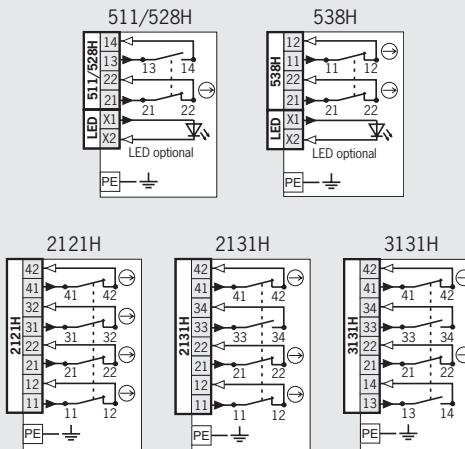
## Cable entry M20 x 1.5

### Dimension drawings



Cable gland  
see page 124

### Wiring diagrams Actuator inserted



### Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display			
					Without LED	12-60 V red LED	110 V red LED	230 V red LED
NZ	VZ Separate actuator	1 Cable entry M20 x 1.5	<b>511</b> <sup>1)</sup> 1 NC ⊖ + 1 NO		<b>089479</b> <sup>1)</sup> NZ1VZ-511E-M	On request	On request	On request
			<b>528H</b> 1 NC ⊖ + 1 NO		<b>090671</b> NZ1VZ-528E-M	<b>090566</b> NZ1VZ-528EL060-M	<b>089480</b> NZ1VZ-528EL110-M	<b>082121</b> NZ1VZ-528EL220-M
			<b>538H</b> 2 NC ⊖		<b>085676</b> NZ1VZ-538E-M	<b>082119</b> NZ1VZ-538EL060-M	<b>089481</b> NZ1VZ-538EL110-M	<b>089482</b> NZ1VZ-538EL220-M
			<b>2121H</b> 4 NC ⊖		<b>089486</b> NZ1VZ-2121E-M	-	-	-
			<b>2131H</b> 3 NC ⊖ + 1 NO		<b>082123</b> NZ1VZ-2131E-M	-	-	-
			<b>3131H</b> 2 NC ⊖ + 2 NO		<b>082122</b> NZ1VZ-3131E-M	-	-	-

1) No DGUV approval for switching element 511

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



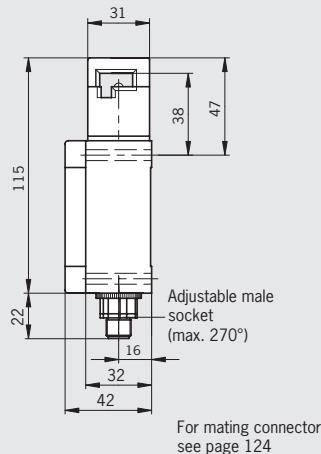
**Plug connector SVM5**  
M12 plug, 5-pin

**Plug connector SR6**  
6-pin + PE

**Plug connector SR11**  
11-pin + PE

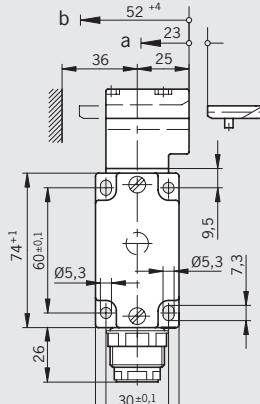
## Dimension drawings

Please order  
actuator separately  
(see page 110)



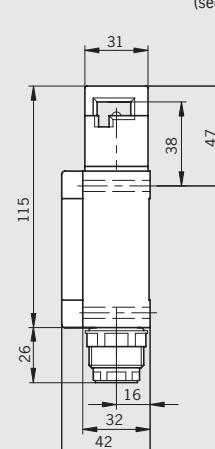
For mating connector  
see page 124

Please order  
actuator separately  
(see page 110)



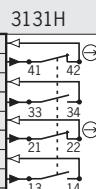
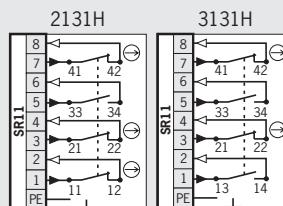
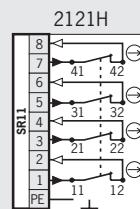
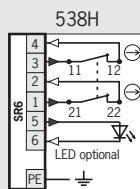
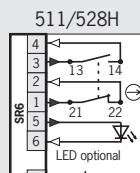
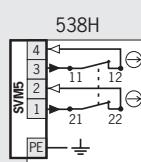
For mating connector  
see page 120

Please order  
actuator separately  
(see page 110)



For mating connector  
see page 120

## Wiring diagrams Actuator inserted



## Ordering table

Series	Actuator	Connec-tion	Switching element	Function display			
				Without LED	12-60 V red LED	110 V red LED	230 V red LED
NZ	VZ Separate actuator	2 Plug connector <b>SVM5</b>	<b>538H</b> 2 NC $\ominus$	<b>084905</b> NZ2VZ-538ESVM5	On request	-	-
			<b>511</b> <sup>1)</sup> 1 NC $\ominus$ + 1 NO	On request	<b>045551</b> <sup>1)</sup> NZ2VZ-511EL060	On request	On request
		2 Plug connector <b>SR6</b>	<b>528H</b> 1 NC $\ominus$ + 1 NO	<b>084885</b> NZ2VZ-528E	<b>045801</b> NZ2VZ-528EL060	<b>059467</b> NZ2VZ-528EL110	<b>038129</b> NZ2VZ-528EL220
			<b>538H</b> 2 NC $\ominus$	<b>090143</b> NZ2VZ-538E	<b>052108</b> NZ2VZ-538EL060	<b>072234</b> NZ2VZ-538EL110	<b>059004</b> NZ2VZ-538EL220
		2 Plug connector <b>SR11</b>	<b>2121H</b> 4 NC $\ominus$	<b>088852</b> NZ2VZ-2121E	-	-	-
			<b>2131H</b> 3 NC $\ominus$ + 1 NO	<b>090144</b> NZ2VZ-2131E	-	-	-
			<b>3131H</b> 2 NC $\ominus$ + 2 NO	<b>090145</b> NZ2VZ-3131E	-	-	-

<sup>1)</sup> No DGUV approval for switching element 511

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



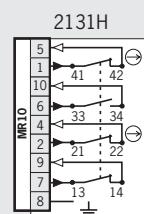
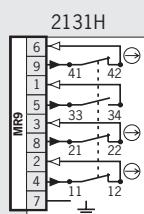
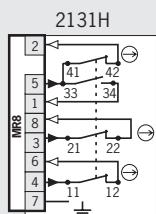
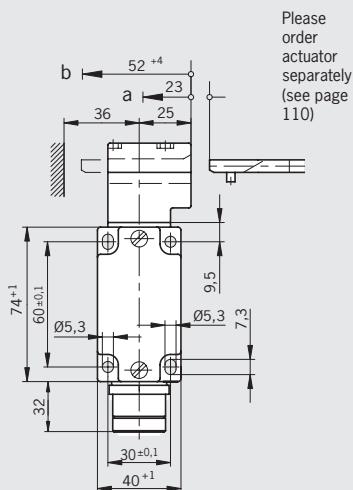
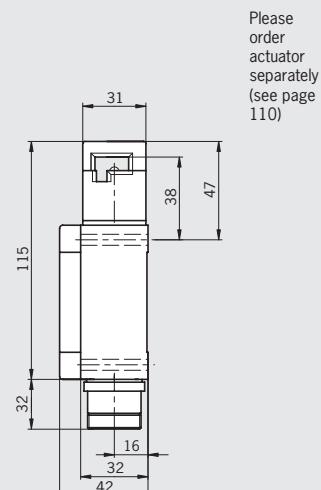
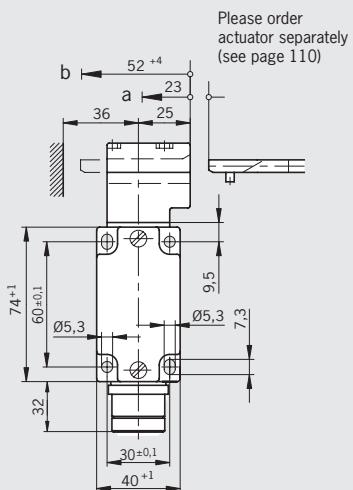
**Plug connector MR8**  
7-pin + PE



**Plug connector MR9**  
8-pin + PE



**Plug connector MR10**  
9-pin + PE



## Ordering table

Series	Actuator	Connec-tion	Switching element	Function display			
				Without LED	12-60 V red LED	110 V red LED	230 V red LED
NZ	VZ Separate actuator	1 Plug connector <b>MR8</b>	<b>2131H</b> 3 NC $\ominus$ + 1 NO	<b>092355</b> NZ1VZ-2131E-8C-GMMF	-	-	-
		1 Plug connector <b>MR9</b>	<b>2131H</b> 3 NC $\ominus$ + 1 NO	<b>077363</b> NZ1VZ-2131E-9C-GMMF	-	-	-
		1 Plug connector <b>MR10</b>	<b>2131H</b> 3 NC $\ominus$ + 1 NO	<b>095896</b> NZ1VZ-2131E-10C-FW	-	-	-

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



## Safety switch NZ.VZ

- ▶ Housing according to EN 50041
- ▶ Protective plate for switch head
- ▶ Plug connector optional
- ▶ LED optional



### Approach direction



Horizontal

Adjustable in 90° steps.

### Protective plate for switch head

Makes it more difficult to tamper with the switch.

### LED function display (optional)

A function display is available for the following voltageranges:

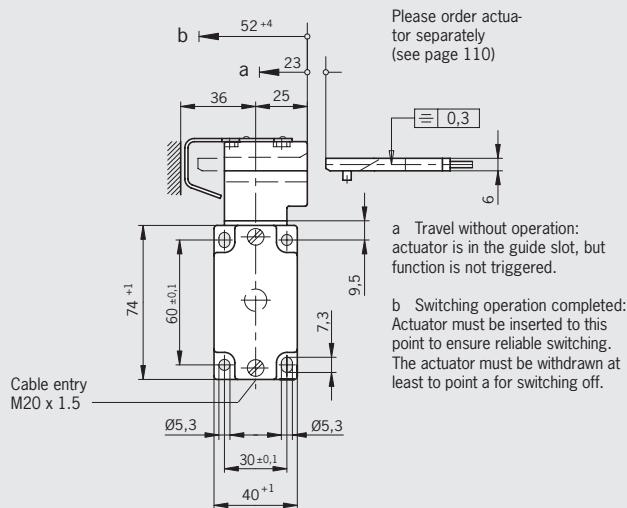
- ▶ AC/DC 12-60 V red
- ▶ AC 230 V ±15% red

### Switching elements (See also page 13/14)

- ▶ **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **538H** Slow-action switching contact  
2 NC ⊖
- ▶ **2121H** Slow-action switching contact  
4 NC ⊖
- ▶ **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO

### Cable entry M20 x 1.5

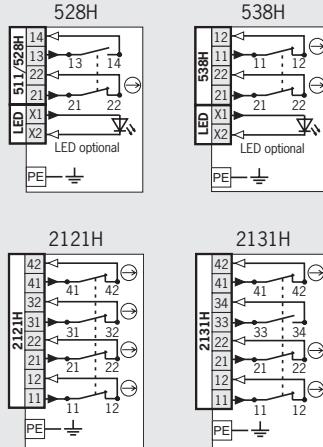
### Dimension drawings



Cable gland  
see page 124

### Wiring diagrams

Actuator inserted



### Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display		
					Without LED	12-60 V red LED	230 V red LED
NZ	VZ Separate actuator	1 Cable entry M20 x 1.5	<b>528H</b> 1 NC ⊖ + 1 NO	With protective plate	<b>082137</b> NZ1VZ-528E-MC1233	<b>089497</b> NZ1VZ-528EL060-MC1233	On request
			<b>538H</b> 2 NC ⊖	With protective plate	<b>093858</b> NZ1VZ-538E-MC1233	On request	<b>089496</b> NZ1VZ-538EL220-MC1233
			<b>2121H</b> 4 NC ⊖	With protective plate	<b>089914</b> NZ1VZ-2121E-MC1233	-	-
			<b>2131H</b> 3 NC ⊖ + 1 NO	With protective plate	<b>093859</b> NZ1VZ-2131E-MC1233	-	-

Please turn over

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



**Plug connector C16-1**  
6-pin + PE

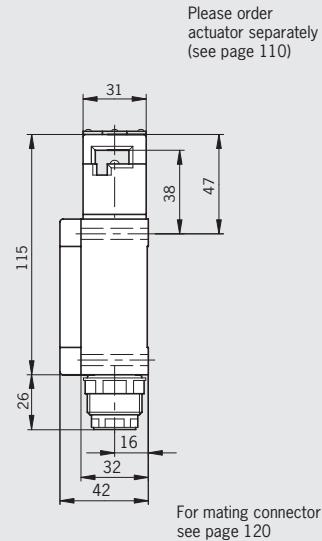
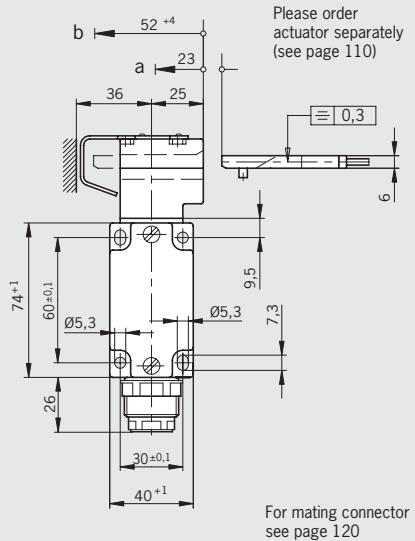
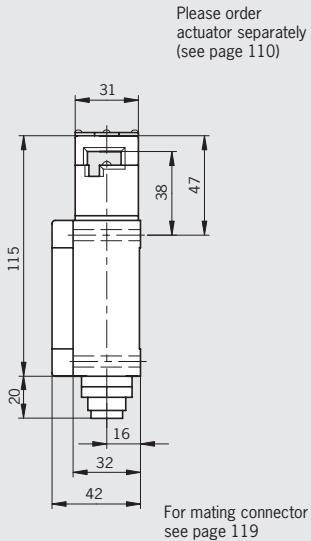


**Plug connector SR6**  
6-pin + PE



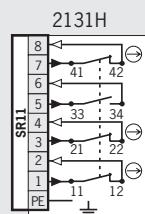
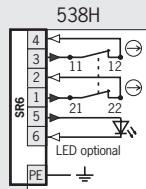
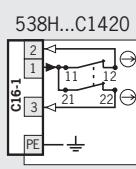
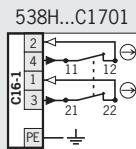
**Plug connector SR11**  
11-pin + PE

## Dimension drawings



## Wiring diagrams

Actuator inserted



## Ordering table

Series	Actuator	Connec-tion	Switching element	Version	Function display	
					Without LED	
NZ	VZ Separate actuator	2 Plug connector <b>C16-1</b>	<b>538H</b> 2 NC $\ominus$	<b>C1701</b> With protective plate	<b>071200</b> NZ2VZ-538EC1701	
		2 Plug connector <b>SR6</b>	<b>C1420</b> With protective plate Alternative wiring		<b>043296</b> NZ2VZ-538EC1420	
		2 Plug connector <b>SR11</b>	<b>2131H</b> 3 NC $\ominus$ + 1 NO	With protective plate	<b>077229</b> NZ2VZ-2131EC1233	
					<b>093857</b> NZ2VZ-2131EC1233	

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Selection table for safety switches NZ.VZ.VS with guard locking without guard lock monitoring



Guard locking		Connection			Switching element	
VSM	VSE	M	SR6	SR11	Two contacts	Four contacts
●		●			●	●
●			●		●	
●				●		●
	●	●			●	●
	●		●		●	
	●			●		●

VSM	Guard locking	VSE	Connection			Switching element		Page
			M	SR6	SR11	Two contacts	Four contacts	
●			●			●	●	54
●				●		●		55
●					●		●	55
	●	●	●			●	●	56
	●			●		●		57
	●				●		●	57

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch NZ.VZ.VSM with guard locking without guard lock monitoring

UL LISTED

- Housing according to EN 50041
- Plug connector optional
- LED optional



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Solenoid operating voltage and optional LED function display

A function display is available for the following voltage ranges:

Solenoid	LED
► DC 24 V ± 10%	AC/DC 12-60 V red
► AC 110 V ± 15%	AC 110 V ± 15% red <sup>1)</sup>
► AC 230 V ± 15%	AC 230 V ± 15% red <sup>1)</sup>

### Guard locking type

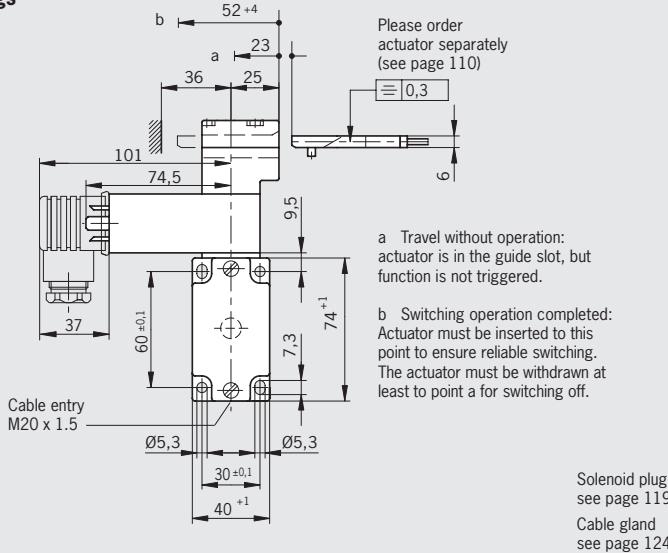
**VSM** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.

### Switching elements (See also page 13/14)

- **511** Snap-action switching contact  
1 NC ⊖ + 1 NO
- **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
- **538H** Slow-action switching contact  
2 NC ⊖
- **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO
- **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO

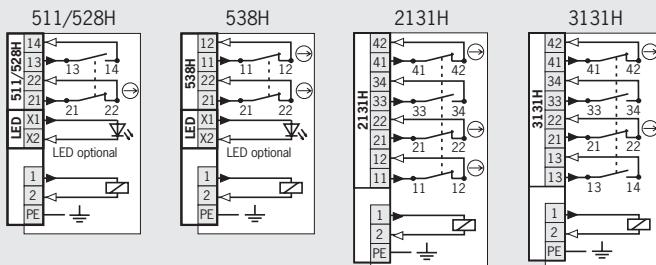
### Cable entry M20 x 1.5

### Dimension drawings



Solenoid plug  
see page 119  
Cable gland  
see page 124

### Wiring diagrams



### Ordering table

Series	Actuator	Connection	Guard locking	Solenoid voltage	Switching element	Function display			
						Without LED	12-60 V red LED	110 V red LED	230 V red LED
NZ	VZ Separate actuator	1 Cable entry M20 x 1.5	VSM Mech. guard locking closed- circuit current principle	04 24 V DC	511 1 NC ⊖ + 1 NO	090339 NZ1VZ-511E3VSM04-M	090344 NZ1VZ-511E3VSM04L060-M	On request	On request
					528H 1 NC ⊖ + 1 NO	082125 NZ1VZ-528E3VSM04-M	082126 NZ1VZ-528E3VSM04L060-M	On request	089488 NZ1VZ-528E3VSM04L220-M
					538H 2 NC ⊖	082131 NZ1VZ-538E3VSM04-M	082132 NZ1VZ-538E3VSM04L060-M	On request	090345 NZ1VZ-538E3VSM04L220-M
					2131H 3 NC ⊖ + 1 NO	088049 NZ1VZ-2131E3VSM04-M	-	-	-
					3131H 2 NC ⊖ + 2 NO	088050 NZ1VZ-3131E3VSM04-M	-	-	-
				07 <sup>1)</sup> 110 V AC	528H 1 NC ⊖ + 1 NO	082129 NZ1VZ-528E3VSM07-M	On request	089485 NZ1VZ-528E3VSM07L110-M	090341 NZ1VZ-528E3VSM07L220-M
					538H 2 NC ⊖	088046 NZ1VZ-538E3VSM07-M	On request	090340 NZ1VZ-538E3VSM07L110-M	On request
					2131H 3 NC ⊖ + 1 NO	088038 NZ1VZ-2131E3VSM07-M	-	-	-
					3131H 2 NC ⊖ + 2 NO	088040 NZ1VZ-3131E3VSM07-M	-	-	-
				09 <sup>1)</sup> 230 V AC	528H 1 NC ⊖ + 1 NO	088045 NZ1VZ-528E3VSM09-M	090349 NZ1VZ-528E3VSM09L060-M	On request	090342 NZ1VZ-528E3VSM09L220-M
					538H 2 NC ⊖	088044 NZ1VZ-538E3VSM09-M	On request	On request	On request
					2131H 3 NC ⊖ + 1 NO	088039 NZ1VZ-2131E3VSM09-M	-	-	-
					3131H 2 NC ⊖ + 2 NO	088041 NZ1VZ-3131E3VSM09-M	-	-	-

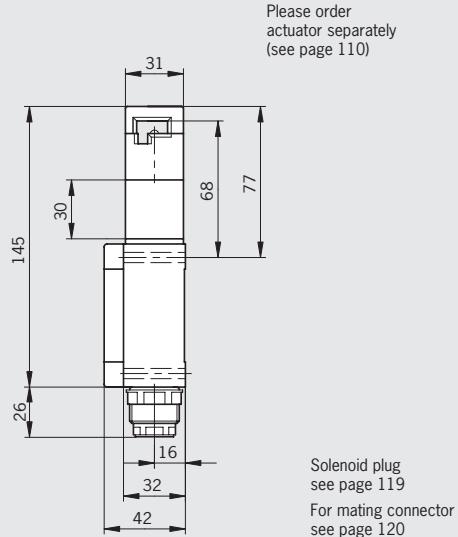
1) Use only solenoid plug with integrated rectifier (see page 119)

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

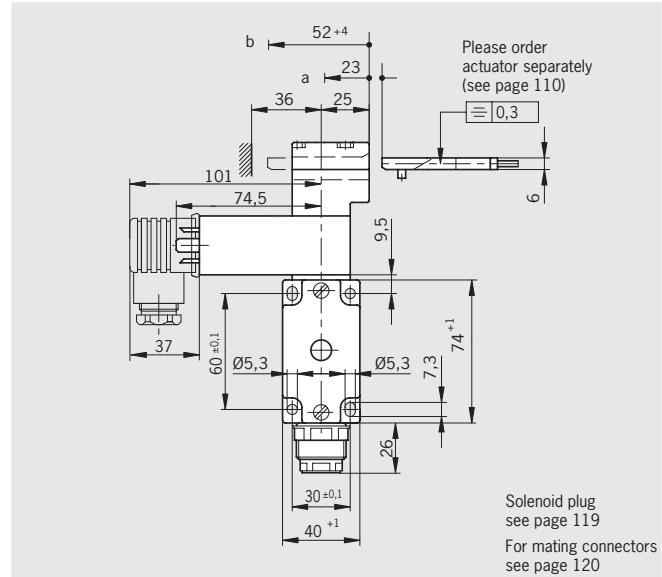


**Plug connector SR6**  
6-pin + PE

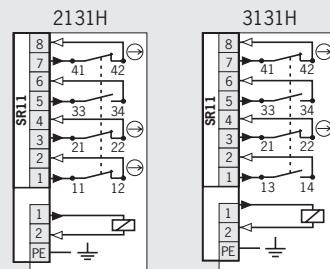
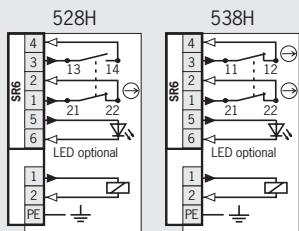
## Dimension drawings



**Plug connector SR11**  
11-pin + PE



## Wiring diagrams



## Ordering table

Series	Actuator	Connection	Guard locking	Solenoid voltage	Switching element	Function display		
						Without LED	12-60 V red LED	230 V red LED
NZ	VZ Separate actuator	2 Plug connector <b>SR6</b>	<b>VSM</b> Mech. guard locking closed-circuit current principle	<b>04</b> 24 V DC	<b>528H</b> 1 NC $\ominus$ + 1 NO	<b>037299</b> NZ2VZ-528E3VSM04	<b>045856</b> NZ2VZ-528E3VSM04L060	<b>070039</b> NZ2VZ-528E3VSM04L220
					<b>538H</b> 2 NC $\ominus$	<b>050428</b> NZ2VZ-538E3VSM04	<b>059427</b> NZ2VZ-538E3VSM04L060	On request
		2 Plug connector <b>SR11</b>	<b>VSM</b> Mech. guard locking closed-circuit current principle	<b>09</b> <sup>1)</sup> 230 V AC	<b>528H</b> 1 NC $\ominus$ + 1 NO	<b>055718</b> NZ2VZ-528E3VSM09	On request	On request
					<b>538H</b> 2 NC $\ominus$	<b>076502</b> NZ2VZ-538E3VSM09	On request	On request
					<b>2131H</b> 3 NC $\ominus$ + 1 NO	<b>074471</b> NZ2VZ-2131E3VSM04	-	-
					<b>3131H</b> 2 NC $\ominus$ + 2 NO	<b>074472</b> NZ2VZ-3131E3VSM04	-	-

1) Use only solenoid plug with integrated rectifier (see page 119)

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch NZ.VZ.VSE with guard locking without guard lock monitoring



- Housing according to EN 50041
- Plug connector optional
- LED optional



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Solenoid operating voltage and optional LED function display

A function display is available for the following voltage ranges:

Solenoid	LED
► DC 24 V ± 10%	AC/DC 12-60 V red
► AC 110 V ± 15%	AC 110 V ± 15% red <sup>1)</sup>
► AC 230 V ± 15%	AC 230 V ± 15% red <sup>1)</sup>

### Guard locking type

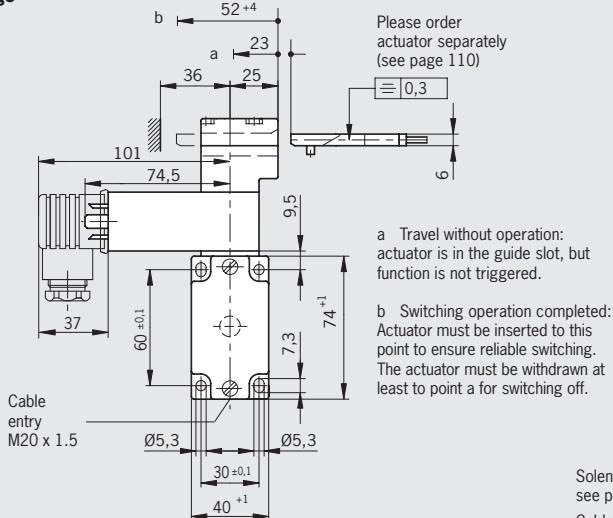
**VSE** Open-circuit current principle, guard locking by applying voltage to the solenoid.  
Release by spring force.

### Switching elements (See also page 13/14)

- **511** Snap-action switching contact  
1 NC ⊖ + 1 NO
- **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
- **538H** Slow-action switching contact  
2 NC ⊖
- **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO
- **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO

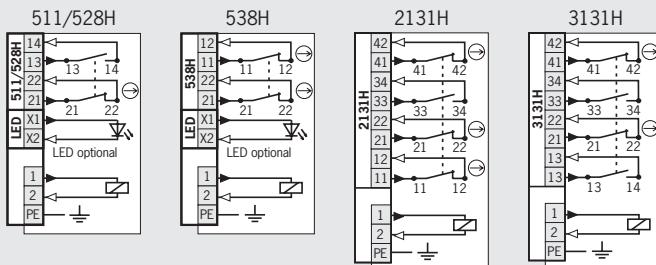
### Cable entry M20 x 1.5

### Dimension drawings



Solenoid plug  
see page 119  
Cable gland  
see page 124

### Wiring diagrams



### Ordering table

Series	Actuator	Connection	Guard locking	Solenoid voltage	Switching element	Function display			
						Without LED	12-60 V red LED	110 V red LED	230 V red LED
NZ	VZ Separate actuator	1 Cable entry M20 x 1.5	VSE Elec. guard locking closed-circuit current principle	04 24 V DC	511 1 NC ⊖ + 1 NO	090343 NZ1VZ-511E3VSE04-M	On request	On request	On request
					528H 1 NC ⊖ + 1 NO	079300 NZ1VZ-528E3VSE04-M	NZ1VZ-528E3VSE04L060-M	On request	091738 NZ1VZ-528E3VSE04L220-M
					538H 2 NC ⊖	089905 NZ1VZ-538E3VSE04-M	NZ1VZ-538E3VSE04L060-M	On request	On request
					2131H 3 NC ⊖ + 1 NO	082134 NZ1VZ-2131E3VSE04-M	-	-	-
					3131H 2 NC ⊖ + 2 NO	088051 NZ1VZ-3131E3VSE04-M	-	-	-
				07 <sup>1)</sup> 110 V AC	528H 1 NC ⊖ + 1 NO	082133 NZ1VZ-528E3VSE07-M	NZ1VZ-528E3VSE07L060-M	089484 NZ1VZ-528E3VSE07L110-M	090336 NZ1VZ-528E3VSE07L220-M
					538H 2 NC ⊖	088048 NZ1VZ-538E3VSE07-M	On request	090348 NZ1VZ-538E3VSE07L110-M	On request
					2131H 3 NC ⊖ + 1 NO	088036 NZ1VZ-2131E3VSE07-M	-	-	-
					3131H 2 NC ⊖ + 2 NO	088042 NZ1VZ-3131E3VSE07-M	-	-	-
				09 <sup>1)</sup> 230 V AC	528H 1 NC ⊖ + 1 NO	088047 NZ1VZ-528E3VSE09-M	NZ1VZ-528E3VSE09L060-M	090346 NZ1VZ-528E3VSE09L220-M	090335 NZ1VZ-528E3VSE09L220-M
					538H 2 NC ⊖	088035 NZ1VZ-538E3VSE09-M	On request	On request	090334 NZ1VZ-538E3VSE09L220-M
					2131H 3 NC ⊖ + 1 NO	088037 NZ1VZ-2131E3VSE09-M	-	-	-
					3131H 2 NC ⊖ + 2 NO	088043 NZ1VZ-3131E3VSE09-M	-	-	-

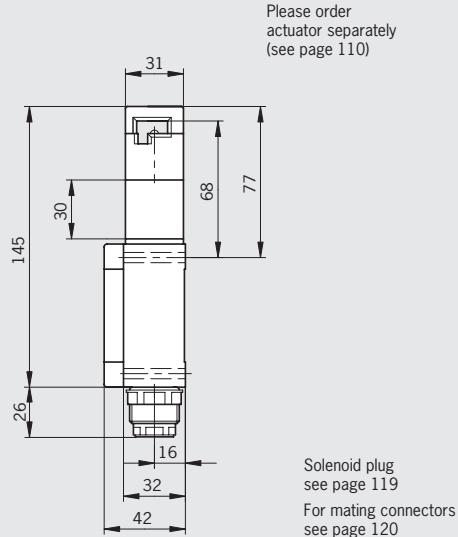
1) Use only solenoid plug with integrated rectifier (see page 119)

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

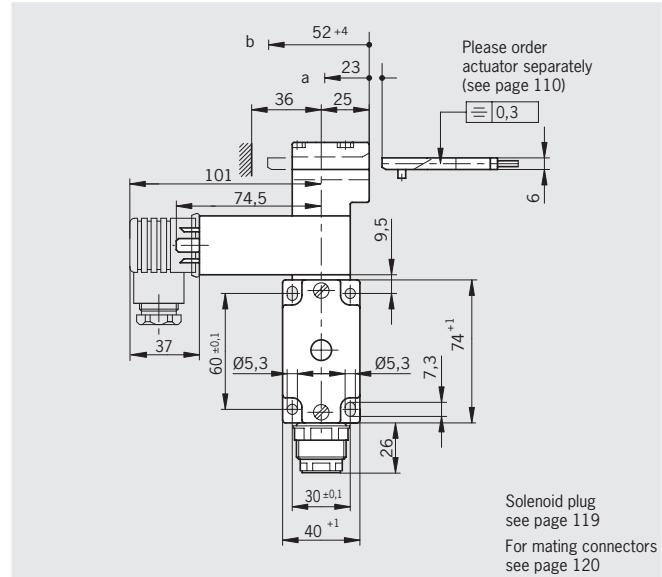


**Plug connector SR6**  
6-pin + PE

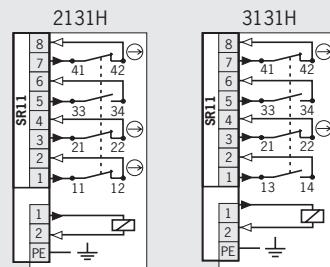
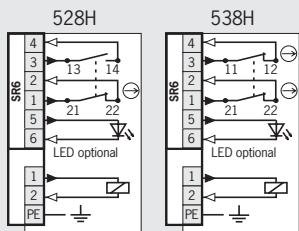
## Dimension drawings



**Plug connector SR11**  
11-pin + PE



## Wiring diagrams



## Ordering table

Series	Actuator	Connection	Guard locking	Solenoid voltage	Switching element	Function display		
						Without LED	12-60 V red LED	110 V red LED
NZ	VZ Separate actuator	2 Plug connector SR6	VSE Elec. guard locking closed- circuit current principle	04 24 V DC	528H 1 NC $\ominus$ + 1 NO	<b>044894</b> NZ2VZ-528E3VSE04	<b>046742</b> NZ2VZ-528E3VSE04L060	On request
					538H 2 NC $\ominus$	<b>047837</b> NZ2VZ-538E3VSE04	<b>057921</b> NZ2VZ-538E3VSE04L060	On request
	VZ Separate actuator	2 Plug connector SR11	VSE Elec. guard locking closed- circuit current principle	07 <sup>1)</sup> 110 V AC	528H 1 NC $\ominus$ + 1 NO	On request	On request	<b>070290</b> NZ2VZ-528E3VSE07L110
					2131H 3 NC $\ominus$ + 1 NO	<b>074473</b> NZ2VZ-2131E3VSE04	-	-
					3131H 2 NC $\ominus$ + 2 NO	<b>074474</b> NZ2VZ-3131E3VSE04	-	-

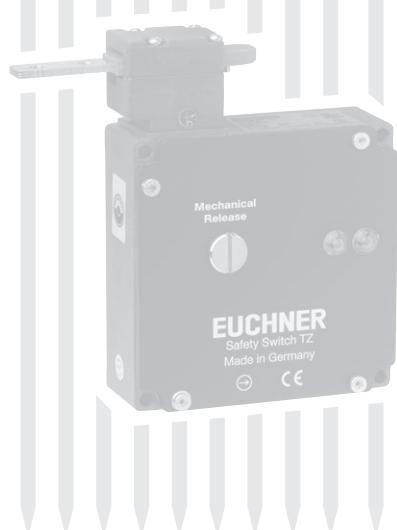
1) Use only solenoid plug with integrated rectifier (see page 119)



# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Selection table for safety switches TZ with guard locking and guard lock monitoring

Release feature, front											
HE	Mechanical release can be sealed										
E	Emergency unlocking										
HD	Mechanical release for triangular key acc. to DIN 22417 (latching)										
ND	Release on the front (pushbutton)										
NR	Emergency unlocking on the front (rotary knob can be sealed)										
O	Without manual release feature										
Release feature, rear											
FS	Escape release on the rear (key button)										
FD	Escape release on the rear (pushbutton/button without key)										
Version											
SB	Protective plate, tamper protection on the switch head										
Enabling switch connection											
BD4	Plug connector 4-pin										
RC12	Plug connector 4-pin										
Connection											
M	Thread M20x1.5 for cable glands										
SR6	Plug connector 6-pin + PE										
MR8	Plug connector 7-pin + PE										
MR10	Plug connector 9-pin + PE										
SR11	Plug connector 11-pin + PE										
MR12	Plug connector 11-pin + PE										
RC18	Plug connector 18-pin + PE										
Switching element											
Two contacts	2 x (1 NC $\ominus$ + 1 NO)										
Four contacts	2 x (4 NC $\ominus$ ) or 1 x (3 NC $\ominus$ + 1 NO) + 1 x (2 NC $\ominus$ + 2 NO)										



Manual release		Enabling switch		Connection						Switching element		With version		Page						
HE	E	HD	ND	NR	O	FS	FD	SB	BD4	RC12	M	SR6	MR8	MR10	SR11	MR12	RC18	2 cont.	4 cont	
●									●								●	●	C1925/C2087	60/65
●										●							●		C1638	62
●																	●	●	C1924	64
●																	●	●	C1826	61
●																	●	●	C1933	63
●					●					●							●	●	C1815/C1828	75
●					●					●							●	●	C1815/C1828	76
●					●				●	●							●	●	C1684	79
●					●			●	●	●							●		C1684	80
●					●			●	●	●							●			67
●					●			●	●	●							●		C1677	68
●					●			●	●	●							●			69
●					●			●	●	●							●		C2082	77
●					●			●	●	●							●		C2140	78
●					●			●	●	●							●		C1903	66
	●				●												●		C2159	70
	●				●					●							●		C1816/C1823	71
	●				●					●							●		C1816/C1823	72
	●				●					●							●			73
	●				●					●							●		C1937	74
	●				●					●							●		C2123	81
	●				●				●	●							●		C1623/C2100	82
	●				●				●	●							●			83
	●				●				●	●							●		C1902/C1971	83
	●				●				●	●							●		C1803	84

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch TZ with guard locking and guard lock monitoring

- Mechanical release on the front
- Two LED indicators, red and green
- Plug connector optional
- Actuating head fitted left or right



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Mechanical release

Is used for releasing the guard locking with the aid of a tool. A sealing wire can be fitted to protect against tampering. Lead seal kit and tool included (already pre-assembled on versions with plug connectors).

### Solenoid operating voltage and LED function display

The following voltage ranges are available:

- 24 V AC/DC -15%, +10%
- 110 V AC -15%, +10%
- 230 V AC -15%, +10%

### Guard locking types

- TZ1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.  
**TZ2** Open-circuit current principle, guard locking by applying voltage to the solenoid. Release by spring force.

### Switching elements

(See also page 13/14)

**SK** For monitoring the door/actuator position

**ÜK** For monitoring the guard locking (built-in solenoid)

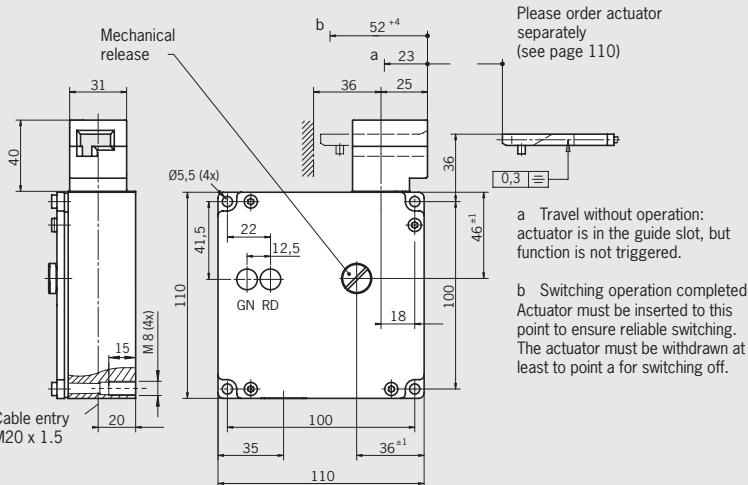
For combinations available see ordering table:

- 528H** Slow-action 1 NC ⊖ + 1 NO
- 2121H** Slow-action 4 NC ⊖
- 2131H** Slow-action 3 NC ⊖ + 1 NO
- 3131H** Slow-action 2 NC ⊖ + 2 NO

### Cable entry M20 x 1.5

### Dimension drawings

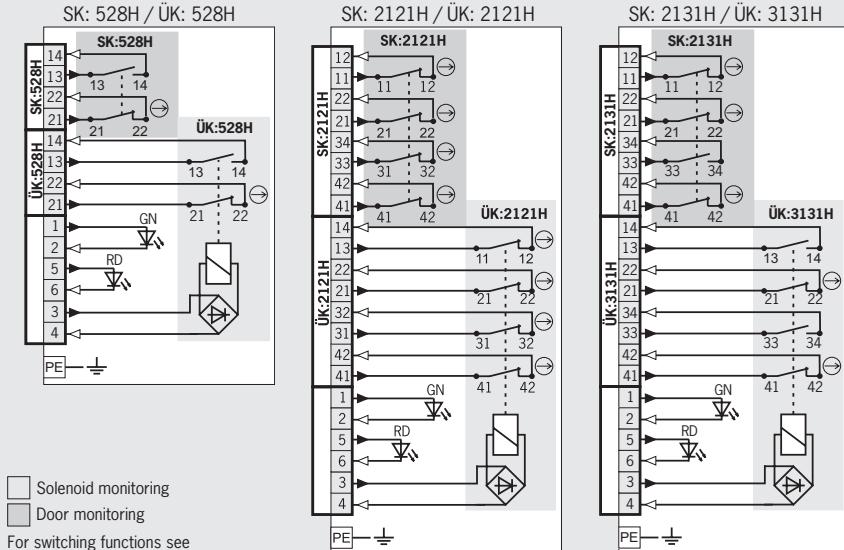
Actuating head on the left is a mirror image



Cable gland  
see page 124

### Wiring diagrams

Actuator inserted and locked



### Ordering table

Series	Connec-tion	Guard locking	Switch head	Switching element	Black cover			Red cover	
					24 V	110 V	230 V	24 V	110 V
TZ	M20x1.5	1	LE left	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	082050 TZ1LE024M	083160 TZ1LE110M	083166 TZ1LE220M	083164 TZ1LE024M-R	083168 TZ1LE110M-R
				SK: 2121H, 4 NC ⊖ ÜK: 2121H, 4 NC ⊖	On request	On request	On request	089464 1) TZ1LE024MVFG-RC1925	On request
		2	RE right	SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	083965 TZ1LE024MVAB	088023 TZ1LE110MVAB	088029 TZ1LE220MVAB	089434 TZ1LE024MVAB-R	On request
				SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	082051 TZ1RE024M	083161 TZ1RE110M	083167 TZ1RE220M	083165 TZ1RE024M-R	089448 TZ1RE110M-R
	M20x1.5	1	RE right	SK: 2121H, 4 NC ⊖ ÜK: 2121H, 4 NC ⊖	On request	On request	On request	089465 1) TZ1RE024MVFG-RC1925	On request
				SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	083966 TZ1RE024MVAB	088024 TZ1RE110MVAB	088030 TZ1RE220MVAB	083233 TZ1RE024MVAB-R	On request
		2	LE left	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	090559 TZ2LE024M	083162 TZ2LE110M	088031 TZ2LE220M	089445 TZ2LE024M-R	On request
				SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	088070 TZ2LE024MVAB	088025 TZ2LE110MVAB	088027 TZ2LE220MVAB	089446 TZ2RE024M-R	On request
		2	RE right	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	090560 TZ2RE024M	083163 TZ2RE110M	088032 TZ2RE220M	089446 TZ2RE024M-R	On request
				SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	088071 TZ2RE024MVAB	088026 TZ2RE110MVAB	088028 TZ2RE220MVAB	089446 TZ2RE024M-R	On request

1) No DGUV approval

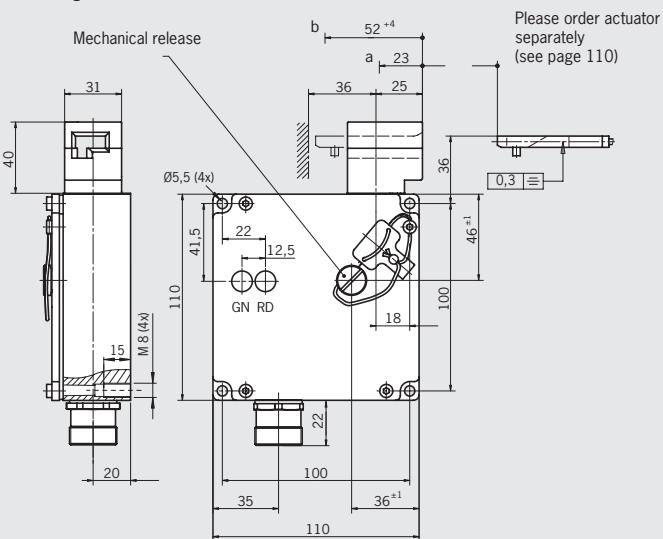


# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



**Plug connector RC18**  
18-pin + PE

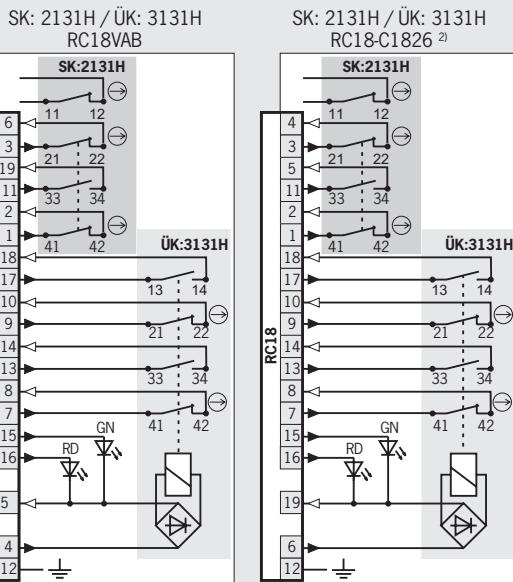
**Dimension drawings** Actuating head on the left is a mirror image



For mating connector  
see page 121

Please turn over

**Wiring diagrams** Actuator inserted and locked



For switching functions see  
technical data on page 170

Solenoid monitoring  
 Door monitoring

## Ordering table

Series	Connection	Guard locking	Switch head	Switching element		Version	Black cover	
				LE left	SK: 2131H, 3 NC $\ominus$ + 1 NO ÜK: 3131H, 2 NC $\ominus$ + 2 NO		24 V	084242 TZ1LE024RC18VAB
TZ	RC18 Plug connector	1 Mechanical	RE right	SK: 2121H, 4 NC $\ominus$ ÜK: 2121H, 4 NC $\ominus$		C1826 Wiring	084246 <sup>2)</sup> TZ1LE024RC18VAB-C1826	084243 TZ1RE024RC18VAB
			LE left	SK: 2131H, 3 NC $\ominus$ + 1 NO ÜK: 3131H, 2 NC $\ominus$ + 2 NO		C1826 Wiring	084247 <sup>2)</sup> TZ1RE024RC18VAB-C1826	084247 TZ1RE024RC18VAB
		2 Electrical	RE right	SK: 2131H, 3 NC $\ominus$ + 1 NO ÜK: 3131H, 2 NC $\ominus$ + 2 NO		C1826 Wiring	085180 <sup>2)</sup> TZ2LE024RC18VAB-C1826	085180 TZ2RE024RC18VAB-C1826
			LE left	SK: 2131H, 3 NC $\ominus$ + 1 NO ÜK: 3131H, 2 NC $\ominus$ + 2 NO		C1826 Wiring	085181 <sup>2)</sup> TZ2RE024RC18VAB-C1826	085181 TZ2RE024RC18VAB-C1826

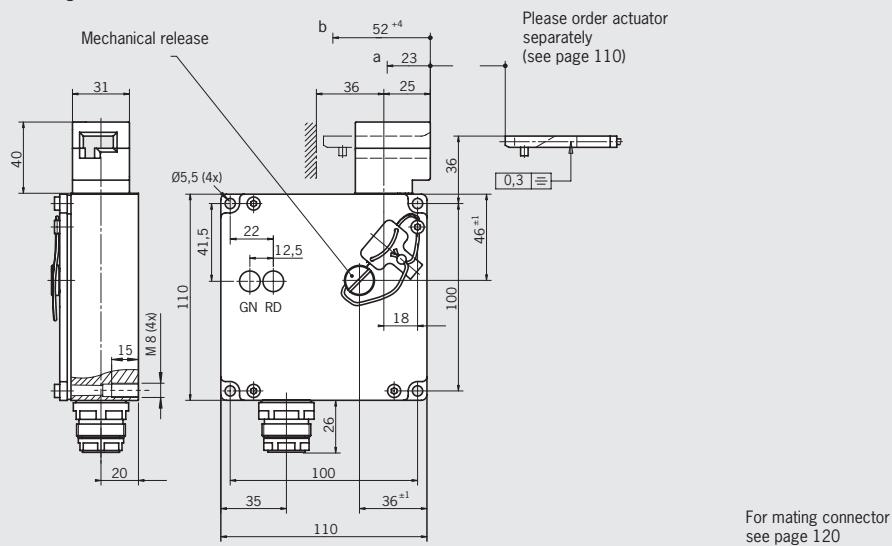
<sup>2)</sup> Important: use suitable mating connector with option C1825!

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

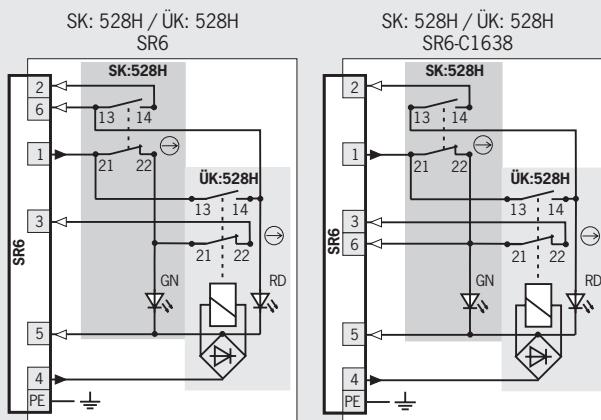


**Plug connector SR6**  
6-pin + PE

**Dimension drawings** Actuating head on the left is a mirror image



**Wiring diagrams** Actuator inserted and locked



For switching functions see  
technical data on page 170

Solenoid monitoring  
 Door monitoring

## Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover			Red cover 24 V
						24 V	110 V	230 V	
TZ	SR6 Plug connector	1 Mechanical	LE left	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO		<b>046502</b> TZ1LE024SR6	<b>046503</b> TZ1LE110SR6	<b>046504</b> TZ1LE220SR6	On request
			RE right	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	<b>C1638<sup>1)</sup></b> Wiring	<b>089476<sup>1)</sup></b> TZ1LE024SR6-C1638	On request	On request	On request
		2 Electrical	LE left	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO		<b>046190</b> TZ1RE024SR6	<b>046191</b> TZ1RE110SR6	<b>051879</b> TZ1RE220SR6	On request
			RE right	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	<b>C1638<sup>1)</sup></b> Wiring	<b>070529<sup>1)</sup></b> TZ1RE024SR6-C1638	On request	On request	On request
	SR6 Push button	1 Mechanical	LE left	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO		<b>049159</b> TZ2LE024SR6	<b>052914</b> TZ2LE110SR6	<b>045450</b> TZ2LE220SR6	<b>046915</b> TZ2LE024SR6-R
			RE right	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	<b>C1638<sup>1)</sup></b> Wiring	<b>076294<sup>1)</sup></b> TZ2LE024SR6-C1638	On request	On request	On request
		2 Electrical	LE left	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO		<b>049102</b> TZ2RE024SR6	<b>049238</b> TZ2RE110SR6	<b>047937</b> TZ2RE220SR6	<b>059672</b> TZ2RE024SR6-R
			RE right	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	<b>C1638<sup>1)</sup></b> Wiring	<b>055819<sup>1)</sup></b> TZ2RE024SR6-C1638	On request	On request	On request

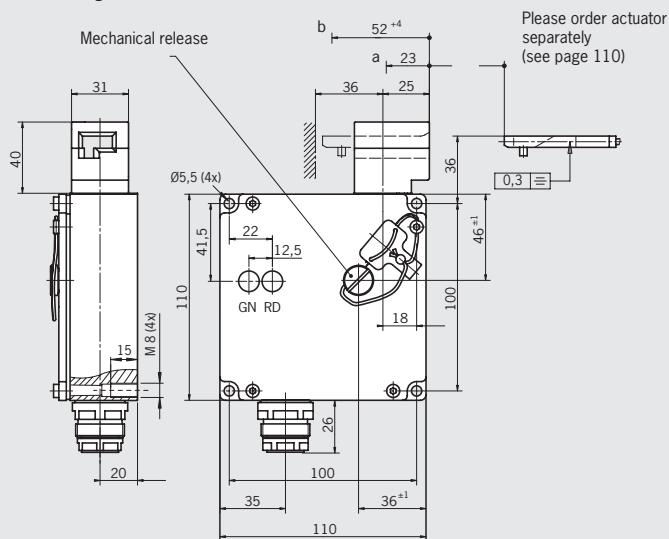
<sup>1)</sup> No DGUV approval

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



**Plug connector SR11**  
11-pin + PE

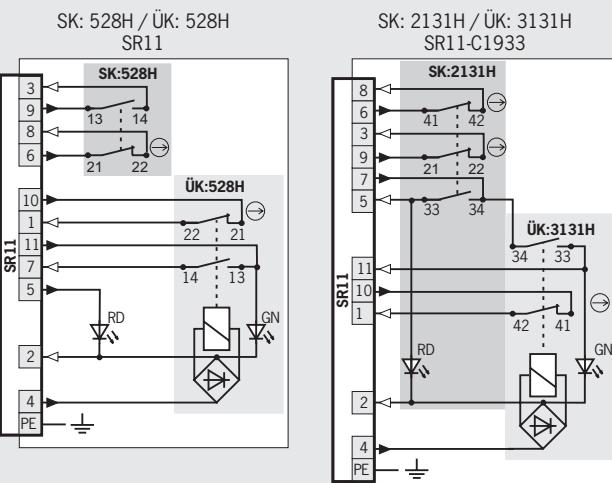
**Dimension drawings** Actuating head on the left is a mirror image



For mating connector  
see page 120

Please turn over

**Wiring diagrams** Actuator inserted and locked



For switching functions see  
technical data on page 170

Solenoid monitoring  
 Door monitoring

## Ordering table

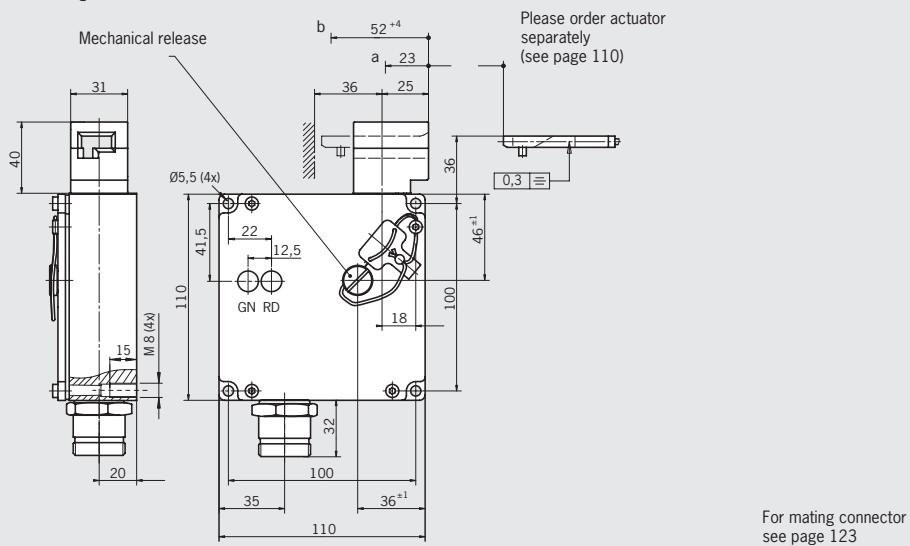
Series	Connection	Guard locking	Switch head	Switching element		Version	Black cover 24 V	
				LE left	RE right			
TZ	SR11 Plug connector	1 Mechanical	LE left	SK: 528H, 1 NC $\ominus$ + 1 NO ÜK: 528H, 1 NC $\ominus$ + 1 NO			<b>070828</b> TZ1LE024SR11	
			RE right	SK: 2131H, 3 NC $\ominus$ + 1 NO ÜK: 3131H, 2 NC $\ominus$ + 2 NO		C1933 <sup>1)</sup> Alternative wiring	<b>083230<sup>1)</sup></b> TZ1LE024SR11VAB-C1933	
		2 Electrical	LE left	SK: 528H, 1 NC $\ominus$ + 1 NO ÜK: 528H, 1 NC $\ominus$ + 1 NO			<b>070826</b> TZ1RE024SR11	
			RE right	SK: 2131H, 3 NC $\ominus$ + 1 NO ÜK: 3131H, 2 NC $\ominus$ + 2 NO		C1933 <sup>1)</sup> Alternative wiring	<b>083231<sup>S</sup></b> TZ1RE024SR11VAB-C1933	
1) No DGUV approval				<b>070958</b> TZ2LE024SR11			<b>070957</b> TZ2RE024SR11	

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

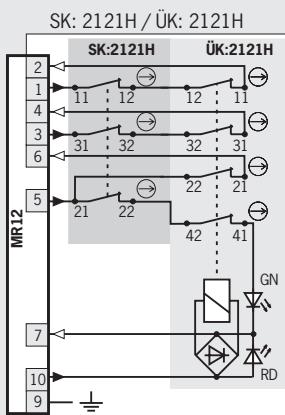


**Plug connector MR12**  
11-pin + PE

**Dimension drawings** Actuating head on the left is a mirror image



**Wiring diagrams** Actuator inserted and locked



For switching functions see  
technical data on page 170

Solenoid monitoring  
 Door monitoring

## Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Black cover			Red cover
					24 V	110 V	230 V	24 V
TZ	<b>MR12</b> Plug connector	1 Mechanical	LE left	SK: 2121H, 4 NC ÜK: 2121H, 4 NC	On request	On request	On request	<b>083190</b> TZ1LE024BHAVFG-RC1924
			RE right	SK: 2121H, 4 NC ÜK: 2121H, 4 NC	On request	On request	On request	<b>083191</b> TZ1RE024BHAVFG-RC1924

Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch TZ with guard locking and guard lock monitoring

- ▶ Mechanical release on the front
  - ▶ Two cable entries M20x1.5
  - ▶ Two LED indicators, red and green
  - ▶ Plug connector on request
  - ▶ Actuating head fitted left or right



#### Approach direction



Horizontal  
Adjustable in 90° steps.

#### Mechanical release

**Mechanical Release**  
Is used for releasing the guard locking with the aid of a tool. A sealing wire can be fitted to protect against tampering. Lead seal kit and tool included (already pre-assembled on versions with plug connectors).

## Solenoid operating voltage and LED function display

The following voltage ranges are available:

- The following voltage ranges are available:

## Guard locking types

**TZ1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.

#### **Switching elements** (See also page 13/14)

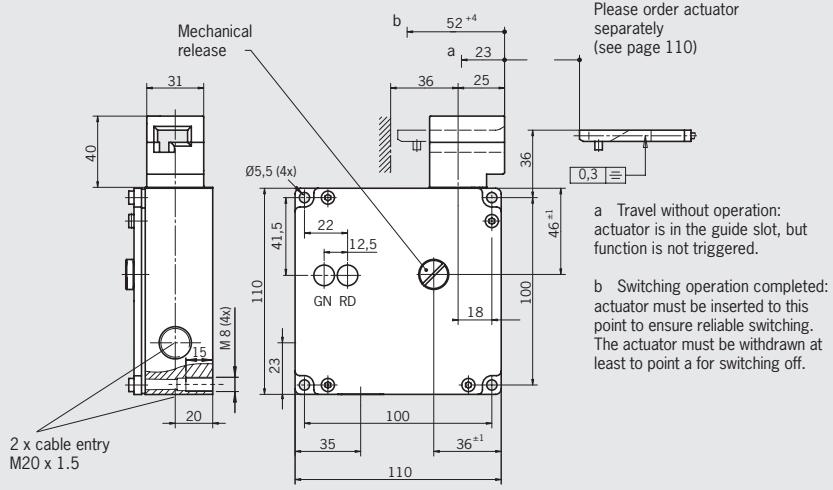
**Switching elements** (see also page 13/14)  
**SK** For monitoring the door/actuator position  
**ÜK** For monitoring the guard locking (built-in solenoid)

For combinations available see ordering table.

- **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
  - **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO
  - **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO

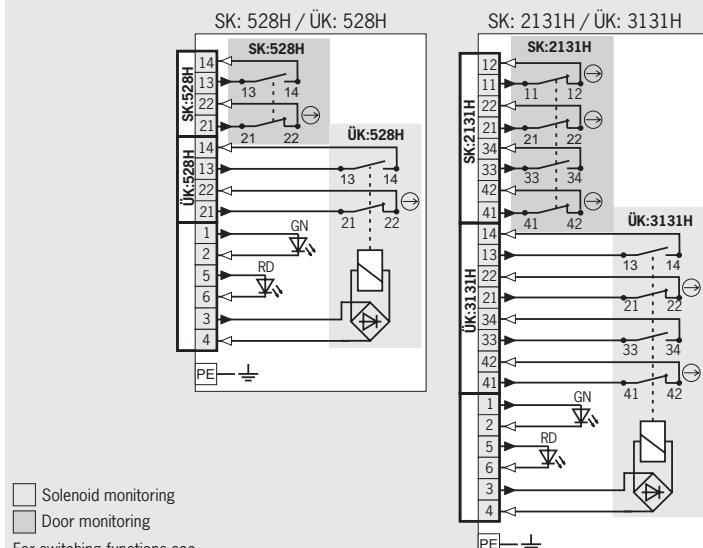


**Dimension drawings** Actuating head on the left is a mirror image



Cable gland  
see page 124

### **Wiring diagrams**



Outlining tables

Ordering table						
Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover 24 V
TZ	2 x M20x1.5	1 Mechanical	LE left	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	2 cable entries	<b>095245</b> TZ1LE024M-C2087
				SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	2 cable entries	On request
			RE right	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	2 cable entries	<b>095253</b> TZ1RE024M-C2087
				SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	2 cable entries	<b>098205</b> TZ1RE024MVAB-C2087



# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



## Safety switch TZ with guard locking and guard lock monitoring

- ▶ Mechanical release on the front
- ▶ Protective plate for switch head
- ▶ Two LED indicators, red and green
- ▶ Plug connector optional
- ▶ Actuating head fitted left or right



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Mechanical release

Is used for releasing the guard locking with the aid of a tool. A sealing wire can be fitted to protect against tampering. Lead seal kit and tool included (already pre-assembled on versions with plug connectors).

### Protective plate for switch head

Makes it more difficult to tamper with the switch.

### Solenoid operating voltage and LED function display

The following voltage range is available:

- ▶ 24 V AC/DC -15%, +10%

### Guard locking types

**TZ1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.

**TZ2** Open-circuit current principle, guard locking by applying voltage to the solenoid. Release by spring force.

### Switching elements (See also page 13/14)

**SK** For monitoring the door/actuator position  
**ÜK** For monitoring the guard locking (builtin solenoid)

For combinations available see ordering table:

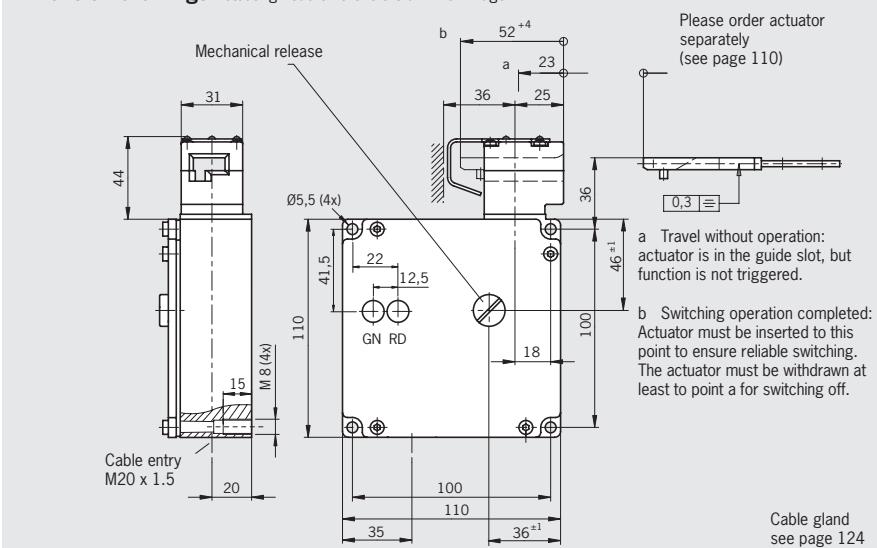
- ▶ **528H** Slow-action switching contact  
1 NC  $\ominus$  + 1 NO
- ▶ **2131H** Slow-action switching contact  
3 NC  $\ominus$  + 1 NO
- ▶ **3131H** Slow-action switching contact  
2 NC  $\ominus$  + 2 NO

### Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover	
						24 V	
<b>TZ</b>	<b>M20x1.5</b>	<b>1</b> Mechanical	<b>LE</b> left	<b>SK: 528H</b> , 1 NC $\ominus$ + 1 NO <b>ÜK: 528H</b> , 1 NC $\ominus$ + 1 NO	With protective plate	<b>089470</b> TZ1LE024M-089470	
			<b>RE</b> right	<b>SK: 528H</b> , 1 NC $\ominus$ + 1 NO <b>ÜK: 528H</b> , 1 NC $\ominus$ + 1 NO		<b>089471</b> TZ1RE024M-089471	

### Cable entry M20 x 1.5

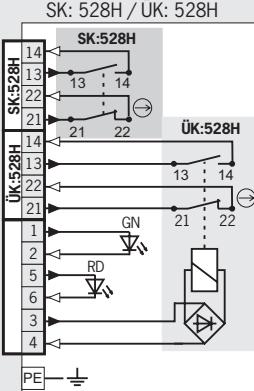
### Dimension drawings



Cable gland  
see page 124

### Wiring diagrams

Actuator inserted and locked



For switching functions see  
technical data on page 170

Solenoid monitoring  
 Door monitoring

Please turn over

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

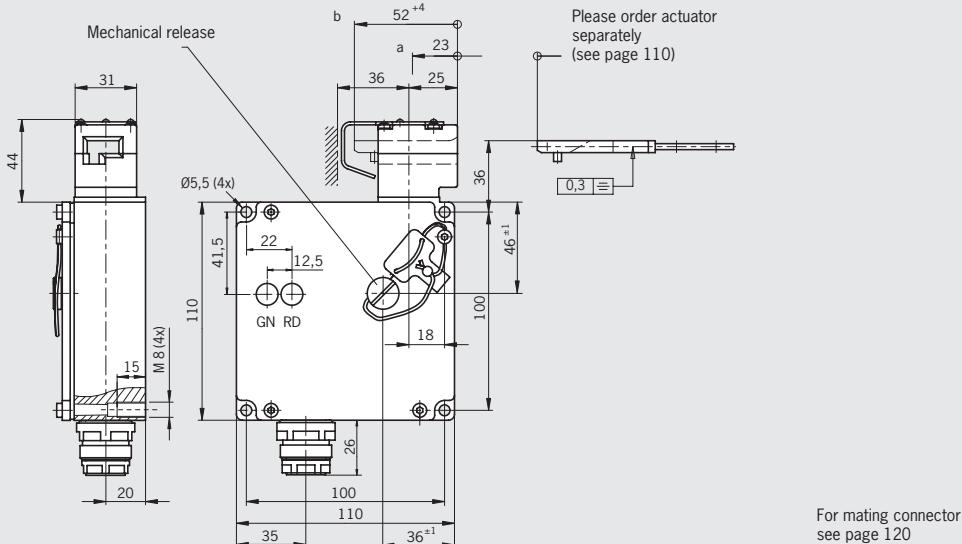
GL

GL

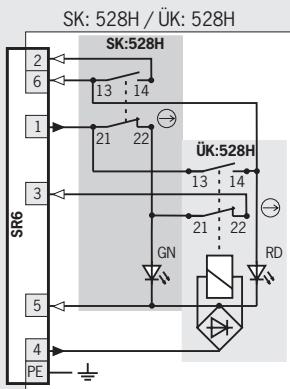
**Plug connector SR6**  
6-pin + PE

**Plug connector SR11**  
11-pin + PE

**Dimension drawings** Actuating head on the left is a mirror image

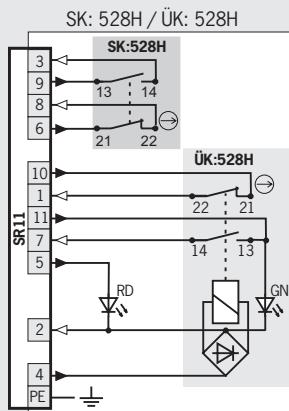


**Wiring diagrams** Actuator inserted and locked



For switching functions see  
technical data on page 170

Solenoid monitoring  
 Door monitoring



For switching functions see  
technical data on page 170

Solenoid monitoring  
 Door monitoring

## Ordering table

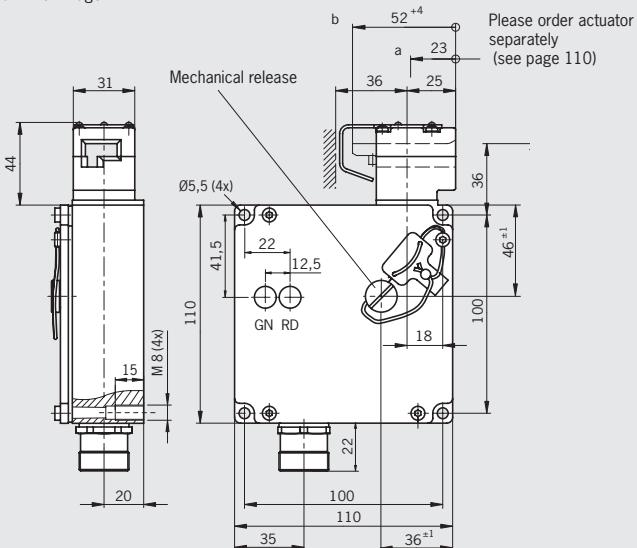
Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover	
						24 V	
TZ	SR6 Plug connector	1 Mechanical	LE left	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	With protective plate	<b>059694</b> TZ1LE024SR6-C1677	
			RE right	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	With protective plate	<b>059692</b> TZ1RE024SR6-C1677	
		2 Electrical	LE left	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	With protective plate	<b>059852</b> TZ2LE024SR6-C1677	
			RE right	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	With protective plate	<b>059699</b> TZ2RE024SR6-C1677	
	SR11 Plug connector	1 Mechanical	LE left	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	With protective plate	<b>093860</b> TZ1LE024SR11-093860	
			RE right	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	With protective plate	<b>093861</b> TZ1RE024SR11-093861	

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

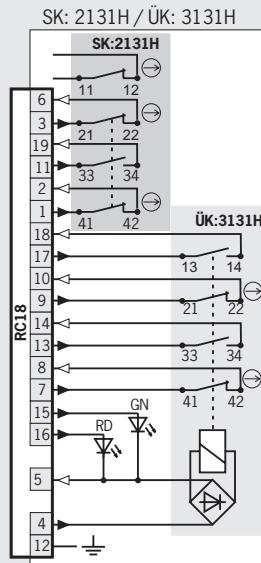
GL

**Plug connector RC18**  
18-pin + PE

**Dimension drawings** Actuating head on the left is a mirror image



**Wiring diagrams** Actuator inserted and locked



For switching functions see  
technical data on page 170

Solenoid monitoring  
 Door monitoring

## Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover 24 V	
						093862	TZ1LE024RC18VAB-093862
TZ	<b>RC18</b> Plug connector	1 Mechanical	LE left	SK: <b>2131H</b> , 3 NC $\ominus$ + 1 NO ÜK: <b>3131H</b> , 2 NC $\ominus$ + 2 NO	With protective plate	<b>093863</b>	TZ1RE024RC18VAB-093863
			RE right	SK: <b>2131H</b> , 3 NC $\ominus$ + 1 NO ÜK: <b>3131H</b> , 2 NC $\ominus$ + 2 NO			

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



## Safety switch TZ with guard locking and guard lock monitoring

- ▶ Mechanical release on the front, release with a triangular key according to DIN 22417
- ▶ Two LED indicators, red and green
- ▶ Actuating head fitted left or right



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Mechanical release

This releases the guard locking after operation with a triangular key acc. to DIN 22417.

### Solenoid operating voltage and LED function display

The following voltage range is available:

- ▶ 24 V AC/DC -15%, +10%

### Guard locking types

**TZ1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.

### Switching elements (See also page 13/14)

**SK** For monitoring the door/actuator position  
**ÜK** For monitoring the guard locking (built-in solenoid)

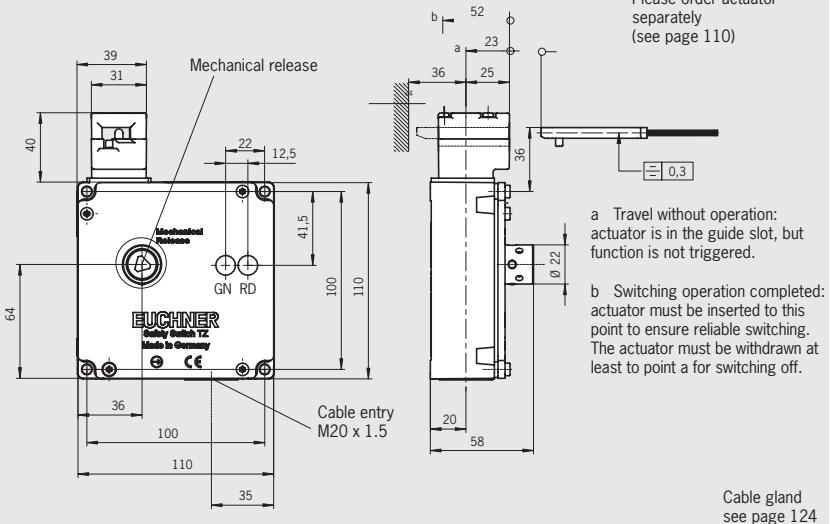
For combinations available see ordering table:

- ▶ **2131H** Slow-action switching contact 3 NC ⊖ + 1 NO
- ▶ **3131H** Slow-action switching contact 2 NC ⊖ + 2 NO

### Cable entry M20 x 1.5

### Dimension drawings

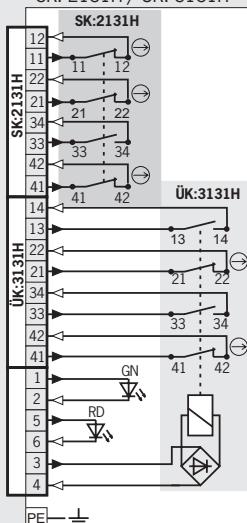
actuator head on the right is a mirror image



### Wiring diagrams

Actuator inserted and locked

SK: 2131H / ÜK: 3131H



For switching functions see technical data on page 170

white square = Solenoid monitoring  
grey square = Door monitoring

### Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover 24 V
<b>TZ</b>	<b>M20x1.5</b>	1 Mechanical	<b>LE</b> left	SK: <b>2131H</b> , 3 NC ⊖ + 1 NO ÜK: <b>3131H</b> , 2 NC ⊖ + 2 NO	Mechanical release with triangular key	<b>098718</b> TZ1LB024MVAB-C2159
			<b>RE</b> right	SK: <b>2131H</b> , 3 NC ⊖ + 1 NO ÜK: <b>3131H</b> , 2 NC ⊖ + 2 NO	Mechanical release with triangular key	<b>098717</b> TZ1RB024MVAB-C2159

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch TZ with guard locking and guard lock monitoring



- ▶ Release on the front with pushbutton
- ▶ Two LED indicators, red and green
- ▶ Plug connector optional
- ▶ Actuating head fitted left or right



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Release

Is used for the manual release of the guard locking without tools. It is possible to remove the disable and return the switch to its operating state by hand without tools.

### Solenoid operating voltage and LED function display

The following voltage range is available:  
▶ 24 V AC/DC -15%, +10%

### Guard locking types

- TZ1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.  
**TZ2** Open-circuit current principle, guard locking by applying voltage to the solenoid. Release by spring force.

### Switching elements (See also page 13/14)

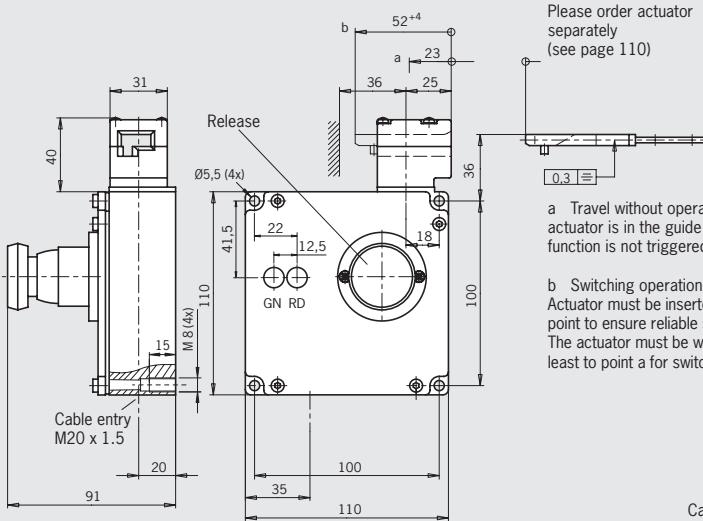
**SK** For monitoring the door/actuator position  
**ÜK** For monitoring the guard locking (built-in solenoid)

For combinations available see ordering table:

- ▶ **528H** Slow-action switching contact  
1 NC  $\ominus$  + 1 NO
- ▶ **2131H** Slow-action switching contact  
3 NC  $\ominus$  + 1 NO
- ▶ **3131H** Slow-action switching contact  
2 NC  $\ominus$  + 2 NO

### Cable entry M20 x 1.5

### Dimension drawings

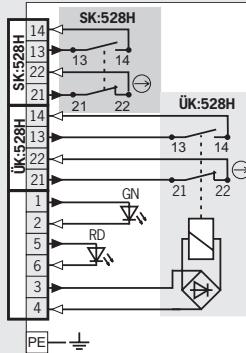


Cable gland  
see page 124

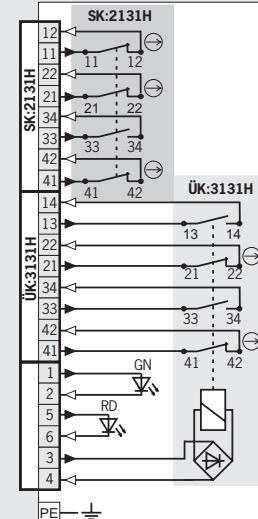
### Wiring diagrams

Actuator inserted and locked

SK: 528H / ÜK: 528H



SK: 2131H / ÜK: 3131H



Solenoid monitoring

Door monitoring

For switching functions see technical data on page 170

### Ordering table

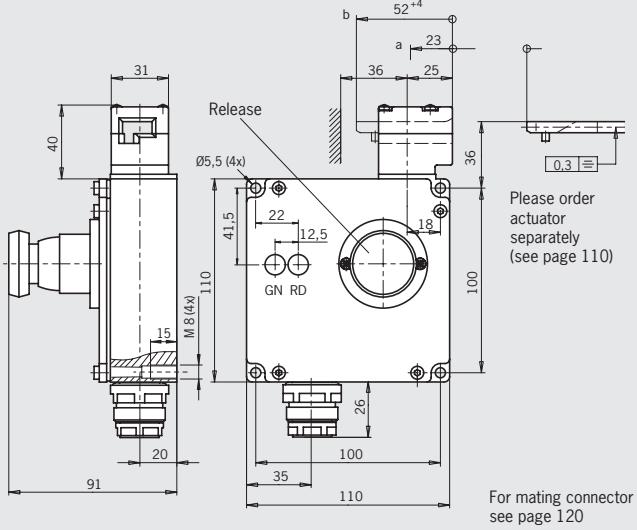
Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover	
						24 V	
TZ	M20x1.5	1 Mechanical	LE left	SK: 528H, 1 NC $\ominus$ + 1 NO ÜK: 528H, 1 NC $\ominus$ + 1 NO	Release (blue push button)	<b>089477</b> TZ1LE024M-C1816	
			RE right	SK: 528H, 1 NC $\ominus$ + 1 NO ÜK: 528H, 1 NC $\ominus$ + 1 NO	Release (blue push button)	<b>096901</b> TZ1RE024M-C1816	
		2 Electrical	LE left	SK: 528H, 1 NC $\ominus$ + 1 NO ÜK: 528H, 1 NC $\ominus$ + 1 NO	Release (blue push button)	<b>087992</b> TZ2LE024M-C1816	
			RE right	SK: 2131H, 3 NC $\ominus$ + 1 NO ÜK: 3131H, 2 NC $\ominus$ + 2 NO	Release (blue push button)	<b>089455</b> TZ2LE024MVAB-C1823	
			LE left	SK: 528H, 1 NC $\ominus$ + 1 NO ÜK: 528H, 1 NC $\ominus$ + 1 NO	Release (blue push button)	<b>087993</b> TZ2RE024M-C1816	
			RE right	SK: 2131H, 3 NC $\ominus$ + 1 NO ÜK: 3131H, 2 NC $\ominus$ + 2 NO	Release (blue push button)	<b>089456</b> TZ2RE024MVAB-C1823	

Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

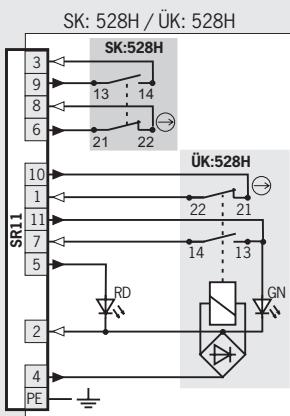


## **Plug connector SR11**

**Dimension drawings** Actuating head on the left is a mirror image



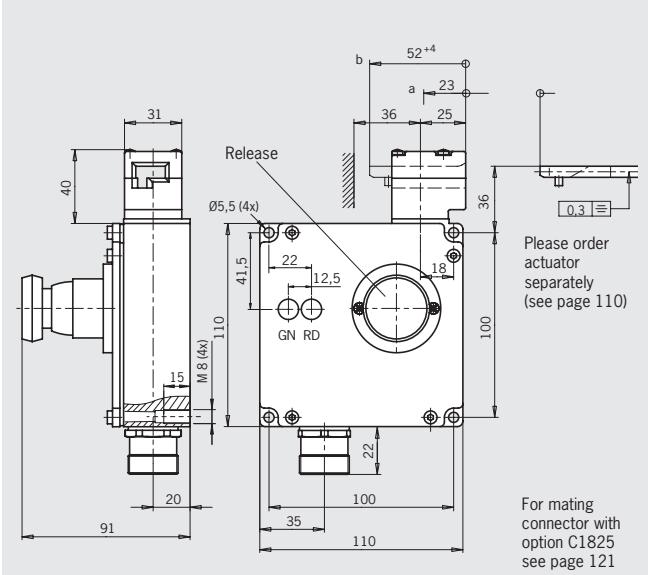
## **Wiring diagrams** Actuator inserted and locked



- Solenoid monitoring
- Door monitoring

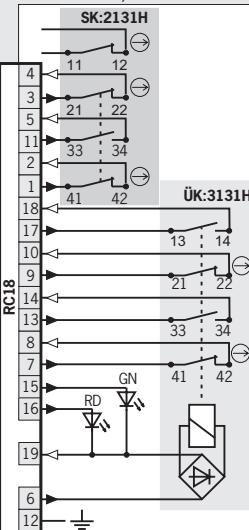
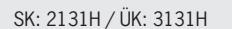
For switching functions see technical data on page 170

## **Plug connector RC18**



For mating  
connector with  
option C1825  
see page 121

### **Wiring diagrams**



- Solenoid monitoring
- Door monitoring

For switching functions see technical data on page 170

## Ordering table

Series	Connection	Guard locking	Switch head	Switching element		Version	Black cover 24 V	
				LE	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO		Release (blue push button)	077044 TZ1LE024SR11-C1816
TZ	SR11 Plug connector	Mechanical	RE right	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	Release (blue push button)	077042 TZ1RE024SR11-C1816		
			LE left	SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	Release (blue push button)	088090 TZ1LE024RC18VAB-C1823		
	RC18 <sup>1)</sup> Plug connector	Mechanical	RE right	SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	Release (blue push button)	088091 TZ1RE024RC18VAB-C1823		

1) **Important:** use suitable mating connector with option C1825!

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

GL

## Safety switch TZ with guard locking and guard lock monitoring

- ▶ Emergency unlocking on the front with rotary knob
- ▶ Protective plate for switch head optional
- ▶ Two LED indicators, red and green
- ▶ Plug connectors
- ▶ Actuating head fitted left or right



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Emergency unlocking

Is used for the manual release of the guard locking without tools. The emergency unlocking mechanism must be returned to the locked state manually. A sealing wire can be fitted to protect against tampering. Lead seal kit and tool included (already pre-assembled on versions with plug connectors).

### Protective plate for switch head

Makes it more difficult to tamper with the switch.

### Solenoid operating voltage and LED function display

The following voltage range is available:

- ▶ 24 V AC/DC -15%, +10%

### Guard locking types

**TZ1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.

### Switching elements (See also page 13/14)

**SK** For monitoring the door/actuator position  
**ÜK** For monitoring the guard locking (built-in solenoid)

For combinations available see ordering table:

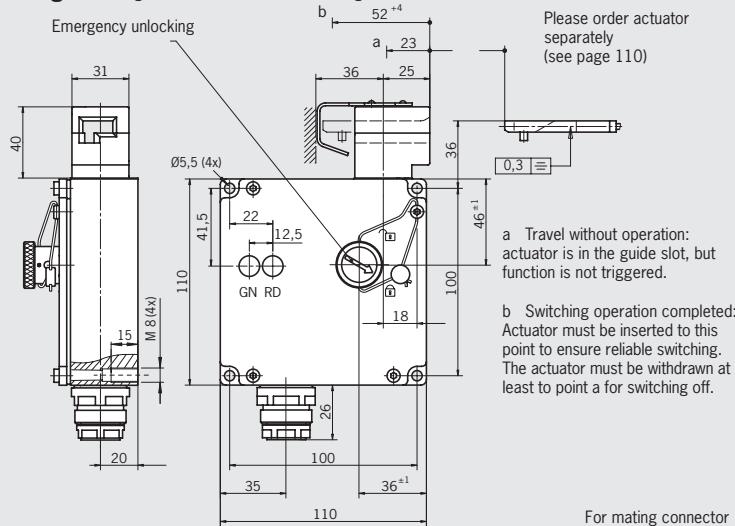
- ▶ **528H** Slow-action switching contact  
1 NC ⊖ + 1 NO
- ▶ **2131H** Slow-action switching contact  
3 NC ⊖ + 1 NO
- ▶ **3131H** Slow-action switching contact  
2 NC ⊖ + 2 NO

### Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover 24 V	
						SR11	1
<b>TZ</b>	<b>SR11</b>	<b>1</b>	<b>LE</b> left	SK: <b>528H</b> , 1 NC ⊖ + 1 NO ÜK: <b>528H</b> , 1 NC ⊖ + 1 NO	Emergency unlocking (rotary knob), with protective plate	<b>094342</b>	TZ1LE024SR11-094342
			<b>RE</b> right	SK: <b>528H</b> , 1 NC ⊖ + 1 NO ÜK: <b>528H</b> , 1 NC ⊖ + 1 NO	Emergency unlocking (rotary knob), with protective plate	<b>094343</b>	TZ1RE024SR11-094343

**Plug connector SR11 with protective plate**  
11-pin + PE

**Dimension drawings** Actuating head on the left is a mirror image

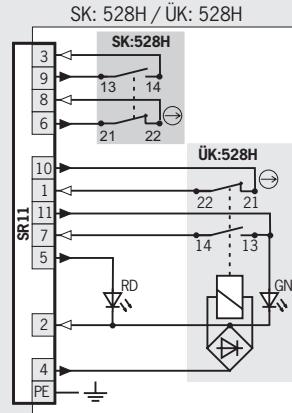


Please order actuator separately  
(see page 110)

- a Travel without operation:  
actuator is in the guide slot, but  
function is not triggered.
- b Switching operation completed:  
Actuator must be inserted to this  
point to ensure reliable switching.  
The actuator must be withdrawn at  
least to point a for switching off.

For mating connector  
see page 120

**Wiring diagrams** Actuator inserted and locked



For switching functions see  
technical data on page 170

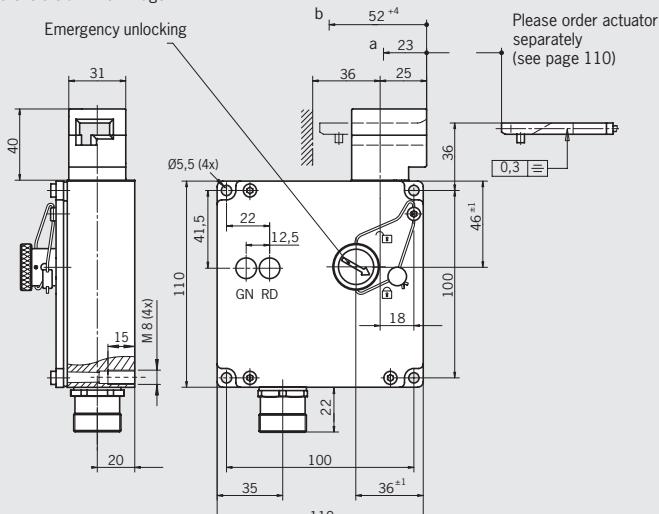
- Solenoid monitoring  
 Door monitoring

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



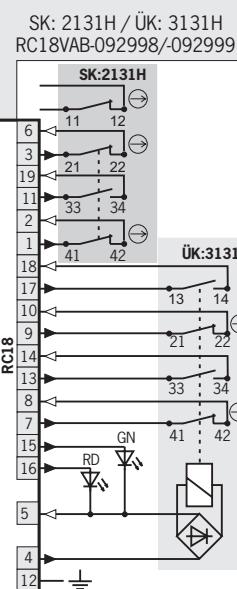
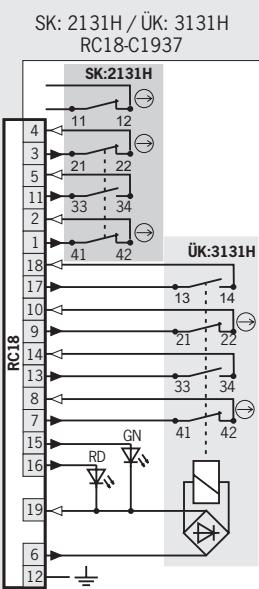
**Plug connector RC18**  
18-pin + PE

**Dimension drawings** Actuating head on the left is a mirror image



For mating  
connector with option C1825  
see page 121

**Wiring diagrams**  
Actuator inserted and locked



For switching functions see  
technical data on page 170

## Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover	
						24 V	
TZ	RC18 <sup>1)</sup> Plug connector	1 Mechanical	LE left	SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	Emergency unlocking (rotary knob)	<b>074260</b> TZ1LE024RC18VAB-C1937	
			RE right	SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	Emergency unlocking (rotary knob)	<b>074261</b> TZ1RE024RC18VAB-C1937	
		2 Electrical	LE left	SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	Emergency unlocking (rotary knob)	<b>100778</b> TZ2LE024RC18VAB-C1937	
			RE right	SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	Emergency unlocking (rotary knob)	<b>100777</b> TZ2RE024RC18VAB-C1937	
	RC18 Plug connector	1 Mechanical	LE left	SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	Emergency unlocking (rotary knob), alternative wiring	<b>092998</b> TZ1LE024RC18VAB-092998	
			RE right	SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	Emergency unlocking (rotary knob), alternative wiring	<b>092999</b> TZ1RE024RC18VAB-092999	

1) Important: use suitable mating connector with option C1825!

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch TZ with guard locking and guard lock monitoring



- ▶ Mechanical release on the front
- ▶ Escape release on the rear with key button
- ▶ Two LED indicators, red and green
- ▶ Plug connector optional
- ▶ Actuating head fitted left or right



### Approach direction



Horizontal

Adjustable in 90° steps.

### Escape release

Is used for the manual release of the guard locking from within the danger area without tools. The disable can only be removed and the switch returned to its operating state using a key included (2 keys included).

### Solenoid operating voltage and LED function display

The following voltage range is available:

- ▶ 24 V AC/DC -15%, +10%
- ▶ 110 V AC -15%, +10%

### Guard locking types

**TZ1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.

**TZ2** Open-circuit current principle, guard locking by applying voltage to the solenoid. Release by spring force.

### Switching elements (See also page 13/14)

**SK** For monitoring the door/actuator position  
**ÜK** For monitoring the guard locking (builtin solenoid)

For combinations available see ordering table:

▶ **528H** Slow-action switching contact

1 NC  $\ominus$  + 1 NO

▶ **2131H** Slow-action switching contact

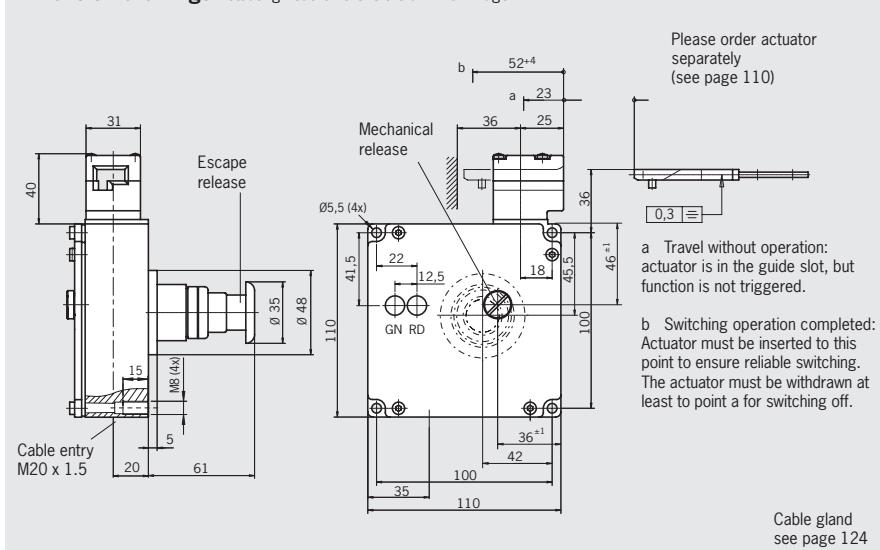
3 NC  $\ominus$  + 1 NO

▶ **3131H** Slow-action switching contact

2 NC  $\ominus$  + 2 NO

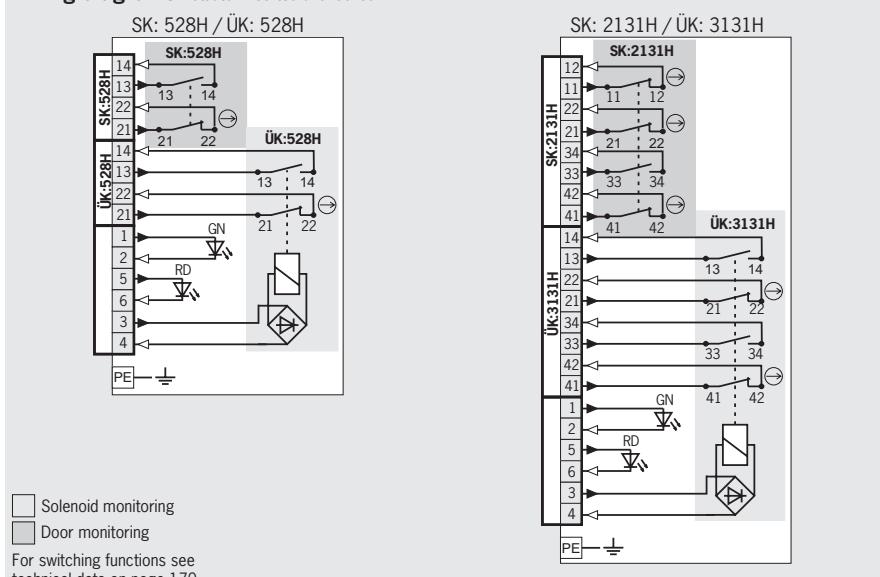
### Cable entry M20 x 1.5

### Dimension drawings



Cable gland  
see page 124

### Wiring diagrams



### Ordering table

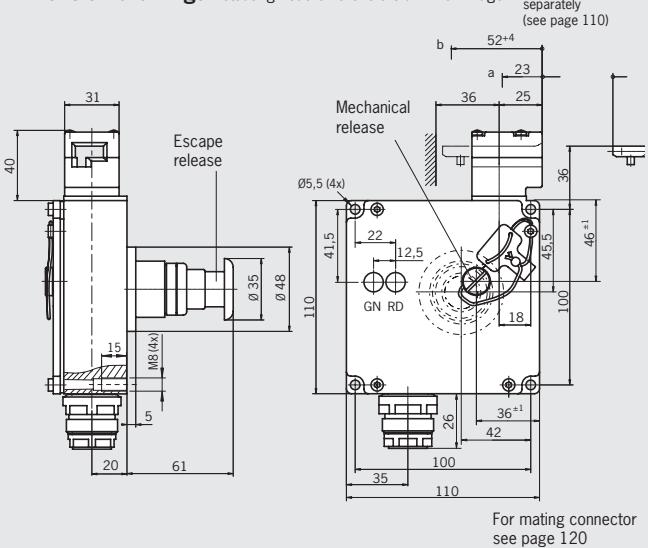
Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover	
						24 V	110 V
TZ	M20x1.5	1 Mechanical	LE left	SK: 528H, 1 NC $\ominus$ + 1 NO ÜK: 528H, 1 NC $\ominus$ + 1 NO	Escape release (red key button)	<b>087990</b> TZ1LE024M-C1815	On request
				SK: 2131H, 3 NC $\ominus$ + 1 NO ÜK: 3131H, 2 NC $\ominus$ + 2 NO	Escape release (red key button)	<b>089468</b> TZ1LE024MVAB-C1828	<b>094311</b> TZ1LE110MVAB-C1828
		RE right	RE right	SK: 528H, 1 NC $\ominus$ + 1 NO ÜK: 528H, 1 NC $\ominus$ + 1 NO	Escape release (red key button)	<b>087991</b> TZ1RE024M-C1815	On request
				SK: 2131H, 3 NC $\ominus$ + 1 NO ÜK: 3131H, 2 NC $\ominus$ + 2 NO	Escape release (red key button)	<b>089469</b> TZ1RE024MVAB-C1828	<b>094312</b> TZ1RE110MVAB-C1828
	2 Electrical	LE left	LE left	SK: 528H, 1 NC $\ominus$ + 1 NO ÜK: 528H, 1 NC $\ominus$ + 1 NO	Escape release (red key button)	<b>089460</b> TZ2LE024M-C1815	On request
				SK: 2131H, 3 NC $\ominus$ + 1 NO ÜK: 3131H, 2 NC $\ominus$ + 2 NO	Escape release (red key button)	<b>087290</b> TZ2LE024MVAB-C1828	On request
		RE right	RE right	SK: 528H, 1 NC $\ominus$ + 1 NO ÜK: 528H, 1 NC $\ominus$ + 1 NO	Escape release (red key button)	<b>089461</b> TZ2RE024M-C1815	On request
				SK: 2131H, 3 NC $\ominus$ + 1 NO ÜK: 3131H, 2 NC $\ominus$ + 2 NO	Escape release (red key button)	<b>087291</b> TZ2RE024MVAB-C1828	On request

Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

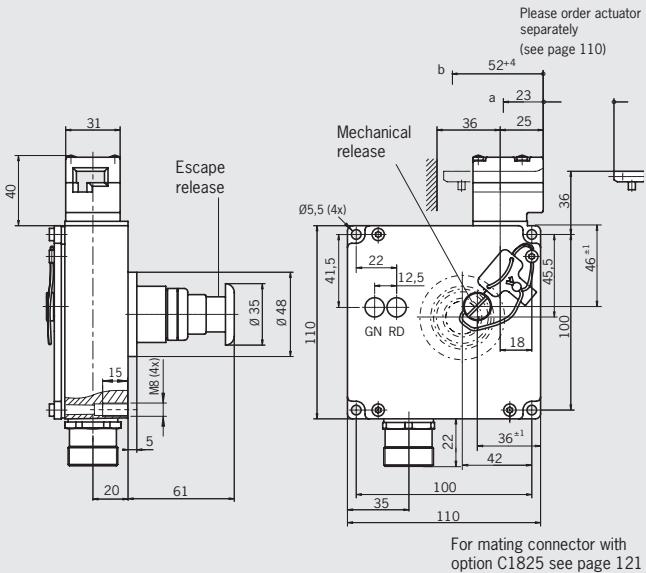


## **Plug connector SR11**

**Dimension drawings** Actuating head on the left is a mirror image

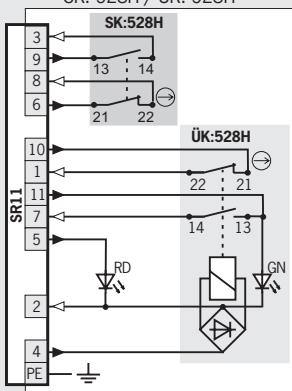


**Plug connector RC18**  
18-pin + PE



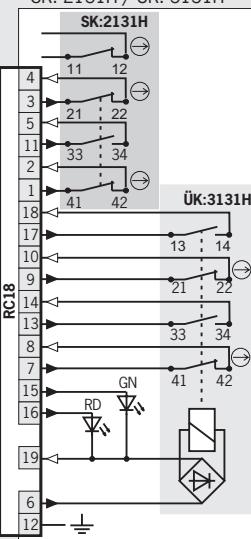
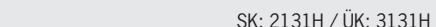
### **Wiring diagrams** Actuator inserted and locked

SK: 528H / ÜK: 528H



- Solenoid monitoring
- Door monitoring

For switching functions see technical data on page 170



- Solenoid monitoring
- Door monitoring

For switching functions see technical data on page 170

## Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover 24 V	
TZ	SR11	2	LE left	SK: <b>528H</b> , 1 NC ⊖ + 1 NO ÜK: <b>528H</b> , 1 NC ⊖ + 1 NO	Escape release (key button)	<b>079660</b> TZ2LE024SR11-C1815	
			RE right	SK: <b>528H</b> , 1 NC ⊖ + 1 NO ÜK: <b>528H</b> , 1 NC ⊖ + 1 NO	Escape release (key button)	<b>079661</b> TZ2RE024SR11-C1815	
	RC18 <sup>1)</sup>	1	LE left	SK: <b>2131H</b> , 3 NC ⊖ + 1 NO ÜK: <b>3131H</b> , 2 NC ⊖ + 2 NO	Escape release (key button)	<b>090352</b> TZ1LE024RC18VAB-C1828	
			RE right	SK: <b>2131H</b> , 3 NC ⊖ + 1 NO ÜK: <b>3131H</b> , 2 NC ⊖ + 2 NO	Escape release (key button)	<b>090353</b> TZ1RE024RC18VAB-C1828	
		2	LE left	SK: <b>2131H</b> , 3 NC ⊖ + 1 NO ÜK: <b>3131H</b> , 2 NC ⊖ + 2 NO	Escape release (key button)	<b>093103</b> TZ2LE024RC18VAB-C1828	
			RE right	SK: <b>2131H</b> , 3 NC ⊖ + 1 NO ÜK: <b>3131H</b> , 2 NC ⊖ + 2 NO	Escape release (key button)	<b>093104</b> TZ2RE024RC18VAB-C1828	

1) **Important:** use suitable mating connector with option C1825!

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch TZ with guard locking and guard lock monitoring



- ▶ Mechanical release on the front
- ▶ Escape release on the rear with push-button
- ▶ Two LED indicators, red and green
- ▶ Plug connector optional
- ▶ Actuating head fitted left or right



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Escape release

Is used for the manual release of the guard locking from within the danger area without tools.

### Solenoid operating voltage and LED function display

The following voltage ranges are available:

- ▶ 24 V AC/DC -15%, +10%
- ▶ 110 V AC -15%, +10%

### Guard locking types

**TZ1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.

### Switching elements (See also page 13/14)

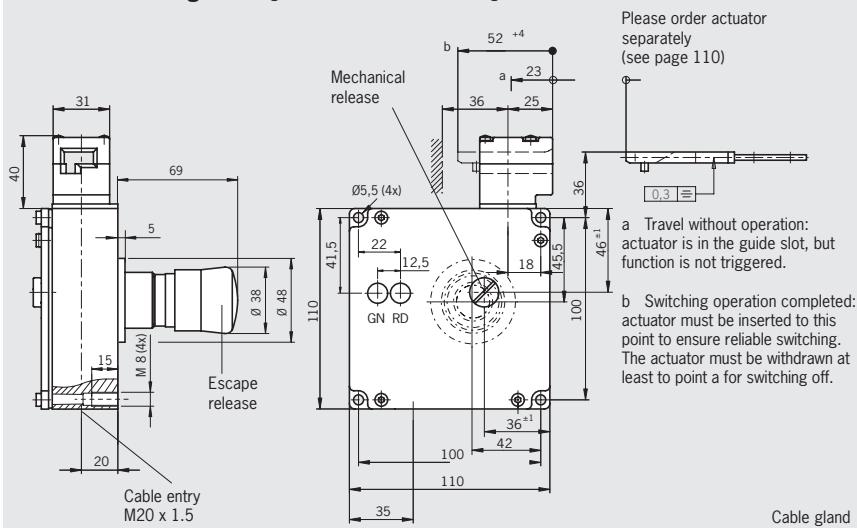
**SK** For monitoring the door/actuator position  
**ÜK** For monitoring the guard locking (built-in solenoid)

For combinations available see ordering table:

- ▶ **2131H** Slow-action switching contact  
3 NC  $\ominus$  + 1 NO
- ▶ **3131H** Slow-action switching contact  
2 NC  $\ominus$  + 2 NO

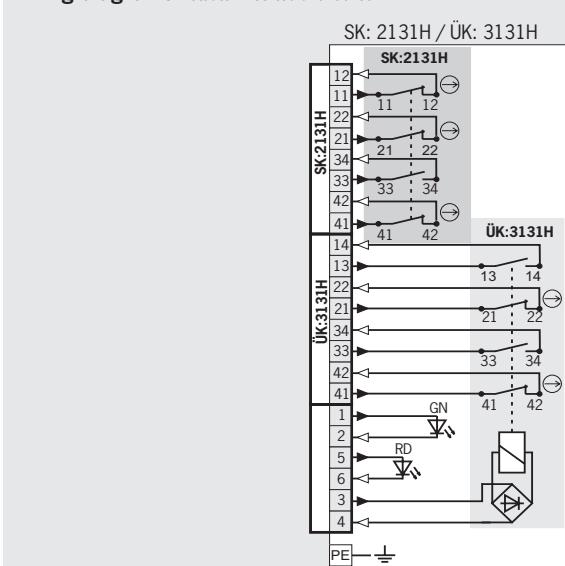
### Cable entry M20 x 1.5

### Dimension drawings



Cable gland  
see page 124

### Wiring diagrams



For switching functions see  
technical data on page 170

Solenoid monitoring  
 Door monitoring

### Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover	
						24 V	110 V
<b>TZ</b>	<b>M20x1.5</b>	1 Mechanical	<b>LE</b> left	SK: <b>2131H</b> , 3 NC $\ominus$ + 1 NO ÜK: <b>3131H</b> , 2 NC $\ominus$ + 2 NO	<b>C2082</b> Escape release (pushbutton)	<b>096487</b> TZ1E024MVAB-C2082	<b>095992</b> TZ1E110MVAB-C2082
			<b>RE</b> right	SK: <b>2131H</b> , 3 NC $\ominus$ + 1 NO ÜK: <b>3131H</b> , 2 NC $\ominus$ + 2 NO	<b>C2082</b> Escape release (pushbutton)	<b>096488</b> TZ1RE024MVAB-C2082	<b>095103</b> TZ1RE110MVAB-C2082

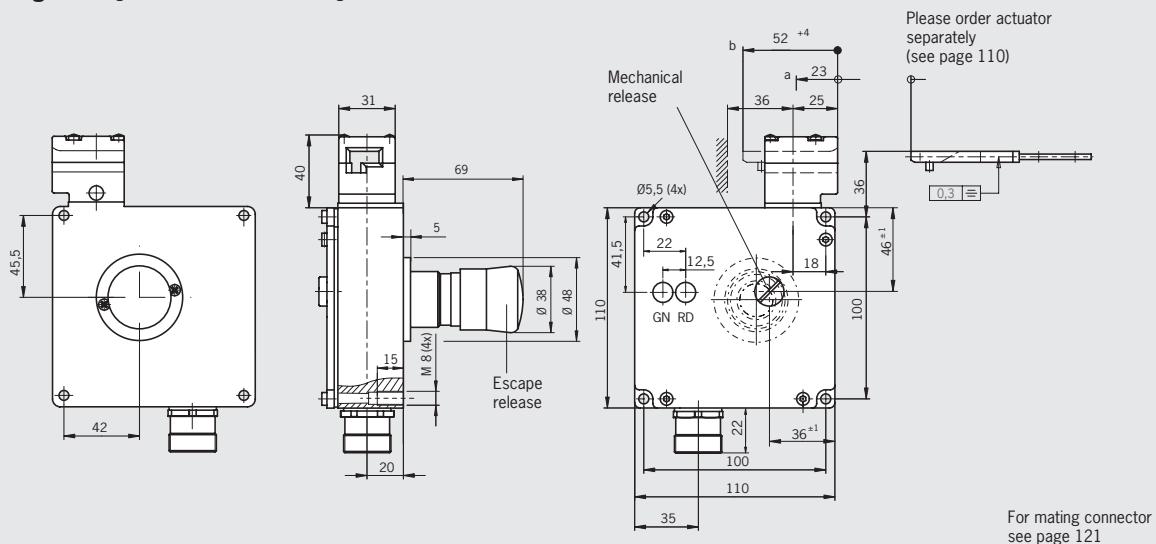
Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



## **Plug connector RC18**

18-pin + PE

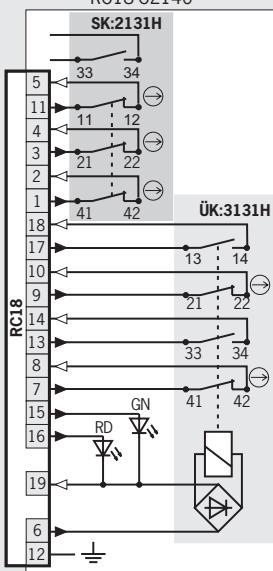
**Dimension drawings** Actuating head on the left is a mirror image



### **Wiring diagrams** Actuator inserted and locked

### **Wiring diagrams** Actuator inserted and locked

SK: 2131H / ÜK: 3131H  
RC18-C2140



For switching functions see  
technical data on page 170

- Solenoid monitoring
- Door monitoring

## Ordering table

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch TZ with guard locking and guard lock monitoring



- ▶ Mechanical release on the front
- ▶ Escape release on the rear with push-button
- ▶ Two LED indicators, red and green
- ▶ Plug connector optional
- ▶ Actuating head fitted left or right



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Escape release

Is used for the manual release of the guard locking from within the danger area without tools.

### Solenoid operating voltage and LED function display

The following voltage ranges are available:

- ▶ 24 V AC/DC -15%, +10%
- ▶ 110 V AC -15%, +10%
- ▶ 230 V AC -15%, +10%

### Guard locking types

**TZ1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.

### Switching elements (See also page 13/14)

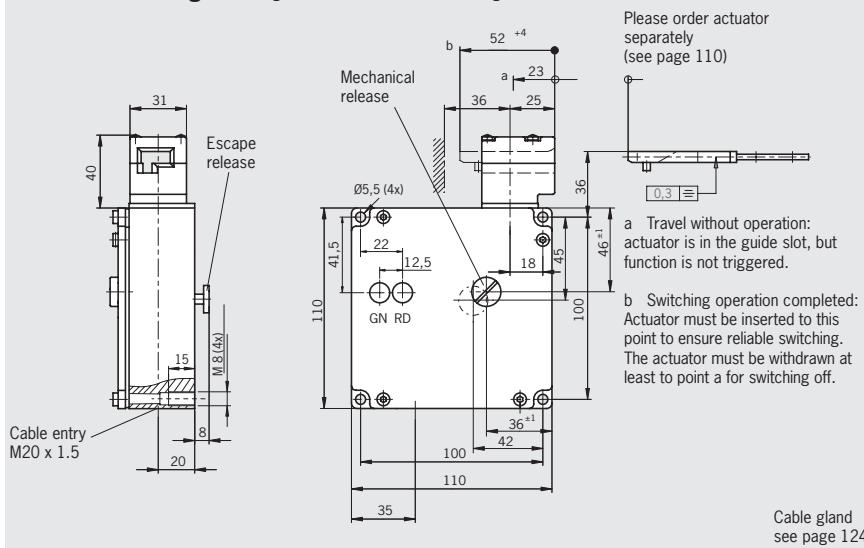
**SK** For monitoring the door/actuator position  
**ÜK** For monitoring the guard locking (built-in solenoid)

For combinations available see ordering table:

- ▶ **528H** Slow-action switching contact  
1 NC  $\ominus$  + 1 NO
- ▶ **2131H** Slow-action switching contact  
3 NC  $\ominus$  + 1 NO
- ▶ **3131H** Slow-action switching contact  
2 NC  $\ominus$  + 2 NO

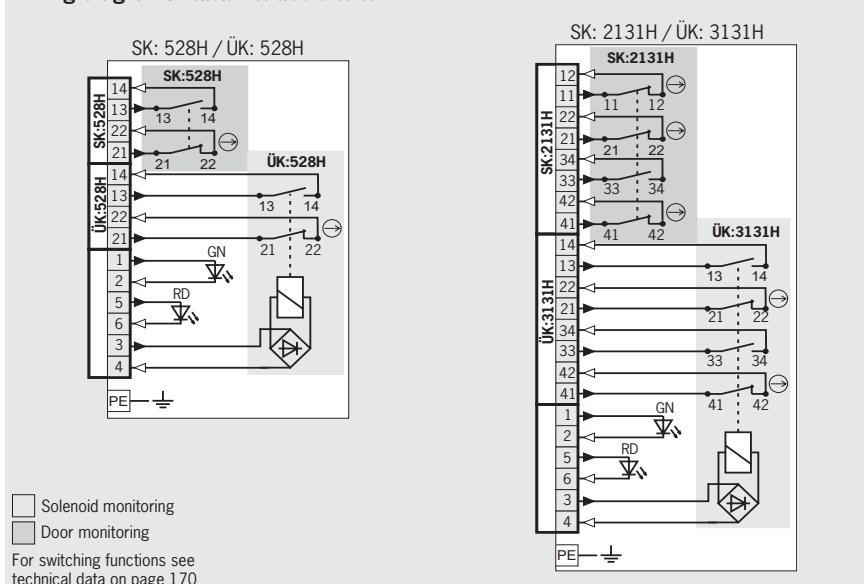
### Cable entry M20 x 1.5

### Dimension drawings



Cable gland  
see page 124

### Wiring diagrams



### Ordering table

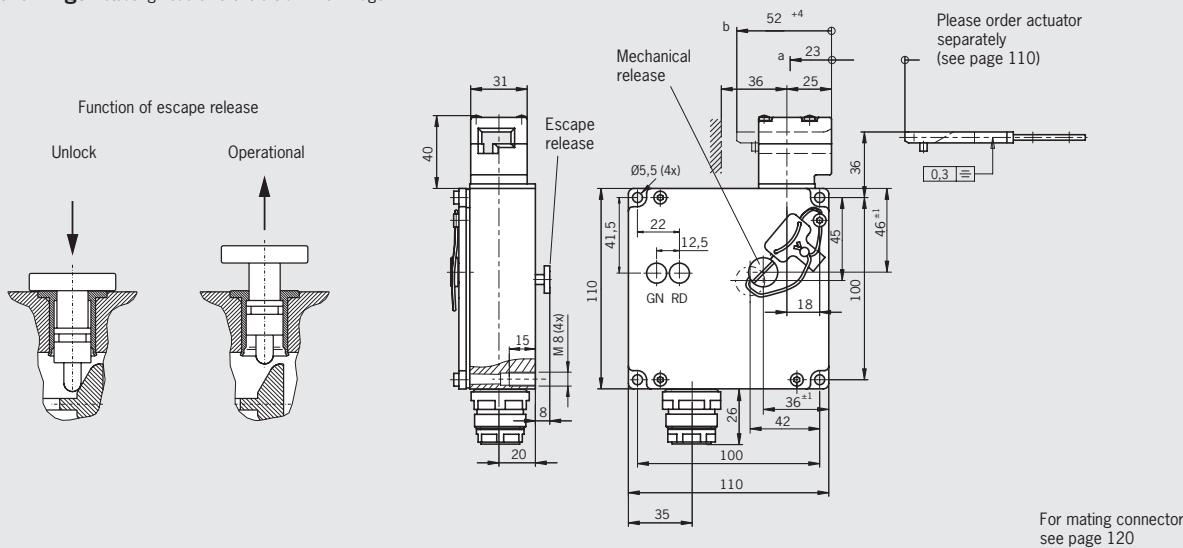
Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover		
						24 V	110 V	230 V
<b>TZ</b>	<b>M20x1.5</b>	<b>1</b> Mechanical	<b>LE</b> left	SK: <b>528H</b> , 1 NC $\ominus$ + 1 NO ÜK: <b>528H</b> , 1 NC $\ominus$ + 1 NO	<b>C1684</b> Escape release (pushbutton)	<b>083170</b> TZ1LE024M-C1684	<b>089924</b> TZ1LE110M-C1684	<b>093770</b> TZ1LE220M-C1684
				SK: <b>2131H</b> , 3 NC $\ominus$ + 1 NO ÜK: <b>3131H</b> , 2 NC $\ominus$ + 2 NO	<b>C1684</b> Escape release (pushbutton)	<b>084820</b> TZ1LE024MVAB-C1684	On request	On request
			<b>RE</b> right	SK: <b>528H</b> , 1 NC $\ominus$ + 1 NO ÜK: <b>528H</b> , 1 NC $\ominus$ + 1 NO	<b>C1684</b> Escape release (pushbutton)	<b>083171</b> TZ1RE024M-C1684	<b>089475</b> TZ1RE110M-C1684	<b>093771</b> TZ1RE220M-C1684
				SK: <b>2131H</b> , 3 NC $\ominus$ + 1 NO ÜK: <b>3131H</b> , 2 NC $\ominus$ + 2 NO	<b>C1684</b> Escape release (pushbutton)	<b>088084</b> TZ1RE024MVAB-C1684	On request	On request

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

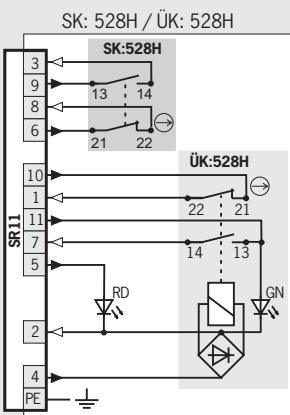


**Plug connector SR11**  
11-pin + PE

**Dimension drawings** Actuating head on the left is a mirror image



**Wiring diagrams** Actuator inserted and locked



For switching functions see  
technical data on page 170

Solenoid monitoring  
 Door monitoring

## Ordering table

Series	Connection	Guard locking	Switch head	Switching element		Version	Black cover 24 V	
				LE left	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO		C1684 Escape release (pushbutton)	070886 TZ1LE024SR11-C1684
TZ	<b>SR11</b> Plug connector	1 Mechanical	LE left	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO	C1684 Escape release (pushbutton)		070884 TZ1RE024SR11-C1684	
			RE right	SK: 528H, 1 NC ⊖ + 1 NO ÜK: 528H, 1 NC ⊖ + 1 NO				

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

GL

## Safety switch TZ with guard locking and guard lock monitoring

- ▶ Emergency unlocking on the front with rotary knob
- ▶ Escape release on the rear with push-button
- ▶ Protective plate for switch head
- ▶ Two LED indicators, red and green
- ▶ Actuating head fitted left or right



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Emergency unlocking

Is used for the manual release of the guard locking without tools. The emergency unlocking mechanism must be returned to the locked state manually. A sealing wire can be fitted to protect against tampering. Lead seal kit and tool included (already pre-assembled on versions with plug connectors).

### Escape release

Is used for the manual release of the guard locking from within the danger area without tools.

### Protective plate for switch head

Makes it more difficult to tamper with the switch.

### Solenoid operating voltage and LED function display

The following voltage range is available:

- ▶ 24 V AC/DC -15%, +10%

### Guard locking types

**TZ1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.

### Switching elements (See also page 13/14)

**SK** For monitoring the door/actuator position  
**ÜK** For monitoring the guard locking (built-in solenoid)

For combinations available see ordering table:

- ▶ **2131H** Slow-action switching contact

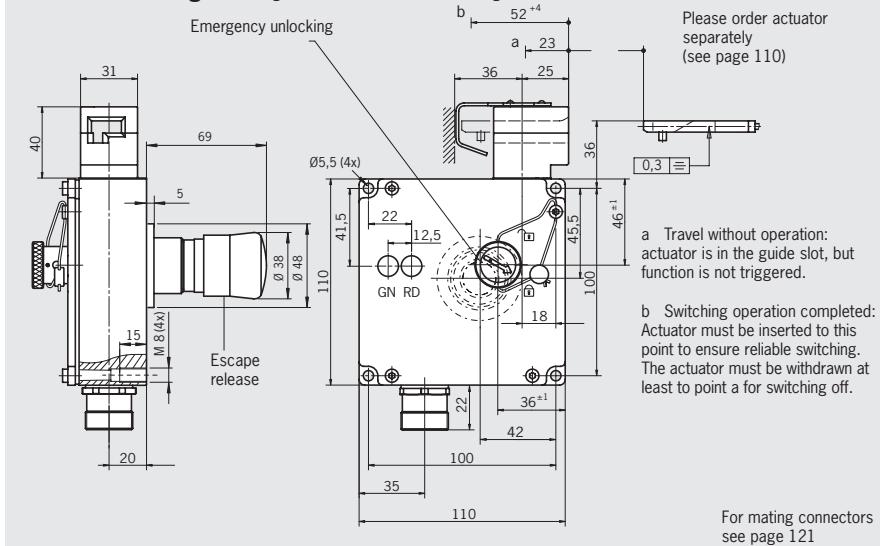
3 NC ⊖ + 1 NO

- ▶ **3131H** Slow-action switching contact

2 NC ⊖ + 2 NO

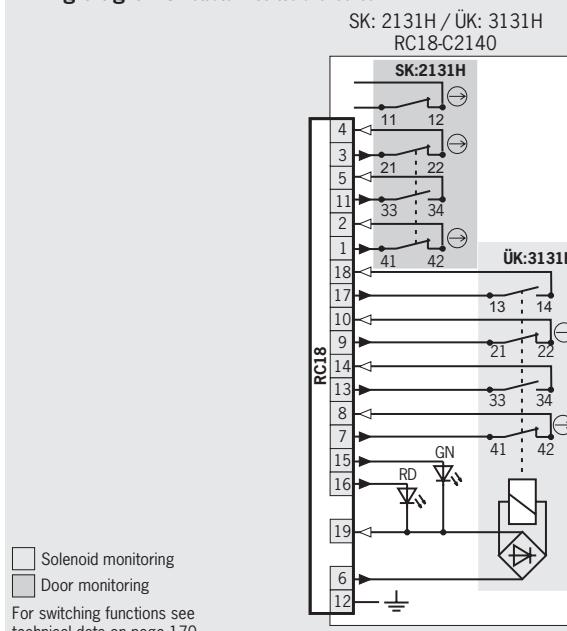
**Plug connector RC18**  
18-pin + PE

### Dimension drawings



For mating connectors see page 121

### Wiring diagrams



### Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover 24 V	
						097347 TZ1LE024RC18VAB-C2123	097348 TZ1RE024RC18VAB-C2123
<b>TZ</b>	RC18 Plug connector	1 Mechanical	LE left	SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	Emergency unlocking (rotary knob), escape release (pushbutton), with protective plate	097347 TZ1LE024RC18VAB-C2123	097348 TZ1RE024RC18VAB-C2123
			RE right	SK: 2131H, 3 NC ⊖ + 1 NO ÜK: 3131H, 2 NC ⊖ + 2 NO	Emergency unlocking (rotary knob), escape release (pushbutton), with protective plate		

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch TZ with guard locking and guard lock monitoring



- ▶ Without mechanical release
- ▶ Protective plate for switch head optional
- ▶ Two LED indicators, red and green
- ▶ Plug connector optional
- ▶ Actuating head fitted left or right



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Protective plate for switch head

Makes it more difficult to tamper with the switch.

### Solenoid operating voltage and LED function display

The following voltage ranges are available:

- ▶ 24 V AC/DC -15%, +10%
- ▶ 110 V AC -15%, +10%

### Guard locking types

**TZ1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.

### Switching elements (See also page 13/14)

**SK** For monitoring the door/actuator position  
**ÜK** For monitoring the guard locking (built-in solenoid)

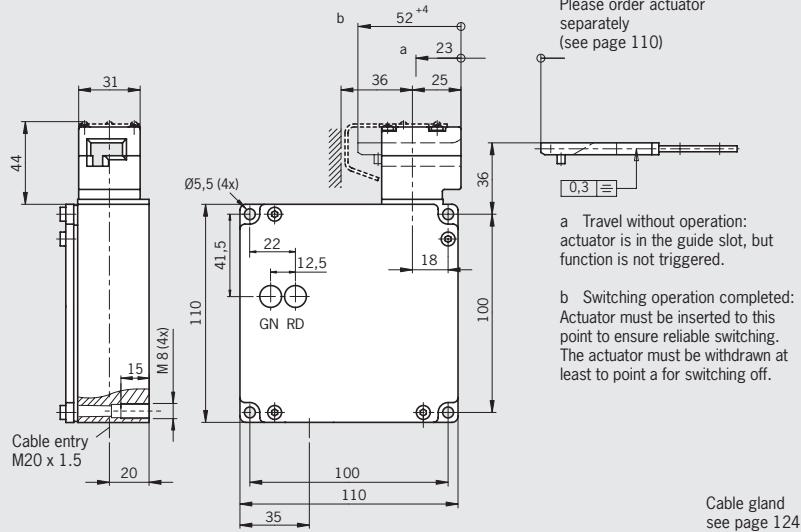
For combinations available see ordering table:

- ▶ **528H** Slow-action switching contact 1 NC ⊖ + 1 NO
- ▶ **2121H** Slow-action switching contact 4 NC ⊖
- ▶ **2131H** Slow-action switching contact 3 NC ⊖ + 1 NO
- ▶ **3131H** Slow-action switching contact 2 NC ⊖ + 2 NO

### Cable entry M20 x 1.5

### Dimension drawings

Actuating head on the left is a mirror image

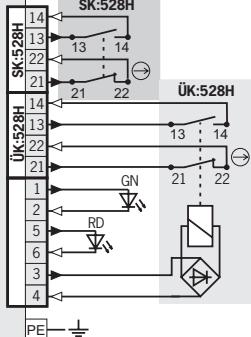


Cable gland  
see page 124

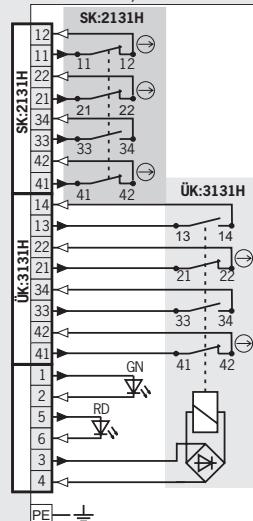
### Wiring diagrams

Actuator inserted and locked

SK: 528H / ÜK: 528H



SK: 2131H / ÜK: 3131H



Solenoid monitoring

Door monitoring

For switching functions see technical data on page 170

### Ordering table

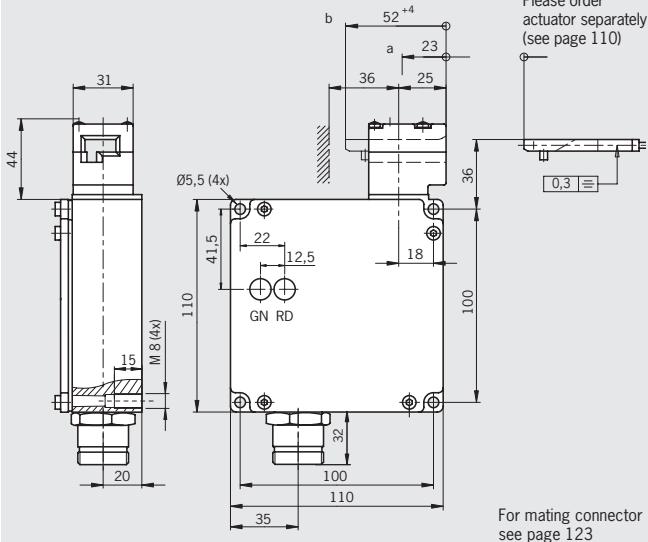
Series	Connection	Guard locking	Switch head	Switching element	Version	Black cover		Red cover
						24 V	110 V	24 V
<b>TZ</b>	<b>M20x1.5</b>	<b>1</b> Mechanical	<b>LE</b> left	SK: <b>528H</b> , 1 NC ⊖ + 1 NO ÜK: <b>528H</b> , 1 NC ⊖ + 1 NO	Without mechanical release, with protective plate	<b>083246</b> TZ1LE024M-C1623	-	On request
				SK: <b>2131H</b> , 3 NC ⊖ + 1 NO ÜK: <b>3131H</b> , 2 NC ⊖ + 2 NO	Without mechanical release, with protective plate	<b>085170</b> TZ1LE024MVAB-C1623	-	<b>089466</b> TZ1LE110MVAB-C1623
			<b>RE</b> right	SK: <b>2131H</b> , 3 NC ⊖ + 1 NO ÜK: <b>3131H</b> , 2 NC ⊖ + 2 NO	Without mechanical release	<b>096052</b> TZ1LE024MVAB-RC2100	-	-
			<b>RE</b> right	SK: <b>528H</b> , 1 NC ⊖ + 1 NO ÜK: <b>528H</b> , 1 NC ⊖ + 1 NO	Without mechanical release, with protective plate	<b>083247</b> TZ1RE024M-C1623	-	On request
				SK: <b>2131H</b> , 3 NC ⊖ + 1 NO ÜK: <b>3131H</b> , 2 NC ⊖ + 2 NO	Without mechanical release, with protective plate	<b>085171</b> TZ1RE024MVAB-C1623	-	<b>088063</b> TZ1RE110MVAB-C1623
				SK: <b>2131H</b> , 3 NC ⊖ + 1 NO ÜK: <b>3131H</b> , 2 NC ⊖ + 2 NO	Without mechanical release	<b>096051</b> TZ1RE024MVAB-RC2100	-	-

Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



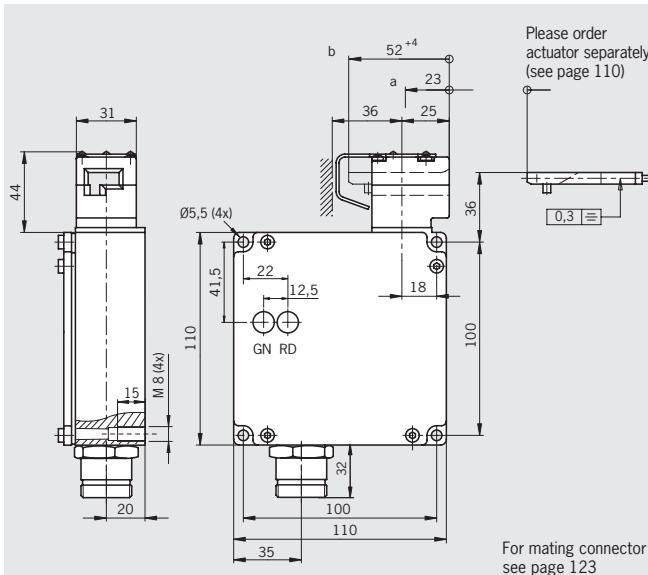
## **Plug connector MR10**

**Dimension drawings** Actuating head on the left is a mirror image



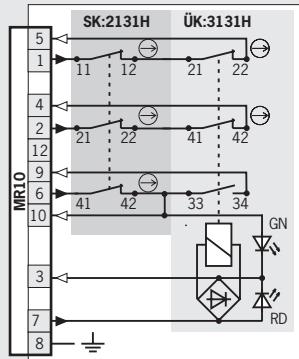
## **Plug connector MR12**

1



### **Wiring diagrams**

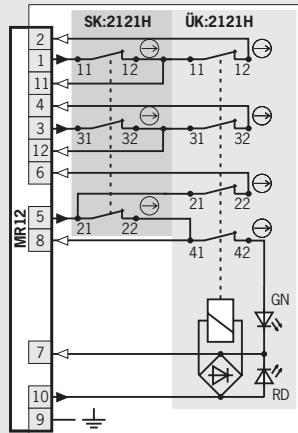
SK: 2131H / ÜK: 3131H  
MR10 VAB-F



For switching functions see  
technical data on page 170

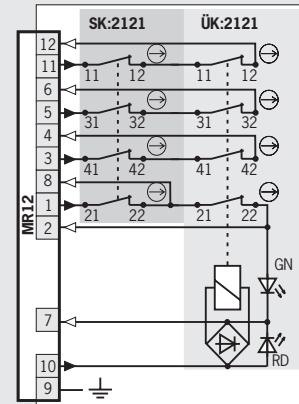
- Solenoid monitoring
- Door monitoring

SK: 2121H / ÜK: 2121H  
C1902



For switching functions see  
technical data on page 170

SK: 2121H / ÜK: 2121H  
RC1971



- Solenoid monitoring
- Door monitoring

## Ordering table

Series	Connection	Guard locking	Switch head	Switching element	Version	Red cover 24 V
TZ	MR10 Plug connector	1 Mechanical	LE left	SK: 2131H, 3 NC ⊖ ÜK: 3131H, 2 NC ⊖ + 1 NO	Without mechanical release	095902 <sup>1)</sup> TZ1LE024MVAB-10C-FW
			RE right	SK: 2131H, 3 NC ⊖ ÜK: 3131H, 2 NC ⊖ + 1 NO	Without mechanical release	095903 <sup>1)</sup> TZ1RE024MVAB-10C-FW
	MR12 Plug connector	1 Mechanical	LE left	SK: 2121H, 4 NC ⊖ ÜK: 2121H, 4 NC ⊖	Without mechanical release, with protective plate	079692 TZ1LE024BHA-C1902
			LE left	SK: 2121H, 4 NC ⊖ ÜK: 2121H, 4 NC ⊖	C1971 Alternative wiring, without mechanical release, with protective plate	085569 TZ1LE024BAVFG-RC1971
			RE right	SK: 2121H, 4 NC ⊖ ÜK: 2121H, 4 NC ⊖	Without mechanical release, with protective plate	079693 TZ1RE024BHA-C1902
			RE right	SK: 2121H, 4 NC ⊖ ÜK: 2121H, 4 NC ⊖	C1971 Alternative wiring, without mechanical release, with protective plate	085570 TZ1RE024BAVFG-RC1971

1) No DGUV approval

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch TZ with guard locking and guard lock monitoring



- ▶ Without mechanical release
- ▶ Two LED indicators, red and green
- ▶ Plug connector for switch connection
- ▶ Plug connector for enabling switch
- ▶ Actuating head fitted left or right



### Approach direction

Horizontal  
Adjustable in 90° steps.

### Solenoid operating voltage and LED function display

The following voltage range is available:  
▶ 24 V AC/DC -15%, +10%

### Guard locking types

**TZ1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.

**TZ2** Open-circuit current principle, guard locking by applying voltage to the solenoid. Release by spring force.

### Switching elements (See also page 13/14)

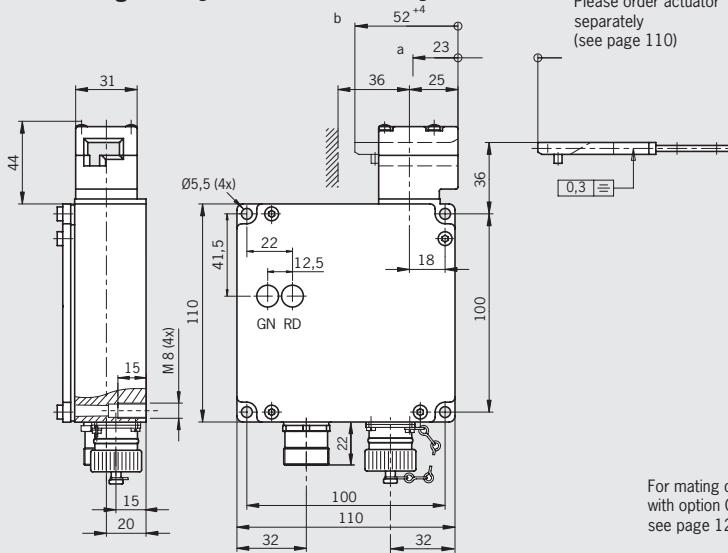
**SK** For monitoring the door/actuator position  
**ÜK** For monitoring the guard locking (built-in solenoid)

For combinations available see ordering table:

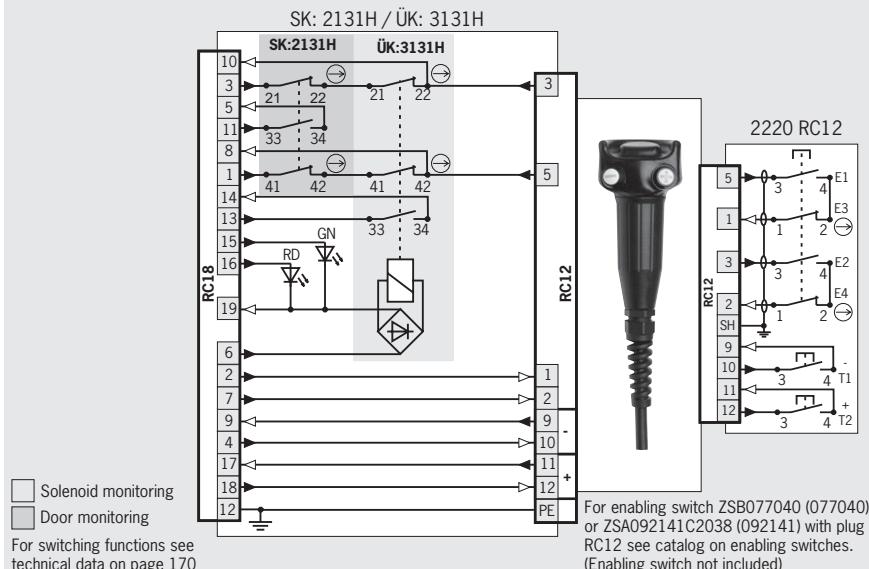
- ▶ **528H** Slow-action 1 NC + 1 NO
- ▶ **2131H** Slow-action 3 NC + 1 NO
- ▶ **3131H** Slow-action 2 NC + 2 NO

**Plug connector RC18 and RC12 (Enabling switch)**  
18-pin + PE / 12-pin

**Dimension drawings** Actuating head on the left is a mirror image



**Wiring diagrams** Actuator inserted and locked



### Ordering table

Series	Connection	Enabling switch connection	Guard locking	Switch head	Switching element		Version	Black cover 24 V	
					LE	RE		PE	
<b>TZ</b>	<b>RC18<sup>1)</sup></b> Plug connector	Enabling switch plug <b>RC12</b>	<b>1</b> Mechanical	LE left	SK: <b>2131H</b> , 3 NC  + 1 NO ÜK: <b>3131H</b> , 2 NC  + 2 NO		Without mechanical release	<b>091062</b> TZ1LE024RC18VAB-C1803	
				RE right	SK: <b>2131H</b> , 3 NC  + 1 NO ÜK: <b>3131H</b> , 2 NC  + 2 NO		Without mechanical release	<b>091063</b> TZ1RE024RC18VAB-C1803	
			<b>2</b> Electrical	LE left	SK: <b>2131H</b> , 3 NC  + 1 NO ÜK: <b>3131H</b> , 2 NC  + 2 NO		Without mechanical release	<b>075955</b> TZ2LE024RC18VAB-C1803	
				RE right	SK: <b>2131H</b> , 3 NC  + 1 NO ÜK: <b>3131H</b> , 2 NC  + 2 NO		Without mechanical release	<b>077149</b> TZ2RE024RC18VAB-C1803	

1) Important: use suitable mating connector with option C1825!

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Selection table for safety switches NX

Connection			Page
M	Switching element		
●	Four contacts		
●	●		86



# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch NX

- Cable entry M20 x 1.5
- LED indicator optional



Cable entry M20 x 1.5

### Approach direction

Horizontal and vertical  
Can be adjusted in 90° steps

### LED function display (optional)

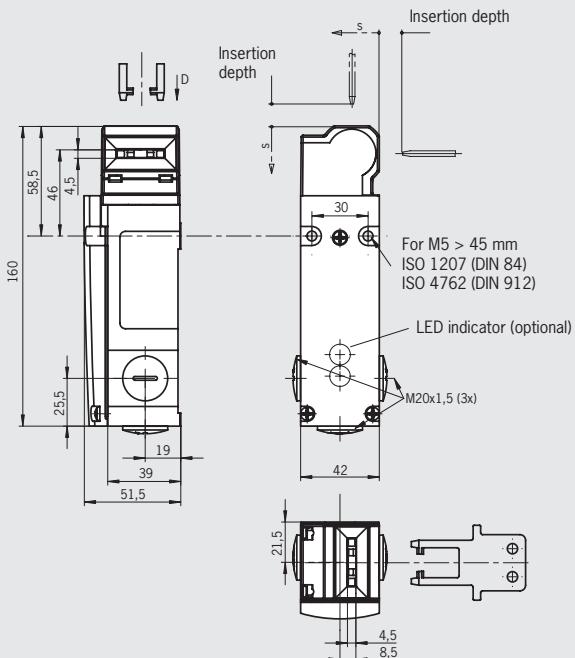
A function display (2 LEDs, red and green) is available for the following voltage ranges:

- DC 24 V +10%, -15%

### Switching elements (See also page 13/14)

- **2121** Slow-action switching contact 4 NC ⊖
- **2131** Slow-action switching contact 3 NC ⊖ + 1 NO
- **3131** Slow-action switching contact 2 NC ⊖ + 2 NO

### Dimension drawing

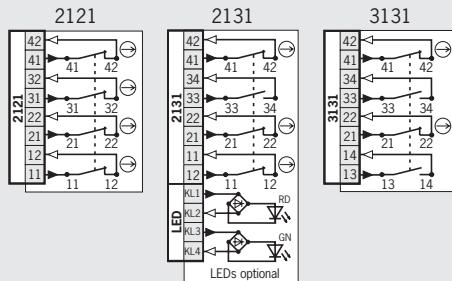


Please order actuator separately  
(see page 114)

For cable glands see page 124

### Wiring diagrams

Actuator inserted



### Ordering table

Series	Connection	Switching element	Version	Order no./item
NX	1 Cable entry 3 x M20 x 1.5	<b>2121</b> 3 NC ⊖		<b>092625</b> NX1-2121AM
		<b>2131</b> 3 NC ⊖ + 1 NO		<b>092624</b> NX1-2131AM
		<b>2131H</b> 3 NC ⊖ + 1 NO	<b>L024</b> LED indicator DC 24 V	<b>091682</b> NX1-2131AL024M
		<b>3131</b> 2 NC ⊖ + 2 NO		<b>092626</b> NX1-3131AM

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Selection table for safety switch TX with guard locking and guard lock monitoring

### Release feature, front

**HE** Mechanical release on the front

### Release feature, rear

**FE** Escape release on the rear side

### Connection

**M**

NPT½"

**BH10**

**SR11**

**BH12**

**RC18**

**M12**

Thread M20x1.5 for cable glands

Thread ½" for cable glands

Plug connector 9-pin + PE

Plug connector 11-pin + PE

Plug connector 11-pin + PE

Plug connector 18-pin + PE

Plug connector 5-pin

### Switching element

2 NC ⊖ / 1 NO + 1 NC or

**Four contacts** 2 NC ⊖ / 1 NO + 1 NO or

2 NC ⊖ + 2 NC ⊖



Manual release		Connection							Switching ele- ment Four contacts	With version	Page
HE	FE	M	NPT½"	BH10	SR11	BH12	RC18	M12			
●		●	●						●		88
●				●					●		89
●		●	●						●		90
●					●	●	●		●		91
●	●	●					●		●	C1991/C2161	92
●	●						●		●	C1991	93
●								●	●	C2129	94

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch TX with guard locking and guard lock monitoring



- Mechanical release on the front
- With door monitoring contact
- Plug connector optional



### Approach direction

Horizontal and vertical  
Can be adjusted in 90° steps

### Mechanical release

Is used for releasing the guard locking with the aid of a tool. The mechanical release must be sealed to prevent tampering (for example with sealing lacquer).

### Solenoid operating voltage

- AC/DC 24 V +10%, -15%
- AC 110 V +10%, -15%
- AC 230 V +10%, -15%

### LED function display

The switch has a function display (2 LEDs, red and green). The LED voltage is same as the solenoid operating voltage.

### Guard locking types

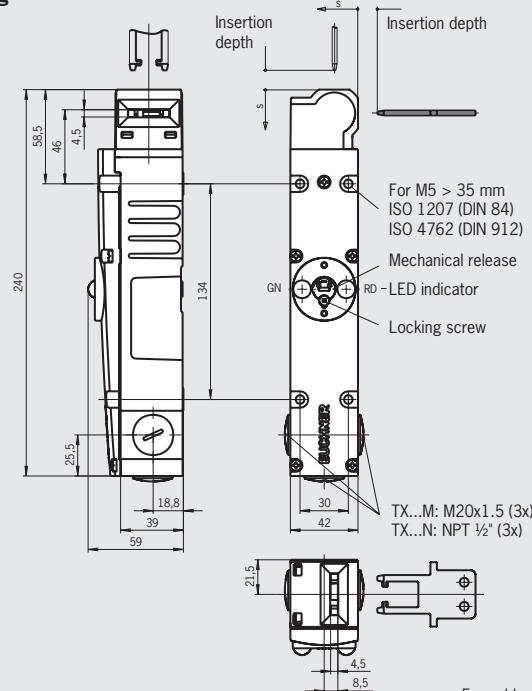
- TX1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.  
**TX2** Open-circuit current principle, guard locking by applying voltage to the solenoid. Release by spring force.

### Switching elements (See also page 14)

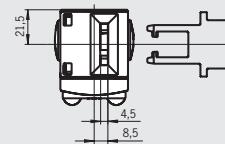
- **ETX B** Slow-action switching contact  
2 NC  $\ominus$  / 1 NO + 1 NC  
(door monitoring contact)
- **ETX C** Slow-action switching contact  
2 NC  $\ominus$  / 1 NO + 1 NO  
(door monitoring contact)
- **ETX D** Slow-action switching contact  
2 NC  $\ominus$  + 2 NC  $\ominus$   
(door monitoring contact)

Cable entry M20 x 1.5 / cable entry NPT 1/2"

### Dimension drawing

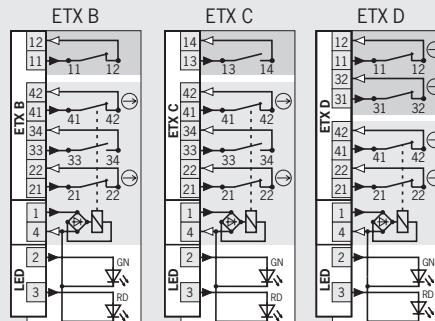


Please order actuator separately  
(see page 114)



For cable glands see page 124

### Wiring diagrams Actuator inserted and locked



Solenoid monitoring  
 Door monitoring

For switching functions see technical data on page 175

### Ordering table

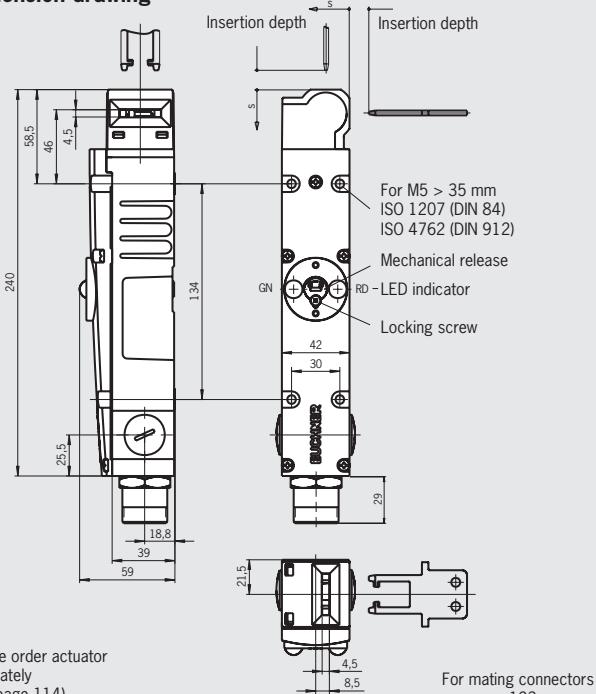
Series	Connection	Guard locking	Switching element	Solenoid operating voltage		
				AC/DC 24 V	AC 110 V	AC 230 V
TX	<b>M</b> Cable entry 3 x M20 x 1.5	1 Mechanical	ETX B 2 NC $\ominus$ / 1 NO + 1 NC	082921 TX1BA024M	085383 TX1BA110M	085385 TX1BA230M
			ETX C 2 NC $\ominus$ / 1 NO + 1 NO	082922 TX1CA024M	085384 TX1CA110M	085386 TX1CA230M
		2 Electrical	ETX D 2 NC $\ominus$ + 2 NC $\ominus$	095025 TX1D-A024MC2081		
			ETX B 2 NC $\ominus$ / 1 NO + 1 NC	082927 TX2BA024M	085387 TX2BA110M	085389 TX2BA230M
			ETX C 2 NC $\ominus$ / 1 NO + 1 NO	082928 TX2CA024M	085388 TX2CA110M	085390 TX2CA230M
	<b>N</b> Cable entry 3 x NPT 1/2"	1 Mechanical	ETX D 2 NC $\ominus$ + 2 NC $\ominus$	095026 TX2D-A024MC2081		
			ETX B 2 NC $\ominus$ / 1 NO + 1 NC	082944 TX1BA024N	085382 TX1BA110N	On request
		2 Electrical	ETX C 2 NC $\ominus$ / 1 NO + 1 NO	082945 TX1CA024N	On request	On request
			ETX B 2 NC $\ominus$ / 1 NO + 1 NC	082946 TX2BA024N	On request	On request
			ETX C 2 NC $\ominus$ / 1 NO + 1 NO	082947 TX2CA024N	On request	On request

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



**Plug connector BH10**  
9-pin + PE

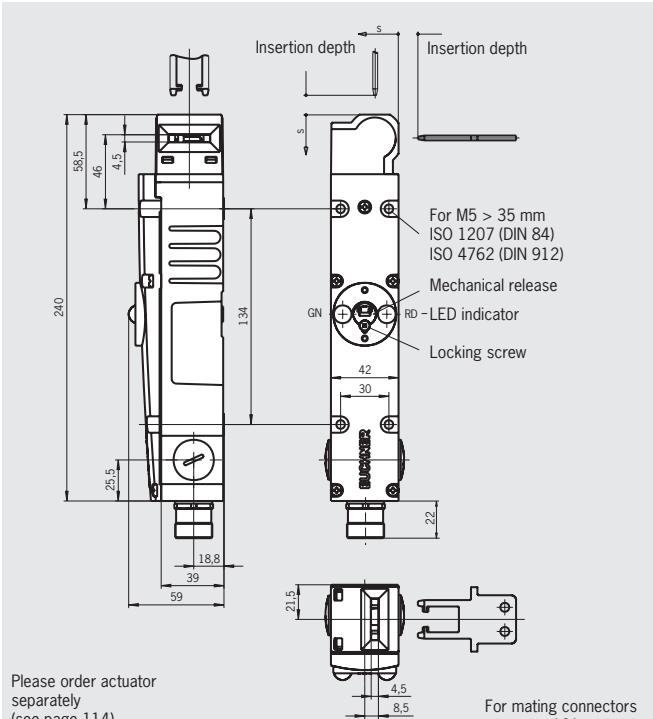
## Dimension drawing



Please order actuator  
separately  
(see page 114)

For mating connectors  
see page 123

**Plug connector RC18**  
18-pin + PE

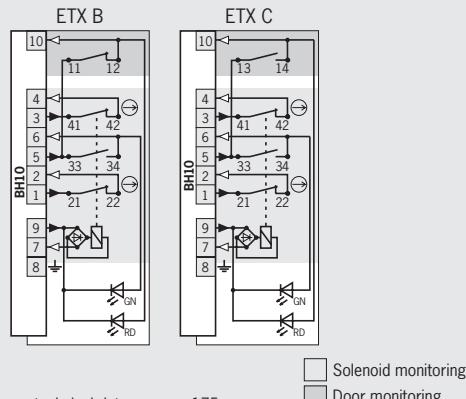


Please order actuator  
separately  
(see page 114)

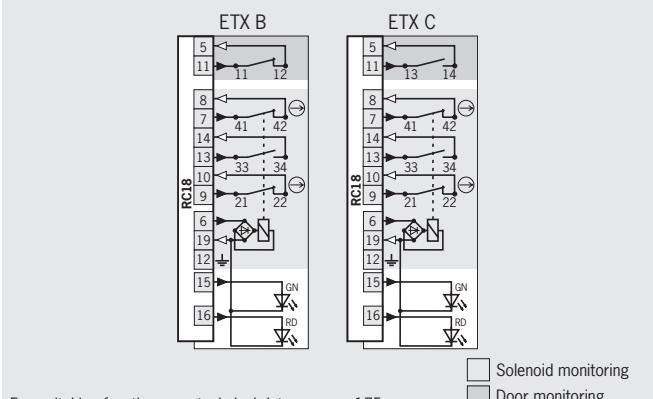
For mating connectors  
see page 121

## Wiring diagrams

Actuator inserted and locked



For switching functions see technical data on page 175



For switching functions see technical data on page 175

## Ordering table

Series	Connection	Guard locking	Switching element	Solenoid operating voltage		
				AC/DC 24 V	AC 110 V	AC 230 V
TX	Plug connector <b>BH10</b>	1 Mechanical	<b>ETX B</b> 2 NC $\ominus$ / 1 NO + 1 NC	<b>085380</b> TX1B-A024BH10	On request	On request
		2 Electrical	<b>ETX B</b> 2 NC $\ominus$ / 1 NO + 1 NC	<b>085381</b> TX2B-A024BH10	On request	On request
	Plug connector <b>RC18</b>	1 Mechanical	<b>ETX B</b> 2 NC $\ominus$ / 1 NO + 1 NC	<b>082933</b> TX1B-A024RC18	-	-
			<b>ETX C</b> 2 NC $\ominus$ / 1 NO + 1 NO	<b>082934</b> TX1C-A024RC18	-	-
		2 Electrical	<b>ETX B</b> 2 NC $\ominus$ / 1 NO + 1 NC	<b>082939</b> TX2B-A024RC18	-	-
			<b>ETX C</b> 2 NC $\ominus$ / 1 NO + 1 NO	<b>082940</b> TX2C-A024RC18	-	-

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



## Safety switch TX with guard locking and guard lock monitoring

- Mechanical release on the front
- Release under load possible
- With door monitoring contact
- Plug connector optional



### Approach direction

 Horizontal and vertical  
Can be adjusted in 90° steps

### Mechanical release

Is used for releasing the guard locking with the aid of a tool. The mechanical release must be sealed to prevent tampering (for example with sealing lacquer).

### Solenoid operating voltage

- AC/DC 24 V +10%, -15%
- AC 110 V +10%, -15%

### LED function display

The switch has a function display (2 LEDs, red and green). The LED voltage is same as the solenoid operating voltage.

### Guard locking types

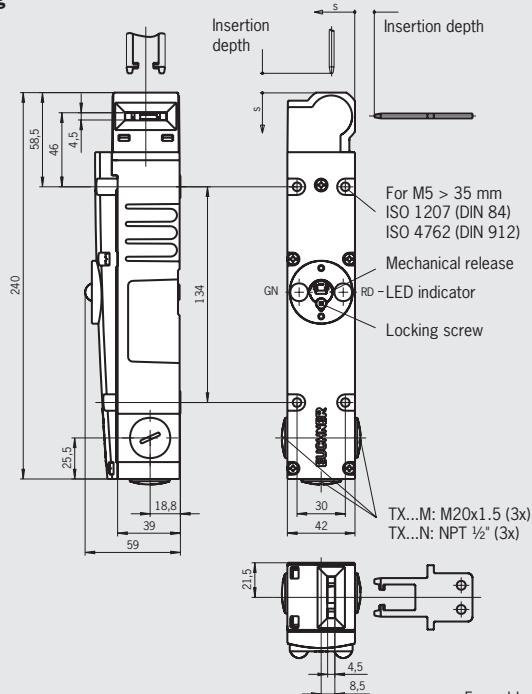
**TX3** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.  
Release under load possible.

### Switching elements (See also page 14)

- **ETX B** Slow-action switching contact  
2 NC ⊖ / 1 NO + 1 NC  
(door monitoring contact)
- **ETX C** Slow-action switching contact  
2 NC ⊖ / 1 NO + 1 NO  
(door monitoring contact)

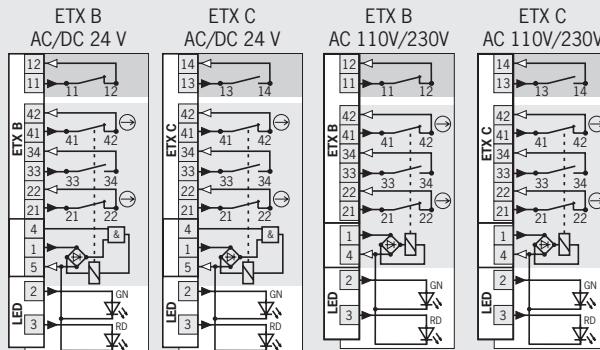
Cable entry M20 x 1.5 / cable entry NPT 1/2"

### Dimension drawing



For cable glands see page 124

### Wiring diagrams Actuator inserted and locked



For switching functions see technical data on page 175

### Ordering table

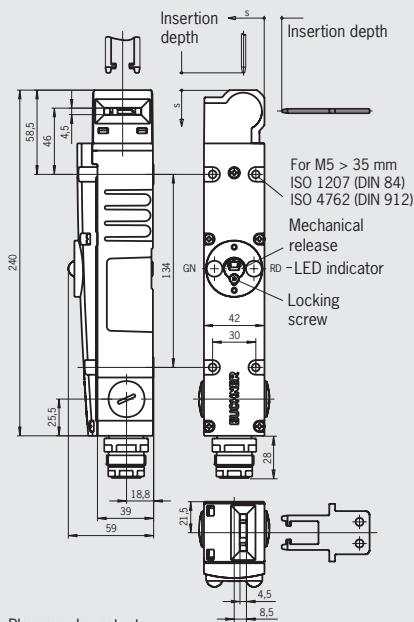
Series	Connection	Guard locking	Switching element	Solenoid operating voltage	
				AC/DC 24 V	AC 110 V
<b>TX</b>	<b>M</b> Cable entry <b>3 x M20 x 1.5</b>	<b>3</b> Mechanical	<b>ETX B</b> 2 NC ⊖ / 1 NO + 1 NC	<b>082952</b> TX3B-A024M	<b>082988</b> TX3B-A110M
			<b>ETX C</b> 2 NC ⊖ / 1 NO + 1 NO	<b>082953</b> TX3C-A024M	<b>082989</b> TX3C-A110M
			<b>ETX B</b> 2 NC ⊖ / 1 NO + 1 NC	<b>082997</b> TX3B-A024N	On request
	<b>N</b> Cable entry <b>3 x NPT 1/2"</b>	<b>3</b> Mechanical	<b>ETX C</b> 2 NC ⊖ / 1 NO + 1 NO	<b>082998</b> TX3C-A024N	On request

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



**Plug connector SR11**  
11-pin + PE

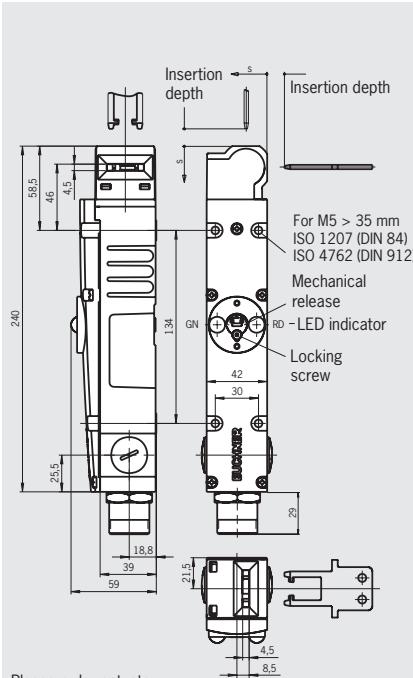
## Dimension drawing



Please order actuator separately  
(see page 114)

For mating connectors  
see page 120

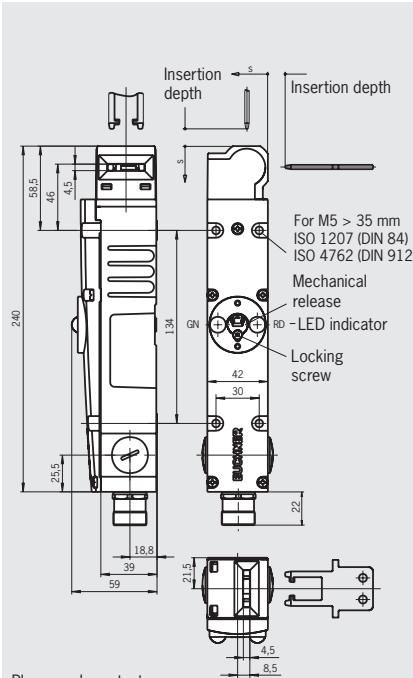
**Plug connector BH12**  
11-pin + PE



Please order actuator separately  
(see page 114)

For mating connectors  
see page 123

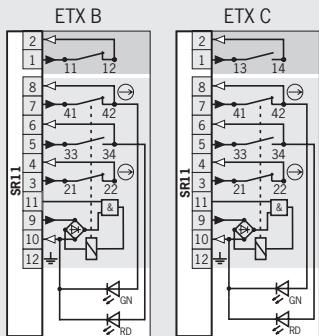
**Plug connector RC18**  
18-pin + PE



Please order actuator separately  
(see page 114)

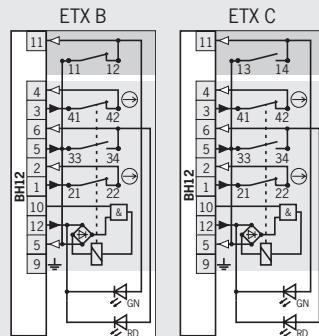
For mating connectors  
see page 121

## Wiring diagrams Actuator inserted and locked



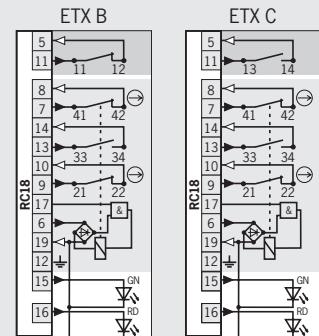
For switching functions see  
technical data see page 175

Solenoid monitoring  
 Door monitoring



For switching functions see  
technical data see page 175

Solenoid monitoring  
 Door monitoring



For switching functions see  
technical data see page 175

Solenoid monitoring  
 Door monitoring

## Ordering table

Series	Connection	Guard locking	Switching element	Solenoid operating voltage	
				AC/DC 24 V	AC 110 V
TX	Plug connector <b>SR11</b>	3 Mechanical	<b>ETX B</b> 2 NC $\ominus$ / 1 NO + 1 NC	On request	-
			<b>ETX C</b> 2 NC $\ominus$ / 1 NO + 1 NO	<b>085396</b> TX3C-A024SR11	-
	Plug connector <b>BH12</b>	3 Mechanical	<b>ETX B</b> 2 NC $\ominus$ / 1 NO + 1 NC	On request	
			<b>ETX C</b> 2 NC $\ominus$ / 1 NO + 1 NO	<b>083000</b> TX3C-A024BH12	On request
	Plug connector <b>RC18</b>	3 Mechanical	<b>ETX B</b> 2 NC $\ominus$ / 1 NO + 1 NC	<b>082964</b> TX3B-A024RC18	-
			<b>ETX C</b> 2 NC $\ominus$ / 1 NO + 1 NO	<b>082965</b> TX3C-A024RC18	-

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch TX with guard locking and guard lock monitoring

- ▶ Escape release on the rear side
- ▶ Release under load possible (only TX3 version)
- ▶ With door monitoring contact
- ▶ Plug connector optional



### Approach direction

Horizontal and vertical  
Can be adjusted in 90° steps

### Escape release

Is used for the manual release of the guard locking from within the danger area without tools. With identification of On/Off position..

### Solenoid operating voltage

► AC/DC 24 V +10%, -15%

### LED function display

The switch has a function display (2 LEDs, red and green). The LED voltage is same as the solenoid operating voltage.

### Guard locking types

**TX1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.

**TX3** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.  
Release under load possible.

### Switching elements (See also page 14)

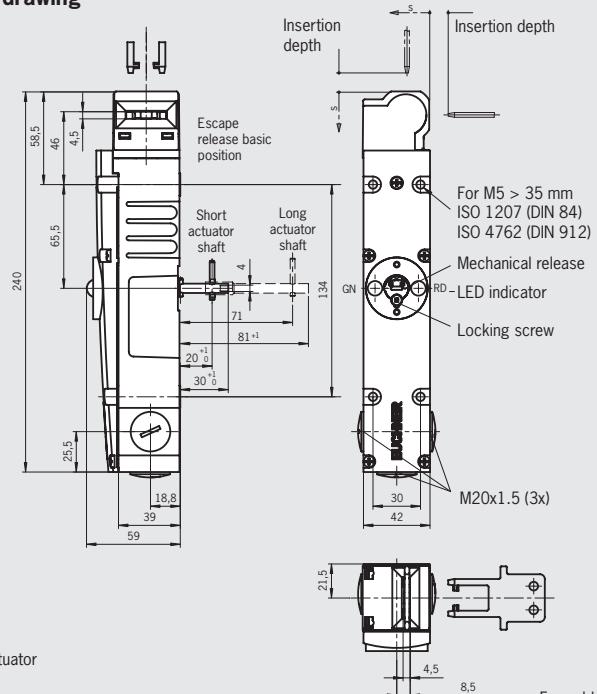
► **ETX B** Slow-action switching contact  
2 NC ⊖ / 1 NO + 1 NC  
(door monitoring contact)

► **ETX C** Slow-action switching contact  
2 NC ⊖ / 1 NO + 1 NO  
(door monitoring contact)

► **ETX D** Slow-action switching contact  
2 NC ⊖ + 2 NC ⊖  
(door monitoring contact)

### Cable entry M20 x 1.5

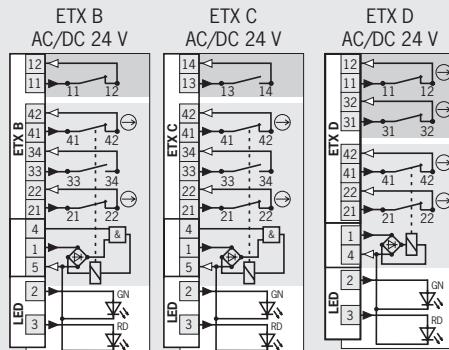
### Dimension drawing



Please order actuator separately  
(see page 114)

For cable glands see page 124

### Wiring diagrams Actuator inserted and locked



Solenoid monitoring  
 Door monitoring

For switching functions see technical data on page 175

### Ordering table

Series	Connection	Guard locking	Switching element	Version	Solenoid operating voltage	
					AC/DC 24 V	
TX	<b>M</b> Cable entry 3 x M20 x 1.5	1 Mechanical	ETX C 2 NC ⊖ / 1 NO + 1 NO	<b>C2161</b>	099489	TX1C-A024MC2161
			ETX D 2 NC ⊖ + 2 NC ⊖	Long actuator shaft <b>C1991</b>	096173	TX1D-A024MC1991
		3 Mechanical	ETX B 2 NC ⊖ / 1 NO + 1 NC	Short actuator shaft <b>C1991</b>	085391	TX3B-A024MC1991
			ETX C 2 NC ⊖ / 1 NO + 1 NO	Short actuator shaft <b>C1991</b>	093118	TX3C-A024MC1991
				<b>C2161</b>	098946	TX3C-A024MC2161
				Long actuator shaft		

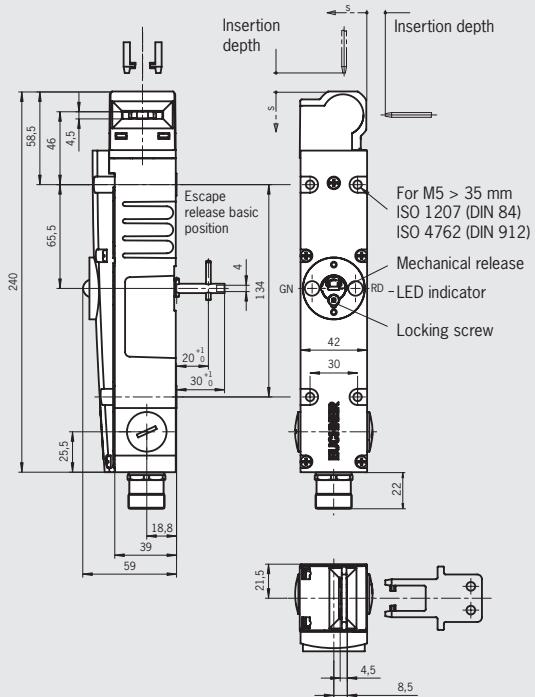


# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



**Plug connector RC18**  
18-pin + PE

## Dimension drawing

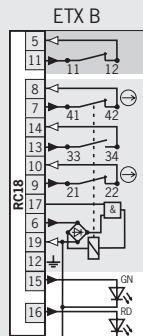


Please order actuator  
separately  
(see page 114)

For mating connectors  
see page 121

## Wiring diagrams

Actuator inserted and locked



For switching functions see technical data on page 175

- Solenoid monitoring
- Door monitoring

## Ordering table

Series	Connection	Guard locking	Switching element	Version	Solenoid operating voltage AC/DC 24 V
TX	Plug connector <b>RC18</b>	3 Mechanical	ETX B 2 NC $\ominus$ / 1 NO + 1 NC	C1991 Short actuator shaft	093559 TX3B-A024RC18C1991

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



## Safety switch TX with guard locking and guard lock monitoring

- Mechanical release on the front
- With door monitoring contact
- Separate plug connector for solenoid monitoring and door monitoring with solenoid operating voltage
- For direct connection to PROFIsafe inputs/outputs



### Approach direction

Horizontal and vertical  
Can be adjusted in 90° steps

### Mechanical release

Is used for releasing the guard locking with the aid of a tool. The mechanical release must be sealed to prevent tampering (for example with sealing lacquer).

### Solenoid operating voltage

- AC/DC 24 V +10%, -15%
- AC 110 V +10%, -15%
- AC 230 V +10%, -15%

### LED function display

The switch has a function display (2 LEDs, red and green). The LED voltage is same as the solenoid operating voltage.

### Guard locking types

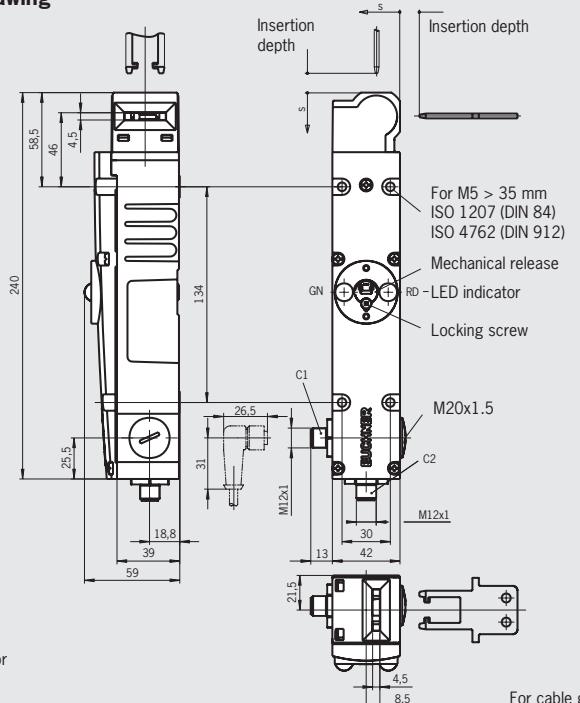
- TX1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the solenoid.
- TX2** Open-circuit current principle, guard locking by applying voltage to the solenoid. Release by spring force.

### Switching elements (See also page 14)

- **ETX B** Slow-action switching contact  
2 NC  $\ominus$  / 1 NO + 1 NC  
(door monitoring contact)

**Plug connector M12**  
2 plug connectors, 5-pin

### Dimension drawing

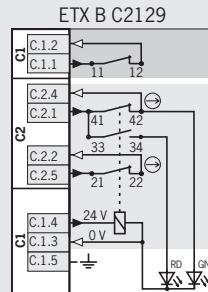


For cable glands see page 124

Please order actuator separately  
(see page 114)

### Wiring diagrams

Actuator inserted and locked



Solenoid monitoring  
 Door monitoring

For switching functions see technical data on page 175

### Ordering table

Series	Connection	Guard locking	Switching element	Version	Solenoid operating voltage	
					AC/DC 24 V	
TX	Plug connectors <b>2 x M12</b>	1 Mechanical	ETX B 2 NC $\ominus$ / 1 NO + 1 NC	C2129	097623	TX1B-A024MC2129

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Selection table for safety switches SGA



Version standard	One metal actuating head		
Connection			
M	SR11	RC18	Thread M20x1.5 for cable glands Plug connector 11-pin + PE Plug connector 18-pin + PE
			Switching element
			Two contacts      2 NC ⊖ Four contacts      3 NC ⊖ + 1 NO, 4 NC ⊖

Version standard	M	SR11	RC18	Two contacts	Four contacts	Page
●	●				●	96
●		●			●	97
●			●		●	98

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

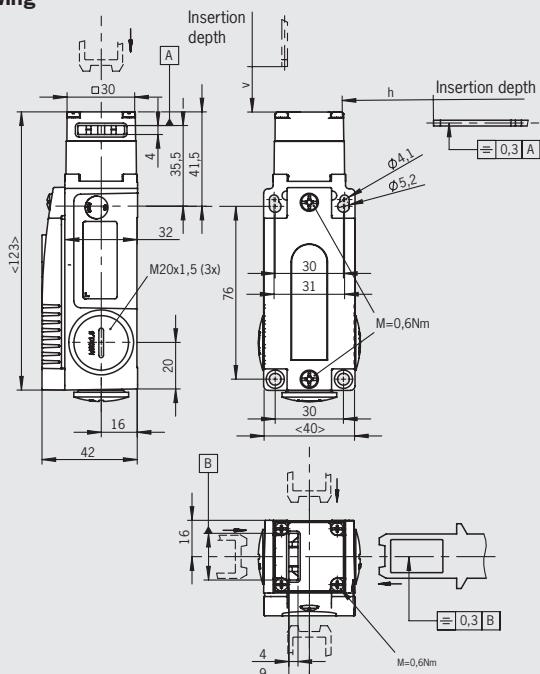
## Safety switch SGA

- Cable entry M20 x 1.5
- Plug connector optional



### Cable entry M20 x 1.5

#### Dimension drawing



#### Approach direction

Horizontal and vertical  
Can be adjusted in 90° steps

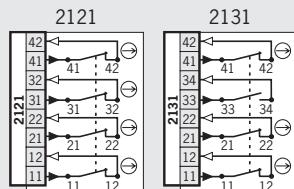
#### Switching elements

- **2121** Slow-action switching contact  
4 NC ⊖
- **2131** Slow-action switching contact  
3 NC ⊖ + 1 NO

Please order actuator separately  
(see pages 116-118)

For cable glands see page 124

#### Wiring diagrams Actuator inserted



#### Ordering table

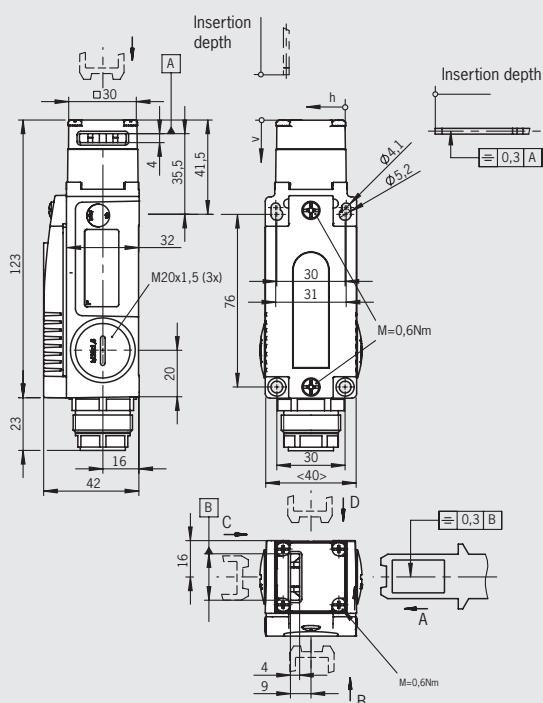
Series	Connection	Switching element	Order no./item
SGA	1 Cable entry <b>3 x M20 x 1.5</b>	<b>2121</b> 4 NC ⊖	<b>103725</b> SGA1A-2121A-M
		<b>2131</b> 3 NC ⊖ + 1 NO	<b>106307</b> SGA1A-2131A-M

Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



## **Plug connector SR11**

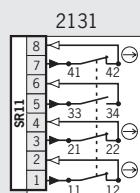
## Dimension drawing



Please order actuator  
separately  
(see pages 116-118)

For plug connectors see page 121

## Wiring diagrams Actuator inserted



## Ordering table

Series	Connection	Switching element	Order no./item
<b>SGA</b>	<b>2</b> Plug connectors <b>SR11</b>	<b>2131</b> 3 NC $\ominus$ + 1 NO	<b>106736</b> SGA2E-2131ASR11

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch SGA

- 2 illuminated pushbuttons
- Plug connector RC18



**Plug connector RC18**  
18-pin + PE



### Approach direction

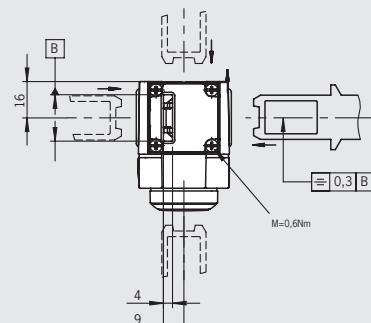
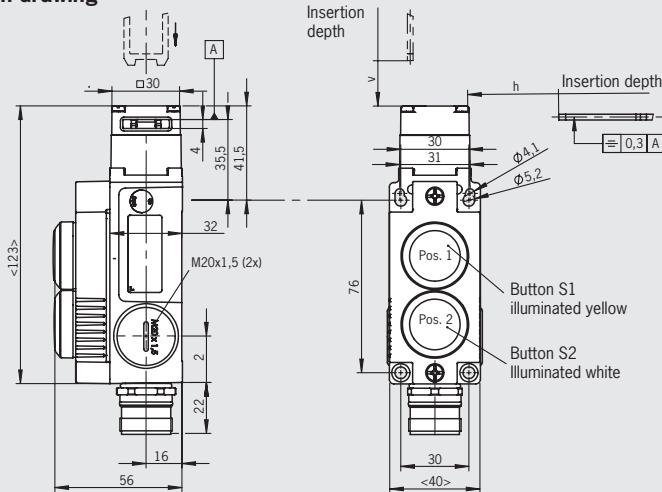


Horizontal and vertical  
Can be adjusted in 90° steps

### Switching elements

- **2121** Slow-action switching contact  
4 NC ⊖

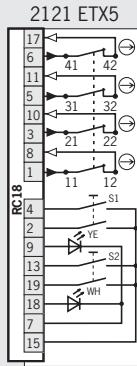
### Dimension drawing



Please order actuator separately  
(see pages 116-118)

For plug connectors see page 121

### Wiring diagrams Actuator inserted

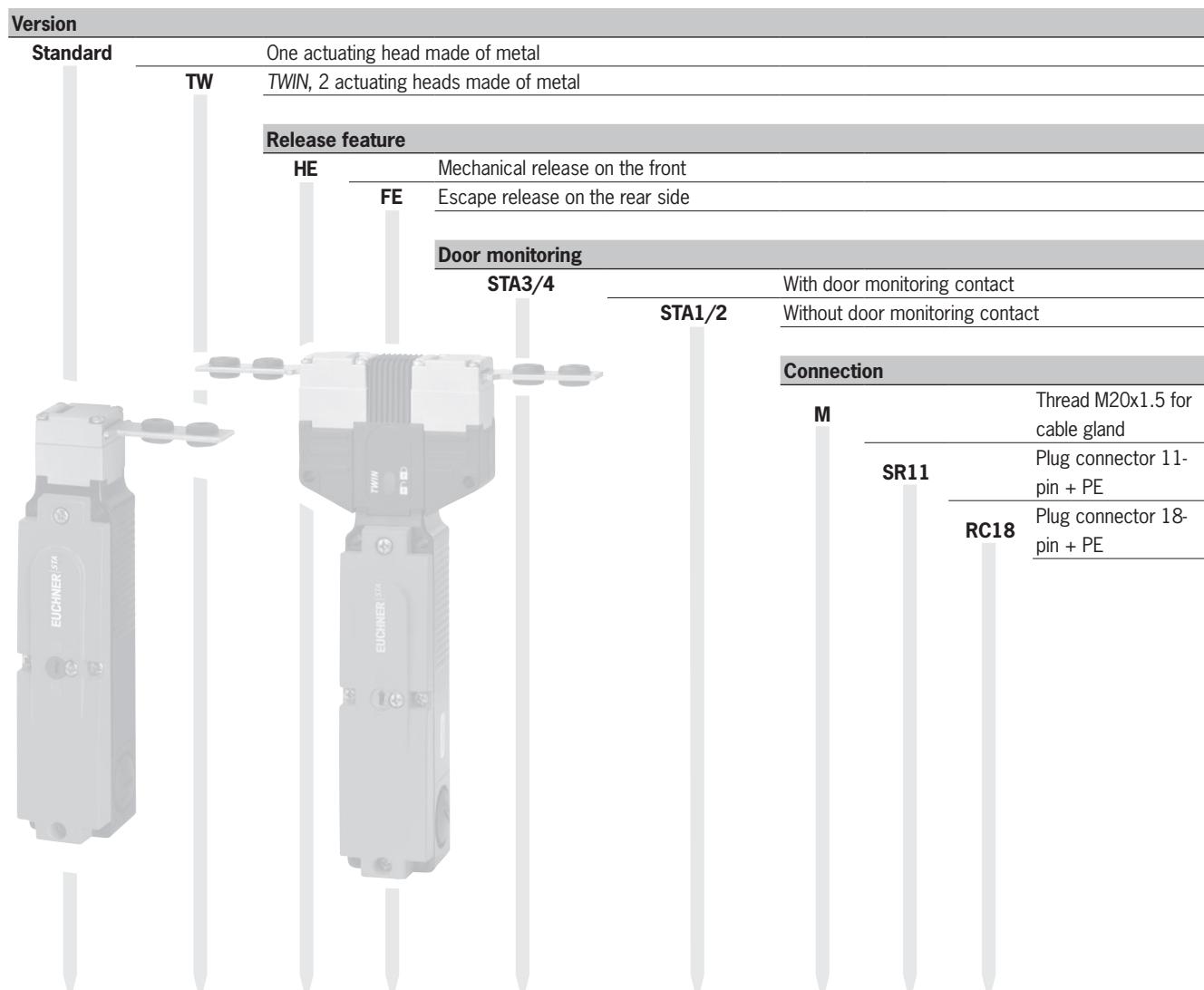


### Ordering table

Series	Connection	Switching element	Version	Order no./item
<b>SGA</b>	<b>2</b> Plug connectors <b>RC18</b>	<b>2121</b> 4 NC ⊖	<b>Pos. 1:</b> yellow push button <b>Pos. 2:</b> white push button	<b>104012</b> SGA2A-2121ARC18-ETX5

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Selection table for safety switches STA with guard locking and guard lock monitoring



Version		Standard		TW		Release feature		Door monitoring		Connection	
						HE		Mechanical release on the front			
				TW		FE		Escape release on the rear side			
						Door monitoring		STA3/4		With door monitoring contact	
								STA1/2		Without door monitoring contact	
										Connection	
										M	
										Thread M20x1.5 for cable gland	
										SR11	
										Plug connector 11-pin + PE	
										RC18	
										Plug connector 18-pin + PE	

Version		Release feature		Door monitoring		Connection			Page
Standard	TW	HE	FE	STA3/4	STA1/2	M	SR11	RC18	
●		●		●		●			100
●		●		●			●	●	101
●		●			●	●			102
●		●	●	●		●			103
	●	●		●		●			104

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch STA with guard locking and guard lock monitoring



- Mechanical release on the front
- With door monitoring contact
- Plug connector optional



### Approach direction

Horizontal and vertical  
Can be adjusted in 90° steps

### Mechanical release

Is used for releasing the guard locking with the aid of a tool. To protect against tampering, the mechanical release is sealed with sealing lacquer.

### Solenoid operating voltage

- AC/DC 24 V +10%, -15%

### LED function display (optional)

A function display (2 LEDs, red and green) is available for the following voltage ranges:

- AC/DC 24 V +10%, -15%

### Guard locking types

**STA3** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the guard locking solenoid.

**STA4** Open-circuit current principle, guard locking by applying voltage to the guard locking solenoid. Release by spring force.

### Switching elements

**2131** Slow-action switching contact  
2 NC  $\ominus$  + 1 NO + 1 NC  
(door monitoring contact)

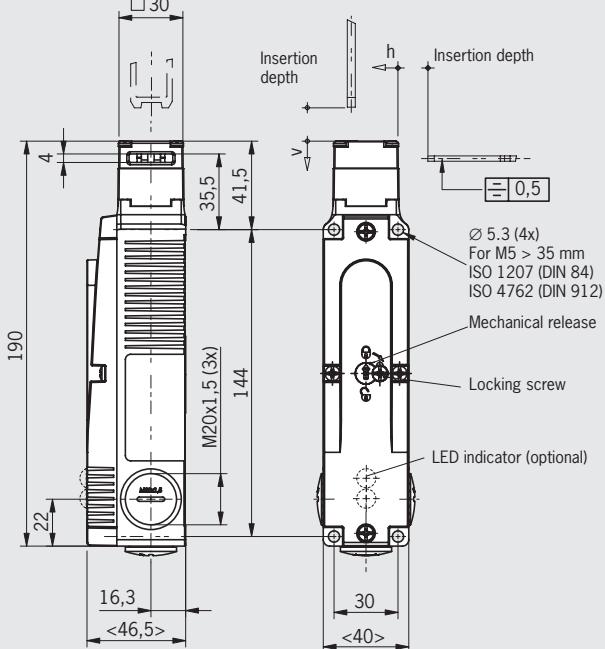
**4121** Slow-action switching contact  
2 NC  $\ominus$  + 1 NC / 1 NO  
(door monitoring contact)

**4131** Slow-action switching contact  
2 NC  $\ominus$  + 1 NO + 1 NO  
(door monitoring contact)

**4141** Slow-action switching contact  
2 NC  $\ominus$  + 2 NC  $\ominus$   
(door monitoring contact)

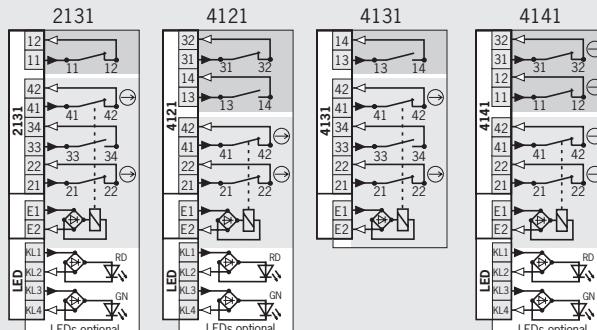
### Cable entry M20 x 1.5

### Dimension drawing



For cable glands see page 124

### Wiring diagrams Actuator inserted and locked



Solenoid monitoring  
 Door monitoring

For switching functions see technical data on page 180

### Ordering table

Series	Connection	Guard locking	Switching element	Version	Solenoid operating voltage	
					AC/DC 24 V	AC 230 V
<b>STA</b>	<b>M</b> Cable entry <b>3 x</b> <b>M20 x 1.5</b>	<b>3</b> Mechanical	<b>2131</b> 2 NC $\ominus$ + 1 NC + 1 NO		<b>096938</b> STA3A-2131A024M	<b>104171</b> STA3A-2131A230M
			<b>4121</b> 2 NC $\ominus$ + 1 NC / 1 NO	<b>024L</b> LED indicator AC/DC 24 V	<b>096936</b> STA3A-4121A024M	-
			<b>4131</b> 2 NC $\ominus$ + 1 NO + 1 NO		<b>106535</b> STA3A-4121A024L024M	-
			<b>4141</b> 2 NC $\ominus$ + 2 NC $\ominus$	<b>099480</b> STA3A-4131A024M	<b>099274</b> STA3A-4141A024M	-
		<b>4</b> Electrical	<b>2131</b> 2 NC $\ominus$ + 1 NC + 1 NO	<b>024L</b> LED indicator AC/DC 24 V	<b>100898</b> STA3A-4141A024L024M	-
			<b>4121</b> 2 NC $\ominus$ + 1 NC / 1 NO		<b>096939</b> STA4A-2131A024M	-
			<b>4131</b> 2 NC $\ominus$ + 1 NO + 1 NO	<b>103926</b> STA4A-2131A024L024M	<b>1096937</b> STA4A-4121A024M	-
			<b>4141</b> 2 NC $\ominus$ + 2 NC $\ominus$		<b>099481</b> STA4A-4131A024M	-
					<b>109172</b> STA4A-4141A024M	-

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



C  
UL  
US  
LISTED

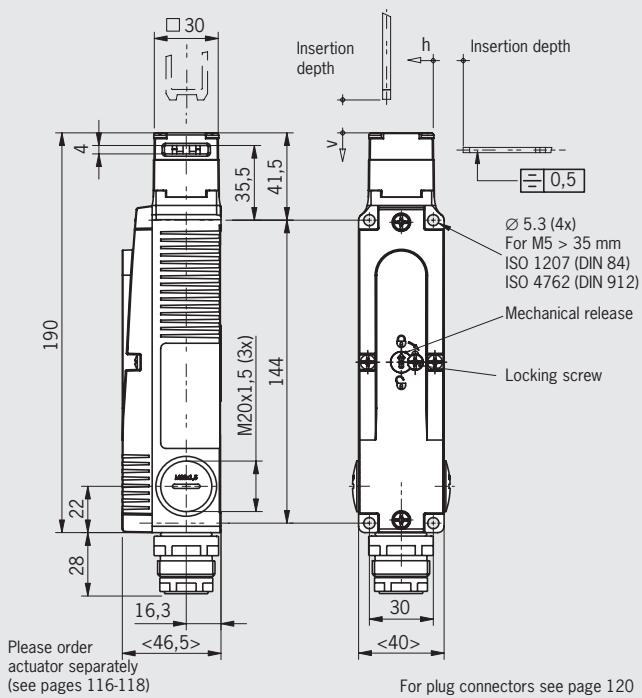


C  
UL  
US  
LISTED

## Plug connector SR11

11-pin + PE

### Dimension drawing

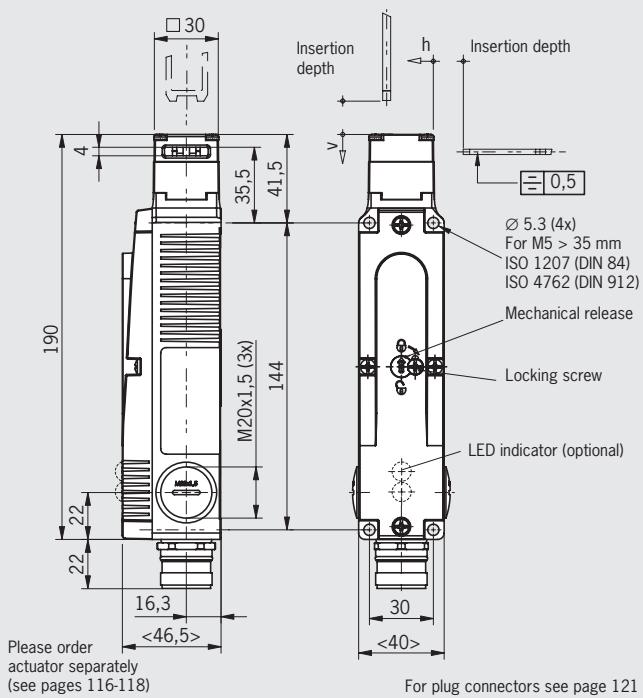


For plug connectors see page 120

## Plug connector RC18

18-pin + PE

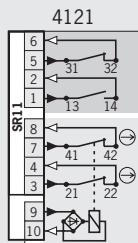
### Dimension drawing



For plug connectors see page 121

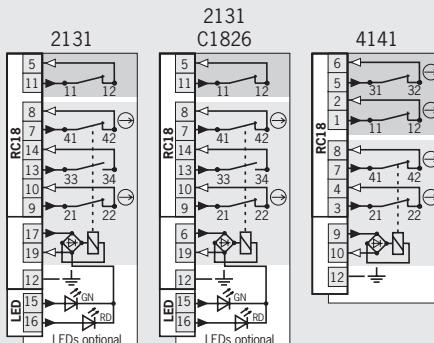
### Wiring diagrams

Actuator inserted and locked



For switching functions see technical data on page 180

Solenoid monitoring  
 Door monitoring



For switching functions see technical data on page 180

Solenoid monitoring  
 Door monitoring

### Ordering table

Series	Connection	Guard locking	Switching element	Version	Solenoid operating voltage AC/DC 24 V	
					105304 STA3A4121A024SR11	
STA	SR11 Plug connector	3 Mechanical	4121 2 NC $\ominus$ + 1 NC / 1 NO		099658 STA3A-2131A024RC18	
			2131 2 NC $\ominus$ + 1 NO + 1 NC	024L LED indicator AC/DC 24 V	106623 STA3A-2131A024LC18C1826	
		3 Mechanical	4141 2 NC $\ominus$ + 2 NC $\ominus$	024L LED indicator AC/DC 24 V C1826 Special wiring	100029 STA3A-4141A024RC18	
	RC18 Plug connector	4 Electrical	2131 2 NC $\ominus$ + 1 NC + 1 NO	024L LED indicator AC/DC 24 V	105303 STA4A-2131A024RC18	
				024L LED indicator AC/DC 24 V C1826 Special wiring	106622 STA4A-2131A024LC18C1826	

Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



## Safety switch STA with guard locking and guard lock monitoring

- ▶ Mechanical release on the front
  - ▶ Without door monitoring contact

## **Cable entry M20 x 1.5**



### Approach direction

 Horizontal and vertical  
Can be adjusted in 90° steps

#### Mechanical release

**Mechanical release**  
Is used for releasing the guard locking with the aid of a tool. To protect against tampering, the mechanical release is sealed with sealing lacquer.

#### Solenoid operating voltage

- AC/DC 24 V +10%, -15%

## Guard locking types

- Guard locking types**

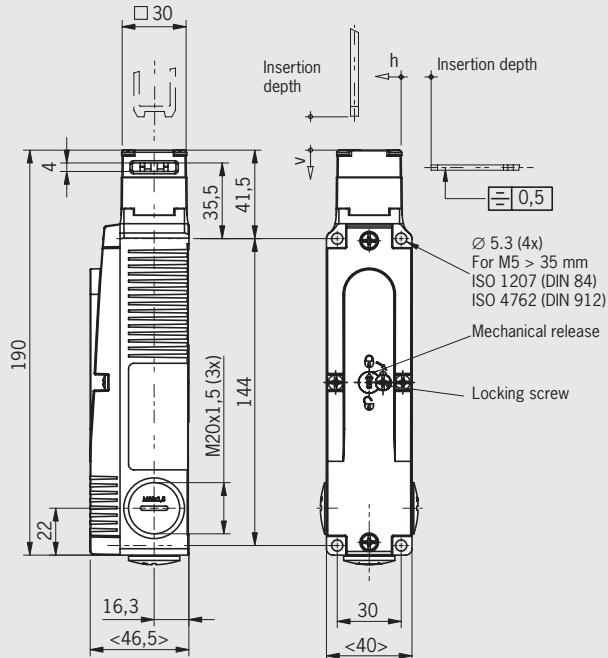
**STA1** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the guard locking solenoid.

**STA2** Open-circuit current principle, guard locking by applying voltage to the guard locking solenoid. Release by spring force.

## **Switching elements**

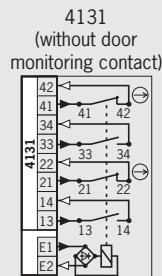
- 4131 Slow-action switching contact  
2 NC ⊖ + 2 NO

## Dimension drawing



For cable glands see page 124

### **Wiring diagrams** Actuator inserted and locked



For switching functions see technical data on page 180

## Ordering table

Series	Connection	Guard locking	Switching element	Solenoid operating voltage AC/DC 24 V
STA	<b>M</b> Cable entry 3 x <b>M20 x 1.5</b>	1 Mechanical	<b>4131</b> 2 NC ⊖ + 2 NO	<b>096439</b> STA1A-4131A024M
		2 Electrical	<b>4131</b> 2 NC ⊖ + 2 NO	<b>096935</b> STA2A-4131A024M

Safety Switches with Separate Actuator, Metal Housing **EUCHNER**



## **Safety switch STA with guard locking and guard lock monitoring**

- ▶ Escape release from the rear
  - ▶ With door monitoring contact

**Cable entry M20 x 1.5**



### Approach direction

**Approach direction**



Horizontal and vertical  
Can be adjusted in 90° steps

## Escape release

Is used for the manual release of the guard locking from within the danger area without tools. With identification of On/Off position..

### Solenoid operating voltage

- AC/DC 24 V +10%, -15%

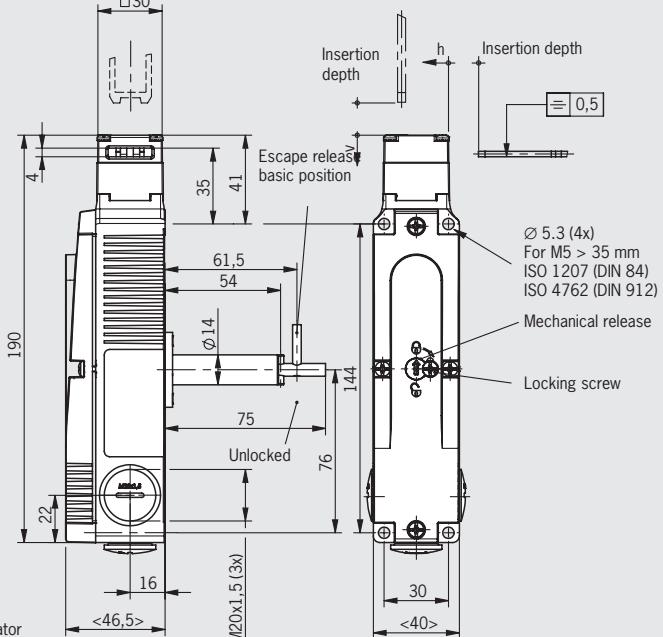
## Guard locking types

**STA3** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the guard locking solenoid.

## **Switching elements**

- **2131** Slow-action switching contact  
2 NC  $\ominus$  + 1 NO + 1 NC  
(door monitoring contact)

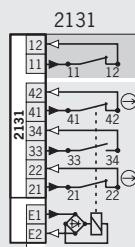
## Dimension drawing



Please order actuators  
separately  
(see pages 116-118)

For cable glands see page 124

### **Wiring diagrams**



For switching functions see technical data on page 180

- Solenoid monitoring
- Door monitoring

## Ordering table

Series	Connection	Guard locking	Switching element	Version	Solenoid operating voltage	
					AC/DC 24 V	
STA	M Cable entry 3 x M20 x 1.5	3 Mechanical	2131 2 NC $\ominus$ + 1 NC + 1 NO	C1993 Long actuator shaft	103660 STA3A-2131A024MC1993	

# Safety Switches with Separate Actuator, Metal Housing **EUCHNER**

## Safety switch STA-TW with guard locking and guard lock monitoring



- ▶ Actuating heads made of metal
- ▶ Simultaneous monitoring of two safety doors
- ▶ Mechanical release on the front
- ▶ Mechanical key release optional
- ▶ With door monitoring contact



### Approach direction

Horizontal and vertical  
Can be adjusted in 90° steps

### Mechanical release

Is used for releasing the guard locking with the aid of a tool. To protect against tampering, the mechanical release is sealed with sealing lacquer.

### Mechanical key release

Additional lock on the switch head. Function as for mechanical release. The mechanical key release setting is indicated in the window. Two keys are included.

### Solenoid operating voltage

▶ AC/DC 24 V +10%, -15%

### LED function display (optional)

A function display (2 LEDs, red and green) is available for the following voltage ranges:

▶ AC/DC 24 V +10%, -15%

### Guard locking types

**STP3** Closed-circuit current principle, guard locking by spring force. Release by applying voltage to the guard locking solenoid.

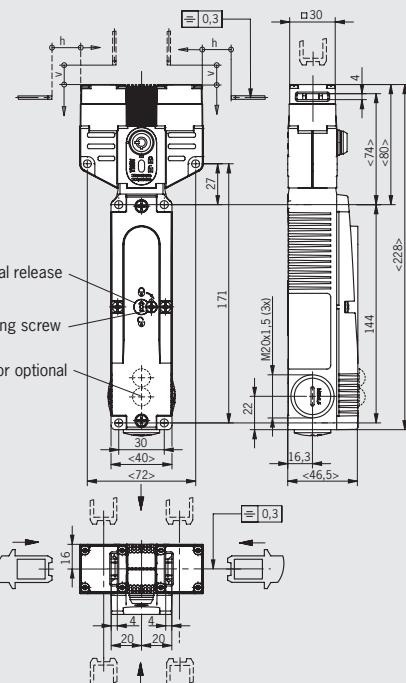
### Switching elements

▶ **2131** Slow-action switching contact  
2 NC  $\ominus$  + 1 NO + 1 NC  
(door monitoring contact)

▶ **4121** Slow-action switching contact  
2 NC  $\ominus$  + 1 NC / 1 NO  
(door monitoring contact)

### Cable entry M20 x 1.5

### Dimension drawing

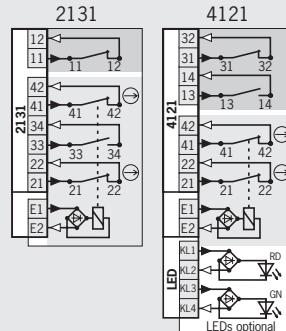


Please order actuator separately  
(see pages 116-118)

For cable glands see page 124

### Wiring diagrams

Actuator inserted and locked



Solenoid monitoring  
 Door monitoring

For switching functions see technical data on page 183

### Ordering table

Series	Connection	Guard locking	Switching element	Version	Solenoid operating voltage AC/DC 24 V	
					2131	4121
STA-TW	<b>M</b> Cable entry <b>3 x</b> <b>M20 x 1.5</b>	<b>3</b> Mechanical	<b>2131</b> 2 NC $\ominus$ + 1 NC + 1 NO	With mechanical key release (identical locking)	<b>105617</b> STA-TW-3A-2131AC024M	
			<b>4121</b> 2 NC $\ominus$ + 1 NC / 1 NO		<b>105888</b> STA-TW-3A-2131AC024M-S1	
					<b>106545</b> STA-TW-3A-4121AC024M	
			<b>024L</b> LED indicator AC/DC 24 V		<b>106379</b> STA-TW-3A-4121AC024L024M	

## Selection table for safety hinge ESH

Switching element		
Two contacts	1 NC ⊖ + 1 NO or 2 NC ⊖	
Switching element		Page
Two contacts	●	106



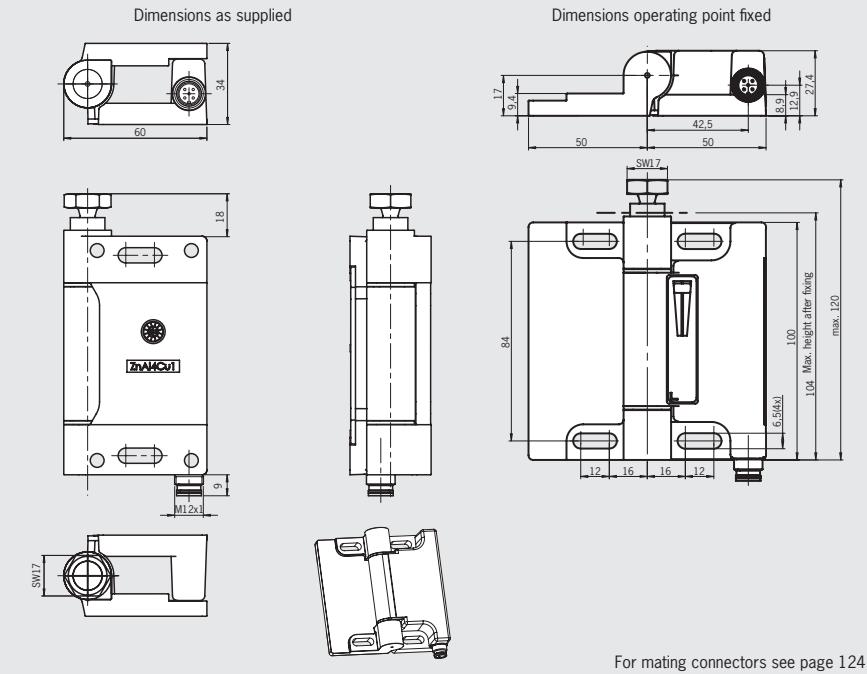
## Hinge ESH

- Hinge with integrated safety function
- Suitable for profile assembly



**Plug connector M12**  
4-pin + PE

### Dimension drawing



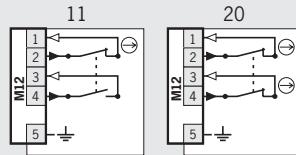
The safety hinges ESH are safety devices for monitoring movable safety guards, such as doors or covers on machinery or systems. On the safety hinges ESH-ARO... the operating point can be adjusted as often as necessary.

**Important:** During mounting the axes of the hinges used must be exactly aligned.

### Switching elements

- **20** Snap-action switching contact  
2 NC ⊖
- **11** Snap-action switching contact  
1 NC ⊖ + 1 NO

### Wiring diagrams



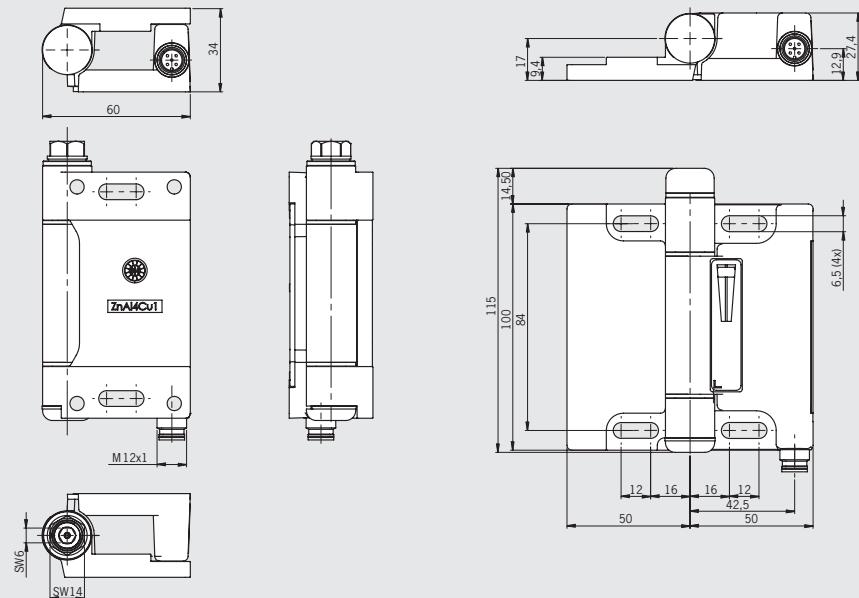
### Ordering table

Series	Switching element	Version	Order no./item
Safety hinge <b>ESH-PRO</b>	<b>11</b> 1 NC ⊖ + 1 NO	Plug connector <b>M12</b>	<b>095895</b> ESH-PRO-11A-1205
	<b>20</b> 2 NC ⊖	Plug connector <b>M12</b>	<b>095894</b> ESH-PRO-20A-1205
	-	Matching hinge (without safety function)	<b>096007</b> ESH-PRO

► Hinge ESH-ARO re-adjustable

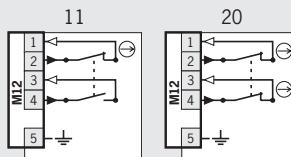
**Plug connector M12**  
4-pin + PE

**Dimension drawing**



For mating connectors see page 124

**Wiring diagrams**



**Ordering table**

Series	Switching element	Version	Order no./item
Safety hinge <b>ESH-ARO</b> re-adjustable	<b>11</b> 1 NC $\ominus$ + 1 NO	Plug connector <b>M12</b>	<b>109409</b> ESHARO-11A-1205
	<b>20</b> 2 NC $\ominus$	Plug connector <b>M12</b>	<b>106548</b> ESHARO-20A-1205
	-	Matching hinge (without safety function)	<b>096007</b> ESH-PRO
	-	Replacement protective cap	<b>110443</b> INSTALLATION KIT CAP



## Selection table for accessories

Actuator														
Plug connectors														
<b>SS4</b>												Male plug 3-pin + PE		
Solenoid												Solenoid plug connector NZ.VZ.VS 2-pin + PE		
<b>C16-1</b>												Female plug 6-pin + PE		
<b>RC12</b>												Blinking plug 12-pin		
<b>SR6</b>												Female plug 6-pin + PE		
<b>SR11</b>												Male socket 6-pin + PE		
<b>RC18</b>												Female plug 11-pin + PE		
<b>MR</b>												Male socket 11-pin + PE		
<b>SVM5</b>												Female plug 18-pin + PE		
												Plug connector 8-/9-/10-/12-pin		
												SVM5 M12 plug connector 5-pin		
Plug connector with cable														
Cable glands														
Mounting plates														
Bolt														
Actuator	SS4	Solenoid	C16-1	RC12	SR6	SR11	RC18	MR	SVM5	With cable	Cable gland	Mounting plates	Bolt	Page
●														110
	●													119
		●												119
			●											119
				●										119
					●									120
						●				●				120
							●			●				121
								●		●				122
									●	●				123
										●				124
											●			124
												●		125
													●	135

## Actuators for safety switches NZ.VZ, NZ.VZ.VS and TZ

- ▶ Two stainless safety screws per actuator
- ▶ Increased overtravel optional
- ▶ Packaging unit 25 pieces optional

### Straight actuator

The straight actuator is used on sliding doors or hinged doors with door radii greater than 1000 mm. Safety screws prevent unscrewing of the actuator. The safety screws included can be inserted with a normal tool, but cannot be removed again.

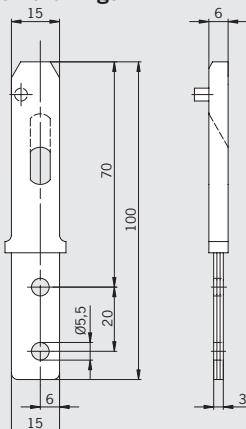
### Actuator with overtravel

- ▶ **4 mm** for doors with normal play
- ▶ **16 mm** for doors with large play (optional)

**Actuator Z-G straight**

Overtravel 4 mm

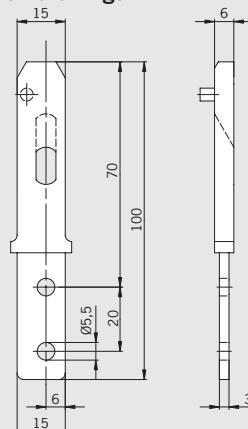
**Dimension drawings**



**Actuator Z-GME straight**

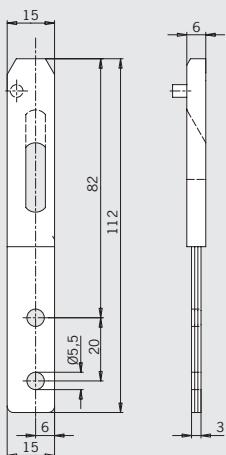
Overtravel 4 mm, solid stainless steel

**Dimension drawings**

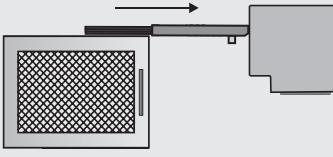
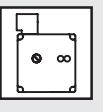
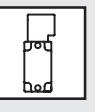
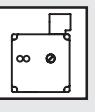
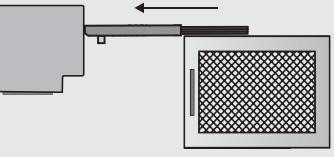
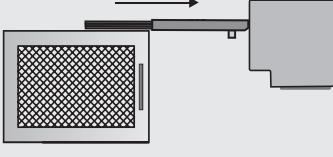
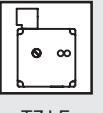
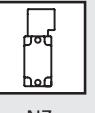
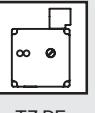
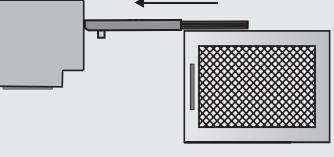
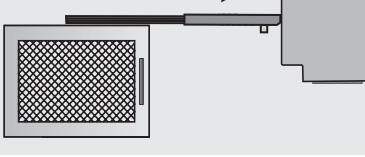
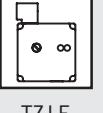
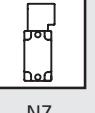
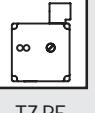
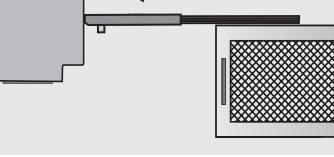
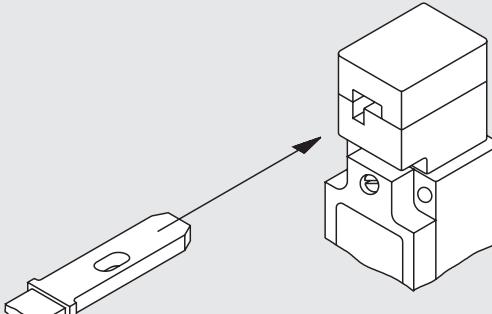


**Actuator Z-GN straight**

Overtravel 16 mm



## Selection table for actuators

Actuator					
		TZ-LE	NZ	TZ-RE	
Actuator straight Z-G 016849 overtravel 4 mm					
Actuator straight Z-GME 097436 overtravel 4 mm					
Actuator straight Z-GN 072251 overtravel 16 mm					
 <p><b>Straight actuator</b> <b>Z-G 016849</b> <b>Z-GME 097436</b> <b>Z-GN 072251</b></p>					

## Ordering table

Designation	Design	Min. door radius r [mm]	Packaging unit	Order no./item
Actuator Straight	<b>Z-G</b> 4 mm overtravel incl. 2 safety screws M5 x 10	$\geq 1000$	1 ea.	<b>016849</b> ACTUATOR-Z-G
			25 ea.	<b>074411</b> ACTUATOR-Z-G/V25
	<b>Z-GME</b> 4 mm overtravel, made of solid stainless steel incl. 2 safety screws M5x10	$\geq 1000$	1 ea.	<b>097436</b> ACTUATOR-Z-GME
	<b>Z-GN</b> 16 mm overtravel incl. 2 safety screws M5x10	$\geq 1000$	1 ea.	<b>072251</b> ACTUATOR-Z-GN

## Actuators for safety switches NZ.VZ, NZ.VZ.VS and TZ

- ▶ Two stainless safety screws per actuator
- ▶ Smaller door radii optional
- ▶ Packaging unit 25 pieces optional

### Hinged actuator

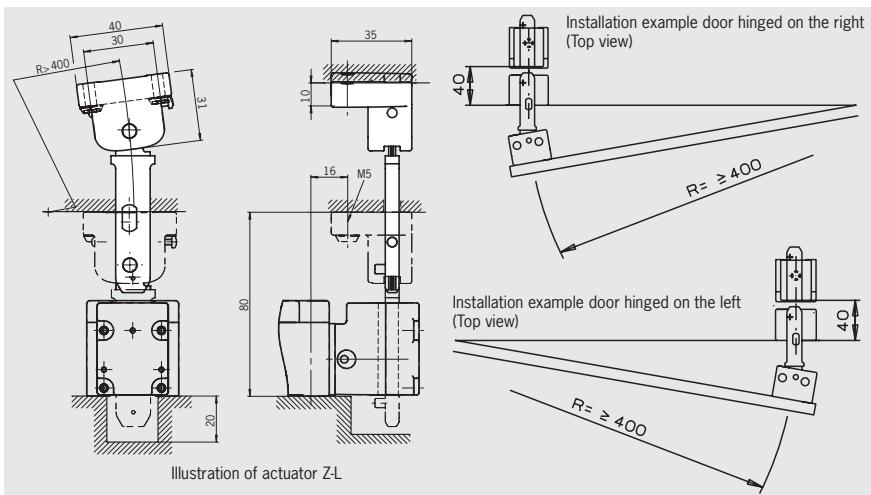
For door radii less than 1000 mm a hinged actuator should be used. The spring action movement of the actuator prevents damage due to the actuator jamming in the actuating head. Depending on the movement of the safety guard, the actuator must be selected for left/right or top/bottom.

#### Option C2241

Hinged actuator made of stainless steel.

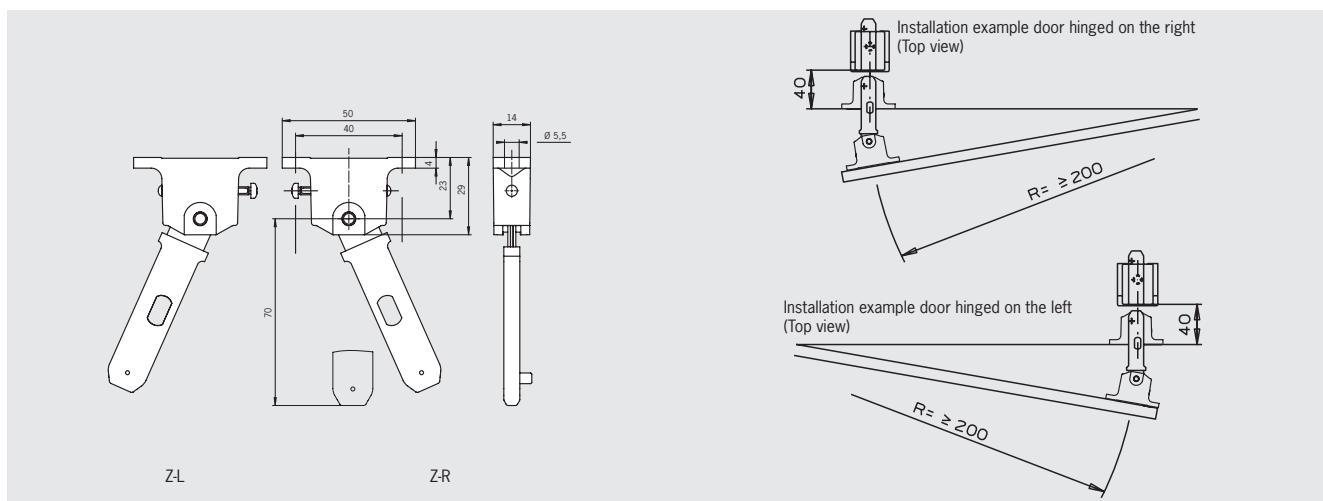
### Hinged actuator Z-R/Z-LL

Radius  $\geq 400$  mm, safety guard hinged on left/right



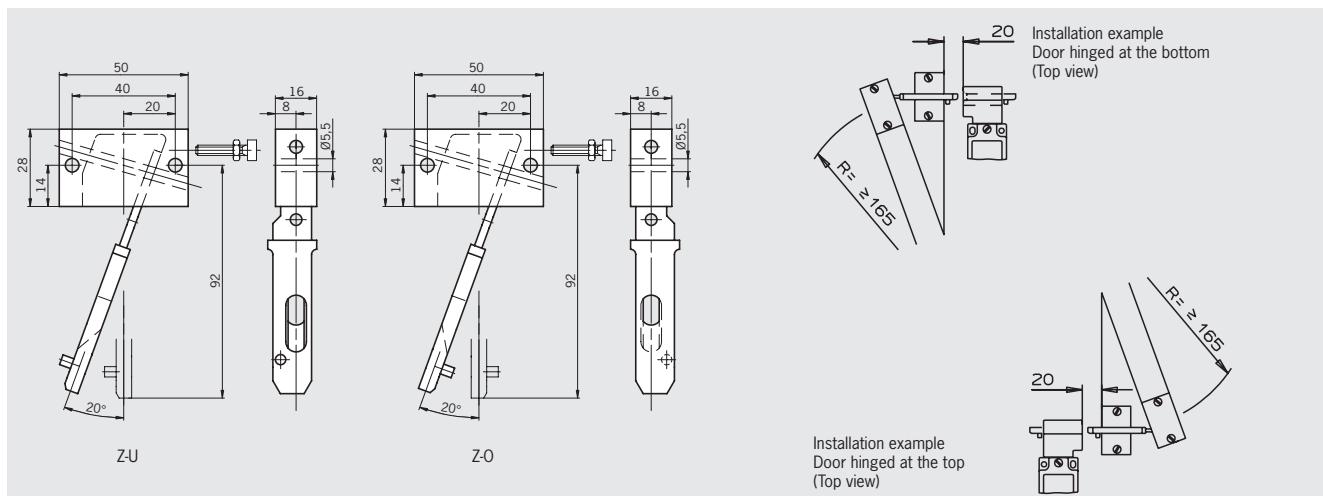
### Hinged actuator Z-R-C2194/Z-L-C2194

Radius  $\geq 200$  mm, safety guard hinged on left/right

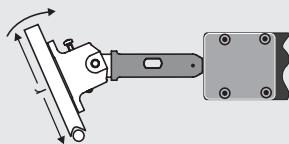
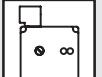
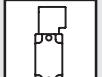
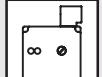
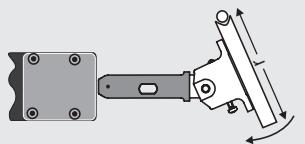
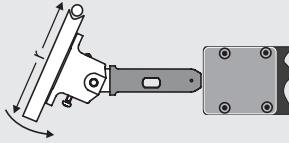
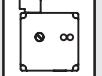
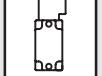
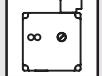
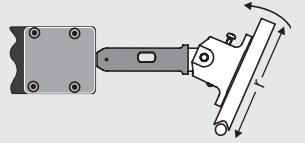
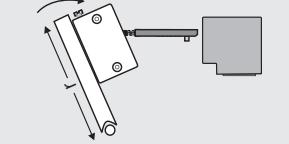
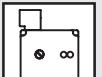
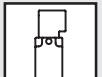
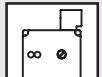
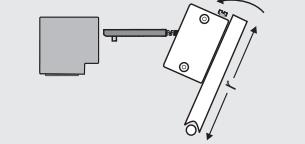
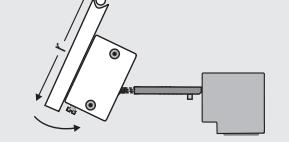
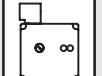
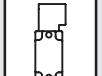
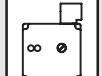
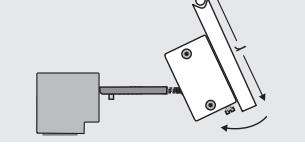
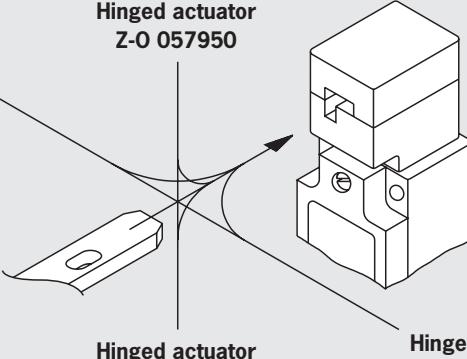


### Hinged actuator Z-U/Z-O/Z-U-C2241/Z-O-C2241

Radius  $\geq 165$  mm, safety guard hinged at bottom/top



## Selection table for actuators

Actuator					
		TZ-LE	NZ	TZ-RE	
Hinged actuator Z-L 024298 Z-L-C2194 100407					
Hinged actuator Z-R 024299 Z-R-C2194 100406					
Hinged actuator Z-U 048850					
Hinged actuator Z-O 057950					
Hinged actuator Z-R 024299 Z-R-C2194 100406		Hinged actuator Z-O 057950		Hinged actuator Z-L 024298 Z-L-C2194 100407	
					

## Ordering table

Designation	Design	Version	Min. door radius r [mm]	Packaging unit	Order no./item
Hinged actuator	Z-R	Safety guard hinged on the left incl. 2 safety screws M5 x 16	$\geq 400$	1 ea.	<b>024299</b> HINGED ACTUATOR-Z-R
	Z-L			25 ea.	<b>074412</b> HINGED ACTUATOR-Z-R/V25
	Z-R-C2194	Safety guard hinged on the left incl. 2 safety screws M5x10	$\geq 200$	1 ea.	<b>024298</b> HINGED ACTUATOR-Z-L
	Z-L-C2194			25 ea.	<b>074413</b> HINGED ACTUATOR-Z-L/V25
	Z-U	Safety guard hinged at bottom incl. 2 safety screws M5 x 25	$\geq 165$	1 ea.	<b>100406</b> HINGED ACTUATOR-Z-R-C2194
	C2241			25 ea.	<b>048850</b> HINGED ACTUATOR-Z-U
	Z-O	Safety guard hinged at top incl. 2 safety screws M5 x 25	$\geq 165$	1 ea.	<b>074414</b> HINGED ACTUATOR-Z-U/V25
	C2241			25 ea.	<b>103845</b> HINGED ACTUATOR-Z-U-C2241
				1 ea.	<b>057950</b> HINGED ACTUATOR-Z-O
				25 ea.	<b>074415</b> HINGED ACTUATOR-Z-O/V25
				1 ea.	<b>104068</b> HINGED ACTUATOR-Z-O-C2241

## Actuators for safety switches NX/TX

- Actuators made of stainless steel
- Two stainless safety screws per actuator
- With rubber bush

### Straight actuator

The straight actuator is used on sliding doors or hinged doors with door radii greater than 300 mm. Safety screws prevent unscrewing of the actuator.

### Actuator with overtravel

- **2 mm** for doors with normal play
- **7 mm** for doors with large play (optional)

### Actuators with rubber bushings

For flexible mounting of the actuator.

### Hinged actuator

For door radii less than 300 mm a hinged actuator should be used. The spring action movement of the actuator prevents damage due to the actuator jamming in the actuating head. Depending on the movement of the safety guard, the actuator must be selected for left/right or top/bottom.

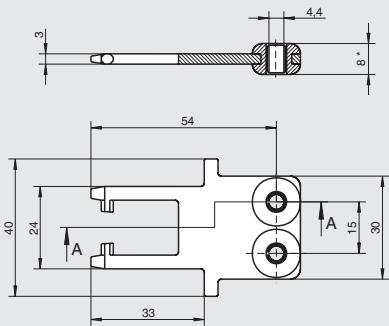
### Screws made of stainless steel

The safety screws included can be inserted with a normal tool, but cannot be removed again.

### Actuator X-GQ straight

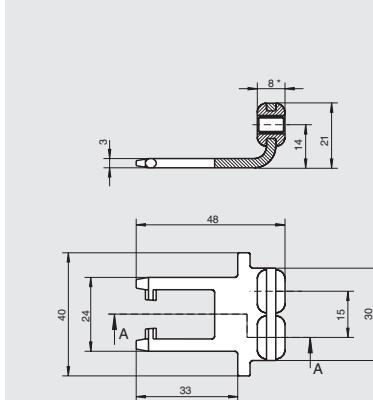
Rubber bush, overtravel 2 mm

### Dimension drawings



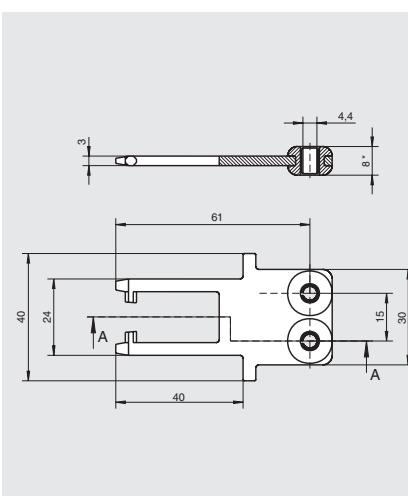
### Actuator X-WQ bent

Rubber bush, overtravel 2 mm



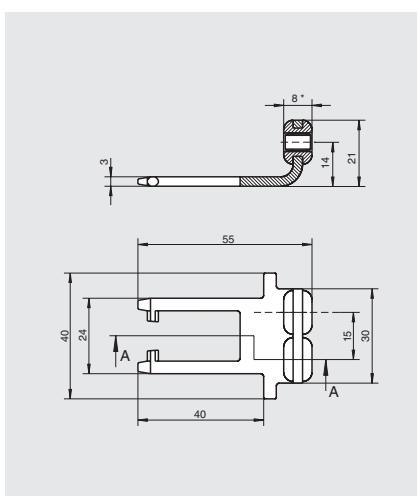
### Actuator X-GNQ straight

Rubber bush, overtravel 7 mm



### Actuator X-WNQ bent

Rubber bush, overtravel 7 mm



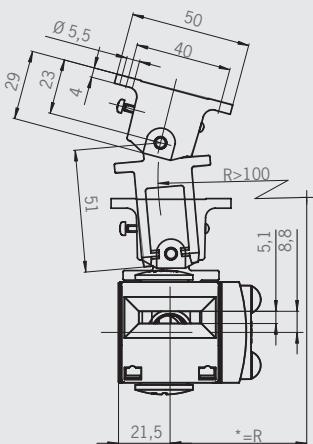
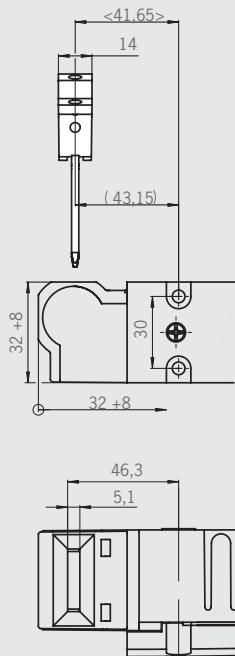
### Ordering table

Designation	Design	Min. door radius r [mm]	Packaging unit	Order no./item
<b>Actuator</b> Straight Rubber bush	<b>X-GQ</b> 2 mm overtravel incl. 2 safety screws M4 x 14	300	1 ea.	<b>079739</b> ACTUATOR-X-GQ
<b>Actuator</b> Angled Rubber bush	<b>X-WQ</b> 2 mm overtravel incl. 2 safety screws M4 x 14	300	1 ea.	<b>079740</b> ACTUATOR-X-WQ
<b>Actuator</b> Straight Rubber bush, overtravel	<b>X-GNQ</b> 7 mm overtravel incl. 2 safety screws M4 x 14	440	1 ea.	<b>079741</b> ACTUATOR-X-GNQ
<b>Actuator</b> Angled Rubber bush, overtravel	<b>X-WNQ</b> 7 mm overtravel incl. 2 safety screws M4 x 14	440	1 ea.	<b>079742</b> ACTUATOR-X-WNQ

\* The dimension 8 relates to the fitted state

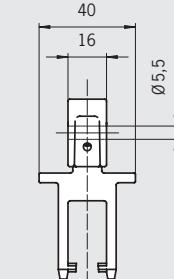
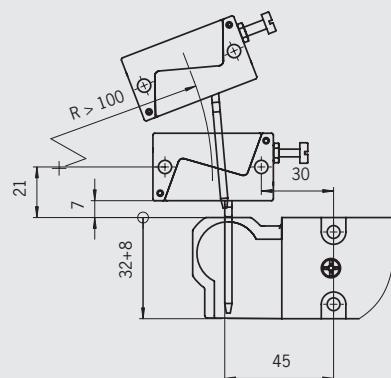
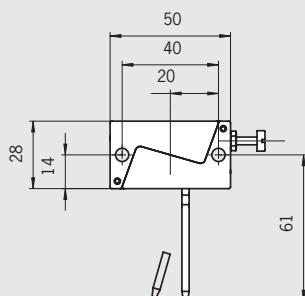
## Hinged actuator X-LR-N

Radius  $\geq 100$  mm, safety guard hinged on right/left



## Hinged actuator X-OU-N

Radius  $\geq 100$  mm, safety guard hinged at bottom/top



## Ordering table

Designation	Design	Min. door radius r [mm]	Packaging unit	Order no./item
Hinged actuator	<b>X-LR-N</b> Safety guard hinged on the right or left incl. 2 safety screws M5 x 10	$\geq 100$	1 ea.	<b>098082</b> HINGED ACTUATOR-X-LR-N
	<b>X-OU-N</b> Safety guard hinged at top or bottom incl. 2 safety screws M5 x 10	$\geq 100$	1 ea.	<b>097906</b> HINGED ACTUATOR-X-OU-N

## Actuators for safety switches SGA/STA

- ▶ Two stainless safety screws per actuator
- ▶ Actuators with rubber bushings

### Note

Type S actuators must not be used in conjunction with insertion funnels.

L actuators must be used for insertion funnels.

### Straight actuator

Suitable for a maximum tensile force of 3000 N  
The straight actuator is used on sliding doors or hinged doors with door radii greater than 300 mm. Safety screws prevent unscrewing of the actuator.

### Bent actuator

Suitable for a maximum tensile force of 1500 N

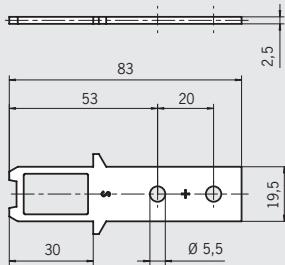
### Screws made of stainless steel

The safety screws included can be inserted with a normal tool, but cannot be removed again.

### Standard actuator S, straight

Without rubber bush, overtravel 5 mm

### Dimension drawings

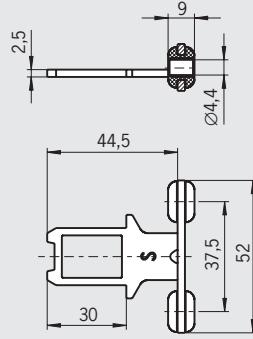
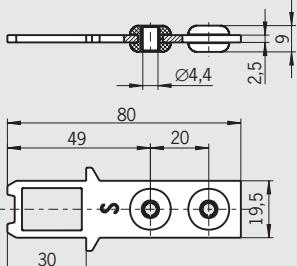


### Standard actuator S, straight

With rubber bush, overtravel 5 mm

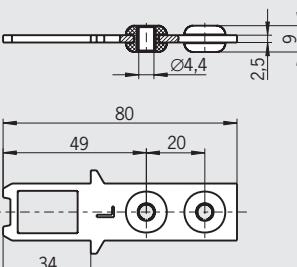
### Standard actuator S, bent

With rubber bush, overtravel 5 mm



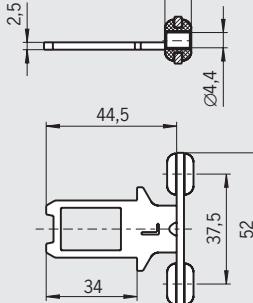
### Actuator L, straight, for insertion funnel

With rubber bush, overtravel 5 mm



### Actuator L, bent, for insertion funnel

With rubber bush, overtravel 5 mm



### Ordering table

Designation	Design	Min. door radius r [mm]	Packaging unit	Order no./item
Actuator S Straight	<b>S-G-SN-C2115</b> Without rubber bush, 5 mm overtravel incl. 2 safety screws M5 x 10	300	1 ea.	<b>097861</b> ACTUATOR SG-SN-C2115
	<b>S-GT-SN</b> With rubber bush, 5 mm overtravel incl. 2 safety screws M4 x 14	300	1 ea.	<b>095738</b> ACTUATOR S-GT-SN
Actuator S Angled	<b>S-WQ-SN</b> With rubber bush, 5 mm overtravel incl. 2 safety screws M4 x 14	300	1 ea.	<b>095740</b> ACTUATOR SWQ-SN
Actuator L Straight	<b>S-GT-LN</b> With rubber bush, 5 mm overtravel incl. 2 safety screws M4 x 14	300	1 ea.	<b>095739</b> ACTUATOR S-GT-LN
Actuator L Angled	<b>S-WQ-LN</b> With rubber bush, 5 mm overtravel incl. 2 safety screws M4 x 14	300	1 ea.	<b>095741</b> ACTUATOR SWQ-LN

## Hinged actuator for safety switches SGA/STA

- ▶ Actuators made of stainless steel
- ▶ Two stainless safety screws per actuator
- ▶ For top and bottom hinged doors
- ▶ For right and left hinged doors

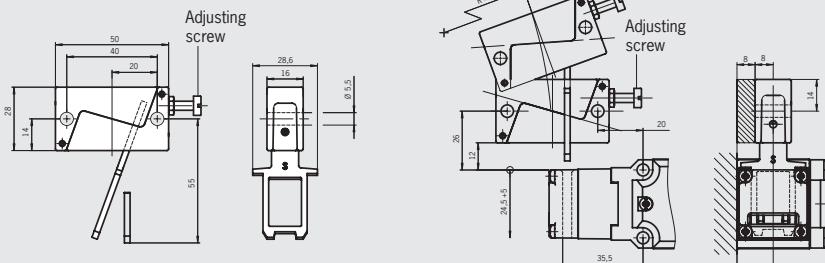
### Hinged actuator

For door radii less than 1000 mm a hinged actuator should be used. The spring action movement of the actuator prevents damage due to the actuator jamming in the actuating head. Depending on the movement of the safety guard, the actuator must be selected for left/right or top/bottom.

### Hinged actuator S-OU-SN

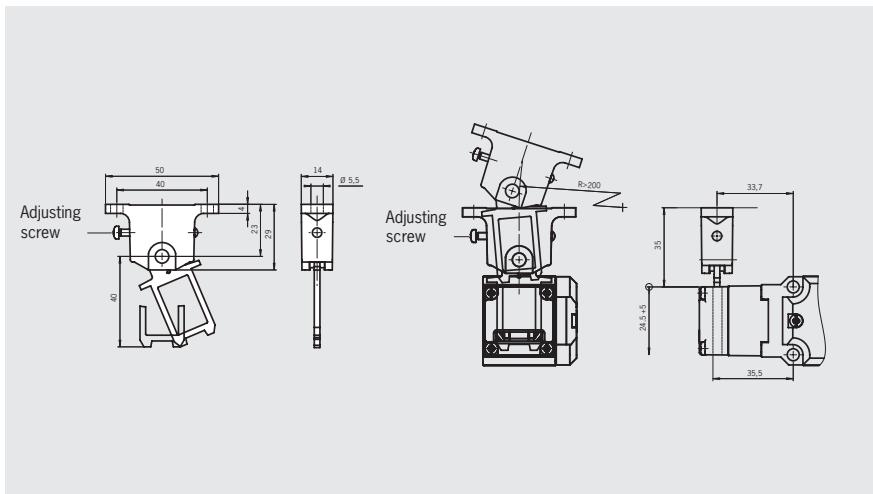
Radius  $\geq 200$  mm, safety guard hinged at top/bottom, overtravel 5 mm

### Dimension drawings



### Hinged actuator S-LR-SN

Radius  $\geq 200$  mm, safety guard hinged on left/right, overtravel 5 mm



### Ordering table

Designation	Design	Min. door radius r [mm]	Packaging unit	Order no./item
Hinged actuator	<b>S-OU-SN</b> For top and bottom hinged doors 5 mm overtravel incl. 2 safety screws M5 x 25	200	1 ea.	<b>095315</b> HINGED ACTUATOR-S-OU-SN
	<b>S-LR-SN</b> For left and right hinged doors 5 mm overtravel incl. 2 safety screws M5 x 10	200	1 ea.	<b>096838</b> HINGED ACTUATOR-S-LR-SN

## Hinged actuator for safety switches SGA/STA

- ▶ Actuators made of stainless steel
- ▶ Two stainless safety screws per actuator
- ▶ For top and bottom hinged doors
- ▶ For right and left hinged doors

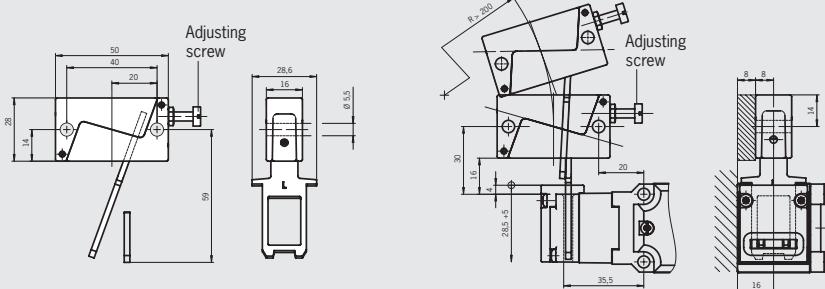
### Hinged actuator

For door radii less than 1000 mm a hinged actuator should be used. The spring action movement of the actuator prevents damage due to the actuator jamming in the actuating head. Depending on the movement of the safety guard, the actuator must be selected for left/right or top/bottom.

### Hinged actuator S-OU-LN for insertion funnel

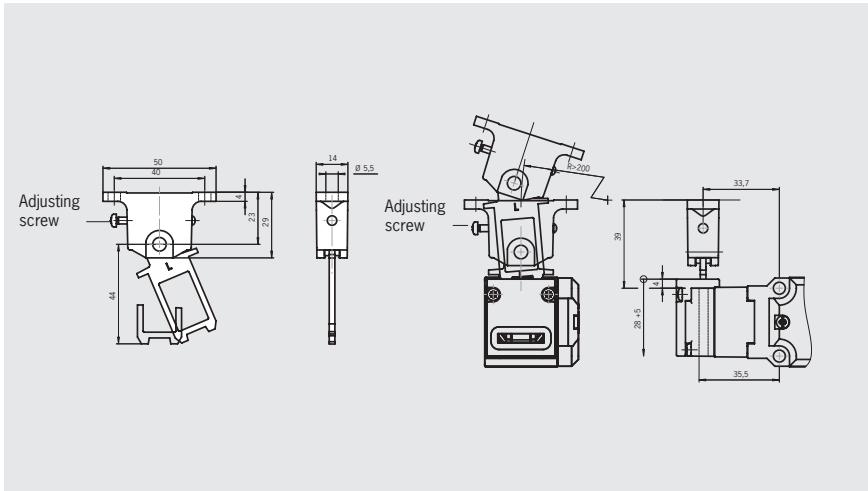
Radius  $\geq 200$  mm, safety guard hinged at top/bottom, overtravel 5 mm

### Dimension drawings



### Hinged actuator S-LR-LN for insertion funnel

Radius  $\geq 200$  mm, safety guard hinged on left/right, overtravel 5 mm



### Ordering table

Designation	Design	Min. door radius r [mm]	Packaging unit	Order no./item
Hinged actuator	<b>S-OU-LN</b> For top and bottom hinged doors 5 mm overtravel incl. 2 safety screws M5 x 25	200	1 ea.	<b>096697</b> HINGED ACTUATOR-S-OU-LN
	<b>S-LR-LN</b> For left and right hinged doors 5 mm overtravel incl. 2 safety screws M5 x 10	200	1 ea.	<b>096844</b> HINGED ACTUATOR-S-LR-LN

## Plug connectors SS4, C16-1, RC12 and solenoid plugs

For safety switches series NZ and TZ

- ▶ Plugs and sockets
- ▶ Blanking plug
- ▶ Solenoid plug

### Blanking plug

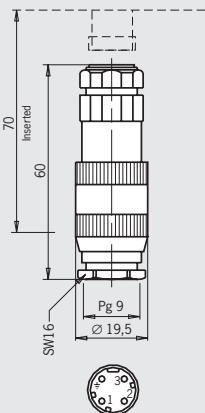
To cover the socket for the enabling switch on the safety switch TZ with socket RC12.

### Plug connector for solenoid locking NZ.VZ.VS

- ▶ Without rectifier
- ▶ For the connection of DC.
- ▶ With rectifier
- ▶ For the connection of AC 110 V - AC 230 V.

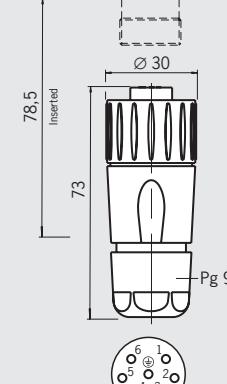
**Male plug SS4**  
3-pin + PE

Dimension drawings



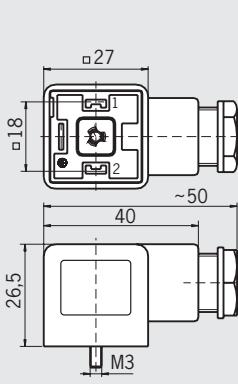
View of connection side, plug

**Female connector C16-1**  
6-pin + PE

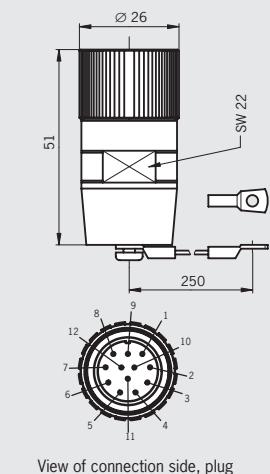


View of connection side, socket

**Solenoidconnector NZ.VZ.VS**  
2-pin + PE

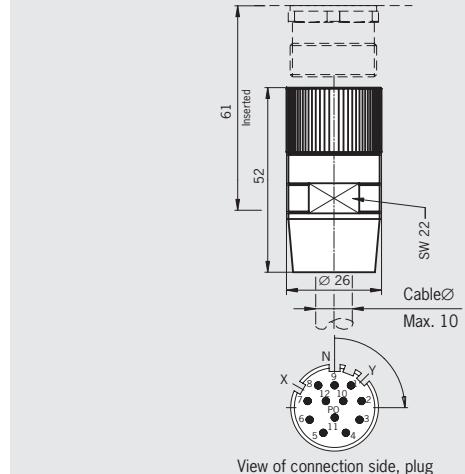


**Blanking plug RC12**  
12-pin



View of connection side, plug

**Male plug RC12**  
12-pin



View of connection side, plug

### Ordering table

Designation	Version	Order no./item
<b>SS4</b> 3-pin + PE	Plug for socket BD4	<b>002787</b> SS4
<b>C16-1<sup>1)</sup></b> 6-pin + PE	Female plug	<b>043861</b> Cable socket 6 + PE
<b>RC12<sup>1)</sup></b> 12-pin	Male plug	<b>073294</b> RC-12P1N8A8096
	Blanking plug without bridges	<b>073293</b> RC-12P1N8A8300
<b>Solenoid plug NZ.VZ..VS</b> 2-pin + PE	For DC without rectifier	<b>028345</b> Plug connector for solenoid locking
	For AC with rectifier max. AC 240 V	<b>028338</b> Plug connector with rectifier for solenoid locking

For information on crimp contacts see page 134.

1) Crimp contacts are included.

## Plug connectors SR6 and SR11

- ▶ Plugs and sockets
- ▶ Crimp contacts
- ▶ 90° angled optional
- ▶ Cable optional
- ▶ Coding shells

### Angled plug connector

On plug connectors without cables the direction of the cable exit can be adjusted.

### Male socket

For fitting in safety switches.

### Coding shells

Two coding shells and screws. If used only matching connectors can be mated.

### Cable (optional)

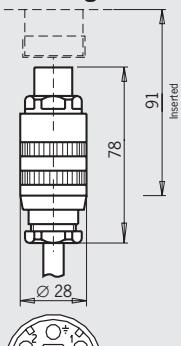
Cable sleeve PUR, color gray, conductor cross-section 1.0 mm<sup>2</sup>.

### Connector assignment for plug with cable

SR6		SR11	
Pin	Wire	Pin	Wire
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
⊕	7	7	7
	8	8	
	9	9	
	10	10	
	11	11	
⊕	12		

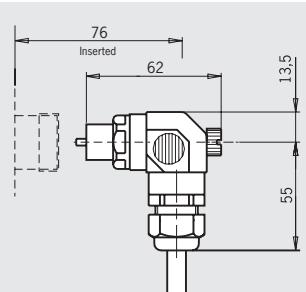
**Female plug SR6 EF**  
6-pin + PE

### Dimension drawings



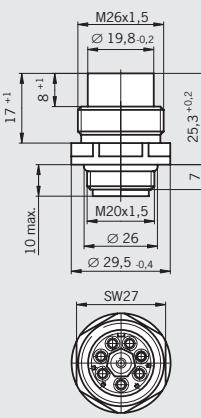
View of connection side, socket  
Contact carrier can be adjusted

**Female connector SR6 WF angled**  
6-pin + PE



View of connection side, socket  
Contact carrier can be adjusted

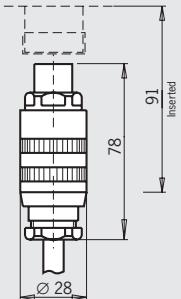
**Male socket SR6 AM**  
6-pin + PE



View of connection side, plug

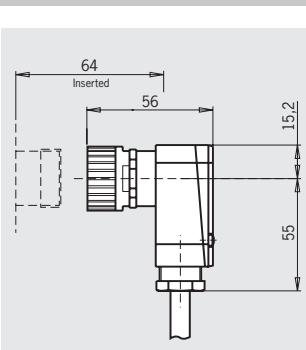
**Female plug SR11 EF**  
11-pin + PE

### Dimension drawings



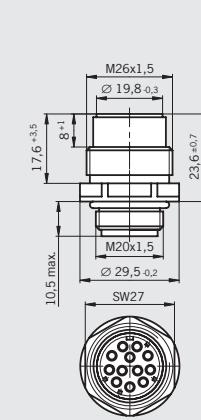
View of connection side, socket  
Contact carrier can be adjusted

**Female connector SR11 WF angled**  
11-pin + PE



View of connection side, socket  
Contact carrier can be adjusted

**Male socket SR11 AM**  
11-pin + PE



View of connection side, plug

### Ordering table

Designation	Version	Cable					
		Without	5 m	10 m	15 m	20 m	25 m
<b>SR6<sup>1)</sup></b> 6-pin + PE	<b>EF</b> Female plug	<b>013176</b> SR6EF	<b>077632</b> SR6EF-5000	<b>077633</b> SR6EF-10000	<b>077634</b> SR6EF-15000	<b>098128</b> SR6EF-20000	
	<b>WF</b> Female plug angled	<b>024999</b> SR6WF	<b>077638</b> SR6WF-5000	<b>077639</b> SR6WF-10000	<b>077640</b> SR6WF-15000	-	-
	<b>K</b> Coding shells	<b>013178</b> SR6K	-	-	-	-	-
	<b>AM</b> Male socket, connection M20x1.5	<b>087180</b> SR6AM2-M20	-	-	-	-	-
<b>SR11<sup>1)</sup></b> 11-pin + PE	<b>EF</b> Female plug	<b>070859</b> SR11EF	<b>077629</b> SR11EF-5000	<b>077630</b> SR11EF-10000	<b>077631</b> SR11EF-15000	<b>096632</b> SR11EF-20000	<b>094749</b> SR11EF-25000
	<b>WF</b> Female plug angled	<b>054773</b> SR11WF	<b>077635</b> SR11WF-5000	<b>077636</b> SR11WF-10000	<b>077637</b> SR11WF-15000	-	-
	<b>AM</b> Male socket, connection M20x1.5	<b>091296</b> SR11AM2-M20	-	-	-	-	-
<b>SR6 and SR11</b>	<b>Socket crimp contacts</b> Conductor cross-section 0.5 - 1.5 mm <sup>2</sup>	<b>071260</b> SRF	-	-	-	-	-
	<b>Pin crimp contacts</b> Conductor cross-section 0.5 - 1.5 mm <sup>2</sup>	<b>071261</b> SRM	-	-	-	-	-

For information on crimp contacts see page 134.

1) Crimp contacts are included.

## Plug connectors RC18 and RC18 with option C1825

- ▶ 90° angled optional
- ▶ Cable optional
- ▶ Halogen-free cable optional

### Crimp contacts

With 19 crimp pins for conductor cross-section 0.75 - 1.00 mm<sup>2</sup>.

### Option C1825

With 16 crimp pins for conductor cross-section 0.38 - 0.5 mm<sup>2</sup> and 3 pins for conductor cross-section 0.75 - 1.0 mm<sup>2</sup> for control of the guard locking solenoid. This plug is easier to connect.  
**Important:** Only for switch with option C1826.

### Angled plug connector (optional)

On plug connectors with cables the direction of the cable exit can be chosen on left/right. On plug connectors without cables the direction can be adjusted in 45° steps.

### Cable (optional)

Cable sleeve PUR, color black, wire cross-section 0.5 mm<sup>2</sup> or 1.0 mm<sup>2</sup>.

### Halogen-free cable (optional)

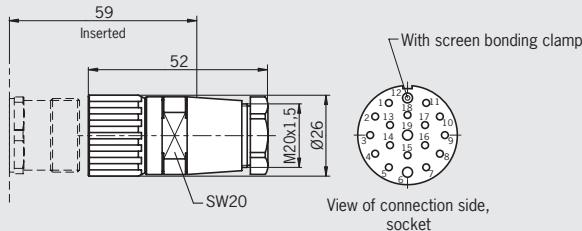
Cable sleeve PUR, color black, halogen-free, silicone-free. Reduction of toxic gases and smoke in case of fire.

Conductor cross-section 0.5 mm<sup>2</sup> or 1.0 mm<sup>2</sup>.

### Female plug RC18 / RC18..C1825

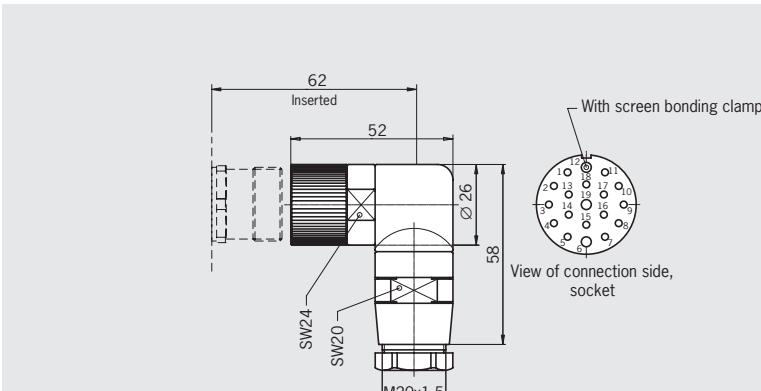
18-pin + PE (for cable diameter 10 ... 14 mm)

#### Dimension drawings



### Female plug RC18 / RC18..C1825

**Angled** 18-pin + PE (for cable diameter 10 ... 14 mm)



### Ordering table

Designation	Version	Without cable
RC18 <sup>2)</sup> 18-pin + PE	<b>EF</b> Female plug <sup>1)</sup>	<b>074616</b> RC18EF
	<b>WF</b> Female plug angled <sup>1)</sup>	<b>074617</b> RC18WF
	<b>Replacement pin crimp contacts</b> Conductor cross-section 19 x 0.75 - 1 mm <sup>2</sup>	<b>094309</b> Pin crimp contact RCM
	<b>EF-C1825</b> Female plug <sup>1)</sup>	<b>077025</b> RC18EF-C1825
	<b>WF-C1825</b> Female plug angled <sup>1)</sup>	<b>077026</b> RC18WF-C1825
	<b>Replacement pin crimp contacts</b> Conductor cross-section 16 x 0.38 - 0.5 mm <sup>2</sup> 3 x 0.75 - 1 mm <sup>2</sup>	<b>094310</b> Pin crimp contact RCM-C1825

For information on crimp contacts see page 134.

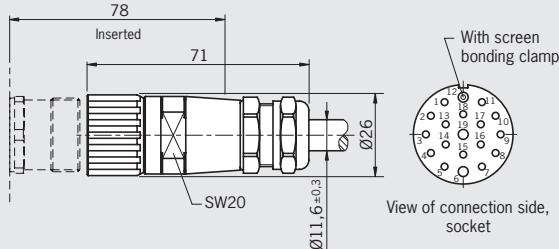
1) Suitable for safety switches TZ without option C1825.

2) Crimp contacts are included.

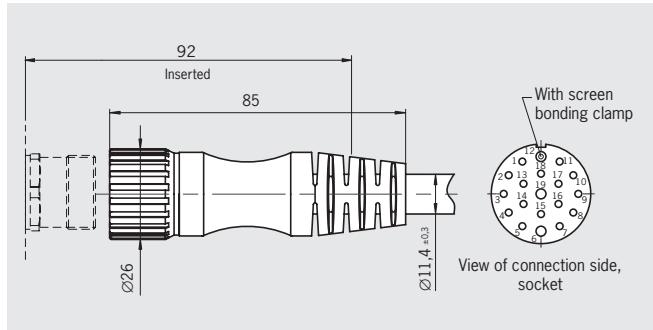
Please turn over

## Female plug RC18 / RC18..C1825 with cable 18-pin + PE / 19-pin PUR

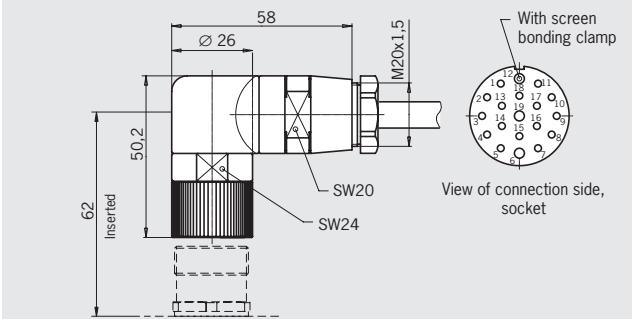
### Dimension drawings



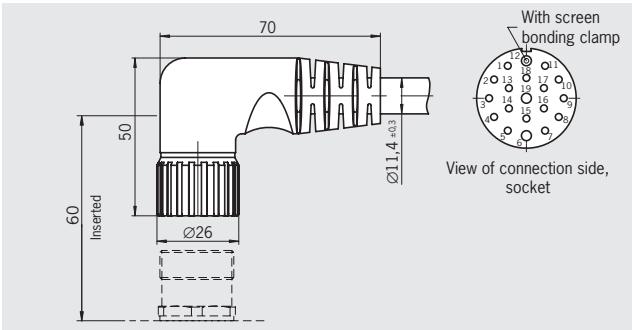
## Female plug RC18 / RC18..C1825 with cable halogen-free 18-pin + PE



## Female plug RC18 / RC18..C1825 angled with cable 18-pin + PE



## Female plug RC18 / RC18..C1825 angled with cable halogen-free 18-pin + PE



## Connector assignment plug RC18 with cable and option C1825

Pin	Wire color	Cond. cross-section [mm]
1	VT	0.5
2	RD	0.5
3	GY	0.5
4	RD/BU	0.5
5	GN	0.5
6	BU	1.0
7	GY/PK	0.5
8	GN/WH	0.5
9	YE/WH	0.5

10	GY/WH	0.5
11	BK	0.5
12	GN/YE	1.0
13	PK	0.5
14	BN/GY	0.5
15	BN/YE	0.5
16	BN/GN	0.5
17	WH	0.5
18	YE	0.5
19	BN	1.0

## Ordering table

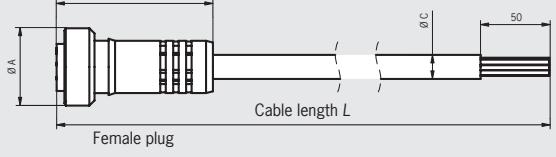
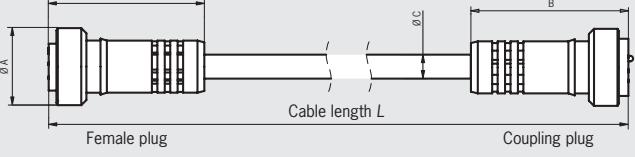
De-scr.	Version	Cable										
		1.5 m	3 m	6 m	8 m	10 m	15 m	20 m	25 m	30 m	40 m	
RC18 18-pin + PE with cable	<b>EF-C1825</b> Female plug	<b>092761</b> RC18F1.5M- C1825	<b>092816</b> RC18F3M- C1825	<b>077014</b> RC18F6M- C1825	<b>077015</b> RC18F8M- C1825	<b>092898</b> RC18F10M- C1825	<b>077016</b> RC18F15M- C1825	<b>092726</b> RC18F20M- C1825	<b>092727</b> RC18F25M- C1825	<b>095993</b> RC18F30M- C1825	<b>102490</b> RC18F40M- C1825	
	<b>WFL-C1825</b> Female connector cable exit left	<b>092906</b> RC18WF1.5ML- C1825	<b>092908</b> RC18WF3ML- C1825	<b>077018</b> RC18WF6ML- C1825	<b>077019</b> RC18WF8ML- C1825	<b>092901</b> RC18WF10ML- C1825	<b>077020</b> RC18WF15ML- C1825	<b>092910</b> RC18WF20ML- C1825	<b>092912</b> RC18WF25ML- C1825	-	-	
	<b>WFR-C1825</b> Female connector cable exit right	<b>092907</b> RC18WF1.5MR- C1825	<b>092909</b> RC18WF3MR- C1825	<b>085194</b> RC18WF6MR- C1825	<b>085195</b> RC18WF8MR- C1825	<b>092902</b> RC18WF10MR- C1825	<b>085196</b> RC18WF15MR- C1825	<b>092911</b> RC18WF20MR- C1825	<b>092913</b> RC18WF25MR- C1825	-	-	
RC18 18-pin + PE with cable halo- gen-free	<b>EFF-C1825</b> Female plug	<b>092883</b> RC18F1.5MF- C1825	<b>092884</b> RC18F3MF- C1825	<b>092885</b> RC18F6MF- C1825	<b>092886</b> RC18F8MF- C1825	<b>092887</b> RC18F10MF- C1825	<b>092888</b> RC18F15MF- C1825	<b>092889</b> RC18F20MF- C1825	<b>092890</b> RC18F25MF- C1825	-	-	
	<b>WFLF-C1825</b> Female connector cable exit left	<b>092891</b> RC18WF1.5MLF- C1825	<b>092893</b> RC18WF3MLF- C1825	<b>092697</b> RC18WF6MLF- C1825	<b>092895</b> RC18WF8MLF- C1825	<b>092699</b> RC18WF10MLF- C1825	<b>092701</b> RC18WF15MLF- C1825	<b>092704</b> RC18WF20MLF- C1825	<b>092724</b> RC18WF25MLF- C1825	-	-	
	<b>WFRF-C1825</b> Female connector cable exit right	<b>092892</b> RC18WF1.5MRF- C1825	<b>092894</b> RC18WF3MRF- C1825	<b>092698</b> RC18WF6MRF- C1825	<b>092896</b> RC18WF8MRF- C1825	<b>092700</b> RC18WF10MRF- C1825	<b>092702</b> RC18WF15MRF- C1825	<b>092708</b> RC18WF20MRF- C1825	<b>092725</b> RC18WF25MRF- C1825	-	-	

Ordering table female connector RC18 with cable PUR, 19-pin, separately numbered cores, black (Numbering as per the pin number)

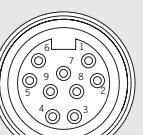
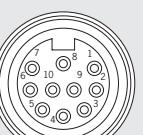
Descr.	Cable *						
	1.5 m	3 m	6 m	10 m	15 m	20 m	25 m
<b>RC18</b> Female plug 19-pin with cable PUR	<b>110301</b> CM23F19-PU01,5-MA-110301	<b>110302</b> CM23F19-PU03,0-MA-110302	<b>110303</b> CM23F19-PU06,0-MA-110303	<b>110304</b> CM23F19-PU10,0-MA-110304	<b>110305</b> CM23F19-PU15,0-MA-110305	<b>110306</b> CM23F19-PU20,0-MA-110306	<b>110307</b> CM23F19-PU25,0-MA-110307

\* Conductor cross-section as connection cable on left.

## Plug connectors MR8/MR9/MR10/MR12 with cable

Female connector with cable 8-, 9-, 10-, 12-pin	Extension cable 8-, 9-, 10-, 12-pin																																								
<b>Dimension drawings</b>  <table border="1"> <thead> <tr> <th>Dim.</th> <th>8-pin</th> <th>9-pin</th> <th>10-pin</th> <th>12-pin</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Ø 29</td> <td>Ø 32</td> <td>Ø 32</td> <td>Ø 32</td> </tr> <tr> <td>B</td> <td>59</td> <td>64</td> <td>64</td> <td>64</td> </tr> <tr> <td>C</td> <td>Ø 8.9</td> <td>Ø 9.7</td> <td>Ø 9.8</td> <td>Ø 10.4</td> </tr> </tbody> </table>	Dim.	8-pin	9-pin	10-pin	12-pin	A	Ø 29	Ø 32	Ø 32	Ø 32	B	59	64	64	64	C	Ø 8.9	Ø 9.7	Ø 9.8	Ø 10.4	<b>Dimension drawings</b>  <table border="1"> <thead> <tr> <th>Dim.</th> <th>8-pin</th> <th>9-pin</th> <th>10-pin</th> <th>12-pin</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Ø 29</td> <td>Ø 32</td> <td>Ø 32</td> <td>Ø 32</td> </tr> <tr> <td>B</td> <td>59</td> <td>64</td> <td>64</td> <td>64</td> </tr> <tr> <td>C</td> <td>Ø 8.9</td> <td>Ø 9.7</td> <td>Ø 9.8</td> <td>Ø 10.4</td> </tr> </tbody> </table>	Dim.	8-pin	9-pin	10-pin	12-pin	A	Ø 29	Ø 32	Ø 32	Ø 32	B	59	64	64	64	C	Ø 8.9	Ø 9.7	Ø 9.8	Ø 10.4
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**Connector assignment** (Conductor cross-section 0.82 mm<sup>2</sup> / 18 AWG)

8-pin	Pin	Wire color	9-pin	Pin	Wire color	10-pin	Pin	Wire color	12-pin	Pin	Wire color
	1	OG		1	OG		1	OG		1	OG
View of connection side, socket	2	BU	View of connection side, socket	2	BU	View of connection side, socket	2	BU	View of connection side, socket	2	BU
	3	WH/BK		3	RD/BK		3	WH/BK		3	WH/BK
	4	BK		4	GN/BK		4	RD/BK		4	RD/BK
	5	WH		5	WH		5	GN/BK		5	GN/BK
	6	RD		6	RD		6	OG/BK		6	OG/BK
	7	GN/YE		7	GN/YE		7	RD		7	BU/BK
	8	RD/BK		8	WH/BK		8	GN/YE		8	BK/WH
				9	BK		9	BK		9	GN/YE
							10	WH		10	RD
										11	WH
										12	BK

## Ordering table

Version	Connection	Material	Cable length L [mm]								
			910	1800	3600	6000	9100	12100	15200	18200	24300
Female connector with cable	MR8	PVC	-	100938	100939	100940	100941	100942	103152	103153	-
		PUR	-	102506	100945	100946	102507	102508	102509	103149	103150
	MR9	PVC	100947	102502	100948	102503	102504	103154	-	103156	-
		PUR	-	102510	102511	102512	102513	102514	102515	103151	-
	MR10	PVC	-	100949	100950	100951	100952	102505	100953	103157	-
		PUR	-	102516	102517	102518	100956	102519	102520	102521	-
	MR12	PVC	-	100959	100960	100961	100962	103158	103159	103160	-
		PUR	-	100966	100967	102522	102523	102524	102525	102526	-
Extension cable	MR8	PVC	-	-	100943	-	100944	-	-	-	-
		PUR	-	-	-	-	-	-	-	-	-
	MR10	PVC	-	-	100954	-	100955	-	-	-	-
		PUR	-	-	-	100957	-	-	100958	-	-
	MR12	PVC	-	-	100963	100964	100965	-	-	-	-
		PUR	-	102527	100968	-	-	-	-	-	-

## Plug connectors SGLF and SWLF with cable

For safety switches series NZ and N1A

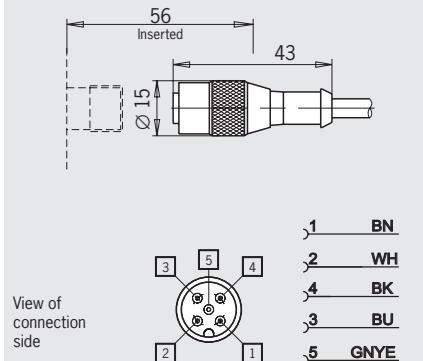
- **Plug connector M12 with cable**
- **90° angled optional**

### Cable

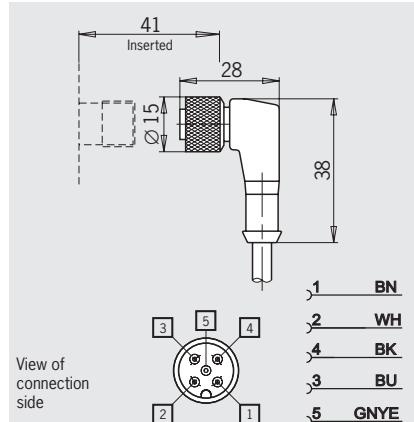
Cable sleeve PUR, color black, halogen-free, flame retardant. Reduction of toxic gases and smoke in case of fire. Conductor cross-section 0.34 mm<sup>2</sup>.

**Plug connector SGLF with cable**  
M12 plug, 5-pin

### Dimension drawings



**Plug connector SWLF with cable**  
Angled, M12 plug, 5-pin



## Ordering table

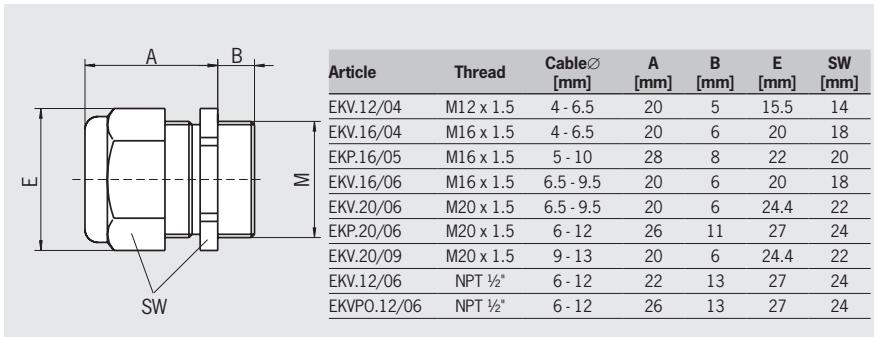
Type	Number of pins	Version	Cable length 5 m
SGLF	5	Female connector M12 for male plug SVM5	<b>073461</b> SGLF5-5000P
SWLF	5	Female connector M12 Angled for male plug SVM5	<b>073462</b> SWLF5-5000P

## Cable glands

- **M12 x 1.5**
- **M16 x 1.5**
- **M20 x 1.5**

### Cable glands

Suitable for various cable diameters. Versions available in plastic and metal.



## Ordering table

Thread	Version	Material	
		Metal	Plastic
M12 x 1.5	Cable diameter 4 - 6.5 mm	<b>086327</b> EKVM12/04	-
M16 x 1.5	Cable diameter 4 - 6.5 mm	<b>086328</b> EKVM16/04	-
	Cable diameter 5 - 10 mm	-	<b>084572</b> EKPM16/05
M20 x 1.5	Cable diameter 6.5 - 9.5 mm	<b>086330</b> EKVM16/06	-
	Cable diameter 6 - 12 mm	-	<b>077679</b> EKPM20/06
	Cable diameter 6.5 - 9.5 mm	<b>077683</b> EKVM20/06	-
NPT ½"	Cable diameter 9 - 13 mm	<b>077684</b> EKVM20/09	-
	Cable diameter 6 - 12 mm	<b>077691</b> EKVN12/06	<b>077692</b> EKPN12/06

## Mounting plates EMP for safety switches NZ.VZ

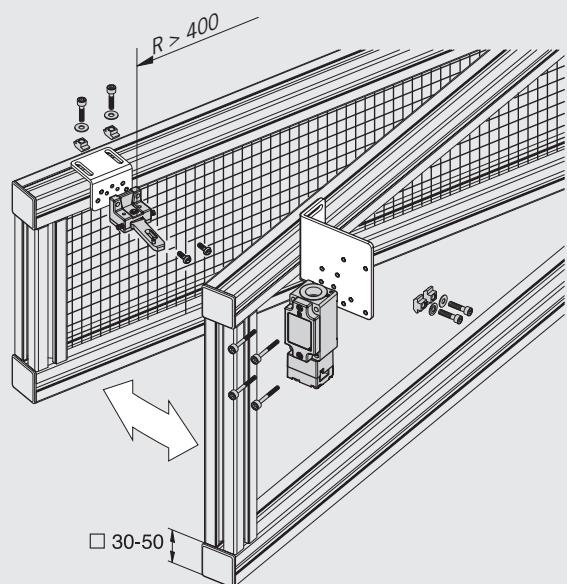
- ▶ For vertical and horizontal mounting of safety switch NZ.VZ

The mounting plates are used for fastening safety switches NZ and actuators to safety guards. The safety switches can be attached vertically and horizontally.

### Note

- ▶ Mounting plate material: galvanized St37.

**Mounting example, safety switch vertical**



**Ordering table**

Switch	Installation method switch	Mounting plate switch	Mounting plate actuator	Actuator	Minimum distance hinged actuator to switch
NZ...	A Vertical	085753 EMP-SC	093457 EMP-B1	024298 024299 	> 400 mm
	B Horizontal		100406 100407 	> 200 mm	
		093458 EMP-B2 	048850 057950 	Page 113	> 165 mm
				Page 113	

## Mounting plates EMP for safety switches STA

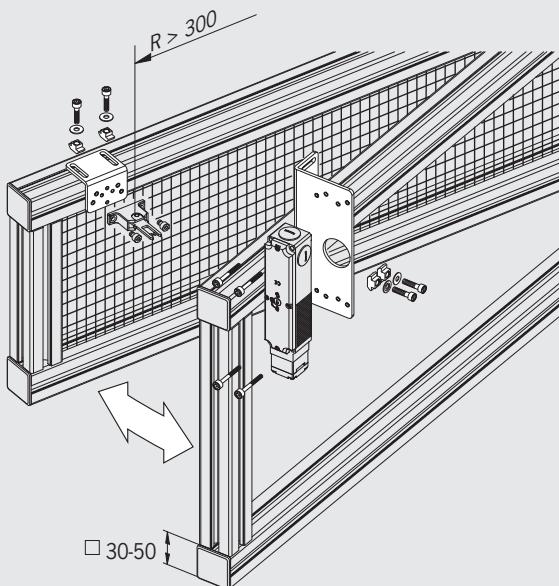
- ▶ For vertical and horizontal mounting of safety switch STA

The mounting plates are used for fastening safety switches STA and actuators to safety guards. The safety switches can be attached vertically and horizontally.

### Note

- ▶ Mounting plate material: galvanized St37.

### Mounting example, safety switch vertical



**Ordering table**

Switch	Installation method switch	Mounting plate switch	Mounting plate actuator	Actuator	Minimum distance hinged actuator to switch
STA...	A Vertical	093456 EMP-SB	093457 EMP-B1	095315 096697	> 200 mm
	B Horizontal			 Page 117/118	

## Mounting plates EMP for safety switches TX

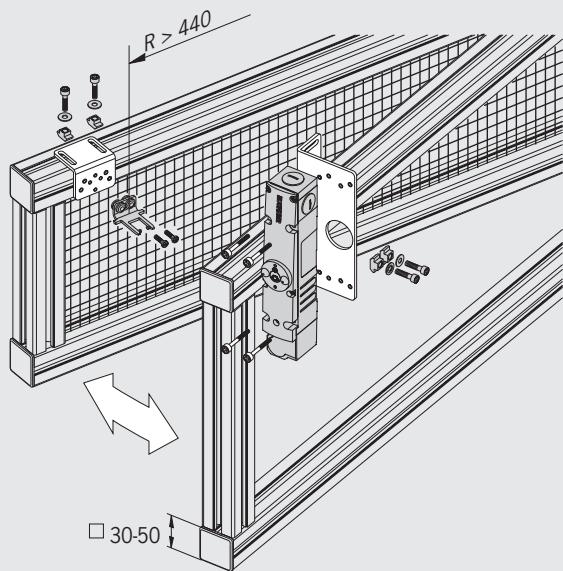
### ► For vertical mounting of safety switch TX

The mounting plates are used for fastening safety switches TX and actuators to safety guards. The safety switches can be attached vertically.

#### Note

- Mounting plate material: galvanized St37.
- The mounting plate EMP-SB is also suitable for the safety switches TX...C1991 with escape release from the rear.

### Mounting example, safety switch vertical



### Ordering table

Switch	Installation method switch	Mounting plate switch	Mounting plate actuator	Actuator	Minimum distance hinged actuator to switch
TX...	C Vertical	093456 EMP-SB	093457 EMP-B1	079740 079742  Page 114  098082	> 400 mm
					> 100 mm
			093458 EMP-B2	097906  Page 115	> 100 mm

## Mounting plates EMP for safety switches TZ

- ▶ For vertical and horizontal mounting of safety switch TZ

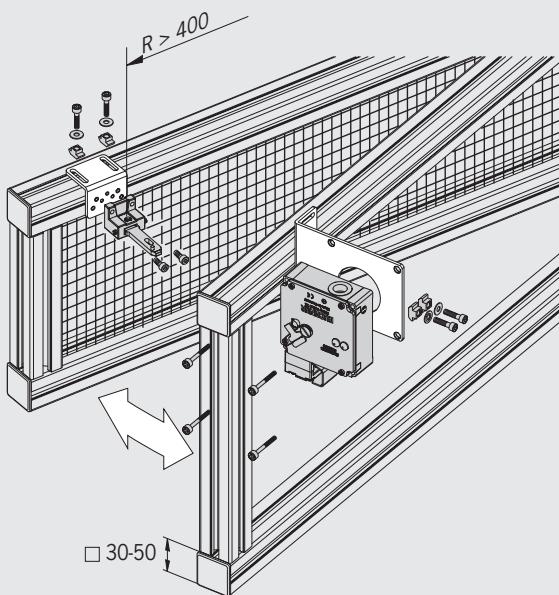
The mounting plates are used for fastening safety switches TZ and actuators to safety guards. The safety switches can be attached horizontally or vertically.

The mounting plate EMP-SA is also suitable for safety switches with escape release from the rear.

### Note

- ▶ Mounting plate material: galvanized St37.
- ▶ The mounting plate EMP-SA is also suitable for the safety switches TZ...C1684, TZ...C1815 and TZ...C1828 with escape release from the rear.

### Mounting example, safety switch vertical



### Ordering table

Switch	Installation method switch	Mounting plate switch	Mounting plate actuator	Actuator	Minimum distance hinged actuator to switch
TZ...	A Vertical	094401 EMP-SA	093457 EMP-B1	 024298 024299  Page 113	> 400 mm
	B Horizontal	 114.5	 6.5 10 50	 048850 057950  Page 113	> 200 mm
					> 165 mm

## Miscellaneous accessories

- ▶ Lockout bar
- ▶ Insertion funnel

### Lockout bar

With the safety door open, can be slid into the actuator head on a switch with separate actuator instead of an actuator. Removal can be prevented using a commercially available padlock. For the protection of people in areas with a possible hazard.

**Cannot be used in combination with the protective plate.**

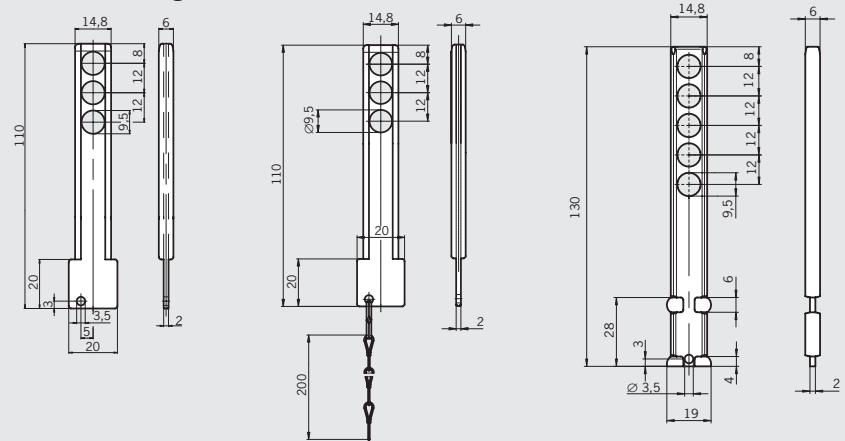
### Insertion funnel

If an insertion funnel is used, even inexactly positioned actuators are inserted reliably in the actuating head due to the large opening funnel, thus protecting the safety switch against mechanical influences.

### Lockout bars

For safety switches series NZ.VZ and TZ

### Dimension drawings

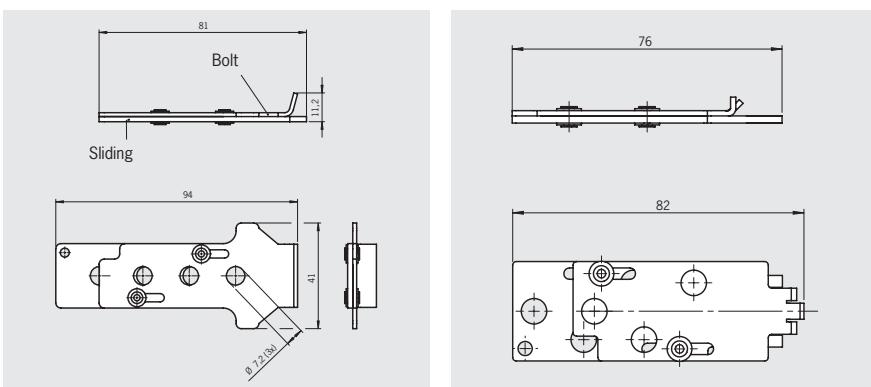


### Lockout bar

For safety switches NX and TX

### Lockout bar

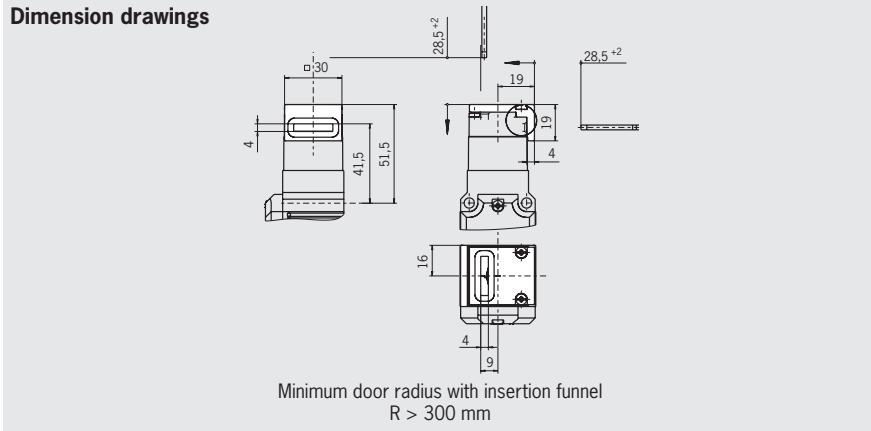
For safety switch STA



### Insertion funnel

For safety switches STA/STP

### Dimension drawings



## Ordering table

Designation	Version	Use	Order no./item
Lockout bar	3 holes	For safety switches series NZ.VZ and TZ without protective plate	<b>046730</b> Lockout bar Z
	3 holes with chain	For safety switches series NZ.VZ and TZ without protective plate	<b>091305</b> Lockout bar with chain
	3 holes	For safety switch STA	<b>105701</b> Lockout bar STP
	5 holes	For safety switches series NZ.VZ and TZ without protective plate	<b>086538</b> Lockout bar Z
	3 holes	For safety switches NX and TX	<b>096098</b> Lockout bar TX
Insertion funnel	Incl. 2 fastening screws	For safety switches STA/STP	<b>093157</b> Insertion funnel STA

## Miscellaneous accessories

- ▶ Protective plate
- ▶ Replacement head for NZ.VZ
- ▶ Lead seal kit
- ▶ LED function display
- ▶ Safety screws

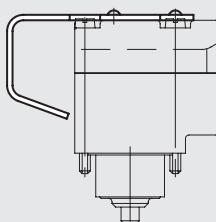
### Protective plate

Optimal protection against tampering on safety switches with separate actuator (NZ.VZ and TZ). The protective plate prevents modification of the switch via the actuator outlet opening.

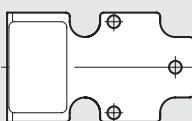
### Replacement head for NZ.VZ

Replacement head for a safety switch with separate actuator (NZ.VZ). With 4 safety screws and replacement screws. As the switches are safety components, in case of defects we recommend replacing the entire safety switch. **Not suitable for the safety switches TZ!**

### Protective plate



### Dimension drawings



### Lead seal kit TZ

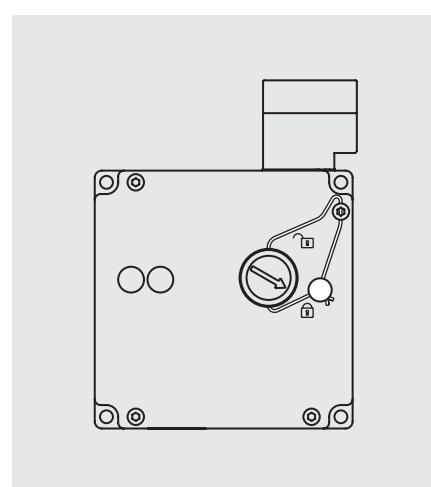
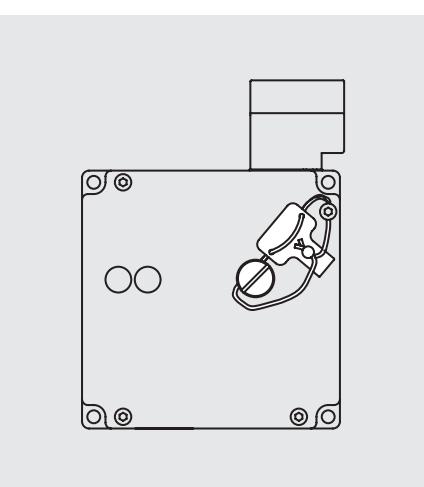
For sealing the mechanical release on the safety switch TZ. The locking screw is included.

### Lead seal kit TZ-C1937

For sealing the emergency unlocking on the safety switch TZ.

### Lead seal kit TZ

### Lead seal kit TZ-C1937



## Ordering table

Designation	Version	Use	Order no./item
Protective plate		For safety switch with separate actuator (NZ.VZ and TZ)	<b>059136</b> Protective plate NZ/TZ
Replacement head NZ.VZ		Not suitable for safety switch TZ!	<b>076250</b> Actuating head NZVZ
Lead seal kit	Comprising lead seal, wire, locking screw and key	For safety switch TZ	<b>048257</b> Lead seal kit TZ
	Comprising lead seal and wire	For safety switch TZ with rotary emergency unlocking	<b>087256</b> Lead seal kit TZ-C1937
Safety screws packaging unit: 100 ea.	<b>M4 x 14</b>	For actuator 079739, 079740, 079741 and 079742	<b>074063</b> M4X14/V100
	<b>M5 x 10</b>	For actuator 016849, 072251, 100406 and 100407	<b>073455</b> M5X10/V100
	<b>M5 x 16</b>	For hinged actuator 024299 and 024298	<b>073456</b> M5X16/V100
	<b>M5 x 25</b>	For hinged actuator 048850 and 057950	<b>073457</b> M5X25/V100
	<b>M3 x 40</b>	For actuator head NZ and TZ	<b>075530</b> M3X40/V100
	<b>M3 x 70</b>	For actuator head NZ.VZ..VSE and NZ.VZ..VSM	<b>075531</b> M3X70/V100

## Miscellaneous accessories

### ► LED function display

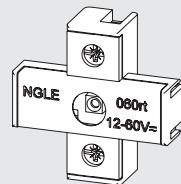
#### LED function display

Upgrade kits with LEDs are available for the safety switches N1A and NZ. The intensity of the light from the indicators is always the same, independent of the voltage applied.

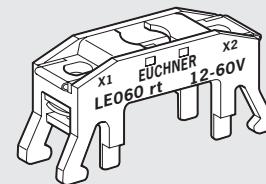
**Note:** The LED function display can only be used in conjunction with double switching elements.

#### LED function display

#### Dimension drawings



NGLE...



LE...

## Ordering table

Designation	Version	Voltage					
		12-60 V red LED	12-60 V yellow	12-60 V green	110 V red LED	230 V red LED	230 V yellow LED
LED function display NGLE	For safety switch NZ	029220 NGLE060RT	029222 NGLE060GE	029221 NGLE060GR	045822 NGLE110RT	045825 NGLE220RT	045827 NGLE220GE
LED function display LE	For safety switch N1A	035495 LE060RT	035497 LE060GE	035496 LE060GR	045579 LE110RT	045582 LE220RT	045584 LE220GE

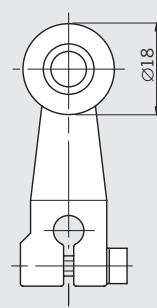
### ► Replacement roller arm

#### Replacement roller arm

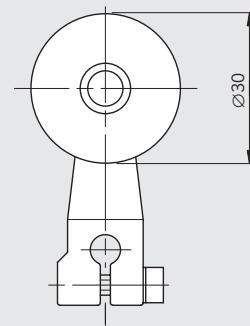
Replacement roller lever for safety switches with safety function with lever arm. As the switches are safety components, in case of defects we recommend replacing the entire switch. Complete switch heads are not available.

#### Replacement roller arm

#### Dimension drawings



NHS (steel roller)  
NHB (plastic roller)



NHBC569

## Ordering table

Designation	Version	Order no./item
Replacement roller arm	Replacement plunger For NZ.HS	012043 Roller arm NHS
	Replacement plunger For NZ.HB	012042 Roller arm NHB
	Replacement plunger For NZ.HB...C569	012044 Roller arm NHBC569

## Miscellaneous accessories

- ▶ Emergency unlocking for safety switches STA and TX
- ▶ Release for safety switches TX
- ▶ Lock for emergency unlocking with manual return for safety switches TX
- ▶ Triangular key for safety switches TZ

### Emergency unlocking

Is used for the manual release of the guard locking without tools. The emergency unlocking mechanism must be returned to the locked state manually. A sealing wire can be fitted to protect against tampering.

**Attention:** Prior to mounting, the locking screw for the mechanical release must be removed.

### Release

Is used for the manual release of the guard locking. The integrated spring automatically resets the emergency unlocking to the locked state. A sealing wire can be fitted to protect against tampering.

**Attention:** Prior to mounting, the locking screw for the mechanical release must be removed.

### Lock

The lock is used in combination with safety switch TX. The mechanical key release enables authorized personnel to actuate the mechanical release using the related key in certain situations. The unlocking mechanism holds the solenoid in the "unlocked" position.

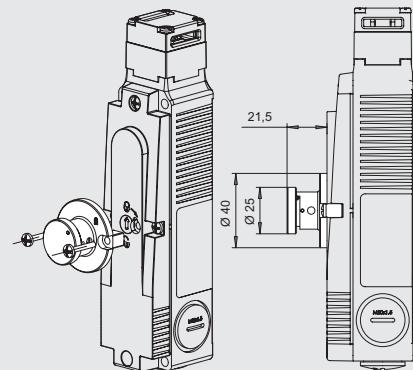
Two screws are used to fix the lock to the cover of the safety switch TX (above the mechanical release).

**Attention:** Prior to mounting, the locking screw for the mechanical release must be removed.

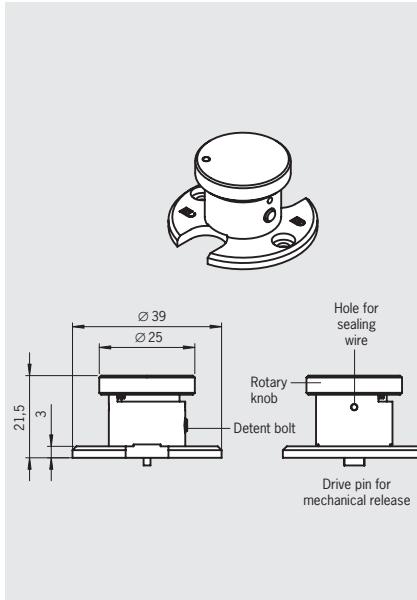
- ▶ Please order safety switch TX separately
- ▶ 2 keys are supplied
- ▶ Every safety switch of series TX can be upgraded to include a lock

### Emergency unlocking For safety switch STA

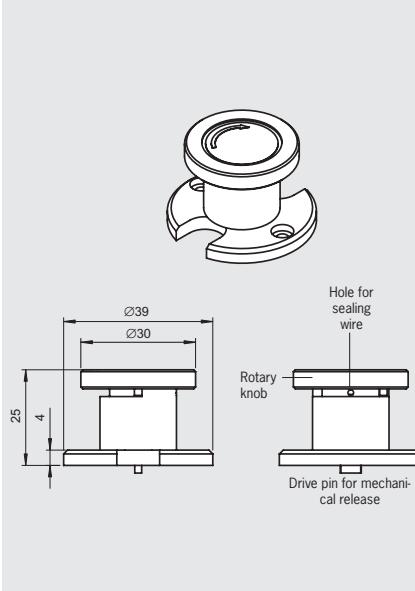
#### Dimension drawings



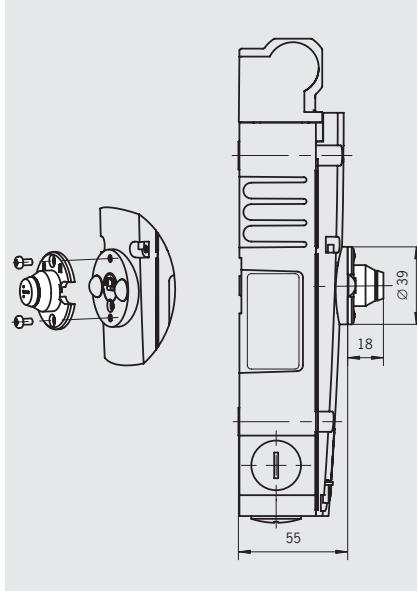
### Emergency unlocking For safety switches TX



### Release For safety switches TX



### Lock For safety switches TX



## Ordering table

Designation	Version	Use	Order no./item
Emergency unlocking	Incl. 2 screws 3,5 x 19	For safety switch STA	<b>099876</b> Emergency unlocking STA
	Incl. 2 screws M3 x 6	For safety switches TX	<b>094771</b> Emergency unlocking TX
Release	Incl. 2 screws M3 x 6	For safety switches TX	<b>094773</b> Release with automatic reset TX
Lead seal kit		For emergency unlocking TX and release TX	<b>087256</b> Lead seal kit
Lock	Unique (unique key needed to open)	For safety switches TX	<b>079796</b> Lock TX
	Identical locking (identical locks)	For safety switches TX	<b>079795</b> Lock TX
	Replacement key (2 x) for identical locking	For safety switches TX	<b>077206</b> Replacement key TX
Triangular key	DIN 22417 M5 100 mm	For safety switches TZ	<b>103057</b> Triangular key

## Miscellaneous accessories

### ► Handle for escape release

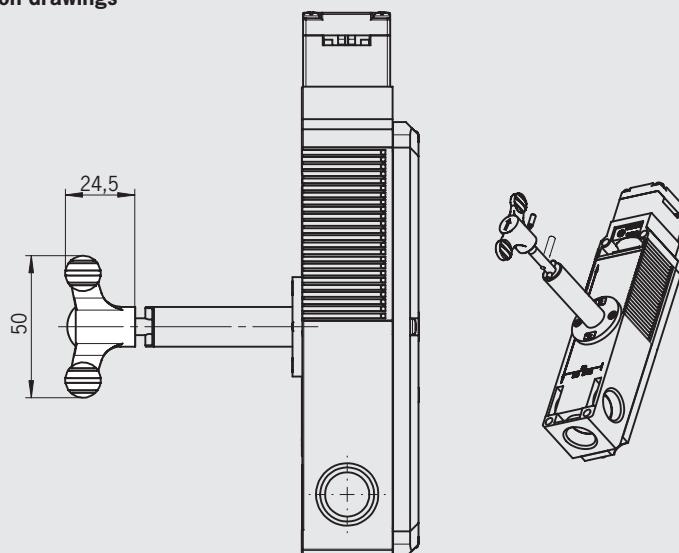
#### Handle for escape release

Can be mounted on all escape release actuator shafts C1993 for safety switches STA for easier use.

#### Handle for escape release

For safety switch STA

#### Dimension drawings



#### Ordering table

Designation	Use	Order no./item
Handle for escape release	For safety switch STA	<b>105329</b> Escape release handle

## List of plug connector suppliers

We provide no guarantee for the completeness and correctness of the ordering data given. The data was valid in October 2004. The related manufacturers reserve the right to make changes without notice. The plug connectors and accessories listed are also available from other manufacturers.

### ► Plug connectors and accessories

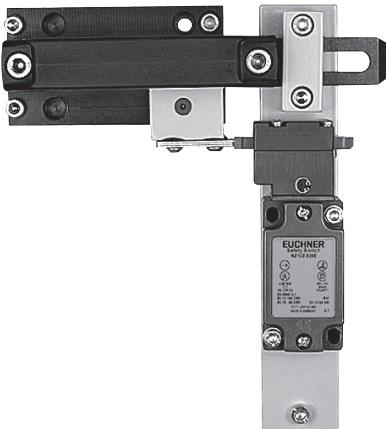
For plug connector	Function	Manufacturer's designation	
SVM5 5 pins	Female connector M12	99-0436-57-05 Cable socket	Binder <a href="http://www.binder-connectors.de">www.binder-connectors.de</a>
	Flange socket M12	09-3442-700-05 Flange connector with flexible wires	
	Blanking plug M12	08-2425-000-000 Protective cap for socket with retaining strap	
CE5 3-pin + N + PE	Mating connector (socket)	<b>CEE plug as per CEE standard</b>	
C16-1 6 pins + PE	Female flange connector	T3107 500 Female receptacle	Amphenol-Tucher <a href="http://www.amphenoltucher.com">www.amphenoltucher.com</a>
	Socket crimp contacts for C16-1, VPE 100 pcs.	VN02 016 0002 (1) Single contact, silver, 0.5-1.5 mm <sup>2</sup>	
	Blanking plug	T6483 000 Protective cap for female receptacle	
HAN10 10 pins + PE	Flange socket 1 cable exit	19 20 010 0251 Socket housing 1 cable exit	Harting <a href="http://www.harting.com">www.harting.com</a>
	Socket contacts (installation for flange socket)	09 20 010 3101 Socket contact insert crimp connection	
	Socket contacts for crimping	09 33 000 6220 Crimp contacts, socket, 0.5 mm <sup>2</sup>	
	Blanking plug	09 20 010 5425 Cover	
RC17-Y coded 17 pins	Female flange connector, solder for male plug RC17Y)	RC-17S1Y122000 Flange plug connector 17-pin	Coninvers <a href="http://www.coninvers.com">www.coninvers.com</a>
	Blanking plug	RC-17P1N8A83NN Protective cap for socket with retaining strap	

### ► Crimp and extraction tools

For plug connector	Function	Manufacturer's designation	
SR6 and SR11	Crimp tool	932 507-002 XZC 0701	Hirschmann <a href="http://www.hirschmann.com">www.hirschmann.com</a>
	Extraction tool	931 812-001 XWA 164	
C16-1	Crimp tool	TA0500 + TA0000163 + TA0002016001 Crimp pliers, jaws and contact receptacle	Amphenol-Tucher <a href="http://www.amphenoltucher.com">www.amphenoltucher.com</a>
	Extraction tool	FG 0300 1461 Extraction tool	
RC12	Crimp tool	RC-Z2378 Crimp pliers for machined contacts	Coninvers <a href="http://www.coninvers.com">www.coninvers.com</a>
	Extraction tool	RC-Z2097 Extraction tool/insertion tool	
RC18	Crimp tool	RC-Z2504 Crimp pliers for machined contacts	Coninvers <a href="http://www.coninvers.com">www.coninvers.com</a>
	Extraction tool	RC-Z2514 Extraction tool	
VP19	Crimp tool	T98143 DAK 83S-30 / 11-7576T3 Insertion tool	Litton/Vteam <a href="http://www.littonvteam.com">www.littonvteam.com</a>
	Extraction tool	46592-MT50 / 11-7576T3 Removal tool	
UT23	Crimp tool	Y16RCM Crimping tool for machined contacts	Bundy <a href="http://www.bundyt.com">www.bundyt.com</a>
	Extraction tool	RX2025GE1 Extraction tool	
TB24	Crimp tool	WT10-04 Crimp tool	Thomas & Betts <a href="http://www.tb.com">www.tb.com</a>
	Extraction tool	TRT16 Contact removal tool	

## Bolts for safety guards

- ▶ For safety switches NZ.VZ und NZ.VZ.VS
- ▶ Bolt NZ-B with ball detent mechanism
- ▶ Bolt NZ-R2 with detent knob
- ▶ For right or left hinged doors



### Special features

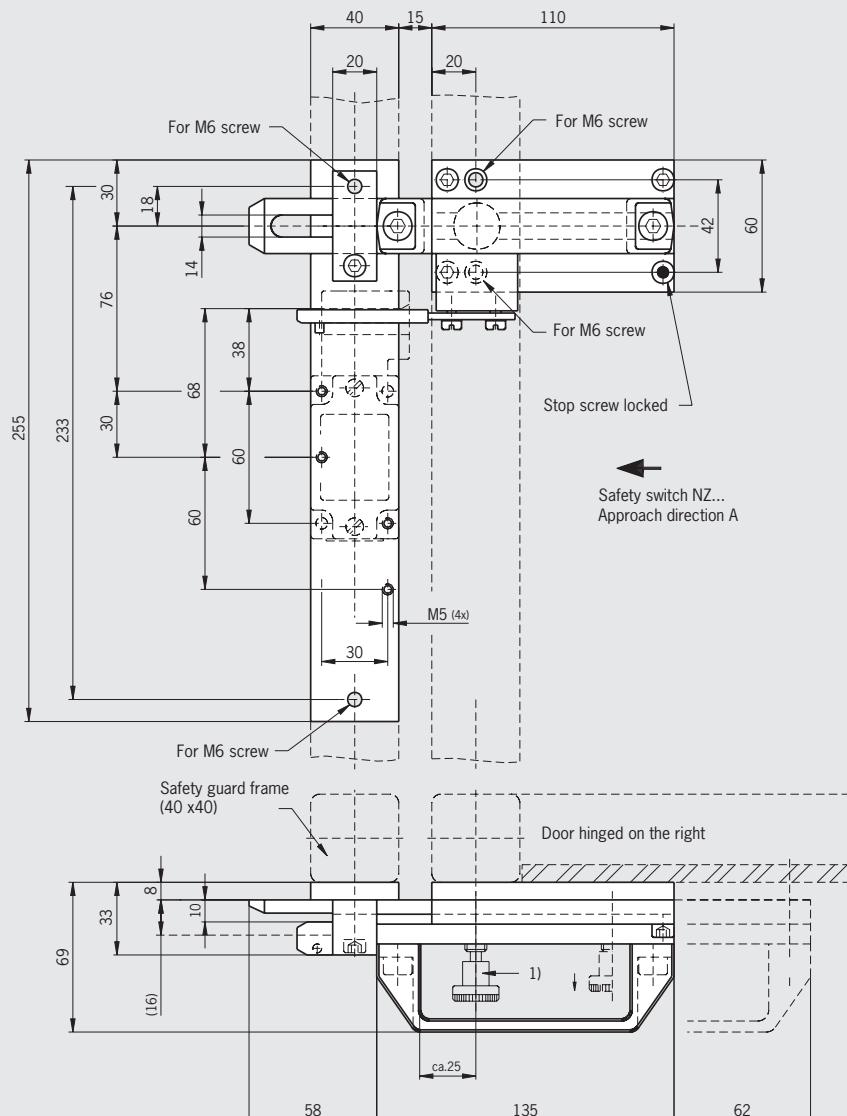
- ▶ Bolt **NZ-B** engages in open and closed position
  - ▶ Prevents accidental opening and closing of the bolt
- ▶ Bolt **NZ-R2** engages in open and closed position. Unlocked by pulling the detent knob upward

### Features

- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Easy to use
- ▶ Distinctive yellow color for easy recognition
- ▶ Robust version for heavy doors
- ▶ No additional door handle necessary
- ▶ Slot on the bolt permits attachment of padlocks

### Bolt for safety switches NZ.VZ and NZ.VZ.VS

Dimension drawings (here: shown with detent knob)



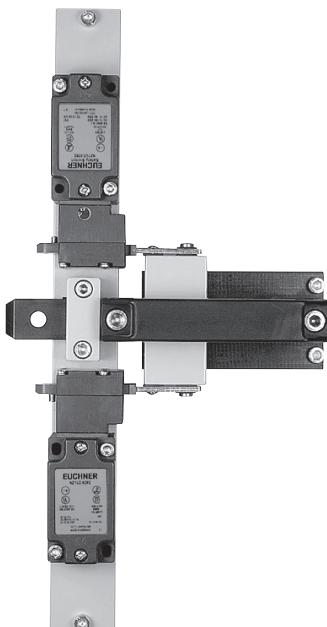
1) Bolt with detent mechanism:  
latches in open position and prevents unintentional closing of the bolt.  
When the bolt is closed, the knob engages and prevent unintentional opening.  
Unlocked by pulling the detent knob upward.

### Ordering table

Designation	Detent mechanism	Version	Order no./item
Bolt NZ-A	Without	For right hinged doors, actuator included	<b>057734</b> Bolt NZ-A
Bolt NZ-C	Without	For left hinged doors, actuator included	<b>057735</b> Bolt NZ-C
Bolt NZ-AB	Ball detent mechanism	For right hinged doors, actuator included	<b>083890</b> Bolt NZ-AB
Bolt NZ-CB	Ball detent mechanism	For left hinged doors, actuator included	<b>083892</b> Bolt NZ-CB
Bolt NZ-AR2	Detent knob	For right hinged doors, actuator included	<b>078455</b> Bolt NZ-AR2
Bolt NZ-CR2	Detent knob	For left hinged doors, actuator included	<b>078456</b> Bolt NZ-CR2

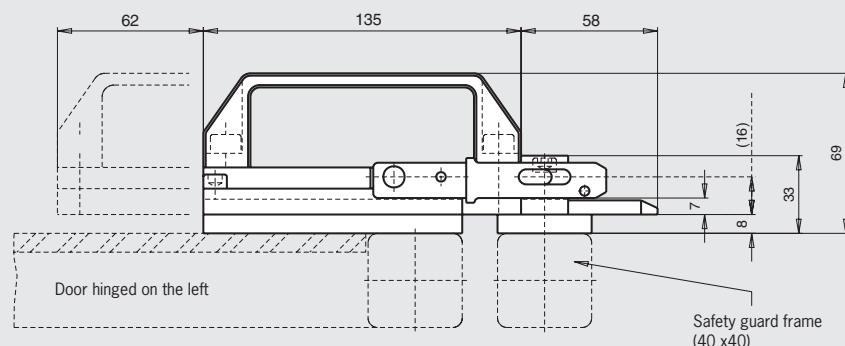
## Bolts for safety guards

- ▶ For 2 safety switches NZ.VZ on one bolt



### Bolt for 2 safety switches NZ.VZ on one bolt

#### Dimension drawings

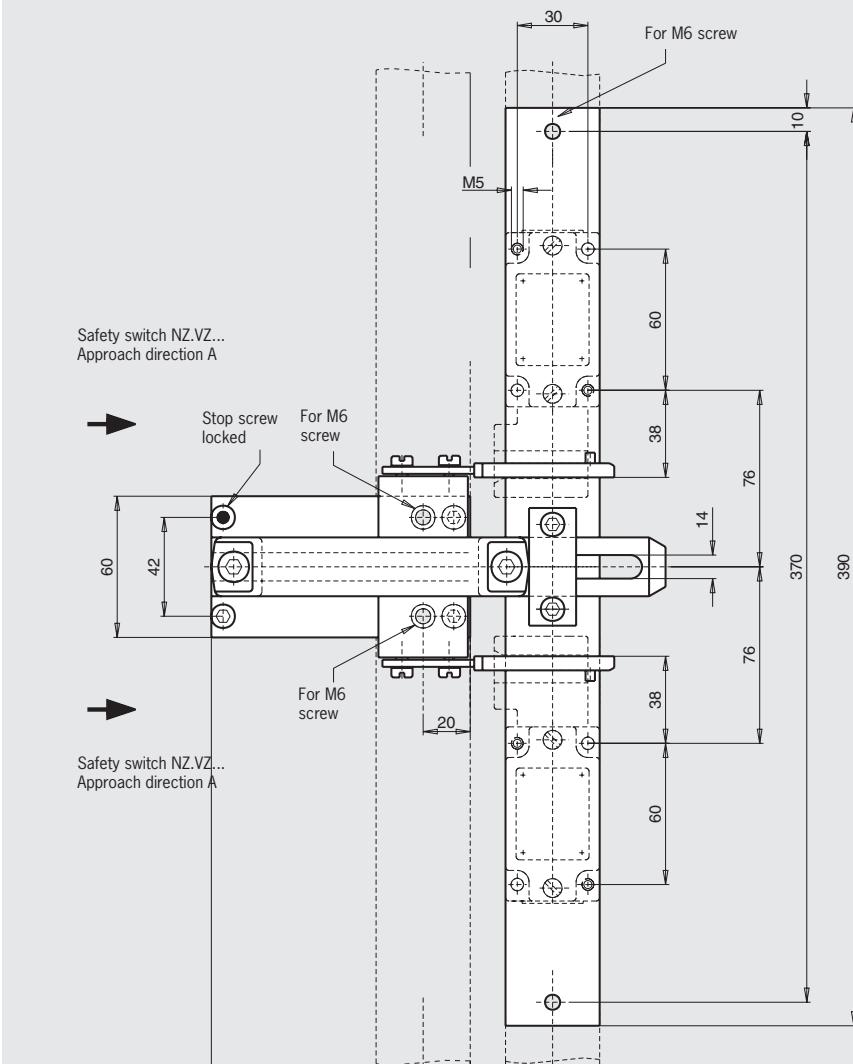


#### Special features

- ▶ One bolt for 2 safety switches
- ▶ A higher safety category according to EN ISO 13849-1 (e.g. category 4) is achieved
- ▶ Bolt can be used for doors hinged on the right or left

#### Features

- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Distinctive yellow color for easy recognition
- ▶ Robust version for heavy doors
- ▶ No additional door handle necessary
- ▶ Slot on the bolt permits attachment of padlocks

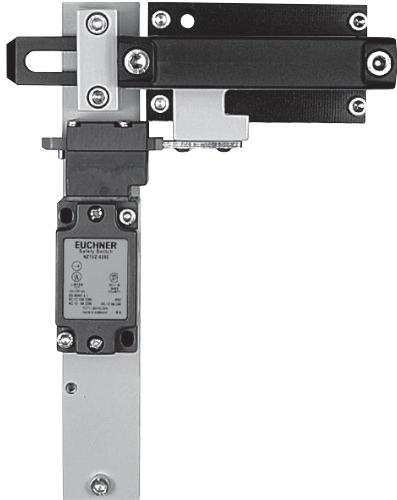


#### Ordering table

Designation	Detent mechanism	Version	Order no./item
Bolt NZ-AC	Without	For right or left hinged doors, 2 safety switches on one bolt, actuator included	076188 Bolt NZ-AC

## Bolts for safety guards

- ▶ For safety switches NZ.VZ
- ▶ Lever for escape release from the danger area
- ▶ Bolt with detent knob
- ▶ For right or left hinged doors



### Special features

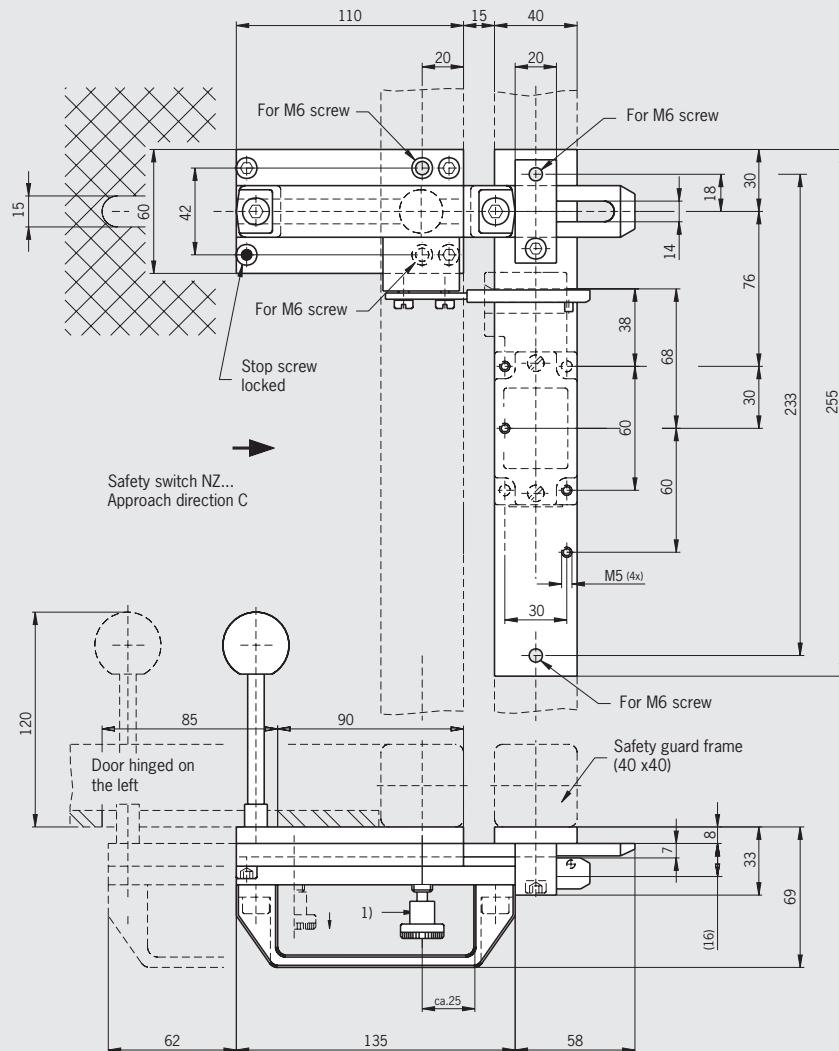
- ▶ Bolt with detent mechanism
- ▶ Latches in open position and prevents unintentional closing of the bolt

### Features

- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Distinctive yellow color for easy recognition
- ▶ Robust version for heavy doors
- ▶ No additional door handle necessary
- ▶ Slot on the bolt permits attachment of padlocks

### Bolt for safety switches NZ.VZ

#### Dimension drawings



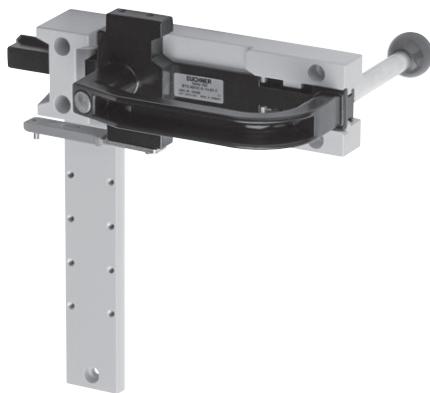
1) Bolt with detent mechanism:  
latches in open position and prevents unintentional closing of the bolt.  
Unlocked by pulling the detent knob upward.

### Ordering table

Designation	Detent mechanism	Version	Order no./item
<b>Bolt NZ-AF</b>	Detent knob	For right hinged doors, escape release from the danger area, actuator included	<b>078451</b> Bolt NZ-AF
<b>Bolt NZ-CF</b>	Detent knob	For left hinged doors, escape release from the danger area, actuator included	<b>078452</b> Bolt NZ-CF

## Bolts for safety guards

- ▶ For safety switches NZ.VZ und NZ.VZ.VS
- ▶ Material: Die-cast aluminum
- ▶ Lever for escape release from the danger area (optional)
- ▶ For doors hinged on the right or left



### Special features

(only for bolt BTC-NVZ-S-TH-01-F with escape release)

- ▶ Bolt with detent mechanism  
Latches in open position and prevents unintentional closing of the bolt. Unlocked by pressing the knob
- ▶ Lever for escape release from the danger area (optional)

### Features

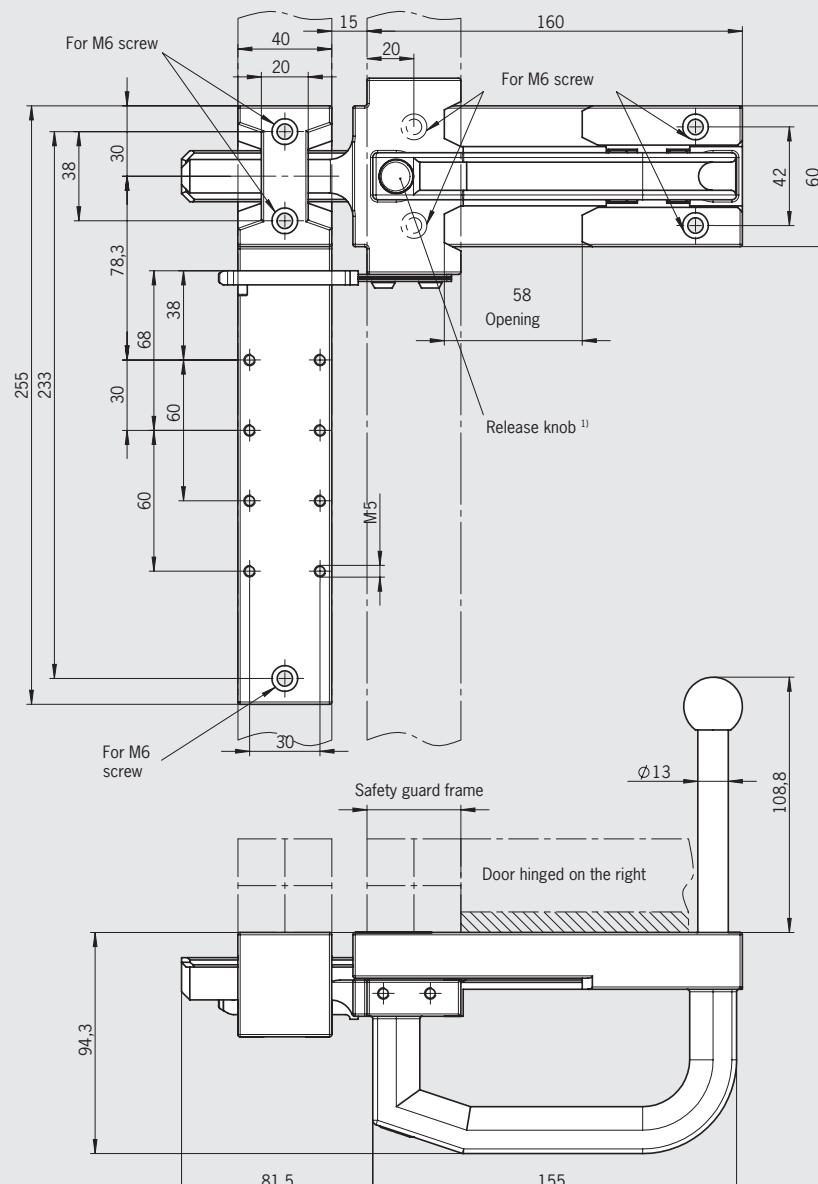
- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Distinctive yellow color for easy recognition
- ▶ Robust version for heavy doors
- ▶ No additional door handle necessary

### Notes

- ▶ Actuator included
- ▶ Order safety switch separately

## Bolt for safety switches NZ.VZ and NZ.VZ.VS

### Dimension drawings (here: shown with escape release)



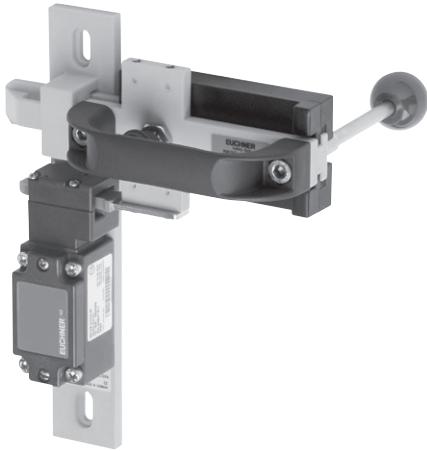
1) Bolt with detent mechanism (only for bolt BTC-NVZ-S-TH-01-F with escape release):  
latches in open position and prevents unintentional closing of the bolt.  
Unlocked by pressing the knob

### Ordering table

Designation	Detent mechanism	Version	Order no./item
Bolt <b>BTC-NVZ-S-TH-01-F</b>	1 x detent mechanism open	For right or left hinged doors, with escape release	<b>104399</b> Bolt BTC-NVZ-S-TH-01-F
Bolt <b>BTC-NVZ-S-TH-00-X</b>	Without	For right or left hinged doors, without escape release	<b>104398</b> Bolt BTC-NVZ-S-TH-00-X

## Bolts for safety guards

- ▶ For safety switches NZ.VZ
- ▶ Material: reinforced plastic
- ▶ Lever for escape release from the danger area
- ▶ Bolt with detent knob
- ▶ For right or left hinged doors



### Special features

- ▶ Bolt with detent mechanism (only bolts with escape release) Bolt latches in open position to prevent unintentional closing

### Features

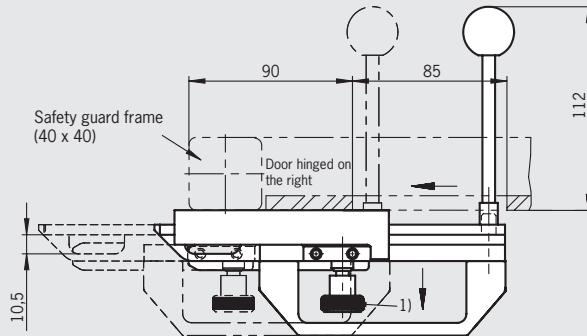
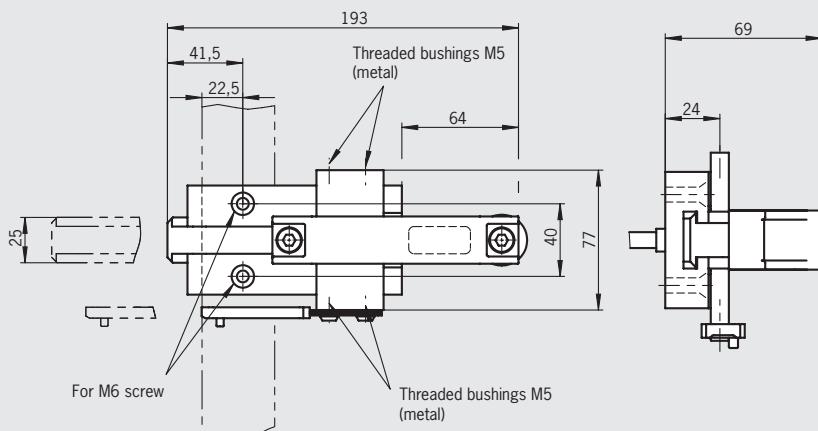
- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Distinctive yellow color for easy recognition
- ▶ Robust version for heavy doors
- ▶ No additional door handle necessary
- ▶ Slot on the bolt permits attachment of padlocks

### Notes

- ▶ Functions only in conjunction with switch bracket NZ-GFK
- ▶ Actuator included
- ▶ Order safety switch separately
- ▶ Order switch bracket separately

### Bolt for safety switches NZ.VZ

#### Dimension drawings



1) Bolt with detent mechanism (only for bolts with escape release): latches in open position and prevents unintentional closing of the bolt. Unlocked by pulling the detent knob upward.

### Ordering table

Designation	Detent mechanism	Version	Order no./item
<b>Bolt NZ-GFK</b>	Without	For right hinged doors, without escape release, actuator included	<b>096617</b> Bolt NZ-GFK
<b>Bolt NZ-GFK-F</b>	Detent knob	For left hinged doors, escape release from the danger area, actuator included	<b>097603</b> Bolt NZ-GFK-F
<b>Switch bracket NZ-GFK</b>		Separate	<b>096614</b> Switch bracket NZ-GFK

## Bolts for safety guards

- ▶ For safety switches NZ.VZ, NZ.VZ.VS and TZ...
- ▶ Bolt with ball handle
- ▶ For right or left hinged doors



### Special features

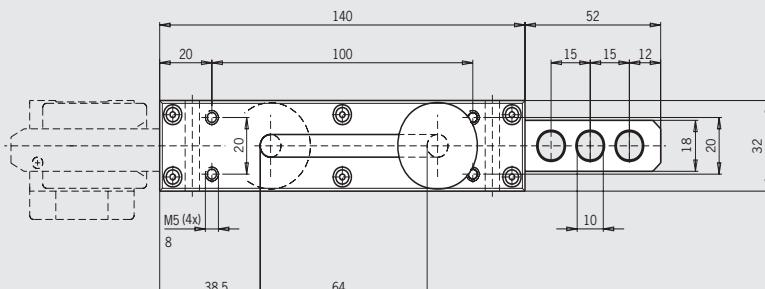
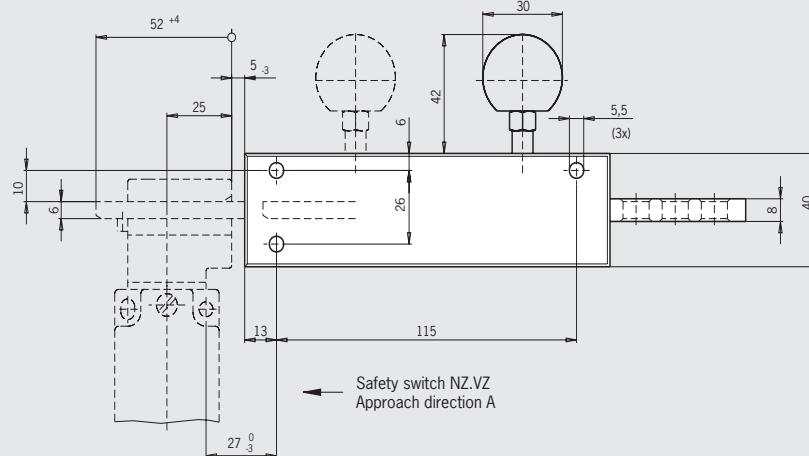
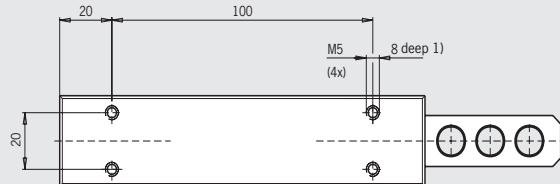
- ▶ With bolt **NZ/TZ-S1** actuating pin on bottom
  - ▶ Safety switch fastened as shown in illustration
- ▶ With bolt **NZ/TZ-S2** actuating pin on top
  - ▶ Safety switch fastened rotated by 180°
- ▶ After the door is opened, the actuator is automatically withdrawn into the bolt by a built-in return spring
  - ▶ Protection of the operator  
When the door is open there is no risk of injury due to a protruding actuator
  - ▶ Protection of the actuator  
When hinged doors are closed it is ensured that the actuator is not used as an end stop

### Features

- ▶ Three holes enable padlocks to be attached

### Bolt for safety switches NZ.VZ, NZ.VZ.VS and TZ

### Dimension drawings



1) Bolt fastening

### Ordering table

Designation	Detent mechanism	Version	Order no./item
<b>Bolt NZ/TZ-S1</b>	Without	For right or left hinged doors, actuating pin on bottom, actuator included	<b>028357</b> Bolt NZ/TZ-S1
<b>Bolt NZ/TZ-S2</b>	Without	For right or left hinged doors, actuating pin on top, actuator included	<b>028359</b> Bolt NZ/TZ-S2

## Bolts for safety guards

- ▶ For safety switches NZ.VZ, NZ.VZ.VS and TZ with escape release
- ▶ Lever for escape release from the danger area
- ▶ Bolt with ball handle
- ▶ For right or left hinged doors



### Special features

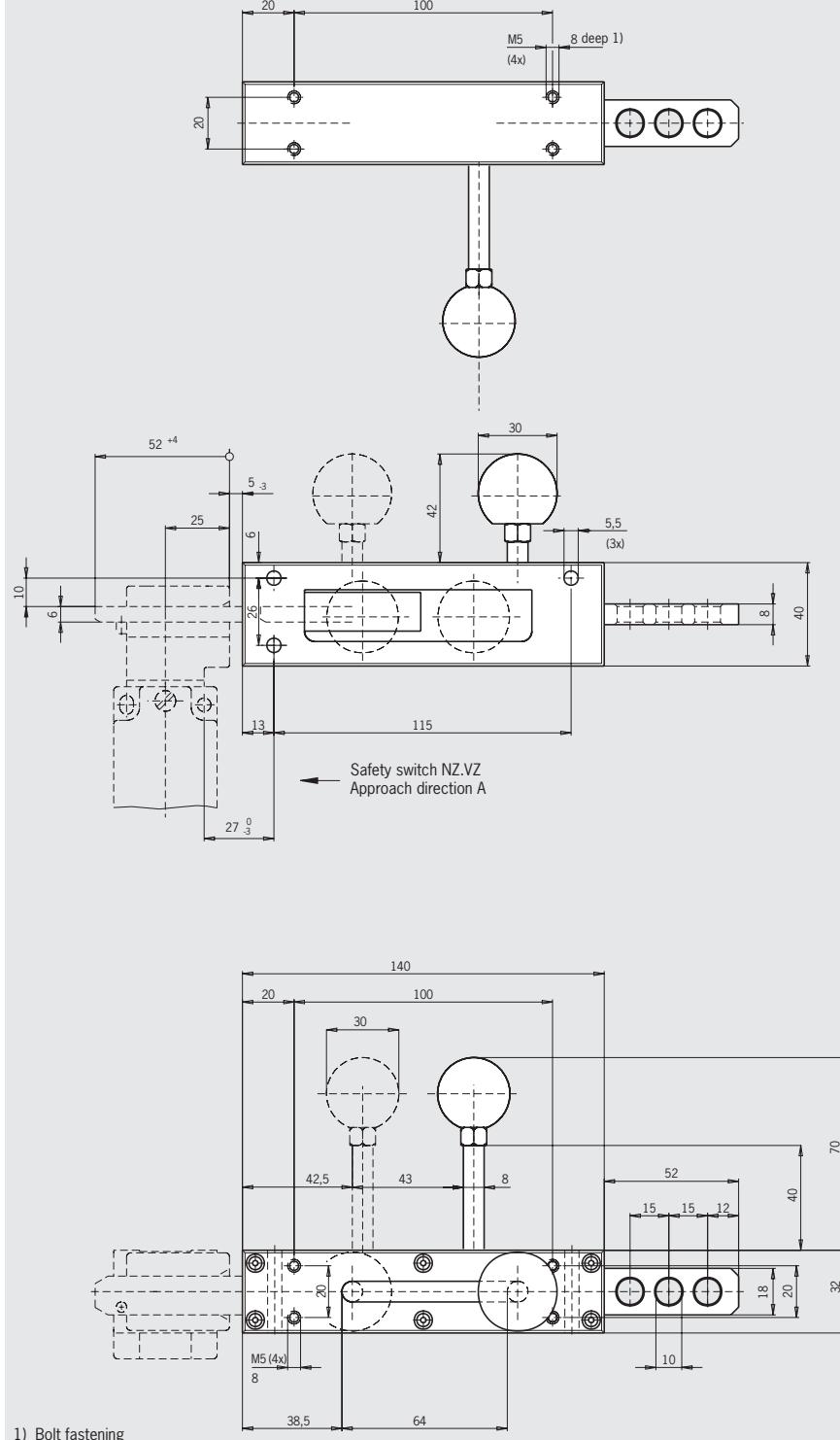
- ▶ After the door is opened, the actuator is automatically withdrawn into the bolt by a built-in return spring
- ▶ Protection of the operator  
When the door is open there is no risk of injury due to a protruding actuator
- ▶ Protection of the actuator  
When hinged doors are closed it is ensured that the actuator is not used as an end stop

### Features

- ▶ The emergency release lever only enables the doors to be **opening** from inside the danger area
- ▶ Three holes enable padlocks to be attached

### Bolt for safety switches NZ.VZ, NZ.VZ.VS and TZ with escape release

#### Dimension drawings

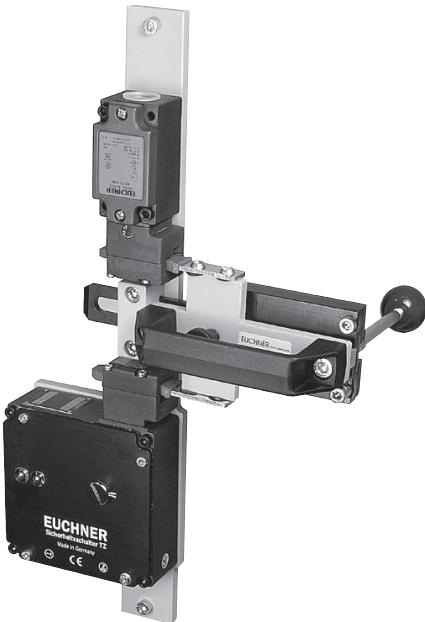


### Ordering table

Designation	Detent mechanism	Version	Order no./item
Bolt NZ/TZ-S1/AF	Without	For right hinged doors, escape release from the danger area, actuator included	<b>079786</b> Bolt NZ/TZ-S1/AF
Bolt NZ/TZ-S1/CF	Without	For left hinged doors, escape release from the danger area, actuator included	<b>079785</b> Bolt NZ/TZ-S1/CF

## Bolts for safety guards

- ▶ For safety switches NZ.VZ and TZ with escape release
- ▶ Lever for escape release from the danger area
- ▶ For 2 safety switches on one bolt (NZ and TZ)
- ▶ For right or left hinged doors



## Special features

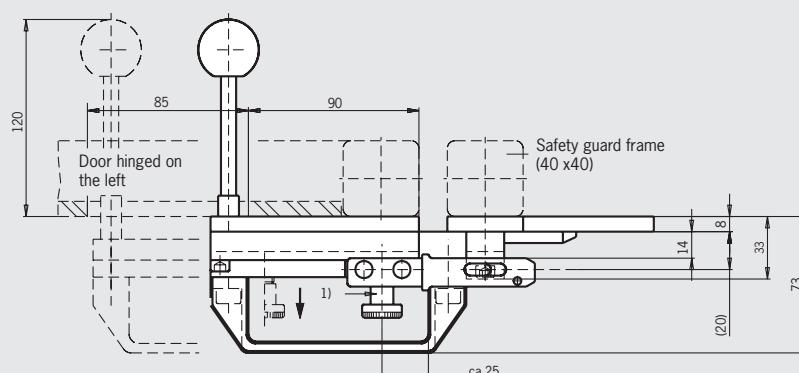
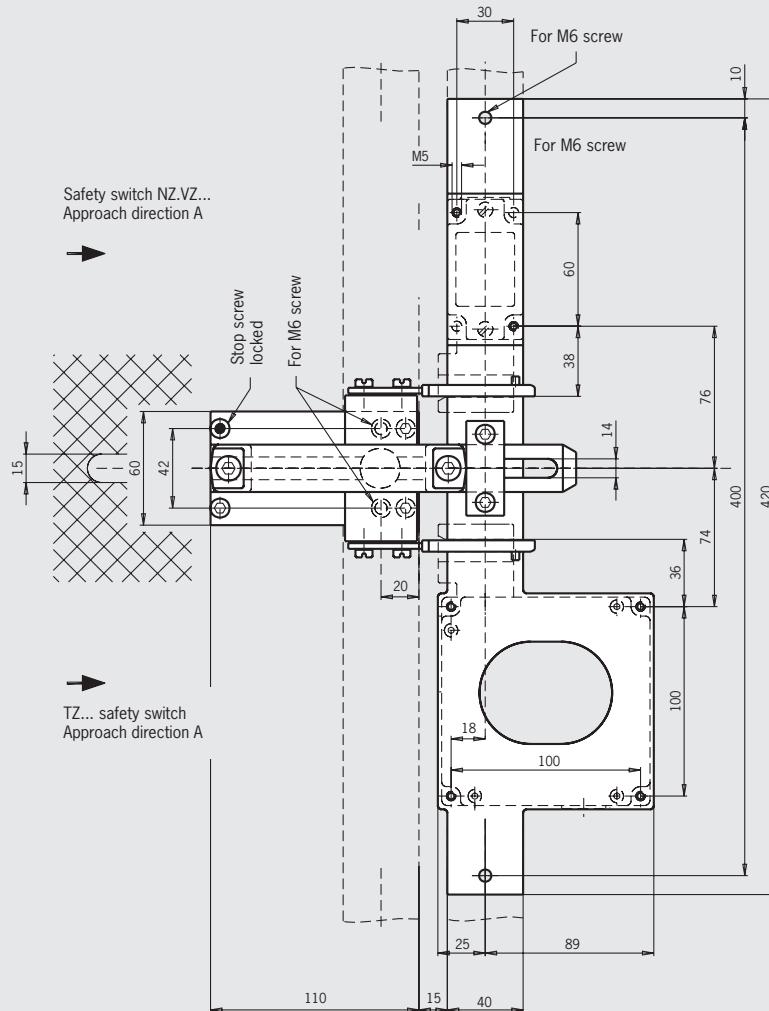
- ▶ One bolt for 2 safety switches (NZ and TZ with guard locking)
- ▶ A higher safety category according to EN ISO 13849-1 (e.g. category 4) is achieved
- ▶ Bolt with detent mechanism  
Latches in open position and prevents unintentional closing of the bolt

## Features

- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Distinctive yellow color for easy recognition
- ▶ Robust version for heavy doors
- ▶ No additional door handle necessary
- ▶ Slot on the bolt permits attachment of padlocks

## Bolt for 2 safety switches NZ.VZ and TZ on one bolt

### Dimension drawings



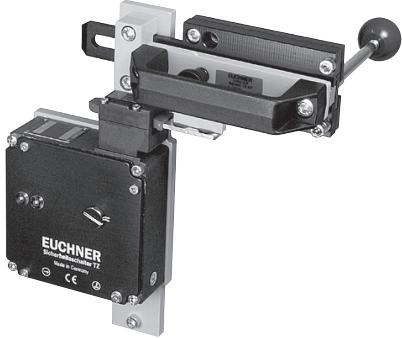
1) Bolt with detent mechanism:  
latches in open position and prevents unintentional closing of the bolt.  
Unlocked by pulling the detent knob upward.

## Ordering table

Designation	Detent mechanism	Version	Order no./item
Bolt NZ/TZ-ACF	Detent knob	For right or left hinged doors, 2 safety switches on one bolt, escape release from the danger area, actuator included	083900 Bolt NZ/TZ-ACF

## Bolts for safety guards

- ▶ For safety switches TZ with escape release
- ▶ Lever for escape release from the danger area
- ▶ For right or left hinged doors



### Special features

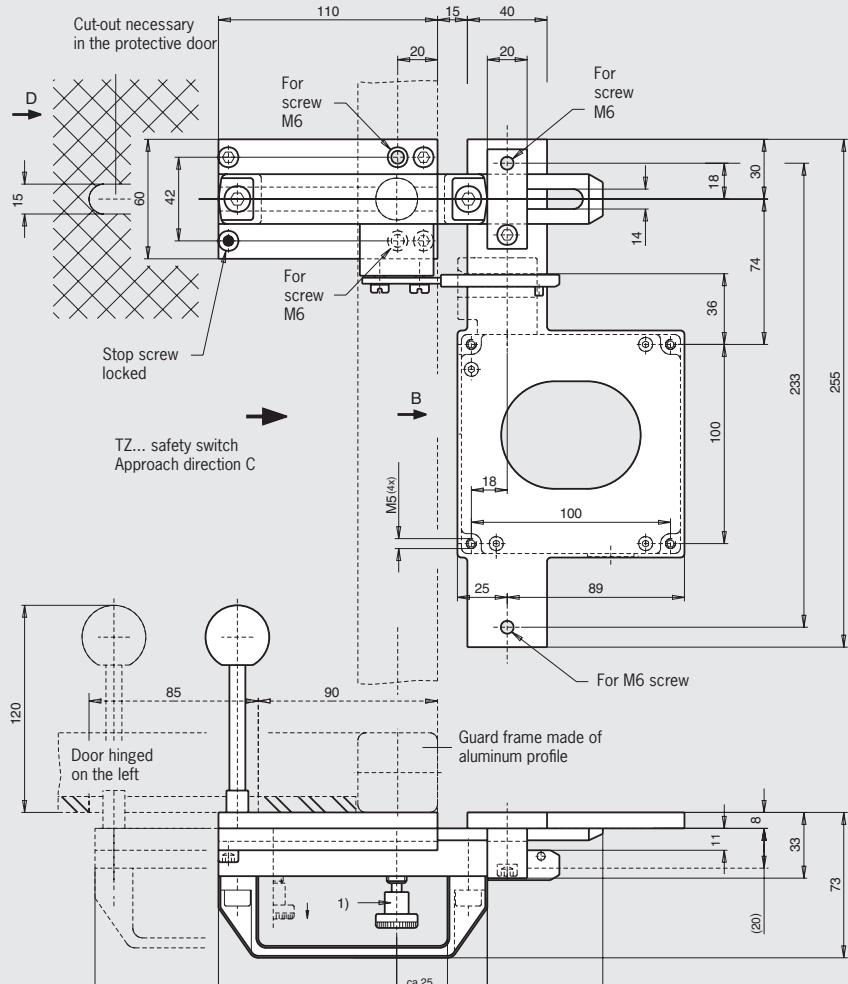
- ▶ Bolt with detent mechanism
- ▶ Latches in open position and prevents unintentional closing of the bolt

### Features

- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Distinctive yellow color for easy recognition
- ▶ Robust version for heavy doors
- ▶ No additional door handle necessary
- ▶ Slot on the bolt permits attachment of padlocks

### Bolt for safety switch TZ with escape release

#### Dimension drawings



### Ordering table

Designation	Detent mechanism	Version	Order no./item
<b>Bolt TZ-AF</b>	Detent knob	For right hinged doors, escape release from the danger area, actuator and switch bracket included	<b>076200</b> Bolt TZ-AF
<b>Bolt TZ-CF</b>	Detent knob	For left hinged doors, escape release from the danger area, actuator and switch bracket included	<b>076199</b> Bolt TZ-CF

## Bolts for safety guards

- ▶ For safety switches TZ
- ▶ Optional stainless steel bolt, 1.4301
- ▶ For right or left hinged doors



### Features

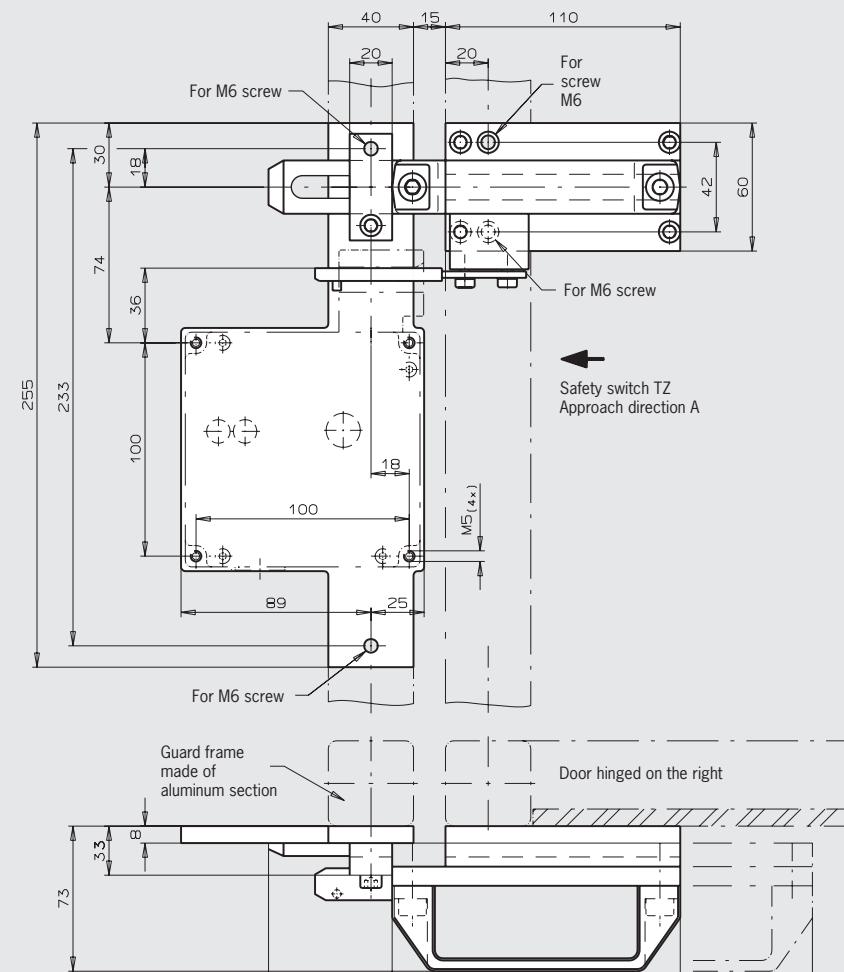
- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Easy to use
- ▶ Distinctive yellow color for easy recognition
- ▶ Robust version for heavy doors
- ▶ No additional door handle necessary
- ▶ Slot on the bolt permits attachment of padlocks

### Version in stainless steel 1.4301

- ▶ Suitable for use in the chemical and foodstuff industries
- ▶ Screw material stainless steel V2A
- ▶ Handle material polypropylene
- ▶ Slide strip material polyethylene

## Bolts for safety switches series TZ

### Dimension drawings

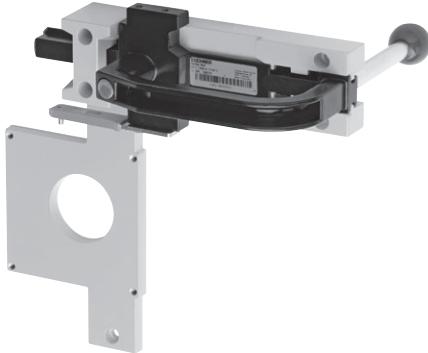


### Ordering table

Designation	Detent mechanism	Version	Order no./item
<b>Bolt TZ-A</b>	Without	For doors hinged on the right, actuator and switch bracket included	<b>057736</b> Bolt TZ-A
<b>Bolt TZ-C</b>	Without	For doors hinged on the left, actuator and switch bracket included	<b>057737</b> Bolt TZ-C
<b>Bolt TZ-A-NIRO</b>	Without	For right hinged doors, bolt blade of stainless steel 1.4301, actuator and switch bracket included	<b>079798</b> Bolt TZ-A-NIRO
<b>Bolt TZ-C-NIRO</b>	Without	For left hinged doors, bolt blade of stainless steel 1.4301, actuator and switch bracket included	<b>079799</b> Bolt TZ-C-NIRO
<b>Bolt TZ-A-NIRO-C2101</b>	Without	For right hinged doors, bolt blade of stainless steel 1.4301, screws made of stainless steel V2A, handle and slide strips made of stainless steel 1.4, actuator and switch bracket included	<b>096057</b> Bolt TZ-A-NIRO-C2101
<b>Bolt TZ-C-NIRO-C2101</b>	Without	For left hinged doors, bolt blade of stainless steel 1.4301, screws made of stainless steel V2A, handle and slide strips made of stainless steel 1.4, actuator and switch bracket included	<b>096058</b> Bolt TZ-C-NIRO-C2101

## Bolts for safety guards

- ▶ For safety switches TZ
- ▶ Material: Die-cast aluminum
- ▶ Lever for escape release from the danger area (optional)
- ▶ For doors hinged on the right or left



### Special features

(only for bolt BTC-TZ00 A/C-TH-01-F with escape release)

- ▶ Bolt with detent mechanism
- ▶ Latches in open position and prevents unintentional closing of the bolt. Unlocked by pressing the knob
- ▶ Lever for escape release from the danger area (optional)

### Features

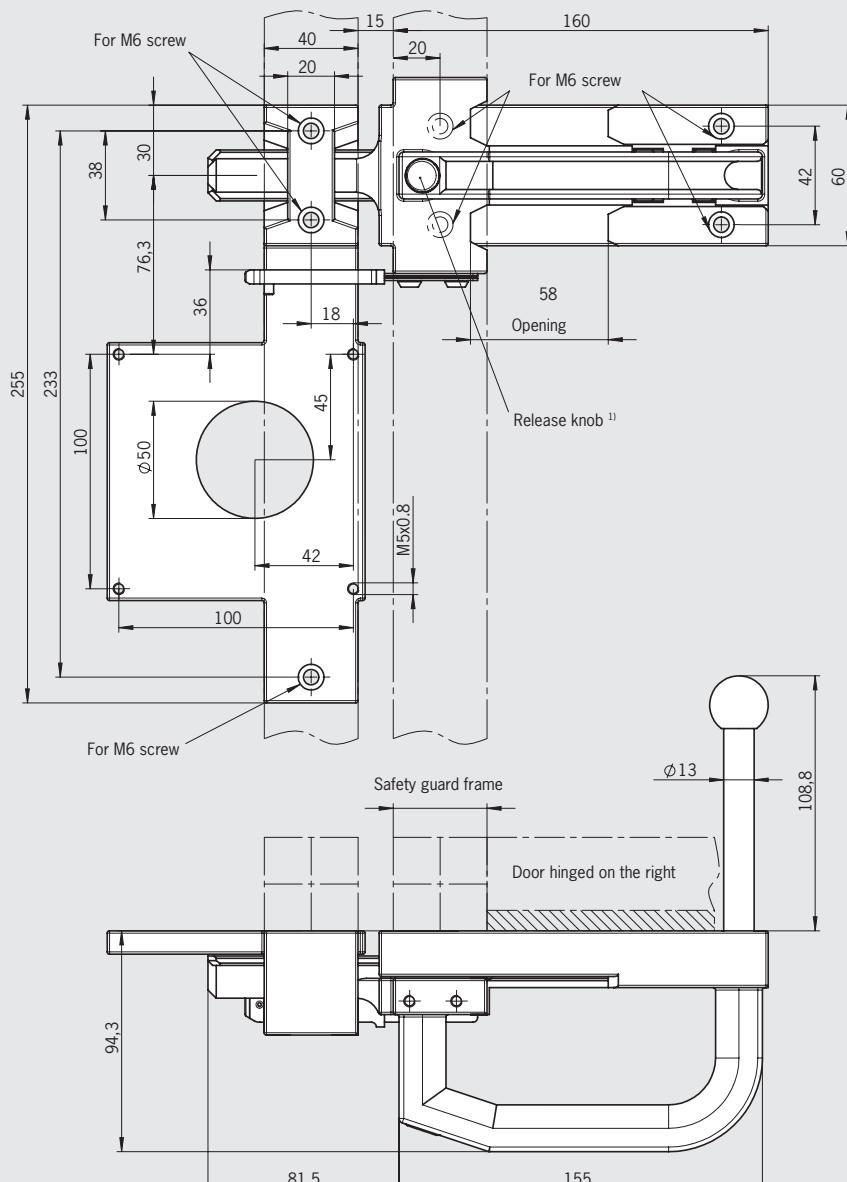
- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Distinctive yellow color for easy recognition
- ▶ Robust version for heavy doors
- ▶ No additional door handle necessary

### Notes

- ▶ Actuator included
- ▶ Order safety switch separately

## Bolts for safety switches series TZ

**Dimension drawings** (here: bolt for doors hinged on the right with escape release)



1) Bolt with detent mechanism  
(only for bolt BTC-TZ00 A/C-TH-01-F with escape release):  
latches in open position and prevents unintentional closing  
of the bolt.  
Unlocked by pressing the knob

### Ordering table

Designation	Detent mechanism	Version	Order no./item
<b>Bolt</b> <b>BTC-TZ00-A-TH-01-F</b>	1 x detent mechanism open	For right hinged doors, with escape release	<b>106279</b> Bolt BTC-TZ00-A-TH-01-F
<b>Bolt</b> <b>BTC-TZ00-C-TH-01-F</b>	1 x detent mechanism open	For left hinged doors, with escape release	<b>106281</b> Bolt BTC-TZ00-C-TH-01-F
<b>Bolt</b> <b>BTC-TZ00-A-TH-00-X</b>	Without	For right hinged doors, without escape release	<b>106278</b> Bolt BTC-TZ00-A-TH-00-X
<b>Bolt</b> <b>BTC-TZ00-C-TH-00-X</b>	Without	For left hinged doors, without escape release	<b>106280</b> Bolt BTC-TZ00-C-TH-00-X

## Bolts for safety guards

- ▶ For safety switches TX and NX
- ▶ For right or left hinged doors

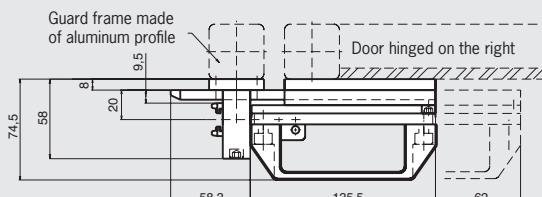
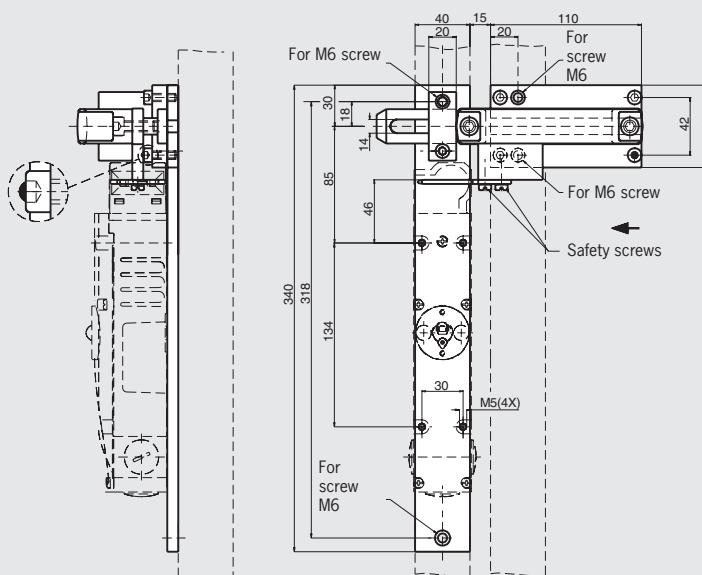


### Features

- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Distinctive yellow color for easy recognition
- ▶ No additional door handle necessary
- ▶ Slot on the bolt tongue permits attachment of padlocks

### Bolt for safety switches series TX and NX

#### Dimension drawings



### Ordering table

Designation	Detent mechanism	Version	Order no./item
<b>Bolt TX-A</b>	Without	Without escape release, for doors hinged on the right, actuator and switch bracket included	<b>082990</b> Bolt TX-A
<b>Bolt TX-C</b>	Without	Without escape release, for doors hinged on the left, actuator and switch bracket included	<b>082991</b> Bolt TX-C

## Bolts for safety guards

- ▶ For safety switches TX...C1991/C2161 with escape release
- ▶ For right or left hinged doors

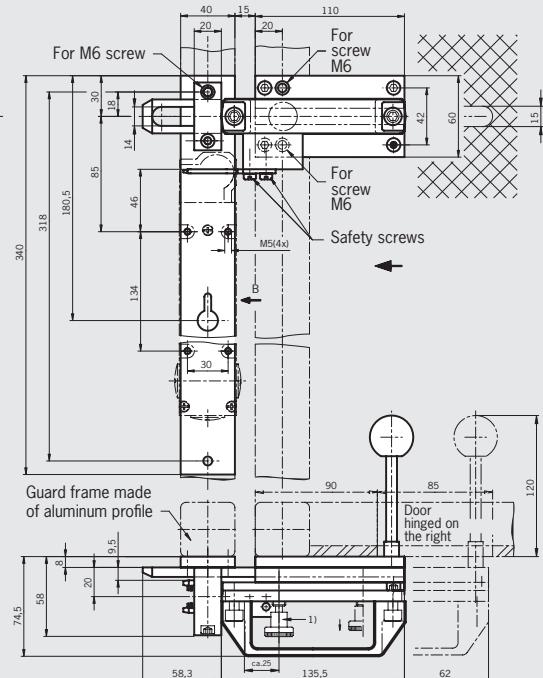
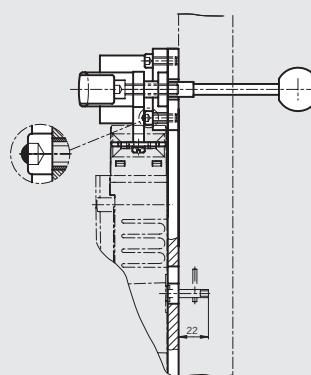


### Features

- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Distinctive yellow color for easy recognition
- ▶ No additional door handle necessary
- ▶ Slot on the bolt tongue permits attachment of padlocks

### Bolts for safety switches series TX...C1991/C2161 with escape release

#### Dimension drawings



### Ordering table

Designation	Detent mechanism	Version	Order no./item
<b>Bolt TX-AF</b>	Detent knob	With escape release, for doors hinged on the right, actuator and switch bracket included	<b>085392</b> Bolt TXAF
<b>Bolt TX-CF</b>	Detent knob	With escape release, for doors hinged on the left, actuator and switch bracket included	<b>085393</b> Bolt TXCF

## Bolt for safety guards for safety switches SGA/STA

- ▶ Lever for escape release from the danger area (optional)



### Special features

(only for bolt S-AF and S-CF with escape release)

- ▶ Bolt with detent mechanism
- ▶ Latches in open position and prevents unintentional closing of the bolt
- ▶ Lever for escape release from the danger area (optional)

### Features

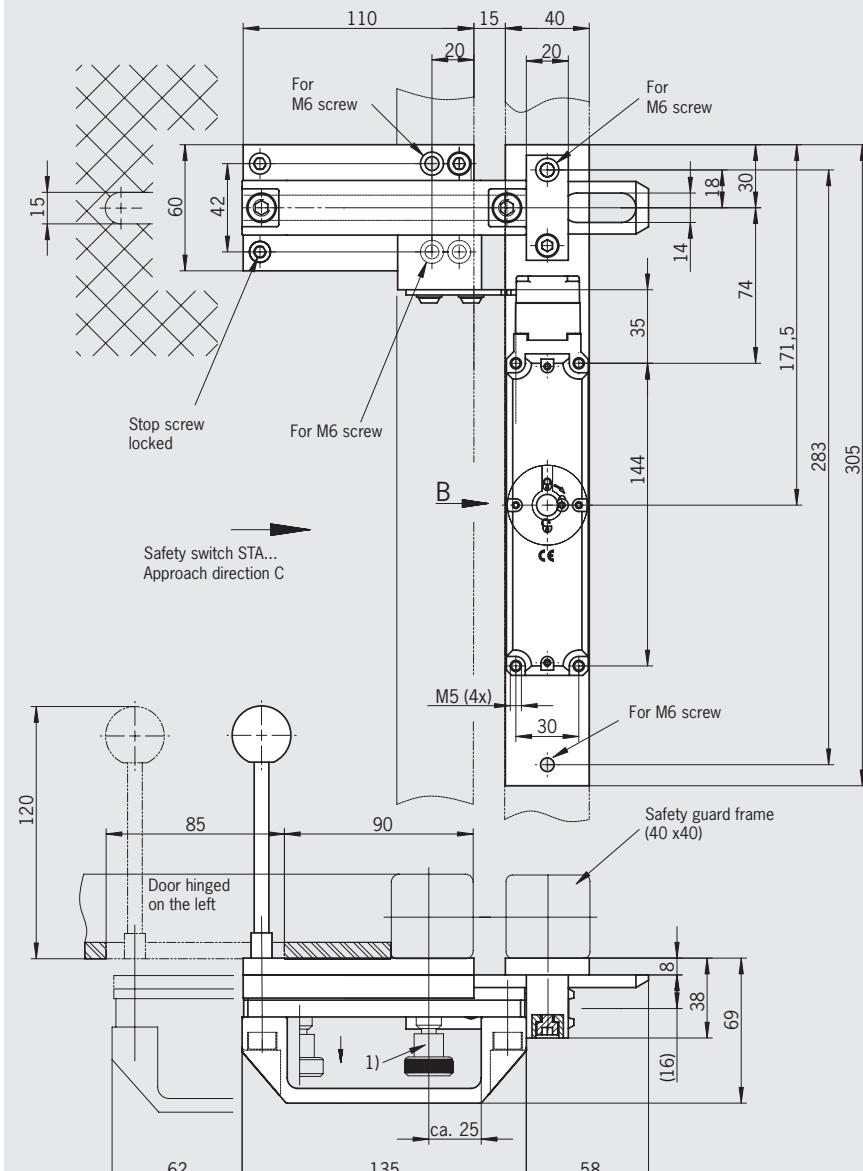
- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Distinctive yellow color for easy recognition
- ▶ Robust version for heavy doors
- ▶ No additional door handle necessary
- ▶ Slot on the bolt permits attachment of padlocks

### Notes

- ▶ The bolts are only suitable for series **SGA/STA**
- ▶ Actuator included
- ▶ Order safety switch separately

### Bolt for safety switch SGA/STA

#### Dimension drawings (here: shown with escape release)

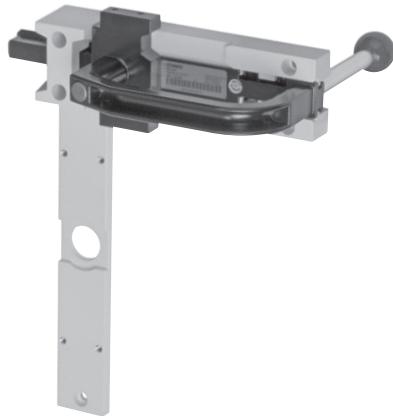


### Ordering table

Designation	Detent mechanism	Version	Order no./item
<b>Bolt S-AF</b>	Detent knob	For right hinged doors, with escape release	<b>096390</b> Bolt S-AF
<b>Bolt S-CF</b>	Detent knob	For left hinged doors, with escape release	<b>096391</b> Bolt S-CF
<b>Bolt S-A</b>	Without	For right hinged doors, without escape release	<b>096384</b> Bolt S-A
<b>Bolt S-C</b>	Without	For left hinged doors, without escape release	<b>096385</b> Bolt S-C

## Bolt for safety guards for safety switches STA/SGA

- ▶ Material: Die-cast aluminum
- ▶ Lever for escape release from the danger area (optional)
- ▶ For doors hinged on the right or left



### Special features

(only for bolt BTC-ST/G-S-TH-01-F with escape release)

- ▶ Bolt with detent mechanism  
Latches in open position and prevents unintentional closing of the bolt. Unlocked by pressing the knob
- ▶ Lever for escape release from the danger area (optional)

### Features

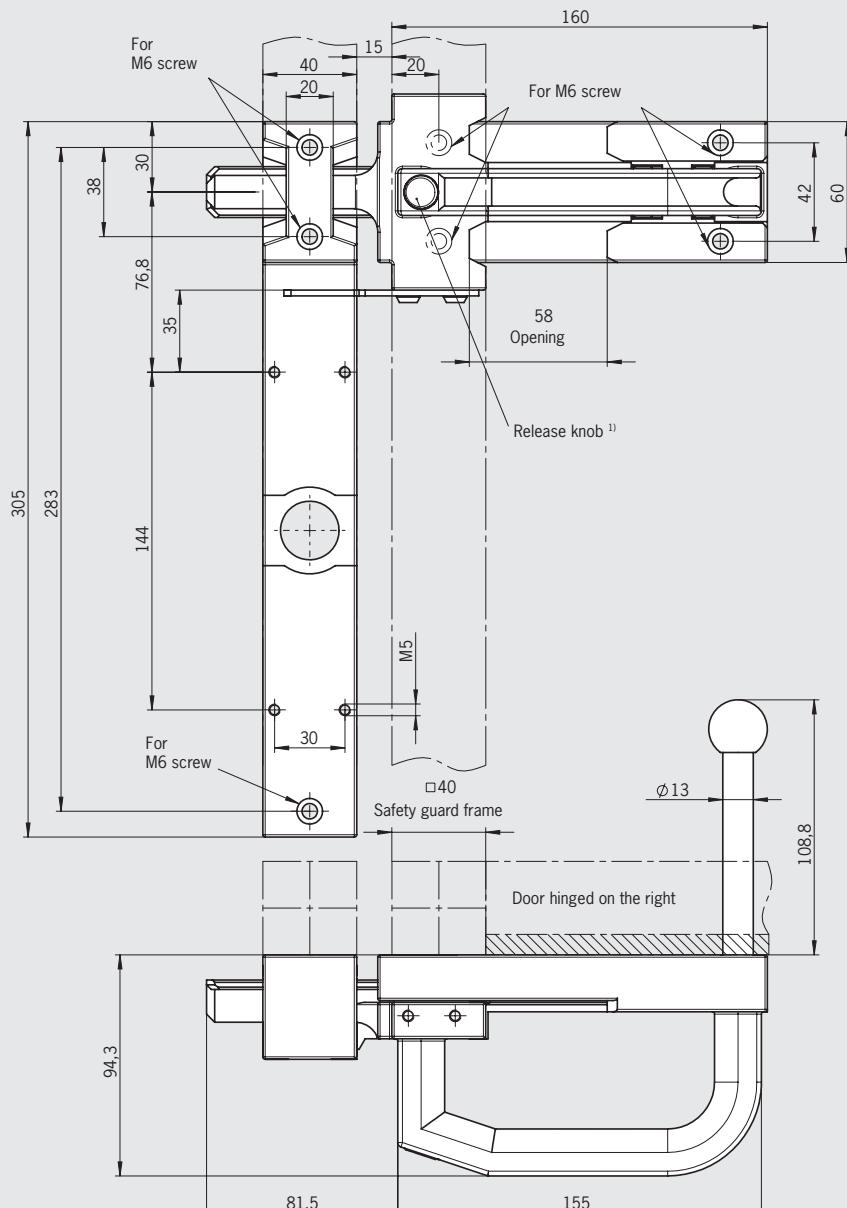
- ▶ Easily fitted to standard aluminum profiles and machine covers by screw connection
- ▶ Distinctive yellow color for easy recognition
- ▶ Robust version for heavy doors
- ▶ No additional door handle necessary

### Notes

- ▶ The bolts are only suitable for series **STA.../SGA...**
- ▶ Actuator included
- ▶ Order safety switch separately

### Bolt for safety switch STA.../SGA...

#### Dimension drawings (here: shown with escape release)



1) Bolt with detent mechanism  
(only for bolts BTC-ST/G-S-TH-01-F with escape release):  
latches in open position and prevents unintentional closing of the bolt.  
Unlocked by pressing the knob

### Ordering table

Designation	Detent mechanism	Version	Order no./item
<b>Bolt</b> <b>BTC-ST/G-S-TH-01-F</b>	1 x detent mechanism open	For right or left hinged doors, with escape release	<b>106285</b> Bolt BTC-ST/G-S-TH-01-F
<b>Bolt</b> <b>BTC-ST/G-S-TH-00-X</b>	Without	For right or left hinged doors, without escape release	<b>106284</b> Bolt BTC-ST/G-S-TH-00-X

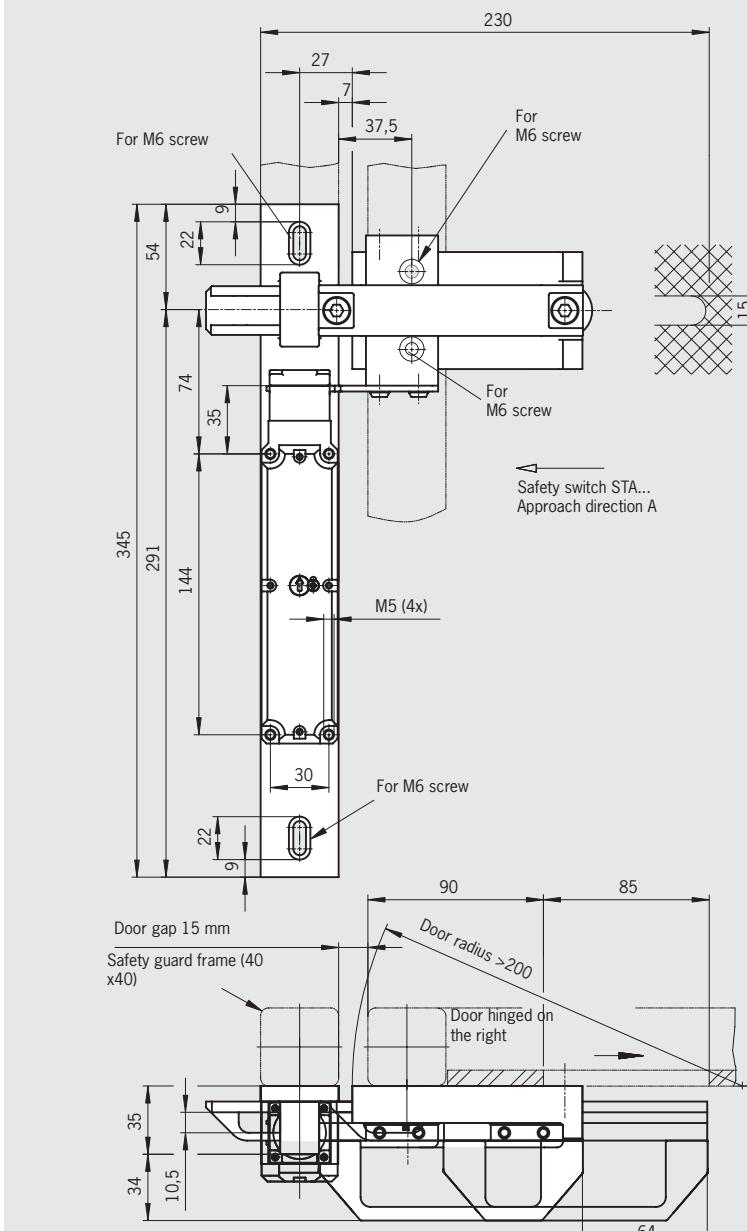
## Bolt for safety guards for safety switches SGA/STA

- Material: reinforced plastic
- For left or right hinged doors



**Bolt for safety switch SGA/STA**

### Dimension drawings



### Features

- Easily fitted to standard aluminum profiles and machine covers by screw connection
- Distinctive yellow color for easy recognition
- Robust version for heavy doors
- No additional door handle necessary
- Slot on the bolt permits attachment of padlocks

### Notes

- Functions only in conjunction with switch bracket TP-GFK
- Actuator included
- Order safety switch separately
- Order switch bracket separately

### Ordering table

Designation	Detent mechanism	Version	Order no./item
Bolt STP-GFK	Without	For right or left hinged doors, without escape release (also for SGA/STA)	<b>098121</b> Bolt STP-GFK
Switch bracket TP-GFK		Separate (also for SGA/STA)	<b>096613</b> Switch bracket TP-GFK

## Accessories for bolts

- ▶ Adapter NZ/TZ... for safety switches NZ.../TZ... for Bosch EcoSafe 45x45 and 30x30
- ▶ Replacement handle for EUCHNER bolts

### Adapter NZ/TZ

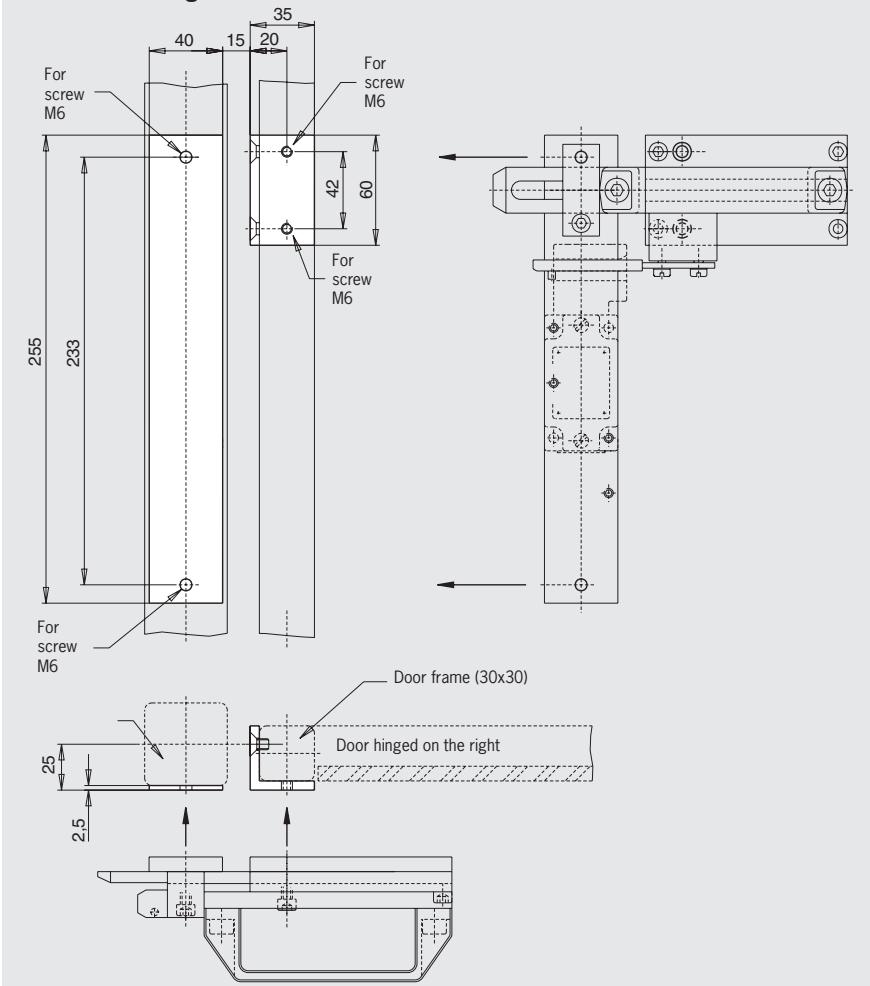
Using the adapter set the **NZ...** and **TZ...** bolts can be fastened to aluminum profiles (Bosch EcoSafe).

The adapter set is only suitable for protection cross-beams 45x45 mm in combination with safety doors 30x30 mm

- ▶ Simple screw mounting
- ▶ Symmetrical design for doors hinged on the right or left

### Adapter NZ/TZ...

#### Dimension drawings

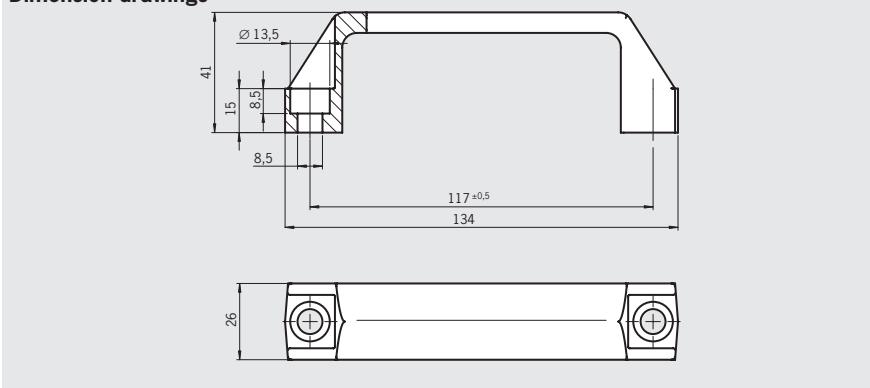


### Replacement handle for EUCHNER bolts

- ▶ Material: plastic, reinforced polypropylene (PP)
- ▶ Color: black, mat
- ▶ Temperature resistance up to 100 °C

### Replacement handle EUCHNER bolts

#### Dimension drawings



### Ordering table

Designation	Version	Order no./item
Adapter NZ/TZ 45/30	Incl. 4 fastening screws for elbow adapter	<b>079033</b> Adapter NZ/TZ 45/30
Bolt handle/V5	Packaging unit 5 pieces, screws not included	<b>093500</b> Bolt handle/V5



## Overview

Safety switch series															Page
N1A	NB01	NZ	NZ.VZ	NZ.VZ.VS	TZ	NX	TX	SGA	STA	STA-TW	ESH	Accesso-ries			
●															154
	●														156
		●													158
			●												162
				●											165
					●										168
						●									171
							●								173
								●							177
									●						179
										●					182
											●				184
															185

## Single limit switch N1A...

The technical data on switches and switching elements apply to all connections. Further technical data are given for the connection selected.



### Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B <sub>10d</sub>	2 x 10 <sup>7</sup> operating cycles	

Switch	Value	Unit
Parameter		
Housing material	Die-cast aluminum, anodized	
Ambient temperature	- 25 ... + 80	°C
Weight	Approx. 0.25	kg
Approach speed, min.	0.1	m/min
Switching element	N1AD      N1AR/N1AB      N1ARL      N1AW	
Approach speed, max. <sup>1)</sup> Depending on actuator	40      80      20      10	m/min
Operating point accuracy depending on actuator <sup>2)</sup>	± 0.002      ± 0.01      ± 0.1      ± 0.002	mm

Switching element	Value	Unit
Parameter		
Switching principle	Slow-action switching contact	Snap-action switching contact
Switching element with 1 switching contact	508 1 NC ⊕	-
Switching element with 2 switching contacts	- 514 1 NC ⊕ + 1 NO	
Mechanical life	30 x 10 <sup>6</sup> operating cycles	1 x 10 <sup>6</sup> operating cycles
Actuating force, min.	15	30
Contact closing time	-	< 5
Contact bounce time	-	< 3
Min. switching current at 24 V DC	10	mA
Switching current max.	6	A
Rated impulse withstand voltage U <sub>imp</sub>	2.5	kV
Contact material	Silver alloy, gold flashed	

Connection, cable entry M16 x 1.5	M16x1,5	Value	Unit
Parameter			
Connection	Screw terminal		
Version	M16 x 1.5		
Conductor cross-section, max.	Per flexible wire 1.5 mm <sup>2</sup>		
Degree of protection according to IEC 60529	IP 67		
Rated insulation voltage U <sub>i</sub>	250	V AC/DC	
Switching element	508      514		
Conventional thermal current I <sub>th</sub>	6      6	A	
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	6      6	A gG	
Utilization category according to IEC 60947-5-1	AC-15      DC-13	Ie 6 A Ue 230 V Ie 6 A Ue 24 V	Ie 2.5 A Ue 230 V Ie 6 A Ue 24 V

1) The approach speed given applies in conjunction with EUCHNER trip dogs at an approach angle of 30°. At a smaller approach angle this approach speed can be exceeded.

2) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2000 operating cycles

## Connection, plug connector SVM 5 (M12)

Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin + PE), male socket adjustable (max. 2700) for elbow connector	
Degree of protection according to IEC 60529	IP 67 <sup>3)</sup>	
Rated insulation voltage U <sub>i</sub>	30	V AC/DC
Switching element	<b>514</b>	
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	AC-15	I <sub>e</sub> 4 A U <sub>e</sub> 30 V
	DC-13	I <sub>e</sub> 4 A U <sub>e</sub> 24 V

3) Screwed tight with the related plug connector (see page 124)

## Travel diagram, N1AD/N1AR/N1AB/N1AW



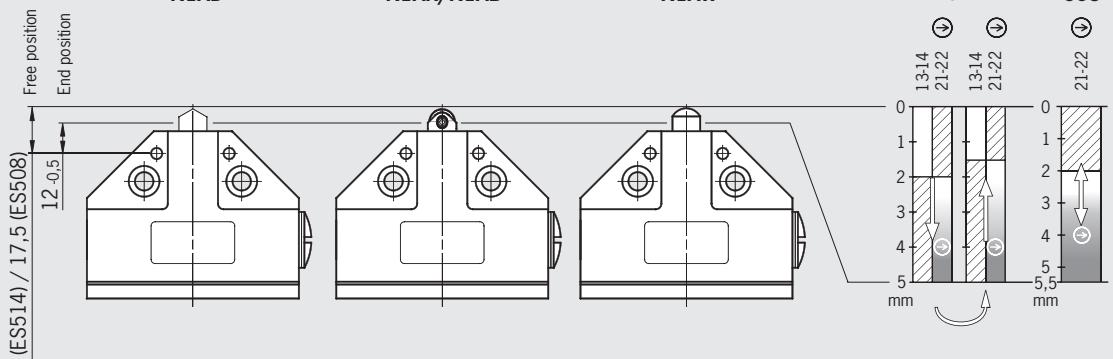
N1AD

N1AR/N1AB

N1AW

**514**

**508**



## Travel diagram, N1ARL



N1ARL

**514**

**508**



## Single limit switch NB01...

The technical data on switches and switching elements apply to all connections. Further technical data are given for the connection selected.



### Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B <sub>10d</sub>	2 x 10 <sup>7</sup> operating cycles	

### Switch

Parameter	Value	Unit
Housing material	Die-cast aluminum, anodized	
Ambient temperature	- 25 ... + 70	°C
Weight	Approx. 0.2	kg
Switching element	NB01D	NB01R
Approach speed, max. <sup>1)</sup> Depending on actuator	20	50
Operating point accuracy depending on actuator <sup>2)</sup>	± 0.02	± 0.05
		mm

### Switching element

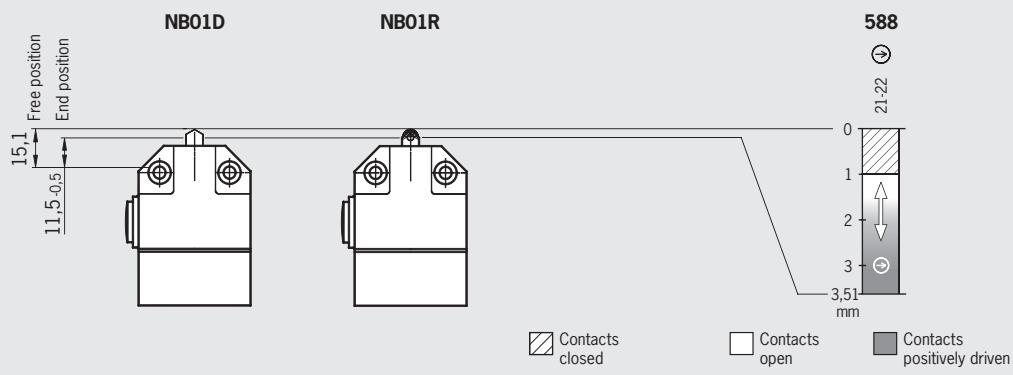
Parameter	Value	Unit
Switching principle	Slow-action switching contact	
Switching element with 1 switching contact	588 1 NC ⊖	
Mechanical life	10 x 10 <sup>6</sup> operating cycles	
Actuating force, min.	15	N
Min. switching current at 24 V DC	1	mA
Switching current max.	6	A
Rated impulse withstand voltage U <sub>imp</sub>	4	kV
Contact material	Silver alloy, gold flashed	

### Connection, cable entry M12 x 1.5

Parameter	Value	Unit
Connection	Screw terminal	
Version	M12 x 1.5	
Conductor cross-section, max.	Per flexible wire 1.5 mm <sup>2</sup>	
Degree of protection according to IEC 60529	IP 67	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Switching element	588	
Conventional thermal current I <sub>th</sub>	6	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	6	A gG
Utilization category according to IEC 60947-5-1	I <sub>e</sub> 4 A U <sub>e</sub> 230 V	
	I <sub>e</sub> 3 A U <sub>e</sub> 24 V	

1) The approach speed given applies in conjunction with EUCHNER trip dogs at an approach angle of 30°. At a smaller approach angle this approach speed can be exceeded.

## Travel diagram, NB01D/NB01R



## Position switches NZ...

The technical data on switches and switching elements apply to all connections. Further technical data are given for the connection selected.



### Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	$2 \times 10^7$ operating cycles	

Switch								
Parameter	Value						Unit	
Housing material	Anodized die-cast alloy							
Mechanical life	$30 \times 10^6$ operating cycles							
Ambient temperature	- 25 ... + 80						°C	
Weight	Approx. 0.3						kg	
Approach speed, min.	0.1						m/min	
Approach speed, max. <sup>1)</sup> Depending on actuator	HB	HS	PB	PS	RG, RL, RS	RK	WO	m/min
	300	60	120	30	20	50	10	
Actuating force, min.	15						N	

Switching element							
Parameter	Value						Unit
Switching principle	Snap-action	Slow-action switching contact					
Switching element with 2 switching contacts	511 1 NC ⊖ + 1 NO	528H 1 NC ⊖ + 1 NO	538H 2 NC ⊖				
Switching element with 4 switching contacts	-	2121H 4 NC ⊖	2131H 3 NC ⊖ + 1 NO	3131H 2 NC ⊖ + 2 NO			
Min. switching current at 24 V DC	1		1				mA
Switching current max.	6		4				A
Contact closing time	< 4		-				ms
Contact bounce time	< 3		-				ms
Rated impulse withstand voltage U <sub>imp</sub>	2.5						kV
Contact material	Silver alloy, gold flashed						

Connection, cable entry M20 x 1.5							
Parameter	Value						Unit
Connection	Screw terminal						
Version	M20 x 1.5						
Conductor cross-section, max.	Per flexible wire 1.5 mm <sup>2</sup>						
Degree of protection according to IEC 60529	IP 67						
Rated insulation voltage U <sub>i</sub>	250						V AC/DC
Switching element	Snap-action switching contact 511	Slow-action switching contact 528H, 538H, 2121H, 2131H, 3131H					
Conventional thermal current I <sub>th</sub>	6	4					A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	6	4					A gG
Utilization category according to IEC 60947-5-1	AC-12	Ie 10 A Ue 230 V	-				
	AC-15	Ie 6 A Ue 230 V	Ie 4 A Ue 230 V				
	DC-13	Ie 6 A Ue 24 V	Ie 4 A Ue 24 V				

1) The approach speed given applies in conjunction with EUCHNER trip dogs at an approach angle of 30°. At a smaller approach angle this approach speed can be exceeded.

## Connection, plug connector SVM 5 (M12)

Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin + PE), male socket adjustable (max. 270°) for elbow connector	
Degree of protection according to IEC 60529	IP 67 <sup>2)</sup>	
Rated insulation voltage U <sub>i</sub>	30	V AC/DC
Switching element	Snap-action switching contact <b>511</b> , Slow-action switching contact <b>528H, 538H</b>	
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	Ie 4 A Ue 30 V Ie 4 A Ue 24 V	
AC-15	Ie 4 A Ue 30 V	
DC-13	Ie 4 A Ue 24 V	

## Connection, plug connector SR6

Parameter	Value	Unit
Connection	Plug connector according to DIN 43651	
Version	SR6 (6-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>2)</sup>	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Switching element	Snap-action switching contact <b>511</b>	Slow-action switching contact <b>528H, 538H</b>
Conventional thermal current I <sub>th</sub>	6	4
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	6	4
Utilization category according to IEC 60947-5-1	Ie 6 A Ue 230 V Ie 6 A Ue 24 V	
AC-15	Ie 6 A Ue 230 V	
DC-13	Ie 6 A Ue 24 V	

## Connection, plug connector MR8

Parameter	Value	Unit
Connection	Plug connector	
Version	MR8 (7-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>2)</sup>	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Switching element	Slow-action switching contact <b>3131H</b>	
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	Ie 4 A Ue 230 V Ie 4 A Ue 24 V	
AC-15	Ie 4 A Ue 230 V	
DC-13	Ie 4 A Ue 24 V	

## Connection, plug connector MR9

Parameter	Value	Unit
Connection	Plug connector	
Version	MR9 (8-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>2)</sup>	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Switching element	Slow-action switching contact <b>2131H, 3131H</b>	
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	Ie 4 A Ue 230 V Ie 4 A Ue 24 V	
AC-15	Ie 4 A Ue 230 V	
DC-13	Ie 4 A Ue 24 V	

## Connection, plug connector MR10

Parameter	Value	Unit
Connection	Plug connector	
Version	MR10 (9-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>2)</sup>	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	Ie 4 A Ue 230 V Ie 4 A Ue 24 V	
AC-15	Ie 4 A Ue 230 V	
DC-13	Ie 4 A Ue 24 V	

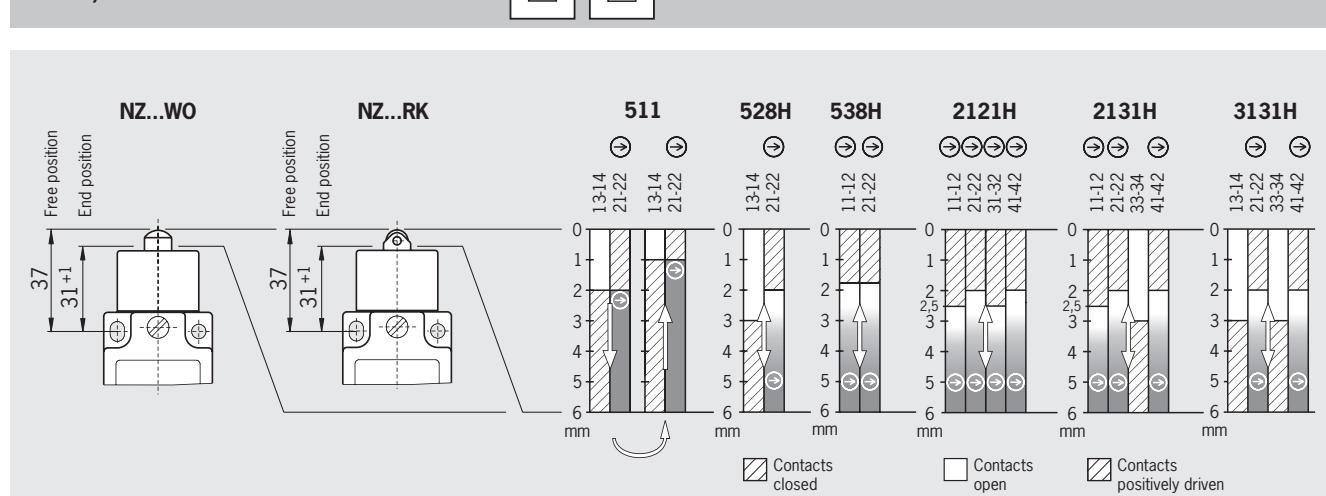
2) Screwed tight with the related plug connector (see page 120 and 123)

## Connection, plug connector SR11

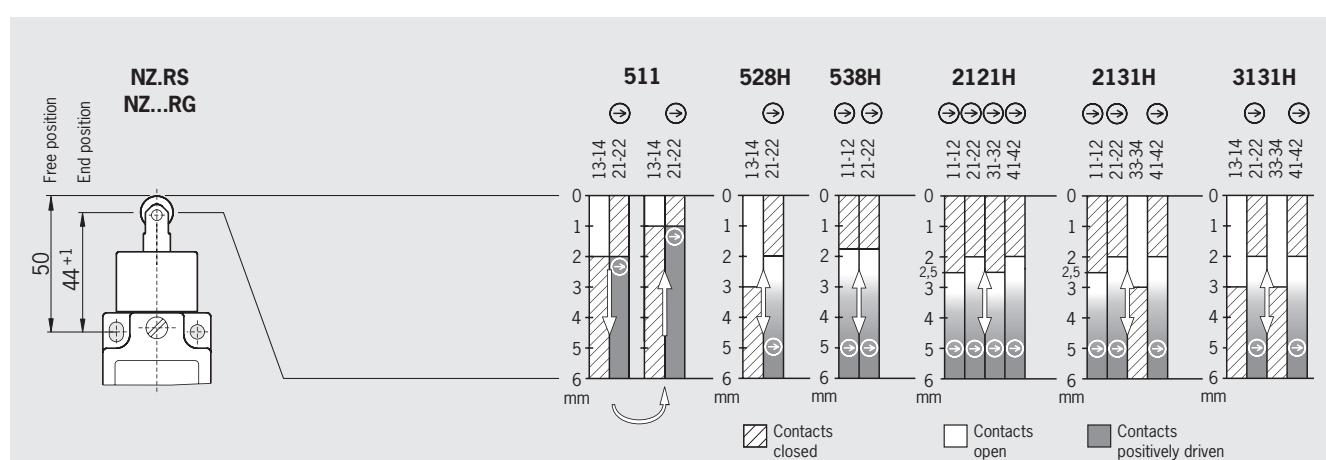
Parameter	Value	Unit
Connection	Plug connector	
Version	SR11 (11-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>2)</sup>	
Rated insulation voltage U <sub>i</sub>	50	V AC/DC
Switching element	Slow-action switching contact <b>2121H, 2131H, 3131H</b>	
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	AC-15	Ie 4 A Ue 50 V
	DC-13	Ie 4 A Ue 24 V

2) Screwed tight with the related plug connector (see page 120)

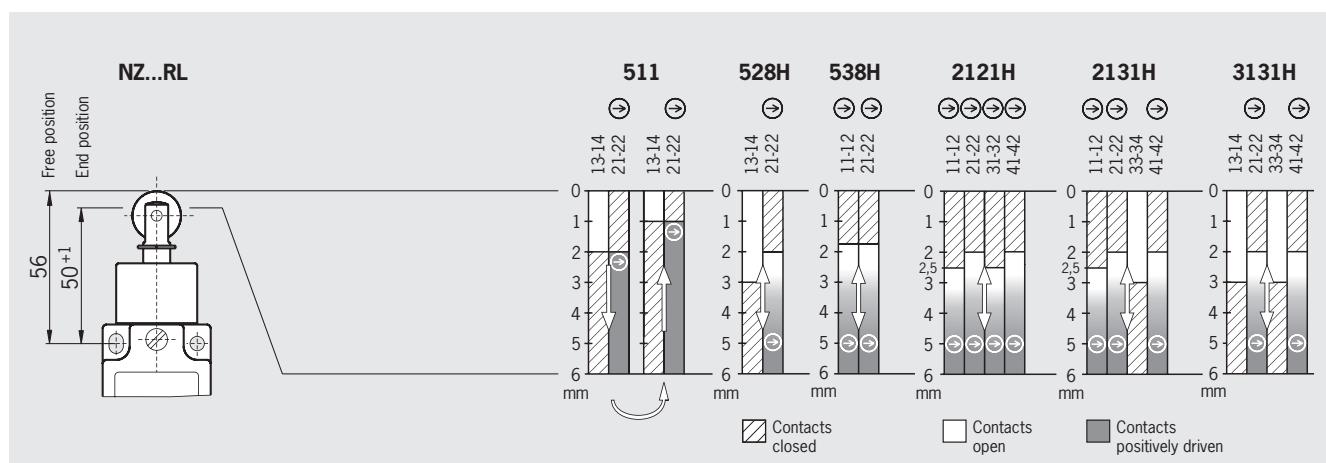
## Travel diagram, NZ.WO/NZ.RK



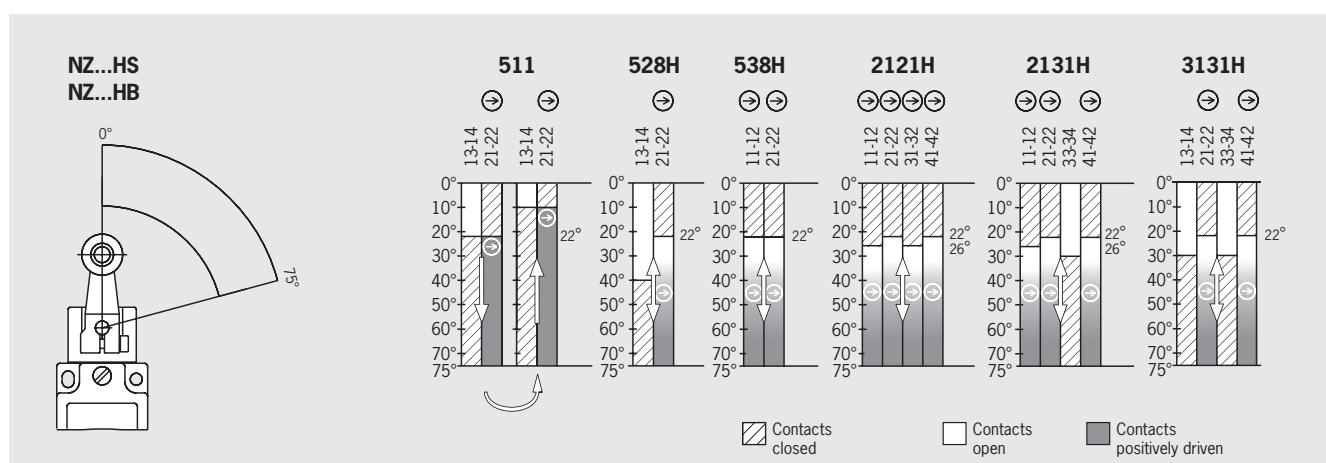
## Travel diagram, NZ.RS/NZ.RG



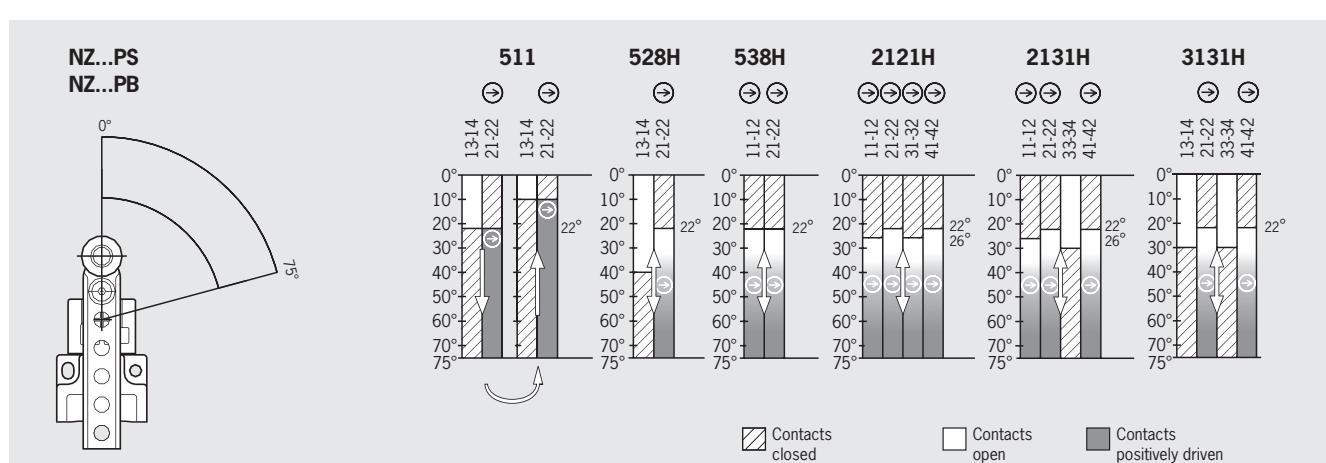
**Travel diagram,  
NZ.RL**



**Travel diagram,  
NZ.HS/NZ.HB**



**Travel diagram,  
NZ.PS/NZ.PB**



## Safety switch NZ.VZ

The technical data on switches and switching elements apply to all connections. Further technical data are given for the connection selected.



### Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B <sub>10d</sub>	4.5 x 10 <sup>6</sup> operating cycles	

### Switch



Parameter	Value	Unit
Housing material	Anodized die-cast alloy	
Mechanical life	2 x 10 <sup>6</sup> operating cycles	
Ambient temperature	- 25 ... + 80	°C
Weight	Approx. 0.3	kg
Approach speed, max.	20	m/min
Approach speed, min.	0.02 (for switching element ES511)	m/min
Actuating force	35	N
Extraction force	35	N
Retention force	8	N

### Switching element



Parameter	Value	Unit
Switching principle	Snap-action	
Switching element with 2 switching contacts	511 1 NC ⊖ + 1 NO	528H 1 NC ⊖ + 1 NO 538H 2 NC ⊖
Switching element with 4 switching contacts	-	2121H 4 NC ⊖ 2131H 3 NC ⊖ + 1 NO 3131H 2 NC ⊖ + 2 NO
Min. switching current at 24 V DC	1	1
Switching current max.	6	4
Contact closing time	< 4	ms
Contact bounce time	< 3	ms
Rated impulse withstand voltage U <sub>imp</sub>	2.5	kV
Contact material	Silver alloy, gold flashed	

### Connection, cable entry M20 x 1.5



Parameter	Value	Unit
Connection	Screw terminal	
Version	M20 x 1.5	
Conductor cross-section, max.	Per flexible wire 1.5 mm <sup>2</sup>	
Degree of protection according to IEC 60529	IP 67	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Switching element	Snap-action switching contact <b>511</b>	Slow-action switching contact <b>528H, 538H, 2121H, 2131H, 3131H</b>
Conventional thermal current I <sub>th</sub>	6	4
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	6	4
Utilization category according to IEC 60947-5-1	AC-12 AC-15 DC-13	Ie 10 A Ue 230 V Ie 6 A Ue 230 V Ie 6 A Ue 24 V
		- Ie 4 A Ue 230 V Ie 4 A Ue 24 V

**Connection, plug connector SVM 5 (M12)**

Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin + PE), male socket adjustable (max. 270°) for elbow connector	
Degree of protection according to IEC 60529	IP 67 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	30	V AC/DC
Switching element	Slow-action switching contact <b>538H</b>	
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	Ie 4 A U <sub>e</sub> 30 V DC-13	Ie 4 A U <sub>e</sub> 24 V

**Connection, plug connector C16-1**

Parameter	Value	Unit
Connection	Plug connector	
Version	C16-1 (6-pin + PE)	
Degree of protection according to IEC 60529	IP 67 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Switching element	Slow-action switching contact <b>538H</b>	
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	Ie 4 A U <sub>e</sub> 30 V DC-13	Ie 4 A U <sub>e</sub> 24 V

**Connection, plug connector SR6**

Parameter	Value	Unit
Connection	Plug connector according to DIN 43651	
Version	SR6 (6-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Switching element	Snap-action switching contact <b>511</b>	Slow-action switching contact <b>528H, 538H</b>
Conventional thermal current I <sub>th</sub>	6	4
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	6	4
Utilization category according to IEC 60947-5-1	Ie 6 A U <sub>e</sub> 230 V AC-15	Ie 4 A U <sub>e</sub> 230 V
	DC-13	Ie 6 A U <sub>e</sub> 24 V Ie 4 A U <sub>e</sub> 24 V

**Connection, plug connector MR8**

Parameter	Value	Unit
Connection	Plug connector	
Version	MR8 (7-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Switching element	Slow-action switching contact <b>2131H</b>	
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	Ie 4 A U <sub>e</sub> 230 V AC-15	Ie 4 A U <sub>e</sub> 230 V
	DC-13	Ie 4 A U <sub>e</sub> 24 V Ie 4 A U <sub>e</sub> 24 V

**Connection, plug connector MR9**

Parameter	Value	Unit
Connection	Plug connector	
Version	MR9 (8-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Switching element	Slow-action switching contact <b>2131H</b>	
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	Ie 4 A U <sub>e</sub> 230 V AC-15	Ie 4 A U <sub>e</sub> 230 V
	DC-13	Ie 4 A U <sub>e</sub> 24 V Ie 4 A U <sub>e</sub> 24 V

1) Screwed tight with the related plug connector (see page 119, 120, 123 and 124)

**Connection, plug connector MR10**

Parameter	Value	Unit
Connection	Plug connector	
Version	MR10 (9-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	I <sub>e</sub> 4 A U <sub>e</sub> 230 V	
	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	
AC-15		
DC-13		

**Connection, plug connector SR11**

Parameter	Value	Unit
Connection	Plug connector	
Version	SR11 (11-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	50	V AC/DC
Switching element	Slow-action switching contact <b>2121H, 2131H, 3131H</b>	
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	I <sub>e</sub> 4 A U <sub>e</sub> 50 V	
	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	
AC-15		
DC-13		

1) Screwed tight with the related plug connector (see page 120 and 123)

## Safety switches NZ.VZ.VS... with guard locking



The technical data on switches, switching elements and guard locking apply to all connections. Further technical data are given for the connection selected.

### Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B <sub>10d</sub>	4.5 x 10 <sup>6</sup> operating cycles	

### Switch



Parameter	Value	Unit
Housing material	Anodized die-cast alloy	
Mechanical life	2 x 10 <sup>6</sup> operating cycles	
Ambient temperature	- 25 ... + 80	°C
Weight	Approx. 0.7	kg
Approach speed, max.	20	m/min
Approach speed, min.	0.02 (for switching element ES511)	m/min
Actuating force	45	N
Extraction force	40	N
Retention force	35	N
Locking force, max.	2000	N
Locking force F <sub>Zh</sub> in acc. with GS-ET-19	1500	N

### Switching element



Parameter	Value	Unit
Switching principle	Snap-action	
Switching element with 2 switching contacts	511 1 NC ⊖ + 1 NO	528H 1 NC ⊖ + 1 NO
Switching element with 4 switching contacts	-	2131H 3 NC ⊖ + 1 NO
Min. switching current at 24 V DC	1	1
Switching current max.	6	4
Contact closing time	< 4	-
Contact bounce time	< 3	-
Rated impulse withstand voltage U <sub>imp</sub>	2.5	kV
Contact material	Silver alloy, gold flashed	

### Guard locking



Parameter	Value	Unit
Solenoid operating voltage	DC 24 V +10/-15%	
Connection	Switch mounted connector (2-pin + PE) according to 43650	
Conductor cross-section	For technical data on the solenoid plug see page 119	
Duty cycle	100	%
Power consumption	< 10	W

1) Use only solenoid plug with integrated rectifier

**Connection, cable entry M20 x 1.5**

Parameter	Value		Unit
Connection	Screw terminal		
Version	M20 x 1.5		
Conductor cross-section, max.	Per flexible wire 1.5 mm <sup>2</sup>		
Degree of protection according to IEC 60529	IP 67		
Rated insulation voltage U <sub>i</sub>	250		V AC/DC
Switching element	Snap-action switching contact <b>511</b>	Slow-action switching contact <b>528H, 538H, 2131H, 3131H</b>	
Conventional thermal current I <sub>th</sub>	6	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	6	4	A gG
Utilization category according to IEC 60947-5-1	AC-12 AC-15 DC-13	I <sub>e</sub> 10 A U <sub>e</sub> 230 V I <sub>e</sub> 6 A U <sub>e</sub> 230 V I <sub>e</sub> 6 A U <sub>e</sub> 24 V	I <sub>e</sub> 4 A U <sub>e</sub> 230 V I <sub>e</sub> 4 A U <sub>e</sub> 24 V

**Connection, plug connector SR6**

Parameter	Value		Unit
Connection	Plug connector according to DIN 43651		
Version	SR6 (6-pin + PE)		
Degree of protection according to IEC 60529	IP 65 <sup>2)</sup>		
Rated insulation voltage U <sub>i</sub>	250		V AC/DC
Switching element	Slow-action switching contact <b>528H, 538H</b>		
Conventional thermal current I <sub>th</sub>	4		A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4		A gG
Utilization category according to IEC 60947-5-1	AC-15 DC-13	I <sub>e</sub> 4 A U <sub>e</sub> 230 V I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

**Connection, plug connector SR11**

Parameter	Value		Unit
Connection	Plug connector		
Version	SR11 (11-pin + PE)		
Degree of protection according to IEC 60529	IP 65 <sup>2)</sup>		
Rated insulation voltage U <sub>i</sub>	50		V AC/DC
Switching element	Slow-action switching contact <b>2131H, 3131H</b>		
Conventional thermal current I <sub>th</sub>	4		A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4		A gG
Utilization category according to IEC 60947-5-1	AC-15 DC-13	I <sub>e</sub> 4 A U <sub>e</sub> 50 V I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

2) Screwed tight with the related plug connector (see page 120)

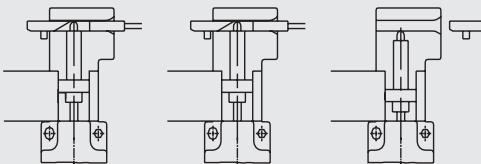
## Switching functions NZ.VZ.VS

Actuator:  
Switching position:

Inserted  
Locked

Inserted  
Not locked

Removed  
Not locked



**511**     $\ominus$  21  $\frac{1}{\text{H}} \text{ } 22$   
**528**     $13^{\circ} \text{ } \text{ } 14$

**538**     $\ominus$  21  $\frac{1}{\text{H}} \text{ } 22$   
 $\ominus$  11  $\frac{1}{\text{H}} \text{ } 12$

**2131**  $\ominus$  41  $\frac{1}{\text{H}} \text{ } 42$   
 $33^{\circ} \text{ } \text{ } 34$

$\ominus$  21  $\frac{1}{\text{H}} \text{ } 22$

$\ominus$  11  $\frac{1}{\text{H}} \text{ } 12$

**2131**  $\ominus$  41  $\frac{1}{\text{H}} \text{ } 42$   
 $33^{\circ} \text{ } \text{ } 34$

$\ominus$  21  $\frac{1}{\text{H}} \text{ } 22$   
 $13^{\circ} \text{ } \text{ } 14$

**2131**  $\ominus$  41  $\frac{1}{\text{H}} \text{ } 42$   
 $33^{\circ} \text{ } \text{ } 34$

$\ominus$  21  $\frac{1}{\text{H}} \text{ } 22$   
 $11^{\circ} \text{ } \text{ } 12$

**2131**  $\ominus$  41  $\frac{1}{\text{H}} \text{ } 42$   
 $33^{\circ} \text{ } \text{ } 34$

$\ominus$  21  $\frac{1}{\text{H}} \text{ } 22$   
 $13^{\circ} \text{ } \text{ } 14$

**Safety switch TZ with guard locking and guard lock monitoring**

The technical data on switches, switching elements and guard locking apply to all connections. Further technical data are given for the connection selected.

**Reliability values acc. to EN ISO 13849-1**

Parameter	Value	Unit
B <sub>10d</sub>	3 x 10 <sup>6</sup> operating cycles	

**Switch**

Parameter	Value	Unit
Housing material	Anodized die-cast alloy	
Mechanical life	1 x 10 <sup>6</sup> operating cycles	
Ambient temperature	- 25 ... + 80	°C
Weight	Approx. 1.2	kg
Approach speed, max.	20	m/min
Actuating force	35	N
Extraction force	30	N
Retention force	10	N
Locking force, max.	2000	N
Locking force F <sub>Zh</sub> in acc. with GS-ET-19	1500	N

**Switching element**

Parameter	Value	Unit
Switching principle	Slow-action switching contact	
Switching element with 2 switching contacts	SK: 528H / ÜK: 528H 1 NC ⊕ + 1 NO / 1 NC ⊖ + 1 NO	
Switching element with 4 switching contacts	SK: 2131H / ÜK: 3131H 3 NC ⊕ + 1 NO / 2 NC ⊖ + 2 NO	SK: 2121H / ÜK: 2121H 4 NC ⊖ / 4 NC ⊕
Min. switching current at 24 V DC	1	mA
Rated impulse withstand voltage U <sub>imp</sub>	2.5	kV
Contact material	Silver alloy, gold flashed	

**Guard locking**

Parameter	Value	Unit
Solenoid operating voltage	AC/DC 24 V +10/-15%	
Duty cycle	100	%
Power consumption	10	W

**Connection, cable entry M20 x 1.5**

Parameter	Value	Unit
Connection	Screw terminal	
Version	M20 x 1.5	
Conductor cross-section, max.	Per flexible wire 1.5 mm <sup>2</sup>	
Degree of protection according to IEC 60529	IP 67	IP 65: With escape release TZ...C1815, TZ...C1828 With emergency release TZ...C1816, TZ...C1823
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	AC-15	Ie 4 A Ue 230 V
	DC-13	Ie 4 A Ue 24 V

**Connection, plug connector RC18**

Parameter	Value	Unit
Connection	Plug connector	
Version	RC18 (18-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	110	V AC/DC
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	I <sub>e</sub> 4 A U <sub>e</sub> 110 V	
	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

**Connection, plug connector SR6**

Parameter	Value	Unit
Connection	Plug connector according to DIN 43651	
Version	SR6 (6-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	I <sub>e</sub> 4 A U <sub>e</sub> 230 V	
	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

**Standard wiring TZ...SR6**

The green LED indicates the state of the safety circuit and the red LED the state of the monitoring circuit.

**Green only:** Safety circuit closed

**Red only:** Actuator unlocked, safety circuit open

The exact states of the safety circuit and the actuator can be seen in the adjacent table for the safety switch TZ...SR6.

LED		Actuator		Safety circuit	
Red	Green	Locked	Unlocked	Closed	Open
ON	ON		X	X	
ON	OFF		X		X
OFF	ON	X		X	
OFF	OFF			Not defined or no power	

**Connection, plug connector SR11**

Parameter	Value	Unit
Connection	Plug connector	
Version	SR11 (11-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	50	V AC/DC
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	I <sub>e</sub> 4 A U <sub>e</sub> 50 V	
	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

**Connection, plug connector MR8**

Parameter	Value	Unit
Connection	Plug connector	
Version	MR8 (7-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	I <sub>e</sub> 4 A U <sub>e</sub> 230 V	
	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

**Connection, plug connector MR10**

Parameter	Value	Unit
Connection	Plug connector	
Version	MR10 (9-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	I <sub>e</sub> 4 A U <sub>e</sub> 230 V	
	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

1) Screwed tight with the related plug connector (see page 120, 121 and 123)

## Connection, plug connector MR12

Parameter	Value	Unit
Connection	Plug connector	
Version	MR12 (11-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	230	V AC/DC
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	I <sub>e</sub> 4 A U <sub>e</sub> 60 V	
	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

1) Screwed tight with the related plug connector (see page 123)

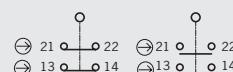
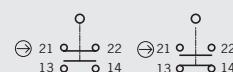
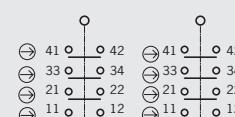
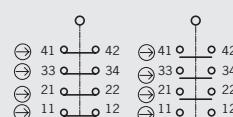
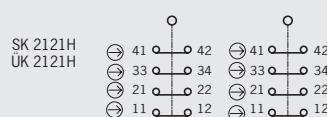
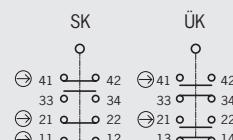
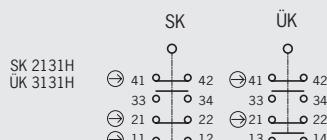
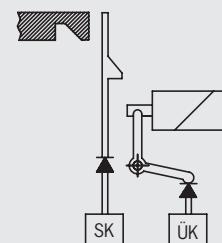
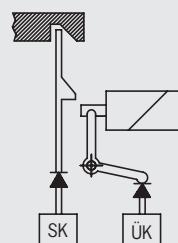
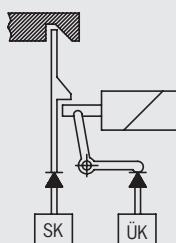
## Switching functions TZ

Actuator:  
Switching position:

Inserted  
Locked

Inserted  
Not locked

Removed  
Not locked



## Safety switch NX



The technical data on switches and switching elements apply to all connections. Further technical data are given for the connection selected.

### Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B <sub>10d</sub>	4.5 x 10 <sup>6</sup> operating cycles	

### Switch



Parameter	Value		Unit
Housing material	Die-cast alloy, cathodically dipped		
Mechanical life	2 x 10 <sup>6</sup> operating cycles		
Ambient temperature	- 20 ... + 80		°C
Weight	Approx. 0.4		kg
Approach speed, max.	20		m/min
Actuating force	40		N
Extraction force	50		N
Retention force	10		N
Insertion depth	Standard actuator	Overtravel actuator	
Required insertion depth S <sub>min.</sub>	32	32	mm
Maximum insertion depth S <sub>max.</sub>	33	40	mm
Actuator travel (in the locked state)	6	13	mm

### Switching element



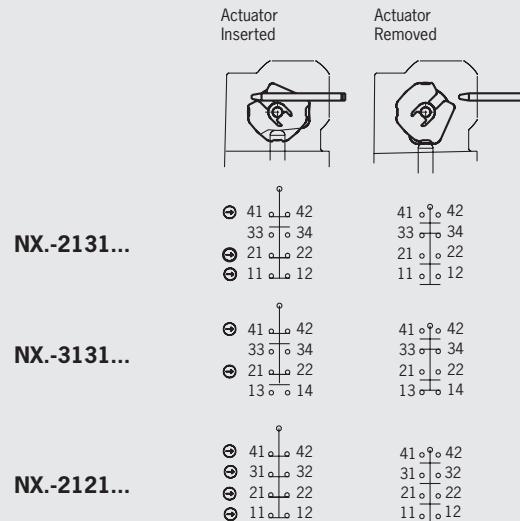
Parameter	Value			Unit
Switching principle	Slow-action switching contact			
Switching element with 4 switching contacts	2121 4 NC ⊖	2131 3 NC ⊖ + 1 NO	3131 2 NC ⊖ + 2 NO	
Min. switching current at 24 V DC	1			mA
Switching voltage, min., at 10 mA	12			V
Contact material	Silver alloy, gold flashed			

### Connection, cable entry M20 x 1.5



Parameter	Value		Unit
Connection	Screw terminal		
Version	M20 x 1.5		
Conductor cross-section	0.34 ... 1.5		mm <sup>2</sup>
Degree of protection according to IEC 60529	IP 67		
Rated insulation voltage U <sub>i</sub>	250		V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>	2.5		kV
Conventional thermal current I <sub>th</sub>	4		A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4		A gG
Utilization category according to IEC 60947-5-1	Ie 4 A Ue 230 V DC-13	Ie 4 A Ue 24 V	

## Switching functions NX



## Safety switch TX... with guard locking and guard lock monitoring



The technical data on switches, switching elements and guard locking apply to all connections. Further technical data are given for the connection selected.

### Reliability values acc. to EN ISO 13849-1

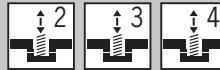
Parameter	Value	Unit
B <sub>10d</sub>	6 x 10 <sup>6</sup> operating cycles	

### Switch



Parameter	Value	Unit
Housing material	Die-cast alloy, cathodically dipped	
Mechanical life	> 1 x 10 <sup>6</sup> operating cycles	
Ambient temperature	- 20 ... + 80	°C
Weight	Approx. 0.8	kg
Approach speed, max.	20	m/min
Actuating force	35	N
Extraction force	35	N
Retention force	20	N
Locking force, max.	1700	N
Locking force F <sub>Zh</sub> in acc. with GS-ET-19	1300	N
Insertion depth	Standard actuator	Overtravel actuator
Required insertion depth S <sub>min</sub> .	32	32
Maximum insertion depth S <sub>max</sub> .	33	40
Actuator travel (in the locked state)	6	13

### Switching element



Parameter	Value	Unit
Switching principle	Slow-action switching contact	
Switching element with 4 switching contacts	ETX B      ETX C      ETX D 2 NC ⊖ + 1 NO + 1 NC    2 NC ⊖ + 1 NO + 1 NO    2 NC ⊖ + 2 NC ⊖	
Min. switching current at 24 V DC	1	mA
Switching voltage, min., at 10 mA	12	V
Contact material	Silver alloy, gold flashed	

### Guard locking



Parameter	Value	Unit
Solenoid operating voltage	AC/DC 24 V +10/-15%    AC 110 V +10/-15% <sup>1)</sup> AC 230 V +10/-15% <sup>1)</sup>	
Connection	Reverse polarity protected, integrated bridge rectifier	
Duty cycle	100	%
Power consumption	10	W

### Connection, cable entry M20 x 1.5



Parameter	Value	Unit
Connection	Screw terminal	
Version	M20 x 1.5	
Conductor cross-section	0.34 ... 1.5	mm <sup>2</sup>
Degree of protection according to IEC 60529	IP 67	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>	2.5	kV
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	Ie 4 A U <sub>e</sub> 230 V DC-13	Ie 4 A U <sub>e</sub> 24 V

## Connection, cable entry NPT 1/2"

Parameter	NPT 1/2"	Value	Unit
Connection		Screw terminal	
Version		NPT 1/2"	
Conductor cross-section, max.		0.34 ... 1.5 mm <sup>2</sup>	
Degree of protection according to IEC 60529		IP 67	
Rated insulation voltage U <sub>i</sub>		250	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>		2.5	kV
Conventional thermal current I <sub>th</sub>		4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)		4	A gG
Utilization category according to IEC 60947-5-1	AC-15	I <sub>e</sub> 4 A U <sub>e</sub> 230 V	
	DC-13	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

## Connection, plug connector SVM 5 (M12)

Parameter	5-pol	Value	Unit
Connection		Plug connector	
Version		M12 (4-pin + PE), male socket adjustable (max. 270°) for elbow connector	
Degree of protection according to IEC 60529		IP 67 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>		30	V AC/DC
Conventional thermal current I <sub>th</sub>		4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)		4	A gG
Utilization category according to IEC 60947-5-1	AC-15	I <sub>e</sub> 4 A U <sub>e</sub> 30 V	
	DC-13	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

1) Screwed tight with the related plug connector

## Connection, plug connector BH10

Parameter	10-pol	Value	Unit
Connection		Plug connector	
Version		BH10 (9-pin + PE)	
Degree of protection according to IEC 60529		IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>		50	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>		2.5	kV
Conventional thermal current I <sub>th</sub>		4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)		4	A gG
Utilization category according to IEC 60947-5-1	AC-15	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	
	DC-13	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

1) Screwed tight with the related plug connector

## Connection, plug connector BH12

Parameter	12-pol	Value	Unit
Connection		Plug connector	
Version		BH12 (11-pin + PE)	
Degree of protection according to IEC 60529		IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>		50	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>		2.5	kV
Conventional thermal current I <sub>th</sub>		4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)		4	A gG
Utilization category according to IEC 60947-5-1	AC-15	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	
	DC-13	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

1) Screwed tight with the related plug connector

## Connection, plug connector SR11

Parameter	12-pol	Value	Unit
Connection		Plug connector	
Version		SR11 (11-pin + PE)	
Degree of protection according to IEC 60529		IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>		50	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>		1.5	kV
Conventional thermal current I <sub>th</sub>		4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)		4	A gG
Utilization category according to IEC 60947-5-1	AC-15	I <sub>e</sub> 4 A U <sub>e</sub> 50 V	
	DC-13	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	

1) Screwed tight with the related plug connector (see page 120 and 123)

**Connection, plug connector RC18**

Parameter	Value	Unit
Connection	Plug connector	
Version	RC18 (18-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	50	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>	2.5	kV
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	
	DC-13	I <sub>e</sub> 4 A U <sub>e</sub> 24 V

1) Screwed tight with the related plug connector (see page 121)

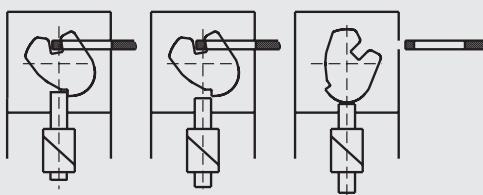
**Switching functions TX**

Actuator:  
Switching position:

Inserted  
Locked

Inserted  
Not locked

Removed  
Not locked



ETX B
⊕ 41  42
33  34
⊕ 21  22
11  12

ETX C
⊕ 41  42
33  34
⊕ 21  22
13  14

ETX D
⊕ 41  42
31  32
⊕ 21  22
11  12

**Switching characteristics safety switch TX3... (mechanical guard locking)**

The application of a voltage  $U_B$  /  $U_S$  when the actuator is not inserted does not produce **any** change in the state of the switching element.

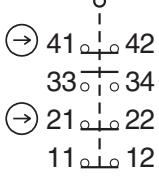
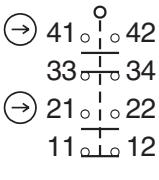
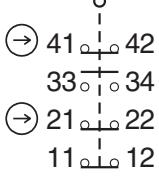
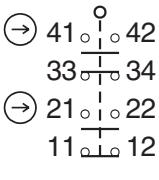
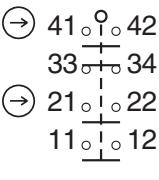
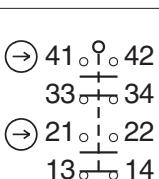
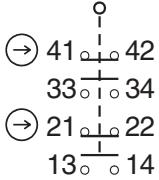
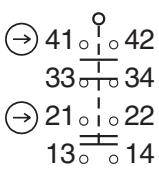
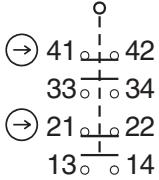
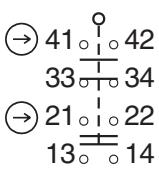
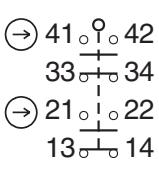
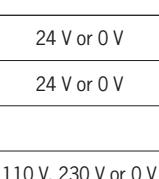
**Solenoid operating voltage  $U_B$** 

On versions TX...110 and TX...230 release is performed using the voltage  $U_B$ .  
A control voltage  $U_S$  is not necessary.

**Control voltage  $U_S$** 

On the version TX...24 an additional control voltage  $U_S$  is only required if  $U_B$  cannot supply the required current of 2 A for  $T_{IMP} = 250$  ms when the solenoid is switched on.  
Otherwise, the connection terminals  $U_S$  and  $U_B$  must be bridged on the version TX...24.

**Safety switch TX3... with door monitoring contact (mechanical guard locking)**

Switching element		Actuator inserted		Actuator removed	
		Locked	Not locked		
	ETX B	 	 	 	
	ETX C	 	 	 	
Switch design	TX3...24	Control voltage $U_S$	0 V	24 V	
		Operating voltage $U_B$	0 V	24 V or 0 V	
	TX3...110 / TX3...230	Control voltage $U_S$	Not connected		
		Operating voltage $U_B$	0 V	110 V or 230 V	110 V, 230 V or 0 V

## Safety switch SGA



The technical data on switches and switching elements apply to all connections. Further technical data are given for the connection selected.

### Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B <sub>10d</sub>	3 x 10 <sup>6</sup> operating cycles	

### Switch



Parameter	Value	Unit
Housing material	Anodized die-cast	
Mechanical life	2 x 10 <sup>6</sup> operating cycles	
Ambient temperature	- 20 ... + 80	°C
Weight	Approx. 0.275	kg
Approach speed, max.	20	m/min
Actuating force	25	N
Extraction force	25	N
Retention force	10	N
Insertion depth (minimum required travel + permissible overtravel)	Actuator S standard	
Approach direction side (h)	24.5 + 5	mm
Approach direction from top (v)	24.5 + 5	mm

### Switching element



Parameter	Value	Unit
Switching principle	Slow-action switching contact	
Switching element with 4 switching contacts	<b>2121</b> 4 NC ⊖	<b>2131</b> 3 NC ⊖ + 1 NO
Min. switching current at 24 V DC	1	mA
Switching voltage, min., at 10 mA	12	V
Contact material	Silver alloy, gold flashed	

### Connection, cable entry M20 x 1.5



Parameter	Value	Unit
Connection	Screw terminal	
Version	M20 x 1.5	
Conductor cross-section	0.34 ... 1.5	mm <sup>2</sup>
Degree of protection according to IEC 60529	IP 67	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>	2.5	kV
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	AC-15 DC-13	I <sub>e</sub> 4 A U <sub>e</sub> 230 V I <sub>e</sub> 4 A U <sub>e</sub> 24 V

**Connection, plug connector SR11**

Parameter	Value	Unit
Connection	Plug connector	
Version	SR11 (11-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	50	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>	1.5	kV
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	I <sub>e</sub> 4 A U <sub>e</sub> 50 V	
	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	
DC-13		

1) Screwed tight with the related plug connector (see page 120)

**Connection, plug connector RC18**

Parameter	Value	Unit
Connection	Plug connector	
Version	RC18 (18-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	50	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>	2.5	kV
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	
	I <sub>e</sub> 4 A U <sub>e</sub> 24 V	
DC-13		

1) Screwed tight with the related plug connector (see page 121)

## Safety switch STA... with guard locking and guard lock monitoring



The technical data on switches, switching elements and guard locking apply to all connections. Further technical data are given for the connection selected.

### Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B <sub>10d</sub>	1.2 x 10 <sup>7</sup> operating cycles	

### Switch

Parameter	Value	Unit
Housing material	Anodized die-cast	
Mechanical life	1 x 10 <sup>6</sup> operating cycles	
Ambient temperature	- 20 ... + 80	°C
Weight	Approx. 0.6	kg
Approach speed, max.	20	m/min
Actuating force	35	N
Extraction force (no locked)	30	N
Retention force	20	N
Locking force, max.	Approach direction	
	From top (v)	Side (h)
	3000	3000
Locking force F <sub>zh</sub> in acc. with GS-ET-19	Approach direction	
	From top (v)	Side (h)
	2300	2300
Insertion depth (minimum required travel + permissible overtravel)	Actuator S standard	Actuator L for insertion funnel
Approach direction side (h)	24.5 + 5	28.5 + 5
Approach direction from top (v)	24.5 + 5	28.5 + 5

### Switching element

Parameter	Value	Unit
Switching principle	Slow-action switching contact	
Switching element with 4 switching contacts	2131      4121      4131      4141 2 NC ⊕ + 1 NO + 1 NC    2 NC ⊖ + 1 NC + 1 NO    2 NC ⊖ + 2 NO    2 NC ⊖ + 2 NC ⊖	
Min. switching current at 24 V DC	1	mA
Switching voltage, min., at 10 mA	12	V
Contact material	Silver alloy, gold flashed	

### Guard locking

Parameter	Value	Unit
Solenoid operating voltage	AC/DC 24 V +10/-15%	
Connection	Reverse polarity protected, integrated bridge rectifier	
Duty cycle	100	%
Power consumption	8	W

### Connection, cable entry M20 x 1.5

Parameter	Value	Unit
Connection	Screw terminal	
Version	M20 x 1.5	
Conductor cross-section	0.34 ... 1.5	mm <sup>2</sup>
Degree of protection according to IEC 60529	IP 67	
Rated insulation voltage U <sub>i</sub>	250	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>	2.5	kV
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	AC-15      DC-13	Ie 4 A Ue 230 V      Ie 4 A Ue 24 V

## Connection, plug connector SR11

Parameter	Value	Unit
Connection	Plug connector	
Version	SR11 (11-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	50	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>	1.5	kV
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	Ie 4 A U <sub>e</sub> 50 V	
	Ie 4 A U <sub>e</sub> 24 V	
AC-15		
DC-13		

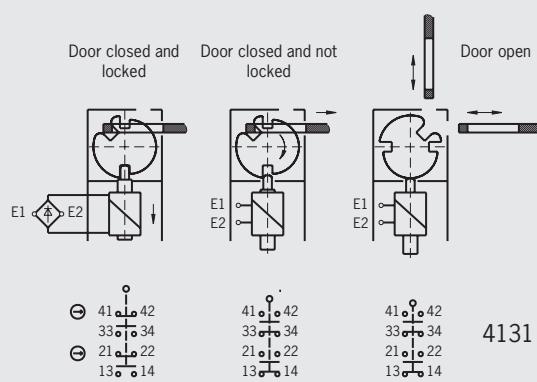
1) Screwed tight with the related plug connector (see page 120)

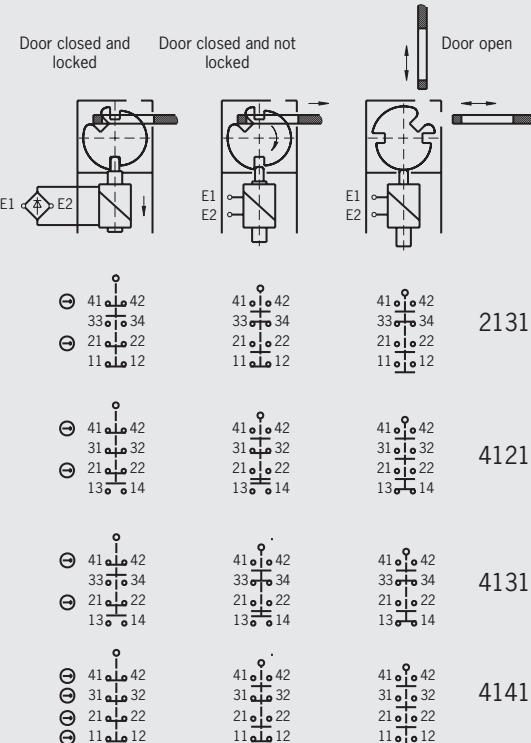
## Connection, plug connector RC18

Parameter	Value	Unit
Connection	Plug connector	
Version	RC18 (18-pin + PE)	
Degree of protection according to IEC 60529	IP 65 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	110	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>	2.5	kV
Conventional thermal current I <sub>th</sub>	4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	4	A gG
Utilization category according to IEC 60947-5-1	Ie 4 A U <sub>e</sub> 110 V	
	Ie 4 A U <sub>e</sub> 24 V	
AC-15		
DC-13		

1) Screwed tight with the related plug connector (see page 121)

## Switching functions STA1/STA2 without door monitoring contact



**Switching functions STA3/STA4  
with door monitoring contact**

## Safety switch STA-TW with guard locking and guard lock monitoring



The technical data on switches, switching elements and guard locking apply to all connections. Further technical data are given for the connection selected.

### Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B <sub>10d</sub>	4.5 x 10 <sup>6</sup> operating cycles	

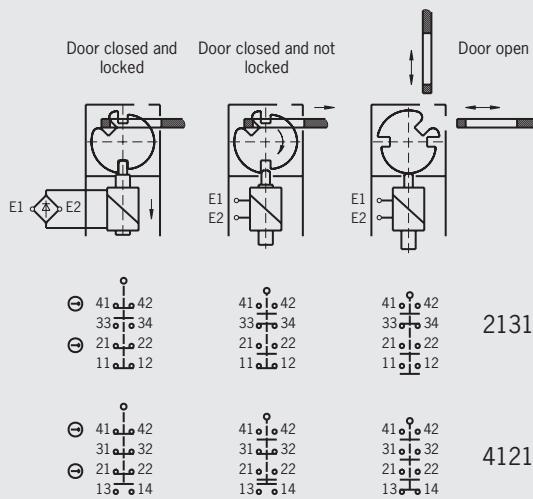
Switch		Value	Unit
Housing material	Housing	Anodized die-cast	
	Actuating heads	Die-cast aluminum	
	Cam in actuating head	Stainless steel	
Mechanical life		1 x 10 <sup>6</sup> operating cycles	
Ambient temperature		- 20 ... + 55	°C
Weight		Approx. 0.62	kg
Approach speed, max.		20	m/min
Actuating force		35	N
Extraction force (no locked)		30	N
Retention force		20	N
Locking force, max.		Approach direction	
	From top (v)	Side (h)	
	2500	2500	
Locking force F <sub>Zh</sub> in acc. with GS-ET-19		Approach direction	
	From top (v)	Side (h)	
	2000	2000	
Insertion depth (minimum required travel + permissible overtravel)		Actuator S standard	
Approach direction side (h)		24.5 + 5	mm
Approach direction from top (v)		24.5 + 5	mm

Switching element		Value	Unit
Switching principle		Slow-action switching contact	
Switching element with 4 switching contacts	2131	4121	
	2 NC ⊕ + 1 NO + 1 NC	2 NC ⊕ + 1 NC + 1 NO	
Min. switching current at 24 V DC		1	mA
Switching voltage, min., at 10 mA		12	V
Contact material		Silver alloy, gold flashed	

Guard locking		Value	Unit
Solenoid operating voltage		AC/DC 24 V +10/-15%	
Connection		Reverse polarity protected, integrated bridge rectifier	
Duty cycle		100	%
Power consumption		8	W

Connection, cable entry M20 x 1.5		Value	Unit
Connection		Screw terminal	
Version		M20 x 1.5	
Conductor cross-section		0.34 ... 1.5	mm <sup>2</sup>
Degree of protection according to IEC 60529		IP 67	
Rated insulation voltage U <sub>i</sub>		250	V AC/DC
Rated impulse withstand voltage U <sub>imp</sub>		2.5	kV
Conventional thermal current I <sub>th</sub>		4	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)		4	A gG
Utilization category according to IEC 60947-5-1	AC-15	Ie 4 A Ue 230 V	
	DC-13	Ie 4 A Ue 24 V	

## Switching functions STA-TW



## Safety hinge ESH



The technical data on switches and switching elements apply to all connections. Further technical data are given for the connection selected.

### Reliability values acc. to EN ISO 13849-1

Parameter	Value	Unit
B10d	2 x 10 <sup>6</sup> operating cycles	

### Switch



Parameter	Value	Unit
Housing material	Die-cast zinc	
Ambient temperature	- 25 ... + 70	°C
Weight	Approx. 0.77	kg
Pivoting angle	- 10 ... 180	°
Max. load as per mechanical life test acc. to EN 1935	Grade 12 (100 kg door weight)	m/min

### Switching element



Parameter	Value	Unit
Switching principle	Slow-action switching contact	
Switching element with 2 switching contacts	20 2 NC ⊖      11 1 NC ⊖ + 1 NO	
Mechanical life	1 x 10 <sup>6</sup> operating cycles	
Operating point	4° from fixing point	
Positively driven	Approx. 10° from fixing point	
Actuation frequency	max. 1200/h	
Degree of contamination (external, according to EN 60947)	3 (industrial)	
Min. switching current at 24 V DC	1	mA
Rated impulse withstand voltage U <sub>imp</sub>	2.5	kV
Contact material	Silver alloy	

### Connection, plug connector SVM 5 (M12)



Parameter	Value	Unit
Connection	Plug connector	
Version	M12 (4-pin + PE)	
Degree of protection according to IEC 60529	IP 67 <sup>1)</sup>	
Rated insulation voltage U <sub>i</sub>	60	V AC/DC
Conventional thermal current I <sub>th</sub>	3	A
Short circuit protection acc. to IEC 60269-1 (control circuit fuse)	2	A gG
Utilization category according to IEC 60947-5-1	Ie 1.5 A Ue 30 V	
	DC-13	Ie 2 A Ue 24 V

1) Screwed tight with the related plug connector

## Accessories for safety switches

### Solenoid plug



Parameter	Value	Unit
Housing material	Plastic	
Number of pins	3 (2 + PE)	
Nominal voltage max.	240	V AC/DC
Degree of protection according to IEC 60529 (inserted)	IP 65	
Connection	Pillar terminals and tab terminals	

### SS4



Parameter	Value	Unit
Housing material	Brass matt chromium plated	
Number of pins	4 (3 + PE)	
Cable diameter	6 - 8	mm
Nominal voltage max.	250	V AC/DC
Degree of protection according to IEC 60529 (inserted)	IP 67	
Connection	Soldered connections	

### SR6



Parameter	Value	Unit
Housing material	Plastic	
Number of pins	7 (6 + PE)	
Cable diameter	7 - 9	mm
Nominal voltage max.	250	V AC/DC
Degree of protection according to IEC 60529 (inserted)	IP 65	
Connection	Crimp contacts 0.5 to 1.5 mm <sup>2</sup>	

### SR11



Parameter	Value	Unit
Housing material	Plastic	
Number of pins	12 (11 + PE)	
Cable diameter	8 - 10	mm
Nominal voltage max.	50	V AC/DC
Degree of protection according to IEC 60529 (inserted)	IP 65	
Connection	Crimp contacts 0.5 to 1.5 mm <sup>2</sup>	

### RC12



Parameter	Value	Unit
Housing material	Metal	
Number of pins	12	
Cable diameter	10.5	mm
Nominal voltage max.	150	V AC/DC
Degree of protection according to IEC 60529 (inserted)	IP 67	
Connection	12 crimp contacts 0.75 to 1.0 mm <sup>2</sup>	

### RC18



Parameter	Value	Unit
Housing material	Metal	
Number of pins	19 (18 + PE)	
Cable diameter	10 - 14	mm
Nominal voltage max.	32	V AC/DC
Degree of protection according to IEC 60529 (inserted)	IP 65	
Connection	19 crimp contacts 0.75 to 1.0 mm <sup>2</sup>	

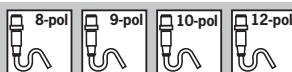
### RC18..C1825



Parameter	Value	Unit
Housing material	Metal	
Number of pins	19 (18 + PE)	
Cable diameter	10 - 14	mm
Nominal voltage max.	32	V AC/DC
Degree of protection according to IEC 60529 (inserted)	IP 65	
Connection	16 crimp contacts 0.38 to 0.5 mm <sup>2</sup> 3 crimp contacts 0.75 to 1.0 mm <sup>2</sup>	

**M12 with cable (SGLF, SWLF)**

Parameter	Value	Unit
Housing material	Metal / plastic	
Number of pins	5	
Nominal voltage max.	30	V AC/DC
Degree of protection according to IEC 60529 (inserted)	IP 68	
Connection	5 open cable ends	

**M8/MR9/MR10/MR12 with cable**

Parameter	Value	Unit
Housing material	PVC/PUR	
Number of pins	8 / 9 / 10 / 12	
Nominal voltage max.	300	V AC/DC
Degree of protection according to IEC 60529 (inserted)	IP 67	
Connection	Plug connector / flying leads	

## Safety precautions

Safety switches perform a personal protection function. Incorrect installation or tampering can lead to severe injuries to personnel.

Prior to installation, use and maintenance, it is imperative that you read the operating instructions. Also take into account the following points:

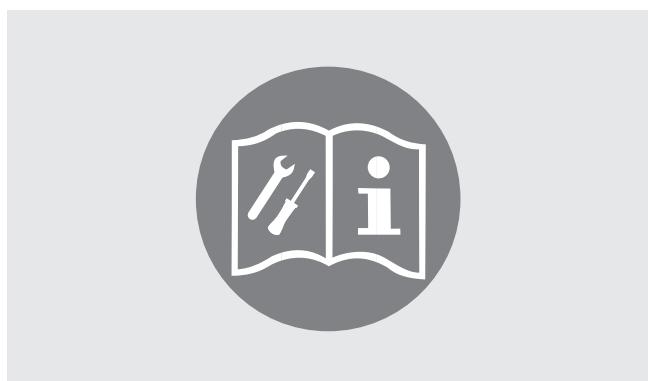
- ▶ Safety switches must **not** be bypassed (bridging of contacts), turned away, removed or otherwise rendered ineffective.
- ▶ The switching operation on safety switches with separate actuator must only be triggered by actuators specifically provided for this purpose which are permanently connected to the safety guard.
- ▶ Mounting and electrical connection must be performed only by authorized personnel.
- ▶ Safety switches and actuators must not be used as an end stop.
- ▶ Switching elements are not allowed to be replaced on safety switches.
- ▶ Series NZ.VZ.VS and TZ safety switches with locking solenoids are not allowed to be used in potentially explosive atmospheres.
- ▶ If damaged or worn, safety switches must be replaced as a unit.



## Notes on installation

### Safety switches with safety function

- ▶ To obtain the direct opening travel, the trip dog setting distance shown in the dimension drawing must be observed (see technical data, travel diagrams). Actuating elements, e. g. cam approach guides, must be positively mounted according to EN 1088, i.e. riveted, welded or secured in some other way against becoming loose.
- ▶ Safety switches must not be used as an end stop. It must be ensured that the safety switch does not move after adjustment.
- ▶ It must be possible to replace safety switches without the need for re-adjustment.



### Safety switches with separate actuator

- ▶ The safety switch and actuator must be installed properly. The actuator must be positively mounted, e. g. by using safety screws (are included with the actuator) or by welding, riveting, or pinning.
- ▶ Safety switches must not be used as an end stop. Safety switches must be mounted such that they can be replaced.
- ▶ A hazard analysis must be prepared as per the Machinery Directive. The hazardous point must be classified with the aid of type C standards or EN 954-1 or its successor. Safety switches must be chosen to match this classification and the information given in DIN EN 1088.

## Overview of the most important standards on machinery safety

<b>Type A standards</b>		
(EN 292-1) withdrawn	ISO 12100-1	Safety of machinery. Basic concepts, general principles for design. Part 1: Basic terminology, methodology
(EN 292-2) withdrawn	ISO 12100-2	Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles
EN 1050	ISO/DIS 14121	Safety of machinery. Principles for risk assessment
<b>Type B standards</b>		
EN 294		Safety of machinery. Safety distances to prevent danger zones being reached by the upper limbs
EN 418		Safety of machinery. Emergency stop equipment, functional aspects. Principles for design
EN 547-1		Safety of machinery. Human body measurements. Part 1: Principles for determining the dimensions required for openings for whole body access into machinery
EN 574		Safety of machinery. Two-hand control circuits. Functional aspects. Principles for design
EN 811		Safety of machinery. Safety distances to prevent danger zones being reached by the lower limbs
EN 953		Safety of machinery. Guards. General requirements for the design and construction of fixed and movable guards
EN 954-1	ISO 13849-1	Safety of machinery. Safety related parts of control systems. Part 1: General principles for design
EN 954-2	ISO 13849-2	Safety of machinery. Safety related parts of control systems. Part 2: Validation
EN 954-100		Sicherheit von Maschinen – Sicherheitsbezogene Teile von Steuerungen – Leitfaden für Benutzung und Anwendung der EN 954-1 (Safety of machinery. Safety related parts of control systems. Guidelines on the use and application of EN 954-1)
EN 999		Safety of machinery. The positioning of protective equipment in respect of approach speeds of parts of the human body
EN 1037		Safety of machinery. Prevention of unexpected start-up
EN 1088		Safety of machinery. Interlocking devices associated with guards. Principles for design and selection.
EN 60204-1	IEC 60204-1	Safety of machinery. Electrical equipment of machines. Part 1: General requirements
EN 60204-11	IEC 60204-11	Safety of machinery. Electrical equipment of machines. Part 11: Requirements for HV equipment for voltages above 1000 V a.c. or 1500 V d.c. and not exceeding 36 kV
EN 60204-31	IEC 60204-31	Safety of machinery. Electrical equipment of machines. Part 31: Particular safety and EMC requirements for sewing machines, units and systems
EN 60204-32	IEC 60204-32	Safety of machinery. Electrical equipment of machines. Part 32: Requirements for hoisting machines
EN 62061	IEC 62061	Safety of machinery. Functional safety of safety-related electrical, electronic and programmable electronic control systems
EN 61496-1	IEC 61496-1	Safety of machinery. Electro-sensitive protective equipment. Part 1: General requirements and tests
EN 61496-3	IEC 61496-3	Safety of machinery. Electro-sensitive protective equipment. Part 3: Particular requirements for active opto-electronic protective devices responsive to diffuse reflection (AOPDDR)
EN 61508	IEC 61508	Functional safety of electrical/electronic/programmable electronic safety-related systems.
<b>Type C standards</b>		
EN 201		Rubber and plastics machines. Injection moulding machines. Safety requirements
EN 415-1		Safety of packaging machines. Part 1: Terminology and classification of packaging machines and associated equipment
EN 415-2		Safety of packaging machines. Part 2: Pre-formed rigid container packaging machines
EN 415-3		Safety of packaging machines. Part 3: Form, fill and seal machines
EN 415-4		Safety of packaging machines. Part 4: Palletizers and depalletizers
EN 422		Rubber and plastics. Machines. Safety. Blow moulding machines intended for the production of hollow articles. Requirements for the design and construction
EN 692		Mechanical presses. Safety
EN 693		Machine tools. Safety. Hydraulic presses
EN 775	ISO 10218	Industrial robots. Recommendations for safety
EN 931		Footwear manufacturing machines. Lasting machines. Safety requirements

EN 848-1	Safety of woodworking machines. One side moulding machines with rotating tool. Part 1: Single spindle vertical moulding machines
EN 848-2	Safety of woodworking machines. One side moulding machines with rotating tool. Part 2: Single spindle handfed/integrated fed routing machines
EN 848-3	Safety of woodworking machines. One side moulding machines with rotating tool. Part 3: Numerical control (NC) boring machines and routing machines
EN 972	Tannery machines. Reciprocating roller machines. Safety requirements
EN 1010	Safety of machinery. Safety requirements for the design and construction of printing and paper converting machines.
EN 1114-1	Rubber and plastics machines. Extruders and extrusion lines. Part 1: Safety requirements for extruders
EN 1114-2	Rubber and plastics machines. Extruders and extrusion lines. Part 2: Safety requirements for die face pelletizers
EN 1114-3	Rubber and plastics machines. Extruders and extrusion lines. Part 3: Safety requirements for haul-offs
EN 1218-1	Safety of woodworking machines. Tenoning machines. Part 1: Single end tenoning machines with sliding table
EN 1870-1	Safety of woodworking machines. Circular sawing machines. Part 1: Circular saw benches (with and without sliding table) and dimension saws
EN 1870-9	Safety of woodworking machines. Circular sawing machines. Part 9: Double blade circular sawing machines for cross-cutting with integrated feed and with manual loading and/or unloading
EN ISO 11111      ISO 11111	Textile machinery. Safety requirements
EN 12415	Safety of machine tools. Small numerically controlled turning machines and turning centres
EN 12417	Machine tools. Safety. Machining centres
EN 12478	Safety of machine tools. Large numerically controlled turning machines and turning centres
EN 12622	Safety of machine tools. Hydraulic press brakes

## OSHA standards

29 CFR 1910.147	The Control of Hazardous Energy
29 CFR 1910.211	Definitions
29 CFR 1910      Subpart O	Machinery and Machine Guarding
29 CFR 1910.212	General Requirements for all machines
29 CFR 1910.213	Woodworking machinery requirements
29 CFR 1910.215	Abrasive wheel machinery
29 CFR 1910.217	Mechanical power presses
29 CFR 1910.217      App A	Mandatory requirements for certification / validation of safety systems for presence sensing device initiation of mechanical power presses
29 CFR 1910.217      App B	Nonmandatory guidelines for certification / validation of safety systems for presence sensing device initiation of mechanical power presses
29 CFR 1910.217      App C	Mandatory requirements for OSHA recognition of thirdparty validation organizations for the PDSI standard
29 CFR 1910.219	Mechanical Power-transmission Apparatus
29 CFR 1910      Subpart P	Hand and Portable Power Tools and Other Hand-Held Equipment
29 CFR 1910.242	Hand and portable powered tools and equipment, general
29 CFR 1910.243	Guarding of portable powered tools
29 CFR 1910      Subpart S	Electrical
29 CFR 1910.303	General requirements
29 CFR 1910.304	Wiring design and protection
29 CFR 1910.305	Wiring methods, components, and equipment for general use
29 CFR 1926.300	General Requirements
29 CFR 1926.301	Hand Tools
29 CFR 1926.302	Power-operated Hand Tools
29 CFR 1926.303	Abrasive Wheels and Tools

29 CFR 1926.304	Woodworking Tools
29 CFR 1926.307	Mechanical Power –Transmission Apparatus
29 CFR 1926.555	Conveyors

## ANSI Standards

ANSI B5.37-1970	External Cylindrical Grinding Machines - Centerless
ANSI B5.42-198	External Cylindrical Grinding Machines – Universal
ANSI B5.52M-1980	Presses, General Purpose, Single Point Gap Type, Mechanical Power (Metric)
ANSI B7.1-2000	Safety Code for the Use, Care and Protection of Abrasive Wheels
ANSI B11.1-1988	Machine Tools – Mechanical Power Presses, Safety Requirement for Construction, Care, and Use
ANSI B11.3-1982	Power Press Brakes, Safety Requirements for the Construction, Care, and Use of
ANSI B11.4-1993	Shears - Safety Requirement for Construction, Care, and Use
ANSI B11.9-1975	Grinding Machines, Safety Requirements for the Construction, Care, and Use of
ANSI B11.12-1975	Roll-Forming and Roll-Bending Machines - Safety Requirement for Construction, Care, and Use
ANSI B11.19-1999	Performance Criteria for the Design, Construction, Care and Operation of Safeguarding when Referenced by the Other Machine Tool Safety Standards
ANSI B11.20	Manufacturing Systems/Cells
ANSI B11-TR3-2000	Risk Assessment and Risk Reduction - A Guide to Estimate, Evaluate and Reduce Risks Associated with Machine Tools
ANSI B15.1-53	Code for Mechanical Power Transmission Apparatus
ANSI B20.1-57	Safety Code for Conveyors, Cableways, and Related Equipment
ANSI B65.1-1995	Safety Standard – Printing Press Systems
ANSI O1.1-54	Safety Code for Woodworking Machinery

## RIA, NFPA Standards

NFPA 79 (2002)	Electrical Standard for Industrial Machinery
RIA 15.06-1999	Industrial Robots and Robot Systems - Safety Requirements

## JIS standards in English

JIS B 6014:1980	General code of safety for machine tools
JIS B 6507:1981	General code of safety for wood working machinery
JIS B 6607:1983	Safety standards for construction of band saw machines with feed carriages
JIS B 9650:1988	General design rules for safety and sanitation of food processing machinery
JIS B 9651:1988	Design rules for safety and sanitation of baking machinery
JIS B 9652:1988	Design rules for safety and sanitation of cake making machinery
JIS B 9653:1988	Design rules for safety and sanitation of meat processing machinery
JIS B 9654:1988	Design rules for safety and sanitation of marine product machinery

## Glossary

### Actuating force

Switches with safety function:

The actuating force is the minimum force required to perform a switching operation.

Switches with separate actuator:

The actuating force is the force required to insert the actuator in order to thus perform a switching operation.

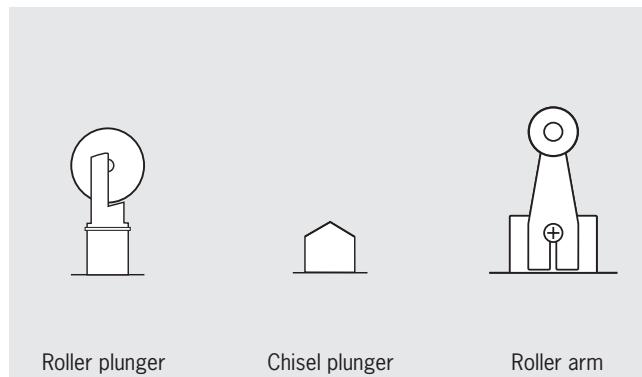
### Actuation (electrical / mechanical)

Transition of a moving contact from one switch position to another. This will result in a change to the switch state of an item of switchgear. A differentiation is made between electrical actuation (e.g. switching on – switching off) and mechanical actuation (e.g. closing – opening).

### Actuator/actuating element

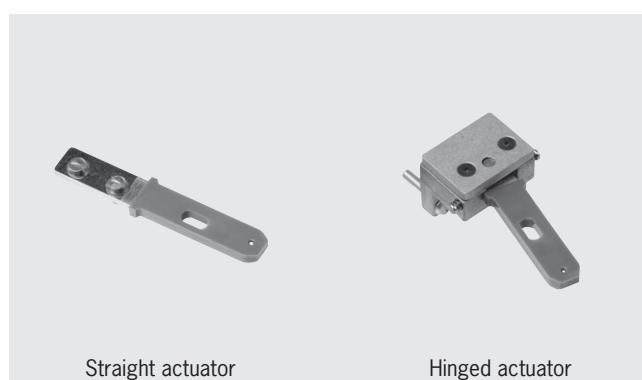
Switches with safety function:

Mechanical element on a safety position switch that triggers the switching operation. Actuators are available in different forms, for example as roller plungers, chisel plunger or roller arms.



Switches with separate actuator:

On switches *\*with separate actuator* the actuating element is separate from the *\*safety switch*. The design of the actuators is matched (coded) to the safety switch so that *\*tampering* using simple means (screwdriver, pieces of wire) is not possible.

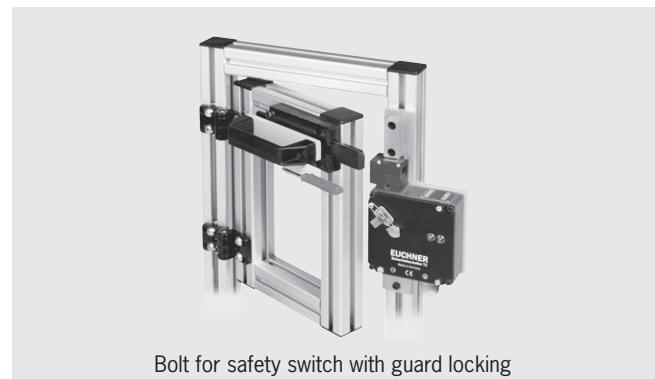


### Approach speed

Speed at which a position switch can be mechanically actuated. The permitted approach speed is dependent on the shape and material of the *\*actuating element* and the approach angle. The higher the approach speed, the lower the approach angle that should be chosen.

### Bolt

Bolts function as follows: the bolt tongue mechanically guides the *\*actuator* when it is inserted in the actuating head of the *\*safety switch*. The bolt mounted on the door frame comprises a protruding bolt tongue, the handle and the actuator, mounted offset somewhat to the rear. The switch holder with the safety switch is fitted to the frame. The bolt absorbs forces that act on the switch and the actuator and that could damage the switch and actuator.



Bolt for safety switch with guard locking

### Category

The *\*categories* according to EN ISO 13849-1 (B, 1, 2, 3 and 4) provide an assessment of the performance of safety-related parts of a control system on the occurrence of failures.

### Closed-circuit current principle

On a *\*safety guard* with *\*guard locking* based on the closed-circuit current principle, the safety guard is locked by spring force until the guard locking solenoid is supplied with power. Unlocking is by solenoid force. The term *\*mechanical guard locking* is also used.

### Cyclic mode

An *\*operating mode* in which the working space on the machine is opened during every operating cycle and the operator therefore frequently needs to work in the *\*danger area*.

### Danger area

Any area in or around a machine in which a person is subject to a risk of injury or a health hazard.

The hazard can

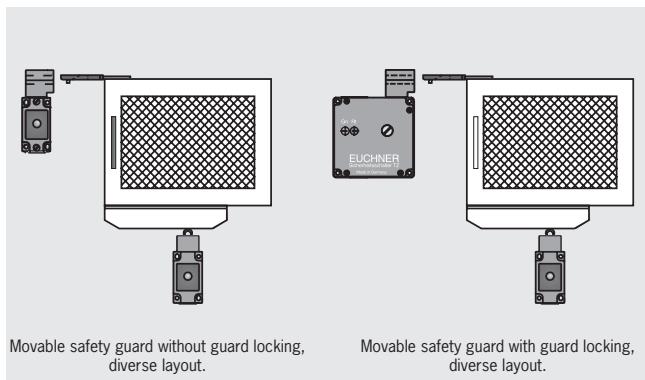
- ▶ Either be present continuously on the correct use of the machine (movement of hazardous moving parts, arcs during welding, etc.)
- ▶ Or can occur unexpectedly (unintentional, unexpected starting, etc.).

### Degree of protection

The degree of protection is defined according to EN 60529-1 and is given as an IP. After the IP there are two digits; the first digit gives the degree of protection against the penetration of solid foreign bodies and the second digit gives the degree of protection against the penetration of liquids. For *\*safety switches* the degree of protection IP 55 is to be provided as a matter of preference (BGI 575).

### Diversity

Diversity is the use of two different concepts to provide a function. For instance, the use of a switch *\*with safety function* and a switch *\*with separate actuator* on a *\*safety guard*. Here it is assumed that a single failure cannot affect two different concepts in the same way. Diversity also makes *\*tampering* more difficult and the safety of *\*redundant* systems is increased.



## Electrical guard locking

Guard locking based *\*open-circuit current principle*.

## Emergency release

The emergency release is used to unlock *\*guard locking* in an emergency. The guard locking can be unlocked without tools.



## Emergency unlocking

The emergency unlocking is used to unlock *\*guard locking* in an emergency. The guard locking can be unlocked without tools and from the access side. With the emergency unlocking, the switch engages in the unlocked position and can only be reset to its original position after an action similar to a repair.



## Automatic mode

The automatic mode is an *\*operating mode* in which, unlike the *\*manual mode* only system starting is triggered by human intervention. All other actions are performed automatically.

## Enable path

An enable path is used to generate a safety-related output signal. Enable paths act to the exterior like NO contacts.

## Enabling switch

If a *\*safety guard* is open, movements are only to be possible if the controls are operated continuously. These are controls with automatic return to their original position. In general the term enabling switches is used here.



## Escape release

The escape release must make it possible to unlock the safety guard from within the *\*danger area* without the use of tools. The device must be manually operated and must positively act on the *\*locking mechanism*. Actuation must result in permanent disabling of the *\*guard locking*.

## Extraction force

The extraction force is the required minimum force to achieve positively driven opening of all NC contacts.

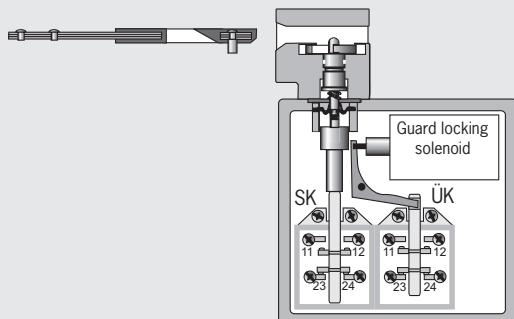
## Guard locking

The guard locking retains a movable safety guard in the closed position until the machine can no longer pose any risk of injury. With the guard locking open, unintentional starting of the machine is prevented.

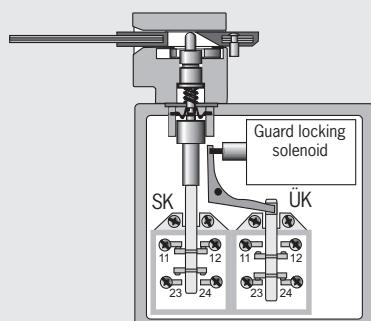
## Guard lock monitoring

The guard lock monitoring monitors the position of the guard locking solenoids. This device is positively linked to the switching element ÜK via a locking arm. On intentional or unintentional unlocking of the guard locking solenoid, the positively driven contact in this switching element is actuated and therefore signals the position of the guard locking solenoid. The sectional drawings show the safety switch TZ in its three switch states:

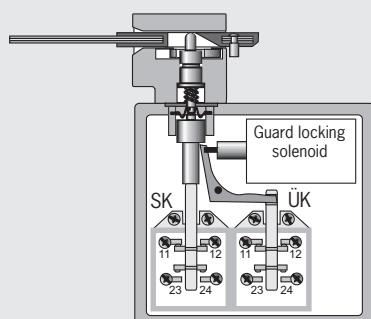
- ① Door open and not locked



- ② Door closed and not locked



- ③ Door closed and locked

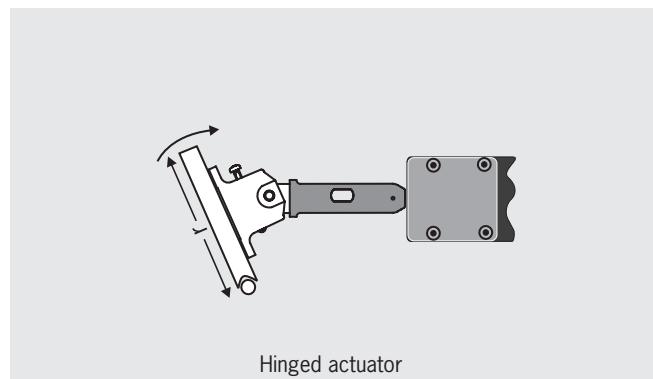


## Hazardous states

Potentially hazardous conditions are states that could result in injury.  
• Safety switches prevent, on the correct use of the *guard locking* this hazard (cf. *safe state*).

## Hinged actuator

The hinged actuator is, unlike the straight actuator, spring mounted and as a result the actuator can be inserted in the actuator head without problems even with small door radii. With larger radii, a straight actuator can be used.



## Interlocking, interlocking device

According to EN 1088 an interlock device is a mechanical, electrical or other device with the purpose of preventing operation of the machine under certain conditions (usually as long as a *movable safety guard* is not closed).

## Locking force

The locking force is the force that *guard locking* can withstand on switches with separate actuator.

The locking force in accordance with GS-ET 19 includes an additional safety coefficient ( $S = 1.3$ ) which is prescribed by the employers' liability insurance association in its test principles.

The locking force  $F_{zh}$  in accordance with GS-ET 19 is calculated as follows:

$$F_{zh} = \frac{\text{Locking force max.}}{\text{Safety coefficient}}$$

## Manual mode

Manual mode is an *operating mode* in which the machine movements are not performed automatically, but using individual commands from the user.

## Mechanical guard locking

Guard locking based *closed-circuit current principle*.

## Mechanical release

On the failure of *guard locking* the locking can be released from the access side using a mechanical release. Unlocking is performed using a tool or a key. The mechanical release should be protected against misuse (seal, lacquer).



## Mounting safety switches and actuators

Safety switches must be mounted such that they are adequately secured against changes to their position. Easy bypassing of the safety switch must be prevented.

## Movable safety guard

A movable *safety guard* is the part of the machine that is used as a barrier to protect against hazards. Movable safety guards form a physical barrier to the *danger area*. They can be, e. g. safety doors, covers, fences, housings, etc.

## Open-circuit current principle

On a *safety guard* with *guard locking* based on the open-circuit current principle, the safety guard is locked until the power supply to the guard locking solenoid is interrupted. Unlocking is by spring force. The term *electrical guard locking* is also used.

## Operating modes

Every machine can have one or more operating modes that are defined by the type of machine and their application. If the selection of an operating mode can cause a hazardous situation, the selection of this operating mode must be prevented by suitable means (e.g. key-operated switch, access code). The selection of an operating mode on its own is not allowed to trigger machine operation. A separate action on the part of the operator must be required to start the operation of the machine. A means of indication of the selected operating mode is to be provided (e.g. the position of an operating mode selector switch, an indicator, a screen indication, etc.). Technical protective measures must remain effective for all operating modes. If it is necessary to disable technical protective measures (e. g. for setting up or maintenance work), a device for operating mode selection is to be provided that can be secured in the required operating mode (e.g. locked with a key) so that automatic operation can be prevented. In addition, one or more of the following devices should be provided:

- ▶ Movement enable using an enabling switch. The machine only runs as long as the enabling switch is operated.
- ▶ A portable control unit with a device for shutting down in an emergency or an enabling device. If a portable control unit is used, it must only be possible to trigger a movement from this point
- ▶ Movement speed or movement energy restriction
- ▶ Movement area restriction

## PDF

The abbreviation PDF can have several meanings in safety engineering:

### ① Probability of Dangerous Failure

According to EN 61508, PDF is the probability of failure of a component and is used to determine the Safety Integrity Level (*SIL*) for the overall machine.

### ② Proximity Devices with defined behaviour under Fault conditions

Proximity switches with defined behavior under fault conditions (see EN 60947-5-3).

## Position switches

Position switches are used to acquire the position of axes or moving *safety guards*. As soon as a position switch is used as a safety-relevant component, the term position switch with safety function or safety-related position switch is used. In this case the switching element must contain at least one *positively driven contact*.

## Positive actuation

Positive actuation is the positive movement of a moving mechanical component together with another component – either by direct contact or via rigid parts. The second component is, as a result, moved positively by the first.

## Positively driven, positively driven contact

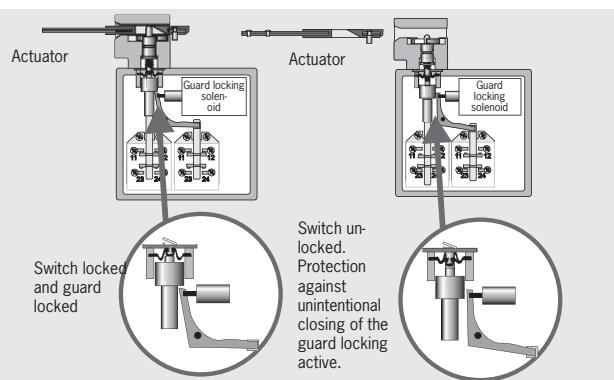
The achievement of contact separation by a positive movement of the *actuating element* is termed positively driven. *Switching contacts* with this switching characteristic are termed positively driven contacts. These NC contacts are drawn with the symbol shown below. Also switches must meet the requirements of EN 60947-5-1 annex K.



Symbol for a positively driven contact

## Protection against unintentional closing

Protection against unintentional closing of an interlock device with *guard locking* mechanically prevents the *safety switch* changing to the locked position with the *safety guard* open and therefore signaling a safe state.



## Protective plate

For switches with separate actuator, a protective plate is available as an option; this plate makes it more difficult to tamper with the actuating head.



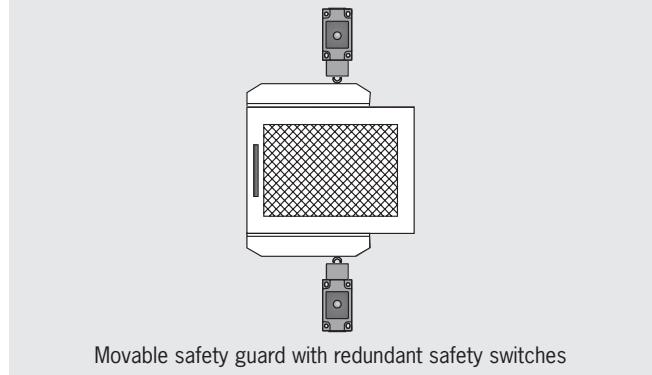
Protective plate on safety switch without guard locking

## Redundancy

Redundancy is the use of more than one system to always maintain the same safety function even on the failure of individual components.

Even for the use of a position switch with two positively driven NC contacts, the term redundant (dual-channel) system is often used. However, here it is to be noted that only duplication of the safety contacts is achieved, the mechanical drive (trip dog and plunger) remains single-channel as before. To setup a redundant system (from safety category 3 according to EN ISO 13849-1), both the mechanism (two position switches) and the electronics should be of dual-channel layout.

By means of *diversity* the safety of a redundant system is further increased.



Movable safety guard with redundant safety switches

## Retention force

The retention force is the maximum force, with the *safety switch* in the locked state, that may be applied to the *actuator* so that the guard locking can still be unlocked.

In the case of switches without guard locking, the retention force is the maximum force that may be applied to the actuator in the withdrawal direction while still guaranteeing reliable contact.

## Risk

The combination of the probability and the severity of injury in a hazardous situation.

## Risk assessment

The *standard* EN 1050 contains procedures necessary to perform a risk assessment. The risk assessment initially involves a risk analysis and a subsequent risk evaluation. In EN 954-1 there is a simple procedure for determining the required *category* to match the *risk*.

## Safe state

A safe state is provided if no hazard can be produced by a system or machine on correct use (cf. *hazardous states*).

## Safety guard

A safety guard is intended to protect people, products and the environment from hazards. A differentiation is made between *movable safety guards* and *fixed safety guards*.

## Safety relays

Safety relays are used to evaluate switchgear connected (safety switches, emergency stop switchgear, etc.). They ensure that the OSSD (Output Signal Switching Device) is opened.

## Safety switch

A safety switch is part of a safety chain. It provides a safe signal in the input circuit. On opening the *safety guard* a stop signal is generated. In this way unintentional machine starting is prevented when the safety guard is open, that is *interlocking* is achieved.

## SIL (Safety Integrity Level)

According to EN 61508 the objective for the probability of failure on the execution of risk-reducing functions. The standard defines the requirements that are necessary to achieve a specific safety level (SIL).

## Single-fault tolerance

Single-fault tolerance means that even after the occurrence of a single failure, the agreed safe function continues to be provided.

## Slow-action contact element

A slow-action contact element is characterized by the opening of the switching contact as a function of the speed at which the *actuator* is moved.

## Snap-action contact element

On snap-action contact elements the *switching element* jumps to the other switch state from a defined position of the *actuator*. The movement of the switching contact is independent of the speed at which the actuator is moved. Snap-action contact elements typically have hysteresis.

## Standards

The European Machinery Directive states that if harmonized standards are observed, it is allowed to assume that the directive is met. Standards specify the requirements of the directive in more detail and as a rule represent the *general state-of-the-art*. Manufacturers of *safety switches* must comply with EN 60947-5. All EUCHNER safety switches comply with this standard.

## Start (automatic or manual)

An item of safety switchgear (e.g. *safety relay*) can be started manually or automatically. On a manual start, an enable signal is generated after the Start button is pressed and a *safe state* has been detected. This function is also termed static operation and is stipulated for emergency stop devices (EN 60204-1).

On an automatic start, an enable signal is generated after a safe state has been detected without any manual enable. This function is also termed dynamic operation and is not allowed for emergency stop devices (EN 60204-1).

## Stop category

EN 60204-1 defines various stop categories; here stopping refers to the shutdown of the machine.

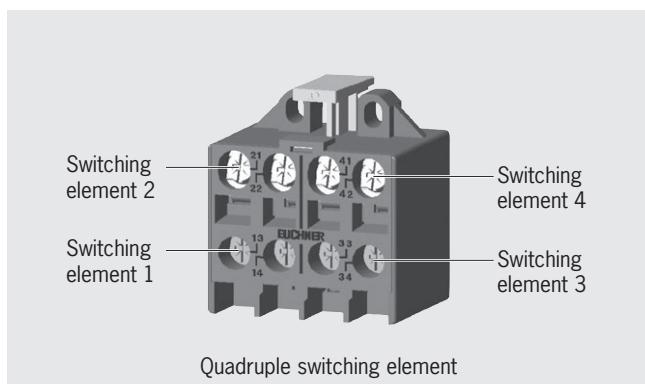
Stop category 0 means that the machine is shutdown by the immediate shutdown of the power.

Stop category 1 means that the machine is shutdown in a controlled manner while the supply of power is maintained to bring the machine to a standstill. Once standstill has been reached, the power is interrupted.

Stop category 2 means that the machine is shutdown in a controlled manner while the supply of power is maintained to bring the machine to a standstill. The power is not interrupted at standstill. This stop category is not allowed to be used for shutdown in an emergency according to EN 60204-1.

## Switching elements

Switching elements are fitted in position switches. Switching elements are available with a normally closed function, with a normally open function and as *\*positively driven contacts*. EUCHNER supplies switching elements with one, two, three or four switching elements for the various switch types. Switching elements can be designed as a *\*slow-action contact element* and as a *\*snap-action contact element*.



## Tampering

Tampering is the conscious disabling or bypassing of *\*safety guards* and their components. *\*Safety switches* and other safety devices must be designed such that the protective function cannot be changed or bypassed by hand or using one simple action. Simple actions include using:

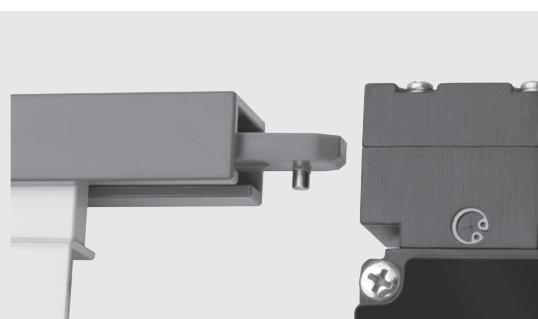
- ▶ Screwdriver
- ▶ Ball-point pens
- ▶ Nails
- ▶ Pieces of wire
- ▶ Adhesive tape
- ▶ etc..

Actions that are not regarded as simple are actions that require more than one work step with tools.

The *inability to bypass by simple means* (BGI 575) is:

- ▶ The dismantling of parts
- ▶ The turning of the safety switch away from its protective position
- ▶ The usage of a second *\*actuator*
- ▶ The bridging of the contacts

It should be taken into account in the design that, despite safety guards, straightforward and correct operation of machines and systems must be possible. If this aspect is not taken into account, the probability of bypassing safety measures will increase.



Guiding the actuator in a C rail

## Testing

Testing is intended to ensure that a safety system functions correctly. Testing can be performed automatically, by the control system, in the form of monitoring or testing during the process. Depending on the requirements, a combination of automatic and manual testing is also possible. The testing must be repeated at defined intervals as a function of the risk analysis. Testing is required for *\*category 2 and 4* according to EN 954-1 and should also be performed for category 3.

## With safety function and with separate actuator (switches)

*\*Safety switches* are divided into two different functional types. On switches with safety function the *\*actuator* is permanently connected to the switch, on switches with separate actuator, the actuator is separate and is mounted on the *\*safety guard*.



With safety function



With separate actuator

## Index by item designation

Article	Order no.	Page
Actuating head NZVZ	076250	130
ACTUATOR S-G-SN-C2115	097861	116
ACTUATOR S-GT-LN	095739	116
ACTUATOR S-GT-SN	095738	116
ACTUATOR S-WQ-LN	095741	116
ACTUATOR S-WQ-SN	095740	116
ACTUATOR-X-GNQ	079741	114
ACTUATOR-X-GQ	079739	114
ACTUATOR-X-WNQ	079742	114
ACTUATOR-X-WQ	079740	114
ACTUATOR-Z-G	016849	111
ACTUATOR-Z-G/V25	074411	111
ACTUATOR-Z-GME	097436	111
ACTUATOR-Z-GN	072251	111
Adapter NZ/TZ45/30	079033	151
Bolt BTC-NZVZ-S-TH-00-X	104398	138
Bolt BTC-NZVZ-S-TH-01-F	104399	138
Bolt BTC-ST/G-S-TH-00-X	106284	149
Bolt BTC-ST/G-S-TH-01-F	106285	149
Bolt BTC-TZ00-A-TH-00-X	106278	145
Bolt BTC-TZ00-A-TH-01-F	106279	145
Bolt BTC-TZ00-C-TH-00-X	106280	145
Bolt BTC-TZ00-CA-TH-01-F	106281	145
Bolt handle/V5	093500	151
Bolt NZ/TZ-ACF	083900	142
Bolt NZ/TZ-S1	028357	140
Bolt NZ/TZ-S1/AF	079786	141
Bolt NZ/TZ-S1/CF	079785	141
Bolt NZ/TZ-S2	028359	140
Bolt NZ-A	057734	135
Bolt NZ-AB	083890	135
Bolt NZ-AC	076188	136
Bolt NZ-AF	078451	137
Bolt NZ-AR2	078455	135
Bolt NZ-C	057735	135
Bolt NZ-CB	083892	135
Bolt NZ-CF	078452	137
Bolt NZ-CR2	078456	135
Bolt NZ-GFK	096617	139
Bolt NZ-GFK-F	097603	139
Bolt S-A	096384	148
Bolt S-AF	096390	148
Bolt S-C	096385	148
Bolt S-CF	096391	148
Bolt STP-GFK	098121	150
Bolt TX-A	082990	146
Bolt TX-AF	085392	147
Bolt TX-C	082991	146
Bolt TX-CF	085393	147
Bolt TZ-A	057736	144
Bolt TZ-A-NIRO	079798	144
Bolt TZ-A-NIRO-C2101	096057	144
Bolt TZ-AF	076200	143
Bolt TZ-C	057737	144
Bolt TZ-C-NIRO	079799	144
Bolt TZ-C-NIRO-C2101	096058	144
Bolt TZ-CF	076199	143
C-23F...		123
C-MINF...		123
Cable socket 6+PE	043861	119
EKPM20/06	077679	124
EKPON12/06	077692	124
EKVM12/04	086327	124
EKVM16/04	086328	124
EKVM16/06	086330	124
EKVM20/06	077683	124
EKVM20/09	077684	124
EKVN12/06	077691	124
Emergency unlocking STA	099876	132
Emergency unlocking TX	094771	132
EMP-B1	093457	125/126/ 127/128
EMP-B2	093458	128
EMP-SA	094401	128
EMP-SB	093456	126/127
EMP-SC	085753	125
Escape release handle	105329	133
ESH-ARO-11A-1205	109409	107
ESH-ARO-20A-1205	106548	107
ESH-PRO	096007	106
ESH-PRO	096007	107
ESH-PRO-11A-1205	095895	106
ESH-PRO-20A-1205	095894	106
HINGED ACTUATOR-S-LR-LN	096844	118
HINGED ACTUATOR-S-LR-SN	096838	117
HINGED ACTUATOR-S-OU-LN	096697	118
HINGED ACTUATOR-S-OU-SN	095315	117
HINGED ACTUATOR-X-LR-N	098082	115
HINGED ACTUATOR-X-OU-N	097906	115
HINGED ACTUATOR-Z-L	024298	113
HINGED ACTUATOR-Z-L/V25	074413	113
HINGED ACTUATOR-Z-L-C2194	100407	113
HINGED ACTUATOR-Z-O	057950	113
HINGED ACTUATOR-Z-O/V25	074415	113
HINGED ACTUATOR-Z-O-C2241	104068	113
HINGED ACTUATOR-Z-R	024299	113
HINGED ACTUATOR-Z-R/V25	074412	113
HINGED ACTUATOR-Z-R-C2194	100406	113
HINGED ACTUATOR-Z-U	048850	113
HINGED ACTUATOR-Z-U/V25	074414	113
HINGED ACTUATOR-Z-U-C2241	103845	113
Insertion funnel STA	093157	129
INSTALLATION KIT CAP	110443	107
LE060GE	035497	131
LE060GR	035496	131
LE060RT	035495	131
LE110RT	045579	131
LE220GE	045584	131
LE220RT	045582	131
Lead seal kit	087256	132
Lead seal kit TZ	048257	130
Lead seal kit TZ-C1937	087256	130
Lock TX	079795	132
Lock TX	079796	132
Lockout bar STP	105701	129
Lockout bar TX	096098	129
Lockout bar with chain	091305	129
Lockout bar-Z-046730	046730	129
Lockout bar-Z-086538	086538	129
M3X40/V100	075530	130
M3X70/V100	075531	130
M4X14/V100	074063	130
M5X10/V100	073455	130
M5X16/V100	073456	130
M5X25/V100	073457	130
N1AB508-M	087245	18

Article	Order no.	Page
N1AB514-M	087247	18
N1AD508-M	083886	16
N1AD508-MC2222	103237	16
N1AD508AM-M	090546	17
N1AD508LE060-M	087218	16
N1AD508LE110-M	087221	16
N1AD508LE220-M	087224	16
N1AD514-M	083849	16
N1AD514AM-M	091261	17
N1AD514SVM5-M	087603	17
N1AR508-M	083887	18
N1AR508-MC2222	103221	18
N1AR508AM-M	090547	19
N1AR508LE060-M	087219	18
N1AR508LE110-M	087222	18
N1AR508LE220-M	087225	18
N1AR514-M	078487	18
N1AR514AM-M	087158	19
N1AR514SVM5-M	087604	19
N1ARL508-M	087147	20
N1ARL514-M	087204	20
N1AW508-M	087205	21
N1AW508-MC2222	103222	21
N1AW508LE060-M	087220	21
N1AW508LE110-M	087223	21
N1AW508LE220-M	087226	21
N1AW514-M	083850	21
N1AW514SVM5-M	090743	21
NB01D588-M	088584	22
NB01R588-M	088583	22
NGLE060GE	029222	131
NGLE060GR	029221	131
NGLE060RT	029220	131
NGLE110RT	045822	131
NGLE220GE	045827	131
NGLE220RT	045825	131
NX1-2121A-M	092625	86
NX1-2131A-M	092624	86
NX1-2131AL024-M	091682	86
NX1-3131A-M	092626	86
NZ1HB-2131-10C-FW	095898	39
NZ1HB-2131-9C-GMMF	077390	39
NZ1HB-2131-M	090968	37
NZ1HB-3131-M	090969	37
NZ1HB-511-M	079952	37
NZ1HB-511-MC569	079965	44
NZ1HB-511L060-M	090039	37
NZ1HB-511L060-MC569	091091	44
NZ1HB-511L060GE-M	086525	37
NZ1HB-511L220-M	090040	37
NZ1HB-528-M	088199	37
NZ1HB-528-MC569	079946	44
NZ1HB-528L060-M	090965	37
NZ1HB-528L060-MC569	091330	44
NZ1HB-528L060GE-M	086527	37
NZ1HB-528L220-M	090051	37
NZ1HB-538-M	090966	37
NZ1HB-538-MC569	079999	44
NZ1HB-538L060-M	090967	37
NZ1HS-2121-M	090254	34
NZ1HS-2131-9C-GMMF	077391	36
NZ1HS-2131-M	090973	34
NZ1HS-3131-8C-Ford /PT60577-101K01	086574	36

Article	Order no.	Page
NZ1HS-3131-9C-GMMF	073508	36
NZ1HS-3131-M	090747	34
NZ1HS-3131-MC1779	079996	45
NZ1HS-511-M	079953	34
NZ1HS-511-MC1833	091312	46
NZ1HS-511L060-M	090035	34
NZ1HS-511L060GE-M	090038	34
NZ1HS-511L110-M	090036	34
NZ1HS-511L220-M	090037	34
NZ1HS-528-M	090970	34
NZ1HS-528L060-M	090971	34
NZ1HS-528L060GE-M	090049	34
NZ1HS-528L110-M	090050	34
NZ1HS-528L220-M	090052	34
NZ1HS-538-M	090972	34
NZ1HS-538L060-M	090760	34
NZ1PB-2131-M	090872	42
NZ1PB-3131-M	090873	42
NZ1PB-511-M	088618	42
NZ1PB-538-M	090871	42
NZ1PS-2131-M	090876	40
NZ1PS-3131-M	090877	40
NZ1PS-511-M	088613	40
NZ1PS-528-M	090874	40
NZ1PS-528L060-M	090430	40
NZ1PS-528L220-M	093521	40
NZ1PS-528L220GE-M	093523	40
NZ1PS-538-M	090875	40
NZ1RG-2131-M	090934	30
NZ1RG-3131-M	090935	30
NZ1RG-511-M	088605	30
NZ1RG-511L060-M	089052	30
NZ1RG-511L220-M	089054	30
NZ1RG-528-M	090932	30
NZ1RG-528L060-M	090008	30
NZ1RG-538-M	090933	30
NZ1RG-538L060-M	090009	30
NZ1RK-2131-M	090907	26
NZ1RK-3131-M	090908	26
NZ1RK-511-M	088608	26
NZ1RK-511L060-M	090354	26
NZ1RK-511L220-M	090355	26
NZ1RK-528-M	090905	26
NZ1RK-528-MC1912	090572	26
NZ1RK-528L060-M	090358	26
NZ1RK-528L060GE-MC1912	086408	26
NZ1RK-538-M	090906	26
NZ1RL-2131-M	090941	32
NZ1RL-3131-M	090942	32
NZ1RL-511-M	088614	32
NZ1RL-511L060-M	088996	32
NZ1RL-511L110-M	089080	32
NZ1RL-511L220-M	089079	32
NZ1RL-528-M	090937	32
NZ1RL-528L060-M	090938	32
NZ1RL-538-M	090939	32
NZ1RL-538L060-M	090940	32
NZ1RS-2121-M	087595	28
NZ1RS-2131-9C-GMMF	077362	29
NZ1RS-2131-M	089633	28
NZ1RS-3131-9C-GMMF	087074	29
NZ1RS-3131-M	089631	28
NZ1RS-511-M	079960	28

<b>Article</b>	<b>Order no.</b>	<b>Page</b>	<b>Article</b>	<b>Order no.</b>	<b>Page</b>
NZ1RS-511-MC1588	091352	43	NZ1VZ-538E3VSE04L060-M	082128	56
NZ1RS-511L060-M	089053	28	NZ1VZ-538E3VSE07-M	088048	56
NZ1RS-511L060GE-M	086528	28	NZ1VZ-538E3VSE07L110-M	090348	56
NZ1RS-511L220-M	089055	28	NZ1VZ-538E3VSE09-M	088035	56
NZ1RS-528-M	089627	28	NZ1VZ-538E3VSE09L220-M	090334	56
NZ1RS-528-MC1588	091339	43	NZ1VZ-538E3VSM04-M	082131	54
NZ1RS-528L060-M	086413	28	NZ1VZ-538E3VSM04L060-M	082132	54
NZ1RS-528L220-M	091291	28	NZ1VZ-538E3VSM04L220-M	090345	54
NZ1RS-538-M	090936	28	NZ1VZ-538E3VSM07-M	088046	54
NZ1RS-538L060-M	090555	28	NZ1VZ-538E3VSM07L110-M	090340	54
NZ1RS-538L060GE-M	090424	28	NZ1VZ-538E3VSM09-M	088044	54
NZ1VZ-2121E-M	089486	48	NZ1VZ-538EL060-M	082119	48
NZ1VZ-2121E-MC1233	089914	51	NZ1VZ-538EL110-M	089481	48
NZ1VZ-2131E-10C-FW	095896	50	NZ1VZ-538EL220-M	089482	48
NZ1VZ-2131E-8C-GMMF	092355	50	NZ1VZ-538EL220-MC1233	089496	51
NZ1VZ-2131E-9C-GMMF	077363	50	NZ1WO-2131-M	089629	24
NZ1VZ-2131E-M	082123	48	NZ1WO-3131-M	089626	24
NZ1VZ-2131E-MC1233	093859	51	NZ1WO-511-M	088611	24
NZ1VZ-2131E3VSE04-M	082134	56	NZ1WO-511L060-M	089057	24
NZ1VZ-2131E3VSE07-M	088036	56	NZ1WO-511L060GE-M	089058	24
NZ1VZ-2131E3VSE09-M	088037	56	NZ1WO-511L110-M	089059	24
NZ1VZ-2131E3VSM04-M	088049	54	NZ1WO-528-M	089624	24
NZ1VZ-2131E3VSM07-M	088038	54	NZ1WO-528L060-M	089078	24
NZ1VZ-2131E3VSM09-M	088039	54	NZ1WO-538-M	090878	24
NZ1VZ-3131E-M	082122	48	NZ1WO-538L060-M	089076	24
NZ1VZ-3131E3VSE04-M	088051	56	NZ2HB-2131	090136	38
NZ1VZ-3131E3VSE07-M	088042	56	NZ2HB-3131	090137	38
NZ1VZ-3131E3VSE09-M	088043	56	NZ2HB-511	089091	38
NZ1VZ-3131E3VSM04-M	088050	54	NZ2HB-511L060	089092	38
NZ1VZ-3131E3VSM07-M	088040	54	NZ2HB-511L060C1630	054121	38
NZ1VZ-3131E3VSM09-M	088041	54	NZ2HB-511L060C1631	054122	38
NZ1VZ-511E-M	089479	48	NZ2HB-511L060GE	090719	38
NZ1VZ-511E3VSE04-M	090343	56	NZ2HB-511SVM5	090861	37
NZ1VZ-511E3VSM04-M	090339	54	NZ2HB-511SVM5L060GE	098649	37
NZ1VZ-511E3VSM04L060-M	090344	54	NZ2HB-528	090845	38
NZ1VZ-528E-M	090671	48	NZ2HB-528L060	090846	38
NZ1VZ-528E-MC1233	082137	51	NZ2HB-528L060C1630	091346	38
NZ1VZ-528E3VSE04-M	079300	56	NZ2HB-528L060C1631	091347	38
NZ1VZ-528E3VSE04I060-M	082130	56	NZ2HB-528L220	091281	38
NZ1VZ-528E3VSE04L220-M	091738	56	NZ2HB-528SVM5	090864	37
NZ1VZ-528E3VSE07-M	082133	56	NZ2HB-538	090847	38
NZ1VZ-528E3VSE07L060-M	090337	56	NZ2HB-538L060	090848	38
NZ1VZ-528E3VSE07L110-M	089484	56	NZ2HB-538SVM5	090862	37
NZ1VZ-528E3VSE07L220-M	090336	56	NZ2HS-2121	091264	35
NZ1VZ-528E3VSE09-M	088047	56	NZ2HS-2131	090146	35
NZ1VZ-528E3VSE09L060-M	090346	56	NZ2HS-3131	090856	35
NZ1VZ-528E3VSE09L220-M	090335	56	NZ2HS-511	089093	35
NZ1VZ-528E3VSM04-M	082125	54	NZ2HS-511L060	089094	35
NZ1VZ-528E3VSM04L060-M	082126	54	NZ2HS-511L060C1630	078473	35
NZ1VZ-528E3VSM04L220-M	089488	54	NZ2HS-511L060GE	090697	35
NZ1VZ-528E3VSM07-M	082129	54	NZ2HS-511SVM5	090867	34
NZ1VZ-528E3VSM07L110-M	089485	54	NZ2HS-511SVM5L060GE	098648	34
NZ1VZ-528E3VSM07L220-M	090341	54	NZ2HS-528	090852	35
NZ1VZ-528E3VSM09-M	088045	54	NZ2HS-528L060	088196	35
NZ1VZ-528E3VSM09L060-M	090349	54	NZ2HS-528SVM5	090868	34
NZ1VZ-528E3VSM09L220-M	090342	54	NZ2HS-538	090853	35
NZ1VZ-528EL060-M	090566	48	NZ2HS-538L060	090854	35
NZ1VZ-528EL060-MC1233	089497	51	NZ2HS-538SVM5	090869	34
NZ1VZ-528EL110-M	089480	48	NZ2PS-2121	091268	41
NZ1VZ-528EL220-M	082121	48	NZ2PS-2131	090151	41
NZ1VZ-538E-M	085676	48	NZ2PS-3131	090150	41
NZ1VZ-538E-MC1233	093858	51	NZ2PS-511	093112	41
NZ1VZ-538E3VSE04-M	089905	56	NZ2PS-511L060	090152	41

Article	Order no.	Page
NZ2PS-538L060	091632	41
NZ2RG-2131	090947	31
NZ2RG-3131	090948	31
NZ2RG-511	090032	31
NZ2RG-511L060	091284	31
NZ2RG-511SVM5	090026	30
NZ2RG-528	090943	31
NZ2RG-528SVM5	090961	30
NZ2RG-538	090945	31
NZ2RG-538L060	090946	31
NZ2RG-538SVM5	090962	30
NZ2RK-2131	090921	27
NZ2RK-3131	090922	27
NZ2RK-511	090016	27
NZ2RK-511L110	088180	27
NZ2RK-511SVM5	089007	26
NZ2RK-528	090919	27
NZ2RK-528L060	091292	27
NZ2RK-528SVM5	090930	26
NZ2RK-538	090920	27
NZ2RK-538SVM5	089018	26
NZ2RL-2121	090975	33
NZ2RL-2121C1831	095806	33
NZ2RL-2131	090958	33
NZ2RL-3131	090959	33
NZ2RL-511	090025	33
NZ2RL-511SVM5	090028	32
NZ2RL-528L060	091282	33
NZ2RL-538L060	091278	33
NZ2RS-2121	090974	29
NZ2RS-2131	090149	29
NZ2RS-3131	090954	29
NZ2RS-511	090024	29
NZ2RS-511L060	090147	29
NZ2RS-511L060C1630	082400	29
NZ2RS-511L060C1631	079350	29
NZ2RS-511L060GE	089622	29
NZ2RS-511SVM5	090027	28
NZ2RS-511SVM5L060GE	098651	28
NZ2RS-528	090950	29
NZ2RS-528L060	088197	29
NZ2RS-528SVM5	090963	28
NZ2RS-538	090951	29
NZ2RS-538L060	090952	29
NZ2RS-538SVM5	090964	28
NZ2VZ-2121E	088852	49
NZ2VZ-2131E	090144	49
NZ2VZ-2131E3VSE04	074473	57
NZ2VZ-2131E3VSM04	074471	55
NZ2VZ-2131EC1233	093857	52
NZ2VZ-3131E	090145	49
NZ2VZ-3131E3VSE04	074474	57
NZ2VZ-3131E3VSM04	074472	55
NZ2VZ-511L060	045551	49
NZ2VZ-528E	084885	49
NZ2VZ-528E3VSE04	044894	57
NZ2VZ-528E3VSE04L060	046742	57
NZ2VZ-528E3VSE07L110	070290	57
NZ2VZ-528E3VSM04	037299	55
NZ2VZ-528E3VSM04L060	045856	55
NZ2VZ-528E3VSM04L220	070039	55
NZ2VZ-528E3VSM09	055718	55
NZ2VZ-528EL060	045801	49

Article	Order no.	Page
NZ2VZ-528EL110	059467	49
NZ2VZ-528EL220	038129	49
NZ2VZ-538E	090143	49
NZ2VZ-538E3VSE04	047837	57
NZ2VZ-538E3VSE04L060	057921	57
NZ2VZ-538E3VSM04	050428	55
NZ2VZ-538E3VSM04L060	059427	55
NZ2VZ-538E3VSM09	076502	55
NZ2VZ-538EC1233	077229	52
NZ2VZ-538EC1420	043296	52
NZ2VZ-538EC1701	071200	52
NZ2VZ-538EL060	052108	49
NZ2VZ-538EL110	072234	49
NZ2VZ-538EL220	059004	49
NZ2VZ-538ESVM5	084905	49
NZ2WO-2121	090976	25
NZ2WO-2131	090912	25
NZ2WO-3131	090913	25
NZ2WO-511	090909	25
NZ2WO-511L060	091280	25
NZ2WO-511L060C1630	059481	25
NZ2WO-511L060C1631	059482	25
NZ2WO-511SVM5	089014	24
NZ2WO-511SVM5L060GE	098652	24
NZ2WO-528	090910	25
NZ2WO-528L060	091279	25
NZ2WO-528SVM5	090923	24
NZ2WO-538	090911	25
NZ2WO-538L060	087558	25
NZ2WO-538SVM5	090924	24
Pin crimp contact RCM	094309	121
Pin crimp contact RCM-C1825	094310	121
Plug connector for solenoid locking	028345	119
Plug connector with rectifier for solenoid locking	028338	119
Protective plate NZ/TZ	059136	130
RC-12P1N8A8096	073294	119
RC-12P1N8A8300	073293	119
RC18EF	074616	121
RC18EF-C1825	077025	121
RC18EF1,5M-C1825	092761	122
RC18EF1,5MF-C1825	092883	122
RC18EF10M-C1825	092898	122
RC18EF10MF-C1825	092887	122
RC18EF15M-C1825	077016	122
RC18EF15MF-C1825	092888	122
RC18EF20M-C1825	092726	122
RC18EF20MF-C1825	092889	122
RC18EF25M-C1825	092727	122
RC18EF25MF-C1825	092890	122
RC18EF30M-C1825	095993	122
RC18EF3M-C1825	092816	122
RC18EF3MF-C1825	092884	122
RC18EF40M-C1825	102490	122
RC18EF6M-C1825	077014	122
RC18EF6MF-C1825	092885	122
RC18EF8M-C1825	077015	122
RC18EF8MF-C1825	092886	122
RC18WF	074617	121
RC18WF-C1825	077026	121
RC18WF1,5ML-C1825	092906	122
RC18WF1,5MLF-C1825	092891	122
RC18WF1,5MR-C1825	092907	122

Article	Order no.	Page	Article	Order no.	Page
RC18WF1,5MRF-C1825	092892	122	SS4	002787	119
RC18WF10ML-C1825	092901	122	STA-TW-3A-2131AC024M	106617	104
RC18WF10MLF-C1825	092699	122	STA-TW-3A-2131AC024M-S1	105888	104
RC18WF10MR-C1825	092902	122	STA-TW-3A-4121AC024L024M	106379	104
RC18WF10MRF-C1825	092700	122	STA-TW-3A-4121AC024M	106545	104
RC18WF15ML-C1825	077020	122	STA1A-4131A024M	096439	102
RC18WF15MLF-C1825	092701	122	STA2A-4131A024M	096935	102
RC18WF15MR-C1825	085196	122	STA3A-2131A024L024RC18	099658	101
RC18WF15MRF-C1825	092702	122	STA3A-2131A024L024RC18C1826	106623	101
RC18WF20ML-C1825	092910	122	STA3A-2131A024M	096938	100
RC18WF20MLF-C1825	092704	122	STA3A-2131A024MC1993	103660	103
RC18WF20MR-C1825	092911	122	STA3A-2131A230M	104171	100
RC18WF20MRF-C1825	092708	122	STA3A-4121A024L024M	106535	100
RC18WF25ML-C1825	092912	122	STA3A-4121A024M	096936	100
RC18WF25MLF-C1825	092724	122	STA3A-4121A024SR11	105304	101
RC18WF25MR-C1825	092913	122	STA3A-4131A024M	099480	100
RC18WF25MRF-C1825	092725	122	STA3A-4131A024M	099481	100
RC18WF2MLF-C1825	092697	122	STA3A-4141A024L024M	100898	100
RC18WF3ML-C1825	092908	122	STA3A-4141A024M	099274	100
RC18WF3MLF-C1825	092893	122	STA3A-4141A024RC18	100029	101
RC18WF3MR-C1825	092909	122	STA4A-2131A024L024M	103926	100
RC18WF3MRF-C1825	092894	122	STA4A-2131A024L024RC18	105303	101
RC18WF6ML-C1825	077018	122	STA4A-2131A024L024RC18C1826	106622	101
RC18WF6MR-C1825	085194	122	STA4A-2131A024M	096939	100
RC18WF6MRF-C1825	092698	122	STA4A-4121A024M	096937	100
RC18WF8ML-C1825	077019	122	STA4A-4141A024M	109172	100
RC18WF8MLF-C1825	092895	122	Switch bracket NZ-GFK	096614	139
RC18WF8MR-C1825	085195	122	Switch bracket TP-GFK	096613	150
RC18WF8MRF-C1825	092896	122	SWLF5-5000P	073462	124
Release with automatic reset TX	094773	132	Triangular key	103057	132
Replacement key TX	077206	132	TX1B-A024BH10	085380	89
Roller arm NHB	012042	131	TX1B-A024M	082921	88
Roller arm NHBC569	012044	131	TX1B-A024MC2129	097623	94
Roller arm NHS	012043	131	TX1B-A024N	082944	88
SGA1A-2121A-M	103725	96	TX1B-A024RC18	082933	89
SGA1A-2131A-M	106307	96	TX1B-A110M	085383	88
SGA2A-2121ARC18-ETX5	104012	98	TX1B-A110N	085382	88
SGA2E-2131ASR11	106736	97	TX1B-A230M	085385	88
SGLF5-5000P	073461	124	TX1C-A024M	082922	88
SR11AM2-M20	091296	120	TX1C-A024MC2161	099489	92
SR11EF	070859	120	TX1C-A024N	082945	88
SR11EF-10000	077630	120	TX1C-A024RC18	082934	89
SR11EF-15000	077631	120	TX1C-A110M	085384	88
SR11EF-20000	096632	120	TX1C-A230M	085386	88
SR11EF-25000	094749	120	TX1D-A024MC1991	096173	92
SR11EF-5000	077629	120	TX1D-A024MC2081	095025	88
SR11WF	054773	120	TX2B-A024BH10	085381	89
SR11WF-10000	077636	120	TX2B-A024M	082927	88
SR11WF-15000	077637	120	TX2B-A024N	082946	88
SR11WF-5000	077635	120	TX2B-A024RC18	082939	89
SR6AM2-M20	087180	120	TX2B-A110M	085387	88
SR6EF	013176	120	TX2B-A230M	085389	88
SR6EF-10000	077633	120	TX2C-A024M	082928	88
SR6EF-15000	077634	120	TX2C-A024N	082947	88
SR6EF-20000	098128	120	TX2C-A024RC18	082940	89
SR6EF-5000	077632	120	TX2C-A110M	085388	88
SR6K	013178	120	TX2C-A230M	085390	88
SR6WF	024999	120	TX2D-A024MC2081	095026	88
SR6WF-10000	077639	120	TX3B-A024BH12	082999	91
SR6WF-15000	077640	120	TX3B-A024M	082952	90
SR6WF-5000	077638	120	TX3B-A024MC1991	085391	92
SRF	071260	120	TX3B-A024N	082997	90
SRM	071261	120	TX3B-A024RC18	082964	91

Article	Order no.	Page	Article	Order no.	Page
TX3B-A024RC18C1991	093559	93	TZ1LE220MVAB	088029	60
TX3B-A110M	082988	90	TZ1LE220SR6	046504	62
TX3C-A024BH12	083000	91	TZ1RB024MVAB-C2159	098717	70
TX3C-A024M	082953	90	TZ1RE024BHA-C1902	079693	83
TX3C-A024MC1991	093118	92	TZ1RE024BHA-C1903	082096	66
TX3C-A024MC2161	098946	92	TZ1RE024BAVFG-RC1924	083191	64
TX3C-A024N	082998	90	TZ1RE024BAVFG-RC1971	085570	83
TX3C-A024RC18	082965	91	TZ1RE024M	082051	60
TX3C-A024SR11	085396	91	TZ1RE024M-089471	089471	67
TX3C-A110M	082989	90	TZ1RE024M-C1623	083247	82
TZ1LB024MVAB-C2159	098718	70	TZ1RE024M-C1684	083171	79
TZ1LE024BHA-C1902	079692	83	TZ1RE024M-C1815	087991	75
TZ1LE024BHA-C1903	082095	66	TZ1RE024M-C1816	096901	71
TZ1LE024BAVFG-RC1924	083190	64	TZ1RE024M-C2087	098253	65
TZ1LE024BAVFG-RC1971	085569	83	TZ1RE024M-R	083165	60
TZ1LE024M	082050	60	TZ1RE024MVAB	083966	60
TZ1LE024M-089470	089470	67	TZ1RE024MVAB-10C-FW	095903	83
TZ1LE024M-C1623	083246	82	TZ1RE024MVAB-C1623	085171	82
TZ1LE024M-C1684	083170	79	TZ1RE024MVAB-C1684	088084	79
TZ1LE024M-C1815	087990	75	TZ1RE024MVAB-C1828	089469	75
TZ1LE024M-C1816	089477	71	TZ1RE024MVAB-C2082	096488	77
TZ1LE024M-C2087	095245	65	TZ1RE024MVAB-C2087	098205	65
TZ1LE024M-R	083164	60	TZ1RE024MVAB-R	083233	60
TZ1LE024MVAB	083965	60	TZ1RE024MVAB-RC2100	096051	82
TZ1LE024MVAB-10C-FW	095902	83	TZ1RE024MVFG-RC1925	089465	60
TZ1LE024MVAB-C1623	085170	82	TZ1RE024PG0R8C	059920	66
TZ1LE024MVAB-C1684	084820	79	TZ1RE024RC18VAB	084243	61
TZ1LE024MVAB-C1828	089468	75	TZ1RE024RC18VAB-092999	092999	74
TZ1LE024MVAB-C2082	096487	77	TZ1RE024RC18VAB-093863	093863	69
TZ1LE024MVAB-R	089434	60	TZ1RE024RC18VAB-C1803	091063	84
TZ1LE024MVAB-RC2100	096052	82	TZ1RE024RC18VAB-C1823	088091	72
TZ1LE024MVFG-RC1925	089464	60	TZ1RE024RC18VAB-C1826	084247	61
TZ1LE024PG0R8C	054964	66	TZ1RE024RC18VAB-C1828	090353	76
TZ1LE024RC18VAB	084242	61	TZ1RE024RC18VAB-C1937	074261	74
TZ1LE024RC18VAB-092998	092998	74	TZ1RE024RC18VAB-C2123	097348	81
TZ1LE024RC18VAB-093862	093862	69	TZ1RE024RC18VAB-C2140	098298	78
TZ1LE024RC18VAB-C1803	091062	84	TZ1RE024SR11	070826	63
TZ1LE024RC18VAB-C1823	088090	72	TZ1RE024SR11-093861	093861	68
TZ1LE024RC18VAB-C1826	084246	61	TZ1RE024SR11-094343	094343	73
TZ1LE024RC18VAB-C1828	090352	76	TZ1RE024SR11-C1684	070884	80
TZ1LE024RC18VAB-C1937	074260	74	TZ1RE024SR11-C1816	077042	72
TZ1LE024RC18VAB-C2123	097347	81	TZ1RE024SR11VAB-C1933	083231	63
TZ1LE024RC18VAB-C2140	098297	78	TZ1RE024SR6	046190	62
TZ1LE024RSR11	070828	63	TZ1RE024SR6-C1638	070529	62
TZ1LE024SR11-093860	093860	68	TZ1RE024SR6-C1677	059692	68
TZ1LE024SR11-094342	094342	73	TZ1RE110M	083161	60
TZ1LE024SR11-C1684	070886	80	TZ1RE110M-C1684	089475	79
TZ1LE024SR11-C1816	077044	72	TZ1RE110M-R	089448	60
TZ1LE024SR11VAB-C1933	083230	63	TZ1RE110MVAB	088024	60
TZ1LE024SR6	046502	62	TZ1RE110MVAB-C1623	088063	82
TZ1LE024SR6-C1638	089476	62	TZ1RE110MVAB-C1828	094312	75
TZ1LE024SR6-C1677	059694	68	TZ1RE110MVAB-C2082	095103	77
TZ1LE110M	083160	60	TZ1RE110PG0R8C	074916	66
TZ1LE110M-C1684	089924	79	TZ1RE110SR6	046191	62
TZ1LE110M-R	083168	60	TZ1RE220M	083167	60
TZ1LE110MVAB	088023	60	TZ1RE220M-C1684	093771	79
TZ1LE110MVAB-C1623	089466	82	TZ1RE220MVAB	088030	60
TZ1LE110MVAB-C1828	094311	75	TZ1RE220SR6	051879	62
TZ1LE110MVAB-C2082	095992	77	TZ2LE024BHA-C1903	082083	66
TZ1LE110PG0R8C	074917	66	TZ2LE024M	090559	60
TZ1LE110SR6	046503	62	TZ2LE024M-C1815	089460	75
TZ1LE220M	083166	60	TZ2LE024M-C1816	087992	71
TZ1LE220M-C1684	093770	79	TZ2LE024M-R	089445	60

Article	Order no.	Page	Article	Order no.	Page
TZ2LE024MVAB	088070	60			
TZ2LE024MVAB-C1823	089455	71			
TZ2LE024MVAB-C1828	087290	75			
TZ2LE024RC18VAB-C1803	075955	84			
TZ2LE024RC18VAB-C1826	085180	61			
TZ2LE024RC18VAB-C1828	093103	76			
TZ2LE024RC18VAB-C1937	100778	74			
TZ2LE024SR11	070958	63			
TZ2LE024SR11-C1815	079660	76			
TZ2LE024SR6	049159	62			
TZ2LE024SR6-C1638	076294	62			
TZ2LE024SR6-C1677	059852	68			
TZ2LE024SR6-R	046915	62			
TZ2LE110M	083162	60			
TZ2LE110MVAB	088025	60			
TZ2LE110SR6	052914	62			
TZ2LE220M	088031	60			
TZ2LE220MVAB	088027	60			
TZ2LE220SR6	045450	62			
TZ2RE024BHA-C1903	082084	66			
TZ2RE024M	090560	60			
TZ2RE024M-C1815	089461	75			
TZ2RE024M-C1816	087993	71			
TZ2RE024M-R	089446	60			
TZ2RE024MVAB	088071	60			
TZ2RE024MVAB-C1823	089456	71			
TZ2RE024MVAB-C1828	087291	75			
TZ2RE024RC18VAB-C1803	077149	84			
TZ2RE024RC18VAB-C1826	085181	61			
TZ2RE024RC18VAB-C1828	093104	76			
TZ2RE024RC18VAB-C1937	100777	74			
TZ2RE024SR11	070957	63			
TZ2RE024SR11-C1815	079661	76			
TZ2RE024SR6	049102	62			
TZ2RE024SR6-C1638	055819	62			
TZ2RE024SR6-C1677	059699	68			
TZ2RE024SR6-R	059672	62			
TZ2RE110M	083163	60			
TZ2RE110MVAB	088026	60			
TZ2RE110SR6	049238	62			
TZ2RE220M	088032	60			
TZ2RE220MVAB	088028	60			
TZ2RE220SR6	047937	62			

## Index by order number

Order no.	Article	Page
002787	SS4	119
012042	Roller arm NHB	131
012043	Roller arm NHS	131
012044	Roller arm NHBC569	131
013176	SR6EF	120
013178	SR6K	120
016849	ACTUATOR-Z-G	111
024298	HINGED ACTUATOR-Z-L	113
024299	HINGED ACTUATOR-Z-R	113
024999	SR6WF	120
028338	Plug connector with rectifier for solenoid locking	119
028345	Plug connector for solenoid locking	119
028357	Bolt NZ/TZ-S1	140
028359	Bolt NZ/TZ-S2	140
029220	NGLE060RT	131
029221	NGLE060GR	131
029222	NGLE060GE	131
035495	LE060RT	131
035496	LE060GR	131
035497	LE060GE	131
037299	NZ2VZ-528E3VSM04	55
038129	NZ2VZ-528EL220	49
043296	NZ2VZ-538EC1420	52
043861	Cable socket 6+PE	119
044894	NZ2VZ-528E3VSE04	57
045450	TZ2LE220SR6	62
045551	NZ2VZ-511EL060	49
045579	LE110RT	131
045582	LE220RT	131
045584	LE220GE	131
045801	NZ2VZ-528EL060	49
045822	NGLE110RT	131
045825	NGLE220RT	131
045827	NGLE220GE	131
045856	NZ2VZ-528E3VSM04L060	55
046190	TZ1RE024SR6	62
046191	TZ1RE110SR6	62
046502	TZ1LE024SR6	62
046503	TZ1LE110SR6	62
046504	TZ1LE220SR6	62
046730	Lockout bar Z-046730	129
046742	NZ2VZ-528E3VSE04L060	57
046915	TZ2LE024SR6-R	62
047837	NZ2VZ-538E3VSE04	57
047937	TZ2RE220SR6	62
048257	Lead seal kit TZ	130
048850	HINGED ACTUATOR-Z-U	113
049102	TZ2RE024SR6	62
049159	TZ2LE024SR6	62
049238	TZ2RE110SR6	62
050428	NZ2VZ-538E3VSM04	55
051879	TZ1RE220SR6	62
052108	NZ2VZ-538EL060	49
052914	TZ2LE110SR6	62
054121	NZ2HB-511L060C1630	38
054122	NZ2HB-511L060C1631	38
054773	SR11WF	120
054964	TZ1LE024PG0R8C	66
055718	NZ2VZ-528E3VSM09	55
055819	TZ2RE024SR6-C1638	62
057734	Bolt NZ-A	135
057735	Bolt NZ-C	135
057736	Bolt TZ-A	144

Order no.	Article	Page
057737	Bolt TZ-C	144
057921	NZ2VZ-538E3VSE04L060	57
057950	HINGED ACTUATOR-Z-O	113
059004	NZ2VZ-538EL220	49
059136	Protective plate NZ/TZ	130
059427	NZ2VZ-538E3VSM04L060	55
059467	NZ2VZ-528EL110	49
059481	NZ2WO-511L060C1630	25
059482	NZ2WO-511L060C1631	25
059672	TZ2RE024SR6-R	62
059692	TZ1RE024SR6-C1677	68
059694	TZ1LE024SR6-C1677	68
059699	TZ2RE024SR6-C1677	68
059852	TZ2LE024SR6-C1677	68
059920	TZ1RE024PG0R8C	66
070039	NZ2VZ-528E3VSM04L220	55
070290	NZ2VZ-528E3VSE07L110	57
070529	TZ1RE024SR6-C1638	62
070826	TZ1RE024SR11	63
070828	TZ1LE024SR11	63
070859	SR11EF	120
070884	TZ1RE024SR11-C1684	80
070886	TZ1LE024SR11-C1684	80
070957	TZ2RE024SR11	63
070958	TZ2LE024SR11	63
071200	NZ2VZ-538EC1701	52
071260	SRF	120
071261	SRM	120
072234	NZ2VZ-538EL110	49
072251	ACTUATOR-Z-GN	111
073293	RC-12P1N8A8300	119
073294	RC-12P1N8A8096	119
073455	M5X10/V100	130
073456	M5X16/V100	130
073457	M5X25/V100	130
073461	SGLF5-5000P	124
073462	SWLF5-5000P	124
073508	NZ1HS-3131-9C-GMMF	36
074063	M4X14/V100	130
074260	TZ1LE024RC18VAB-C1937	74
074261	TZ1RE024RC18VAB-C1937	74
074411	ACTUATOR-Z-G/V25	111
074412	HINGED ACTUATOR-Z-R/V25	113
074413	HINGED ACTUATOR-Z-L/V25	113
074414	HINGED ACTUATOR-Z-U/V25	113
074415	HINGED ACTUATOR-Z-O/V25	113
074471	NZ2VZ-2131E3VSM04	55
074472	NZ2VZ-3131E3VSM04	55
074473	NZ2VZ-2131E3VSE04	57
074474	NZ2VZ-3131E3VSE04	57
074616	RC18EF	121
074617	RC18WF	121
074916	TZ1RE110PG0R8C	66
074917	TZ1LE110PG0R8C	66
075530	M3X40/V100	130
075531	M3X70/V100	130
075955	TZ2LE024RC18VAB-C1803	84
076188	Bolt NZ-AC	136
076199	Bolt TZ-CF	143
076200	Bolt TZ-AF	143
076250	Actuating head NZVZ	130
076294	TZ2LE024SR6-C1638	62
076502	NZ2VZ-538E3VSM09	55

Order no.	Article	Page	Order no.	Article	Page
077014	RC18EF6M-C1825	122	079999	NZ1HB-538-MC569	44
077015	RC18EF8M-C1825	122	082050	TZ1LE024M	60
077016	RC18EF15M-C1825	122	082051	TZ1RE024M	60
077018	RC18WF6ML-C1825	122	082083	TZ2LE024BHA-C1903	66
077019	RC18WF8ML-C1825	122	082084	TZ2RE024BHA-C1903	66
077020	RC18WF15ML-C1825	122	082095	TZ1LE024BHA-C1903	66
077025	RC18EF-C1825	121	082096	TZ1RE024BHA-C1903	66
077026	RC18WF-C1825	121	082119	NZ1VZ-538EL060-M	48
077042	TZ1RE024SR11-C1816	72	082121	NZ1VZ-528EL220-M	48
077044	TZ1LE024SR11-C1816	72	082122	NZ1VZ-3131E-M	48
077149	TZ2RE024RC18VAB-C1803	84	082123	NZ1VZ-2131E-M	48
077206	Replacement key TX	132	082125	NZ1VZ-528E3VSM04-M	54
077229	NZ2VZ-538EC1233	52	082126	NZ1VZ-528E3VSM04L060-M	54
077362	NZ1RS-2131-9C-GMMF	29	082128	NZ1VZ-538E3VSE04L060-M	56
077363	NZ1VZ-2131E-9C-GMMF	50	082129	NZ1VZ-528E3VSM07-M	54
077390	NZ1HB-2131-9C-GMMF	39	082130	NZ1VZ-528E3VSE04I060-M	56
077391	NZ1HS-2131-9C-GMMF	36	082131	NZ1VZ-538E3VSM04-M	54
077629	SR11EF-5000	120	082132	NZ1VZ-538E3VSM04L060-M	54
077630	SR11EF-10000	120	082133	NZ1VZ-528E3VSE07-M	56
077631	SR11EF-15000	120	082134	NZ1VZ-2131E3VSE04-M	56
077632	SR6EF-5000	120	082137	NZ1VZ-528E-MC1233	51
077633	SR6EF-10000	120	082400	NZ2RS-511L060C1630	29
077634	SR6EF-15000	120	082921	TX1B-A024M	88
077635	SR11WF-5000	120	082922	TX1C-A024M	88
077636	SR11WF-10000	120	082927	TX2B-A024M	88
077637	SR11WF-15000	120	082928	TX2C-A024M	88
077638	SR6WF-5000	120	082933	TX1B-A024RC18	89
077639	SR6WF-10000	120	082934	TX1C-A024RC18	89
077640	SR6WF-15000	120	082939	TX2B-A024RC18	89
077679	EKPM20/06	124	082940	TX2C-A024RC18	89
077683	EKVM20/06	124	082944	TX1B-A024N	88
077684	EKVM20/09	124	082945	TX1C-A024N	88
077691	EKVN12/06	124	082946	TX2B-A024N	88
077692	EKPON12/06	124	082947	TX2C-A024N	88
078451	Bolt NZ-AF	137	082952	TX3B-A024M	90
078452	Bolt NZ-CF	137	082953	TX3C-A024M	90
078455	Bolt NZ-AR2	135	082964	TX3B-A024RC18	91
078456	Bolt NZ-CR2	135	082965	TX3C-A024RC18	91
078473	NZ2HS-511L060C1630	35	082988	TX3B-A110M	90
078487	N1AR514-M	18	082989	TX3C-A110M	90
079033	Adapter NZ/TZ45/30	151	082990	Bolt TX-A	146
079300	NZ1VZ-528E3VSE04-M	56	082991	Bolt TX-C	146
079350	NZ2RS-511L060C1631	29	082997	TX3B-A024N	90
079660	TZ2LE024SR11-C1815	76	082998	TX3C-A024N	90
079661	TZ2RE024SR11-C1815	76	082999	TX3B-A024BH12	91
079692	TZ1LE024BHA-C1902	83	083000	TX3C-A024BH12	91
079693	TZ1RE024BHA-C1902	83	083160	TZ1LE110M	60
079739	ACTUATOR-X-GQ	114	083161	TZ1RE110M	60
079740	ACTUATOR-X-WQ	114	083162	TZ2LE110M	60
079741	ACTUATOR-X-GNQ	114	083163	TZ2RE110M	60
079742	ACTUATOR-X-WNQ	114	083164	TZ1LE024M-R	60
079785	Bolt NZ/TZ-S1/CF	141	083165	TZ1RE024M-R	60
079786	Bolt NZ/TZ-S1/AF	141	083166	TZ1LE220M	60
079795	Lock TX	132	083167	TZ1RE220M	60
079796	Lock TX	132	083168	TZ1LE110M-R	60
079798	Bolt TZ-A-NIRO	144	083170	TZ1LE024M-C1684	79
079799	Bolt TZ-C-NIRO	144	083171	TZ1RE024M-C1684	79
079946	NZ1HB-528-MC569	44	083190	TZ1LE024BHAVFG-RC1924	64
079952	NZ1HB-511-M	37	083191	TZ1RE024BHAVFG-RC1924	64
079953	NZ1HS-511-M	34	083230	TZ1LE024SR11VAB-C1933	63
079960	NZ1RS-511-M	28	083231	TZ1RE024SR11VAB-C1933	63
079965	NZ1HB-511-MC569	44	083233	TZ1RE024MVAB-R	60
079996	NZ1HS-3131-MC1779	45	083246	TZ1LE024M-C1623	82

<b>Order no.</b>	<b>Article</b>	<b>Page</b>
083247	TZ1RE024M-C1623	82
083849	N1AD514-M	16
083850	N1AW514-M	21
083886	N1AD508-M	16
083887	N1AR508-M	18
083890	Bolt NZ-AB	135
083892	Bolt NZ-CB	135
083900	Bolt NZ/TZ-ACF	142
083965	TZ1LE024MVAB	60
083966	TZ1RE024MVAB	60
084242	TZ1LE024RC18VAB	61
084243	TZ1RE024RC18VAB	61
084246	TZ1LE024RC18VAB-C1826	61
084247	TZ1RE024RC18VAB-C1826	61
084820	TZ1LE024MVAB-C1684	79
084885	NZ2VZ-528E	49
084905	NZ2VZ-538ESVM5	49
085170	TZ1LE024MVAB-C1623	82
085171	TZ1RE024MVAB-C1623	82
085180	TZ2LE024RC18VAB-C1826	61
085181	TZ2RE024RC18VAB-C1826	61
085194	RC18WF6MR-C1825	122
085195	RC18WF8MR-C1825	122
085196	RC18WF15MR-C1825	122
085380	TX1B-A024BH10	89
085381	TX2B-A024BH10	89
085382	TX1B-A110N	88
085383	TX1B-A110M	88
085384	TX1C-A110M	88
085385	TX1B-A230M	88
085386	TX1C-A230M	88
085387	TX2B-A110M	88
085388	TX2C-A110M	88
085389	TX2B-A230M	88
085390	TX2C-A230M	88
085391	TX3B-A024MC1991	92
085392	Bolt TX-AF	147
085393	Bolt TX-CF	147
085396	TX3C-A024SR11	91
085569	TZ1LE024BHAFG-RC1971	83
085570	TZ1RE024BHAFG-RC1971	83
085676	NZ1VZ-538E-M	48
085753	EMP-SC	125
086327	EKVM12/04	124
086328	EKVM16/04	124
086330	EKVM16/06	124
086408	NZ1RK-528L060GE-MC1912	26
086413	NZ1RS-528L060-M	28
086525	NZ1HB-511L060GE-M	37
086527	NZ1HB-528L060GE-M	37
086528	NZ1RS-511L060GE-M	28
086538	Lockout bar-Z-086538	129
086574	NZ1HS-3131-8C-Ford /PT60577-101K01	36
087074	NZ1RS-3131-9C-GMMF	29
087147	N1ARL508-M	20
087158	N1AR514AM-M	19
087180	SR6AM2-M20	120
087204	N1ARL514-M	20
087205	N1AW508-M	21
087218	N1AD508LE060-M	16
087219	N1AR508LE060-M	18
087220	N1AW508LE060-M	21
087221	N1AD508LE110-M	16

<b>Order no.</b>	<b>Article</b>	<b>Page</b>
087222	N1AR508LE110-M	18
087223	N1AW508LE110-M	21
087224	N1AD508LE220-M	16
087225	N1AR508LE220-M	18
087226	N1AW508LE220-M	21
087245	N1AB508-M	18
087247	N1AB514-M	18
087256	Lead seal kit TZ-C1937	130
087256	Lead seal kit	132
087290	TZ2LE024MVAB-C1828	75
087291	TZ2RE024MVAB-C1828	75
087558	NZ2WO-538L060	25
087595	NZ1RS-2121-M	28
087603	N1AD514SVM5-M	17
087604	N1AR514SVM5-M	19
087990	TZ1LE024M-C1815	75
087991	TZ1RE024M-C1815	75
087992	TZ2LE024M-C1816	71
087993	TZ2RE024M-C1816	71
088023	TZ1LE110MVAB	60
088024	TZ1RE110MVAB	60
088025	TZ2LE110MVAB	60
088026	TZ2RE110MVAB	60
088027	TZ2LE220MVAB	60
088028	TZ2RE220MVAB	60
088029	TZ1LE220MVAB	60
088030	TZ1RE220MVAB	60
088031	TZ2LE220M	60
088032	TZ2RE220M	60
088035	NZ1VZ-538E3VSE09-M	56
088036	NZ1VZ-2131E3VSE07-M	56
088037	NZ1VZ-2131E3VSE09-M	56
088038	NZ1VZ-2131E3VSM07-M	54
088039	NZ1VZ-2131E3VSM09-M	54
088040	NZ1VZ-3131E3VSM07-M	54
088041	NZ1VZ-3131E3VSM09-M	54
088042	NZ1VZ-3131E3VSE07-M	56
088043	NZ1VZ-3131E3VSE09-M	56
088044	NZ1VZ-538E3VSM09-M	54
088045	NZ1VZ-528E3VSM09-M	54
088046	NZ1VZ-538E3VSM07-M	54
088047	NZ1VZ-528E3VSE09-M	56
088048	NZ1VZ-538E3VSE07-M	56
088049	NZ1VZ-2131E3VSM04-M	54
088050	NZ1VZ-3131E3VSM04-M	54
088051	NZ1VZ-3131E3VSE04-M	56
088063	TZ1RE110MVAB-C1623	82
088070	TZ2LE024MVAB	60
088071	TZ2RE024MVAB	60
088084	TZ1RE024MVAB-C1684	79
088090	TZ1LE024RC18VAB-C1823	72
088091	TZ1RE024RC18VAB-C1823	72
088180	NZ2RK-511L110	27
088196	NZ2HS-528L060	35
088197	NZ2RS-528L060	29
088199	NZ1HB-528-M	37
088583	NB01R588-M	22
088584	NB01D588-M	22
088605	NZ1RG-511-M	30
088608	NZ1RK-511-M	26
088611	NZ1WO-511-M	24
088613	NZ1PS-511-M	40
088614	NZ1RL-511-M	32

<b>Order no.</b>	<b>Article</b>	<b>Page</b>	<b>Order no.</b>	<b>Article</b>	<b>Page</b>
088618	NZ1PB-511-M	42	090025	NZ2RL-511	33
088852	NZ2VZ-2121E	49	090026	NZ2RG-511SVM5	30
088996	NZ1RL-511L060-M	32	090027	NZ2RS-511SVM5	28
089007	NZ2RK-511SVM5	26	090028	NZ2RL-511SVM5	32
089014	NZ2WO-511SVM5	24	090032	NZ2RG-511	31
089018	NZ2RK-538SVM5	26	090035	NZ1HS-511L060-M	34
089052	NZ1RG-511L060-M	30	090036	NZ1HS-511L110-M	34
089053	NZ1RS-511L060-M	28	090037	NZ1HS-511L220-M	34
089054	NZ1RG-511L220-M	30	090038	NZ1HS-511L060GE-M	34
089055	NZ1RS-511L220-M	28	090039	NZ1HB-511L060-M	37
089057	NZ1WO-511L060-M	24	090040	NZ1HB-511L220-M	37
089058	NZ1WO-511L060GE-M	24	090049	NZ1HS-528L060GE-M	34
089059	NZ1WO-511L110-M	24	090050	NZ1HS-528L110-M	34
089076	NZ1WO-538L060-M	24	090051	NZ1HB-528L220-M	37
089078	NZ1WO-528L060-M	24	090052	NZ1HS-528L220-M	34
089079	NZ1RL-511L220-M	32	090136	NZ2HB-2131	38
089080	NZ1RL-511L110-M	32	090137	NZ2HB-3131	38
089091	NZ2HB-511	38	090143	NZ2VZ-538E	49
089092	NZ2HB-511L060	38	090144	NZ2VZ-2131E	49
089093	NZ2HS-511	35	090145	NZ2VZ-3131E	49
089094	NZ2HS-511L060	35	090146	NZ2HS-2131	35
089434	TZ1LE024MVAB-R	60	090147	NZ2RS-511L060	29
089445	TZ2LE024M-R	60	090149	NZ2RS-2131	29
089446	TZ2RE024M-R	60	090150	NZ2PS-3131	41
089448	TZ1RE110M-R	60	090151	NZ2PS-2131	41
089455	TZ2LE024MVAB-C1823	71	090152	NZ2PS-511L060	41
089456	TZ2RE024MVAB-C1823	71	090254	NZ1HS-2121-M	34
089460	TZ2LE024M-C1815	75	090334	NZ1VZ-538E3VSE09L220-M	56
089461	TZ2RE024M-C1815	75	090335	NZ1VZ-528E3VSE09L220-M	56
089464	TZ1LE024MVFG-RC1925	60	090336	NZ1VZ-528E3VSE07L220-M	56
089465	TZ1RE024MVFG-RC1925	60	090337	NZ1VZ-528E3VSE07L060-M	56
089466	TZ1LE110MVAB-C1623	82	090339	NZ1VZ-511E3VSM04-M	54
089468	TZ1LE024MVAB-C1828	75	090340	NZ1VZ-538E3VSM07L110-M	54
089469	TZ1RE024MVAB-C1828	75	090341	NZ1VZ-528E3VSM07L220-M	54
089470	TZ1LE024M-089470	67	090342	NZ1VZ-528E3VSM09L220-M	54
089471	TZ1RE024M-089471	67	090343	NZ1VZ-511E3VSE04-M	56
089475	TZ1RE110M-C1684	79	090344	NZ1VZ-511E3VSM04L060-M	54
089476	TZ1LE024SR6-C1638	62	090345	NZ1VZ-538E3VSM04L220-M	54
089477	TZ1LE024M-C1816	71	090346	NZ1VZ-528E3VSE09L060-M	56
089479	NZ1VZ-511E-M	48	090348	NZ1VZ-538E3VSE07L110-M	56
089480	NZ1VZ-528EL110-M	48	090349	NZ1VZ-528E3VSM09L060-M	54
089481	NZ1VZ-538EL110-M	48	090352	TZ1LE024RC18VAB-C1828	76
089482	NZ1VZ-538EL220-M	48	090353	TZ1RE024RC18VAB-C1828	76
089484	NZ1VZ-528E3VSE07L110-M	56	090354	NZ1RK-511L060-M	26
089485	NZ1VZ-528E3VSM07L110-M	54	090355	NZ1RK-511L220-M	26
089486	NZ1VZ-2121E-M	48	090358	NZ1RK-528L060-M	26
089488	NZ1VZ-528E3VSM04L220-M	54	090424	NZ1RS-538L060GE-M	28
089496	NZ1VZ-538EL220-MC1233	51	090430	NZ1PS-528L060-M	40
089497	NZ1VZ-528EL060-MC1233	51	090546	N1AD508AM-M	17
089622	NZ2RS-511L060GE	29	090547	N1AR508AM-M	19
089624	NZ1WO-528-M	24	090555	NZ1RS-538L060-M	28
089626	NZ1WO-3131-M	24	090559	TZ2LE024M	60
089627	NZ1RS-528-M	28	090560	TZ2RE024M	60
089629	NZ1WO-2131-M	24	090566	NZ1VZ-528EL060-M	48
089631	NZ1RS-3131-M	28	090572	NZ1RK-528-MC1912	26
089633	NZ1RS-2131-M	28	090671	NZ1VZ-528E-M	48
089905	NZ1VZ-538E3VSE04-M	56	090697	NZ2HS-511L060GE	35
089914	NZ1VZ-2121E-MC1233	51	090719	NZ2HB-511L060GE	38
089924	TZ1LE110M-C1684	79	090743	N1AW514SVM5-M	21
090008	NZ1RG-528L060-M	30	090747	NZ1HS-3131-M	34
090009	NZ1RG-538L060-M	30	090760	NZ1HS-538L060-M	34
090016	NZ2RK-511	27	090845	NZ2HB-528	38
090024	NZ2RS-511	29	090846	NZ2HB-528L060	38

<b>Order no.</b>	<b>Article</b>	<b>Page</b>
090847	NZ2HB-538	38
090848	NZ2HB-538L060	38
090852	NZ2HS-528	35
090853	NZ2HS-538	35
090854	NZ2HS-538L060	35
090856	NZ2HS-3131	35
090861	NZ2HB-511SVM5	37
090862	NZ2HB-538SVM5	37
090864	NZ2HB-528SVM5	37
090867	NZ2HS-511SVM5	34
090868	NZ2HS-528SVM5	34
090869	NZ2HS-538SVM5	34
090871	NZ1PB-538-M	42
090872	NZ1PB-2131-M	42
090873	NZ1PB-3131-M	42
090874	NZ1PS-528-M	40
090875	NZ1PS-538-M	40
090876	NZ1PS-2131-M	40
090877	NZ1PS-3131-M	40
090878	NZ1WO-538-M	24
090905	NZ1RK-528-M	26
090906	NZ1RK-538-M	26
090907	NZ1RK-2131-M	26
090908	NZ1RK-3131-M	26
090909	NZ2WO-511	25
090910	NZ2WO-528	25
090911	NZ2WO-538	25
090912	NZ2WO-2131	25
090913	NZ2WO-3131	25
090919	NZ2RK-528	27
090920	NZ2RK-538	27
090921	NZ2RK-2131	27
090922	NZ2RK-3131	27
090923	NZ2WO-528SVM5	24
090924	NZ2WO-538SVM5	24
090930	NZ2RK-528SVM5	26
090932	NZ1RG-528-M	30
090933	NZ1RG-538-M	30
090934	NZ1RG-2131-M	30
090935	NZ1RG-3131-M	30
090936	NZ1RS-538-M	28
090937	NZ1RL-528-M	32
090938	NZ1RL-528L060-M	32
090939	NZ1RL-538-M	32
090940	NZ1RL-538L060-M	32
090941	NZ1RL-2131-M	32
090942	NZ1RL-3131-M	32
090943	NZ2RG-528	31
090945	NZ2RG-538	31
090946	NZ2RG-538L060	31
090947	NZ2RG-2131	31
090948	NZ2RG-3131	31
090950	NZ2RS-528	29
090951	NZ2RS-538	29
090952	NZ2RS-538L060	29
090954	NZ2RS-3131	29
090958	NZ2RL-2131	33
090959	NZ2RL-3131	33
090961	NZ2RG-528SVM5	30
090962	NZ2RG-538SVM5	30
090963	NZ2RS-528SVM5	28
090964	NZ2RS-538SVM5	28
090965	NZ1HB-528L060-M	37

<b>Order no.</b>	<b>Article</b>	<b>Page</b>
090966	NZ1HB-538-M	37
090967	NZ1HB-538L060-M	37
090968	NZ1HB-2131-M	37
090969	NZ1HB-3131-M	37
090970	NZ1HS-528-M	34
090971	NZ1HS-528L060-M	34
090972	NZ1HS-538-M	34
090973	NZ1HS-2131-M	34
090974	NZ2RS-2121	29
090975	NZ2RL-2121	33
090976	NZ2WO-2121	25
091062	TZ1LE024RC18VAB-C1803	84
091063	TZ1RE024RC18VAB-C1803	84
091091	NZ1HB-511L060-MC569	44
091261	N1AD514AM-M	17
091264	NZ2HS-2121	35
091268	NZ2PS-2121	41
091278	NZ2RL-538L060	33
091279	NZ2WO-528L060	25
091280	NZ2WO-511L060	25
091281	NZ2HB-528L220	38
091282	NZ2RL-528L060	33
091284	NZ2RG-511L060	31
091291	NZ1RS-528L220-M	28
091292	NZ2RK-528L060	27
091296	SR11AM2-M20	120
091305	Lockout bar with chain	129
091312	NZ1HS-511-MC1833	46
091330	NZ1HB-528L060-MC569	44
091339	NZ1RS-528-MC1588	43
091346	NZ2HB-528L060C1630	38
091347	NZ2HB-528L060C1631	38
091352	NZ1RS-511-MC1588	43
091632	NZ2PS-538L060	41
091682	NX1-2131AL024-M	86
091738	NZ1VZ-528E3VSE04L220-M	56
092355	NZ1VZ-2131E-8C-GMMF	50
092624	NX1-2131A-M	86
092625	NX1-2121A-M	86
092626	NX1-3131A-M	86
092697	RC18WF2MLF-C1825	122
092698	RC18WF6MRF-C1825	122
092699	RC18WF10MLF-C1825	122
092700	RC18WF10MRF-C1825	122
092701	RC18WF15MLF-C1825	122
092702	RC18WF15MRF-C1825	122
092704	RC18WF20MLF-C1825	122
092708	RC18WF20MRF-C1825	122
092724	RC18WF25MLF-C1825	122
092725	RC18WF25MRF-C1825	122
092726	RC18EF20M-C1825	122
092727	RC18EF25M-C1825	122
092761	RC18EF1,5M-C1825	122
092816	RC18EF3M-C1825	122
092883	RC18EF1,5MF-C1825	122
092884	RC18EF3MF-C1825	122
092885	RC18EF6MF-C1825	122
092886	RC18EF8MF-C1825	122
092887	RC18EF10MF-C1825	122
092888	RC18EF15MF-C1825	122
092889	RC18EF20MF-C1825	122
092890	RC18EF25MF-C1825	122
092891	RC18WF1,5MLF-C1825	122

Order no.	Article	Page	Order no.	Article	Page
092892	RC18WF1,5MRF-C1825	122	095898	NZ1HB-2131-10C-FW	39
092893	RC18WF3MLF-C1825	122	095902	TZ1LE024MVAB-10C-FW	83
092894	RC18WF3MRF-C1825	122	095903	TZ1RE024MVAB-10C-FW	83
092895	RC18WF8MLF-C1825	122	095992	TZ1LE110MVAB-C2082	77
092896	RC18WF8MRF-C1825	122	095993	RC18EF30M-C1825	122
092898	RC18EF10M-C1825	122	096007	ESH-PRO	106
092901	RC18WF10ML-C1825	122	096007	ESH-PRO	107
092902	RC18WF10MR-C1825	122	096051	TZ1RE024MVAB-RC2100	82
092906	RC18WF1,5ML-C1825	122	096052	TZ1LE024MVAB-RC2100	82
092907	RC18WF1,5MR-C1825	122	096057	Bolt TZ-A-NIRO-C2101	144
092908	RC18WF3ML-C1825	122	096058	Bolt TZ-C-NIRO-C2101	144
092909	RC18WF3MR-C1825	122	096098	Lockout bar TX	129
092910	RC18WF20ML-C1825	122	096173	TX1D-A024MC1991	92
092911	RC18WF20MR-C1825	122	096384	Bolt S-A	148
092912	RC18WF25ML-C1825	122	096385	Bolt S-C	148
092913	RC18WF25MR-C1825	122	096390	Bolt S-AF	148
092998	TZ1LE024RC18VAB-092998	74	096391	Bolt S-CF	148
092999	TZ1RE024RC18VAB-092999	74	096439	STA1A-4131A024M	102
093103	TZ2LE024RC18VAB-C1828	76	096487	TZ1LE024MVAB-C2082	77
093104	TZ2RE024RC18VAB-C1828	76	096488	TZ1RE024MVAB-C2082	77
093112	NZ2PS-511	41	096613	Switch bracket TP-GFK	150
093118	TX3C-A024MC1991	92	096614	Switch bracket NZ-GFK	139
093157	Insertion funnel STA	129	096617	Bolt NZ-GFK	139
093456	EMP-SB	126/127	096632	SR11EF-20000	120
093457	EMP-B1	125/126/ 127/128	096697	HINGED ACTUATOR-S-OU-LN	118
093458	EMP-B2	128	096838	HINGED ACTUATOR-S-LR-SN	117
093500	Bolt handle/V5	151	096844	HINGED ACTUATOR-S-LR-LN	118
093521	NZ1PS-528L220-M	40	096901	TZ1RE024M-C1816	71
093523	NZ1PS-528L220GE-M	40	096935	STA2A-4131A024M	102
093559	TX3B-A024RC18C1991	93	096936	STA3A-4121A024M	100
093770	TZ1LE220M-C1684	79	096937	STA4A-4121A024M	100
093771	TZ1RE220M-C1684	79	096938	STA3A-2131A024M	100
093857	NZ2VZ-2131EC1233	52	096939	STA4A-2131A024M	100
093858	NZ1VZ-538E-MC1233	51	097347	TZ1LE024RC18VAB-C2123	81
093859	NZ1VZ-2131E-MC1233	51	097348	TZ1RE024RC18VAB-C2123	81
093860	TZ1LE024SR11-093860	68	097436	ACTUATOR-Z-GME	111
093861	TZ1RE024SR11-093861	68	097603	Bolt NZ-GFK-F	139
093862	TZ1LE024RC18VAB-093862	69	097623	TX1B-A024MC2129	94
093863	TZ1RE024RC18VAB-093863	69	097861	ACTUATOR S-G-SN-C2115	116
094309	Pin crimp contact RCM	121	097906	HINGED ACTUATOR-X-OU-N	115
094310	Pin crimp contact RCM-C1825	121	098082	HINGED ACTUATOR-X-LRN	115
094311	TZ1LE110MVAB-C1828	75	098121	Bolt STP-GFK	150
094312	TZ1RE110MVAB-C1828	75	098128	SR6EF-20000	120
094342	TZ1LE024SR11-094342	73	098205	TZ1RE024MVAB-C2087	65
094343	TZ1RE024SR11-094343	73	098253	TZ1RE024M-C2087	65
094401	EMP-SA	128	098297	TZ1LE024RC18VAB-C2140	78
094749	SR11EF-25000	120	098298	TZ1RE024RC18VAB-C2140	78
094771	Emergency unlocking TX	132	098648	NZ2HS-511SVM5L060GE	34
094773	Release with automatic reset TX	132	098649	NZ2HB-511SVM5L060GE	37
095025	TX1D-A024MC2081	88	098651	NZ2RS-511SVM5L060GE	28
095026	TX2D-A024MC2081	88	098652	NZ2WO-511SVM5L060GE	24
095103	TZ1RE110MVAB-C2082	77	098717	TZ1RB024MVAB-C2159	70
095245	TZ1LE024M-C2087	65	098718	TZ1LB024MVAB-C2159	70
095315	HINGED ACTUATOR-S-OU-SN	117	098946	TX3C-A024MC2161	92
095738	ACTUATOR S-GT-SN	116	099274	STA3A-4141A024M	100
095739	ACTUATOR S-GT-LN	116	099480	STA3A-4131A024M	100
095740	ACTUATOR S-WQ-SN	116	099481	STA3A-4131A024M	100
095741	ACTUATOR S-WQ-LN	116	099489	TX1C-A024MC2161	92
095806	NZ2RL-2121C1831	33	099658	STA3A-2131A024L024RC18	101
095894	ESH-PRO-20A-1205	106	099876	Emergency unlocking STA	132
095895	ESH-PRO-11A-1205	106	100029	STA3A-4141A024RC18	101
095896	NZ1VZ-2131E-10C-FW	50	100406	HINGED ACTUATOR-Z-R-C2194	113
			100407	HINGED ACTUATOR-Z-L-C2194	113

<b>Order no.</b>	<b>Article</b>	<b>Page</b>
100777	TZ2RE024RC18VAB-C1937	74
100778	TZ2LE024RC18VAB-C1937	74
100898	STA3A-4141A024L024M	100
100938	C-MINF...	123
100939	C-MINF...	123
100940	C-MINF...	123
100941	C-MINF...	123
100942	C-MINF...	123
100943	C-MINF...	123
100944	C-MINF...	123
100945	C-MINF...	123
100946	C-MINF...	123
100947	C-MINF...	123
100948	C-MINF...	123
100949	C-MINF...	123
100950	C-MINF...	123
100951	C-MINF...	123
100952	C-MINF...	123
100953	C-MINF...	123
100954	C-MINF...	123
100955	C-MINF...	123
100956	C-MINF...	123
100957	C-MINF...	123
100958	C-MINF...	123
100959	C-MINF...	123
100960	C-MINF...	123
100961	C-MINF...	123
100962	C-MINF...	123
100963	C-MINF...	123
100964	C-MINF...	123
100965	C-MINF...	123
100966	C-MINF...	123
100967	C-MINF...	123
100968	C-MINF...	123
102490	RC18EF40M-C1825	122
102502	C-MINF...	123
102503	C-MINF...	123
102504	C-MINF...	123
102505	C-MINF...	123
102506	C-MINF...	123
102507	C-MINF...	123
102508	C-MINF...	123
102509	C-MINF...	123
102510	C-MINF...	123
102511	C-MINF...	123
102512	C-MINF...	123
102513	C-MINF...	123
102514	C-MINF...	123
102515	C-MINF...	123
102516	C-MINF...	123
102517	C-MINF...	123
102518	C-MINF...	123
102519	C-MINF...	123
102520	C-MINF...	123
102521	C-MINF...	123
102522	C-MINF...	123
102523	C-MINF...	123
102524	C-MINF...	123
102525	C-MINF...	123
102526	C-MINF...	123
102527	C-MINF...	123
103057	Triangular key	132
103149	C-MINF...	123

<b>Order no.</b>	<b>Article</b>	<b>Page</b>
103150	C-MINF...	123
103151	C-MINF...	123
103152	C-MINF...	123
103153	C-MINF...	123
103154	C-MINF...	123
103156	C-MINF...	123
103157	C-MINF...	123
103158	C-MINF...	123
103159	C-MINF...	123
103160	C-MINF...	123
103221	N1AR508-MC2222	18
103222	N1AW508-MC2222	21
103237	N1AD508-MC2222	16
103660	STA3A-2131A024MC1993	103
103725	SGA1A-2121A-M	96
103845	HINGED ACTUATOR-Z-U-C2241	113
103926	STA4A-2131A024L024M	100
104012	SGA2A-2121ARC18-ETX5	98
104068	HINGED ACTUATOR-Z-O-C2241	113
104171	STA3A-2131A230M	100
104398	Bolt BTC-NZVZ-S-TH-00-X	138
104399	Bolt BTC-NZVZ-S-TH-01-F	138
105303	STA4A-2131A024L024RC18	101
105304	STA3A-4121A024SR11	101
105329	Escape release handle	133
105701	Lockout bar STP	129
105888	STA-TW-3A-2131AC024M-S1	104
106278	Bolt BTC-TZ00-A-TH-00-X	145
106279	Bolt BTC-TZ00-A-TH-01-F	145
106280	Bolt BTC-TZ00-C-TH-00-X	145
106281	Bolt BTC-TZ00-CA-TH-01-F	145
106284	Bolt BTC-ST/G-S-TH-00-X	149
106285	Bolt BTC-ST/G-S-TH-01-F	149
106307	SGA1A-2131A-M	96
106379	STA-TW-3A-4121AC024L024M	104
106535	STA3A-4121A024L024M	100
106545	STA-TW-3A-4121AC024M	104
106548	ESH-ARO-20A-1205	107
106617	STA-TW-3A-2131AC024M	104
106622	STA4A-2131A024L024RC18C1826	101
106623	STA3A-2131A024L024RC18C1826	101
106736	SGA2E-2131ASR11	97
109172	STA4A-4141A024M	100
109409	ESH-ARO-11A-1205	107
110301	C-23F...	123
110302	C-23F...	123
110303	C-23F...	123
110304	C-23F...	123
110305	C-23F...	123
110306	C-23F...	123
110307	C-23F...	123
110443	INSTALLATION KIT CAP	107







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